APPENDIX 6 – ASSESSMENT OF SIGNIFICANCE (BC ACT & FM Act)

The EP&A Act includes in Section 5A, five factors which are to be considered when determining if a proposed development or activity '*is likely to have a significant effect on the threatened species, populations or ecological communities, or their habitats'.* These five factors must be taken into account by consent or determining authorities when considering a development proposal or development application. This enables a decision to be made as to whether there is likely to be a significant effect on the species and hence if a Species Impact Statement is required (DECC 2007).

Table 18 (Appendix 5) found that 10 presumed extinct species were to be reintroduced, 19 threatened biota were known to occur within the vicinity of the proposed CFAI, with an additional 11 species having a moderate to high potential of occurring based on the evaluation completed. The 40 biota considered for the Assessment of Significance are:

To be reintroduced

- Western Quoll, presumed extinct BC Act
- Red-tailed Phascogale, presumed extinct BC Act
- Numbat, presumed extinct BC Act
- Western Barred Bandicoot, presumed extinct BC Act
- Bilby, presumed extinct BC Act
- Burrowing Bettong, presumed extinct BC Act
- Brush-tailed Bettong, presumed extinct BC Act
- Bridled Nailtail Wallaby, presumed extinct BC Act
- Greater Stick-nest Rat, presumed extinct BC Act
- Mitchell's Hopping-mouse, presumed extinct BC Act

Known to occur

- Chestnut Quail-thrush, vulnerable BC Act
- Dusky Woodswallow, vulnerable BC Act
- Gilbert's Whistler, vulnerable BC Act
- Hooded Robin, vulnerable BC Act
- Major Mitchell's (Pink) Cockatoo, vulnerable BC Act
- Malleefowl, endangered BC Act
- Pied Honeyeater, vulnerable BC Act
- Purple-gaped Honeyeater, vulnerable BC Act
- Shy Heathwren, vulnerable BC Act
- Southern Scrub-robin, vulnerable BC Act
- Spotted Harrier, vulnerable BC Act
- Varied Sittella, vulnerable BC Act
- White-fronted Chat, vulnerable BC Act
- Southern Ningaui, vulnerable BC Act
- Western Pygmy-possum, endangered BC Act
- Jewelled Gecko, vulnerable BC Act

- Mallee Worm-lizard, endangered BC Act
- Western Blue-tongue Lizard, vulnerable BC Act
- Bitter Quandong, endangered BC Act

Moderate to High likelihood of occurrence

- Black-chinned Honeyeater, vulnerable BC Act (moderate)
- Flame Robin, vulnerable BC Act (moderate)
- Little Eagle, vulnerable BC Act (moderate)
- Little Pied Bat, vulnerable BC Act (high)
- Bardick, endangered BC Act (moderate)
- Mallee Slender Blue-tongue Lizard, endangered BC Act (high)
- Marble-faced Delma, endangered BC Act (moderate)
- Yellow-tailed Plain Slider, vulnerable BC Act (moderate)
- Cobar Greenhood, vulnerable BC Act (moderate)
- Mossgiel Daisy, vulnerable BC Act (moderate)
- Yellow Swainson-pea, vulnerable BC Act (moderate)

Western Quoll

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

Western Quoll is currently listed as Extinct in NSW under the BC Act. The last recorded sighting was in 1857. Given that the species does not currently occur within the vicinity of the proposal, the direct and indirect impacts *will not* have an adverse effect on a viable local population, as none is present. The proposal will not adversely affect source population(s) 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 Quoll will be reintroduced into the proposed fence area as part of the proposal. As a mid-sized native predator, the Western Quoll may play a role in the regulation of populations of prey species; a natural process of landscape restoration.

Predicted population size is challenging to estimate given large variation in density estimates. The population size within a 9,570 ha enclosure would be around 90 animals.

It is envisaged that the species will build a population outside the proposed feral-free fenced areas in conjunction with feral predator control, such that the total population sizes will be larger than the proposed feral-free fenced area alone. Population densities outside the fence, assuming intensive feral predator control, are predicted to be 0.007/ha at Mallee Cliffs, or 350 animals in about 48,548 ha of the project area outside the fence.

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.

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

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

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

Western Quoll is currently listed as Extinct in NSW under the BC Act. It is not listed as an Endangered Ecological Community or Critically Endangered Ecological Community.

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

Western Quoll is currently listed as Extinct in NSW under the BC Act, so does not currently occur in NSW, or in the vicinity of the proposed CFAI. The proposed CFAI will create 9,570 ha of habitat free of introduced predators for Western Quoll, which would be reintroduced by AWC. The action would not affect existing habitat for the Western Quoll but will improve potential habitat to enable a successful reintroduction which is important for the long-term survival of the species.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The Western Quoll is currently listed as Extinct in NSW under the BC Act, so does not currently occur in NSW, or in the vicinity of the proposed CFAI. The action does not constitute, and is not part of, a key threatening process and is not likely to result in the operation of, or an increase in the impact of, a key threatening process.

Conclusion

This Assessment of Significance has determined that the proposed activity *will not* have a *'significant effect'* on Western Quoll or their habitats. Therefore, the proposed activity will not require a Species Impact Statement.

Red-tailed Phascogale

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

Red-tailed Phascogale is currently listed as Extinct in NSW under the BC Act. The last recorded sighting was in 1857. Given that the species does not currently occur within the vicinity of the proposal, the direct and indirect impacts *will not* have an adverse effect on a viable local population, as none is present. The proposal will not adversely affect source population(s) 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.

Predicted population size within a 9,570 ha enclosure would be 1,700 animals, assuming 75% of the proposed feral-free fenced area supports suitable habitat (woodlands).

A translocation has recently been made to Kojonup WA, which is unfenced. This population has persisted, although the long-term success of the translocation has yet to be determined.

For this project, AWC intends to source Red-tailed Phascogales from several wild populations in WA. The intention would be to maximise the genetic diversity of the reintroduced population.

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

Red-tailed Phascogale is currently listed as Extinct in NSW under the BC Act. It is not listed as an Endangered Ecological Community or Critically Endangered Ecological Community.

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

Red-tailed Phascogale is currently listed as Extinct in NSW under the BC Act, so does not currently occur in NSW, or in the vicinity of the proposed CFAI. The proposed CFAI will create 9,570 ha of habitat free of introduced predators for Red-tailed Phascogale, which would be reintroduced by AWC. The action would not affect existing habitat for Red-tailed Phascogale but will improve potential habitat to enable a successful reintroduction which is important for the long-term survival of the species.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The Red-tailed Phascogale is currently listed as Extinct in NSW under the BC Act, so does not currently occur in NSW, or in the vicinity of the proposed CFAI. The action does not constitute, and is not part of, a key threatening process and is not likely to result in the operation of, or an increase in the impact of, a key threatening process affecting the Red-tailed Phascogale.

Conclusion

This Assessment of Significance has determined that the proposed activity ***will not*** have a *'significant effect'* on Red-tailed Phascogale or their habitats. Therefore, the proposed activity will not require a Species Impact Statement.

Numbat

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

Numbat is currently listed as Extinct in NSW under the BC Act. The last recorded sighting (other than at Scotia Wildlife Sanctuary) was in 1900. Given that the species does not currently occur within the vicinity of the proposal, the direct and indirect impacts *will not* have an adverse effect on a viable local population, as none is present. The proposal will not adversely affect source population(s) 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.

Numbats have been reintroduced to nine sites in south-west WA; populations are reported to persist at two of these sites. Numbats have been successfully reintroduced to three fenced feral predator-free areas in AWC sanctuaries: Scotia (NSW), Yookamurra (SA) and Mt Gibson (WA).

Predicted population size within a 9,570 ha enclosure (as proposed for Mallee Cliffs) would be 270 animals, assuming 75% of the proposed feral-free fenced area supports high quality habitat (woodlands).

Reintroductions outside proposed feral-free fenced areas have a low chance of success unless coupled with intensive feral predator control that eliminates or suppresses feral predator densities to insignificant levels; this is not currently feasible. Populations in south-west WA initially responded to fox control, but have since declined due to cat predation (Woinarski et al. 2014). The collapse of Numbat populations suggests a high degree of vulnerability to feral predators.

Given the decline in remnant populations, it is likely to be necessary to obtain some or all of the founders from reintroduced populations (Scotia, Yookamurra, Mt Gibson or other reintroduced WA populations), supplemented with captive bred animals.

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

- *(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
- *(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,*

Numbat is currently listed as Extinct in NSW under the BC Act. It is not listed as an Endangered Ecological Community or Critically Endangered Ecological Community.

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

- *(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and*
- *(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and*
- *(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,*

Numbat is currently listed as Extinct in NSW under the BC Act, so does not currently occur in the vicinity of the proposed CFAI. The proposed CFAI will create 9,570 ha of habitat free of introduced predators for Numbat, which would be reintroduced by AWC. The action would not affect existing habitat for the Numbat but will improve potential habitat to enable a successful reintroduction which is important for the long-term survival of the species.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The Numbat is currently listed as Extinct in NSW under the BC Act, so does not currently occur in the vicinity of the proposed CFAI. The action does not constitute, and is not part of, a key threatening process and is not likely to result in the operation of, or an increase in the impact of, a key threatening process affecting the Numbat.

Conclusion

This Assessment of Significance has determined that the proposed activity ***will not*** have a *'significant effect'* on Numbat or its habitats. Therefore, the proposed activity will not require a Species Impact Statement.

Western Barred Bandicoot

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

Western Barred Bandicoot is currently listed as Extinct in NSW under the BC Act. The last recorded sighting was in 1866. Given that the species does not currently occur within the vicinity of the proposal, the direct and indirect impacts *will not* have an adverse effect on a viable local population, as none is present. The proposal will not adversely affect source population(s) 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 in 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.

Predicted population size within a 9,570 ha enclosure (as proposed for Mallee Cliffs) would be 1,600 animals, although substantial variation is likely with rainfall.

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

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

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

Western Barred Bandicoot is currently listed as Extinct in NSW under the BC Act. It is not listed as an Endangered Ecological Community or Critically Endangered Ecological Community.

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

Western Barred Bandicoot is currently listed as Extinct in NSW under the BC Act, so does not currently occur in NSW, or in the vicinity of the proposed CFAI. The proposed CFAI will create 9,570 ha of habitat free of introduced predators for Western Barred Bandicoot. The action would not affect existing habitat for the Western Barred Bandicoot but will improve potential habitat to enable a successful reintroduction which is important for the long-term survival of the species.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The Western Barred Bandicoot is currently listed as Extinct in NSW under the BC Act, so does not currently occur in NSW, or in the vicinity of the proposed CFAI. The action does not constitute, and is not part of, a key threatening process and is not likely to result in the operation of, or an increase in the impact of, a key threatening process affecting the Western Barred Bandicoot.

Conclusion

This Assessment of Significance has determined that the proposed activity ***will not*** have a *'significant effect'* on Western Barred Bandicoot or their habitats. Therefore, the proposed activity will not require a Species Impact Statement.

Bilby

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

Bilby is currently listed as Extinct in NSW under the BC Act. The last recorded sighting (other than at Scotia Wildlife Sanctuary) was in 1912. Given that the species does not currently occur within the vicinity of the proposal, the direct and indirect impacts *will not* have an adverse effect on a viable local population, as none is present. The proposal will not adversely affect source population(s) 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 proposed feral-free 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.

Predicted population size within a 9,570 ha enclosure (as proposed for Mallee Cliffs) would be 1,100 animals.

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

Bilby is currently listed as Extinct in NSW under the BC Act. It is not listed as an Endangered Ecological Community or Critically Endangered Ecological Community.

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

Bilby is currently listed as Extinct in NSW under the BC Act, so does not currently occur in the vicinity of the proposed CFAI. The proposed CFAI will create 9,570 ha of habitat free of introduced predators for Bilby The action would not affect existing habitat for the Bilby but will improve potential habitat to enable a successful reintroduction which is important for the long-term survival of the species.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The Bilby is currently listed as Extinct in NSW under the BC Act, so does not currently occur in the vicinity of the proposed CFAI. The action *does not* constitute, and is not part of, a key threatening process and is not likely to result in the operation of, or increase the impact of, a key threatening process affecting the Bilby.

Conclusion

This Assessment of Significance has determined that the proposed activity ***will not*** have a *'significant effect'* on Bilby or their habitats. Therefore, the proposed activity will not require a Species Impact Statement.

Burrowing Bettong

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

Burrowing Bettong is currently listed as Extinct in NSW under the BC Act. The last recorded sighting (other than at Scotia Wildlife Sanctuary) was in 1906. Given that the species does not currently occur within the vicinity of the proposal, the direct and indirect impacts *will not* have an adverse effect on a viable local population, as none is present. The proposal will not adversely affect source population(s) 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 Boodie Island (WA), AWC's Faure Island (WA) and to 'mainland islands' at AWC's Scotia (NSW) and Yookamurra (SA) sanctuaries, as well as Arid Recovery (SA) and Heirisson Prong (WA). 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 (Short and Turner 2000). A recent release of 1600 animals outside the fence at Arid Recovery failed completely within months, largely due to cat predation (Bannister et al. 2016).

Assuming a density of 0.32/ha (Scotia average density), population size within a 9,570 ha enclosure (as proposed for Mallee Cliffs) would be in the order of 2,900 animals. Numbers would be predicted to vary substantially with rainfall.

For this project, AWC will seek to source Burrowing Bettongs from reintroduced populations on Scotia and Yookamurra, supplemented if necessary from wild populations in WA (Bernier, Dorre and possibly Barrow Islands), to maximise the genetic diversity of the reintroduced population. Additional sources include reintroduced populations on AWC's Faure Island and Arid Recovery (if available).

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

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

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

Burrowing Bettong is currently listed as Extinct in NSW under the BC Act. It is not listed as an Endangered Ecological Community or Critically Endangered Ecological Community.

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

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

Burrowing Bettong is currently listed as Extinct in NSW under the BC Act, so does not currently occur in the vicinity of the proposed CFAI. The proposed CFAI will create 9,570 ha of habitat free of introduced predators for Burrowing Bettong. The action would not affect existing habitat for the Burrowing Bettong but will improve potential habitat to enable a successful reintroduction which is important for the long-term survival of the species.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The Burrowing Bettong is currently listed as Extinct in NSW under the BC Act, so does not currently occur in the vicinity of the proposed CFAI. The action does not constitute, and is not part of, a key threatening process and is not likely to result in the operation of, or an increase in the impact of, a key threatening process affecting the Burrowing Bettong.

Conclusion

This Assessment of Significance has determined that the proposed activity ***will not*** have a *'significant effect'* on Burrowing Bettong or their habitats. Therefore, the proposed activity will not require a Species Impact Statement.

Brush-tailed Bettong

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

Brush-tailed Bettong is currently listed as Extinct in NSW under the BC Act. The last recorded sighting (other than at Scotia Wildlife Sanctuary) was in 1906. Given that the species does not currently occur within the vicinity of the proposal, the direct and indirect impacts *will not* have an adverse effect on a viable local population, as none is present. The proposal will not adversely affect source population(s) 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, St Peters Island, Wedge Island and Venus Bay (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.

Assuming a density of 0.2/ha, population size within a 9,570 ha enclosure (as proposed for Mallee Cliffs) would be in the order of 1,800 animals.

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

Brush-tailed Bettong is currently listed as Extinct in NSW under the BC Act. It is not listed as an Endangered Ecological Community or Critically Endangered Ecological Community.

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

Brush-tailed Bettong is currently listed as Extinct in NSW under the BC Act, so does not currently occur in the vicinity of the proposed CFAI. The proposed CFAI will create 9,570 ha of habitat free of introduced predators for Brush-tailed Bettongs. The action would not affect existing habitat for the Brush-tailed Bettong but will improve potential habitat to enable a successful reintroduction which is important for the long-term survival of the species.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The Brush-tailed Bettong is currently listed as Extinct in NSW under the BC Act, so does not currently occur in the vicinity of the proposed CFAI. The action does not constitute, and is not part of, a key threatening process and is not likely to result in the operation of, or an increase in the impact of, a key threatening process affecting the Brush-tailed Bettong.

Conclusion

This Assessment of Significance has determined that the proposed activity is ***will not*** have a *'significant effect'* on Brush-tailed Bettong or their habitats. Therefore, the proposed activity will not require a Species Impact Statement.

Bridled Nailtail Wallaby

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

Bridled Nailtail Wallaby is currently listed as Extinct in NSW under the BC Act. The last recorded sighting (other than at Scotia Wildlife Sanctuary) was in 1924. Given that the species does not currently occur within the vicinity of the proposal, the direct and indirect impacts *will not* have an adverse effect on a viable local population, as none is present. The proposal will not adversely affect source population(s) 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.

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

Population size within a 9,570 ha enclosure (as proposed for Mallee Cliffs) would be in the order of 2,150 animals, based on mean density at Scotia (0.24/ha). Abundance is likely to vary with rainfall.

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

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

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

Bridled Nailtail Wallaby is currently listed as Extinct in NSW under the BC Act. It is not listed as an Endangered Ecological Community or Critically Endangered Ecological Community.

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

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

Bridled Nailtail Wallaby is currently listed as Extinct in NSW under the BC Act, so does not currently occur in the vicinity of the proposed CFAI. The proposed CFAI will create 9,570 ha of habitat free of introduced predators for Bridled Nailtail Wallabies. The action would not affect existing habitat for the Bridled Nailtail Wallaby but will improve potential habitat to enable a successful reintroduction which is important for the long-term survival of the species.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The Bridled Nailtail Wallaby is currently listed as Extinct in NSW under the BC Act, so does not currently occur in the vicinity of the proposed CFAI. The action does not constitute, and is not part of, a key threatening process and is not likely to result in the operation of, or an increase in the impact of, a key threatening process affecting the Bridled Nailtail Wallaby.

Conclusion

This Assessment of Significance has determined that the proposed activity ***will not*** have a *'significant effect'* on Bridled Nailtail Wallaby or their habitats. Therefore, the proposed activity will not require a Species Impact Statement.

Greater Stick-nest Rat

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

Greater Stick-nest Rat is currently listed as Presumed Extinct in NSW under the BC Act. The last recorded sighting (other than at Scotia Wildlife Sanctuary) was in 1857. Given that the species does not currently occur within the vicinity of the proposal, the direct and indirect impacts *will not* have an adverse effect on a viable local population, as none is present. 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.

Greater Stick-nest Rats have been successfully reintroduced to Reevesby and St Peters Islands (SA), Salutation Island (WA), and fenced 'mainland islands' at AWC's Mt Gibson sanctuary (WA) (Mt Gibson population still being established) and Arid Recovery (SA).

It is difficult to predict population density, as there are no well-established mainland populations. At a density of 0.2/ha, population size within a 9,570 ha enclosure (as proposed for Mallee Cliffs) would be 1,800 animals.

For this project, AWC would seek to obtain Greater Stick-nest Rats from remnant populations on the Franklin Islands (SA) and/or from reintroduced populations on one or more of the following: Reevesby and St Peters Islands (SA), Salutation Island (WA), Arid Recovery (SA) and potentially Mt Gibson (WA).

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

Greater Stick-nest Rat is currently listed as Extinct in NSW under the BC Act. It is not listed as an Endangered Ecological Community or Critically Endangered Ecological Community.

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

Greater Stick-nest Rat is currently listed as Extinct in NSW under the BC Act, so does not currently occur in the vicinity of the proposed CFAI. The proposed CFAI will create 9,570 ha of habitat free of introduced predators for Greater Stick-nest Rat. The action would not affect existing habitat for the Greater Stick-nest Rat but will improve potential habitat to enable a successful reintroduction which is important for the long-term survival of the species.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The Greater Stick-nest Rat is currently listed as Extinct in NSW under the BC Act, so does not currently occur in the vicinity of the proposed CFAI. The action does not constitute, and is not part of, a key threatening process and is not likely to result in the operation of, or an increase in the impact of, a key threatening process affecting the Greater Stick-nest Rat.

Conclusion

This Assessment of Significance has determined that the proposed activity ***will not*** have a *'significant effect'* on Greater Stick-nest Rat or their habitats. Therefore, the proposed activity will not require a Species Impact Statement.

Mitchell's Hopping-mouse

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

Mitchell's Hopping-mouse is currently listed as Presumed Extinct in NSW under the BC Act. The last recorded sighting was in 1857. Given that the species does not currently occur

within the vicinity of the proposal, the direct and indirect impacts *will not* have an adverse effect on a viable local population, as none is present. The proposal will not adversely affect source population(s) 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.

There is no reintroduction history for this species.

At a density of 0.11/ha, population size within a 9,570 ha enclosure (as proposed for Mallee Cliffs) would be in the order of 1,000 animals. Densities are likely to fluctuate greatly with rainfall.

AWC would source Mitchell's Hopping-mice from wild populations, ideally from close to NSW (Victoria or South Australia).

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

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

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

Mitchell's Hopping-mouse is currently listed as Extinct in NSW under the BC Act. It is not listed as an Endangered Ecological Community or Critically Endangered Ecological Community.

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

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

Mitchell's Hopping-mouse is currently listed as Extinct in NSW under the BC Act, so does not currently occur in NSW, or in the vicinity of the proposed CFAI. The proposed CFAI will create 9,570 ha of habitat free of introduced predators for Mitchell's Hopping-mouse. The action would not affect existing habitat for Mitchell's Hopping-mouse but will improve potential habitat to enable a successful reintroduction which is important for the long-term survival of the species.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Mitchell's Hopping-mouse is currently listed as Extinct in NSW under the BC Act, so does not currently occur in NSW, or in the vicinity of the proposed CFAI. The action does not constitute, and is not part of, a key threatening process and is not likely to result in the operation of, or an increase in the impact of, a key threatening process affecting Mitchell's Hopping-mouse.

Conclusion

This Assessment of Significance has determined that the proposed activity ***will not*** have a *'significant effect'* on Mitchell's Hopping-mouse or their habitats. Therefore, the proposed activity will not require a Species Impact Statement.

Chestnut Quail-thrush

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

Chestnut Quail-thrush is considered a mallee habitat specialist in NSW (OEH 2017d). It is primarily recorded in vegetation communities which present a dense shrubby understorey. In south-west NSW, surveys across 60 sites found them to be the most frequently encountered threatened bird species, being recorded at 42 of the survey sites (Val et al. 2012). There are 38 existing records of Chestnut Quail-thrush within Mallee Cliffs NP, and field surveys by AWC recorded this species on three occasions.

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

- Loss of habitat as a result of clearing has led to a decline in species distribution and abundance.
- Fragmentation, resulting from clearing or degradation of the habitat has reduced genetic variability and reproductive opportunities and has increased genetic isolation and the potential for significant impacts arising from stochastic events such as drought or fire.
- Degradation of the habitat, as a result of inappropriate grazing or fire regimes, has resulted in changes to the physical nature of the habitat, for example change in diversity and structure of floristics or invertebrates. Changes to the habitat may result in it being unsuitable for the species or may increase other threatening processes such as predation.
- Fire may cause the direct loss of individuals, and inappropriate fire regimes may cause long-term changes to physical features such as floristic structure or leaf litter, which is unfavourable to sustaining a viable population of the species.
- Predation by foxes or cats may have an impact, particularly where populations have already declined.
- Anthropogenic climate change is a long-term significant threat as it will alter physical characteristics of the habitat such that it is no longer able to sustain a viable population.

The proposed activity is not likely 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 is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of this clearing (up to 11 m wide) will have no impact on the habitat of the Chestnut Quail-thrush given that the species is observed crossing the fenceline clearing at AWC's Scotia Sanctuary. It is also known to move across the landscape, with a single movement of a ringed individual of nearly 10 km recorded.

The project area, and areas of adjacent continuous woodland, support populations of the Chestnut Quail-thrush. The levels of nesting and foraging resources available to Chestnut Quail-thrush will not be significantly affected by the proposed activity. Indeed, the proposed conservation fence is likely to increase general survival rates and reproductive success in those Chestnut Quail-thrush home ranges which overlap the fence because of the removal of feral predators and large introduced herbivores. The conservation fence will create a significant area free of introduced predators (9,570 ha).

The proposed activity will require a Strategic Fire Advantage Zone (SFAZ) and an Asset Protection Zone (APZ) of 100-200m around the proposed infrastructure. Understorey vegetation in these areas will be managed to reduce the severity of any wildfire. Impacts to Chestnut Quail-thrush as a result of the SFAZ and APZ are unlikely given that this species can readily move across cleared areas (i.e., conservation fenceline clearing at AWC's Scotia Sanctuary).

It is *unlikely* that the proposed activity will have an adverse impact on the life cycle of this species (and so the action is not likely to place a viable local population at risk of extinction). The levels of habitat available to the Chestnut Quail-thrush will not be significantly affected by the proposed activity. Indeed, the proposed conservation fence is likely to increase general survival rates and nesting success in Chestnut Quail-thrush because of the removal of feral predators and large introduced herbivores.

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

- *(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
- *(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,*

Chestnut Quail-thrush at Mallee Cliffs National Park is not listed as an endangered ecological community or critically endangered ecological community.

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

- *(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and*
- *(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and*
- *(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,*

(i) The proposed CFAI would result in the modification of up to about 78 ha of habitat where the Chestnut Quail-thrush is known to occur. This is a tiny proportion of the total habitat available to the species within the proposed project area.
(ii) The proposal would not isolate or fragment habitats as Chestnut Quail-thrush are relatively mobile and can fly across gaps of 11 m.
(iii) The habitat modification will be minor in the context of the project area: up to about 78 ha of habitat within an area of 58,118 ha (up to 0.14%), which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of most of the proposed clearing (11 m wide) further reduces

the likelihood of any significant impact. In addition, the proposed activity would create a 9,570 ha area free of feral cats and foxes. This will be a significant benefit to the long-term viability of the species in Mallee Cliffs NP. Given that large areas of mallee would remain unaffected (including those within the proposed feral-free fenced area), it is unlikely that the proposed habitat modifications could be important to the long-term survival of the species in the locality.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity – reintroducing extinct mammals – is not recognised as a key threatening process (KTP) under schedule 3 of the BC Act. However, one KTP is relevant to the proposed activity: *Clearing of native vegetation*.

The clearing of some vegetation is necessary to create the proposed CFAI, but the amount would be only a tiny proportion of the Mallee Cliffs NP (about 0.14%) which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of this clearing (11 m) will have no impact on the habitat of the Chestnut Quail-thrush given that the species is observed crossing the fenceline clearing at AWC's Scotia sanctuary. It is also known to move across the landscape, with a single movement of a ringed individual of nearly 10 km recorded.

The removal of feral predators and herbivores from within the 9,570 ha proposed feral-free fenced area will deliver substantial benefits for the species. It will provide a significant reduction in the operation of seven KTPs: *Competition and grazing by the feral European Rabbit*, *Competition and habitat degradation by Feral Goats*, *Predation and hybridisation by Feral dogs*, *Predation by the European Red Fox*, *Predation by feral cats*, and *Predation, habitat degradation, competition and disease transmission by Feral Pigs.*

In summary, the proposed activity is *unlikely* to result in the operation of, or significantly increase the impact of, any key threatening process in the project area and is *likely* to improve the status of this species within Mallee Cliffs National Park.

Conclusion

This Assessment of Significance has determined that the proposed activity is *'unlikely'* to have a *'significant effect'* on Chestnut Quail-thrush in the project area. The levels of nesting and foraging resources available to the Chestnut Quail-thrush will not be significantly affected by the proposed activity. Therefore, the proposed activity will not require a Species Impact Statement.

Dusky Woodswallow

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

The Dusky Woodswallow is often reported in woodlands and dry open sclerophyll forests, usually dominated by eucalypts, including mallee associations. It has also been recorded in shrublands and heathlands and various modified habitats, including regenerating forests; very occasionally in moist forests or rainforests.

In Mallee Cliffs NP, habitat for Dusky Woodswallow is likely to be widespread based on known habitat associations. Previous records in the BioNET database identify four records for this species in Mallee Cliffs NP. During the AWC survey, Dusky Woodswallow was observed on seven occasions. The home range of the Dusky Woodswallow is thought to be around 2 ha, although no detailed study of the home range of this species has been conducted.

OEH (2017d) identifies the following threats for Dusky Woodswallow:

- Past and ongoing reductions in habitat quality
- Competitive exclusion by Noisy Miners (*Manorina melanocephala*)
- Nest predation by Currawongs, Magpies and Grey Butcherbirds
- Inappropriate fire regimes, excessive grazing and removal of coarse woody debris from the groundlayer.

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 is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of most of this limited clearing will have no adverse impact on the life cycle of the Dusky Woodswallow since this species often forages in cleared areas and, in particular, in ecotone environments.

In the context of the vast area of Mungo landscape that will be unaltered by the proposed activity, the modification of up to about 78 ha is considered *unlikely* to result in an adverse effect on the life cycle of Dusky Woodswallow such that a viable local population would be placed at risk of extinction.

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

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

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

Dusky Woodswallow is not listed as an endangered ecological community or critically endangered ecological community.

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

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

(i) The proposed CFAI would result in habitat modification of up to about 78 ha through areas that Dusky Woodswallows are known to occur. This is a tiny proportion of the total habitat area for the species within the proposed project area and within the entire Mungo landscape.
(ii) The proposal would not isolate or fragment habitats as Dusky Woodswallow are known to fly and forage across large cleared areas.
(iii) The habitat modification will be minor in the context of the project area: up to about 78 ha of habitat within an area of 58,118 ha (about 0.14%), which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of most of the proposed clearing (11 m wide) further reduces the likelihood of any significant impact. Given that large areas of mallee would remain unaffected (including those within the proposed feral-free fenced area), it is unlikely that the proposed habitat modifications could be important to the long-term survival of the species in the locality.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity – reintroducing extinct mammals – is not recognised as a key threatening process (KTP) under schedule 3 of the BC Act. However, three KTPs are relevant to the impacts of the proposed activity: *The Removal of dead wood and dead trees*, *Clearing of native vegetation* and *Removal of hollow-bearing trees*.

The clearing of some vegetation is necessary to create the proposed CFAI, but the amount would be only a tiny proportion of the Mallee Cliffs NP (about 0.14%) which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape.

The proposed activity will result in the retention (but relocation) of dead wood and the removal of dead trees if they occur directly on the path of the linear conservation fence and other infrastructure. The minor amounts of dead wood that would be relocated are not expected to have significant impacts on the species.

AWC surveys have shown that hollow-bearing trees are widespread and common throughout the project area. The removal of a limited number of hollow-bearing trees during clearing for the proposed fence would have a negligible impact on availability of hollows and not have adverse impacts on life cycles of Dusky Woodswallows.

The removal of feral predators and herbivores from within the 9,570 ha proposed feral-free fenced area will deliver substantial benefits for the species. It will provide a significant reduction in the operation of seven KTPs: *Competition and grazing by the feral European Rabbit*, *Competition and habitat degradation by Feral Goats*, *Predation and hybridisation by Feral dogs*, *Predation by the European Red Fox*, *Predation by feral cats*, and *Predation, habitat degradation, competition and disease transmission by Feral Pigs.*

In summary, the proposed activity is *unlikely* to result in the operation of, or significantly increase the impact of, any key threatening process in the project area.

Conclusion

This Assessment of Significance has determined that the proposed activity is ***'unlikely'*** to have a ***'significant effect'*** on Dusky Woodswallow in the project area. The levels of nesting and foraging resources available to the Dusky Woodswallow within their home-ranges will not be significantly affected by the proposed activity. Therefore, the proposed activity will not require a Species Impact Statement.

Gilbert's Whistler

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

Gilbert's Whistler occurs in a range of habitats within NSW including mallee shrublands (OEH 2017d). Within mallee-dominated woodlands, the presence of spinifex or a shrubby understorey is generally preferred. Gilbert's Whistler is generally associated with larger, high-quality areas of remnant vegetation, given its apparent sensitivity to fragmentation and patch size (Murphy 1999, Watson et al. 2000).

Gilbert's Whistler is known to occur within the Mallee Cliffs project area with 15 existing records within the BioNET database. Recent AWC field survey observed Gilbert's Whistler on 11 occasions. Given these new records, it is highly likely that the species may now be more abundant in the Mallee Cliffs project area than historic records would indicate. The home range of Gilbert's Whistler is poorly understood, but it is believed that it is fairly sedentary and does not make any regular large-scale movements.

OEH (2017d) identifies the following threats to Gilbert's Whistler:

- Clearing and fragmentation of the species' mallee, woodland and Red Gum forest habitat.
- Overgrazing may remove the litter layer of foraging habitat and may also prevent or delay regeneration of the shrub layer and open dense thickets of cypress pine regrowth in *Callitris* woodlands.
- High frequency fires will restrict regeneration of the shrubby foraging and nesting habitat.
- Infestation of habitat by invasive weeds.
- Aggressive exclusion from forest and woodland habitat by over abundant Noisy Miners.
- Climate change impacts including reduction in resources due to drought.

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 is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of this clearing (11 m) will have no impact on the habitat of the Gilbert's Whistler given that in Cowra, three pairs were known to occur in a patch of habitat of about 25 ha. Furthermore, any possible impacts will be confined to a small area of the larger Mungo landscape.

In the context of the woodland that remains unaffected by the proposed activity and the creation of a 9,570 ha area free of feral cats and foxes, the loss of up to about 78 ha is considered *unlikely* to result in an adverse effect on the life cycle of Gilbert's Whistler such that a viable local population is likely to be placed at risk of extinction. The levels of habitat available to the Gilbert's Whistler will not be significantly affected by the proposed activity. Indeed, the proposed conservation fence is likely to increase general survival rates and nesting success of the Gilbert's Whistler because of the removal of feral predators and large introduced herbivores.

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

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

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

Gilbert's Whistler is not listed as an endangered ecological community or critically endangered ecological community.

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

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

(i) The proposed CFAI would result in the removal of up to about 78 ha of native habitat that Gilbert's Whistler is known to occur. This is a tiny proportion of the total habitat available to the species within the proposed project area and the broader Mungo landscape.

(ii) The proposal would not isolate or fragment other areas of habitats given the ability of Gilbert's Whistler to move across clearings of greater than 11 m width.

(iii) The habitat modification will be minor in the context of the project area: up to about 78 ha of habitat within an area of 58,118 ha (about 0.14%), which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of most of the proposed clearing (11 m wide) further reduces the likelihood of any significant impact. Given that large areas of mallee would remain unaffected (including those within the proposed feral-free fenced area), it is unlikely that the proposed habitat modifications could be important to the long-term survival of the species in the locality.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity – reintroducing extinct mammals – is not recognised as a key threatening process (KTP) under schedule 3 of the BC Act. However, two KTPs are relevant to the impacts of the proposed activity: The *Removal of dead wood and dead trees*, and the *Clearing of native vegetation*.

The clearing of some vegetation is necessary to create the proposed CFAI, but the amount would be only a tiny proportion of the Mallee Cliffs NP (about 0.14%) which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape.

The proposed activity will result in the retention (but relocation) of dead wood and the removal of dead trees if they occur directly on the path of the linear conservation fence and other infrastructure. The minor amounts of dead wood that would be relocated are not expected to have significant impacts on the species.

The removal of feral predators and herbivores from within the 9,570 ha proposed feral-free fenced area will deliver substantial benefits for the species. It will provide a significant reduction in the operation of seven KTPs: *Competition and grazing by the feral European Rabbit*, *Competition and habitat degradation by Feral Goats*, *Predation and hybridisation by Feral dogs*, *Predation by the European Red Fox*, *Predation by feral cats*, and *Predation, habitat degradation, competition and disease transmission by Feral Pigs.*

In summary, the proposed activity is *unlikely* to result in the operation of, or significantly increase the impact of, any key threatening process in the project area.

Conclusion

This Assessment of Significance has determined that the proposed activity is *'unlikely'* to have a *'significant effect'* on Gilbert's Whistler in the project area. The levels of nesting and foraging resources available to the Gilbert's Whistler within their home-ranges will not be significantly affected by the proposed activity. Therefore, the proposed activity will not require a Species Impact Statement.

Hooded Robin

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

The Hooded Robin is found across many parts of Australia in woodlands, acacia scrub and mallee (Sass 2009, Reid 1999). It is generally considered that the Hooded Robin requires a structurally diverse habitat including microhabitat such as native grasses, shrubs and fallen timber across a breeding territory of around 10 ha (OEH 2017d). However, it is believed that the species generally exhibits demanding requirements for both habitat complexity and area (>100 ha) (Watson et al. 2001) confirming that the study area provides both of these attributes. Indeed, field surveys by AWC identified Hooded Robin within the project area with 2 observations made at 2 different sites. Previous records within the BioNET database total 13 within Mallee Cliffs NP.

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

- Clearing of woodlands, resulting in loss and fragmentation of habitat.
- Modification and destruction of ground habitat through heavy grazing and compaction by stock, removal of litter and fallen timber, introduction of exotic pasture grasses and frequent fire.

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 is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of this clearing (11 m) will have no impact on the habitat of the Hooded Robin

In the context of the woodland that remains unaffected by the proposed activity and the creation of a 9,570 ha area free of feral cats and foxes, the loss of up to about 78 ha is considered *unlikely* to result in an adverse effect on the life cycle of Hooded Robin such that a viable local population is likely to be placed at risk of extinction. The levels of habitat available to the Hooded Robin will not be significantly affected by the proposed activity. Indeed, the proposed conservation fence is likely to increase general survival rates and nesting success in Hooded Robin because of the removal of feral predators and large introduced herbivores.

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

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

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

Hooded Robin is not listed as an endangered ecological community or critically endangered ecological community within Mallee Cliffs NP.

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

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

(i) The proposed CFAI would result in the removal of up to about 78 ha of native habitat that Hooded Robin is known to occur. This is a tiny proportion of the total habitat available to the species within the proposed project area and the broader Mungo landscape.

(ii) The proposal would not isolate or fragment habitats as Hooded Robin are known to forage on woodland edges and a 12-metre clearing is unlikely to represent a significant barrier.

(iii) The habitat modification will be minor in the context of the project area: up to about 78 ha of habitat within an area of 58,118 ha (about 0.14%), which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of most of the proposed clearing (11 m wide) further reduces the likelihood of any significant impact. In addition, the proposed activity

would create a 9,570 ha area free of feral cats and foxes. This will be a significant benefit to the long-term viability of the species in Mallee Cliffs NP. Given that large areas of mallee would remain unaffected (including those within the proposed feral-free fenced area), it is unlikely that the proposed habitat modifications could be important to the long-term survival of the species in the locality.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity – reintroducing extinct mammals – is not recognised as a key threatening process (KTP) under schedule 3 of the BC Act. However, one KTP is relevant to the proposed activity: The *Clearing of native vegetation*.

The clearing of some vegetation is necessary to create the proposed CFAI, but the amount would be only a tiny proportion of the Mallee Cliffs NP (about 0.14%) which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. In this context, the relatively minor loss of vegetation is considered negligible given the extent of woodland remaining in the locality and that Hooded Robin will be able to continue to forage and breed in the project area given the largely linear nature of the proposed clearing, and their moderately sized home ranges. Additionally, the species is often encountered in ecotone environments and observed in agricultural landscapes.

The removal of feral predators and herbivores from within the 9,570 ha proposed feral-free fenced area will deliver substantial benefits for the species. It will provide a significant reduction in the operation of seven KTPs: *Competition and grazing by the feral European Rabbit*, *Competition and habitat degradation by Feral Goats*, *Predation and hybridisation by Feral dogs*, *Predation by the European Red Fox*, *Predation by feral cats*, and *Predation, habitat degradation, competition and disease transmission by Feral Pigs.*

In summary, the proposed activity is *unlikely* to result in the operation of, or significantly increase the impact of, any key threatening process in the project area.

Conclusion

This Assessment of Significance has determined that the proposed activity is *'unlikely'* to have a *'significant effect'* on Hooded Robin or their habitats. Indeed, the proposed conservation fence is likely to increase general longevity and reproductive success following the removal of feral predators. Therefore, the proposed activity will not require a Species Impact Statement.

Major Mitchell's (Pink) Cockatoo

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

The Major Mitchell's Cockatoo is found in arid and semi-arid zone woodlands dominated by mulga, mallee and box eucalypts, cypress pine or Belah where it feeds primarily on seeds, roots and fruits (OEH 2017d, Morcombe 2004, Sass 2009). Breeding pairs occupy nests at least 1 km apart with densities of about one pair per 30 km^2 recorded (OEH 2017d).

There was one incidental sighting of a Major Mitchell's Cockatoo during AWC field surveys. Twelve additional records are known from within Mallee Cliffs NP from the BioNET database.

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

- Clearing of woodlands.
- Heavy grazing of feeding areas resulting in the removal of seeding grasses and preventing regeneration of food plants.
- Loss of existing and future hollow-bearing trees.
- Illegal nest-robbing and trapping.

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 is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of this clearing (11 m) will have no impact on the habitat of the Major Mitchell's Cockatoo given that this species forages over large areas, including cleared agricultural areas.

In the context of the woodland that remains unaffected by the proposed activity and the creation of a 9,570 ha area free of feral cats and foxes, the loss of up to about 78 ha is considered *unlikely* to result in an adverse effect on the life cycle of Major Mitchell's Cockatoo such that a viable local population is likely to be placed at risk of extinction.

The levels of habitat available to the Major Mitchell's Cockatoo will not be significantly affected by the proposed activity. Indeed, the proposed conservation fence is likely to increase general survival rates and nesting success in Major Mitchell's Cockatoo because of the removal of feral predators and large introduced herbivores as well as protection from illegal nest-robbing and trapping.

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

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

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

The Major Mitchell's Cockatoo is not listed as an endangered ecological community or critically endangered ecological community within Mallee Cliffs NP.

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

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

(i) The proposed CFAI would result in the removal of up to about 78 ha of native habitat within which the Major Mitchell's Cockatoo is likely to occur. This is a tiny proportion of the total habitat available to the species within the proposed project area and the broader Mungo landscape.

(i) The proposal would not isolate or fragment habitat as the Major Mitchell's Cockatoo has a large home range (30 km^2) and it is regularly observed in cleared, agricultural land.

(ii) The habitat modification will be minor in the context of the project area: up to about 78 ha of habitat within an area of 58,118 ha (about 0.14%), which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of most of the proposed clearing (11 m wide) further reduces the likelihood of any significant impact. Given that large areas of mallee would remain unaffected (including those within the proposed feral-free proposed feral-free fenced area), it is unlikely that the proposed habitat modifications could be important to the long-term survival of the species in the locality.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity – reintroducing extinct mammals – is not recognised as a key threatening process (KTP) under schedule 3 of the BC Act. However, three KTPs are relevant to the proposed activity: The *Removal of dead wood and dead trees*, *Clearing of native vegetation* and *Removal of hollow-bearing trees*.

The clearing of some vegetation is necessary to create the proposed CFAI, but the amount would be only a tiny proportion of the Mallee Cliffs NP (about 0.14%) which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. In this context, the relatively minor loss of vegetation is considered negligible given the extent of woodland remaining in the locality and that Major Mitchell's Cockatoo will be able to continue to forage and breed in the project area given the largely linear nature of the proposed clearing, and the high mobility of this species.

The proposed activity will result in the retention (but relocation) of dead wood and the removal of dead trees if they occur directly on the path of the linear conservation fence and other infrastructure. The minor amounts of dead wood that would be relocated are not expected to have significant impacts on the species.

AWC surveys have shown that hollow-bearing trees are widespread and common throughout the project area. The removal of a limited number of hollow-bearing trees during clearing for the proposed fence would have a negligible impact on availability of hollows and not have adverse impacts on life cycles of Major Mitchell's Cockatoos.

The removal of feral predators and herbivores from within the 9,570 ha proposed feral-free fenced area will deliver substantial benefits for the species. It will provide a significant reduction in the operation of seven KTPs: *Competition and grazing by the feral European Rabbit*, *Competition and habitat degradation by Feral Goats*, *Predation and hybridisation by*

Feral dogs, *Predation by the European Red Fox*, *Predation by feral cats*, and *Predation, habitat degradation, competition and disease transmission by Feral Pigs.*

In summary, the proposed activity is *unlikely* to result in the operation of, or significantly increase the impact of, any key threatening process in the project area.

Conclusion

This Assessment of Significance has determined that the proposed activity is *'unlikely'* to have a *'significant effect'* on Major Mitchell's Cockatoo or their habitats. Indeed, the proposed conservation fence is likely to increase general longevity and reproductive success following the removal of feral predators and herbivores, as well as provide some protection from illegal nest-robbing and trapping. Therefore, the proposed activity will not require a Species Impact Statement.

Malleefowl

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

The 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 1999a, 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 birds 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 the 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; and

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 is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of this clearing (11 m) will have no impact on the habitat of Malleefowl given that this species forages over large areas. Any Malleefowl mounds discovered during construction activities, including the new active mounds discovered during fenceline and track surveys in 2017, will be protected by buffers of at least 50 m around which the fenceline and management track, respectively, will be re-aligned.

It is *unlikely* that the proposed activity will have an adverse impact on the life cycle of the Malleefowl, and so the action is not likely to place a viable local population at risk of extinction. The levels of habitat available to the Malleefowl will not be significantly affected by the proposed activity. Indeed, the proposed conservation fence is likely to increase general survival rates and nesting success for the Malleefowl because of the removal of feral predators and large introduced herbivores. In 2016-2017, all five of the active Malleefowl mounds at Scotia were located inside the predator-proof fence.

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

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

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

The Malleefowl in Mallee Cliffs NP is not listed as an endangered ecological community or critically endangered ecological community.

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

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

(i) The proposed CFAI would result in habitat removal or modification across up to about 78 ha of native vegetation where the Malleefowl is generally known to occur. This is a tiny proportion of the total habitat available to the species within the proposed project area and the broader Mungo landscape.
(ii) The proposal would not isolate or fragment habitats as Malleefowl are known to fly and forage across variegated and fragmented landscapes, and could easily fly over the proposed fence.
(iii) The habitat modification will be minor in the context of the project area: up to about 78 ha of habitat within an area of 58,118 ha (about 0.14%), which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of most of the proposed clearing (11 m wide) further reduces the likelihood of any significant impact. In addition, the proposed activity would create a 9,570 ha area free of feral cats and foxes. This will be a significant benefit to the long-term viability of the species in Mallee Cliffs NP. Given that large areas of mallee would remain unaffected (including those within the proposed feral-free fenced area), it is unlikely that the proposed habitat modifications could be important to the long-term survival of the species in the locality.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity – reintroducing extinct mammals – is not recognised as a key threatening process (KTP) under schedule 3 of the BC Act. However, two KTPs are relevant to the proposed activity: *The Removal of dead wood and dead trees*, and *Clearing of native vegetation*.

The proposed activity will result in the retention (but relocation) of dead wood and the removal of dead trees if they occur directly on the path of the linear conservation fence and other infrastructure. The minor amounts of dead wood that would be relocated are not expected to have significant impacts on the species.

The clearing of some vegetation is necessary to create the proposed CFAI, but the amount would be only a tiny proportion of the Mallee Cliffs NP (about 0.14%) which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of this clearing (11 m wide) will have no impact on the habitat of the Malleefowl whose home-ranges can be as large as 4 square kilometres. Any active mounds discovered will be protected by means of a 50 m buffer outside which local infrastructure will be re-aligned.

The removal of feral predators and herbivores from within the 9,570 ha feral-free fenced area will deliver substantial benefits for the species. It will provide a significant reduction in the operation of seven KTPs: *Competition and grazing by the feral European Rabbit*,

Competition and habitat degradation by Feral Goats, *Predation and hybridisation by Feral dogs*, *Predation by the European Red Fox*, *Predation by feral cats*, and *Predation, habitat degradation, competition and disease transmission by Feral Pigs.*

In summary, the proposed activity is unlikely to significantly increase the impact of any relevant key threatening process in the project area. It is certain to reduce the impact of several key threatening processes.

Conclusion

This Assessment of Significance has determined that the proposed activity is *'unlikely'* to have a *'significant effect'* on Malleefowl or their habitats. Indeed, the proposed conservation fence is likely to increase reproductive success following the removal of feral predators. Therefore, the proposed activity will not require a Species Impact Statement.

Pied Honeyeater

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

The Pied Honeyeater is known from a variety of habitats types in western NSW (Sass 2009, OEH 2017d). It is highly nomadic following the erratic flowering of shrubs including mistletoe in which it nests (Cooney et al. 2006, OEH 2017d). While Sass (2009) regularly recorded Pied Honeyeater during surveys in western NSW, Val et al (2012) found no Pied Honeyeaters after collecting 2,537 records of 76 species of bird in their work in south-west NSW including near Mallee Cliffs NP. AWC recorded Pied Honeyeater in their field surveys within Mallee Cliffs NP within proximity of the proposed CFAI. This irregularity of records demonstrates the erratic distribution of Pied Honeyeater based on availability of resources in dynamic landscapes (Roshier and Reid 2003).

OEH (2017d) identify the following threats to Pied Honeyeater:

- The clearing of nectar-producing shrubs (such as *Eremophila* and *Grevillea* spp) reduces food supplies and may interrupt broadscale nomadic movements.
- Grazing has a similar but less immediate impact compared to clearing, although many of the preferred food shrubs appear immune to grazing effects.
- Infestation of habitat by boxthorn in some areas.
- Loss of woodland habitat, including large old trees.
- Fragmentation of woodland habitat.
- Inappropriate fire regimes.
- Aggressive exclusion from forest and woodland habitat by over abundant Noisy Miners.
- Reduction in resources due to drought conditions, increasing due to climate change.

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 is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of this clearing (11 m) will have no impact on the habitat of the Pied Honeyeater given that this species is highly nomadic and capable of landscape scale movements.

Given the largely lineal nature of the proposed clearing, it is probable that only small proportions of any existing home ranges within the proposed fenceline clearing would be affected. In the context of the habitat that remains unaffected by the proposed activity and the creation of a 9,570 ha area free of feral cats and foxes, the loss of up to about 78 ha is considered *unlikely* to result in an adverse effect on the life cycle of Pied Honeyeater such that a viable local population is likely to be placed at risk of extinction. The levels of habitat available to the Pied Honeyeater will not be significantly affected by the proposed activity. Indeed, the proposed conservation fence is likely to increase general survival rates and nesting success in Pied Honeyeater because of the removal of feral predators and large introduced herbivores.

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

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

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

Pied Honeyeater at Mallee Cliffs NP is not listed as an endangered ecological community or critically endangered ecological community.

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

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

(i) The proposed CFAI would result in the removal of up to about 78 ha of native habitat that Pied Honeyeater is known to occur. This is a tiny proportion of the total habitat available to the species within the proposed project area and the broader Mungo landscape.

(ii) The proposal would not isolate or fragment habitats as Pied Honeyeater are highly nomadic.

(iii) The habitat modification will be minor in the context of the project area: up to about 78 ha of habitat within an area of 58,118 ha (about 0.14%), which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of most of the proposed clearing (11 m wide) further reduces the likelihood of any significant impact. In addition, the proposed activity would create a 9,570 ha area free of feral cats and foxes. This will be a significant benefit to the long-term viability of the species in Mallee Cliffs NP. Given that large areas of mallee would remain unaffected (including those within the proposed feral-free fenced area), it is unlikely that the proposed habitat modifications could be important to the long-term survival of the species in the locality.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity – reintroducing extinct mammals – is not recognised as a key threatening process (KTP) under schedule 3 of the BC Act. However, one KTP is relevant to the impacts of the proposed activity: *The Clearing of native vegetation*.

The clearing of some vegetation is necessary to create the proposed CFAI, but the amount would be only a tiny proportion of the Mallee Cliffs NP (about 0.14%) which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The relatively minor loss of vegetation is considered negligible in the context of the extent of woodland remaining in the locality and the highly nomadic nature of Pied Honeyeater and their ability to undertake landscape scale movements.

The removal of feral predators and herbivores from within the 9,570 ha proposed feral-free fenced area will deliver substantial benefits for the species. It will provide a significant reduction in the operation of seven KTPs: *Competition and grazing by the feral European Rabbit*, *Competition and habitat degradation by Feral Goats*, *Predation and hybridisation by Feral dogs*, *Predation by the European Red Fox*, *Predation by feral cats*, and *Predation, habitat degradation, competition and disease transmission by Feral Pigs.*

In summary, the proposed activity is *unlikely* to result in the operation of, or significantly increase the impact of, any key threatening process in the project area.

Conclusion

This Assessment of Significance has determined that the proposed activity is *'unlikely'* to have a *'significant effect'* on Pied Honeyeater or their habitats. Indeed, the proposed conservation fence is likely to increase general longevity and reproductive success following the removal of feral predators. Therefore, the proposed activity will not require a Species Impact Statement.

Purple-gaped Honeyeater

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

The Purple-gaped Honeyeater occurs in disjunct populations across southern Australia, with the eastern population largely occurring south of the Murray River. NSW forms the extreme north-east of their range. They inhabit mallee heathlands, and are less commonly found in mallee with spinifex understorey (OEH 2017d). Only a single record is known from Mallee Cliffs NP (BioNET) and one incidental observation was made during field surveys by AWC.

OEH (2017d) identify that the clearing of mallee is the main threat to this species by removing food plants and nesting sites.

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 is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of this clearing (11 m) will have no impact on the habitat of the Purple-gaped Honeyeater given that this species is relatively nomadic in search of food.

Given the largely lineal nature of the proposed clearing, and that this species is highly mobile, the loss of up to about 78 ha is considered *unlikely* to result in an adverse effect on the life cycle of the Purple-gaped Honeyeater such that a viable local population is likely to be placed at risk of extinction. The levels of habitat available to the Purple-gaped Honeyeater will not be significantly affected by the proposed activity.

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

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

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

The Purple-gaped Honeyeater is not listed as an endangered ecological community or critically endangered ecological community within Mallee Cliffs NP.

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

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

(i) The proposed CFAI would result in the removal of up to about 78 ha of native habitat within which the Purple-gaped Honeyeater is predicted to occur. This is a tiny proportion of the total habitat available to the species within the proposed project area and the broader Mungo landscape.

(ii) The proposal would not isolate or fragment habitats given the nomadic nature of this species in response to flowering events.

(iii) The habitat modification will be minor in the context of the project area: up to about 78 ha of habitat within an area of 58,118 ha (about 0.14%), which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of most of the proposed clearing (11 m wide) further reduces the likelihood of any significant impact. Given that large areas of mallee would remain unaffected (including those within the proposed feral-free fenced area), it is unlikely that the proposed habitat modifications could be important to the long-term survival of the species in the locality.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Whilst the proposed activity – reintroducing extinct mammals – is not recognised as a key threatening process (KTP) under schedule 3 of the BC Act, one KTP is relevant to the negative impacts of the proposed activity: *Clearing of native vegetation*.

The clearing of some vegetation is necessary to create the proposed CFAI, but the amount would be only a tiny proportion of the Mallee Cliffs NP (about 0.14%) which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The relatively minor loss of vegetation is considered negligible in the context of the extent of woodland remaining in the locality and the highly nomadic nature of Purple-gaped Honeyeater in response to flowering events.

The removal of feral predators and herbivores from within the 9,570 ha proposed feral-free fenced area will deliver substantial benefits for the species. It will provide a significant reduction in the operation of seven KTPs: *Competition and grazing by the feral European Rabbit*, *Competition and habitat degradation by Feral Goats*, *Predation and hybridisation by Feral dogs*, *Predation by the European Red Fox*, *Predation by feral cats*, and *Predation, habitat degradation, competition and disease transmission by Feral Pigs.*

In summary, the proposed activity is *unlikely* to result in the operation of, or significantly increase the impact of, any key threatening process in the project area.

Conclusion

This Assessment of Significance has determined that the proposed activity is *'unlikely'* to have a *'significant effect'* on Purple-gaped Honeyeater or their habitats. Therefore, the proposed activity will not require a Species Impact Statement.

Shy Heathwren

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

The Shy Heathwren is a mallee specialist, generally occurring where there is a dense understorey of shrubs (OEH 2017d). In rocky hills outside of mallee, the species can also occur where a thick shrub layer such as broombush or tea-tree is present.

Shy Heathwren is known to occur within Mallee Cliffs NP, with previous records on the BioNET database totalling 18. During the AWC field survey, one individual was recorded. Information relating to the home range of Shy Heathwren is not known, it is likely that they have some similarities to other small passerines. Home ranges of the similarly sized Hooded Robin are around 10 ha (OEH 2017d).

OEH (2017d) identify the following threats to Shy Heathwren:

- 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, has resulted in changes to the physical and biological nature of the habitat (e.g. changes in the structure and floral composition of the vegetation, and diversity and abundance of invertebrates); these changes may render habitat unsuitable or increase the risk posed by other threatening processes (e.g. predation).
- Fire may cause the direct loss of individuals.
- Predation by foxes or cats, particularly where populations have already declined.
- Human-induced climate change is a long-term threat as it may alter habitat characteristics (e.g. changes in physical structure or productivity) such that its capacity to support viable populations is reduced.

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 is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of this clearing (11 m) will have no impact on the habitat of the Shy Heathwren as the home range of any individuals is unlikely to be fully contained within the proposed clearing zone, and habitat for foraging and breeding will remain. Furthermore, any possible impacts will be confined to a small area of the larger Mungo landscape.

In the context of the woodland that remains unaffected by the proposed activity and the creation of a 9,570 ha area free of feral cats and foxes, the loss of up to about 78 ha is considered *unlikely* to result in an adverse effect on the life cycle of Shy Heathwren such that a viable local population is likely to be placed at risk of extinction. The levels of habitat available to the Shy Heathwren will not be significantly affected by the proposed activity. Indeed, the proposed conservation fence is likely to increase general survival rates and nesting success in Shy Heathwren because of the removal of feral predators and large introduced herbivores.

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

Shy Heathwren at Mallee Cliffs NP is not listed as an endangered ecological community or critically endangered ecological community.

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

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

(i) The proposed CFAI would result in the removal of up to about 78 ha of native habitat that Shy Heathwren is known to occur. This is a tiny proportion of the total habitat available to the species within the proposed project area and the broader Mungo landscape.
(ii) The proposal us unlikely to isolate or fragment habitats as a 12-metre wide clearing is unlikely to impede any movement of Shy Heathwren, particularly as ground vegetation regenerates.
(iii) The habitat modification will be minor in the context of the project area: up to about 78 ha of habitat within an area of 58,118 ha (about 0.14%), which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of most of the proposed clearing (11 m wide) further reduces the likelihood of any significant impact. In addition, the proposed activity would create a 9,570 ha area free of feral cats and foxes. This will be a significant benefit to the long-term viability of the species in Mallee Cliffs NP. Given that large areas of mallee would remain unaffected (including those within the proposed feral-free fenced area), it is unlikely that the proposed habitat modifications could be important to the long-term survival of the species in the locality.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity – reintroducing extinct mammals – is not recognised as a key threatening process (KTP) under schedule 3 of the BC Act. However, two KTP are relevant to the proposed activity: *The* Removal *of dead wood and dead trees*, and the *Clearing of native vegetation*.

The clearing of some vegetation is necessary to create the proposed CFAI, but the amount would be only a tiny proportion of the Mallee Cliffs NP (about 0.14%) which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The relatively minor loss of vegetation is considered negligible in the context of the extent of woodland remaining in the locality and the largely linear nature of the proposed vegetation clearing. Shy Heathwren will be able to continue to forage and breed across the Mallee Cliffs project area.

The proposed activity will result in the retention (but relocation) of dead wood and the removal of dead trees if they occur directly on the path of the linear conservation fence and other infrastructure. The minor amounts of dead wood that would be relocated are not expected to have significant impacts on the species.

The removal of feral predators and herbivores from within the 9,570 ha proposed feral-free fenced area will deliver substantial benefits for the species. It will provide a significant reduction in the operation of seven KTPs: *Competition and grazing by the feral European Rabbit*, *Competition and habitat degradation by Feral Goats*, *Predation and hybridisation by*

Feral dogs, *Predation by the European Red Fox*, *Predation by feral cats*, and *Predation, habitat degradation, competition and disease transmission by Feral Pigs.*

In summary, the proposed activity is *unlikely* to result in the operation of, or significantly increase the impact of, any key threatening process in the project area.

Conclusion

This Assessment of Significance has determined that the proposed activity is *'unlikely'* to have a *'significant effect'* on Shy Heathwren or their habitats. Indeed, the proposed conservation fence is likely to increase general longevity and reproductive success following the removal of feral predators. Therefore, the proposed activity will not require a Species Impact Statement.

Southern Scrub-robin

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

The Southern Scrub-robin is restricted to mallee and shrublands across southern Australia. In NSW, the main population has been centred on the Round Hill and Nombinnie Nature Reserves and surrounds, however, in recent times, a population in Mallee Cliffs NP has been detected (Val et al. 2012, OEH 2017d). Habitat occupancy is determined by time since fire, as the species is dependent on a well-developed shrub layer. Information relating to the home range of Southern Scrub-wren is not known, however, it is likely that they have some similarities to other small passerines. Home ranges of the similarly-sized Hooded Robin are around 10 ha (OEH 2017d).

There are ten records of Southern Scrub-robin in Mallee Cliffs NP (BioNET database). An incidental observation of the Southern Scrub-robin within the proposed feral-free fenced areas was made by AWC during their field surveys.

OEH (2017d) have identified 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 may cause the direct loss of individuals.
- Predation by foxes or cats, particularly where populations have already declined.
- 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.

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 is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of this clearing (11 m) will have no impact on the habitat of the Southern Scrub-robin as the home range of any individuals is unlikely to be fully contained within the proposed clearing zone, and habitat for foraging and breeding will remain. Furthermore, any possible impacts will be confined to a small area of the larger Mungo landscape.

Given the largely lineal nature of the proposed clearing, it is unlikely to affect a substantial area of any existing home ranges. In the context of the woodland that remains unaffected by the proposed activity and the creation of a 9,570 ha area free of feral cats and foxes (which could potentially support hundreds of home ranges of Southern Scrub-robin), the loss of up to about 78 ha is considered *unlikely* to result in an adverse effect on the life cycle of the Southern Scrub-Robin such that a viable local population is likely to be placed at risk of extinction. The levels of habitat available to the Southern Scrub-Robin will not be significantly affected by the proposed activity. Indeed, the proposed conservation fence is likely to increase general survival rates and nesting success of the Southern Scrub-Robin because of the removal of feral predators and large introduced herbivores.

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

- *(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
- *(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,*

Southern Scrub-robin is not listed as an endangered ecological community or critically endangered ecological community in Mallee Cliffs NP.

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

- *(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and*
- *(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and*
- *(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,*

(i) The proposed CFAI would result in the removal of up to about 78 ha of native habitat that Southern Scrub-robin is known to occur. This is a tiny proportion of the total habitat available to the species within the proposed project area and the broader Mungo landscape.

(ii) The proposal is unlikely to isolate or fragment habitats as a 11 m wide clearing is unlikely to impede any movement of the Southern Scrub-robin, particularly as ground vegetation regenerates.

(iii) The habitat modification will be minor in the context of the project area: up to about 78 ha of habitat within an area of 58,118 ha (about 0.14%), which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of most of the proposed clearing (11 m wide) further reduces the likelihood of any significant impact. In addition, the proposed activity would create a 9,570 ha area free of feral cats and foxes. This will be a significant

benefit to the long-term viability of the species in Mallee Cliffs NP. Given that large areas of mallee would remain unaffected (including those within the proposed feral-free fenced area), it is unlikely that the proposed habitat modifications could be important to the long-term survival of the species in the locality.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity – reintroducing extinct mammals – is not recognised as a key threatening process (KTP) under schedule 3 of the BC Act. However, one KTP is relevant to the proposed activity: *The Clearing of native vegetation*.

The clearing of some vegetation is necessary to create the proposed CFAI, but the amount would be only a tiny proportion of the Mallee Cliffs NP (about 0.14%) which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. In this context, the relatively minor loss of vegetation is considered negligible given the extent of woodland remaining in the locality and that Southern Scrub-Robin will be able to continue to forage and breed in the project area given the largely linear nature of the proposed clearing, and their moderately sized home ranges.

The removal of feral predators and herbivores from within the 9,570 ha proposed feral-free fenced area will deliver substantial benefits for the species. It will provide a significant reduction in the operation of seven KTPs: *Competition and grazing by the feral European Rabbit*, *Competition and habitat degradation by Feral Goats*, *Predation and hybridisation by Feral dogs*, *Predation by the European Red Fox*, *Predation by feral cats*, and *Predation, habitat degradation, competition and disease transmission by Feral Pigs.*

In summary, the proposed activity is *unlikely* to result in the operation of, or significantly increase the impact of, any key threatening process in the project area.

Conclusion

This Assessment of Significance has determined that the proposed activity is *'unlikely'* to have a *'significant effect'* on Southern Scrub-wren or their habitats. Indeed, the proposed conservation fence is likely to increase general longevity and reproductive success following the removal of feral predators and herbivores. Therefore, the proposed activity will not require a Species Impact Statement.

Spotted Harrier

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

The Spotted Harrier occurs in open woodland and grassland habitats across mainland Australia. It builds a stick nest in a live tree and breeds in Spring, occasionally Autumn (OEH 2017d).A single record of Spotted Harrier is known from Mallee Cliffs NP (BioNET database). An incidental observation of this species was recorded by AWC during their surveys.

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

- Secondary poisoning from rabbit baiting.
- Secondary poisoning from rodenticides.
- Clearing and degradation of foraging and breeding habitat, particularly that which affects prey densities.

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%).

Spotted Harrier are likely to occur within the vicinity of the proposed CFAI based on the presence of woodland/forest. The clearing of up to about 78 ha of native vegetation is necessary to create the proposed CFAI and is considered of little consequence to Spotted Harrier. This is on the basis that the entire NSW population is considered a single population given its very wide dispersal capability. While it is acknowledged that the proposed CFAI would result in the removal of a small proportion of the 58,118 ha Mallee Cliffs project area (about 0.14%), the ability of Spotted Harrier to move easily across cleared, fragmented and woodland landscapes, would ensure that it could continue to utilise the remaining habitats of the project area and the broader Mungo landscape in general. The Spotted Harrier regularly forages within open and cleared agricultural areas. Given this high level of mobility, detrimental impacts are only likely should a nest site be removed. No nesting site would be removed by the proposal.

With consideration of these factors, it is *unlikely* that the proposal could have an adverse effect on the life cycle of Spotted Harrier such that a viable local population is likely to be placed at risk of extinction.

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

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

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

The Spotted Harrier is not listed as an endangered ecological community or critically endangered ecological community within Mallee Cliffs NP.

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

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

(i) The proposed CFAI would result in the removal of up to about 78 ha of native habitat that Spotted Harrier is predicted to occur. This is a tiny proportion of the total habitat available to the species within the proposed project area and the broader Mungo landscape.
(ii) The proposal is unlikely to isolate or fragment habitats as a 11 m wide clearing is would not impede any movement of the Spotted Harrier given that they regularly cross much wider clearings in agricultural landscapes.
(iii) The habitat modification will be minor in the context of the project area: up to about 78 ha of habitat within an area of 58,118 ha (about 0.14%), which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of most of the proposed clearing (11 m wide) further reduces the likelihood of any significant impact. In addition, the proposed activity would create a 9,570 ha area free of feral cats and foxes which is likely to favour the prey of the Spotted Harrier (small mammals, birds and reptiles). This benefit will improve the long-term viability of the Spotted Harrier in Mallee Cliffs NP. Given that large areas of mallee would remain unaffected (including those within the proposed feral-free fenced area), it is unlikely that the proposed habitat modifications could be important to the long-term survival of the species in the locality.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity – reintroducing extinct mammals – is not recognised as a key threatening process (KTP) under schedule 3 of the BC Act. However, two KTPs are relevant to the proposed activity: *The Clearing of native vegetation* and *Loss of dead wood and dead trees.*

The clearing of some vegetation is necessary to create the proposed CFAI, but the amount would be only a tiny proportion of the Mallee Cliffs NP (about 0.14%) which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of this clearing (11 m wide) will have no impact on the habitat of the Spotted Harrier who forages widely (over tens of kilometres).

The proposed activity will result in the retention (but relocation) of dead wood and the removal of dead trees if they occur directly on the path of the linear conservation fence and other infrastructure. The minor amounts of dead wood that would be relocated are not expected to have significant impacts on the species.

The removal of feral predators and herbivores from within the 9,570 ha proposed feral-free fenced area will deliver substantial benefits for the species. It will provide a significant reduction in the operation of seven KTPs: *Competition and grazing by the feral European Rabbit*, *Competition and habitat degradation by Feral Goats*, *Predation and hybridisation by Feral dogs*, *Predation by the European Red Fox*, *Predation by feral cats*, and *Predation, habitat degradation, competition and disease transmission by Feral Pigs.*

In summary, the proposed activity is *unlikely* to result in the operation of, or significantly increase the impact of, any key threatening process in the project area.

Conclusion

This Assessment of Significance has determined that the proposed activity is *'unlikely'* to have a *'significant effect'* on Spotted Harrier or their habitats. Indeed, the proposed conservation fence is likely to increase the availability of prey items for this species following the removal of feral predators. Therefore, the proposed activity will not require a Species Impact Statement.

Varied Sittella

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

The Varied Sittella is sedentary and inhabits most of mainland Australia except the treeless deserts and open grasslands, with a nearly continuous distribution in NSW from the coast to the far west (Noske 2001, OEH 2017d). It inhabits eucalypt forests and woodlands, especially rough-barked species and mature smooth-barked gums with dead branches, mallee and *Acacia* woodland. The Varied Sittella feeds on arthropods gleaned from crevices in rough or decorticating bark, dead branches, standing dead trees, and from small branches and twigs in the tree canopy. It builds a cup-shaped nest of plant fibres and cobweb in an upright tree fork high in the living tree canopy, and often re-uses the same fork or tree in successive years. The apparent decline has been attributed to declining habitat cover and quality (Watson et al. 2001).

The Varied Sittella is known to occur within Mallee Cliffs NP, with previous records on the BioNET database totalling 12. During the AWC field survey, 22 observations were made, with the results of this single survey almost doubling all previously known records. Given this, Varied Sittella is likely to be widespread across the Mallee Cliffs project area.

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

- Population viability is sensitive to habitat isolation and simplification, including reductions in tree species diversity, tree canopy cover, shrub cover, ground cover, logs, fallen branches and litter.
- Apparent decline has been attributed to declining habitat. The sedentary nature of the Varied Sittella makes cleared land a potential barrier to movement.
- The Varied Sittella is also adversely affected by the dominance of Noisy Miners in woodland patches.
- Threats include habitat degradation through small-scale clearing for fencelines and road verges, rural tree decline, loss of paddock trees and connectivity, 'tidying up' on farms, and firewood collection.
- Overgrazing by stock impacting on leaf litter and shrub layer.

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 is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of this clearing (11 m) will have little or no impact on the habitat of the Varied Sittella given that they have a home range between 13 and 20 ha (Noske 1998) as the home range of this species is generally not linear and the species can readily move across the landscape.

The proposed activity will require a Strategic Fire Advantage Zone (SFAZ) and an Asset Protection Zone (APZ) within 100-200 m of the proposed infrastructure. Understorey vegetation in these areas will be managed to reduce the severity of any wildfire. Varied Sittella will be able to continue to forage and nest in the SFAZ and APZ unaffected given that they are known to forage and nest in highly modified woodland patches.

For the reasons provided above, it is *unlikely* that the proposed activity will have an adverse impact on the life cycle of this species (and so the action is not likely to place a viable local population at risk of extinction). Indeed, the proposed conservation fence is likely to increase general longevity and reproductive success following the removal of feral predators.

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

- *(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
- *(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,*

Varied Sittella is not listed as an endangered ecological community or critically endangered ecological community at Mallee Cliffs NP.

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

- *(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and*
- *(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and*
- *(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,*

(i) The proposed CFAI would result in the removal of up to about 78 ha of native habitat that Varied Sittella is known to occur. This is a tiny proportion of the total habitat available to the species within the proposed project area and the broader Mungo landscape.

(ii) The proposal would not isolate or fragment habitats as Varied Sittella are known to disperse and forage across fragmented landscapes.

(iii) The habitat modification will be minor in the context of the project area: up to about 78 ha of habitat within an area of 58,118 ha (about 0.14%), which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of most of the proposed clearing (11 m wide) further reduces the likelihood of any significant impact. Given that large areas of mallee would remain unaffected (including those within the proposed feral-free fenced area), it is unlikely that the proposed habitat modifications could be important to the long-term survival of the species in the locality.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity – reintroducing extinct mammals – is not recognised as a key threatening process (KTP) under schedule 3 of the BC Act. However, two KTPs are relevant to the impacts of the proposed activity: *The Removal of dead wood and dead trees*, and *Clearing of native vegetation*.

The clearing of some vegetation is necessary to create the proposed CFAI, but the amount would be only a tiny proportion of the Mallee Cliffs NP (about 0.14%) which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The relatively minor loss of vegetation is considered negligible in the context of the extent of woodland remaining in the locality and the largely linear nature of the proposed vegetation clearing.

The proposed activity will result in the retention (but relocation) of dead wood and the removal of dead trees if they occur directly on the path of the linear conservation fence and other infrastructure. The minor amounts of dead wood that would be relocated are not expected to have significant impacts on the species.

The removal of feral predators and herbivores from within the 9,570 ha proposed feral-free fenced area will deliver substantial benefits for the species. It will provide a significant reduction in the operation of seven KTPs: *Competition and grazing by the feral European Rabbit*, *Competition and habitat degradation by Feral Goats*, *Predation and hybridisation by Feral dogs*, *Predation by the European Red Fox*, *Predation by feral cats*, and *Predation, habitat degradation, competition and disease transmission by Feral Pigs.*

In summary, the proposed activity is *unlikely* to result in the operation of, or significantly increase the impact of, any key threatening process in the project area.

Conclusion

This Assessment of Significance has determined that the proposed activity is *'unlikely'* to have a *'significant effect'* on Varied Sittella or their habitats. Therefore, the proposed activity will not require a Species Impact Statement.

White-fronted Chat

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

The White-fronted Chat occurs throughout much of southern NSW, often in damp open areas, or in saltmarsh or sedge vegetation in coastal areas. Also known to occur in open grasslands and herblands.

There are six historic records of the White-fronted Chat within Mallee Cliffs NP, from the BioNET database. AWC field surveys revealed 14 observations of White-fronted Chat. The White-fronted Chat is considered highly mobile, and in southern NSW, eruptive patterns of occurrence are often associated with rainfall events.

OEH (2017d) identify the following threats to the White-fronted Chat:

- Reduction in habitat size and quality.
- Human disturbance (particularly in urban areas) and elevated nest-predation levels.

- Much of their natural habitat is prone to alteration due to modification of river flows and floodplains.
- Prone to predation from snakes and mammals, particularly Feral Cats, European Red Foxes and rodents, as well as birds, particularly ravens.
- In coastal areas mangrove encroachment and sea-level rise associated with global warming present an additional future threat to their preferred habitat.

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%). The clearing of up to about 78 ha of native vegetation is necessary to create the proposed CFAI which includes 11.9 ha of herbland of potential habitat. Approximately 6,800 ha of herbland remain unaffected in Mallee Cliffs NP including over 800 ha within the proposed fence area. The proposed fence area would result in the creation of a 9,570 ha area free of feral cats and foxes. In the context of the highly mobile nature of White-fronted Chat, the proposed clearing would not affect the movement of this species, and foraging and breeding habitat remains accessible to this species in the project area. On this basis, the loss of up to about 78 ha is considered *unlikely* to result in an adverse effect on the life cycle of the White-fronted Chat such that a viable local population is likely to be placed at risk of extinction. The levels of habitat available to the White-fronted Chat will not be significantly affected by the proposed activity. Indeed, the proposed conservation fence is likely to increase general survival rates and nesting success in White-fronted Chat because of the removal of feral predators and large introduced herbivores.

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

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

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

White-fronted Chat is not listed as an endangered ecological community or critically endangered ecological community at Mallee Cliffs NP.

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

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

(i) The proposed CFAI would result in the removal of about 11.9 ha of habitat (herbland) for White-fronted Chat. This is a tiny proportion of the total habitat available to the species within the proposed project area and the broader Mungo landscape.
(ii) The proposal would not isolate or fragment habitats given highly mobile nature of White-fronted Chat across their range.
(iii) The habitat modification will be minor in the context of the project area: up to about 78 ha of habitat within an area of 58,118 ha (about 0.14%), which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of most of the proposed clearing (11 m wide) further reduces the likelihood of any significant impact. In addition, the proposed activity would create a 9,570 ha area free of feral cats and foxes. This will be a significant benefit to the long-term viability of the species in Mallee Cliffs NP. Given that large areas of mallee would remain unaffected (including those within the proposed feral-free fenced area), it is unlikely that the proposed habitat modifications could be important to the long-term survival of the species in the locality.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity – reintroducing extinct mammals – is not recognised as a key threatening process (KTP) under schedule 3 of the BC Act. However, one KTP is relevant to the impacts of the proposed activity: *The Clearing of native vegetation*.

The clearing of some vegetation is necessary to create the proposed CFAI, but the amount would be only a tiny proportion of the Mallee Cliffs NP (about 0.14%) which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The relatively minor loss of vegetation is considered negligible in the context of the extent of habitat remaining in the locality and the highly nomadic nature of White-fronted Chat.

The removal of feral predators and herbivores from within the 9,570 ha proposed feral-free fenced area will deliver substantial benefits for the species. It will provide a significant reduction in the operation of seven KTPs: *Competition and grazing by the feral European Rabbit*, *Competition and habitat degradation by Feral Goats*, *Predation and hybridisation by Feral dogs*, *Predation by the European Red Fox*, *Predation by feral cats*, and *Predation, habitat degradation, competition and disease transmission by Feral Pigs.*

In summary, the proposed activity is *unlikely* to result in the operation of, or significantly increase the impact of, any key threatening process in the project area.

Conclusion

This Assessment of Significance has determined that the proposed activity is *'unlikely'* to have a *'significant effect'* on White-fronted Chat or their habitats. Indeed, the proposed conservation fence is likely to increase general longevity and reproductive success following the removal of feral predators. Therefore, the proposed activity will not require a Species Impact Statement.

Southern Ningaui

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

Southern Ningaui is a tiny (5-14 g) marsupial mouse known from scattered locations across southern WA, north-west Victoria and south-western NSW (OEH 2017d). Habitat occupancy is largely driven by the presence of spinifex grass which provides protection from predators (Bos et al. 2002).

Mallee Cliffs NP is known to support a population of Southern Ningaui (Val et al. 2012) and the BioNET database reveals 152 previous records.

A small dasyurids, Southern Ningaui is quite capable of moving some distance over their home range. Movements of several hundred metres to several kilometres have been reported (Dickman et al. 2001).

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

- Repeated fires, which impacts on the presence of spinifex, can cause the local extinction of this species if refuge areas from which recolonisation can occur are not retained.
- Predation by foxes and feral cats, though the impact of predation is unknown.
- Loss of habitat through clearing (trees, shrubs and spinifex) and removal of ground cover and debris.
- Heavy grazing and trampling of habitat and food resources, particularly spinifex, by domestic stock, feral goats and rabbits may impact on this species.

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%) with the majority of woodland within and adjoining being unaffected. The clearing of up to about 78 ha of native vegetation is necessary to create the proposed CFAI. The narrow, linear nature of this clearing (11 m) will have no impact on the habitat of the Southern Ningaui given the ability of this species to move across ground vegetation. With logs and spinifex likely to still remain within the 11 m wide clearing, the Southern Ningaui will be able to continue to forage and breed in the project area. The proposed feral-free fenced area would result in the creation of a 9,570 ha area free of feral cats and foxes providing long-term security to the life cycle of the Southern Ningaui. Nonetheless, safeguards within the REF provide a framework for pre-clearance surveys which would minimise the risk of any fatalities to the Southern Ningaui that may be denning within or under hollow logs on the ground, or spinifex clumps.

In the context of the woodland that remains unaffected by the proposed activity and the creation of a 9,570 ha area free of feral cats and foxes which is a significant benefit to the Southern Ningaui, the loss of up to about 78 ha is considered *unlikely* to result in an adverse effect on the life cycle of Southern Ningaui such that a viable local population is likely to be placed at risk of extinction.

The levels of habitat available to the Southern Ningaui will not be significantly affected by the proposed activity. Indeed, the proposed conservation fence is likely to increase general survival rates and breeding success of the Southern Ningaui because of the removal of feral predators and large introduced herbivores. For example, at Scotia, equal numbers of sites in matched habitats were surveyed inside and outside the feral predator-free area during the same period in 2016. A total of 29 Ningaui were captured, 23 at sites within the feral predator-free area compared to only 6 captures made outside of the fences (AWC, unpublished data).

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

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

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

The Southern Ningaui is not listed as an endangered ecological community or critically endangered ecological community at Mallee Cliffs.

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

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

(i) The proposed CFAI would result in the removal of up to about 78 ha of native habitat within which the Southern Ningaui is known to occur. This is a tiny proportion of the total habitat available to the species within the proposed project area and the broader Mungo landscape.

(ii) The proposal would not create a barrier to the Southern Ningaui as they could easily pass through the netting. The creation of a 9,570 ha proposed feral-free fenced area is likely to be of great benefit to the long-term viability of the Southern Ningaui in Mallee Cliffs NP. The proposal is unlikely to isolate or fragment habitats as a 11 m wide clearing is unlikely to impede any movement of Southern Ningaui as spinifex regenerates and individuals have been known to move up to 2 km.

(iii) The habitat modification will be minor in the context of the project area: up to about 78 ha of habitat within an area of 58,118 ha (about 0.14%), which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of most of the proposed clearing (11 m wide) further reduces the likelihood of any significant impact. In addition, the proposed activity would create a 9,570 ha area free of feral cats and foxes. This will be a significant benefit to the long-term viability of the species in Mallee Cliffs NP. Given that large areas of mallee would remain unaffected (including those within the proposed feral-free fenced area), it is unlikely that the proposed habitat modifications could be important to the long-term survival of the species in the locality.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity – reintroducing extinct mammals – is not recognised as a key threatening process (KTP) under schedule 3 of the BC Act. However, two KTPs are relevant to the proposed activity: *The Removal of dead wood and dead trees*, and *Clearing of native vegetation*.

The clearing of some vegetation is necessary to create the proposed CFAI, but the amount would be only a tiny proportion of the Mallee Cliffs NP (about 0.14%) which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. In this context, the relatively minor loss of vegetation is considered negligible given the extent of woodland remaining in the locality and that the Southern Ningaui will be able to continue to forage and breed in the project area given that they are relatively mobile, that the linear conservation fence would not provide a barrier to this species, and that feral predators would be removed from within the proposed feral-free fenced area.

The proposed activity will result in the retention (but relocation) of dead wood and the removal of dead trees if they occur directly on the path of the linear conservation fence and other infrastructure. The minor amounts of dead wood that would be relocated are not expected to have significant impacts on the species.

The removal of feral predators and herbivores from within the 9,570 ha proposed feral-free fenced area will deliver substantial benefits for the species. It will provide a significant reduction in the operation of seven KTPs: *Competition and grazing by the feral European Rabbit*, *Competition and habitat degradation by Feral Goats*, *Predation and hybridisation by Feral dogs*, *Predation by the European Red Fox*, *Predation by feral cats*, and *Predation, habitat degradation, competition and disease transmission by Feral Pigs.*

In summary, the proposed activity is *unlikely* to result in the operation of, or significantly increase the impact of, any key threatening process in the project area.

Conclusion

This Assessment of Significance has determined that the proposed activity is *'unlikely'* to have a *'significant effect'* on Southern Ningaui or their habitats. Indeed, the proposed conservation fence is likely to increase general longevity and reproductive success following the removal of feral predators. Therefore, the proposed activity will not require a Species Impact Statement.

Western Pygmy-possum

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

The Western Pygmy-possum occurs in temperate to arid woodlands across southern Australia, extending from the south west corner of Western Australia, through South Australia and western Victoria, with the eastern limit in south-western NSW (NPWS 2001c). In NSW it was first trapped in Mallee Cliffs NP in surveys in 1996 (OEH 2017d). In NSW the numbers in the local population appear to vary significantly from year to year, though the factors causing this are not known (though fluctuations elsewhere are suspected to be linked to rainfall and subsequent food availability) (NPWS 1999b). Indeed, landscape scale surveys

targeting Western Pygmy-possum (amongst other species) failed to detect any individuals (Val et al. 2012). However, Western Pygmy-possum is known to occur within the Mallee Cliffs project area, with previous records totalling 95 (BioNET database). Four individuals of the Western Pygmy-possum were captured at three different sites by AWC during Autumn 2017. Western Pygmy-possums were captured in both predominant Mallee types in the Park; those with spinifex and those with shrubs in the understorey.

While little information exists relating to home range and movements of Western Pygmy-possum, we know that distances moved by individuals in South Australia ranged between 24 and 60 m, with some moving as far as 195 m (NPWS 2001c).

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

- Habitat clearance; in particular clearing of Belah woodlands and mallee areas containing spinifex.
- Overgrazing, which removes food sources and refuge habitat.
- Predation by foxes and cats is possible, given the feeding habits and activity times of this species.
- Altered fire regimes including too frequent burning of habitat that removes mallee and/or shrub species that provide food and shelter.

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%) with the majority of woodland within and adjoining being unaffected. The project area is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of the clearing (up to 11 m wide) will have no impact on the use of habitat given that the species can cross the fenceline. Significantly, however, the proposal addresses the major threat of fox and cat predation, and creates a large (9,570 ha) feral predator free and herbivore free fenced area. The proposed feral-free fenced area will create high quality habitat for the Western Pygmy-possum when these key threats are removed.

The clearing of up to about 78 ha of native vegetation is necessary to create the proposed CFAI. It is unlikely that the creation of a 11 m wide clearing would be a barrier to this species, given that Western Pygmy-possums have been observed moving between feeding resources at ground level, and they are small enough to pass through the wire holes in the fence. Foxes and cats would be removed from inside the proposed feral-free fenced area, and significant improvements in feral predator control would also occur outside of the proposed feral-free fenced area. It is *unlikely* that the proposed activity will have an adverse impact on the life cycle of the Western Pygmy-possum and so the action is not likely to place a viable local population at risk of extinction.

The levels of habitat available to the Western Pygmy-possum will not be significantly affected by the proposed activity. Indeed, the proposed conservation fence is likely to

increase general survival rates and general recruitment in Western Pygmy-possum because of the removal of feral predators.

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

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

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

The Western Pygmy-possum population at Mallee Cliffs NP is not listed as an endangered ecological community or critically endangered ecological community.

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

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

(i) The proposed CFAI would result in the removal or modification of up to about 78 ha of native habitat where the Western Pygmy-possum is known to occur. This is a tiny proportion of the total habitat available to the species within the proposed project area and the broader Mungo landscape.

(ii) The proposal would not create a barrier to the Western Pygmy-possum as they could easily pass through the netting. The creation of a 9,570 ha proposed feral-free fenced area is likely to be of great benefit to the long-term viability of Western Pygmy-possum in Mallee Cliffs NP.

(iii) The habitat modification will be minor in the context of the project area: up to about 78 ha of habitat within an area of 58,118 ha (about 0.14%), which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of most of the proposed clearing (11 m wide) further reduces the likelihood of any significant impact. In addition, the proposed activity would create a 9,570 ha area free of feral cats and foxes. This will be a significant benefit to the long-term viability of the species in Mallee Cliffs NP. Given that large areas of mallee would remain unaffected (including those within the proposed feral-free fenced area), it is unlikely that the proposed habitat modifications could be important to the long-term survival of the species in the locality.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity – reintroducing extinct mammals – is not recognised as a key threatening process (KTP) under schedule 3 of the BC Act. However, three KTPs are relevant to the proposed activity: *Removal of dead wood and dead trees*, and *Clearing of native vegetation* and *Removal of hollow-bearing trees*.

The clearing of some vegetation is necessary to create the proposed CFAI, but the amount would be only a tiny proportion of the Mallee Cliffs NP (about 0.14%) which is embedded

within more than 600,000 ha of continuous habitat across the Mungo landscape. In addition, the creation of a 9,570 ha feral predator free area is of significant benefit to the long-term viability of the population of Western Pygmy-possum within the Mallee Cliffs project area.

The proposed activity will result in the retention (but relocation) of dead wood and the removal of dead trees if they occur directly on the path of the linear conservation fence and other infrastructure. The minor amounts of dead wood that would be relocated are not expected to have significant impacts on the species.

AWC surveys have shown that hollow-bearing trees are widespread and common throughout the project area. The removal of a limited number of hollow-bearing trees during clearing for the proposed fence would have a negligible impact on availability of hollows and not have adverse impacts on life cycles of Western Pygmy-possums.

The removal of feral predators and herbivores from within the 9,570 ha proposed feral-free fenced area will deliver substantial benefits for the species. It will provide a significant reduction in the operation of seven KTPs: *Competition and grazing by the feral European Rabbit*, *Competition and habitat degradation by Feral Goats*, *Predation and hybridisation by Feral dogs*, *Predation by the European Red Fox*, *Predation by feral cats*, and *Predation, habitat degradation, competition and disease transmission by Feral Pigs.*

In summary, the proposed activity is *unlikely* to result in the operation of, or significantly increase the impact of, any key threatening process in the project area. It is certain to reduce the impact of several key threatening processes.

Conclusion

This Assessment of Significance has determined that the proposed activity is *'unlikely'* to have a *'significant effect'* on the Western Pygmy-possum or its habitats. Indeed, the proposed conservation fence is likely to increase general longevity and recruitment following the removal of feral predators. Therefore, the proposed activity will not require a Species Impact Statement.

Jewelled Gecko

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

The Jewelled Gecko is restricted to the south-western corner of NSW and within spinifex dominated habitats (OEH 2017d, Shea and Wells 1983). This species is nocturnal, foraging either within or on the exterior of spinifex clump, or between spinifex clumps. Detectability is generally guaranteed with storm activity (pers. obs).

The Jewelled Gecko is known from the Mallee Cliffs project area, with 15 previous records in the BioNET database. One Jewelled Gecko was recorded during the AWC field surveys. The Jewelled Gecko is likely to occur within spinifex habitats, as they are generally common in Mungo landscape. The home range and movement/dispersal capability is poorly known, however, one author (SS) has observed unassisted movements of a single animal hunting between spinifex clumps over a distance of more than 10 m over one hour. Given this, it could be assumed that the Jewelled Gecko could move much further over a single night of foraging.

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

- Habitat clearance, in particular, clearing of spinifex grasslands either with or without a mallee overstorey, usually for agricultural purposes.

- Inappropriate fire frequency, which directly affects the amount of cover provided by spinifex. Alteration of fire frequency may reduce the availability of suitable habitat and food species.
- Predation by foxes and cats is possible given the feeding habits and activity times of this species.
- Heavy grazing and trampling of habitat and food resources by domestic stock, feral goats, rabbits and 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 is within the 600,000 ha Mungo landscape. The clearing of up to about 78 ha of native vegetation is necessary to create the proposed CFAI. The limited extent of clearing and the narrow, linear nature of this clearing (11 m) will have no impact on the use of habitat by the Jewelled Gecko given the ability of this species to move more than 10 m in an hour (see pers. obs SS above). On that basis, the Jewelled Gecko will be able to easily traverse the 11 m wide clearing, and will be able to continue to forage and breed in the project area. However, this is likely only to occur once spinifex regenerates in the cleared strip.

The proposed feral-free fenced area would result in the creation of a 9,570 ha area free of feral cats and foxes providing long-term security to the life cycle of Jewelled Gecko. Further, safeguards within the REF provide a framework for pre-clearance surveys which would minimise the risk of any fatalities to the Jewelled Gecko that may be sheltering within spinifex clumps.

With consideration of these factors, it is *unlikely* that the proposal could have an adverse effect on the life cycle of the Jewelled Gecko such that a viable local population is likely to be placed at risk of extinction. The levels of habitat available to the Jewelled Gecko will not be significantly affected by the proposed activity. Indeed, the proposed conservation fence is likely to increase general survival rates and general recruitment in populations of the Jewelled Gecko because of the removal of feral predators.

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

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

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

The Jewelled Gecko is not listed as an endangered ecological community or critically endangered ecological community within Mallee Cliffs NP.

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

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

(i) The proposed CFAI would result in the removal of up to about 78 ha of native habitat in which the Jewelled Gecko is predicted to occur. This is a tiny proportion of the total habitat available to the species within the proposed project area and the broader Mungo landscape.
(ii) The proposal would not create a barrier to the Jewelled Gecko as they could easily pass through the netting. The creation of a 9,570 ha proposed feral-free fenced area is likely to be of great benefit to the long-term viability of the Jewelled Gecko in Mallee Cliffs NP. The proposal is unlikely to isolate or fragment habitat as the Jewelled Gecko is likely to be able to traverse the 11 m wide clearing given that spinifex and other ground cover vegetation is likely to regenerate.
(iii) The habitat modification will be minor in the context of the project area: up to about 78 ha of habitat within an area of 58,118 ha (about 0.14%), which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of most of the proposed clearing (11 m wide) further reduces the likelihood of any significant impact. In addition, the proposed activity would create a 9,570 ha area free of feral cats and foxes. This will be a significant benefit to the long-term viability of the species in Mallee Cliffs NP. Given that large areas of mallee would remain unaffected (including those within the proposed feral-free fenced area), it is unlikely that the proposed habitat modifications could be important to the long-term survival of the species in the locality.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity – reintroducing extinct mammals – is not recognised as a key threatening process (KTP) under schedule 3 of the BC Act. However, one KTP is relevant to the impacts of the proposed activity: *Clearing of native vegetation*.

The clearing of some vegetation is necessary to create the proposed CFAI, but the amount would be only a tiny proportion of the Mallee Cliffs NP (about 0.14%) which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. Further, safeguards within the REF provide a framework for pre-clearance surveys which would minimise the risk of any fatalities to Jewelled Gecko that may be sheltering within or under spinifex clumps at the time of clearing. These would be relocated to adjacent habitat immediately prior to clearing commencing.

The removal of feral predators and herbivores from within the 9,570 ha proposed feral-free fenced area will deliver substantial benefits for the species. It will provide a significant reduction in the operation of seven KTPs: *Competition and grazing by the feral European Rabbit*, *Competition and habitat degradation by Feral Goats*, *Predation and hybridisation by Feral dogs*, *Predation by the European Red Fox*, *Predation by feral cats*, and *Predation, habitat degradation, competition and disease transmission by Feral Pigs.*

In summary, the proposed activity is *unlikely* to result in the operation of, or significantly increase the impact of, any key threatening process in the project area.

Conclusion

This Assessment of Significance has determined that the proposed activity is *'unlikely'* to have a *'significant effect'* on the Jewelled Gecko or its habitats. Indeed, the proposed conservation fence is likely to increase general longevity and reproductive success following the removal of feral predators. Therefore, the proposed activity will not require a Species Impact Statement.

Mallee Worm-lizard

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

The Mallee Worm-lizard is known from western and central-western NSW with most records from the mallee between Balranald and Gol Gol including Mallee Cliffs NP (OEH 2017b, OEH 2017d, Val et al. 2001, Val et al. 2012). They occur in mallee woodlands and the species is likely a spinifex-obligate and has long been considered a species of conservation concern (Sadlier and Pressey 1994).

The Mallee Worm-lizard is known from the Mallee Cliffs project area, with 10 previous records in the BioNET database. There were two records of the species during the AWC field surveys. The home range and movement/dispersal ability of this species is unknown, so it is appropriate to consider species in the same genera, such as the highly studied *Aprasia parapulchella*. Previous studies have identified movement of over 30 m from possible source populations, to colonise new areas of habitat (Wong et al. 2011).

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

- Habitat clearance, in particular, clearing of mallee areas containing spinifex, though in South Australia it has been shown to survive in a fragmented landscape.
- Inappropriate fire frequency, which directly affects the amount of cover provided by vegetation, although a study in South Australia showed capture rates did not vary significantly based on fire history. Alteration of fire frequency may reduce the availability of suitable habitat for this species and its prey.
- Loss of leaf litter, fallen timber, bark and other ground cover.
- Soil compaction from machinery and domestic stock.
- Heavy grazing and trampling of habitat and food resources by domestic stock, feral goats, rabbits and 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 is within the 600,000 ha Mungo landscape.

The clearing of up to about 78 ha of native vegetation is necessary to create the proposed CFAI. The limited extent of the clearing and the narrow, linear nature of this clearing (11 m) is unlikely to have an impact on the use of habitat by the Mallee Worm-lizard given the ability of this species to move short distances (likely about 30 m) and the fact it will be able to continue to forage and breed in the project area. However, this is likely only to occur once spinifex regenerates in the cleared strip. Further, safeguards within the REF provide a framework for pre-clearance surveys which would minimise the risk of any fatalities to the Mallee Worm-lizard that may be sheltering within spinifex clumps prior to clearing.

The proposed activity would result in the creation of a 9,570 ha area free of feral cats and foxes which is likely to be of significant benefit to the life cycle of the Mallee Worm-lizard.

With consideration of these factors, it is *unlikely* that the proposal could have an adverse effect on the life cycle of the Mallee Worm-lizard such that a viable local population is likely to be placed at risk of extinction. The levels of habitat available to the Mallee Worm-lizard will not be significantly affected by the proposed activity. Indeed, the proposed conservation fence is likely to increase general survival rates and general recruitment in populations of the Mallee Worm-lizard because of the removal of feral predators.

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

- *(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
- *(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,*

The Mallee Worm-lizard is not listed as an endangered ecological community or critically endangered ecological community within Mallee Cliffs NP.

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

- *(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and*
- *(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and*
- *(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,*

(i) The proposed CFAI would result in the removal of up to about 78 ha of native habitat that Mallee Worm-lizard is predicted to occur. This is a tiny proportion of the total habitat available to the species within the proposed project area and the broader Mungo landscape.

(ii) The proposal would not create a barrier to the Mallee Worm-lizard as they could easily pass through the netting. The creation of a 9,570 ha proposed feral-free fenced area is likely to be of great benefit to the long-term viability of the Mallee Worm-lizard in Mallee Cliffs NP. The proposal would not isolate or fragment habitat as the Mallee Worm-lizard is likely to be able to traverse the 11-metre wide clearing given that spinifex and other ground cover vegetation is likely to regenerate.

(iii) The habitat modification will be minor in the context of the project area: up to about 78 ha of habitat within an area of 58,118 ha (up to 0.14%), which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of most of the proposed clearing (11 m wide) further reduces the likelihood of any significant impact. Given that large areas of mallee with spinifex would remain unaffected (including those within the proposed feral-free

fenced area), it is unlikely that the habitat to be directly affected is important to the long-term survival of the Mallee Worm-lizard in the locality. In addition, the proposed activity would create a 9,570 ha area free of feral cats and foxes and introduced herbivores. This is a significant benefit to the long-term viability of the Mallee Worm-lizard.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity – reintroducing extinct mammals – is not recognised as a key threatening process (KTP) under schedule 3 of the BC Act. However, two KTPs are relevant to the proposed activity: *the Removal of dead wood and dead trees*, and *Clearing of native vegetation*.

The clearing of some vegetation is necessary to create the proposed CFAI, but the amount would be only a tiny proportion of the Mallee Cliffs NP (about 0.14%) which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. Further, safeguards within the REF provide a framework for pre-clearance surveys which would minimise the risk of any fatalities to individuals that may be sheltering within or under spinifex clumps at the time of clearing. These would be relocated to adjacent habitat immediately prior to clearing commencing.

The proposed activity will result in the retention (but relocation) of dead wood and the removal of dead trees if they occur directly on the path of the linear conservation fence and other infrastructure. The minor amounts of dead wood that would be relocated are not expected to have significant impacts on the species.

The removal of feral predators and herbivores from within the 9,570 ha proposed feral-free fenced area will deliver substantial benefits for the species. It will provide a significant reduction in the operation of seven KTPs: *Competition and grazing by the feral European Rabbit*, *Competition and habitat degradation by Feral Goats*, *Predation and hybridisation by Feral dogs*, *Predation by the European Red Fox*, *Predation by feral cats*, and *Predation, habitat degradation, competition and disease transmission by Feral Pigs.*

In summary, the proposed activity is *unlikely* to result in the operation of, or significantly increase the impact of, any key threatening process in the project area.

Conclusion

This Assessment of Significance has determined that the proposed activity is *'unlikely'* to have a *'significant effect'* on the Mallee Worm-lizard or its habitat provided safeguards are adopted and fully implemented. Therefore, the proposed activity will not require a Species Impact Statement.

Western Blue-tongue Lizard

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

The Western Blue-tongue Lizard occurs as scattered records across central western and western NSW that is known to inhabit a range of landscapes including plains, swales, ranges and dunes (Shea 1992, Sass 2006, Sass and Swan 2010). Preferred habitat appears to be that with a spinifex understory (Sass 2006, Sass and Swan 2010, Fyfe 1983). While the home range of this species of blue-tongue is not known, the Eastern Blue-tongue lizard has a wide ranging home range with high dispersal capability. Previous study has found individuals ranging between 2,000 to 4,500 square metres (Koenig et al. 2001).

In Mallee Cliffs NP, there are four previous records of Western Blue-tongue Lizard. The non-detection of this species during the AWC field surveys is not surprising given the relatively low abundance of this species, and that the majority of existing records are from opportunistic sightings, rather the results of systematic reptile surveys.

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

- Clearing and heavy grazing of mallee destroys or fragments habitat.
- Ripping of rabbit warrens potentially reduces shelter.
- Predation by foxes and cats may be problematic.

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 is within the 600,000 ha Mungo landscape.

The clearing of up to about 78 ha of native vegetation is necessary to create the proposed CFAI. The narrow, linear nature of this clearing (11 m) will have no impact on the habitat of the Western Blue-tongue lizard given the ability to move across clearings as great as 50 m in width, and young individuals will be able to pass through the 30 mm aperture of the fence. This ensures that the species will be able to continue to forage and breed in the project area both inside and outside the proposed feral-free fenced area. Further, safeguards within the REF provide a framework for pre-clearance surveys which would minimise the risk of any fatalities to Western Blue-tongue lizard individuals that may be sheltering within spinifex clumps or under fallen timber prior to clearing.

With consideration of these factors, it is *unlikely* that the proposal could have an adverse effect on the life cycle of the Western Blue-tongue lizard such that a viable local population is likely to be placed at risk of extinction. The levels of habitat available to the Western Blue-tongue lizard will not be significantly affected by the proposed activity. Indeed, the proposed conservation fence is likely to increase general survival rates and general recruitment in the population of the Western Blue-tongue lizard because of the removal of feral predators.

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

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

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

The Western Blue-tongue Lizard is not listed as an endangered ecological community or critically endangered ecological community at Mallee Cliffs NP.

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

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

(i) The proposed CFAI would result in the removal of up to about 78 ha of native habitat within which the Western Blue-tongue Lizard is predicted to occur. This is a tiny proportion of the total habitat available to the species within the proposed project area and the broader Mungo landscape.

(ii) The proposal would not isolate or fragment habitat as the Western Blue-tongue Lizard will be able to traverse the 11 m wide clearing given that they have been observed crossing 50 m wide fire breaks in the mallee of Nombinnie Nature Reserve (SS, pers. obs.). Furthermore, young individuals will be able to pass through the 30 mm aperture of the fence.

(iii) The habitat modification will be minor in the context of the project area: up to about 78 ha of habitat within an area of 58,118 ha (up to 0.14%), which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of most of the proposed clearing (11 m wide) further reduces the likelihood of any significant impact. Given that large areas of mallee with spinifex would remain unaffected (including those within the proposed feral-free fenced area), it is unlikely that the habitat to be directly affected is important to the long-term survival of the Western Blue-tongue Lizard in the locality. In addition, the proposed activity would create a 9,570 ha area free of feral cats and foxes and introduced herbivores. This is a significant benefit to the long-term viability of the species.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity – reintroducing extinct mammals – is not recognised as a key threatening process (KTP) under schedule 3 of the BC Act. However, two KTPs are relevant to the proposed activity: *Removal of dead wood and dead trees*, and *Clearing of native vegetation*.

The clearing of some vegetation is necessary to create the proposed CFAI, but the amount would be only a tiny proportion of the Mallee Cliffs NP (about 0.14%) which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. Further, safeguards within the REF provide a framework for pre-clearance surveys which would minimise the risk of any fatalities to any individuals that may be sheltering within or under spinifex clumps or fallen timber at the time of clearing. These would be relocated to adjacent habitat immediately prior to clearing commencing.

The proposed activity will result in the retention (but relocation) of dead wood and the removal of dead trees if they occur directly on the path of the linear conservation fence and other infrastructure. The minor amounts of dead wood that would be relocated are not expected to have significant impacts on the species.

The removal of feral predators and herbivores from within the 9,570 ha proposed feral-free fenced area will deliver substantial benefits for the species. It will provide a significant reduction in the operation of seven KTPs: *Competition and grazing by the feral European Rabbit*, *Competition and habitat degradation by Feral Goats*, *Predation and hybridisation by Feral dogs*, *Predation by the European Red Fox*, *Predation by feral cats*, and *Predation, habitat degradation, competition and disease transmission by Feral Pigs.*

In summary, the proposed activity is *unlikely* to result in the operation of, or significantly increase the impact of, any key threatening process in the project area.

Conclusion

This Assessment of Significance has determined that the proposed activity is *'unlikely'* to have a *'significant effect'* on the Western Blue-tongue lizard or its habitats. Indeed, the proposed conservation fence is likely to increase general longevity and reproductive success following the removal of feral predators. Therefore, the proposed activity will not require a Species Impact Statement.

Bitter Quandong

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

The Bitter Quandong usually grows in mallee communities. The majority of NSW records occur within the vicinity of the Sturt Highway, between Dareton and Balranald. According to OEH (2017d), only one plant is known from formal conservation lands in NSW, being Mallee Cliffs NP.

Surveys along the proposed fenceline, tracks and around the operations base identified four small trees of the *Santalum* genus near the proposed fence clearing, but at least 20 m away from it. In the absence of fruits, a positive identification for Bitter Quandong, *Santalum murrayanum*, could not be made. In consideration of the precautionary principle, these four individuals are assumed to be Bitter Quandong, and will be assessed accordingly.

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

- Clearing of mallee habitat areas.
- Wildfires may kill individuals, but the species' response to fire is poorly known.
- Vulnerable to habitat disturbance and fragmentation.
- Erosion (sites subject to wind-sheeting and drift).
- Germination restrictions (as root parasites, the presence of appropriate host species may be a limiting factor) and grazing by goats may also be impacting on regeneration success.

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 is within the 600,000 ha Mungo landscape.

The clearing of up to about 78 ha of native vegetation is necessary to create the proposed CFAI. This would not result in the removal of any Bitter Quandong plants.

In the context of the habitat that remains unaffected by the proposed activity and the creation of a 9,570 ha area free of feral herbivores, the loss of up to about 78 ha is considered *unlikely* to result in an adverse effect on the life cycle of Bitter Quandong such that a viable local population (should one occur there) is likely to be placed at risk of extinction. The levels of habitat available to the Bitter Quandong will not be significantly affected by the proposed activity. Indeed, the proposed conservation fence is likely to increase the availability of potential habitat because of the removal of large introduced herbivores.

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

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

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

Bitter Quandong is not listed as an endangered ecological community or critically endangered ecological community within Mallee Cliffs NP.

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

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

(i) The proposed CFAI would result in the removal of up to about 78 ha of habitat. Surveys found no Bitter Quandong plants would be removed.

(ii) The proposal would not isolate or fragment habitats to the extent that Bitter Quandong would not be able to exchange genetic material.

(iii) The habitat modification will be minor in the context of the project area: up to about 78 ha of habitat within an area of 58,118 ha (about 0.14%), which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. In addition, the proposed activity would create a 9,570 ha area free of feral herbivores and inhabited by small mammals that disperse and cache quandong seeds, and this would be a significant benefit to the long-term viability of Bitter Quandong in the project area. It is unlikely that the habitat to be directly affected is important to the long-term survival of Bitter Quandong in the locality.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity – reintroducing extinct mammals – is not recognised as a key threatening process (KTP) under schedule 3 of the BC Act. However, one KTP is relevant to the impacts of the proposed activity: *The Clearing of native vegetation*.

The clearing of some vegetation is necessary to create the proposed CFAI, but the amount would be only a tiny proportion of the Mallee Cliffs NP (about 0.14%) which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. No Bitter Quandong plants will be cleared.

The removal of feral predators and herbivores from within the 9,570 ha proposed feral-free fenced area will deliver substantial benefits for the species. It will provide a significant reduction in the operation of seven KTPs: *Competition and grazing by the feral European Rabbit*, *Competition and habitat degradation by Feral Goats*, *Predation and hybridisation by Feral dogs*, *Predation by the European Red Fox*, *Predation by feral cats*, and *Predation, habitat degradation, competition and disease transmission by Feral Pigs.*

Conclusion

This Assessment of Significance has determined that the proposed activity is *'unlikely'* to have a *'significant effect'* on Bitter Quandong or their habitats. Indeed, the proposed conservation fence is likely to increase reproductive and regenerative success following the removal of feral herbivores. Therefore, the proposed activity will not require a Species Impact Statement.

Black-chinned Honeyeater

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

The Black-chinned Honeyeater extends south from central Queensland, through NSW, Victoria into south eastern South Australia (Ford and Paton 1977). In NSW it is widespread, with records from the tablelands and western slopes of the Great Dividing Range to the north-west and central-west plains and the Riverina. It is rarely recorded east of the Great Dividing Range, although regularly observed in the Richmond and Clarence River areas. It has also been recorded at a few scattered sites in the Hunter, Central Coast and Illawarra regions, though it is very rare in the latter. The species occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (*Eucalyptus sideroxylon*), White Box (*E. albens*), Inland Grey Box (*E. microcarpa*), Yellow Box (*E. melliodora*), Blakely's Red Gum (*E. blakelyi*) and Forest Red Gum (*E. tereticornis*). Feeding territories are large making the species locally nomadic. Recent studies have found that the Black-chinned Honeyeater tends to occur in the largest woodland patches in the landscape as birds forage over large home ranges of at least 5 ha (Montague-Drake et al. 2009).

The Black-chinned Honeyeater has been recorded previously in Mallee Cliffs NP, on a single occasion according to the BioNET database, suggesting that it is a rare vagrant given that it is generally readily detectable where it occurs.

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

- Clearing of remnant open forest and woodland habitat.
- Poor regeneration of open forest and woodland habitats because of intense grazing.
- May be excluded from smaller remnants by aggressive species such as the Noisy Miner (*Manorina melanocephala*).
- Fragmentation of woodland habitat.
- Infestation by invasive weeds.
- Inappropriate fire regimes.
- Climate change and reduction in resources due to drought.

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 is within the 600,000 ha Mungo landscape.

The limited extent and narrow, linear nature of this clearing (11 m) will have no impact on the use of habitat by the Black-chinned Honeyeater given that this species is partially nomadic. The moderately sized home range (around 5 ha), means individuals are likely to readily find alternative resource opportunities to the very limited resources lost as a consequence of this project.

Given the largely lineal nature of the proposed clearing, it is unlikely that a large area of an individual's home range will be affected. In the context of the woodland that remains unaffected by the proposed activity and the creation of a 9,570 ha area free of feral cats and foxes (which could potentially support as many as thousands of home ranges of Black-chinned Honeyeater), the loss of up to about 78 ha is considered *unlikely* to result in an adverse effect on the life cycle of Black-chinned Honeyeater such that a viable local population is likely to be placed at risk of extinction.

The levels of habitat available to the Black-chinned Honeyeater will not be significantly affected by the proposed activity. Indeed, the proposed conservation fence is likely to increase general survival rates and nesting success in Black-chinned Honeyeater because of the removal of feral predators and large introduced herbivores.

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

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

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

Black-chinned Honeyeater is not listed as an endangered ecological community or critically endangered ecological community within Mallee Cliffs NP.

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

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

(i) The proposed CFAI would result in the removal of up to about 78 ha of native habitat in which Black-chinned Honeyeater may occur. This is a tiny proportion of the total habitat available to the species within the proposed project area and the broader Mungo landscape.
(ii) The proposal would not isolate or fragment habitats as Black-chinned Honeyeaters are highly mobile.
(iii) The habitat modification will be minor in the context of the project area: up to about 78 ha of habitat within an area of 58,118 ha (about 0.14%), which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of most of the proposed clearing (11 m wide) further reduces the likelihood of any significant impact. Given that large areas of mallee would remain unaffected (including those within the proposed feral-free fenced area), it is unlikely that the proposed habitat modifications could be important to the long-term survival of the species in the locality.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity – reintroducing extinct mammals – is not recognised as a key threatening process (KTP) under schedule 3 of the BC Act. However, one KTP is relevant to the proposed activity: *The Clearing of native vegetation*.

The clearing of some vegetation is necessary to create the proposed CFAI, but the amount would be only a tiny proportion of the Mallee Cliffs NP (about 0.14%) which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. In this context, the relatively minor loss of vegetation is considered negligible given the extent of woodland remaining in the locality and that Black-chinned Honeyeater will be able to continue to forage and breed in the project area given the largely linear nature of the proposed clearing, and the high mobility of this species.

The removal of feral predators and herbivores from within the 9,570 ha proposed feral-free fenced area will deliver substantial benefits for the species. It will provide a significant reduction in the operation of seven KTPs: *Competition and grazing by the feral European Rabbit*, *Competition and habitat degradation by Feral Goats*, *Predation and hybridisation by Feral dogs*, *Predation by the European Red Fox*, *Predation by feral cats*, and *Predation, habitat degradation, competition and disease transmission by Feral Pigs.*

In summary, the proposed activity is *unlikely* to result in the operation of, or significantly increase the impact of, any key threatening process in the project area.

Conclusion

This Assessment of Significance has determined that the proposed activity is ***'unlikely'*** to have a ***'significant effect'*** on Black-chinned Honeyeater or their habitats. Therefore, the proposed activity will not require a Species Impact Statement.

Flame Robin

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

In NSW, the Flame Robin breeds in upland, moist eucalypt forests and woodlands spending winter in more open lowland habitats such as grassland with scattered trees and open woodland on the inland slopes and plains (Watson et al. 2001, OEH 2017d). The species often occurs in recently burnt areas, however habitat becomes unsuitable as vegetation regenerates.

The Flame Robin forages from low perches, where it pounces on small invertebrates from the ground or tree trunks. The species breeds in spring to late summer, often building their nests near the ground and sheltered sites such as shallow cavities in trees, stumps, and banks.

While not recorded by AWC during field surveys, two previous records of Flame Robin for Mallee Cliffs NP are noted in the BioNET database.

Flame Robins are considered highly mobile, with regular movements across landscapes, particularly associated with individuals moving from the highlands in winter, to lowland, milder habitats, and returning to the highlands in summer to nest. However, where they do occur, they generally occupy a home range of about 5-10 ha.

OEH (2017d) identify the following threats to Flame Robin:

- Clearing and degradation of breeding and wintering habitats.
- Degradation and simplification of habitat by removal of standing dead timber, logs and coarse woody debris.
- Nest predation by native and exotic predators, including artificially large populations of Pied Currawong (*Strepera graculina*) in some areas.
- Habitat for this species may become unsuitable if dense regeneration occurs after bushfires or other disturbances.
- Competitive exclusion by over-abundant Noisy Miners (Manorina melanocephala) within habitat.
- Isolation of patches of habitat, particularly where these patches are smaller than 10 ha, and in landscapes where clearing has been heavy or where remnants are surrounded by cropping or stock grazing.
- Degradation and simplification of habitat due to overgrazing.
- Reduction of the native ground cover in favour of exotic grasses.
- Reduction in the structural complexity of habitat, including reductions in canopy cover, shrub cover, ground cover, logs, fallen branches and leaf litter.

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 is within the 600,000 ha Mungo landscape.

The limited extent and narrow, linear nature of this clearing (11 m) means it will have no impact on the use of habitat by the Flame Robin, noting that this species is relatively mobile.

Given the largely lineal nature of the proposed clearing, it is unlikely to reduce resource availability within an individual's home range (5-10 ha). In the context of the woodland that remains unaffected by the proposed activity and the creation of a 9,570 ha area free of feral cats and foxes (which could potentially support as many as thousands of home ranges of Flame Robin), the loss of up to about 78 ha is considered *unlikely* to result in an adverse effect on the life cycle of Flame Robin such that a viable local population is likely to be placed at risk of extinction.

The levels of habitat available to the Flame Robin will not be significantly affected by the proposed activity. Indeed, the proposed conservation fence is likely to increase general survival rates and nesting success in Flame Robin because of the removal of feral predators and large introduced herbivores.

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

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

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

The Flame Robin is not listed as an endangered ecological community or critically endangered ecological community within Mallee Cliffs NP.

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

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

(i) The proposed CFAI would result in the removal of up to about 78 ha of native habitat that Flame Robin is predicted to occur. This is a tiny proportion of the total habitat available to the species within the proposed project area and the broader Mungo landscape.

(ii) The proposal would not isolate or fragment habitats given the ability of Flame Robin to move across clearings of 11 m width.

(iii) The habitat modification will be minor in the context of the project area: up to about 78 ha of habitat within an area of 58,118 ha (about 0.14%), which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of most of the proposed clearing (11 m wide) further reduces the likelihood of any significant impact. In addition, the proposed activity would create a 9,570 ha area free of feral cats and foxes. This will be a significant

benefit to the long-term viability of the species in Mallee Cliffs NP. Given that large areas of mallee would remain unaffected (including those within the proposed feral-free fenced area), it is unlikely that the proposed habitat modifications could be important to the long-term survival of the species in the locality.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity – reintroducing extinct mammals – is not recognised as a key threatening process (KTP) under schedule 3 of the BC Act. However, one KTP is relevant to the proposed activity: *The Clearing of native vegetation*.

The clearing of some vegetation is necessary to create the proposed CFAI, but the amount would be only a tiny proportion of the Mallee Cliffs NP (about 0.14%) which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. In this context, the relatively minor loss of vegetation is considered negligible given the extent of woodland/herbland remaining in the locality and that Flame Robin will be able to continue to forage and breed in the project area given the largely linear nature of the proposed clearing, and the high mobility of this species.

The removal of feral predators and herbivores from within the 9,570 ha proposed feral-free fenced area will deliver substantial benefits for the species. It will provide a significant reduction in the operation of seven KTPs: *Competition and grazing by the feral European Rabbit*, *Competition and habitat degradation by Feral Goats*, *Predation and hybridisation by Feral dogs*, *Predation by the European Red Fox*, *Predation by feral cats*, and *Predation, habitat degradation, competition and disease transmission by Feral Pigs.*

In summary, the proposed activity is *unlikely* to result in the operation of, or significantly increase the impact of, any key threatening process in the project area.

Conclusion

This Assessment of Significance has determined that the proposed activity is *'unlikely'* to have a *'significant effect'* on Flame Robin or their habitats. Indeed, the proposed conservation fence is likely to increase general longevity and reproductive success following the removal of feral predators. Therefore, the proposed activity will not require a Species Impact Statement.

Little Eagle

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

The Little Eagle is found across mainland Australia except in densely forested areas. They nest in tall, living trees, where a large stick nest is built (OEH 2017d).

The Little Eagle is considered highly mobile, with the NSW population considered a single population (OEH 2017d). Recently, a tagged individual from the ACT was observed in the NT.

Two previous records within Mallee Cliffs NP are known from the BioNET database.

OEH (2017d) identify the following threats to Little Eagle:

- Secondary poisoning from rabbit baiting
- Clearing and degradation of foraging and breeding habitat

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 is within the 600,000 ha Mungo landscape.

The narrow, linear nature of this clearing (11 m) will have no impact on the habitat of the Little Eagle given that the highly nomadic nature of the species, and that all individuals within NSW are considered a single population. Given this, impacts to this species are only likely if a known nesting location were to be affected. No evidence of any breeding was noted by AWC ecologists during field surveys.

The proposed activity will require a Strategic Fire Advantage Zone (SFAZ) and an Asset Protection Zone (APZ) to be located within 100-200m of the proposed infrastructure. Understorey vegetation in these areas will be managed to reduce the severity of wildfire. The nomadic nature and large foraging range will ensure that any impact will be minimal.

In the above context, the loss of up to about 78 ha is considered *unlikely* to result in an adverse effect on the life cycle of Little Eagle such that a viable local population is likely to be placed at risk of extinction.

The levels of habitat available to the Little Eagle will not be significantly affected by the proposed activity. The Little Eagle could continue to forage and breed across the remaining portion of Mallee Cliffs NP unaffected.

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

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

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

The Little Eagle is not listed as an endangered ecological community or critically endangered ecological community within Mallee Cliffs NP.

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

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

(i) The proposed CFAI would result in the removal of up to about 78 ha of native habitat in which Little Eagle is predicted to occur. This is a tiny proportion of the total habitat available to the species within the proposed project area and the broader Mungo landscape.
(ii) The proposal would not isolate or fragment habitats as Little Eagle are known to fly and forage across large cleared areas
(iii) The habitat modification will be minor in the context of the project area: up to about 78 ha of habitat within an area of 58,118 ha (about 0.14%), which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of most of the proposed clearing (11 m wide) further reduces the likelihood of any significant impact. In addition, the proposed activity would create a 9,570 ha area free of feral cats and foxes. This will be a significant benefit to the long-term viability of the species in Mallee Cliffs NP given the beneficial effects of the proposed fence on potential prey species. Given that large areas of mallee would remain unaffected (including those within the proposed feral-free fenced area), it is unlikely that the proposed habitat modifications could be important to the long-term survival of the species in the locality.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity – reintroducing extinct mammals – is not recognised as a key threatening process (KTP) under schedule 3 of the BC Act. However, one KTP is relevant to the proposed activity: *The Clearing of native vegetation*.

The clearing of some vegetation is necessary to create the proposed CFAI, but the amount would be only a tiny proportion of the Mallee Cliffs NP (about 0.14%) which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of this clearing (11 m wide) will have no impact on the habitat of the Little Eagle which can easily travel several hundreds of kilometres.

The removal of feral predators and herbivores from within the 9,570 ha proposed feral-free fenced area will deliver substantial benefits for the species. It will provide a significant reduction in the operation of seven KTPs: *Competition and grazing by the feral European Rabbit*, *Competition and habitat degradation by Feral Goats*, *Predation by Feral dogs*, *Predation by the European Red Fox*, *Predation by feral cats*, and *Predation, habitat degradation, competition and disease transmission by Feral Pigs.*

In summary, the proposed activity is *unlikely* to result in the operation of, or significantly increase the impact of, any key threatening process in the project area.

Conclusion

This Assessment of Significance has determined that the proposed activity is *'unlikely'* to have a *'significant effect'* on Little Eagle or their habitats. Therefore, the proposed activity will not require a Species Impact Statement.

Little Pied Bat

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

The Little Pied Bat is known from a variety of habitats including open woodland and mallee (OEH 2017d). They are known to use derelict mine shafts, disused buildings and tree hollows for roosting and maternity purposes (NPWS 2001a, NPWS 2001b, Churchill 2008).

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 Little Pied Bat is known from only a single record within the Mallee Cliffs NP. This paucity of presence data is likely to due to the lack of targeted surveys, rather than being reflective of the actual distribution of this species within the project area.

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

- Loss or modification of habitat.
- Predation by feral cats.
- Application of pesticides in or adjacent to foraging area.

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%), with the majority of woodland within and adjoining being unaffected.

The clearing of up to about 78 ha of native vegetation is necessary to create the proposed CFAI. As mentioned earlier, microchiropteran bats are highly mobile fauna, and are able to forage over tens of kilometres over a single night. The habitats to be removed are not likely to contain the only foraging habitat for these species given that microchiropteran bats can easily forage over cleared land and isolated paddock trees.

The proposed feral-free fenced area would result in the creation of a 9,570 ha area free of feral cats and foxes. Both this proposed feral-free fenced area, and a large proportion of Mallee Cliffs NP (99.9%) would continue to be available for the life cycle of this species. Similarly, hollow-bearing trees (HBT), which could provide potential roosting and maternity sites for this species, are widespread features across the project area and the majority of the project area would remain unaffected by the proposed activity. Safeguards relating to the removal of HBT to minimise potential impacts to microchiropteran bats have been incorporated into this REF.

The creation of a 9,570 ha area free of feral cats and foxes would be highly beneficial for this species in the Mallee Cliffs project area. With predation by foxes and cats being an identified threat to microchiropteran bats, the proposal addresses this key threat that is known to be currently operating in the project area.

With consideration of these factors, it is *unlikely* that the proposal could have an adverse effect on the life cycle of the Little Pied Bat such that a viable local population is likely to be placed at risk of extinction.

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

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

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

The Little Pied Bat is not listed as an endangered ecological community or critically endangered ecological community within Mallee Cliffs NP.

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

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

(i) The proposed CFAI would result in the removal of up to about 78 ha of native habitat that Little Pied Bat is predicted to occur. This is of little consequence to a highly mobile species like Little Pied Bat, which forages over tens of kilometres each night, including over cleared land.

(ii) The proposal would not isolate or fragment habitat as Little Pied Bat is highly mobile and able to forage of large areas of cleared land.

(iii) The habitat modification will be minor in the context of the project area: up to about 78 ha of habitat within an area of 58,118 ha (about 0.14%), which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of most of the proposed clearing (11 m wide) further reduces the likelihood of any significant impact. In addition, the proposed activity would create a 9,570 ha area free of feral cats and foxes. This will be a significant benefit to the long-term viability of the species in Mallee Cliffs NP. Given that large areas of mallee would remain unaffected (including those within the proposed feral-free fenced area), it is unlikely that the proposed habitat modifications could be important to the long-term survival of the species in the locality

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity – reintroducing extinct mammals – is not recognised as a key threatening process (KTP) under schedule 3 of the BC Act. However, two KTPs are relevant to the proposed activity: *Clearing of native vegetation* and *Removal of hollow-bearing trees*.

The clearing of some vegetation is necessary to create the proposed CFAI, but the amount would be only a tiny proportion of the Mallee Cliffs NP (about 0.14%) which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of this clearing (11 m wide) will have no impact on the habitat of this species given their ability to forage along linear clearings, and over vast differences (more than 10 km).

Pre-clearing assessments for the proposed activity showed that hollow-bearing trees are widespread and common throughout the project area. These assessments also showed that there were sufficient HBT to provide a range of roosting opportunities across the wider project area for this species within their very large foraging ranges.

The removal of feral predators and herbivores from within the 9,570 ha proposed feral-free fenced area will deliver substantial benefits for the species. It will provide a significant reduction in the operation of seven KTPs: *Competition and grazing by the feral European Rabbit*, *Competition and habitat degradation by Feral Goats*, *Predation and hybridisation by Feral dogs*, *Predation by the European Red Fox*, *Predation by feral cats*, and *Predation, habitat degradation, competition and disease transmission by Feral Pigs.*

In summary, the proposed activity is unlikely to result in the operation of, or increase the impact of a key threatening process with consideration of the mitigation measures proposed.

Conclusion

This Assessment of Significance has determined that the proposed activity is *'unlikely'* to have a *'significant effect'* on the Little Pied Bat or their habitats. Indeed, the proposed conservation fence is likely to increase general longevity and reproductive success following the removal of feral predators. Therefore, the proposed activity will not require a Species Impact Statement.

Bardick

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

The Bardick is a short elapid snake known from the arid and semi-arid regions of southern Australia (Wilson and Swan 2013, Swan et al. 2004). Rarely recorded in NSW, the species is known from spinifex communities on sandy soils where it feeds primarily on lizards (Spence-Bailey and Nimmo 2008, OEH 2017d). There are no previous records of the Bardick within Mallee Cliffs NP, however, it has been detected in the wider Mungo landscape, so could feasibly occur there. Little is known of the home range, movement or dispersal ability of the Bardick, but like other small terrestrial snakes, it is likely to occur within areas of suitable habitat, and is likely to forage relatively widely.

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

- Habitat clearance, in particular, clearing of mallee areas containing spinifex but also removal of fallen timber and other ground cover used for shelter.
- Fire frequency, which directly affects the amount of cover provided and the alteration of fire frequency may reduce the availability of suitable habitat and food species.
- Predation by foxes is possible given the feeding habits and activity times of this species.
- Heavy grazing and trampling of habitat by domestic stock, feral goats, rabbits and pigs.
- Loss of leaf litter, which provides shelter and foraging habitat.

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%), with the majority of woodland within and adjoining being unaffected, within a 600,000 ha area of continuous habitat across the Mungo landscape.

The clearing of up to about 78 ha of native vegetation is necessary to create the proposed CFAI. The limited extent and the narrow, linear nature of this clearing (11 m) will have no impact on the habitat of the Bardick given the ability of this species to move across ground vegetation and it would most likely be unimpeded by a 11 m wide clearing. The Bardick will be able to easily traverse the 11 m wide clearing, and will be able to continue to forage and breed in the project area (should it occur there). Further, safeguards within the REF provide a framework for pre-clearance surveys which would minimise the risk of any fatalities to any individuals that may be sheltering within or under hollow logs on the ground, or spinifex clumps.

The proposed feral-free fenced area would result in the creation of a 9,570 ha area free of feral cats and foxes providing long-term security to the life cycle of the Bardick (should it occur there).

With consideration of these factors, it is *unlikely* that the proposal could have an adverse effect on the life cycle of the Bardick such that a viable local population is likely to be placed at risk of extinction. The levels of habitat available to the Bardick will not be significantly affected by the proposed activity. Indeed, the proposed conservation fence is likely to increase general survival rates and general recruitment in Bardick populations because of the removal of feral predators.

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

- *(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
- *(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,*

The Bardick is not listed as an endangered ecological community or critically endangered ecological community at Mallee Cliffs NP.

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

- *(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and*
- *(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and*
- *(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,*

(i) The proposed CFAI would result in the removal of up to about 78 ha of native habitat within which the Bardick is predicted to occur. This is a tiny proportion of the total habitat available to the species within the proposed project area and the broader Mungo landscape.
(ii) The proposal would not isolate or fragment habitat as the Bardick is likely to be able to traverse the 11 m wide clearing given the presence of fallen timber, as well as spinifex and other ground cover vegetation when it regenerates. Furthermore, young individuals will be able to pass through the 30 mm aperture of the fence.
(iii) The habitat modification will be minor in the context of the project area: up to about 78 ha of habitat within an area of 58,118 ha (about 0.14%), which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of most of the proposed clearing (11 m wide) further reduces the likelihood of any significant impact. In addition, the proposed activity would create a 9,570 ha area free of feral cats and foxes. This will be a significant benefit to the long-term viability of the species in Mallee Cliffs NP. Given that large areas of mallee would remain unaffected (including those within the proposed feral-free fenced area), it is unlikely that the proposed habitat modifications could be important to the long-term survival of the species in the locality.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity – reintroducing extinct mammals – is not recognised as a key threatening process (KTP) under schedule 3 of the BC Act. However, two KTPs are relevant to the proposed activity: *Removal of dead wood and dead trees*, and *Clearing of native vegetation*.

The clearing of some vegetation is necessary to create the proposed CFAI, but the amount would be only a tiny proportion of the Mallee Cliffs NP (about 0.14%) which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of this clearing (11 m) will have no impact on the habitat of the Bardick given the ability of this species to move across ground vegetation and it would most likely be unimpeded by a 11 m wide clearing. The Bardick will be able to easily traverse the 11 m wide clearing, and will be able to continue to forage and breed in the project area (should it occur there). The proposed CFAI would result in the removal of a small proportion of the 58,118 ha Mallee Cliffs NP (about 0.14%), and an even smaller portion of the 600,000-ha Mungo landscape. Further, safeguards within the REF provide a framework for pre-clearance surveys which would minimise the risk of any fatalities to the Bardick that may be sheltering within or under hollow logs on the ground, or spinifex clumps. These would be relocated to adjacent habitat immediately prior to clearing commencing.

The proposed activity will result in the retention (but relocation) of dead wood and the removal of dead trees if they occur directly on the path of the linear conservation fence and other infrastructure. The minor amounts of dead wood that would be relocated are not expected to have significant impacts on the species.

The removal of feral predators and herbivores from within the 9,570 ha proposed feral-free fenced area will deliver substantial benefits for the species. It will provide a significant reduction in the operation of seven KTPs: *Competition and grazing by the feral European*

Rabbit, *Competition and habitat degradation by Feral Goats*, *Predation and hybridisation by Feral dogs*, *Predation by the European Red Fox*, *Predation by feral cats*, and *Predation, habitat degradation, competition and disease transmission by Feral Pigs.*

In summary, the proposed activity is *unlikely* to result in the operation of, or significantly increase the impact of, any key threatening process in the project area.

Conclusion

This Assessment of Significance has determined that the proposed activity is *'unlikely'* to have a *'significant effect'* on the Bardick or their habitats. Indeed, the proposed conservation fence is likely to increase general longevity and recruitment following the removal of feral predators. Therefore, the proposed activity will not require a Species Impact Statement.

Mallee Slender Blue-tongue Lizard

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

The Mallee Slender Blue-tongue Lizard is widely distributed in inland areas of all Australian states (OEH 2017d). In NSW, mallee with spinifex is considered desirable habitat where it occurs on sandy soils (Shea and Wells 1983), rocky hillsides containing spinifex are also occupied (Sass et al. 2011).

The Mallee Slender Blue-tongue Lizard is known from the Mallee Cliffs project area, with two previous records in the BioNET database. Despite not being detected during the AWC field surveys, the Mallee Slender Blue-tongue Lizard is likely to still occur within spinifex habitats, as they are generally widespread in the spinifex habitats of the Murray-Darling Depression Bioregion. The home range and movement/dispersal capability is poorly known.

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

- Habitat clearance, in particular, clearing of mallee areas containing spinifex.
- Inappropriate fire frequency, which directly affects the amount of cover provided by vegetation. Alteration of fire frequency may reduce the availability of suitable habitat and food species.
- Predation by foxes is possible given the feeding habits and activity times of this species.
- Heavy grazing and trampling of habitat and food resources by domestic stock, feral goats, rabbits and pigs.
- Loss of leaf litter, surface rocks, fallen timber and bark and other ground cover.

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 clearing of up to about 78 ha of native vegetation is necessary to create the proposed CFAI. The limited extent and the narrow, linear nature of this clearing (11 m) will have no impact on the use of habitat by the Mallee Slender Blue-tongue Lizard based on the assumption that the species will have similar movement habits to other species in the genus, with home ranges varying between 2-12 ha (Price-Rees et al. 2013). On that basis, the Mallee Slender Blue-tongue Lizard will be able to traverse the 11 m wide clearing, and will be able to continue to forage and breed in the project area. However, this is likely only to occur once spinifex regenerates in the cleared strip. During the construction phase, safeguards within the REF provide a framework for pre-clearance surveys which would minimise the risk of any fatalities to the Mallee Slender Blue-tongue Lizard that may be sheltering within spinifex clumps.

The proposed feral-free fenced area would result in the creation of a 9,570 ha area free of feral cats and foxes providing long-term security to the life cycle of the Mallee Slender Blue-tongue Lizard.

With consideration of these factors, it is *unlikely* that the proposal could have an adverse effect on the life cycle of the Mallee Slender Blue-tongue lizard such that a viable local population is likely to be placed at risk of extinction. The levels of habitat available to the Mallee Slender Blue-tongue Lizard will not be significantly affected by the proposed activity. Indeed, the proposed conservation fence is likely to increase general survival rates and general recruitment in the Mallee Slender Blue-tongue Lizard because of the removal of feral predators.

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

- *(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
- *(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,*

The Mallee Slender Blue-tongue lizard is not listed as an endangered ecological community or critically endangered ecological community at Mallee Cliffs NP.

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

- *(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and*
- *(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and*
- *(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,*

(i) The proposed CFAI would result in the removal of up to about 78 ha of native habitat that Mallee Slender Blue-tongue lizard is predicted to occur. This is a tiny proportion of the total habitat available to the species within the proposed project area and the broader Mungo landscape.

(ii) The proposal would not isolate or fragment habitat as Mallee Slender Blue-tongue Lizard is likely to be able to traverse the 11 m wide clearing, given that spinifex and other ground cover vegetation is likely to regenerate. Furthermore, young individuals will be able to pass through the 30 mm aperture of the fence.

(iii) The habitat modification will be minor in the context of the project area: up to about 78 ha of habitat within an area of 58,118 ha (about 0.14%), which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape.

The narrow, linear nature of most of the proposed clearing (11 m wide) further reduces the likelihood of any significant impact. In addition, the proposed activity would create a 9,570 ha area free of feral cats and foxes. This will be a significant benefit to the long-term viability of the species in Mallee Cliffs NP. Given that large areas of mallee would remain unaffected (including those within the proposed feral-free fenced area), it is unlikely that the proposed habitat modifications could be important to the long-term survival of the species in the locality.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity – reintroducing extinct mammals – is not recognised as a key threatening process (KTP) under schedule 3 of the BC Act. However, two KTPs are relevant to the proposed activity: *Removal of dead wood and dead trees*, and *Clearing of native vegetation*.

The narrow, linear nature of the proposed clearing (11 m) will have no impact on the habitat of the Mallee Slender Blue-tongue lizard given the ability of this species to move more than 50 m in two days (Sass, S, unpublished data). On that basis, the Mallee Slender Blue-tongue Lizard will be able to easily traverse the 11 m wide clearing, and will be able to continue to forage and breed in the project area. Furthermore, young individuals will be able to pass through the 30 mm aperture of the fence. The proposed CFAI would result in the removal of a small proportion of the 58,118 ha Mallee Cliffs NP (about 0.14%), and an even smaller portion of the 600,000-ha Mungo landscape.

The proposed activity will result in the retention (but relocation) of dead wood and the removal of dead trees if they occur directly on the path of the linear conservation fence and other infrastructure. The minor amounts of dead wood that would be relocated are not expected to have significant impacts on the species.

The removal of feral predators and herbivores from within the 9,570 ha proposed feral-free fenced area will deliver substantial benefits for the species. It will provide a significant reduction in the operation of seven KTPs: *Competition and grazing by the feral European Rabbit*, *Competition and habitat degradation by Feral Goats*, *Predation and hybridisation by Feral dogs*, *Predation by the European Red Fox*, *Predation by feral cats*, and *Predation, habitat degradation, competition and disease transmission by Feral Pigs.*

In summary, the proposed activity is *unlikely* to result in the operation of, or significantly increase the impact of, any key threatening process in the project area.

Conclusion

This Assessment of Significance has determined that the proposed activity is *'unlikely'* to have a *'significant effect'* on the Mallee Slender Blue-tongue Lizard or its habitats. Indeed, the proposed conservation fence is likely to increase general longevity and reproductive success following the removal of feral predators. Therefore, the proposed activity will not require a Species Impact Statement.

Marble-faced Delma

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

In NSW, the Marble-faced Delma appears confined to mallee woodlands, or spinifex grasslands (OEH 2017d). In recent times, it was confirmed that the Marble-faced Delma is not a substrate specialist (i.e., sand dunes or sand plains), as it was detected on rocky hillsides containing spinifex north-west of Broken Hill (Sass et al. 2011).

The home range and movement/dispersal capability is poorly known, however, it is likely to be similar to that of others species in the *Delma* genus, such as the Collared Delma. which has been recorded about 18 m from an original capture site (SPRAT 2017) suggesting low levels of movement ability.

The Marble-faced Delma has not been observed within Mallee Cliffs NP, however, there are records nearby in similar habitats. This apparent absence may be likely to a paucity of recent surveys using techniques conducive to detecting Marble-faced Delma, such as active searches or the placement of artificial substrates.

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

- Habitat clearance, in particular, clearing of mallee areas containing spinifex but also heathland and riparian habitats.
- Inappropriate fire frequency, which directly affects the amount of cover provided by vegetation. Alteration of fire frequency may reduce the availability of suitable habitat and food species.
- Predation by foxes is possible given the feeding habits and activity times of this species.
- Heavy grazing and trampling of habitat and food resources by domestic stock, feral goats, rabbits and pigs.
- Loss of leaf litter, surface rocks, fallen timber and bark and other ground cover, which supports not only this species but also its food species.

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 clearing of up to about 78 ha of native vegetation is necessary to create the proposed CFAI. The limited extent and narrow, linear nature of this clearing (11 m) is unlikely to have a significant impact on the habitat of the Marble-faced Delma given the ability of others in the genus to move short distances (likely about 18 m). Further, safeguards within the REF

provide a framework for pre-clearance surveys which would minimise the risk of any fatalities to any individuals that may be sheltering within spinifex clumps prior to clearing.

The proposed activity would result in the creation of a 9,570 ha area free of feral cats and foxes which is likely to be of significant benefit to the life cycle of the Marble-faced Delma.

With consideration of these factors, it is *unlikely* that the proposal could have an adverse effect on the life cycle of the Marble-faced Delma such that a viable local population is likely to be placed at risk of extinction. The levels of habitat available to the Marble-faced Delma will not be significantly affected by the proposed activity. Indeed, the proposed conservation fence is likely to increase general survival rates and general recruitment in the population of the Marble-faced Delma because of the removal of feral predators.

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

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

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

The Marble-faced Delma is not listed as an endangered ecological community or critically endangered ecological community within Mallee Cliffs NP.

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

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

(i) The proposed CFAI would result in the removal of up to about 78 ha of native habitat within which the Marble-faced Delma is predicted to occur. This is a tiny proportion of the total habitat available to the species within the proposed project area and the broader Mungo landscape.

(i) The proposal would not isolate or fragment habitat as the Marble-faced Delma is likely to be able to traverse the 11 m wide clearing given that spinifex and other ground cover vegetation is likely to regenerate. Furthermore, individuals will be able to pass through the 30 mm aperture of the fence.

(ii) The habitat modification will be minor in the context of the project area: up to about 78 ha of habitat within an area of 58,118 ha (about 0.14%), which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of most of the proposed clearing (11 m wide) further reduces the likelihood of any significant impact. In addition, the proposed activity would create a 9,570 ha area free of feral cats and foxes. This will be a significant benefit to the long-term viability of the species in Mallee Cliffs NP. Given that large areas of mallee would remain unaffected (including those within the proposed feral-free fenced area), it is unlikely that the proposed habitat modifications could be important to the long-term survival of the species in the locality.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CF*AI.*

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity – reintroducing extinct mammals – is not recognised as a key threatening process (KTP) under schedule 3 of the BC Act, one KTP is relevant to the impacts of the proposed activity: *Clearing of native vegetation*.

The clearing of vegetation is necessary to create the proposed CFAI. The narrow, linear nature of this clearing (11 m) is unlikely to have a significant impact on the habitat of the Marble-faced Delma. The proposed CFAI would result in the removal of a small proportion of the 58,118 ha Mallee Cliffs NP (about 0.14%), and an even smaller portion of the 600,000-ha Mungo landscape. Further, safeguards within the REF provide a framework for pre-clearance surveys which would minimise the risk of any fatalities to Marble-faced Delma that may be sheltering within or under spinifex clumps at the time of clearing. These would be relocated to adjacent habitat immediately prior to clearing commencing.

The removal of feral predators and herbivores from within the 9,570 ha proposed feral-free fenced area will deliver substantial benefits for the species. It will provide a significant reduction in the operation of seven KTPs: *Competition and grazing by the feral European Rabbit*, *Competition and habitat degradation by Feral Goats*, *Predation and hybridisation by Feral dogs*, *Predation by the European Red Fox*, *Predation by feral cats*, and *Predation, habitat degradation, competition and disease transmission by Feral Pigs.*

In summary, the proposed activity is *unlikely* to result in the operation of, or significantly increase the impact of, any key threatening process in the project area.

Conclusion

This Assessment of Significance has determined that the proposed activity is *'unlikely'* to have a *'significant effect'* on the Marble-faced Delma or its habitats. Indeed, the proposed conservation fence is likely to increase general longevity and recruitment following the removal of feral predators. Therefore, the proposed activity will not require a Species Impact Statement.

Yellow-tailed Plain Slider

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

The Yellow-tailed Plain Slider occurs in two disjunct populations in NSW in a variety of semi-arid and arid habitats (OEH 2017d). A cryptic species, the Yellow-tailed Plain Slider was detected during landscape scale field surveys at only 6 out of 60 sites in the Dune Mallee of the region (Val et al. 2012).

Given the cryptic nature of this species, it is not surprising that there are no previous records within the Mallee Cliffs NP (BioNET database), nor has the Yellow-tailed Plain Slider been detected during the AWC field surveys. The home range and dispersal capability of this species is unknown, but the home range is likely to be limited given their small size; they are likely to be able to disperse/move across the 11 m clearing, particularly after it regenerates.

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

- Loss of habitat as a result of clearing has led to a decline in species distribution and abundance
- Fragmentation, resulting from clearing or degradation of the habitat has reduced genetic variability and reproductive opportunities and has increased genetic isolation

and the potential for significant impacts arising from stochastic events such as drought or fire.

- Degradation of the habitat, as a result of inappropriate grazing or fire regimes, has resulted in changes to the physical nature of the habitat, for example change in diversity and structure of floristics or invertebrates. Changes to the habitat may result in it being unsuitable for the species or may increase other threatening processes such as predation.
- Fire may cause the direct loss of individuals, and inappropriate fire regimes may cause long-term changes to physical features such as floristic structure or leaf litter, which is unfavourable to sustaining a viable population of the species.
- Predation by foxes or cats may have an impact, particularly where populations have already declined.
- Catastrophic events such as drought or extensive wildfire.
- Anthropogenic climate change is a long-term significant threat as it will alter physical characteristics of the habitat such that it is no longer able to sustain a viable population.

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 clearing of up to about 78 ha of native vegetation is necessary to create the proposed CFAI. The limited extent and narrow, linear nature of this clearing (11 m) is unlikely to have a significant impact on the habitat of the Yellow-tailed Plain Slider. Further, safeguards within the REF provide a framework for pre-clearance surveys which would minimise the risk of fatalities to any individuals during clearing.

The proposed feral-free fenced area would result in the creation of a 9,570 ha area free of feral cats and foxes providing long-term security for the life cycle of the Yellow-tailed Plain Slider.

With consideration of these factors, it is *unlikely* that the proposal could have an adverse effect on the life cycle of Yellow-tailed Plain Slider such that a viable local population is likely to be placed at risk of extinction. The levels of habitat available to the Yellow-tailed Plain Slider will not be significantly affected by the proposed activity. Indeed, the proposed conservation fence is likely to increase general survival rates and general recruitment in the Yellow-tailed Plain Slider because of the removal of feral predators.

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

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

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

The Yellow-tailed Plain Slider is not listed as an endangered ecological community or critically endangered ecological community within Mallee Cliffs NP.

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

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

(i) The proposed CFAI would result in the removal of up to about 78 ha of native habitat that Yellow-tailed Plain Slider is predicted to occur. This is a tiny proportion of the total habitat available to the species within the proposed project area and the broader Mungo landscape.

(ii) The proposal would not isolate or fragment habitat as the Yellow-tailed Plain Slider is likely to be able to traverse the 12-metre wide clearing. Furthermore, individuals will be able to pass through the 30 mm aperture of the fence.

(iii) The habitat modification will be minor in the context of the project area: up to about 78 ha of habitat within an area of 58,118 ha (about 0.14%), which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of most of the proposed clearing (11 m wide) further reduces the likelihood of any significant impact. In addition, the proposed activity would create a 9,570 ha area free of feral cats and foxes. This will be a significant benefit to the long-term viability of the species in Mallee Cliffs NP. Given that large areas of mallee would remain unaffected (including those within the proposed feral-free fenced area), it is unlikely that the proposed habitat modifications could be important to the long-term survival of the species in the locality.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity – reintroducing extinct mammals – is not recognised as a key threatening process (KTP) under schedule 3 of the BC Act. However, two KTPs are relevant to the impacts of the proposed activity: the *Removal of dead wood and dead trees*, and *Clearing of native vegetation*.

The clearing of vegetation is necessary to create the proposed CFAI. The narrow, linear nature of this clearing (11 m) is unlikely to have an impact on the habitat of the Yellow-tailed Plain Slider given the limited ability of this species to move across ground vegetation and it would most likely be unimpeded by a 11 m wide clearing, particular once spinifex regenerates. The proposed CFAI would result in the removal of a small proportion of the 58,118 ha Mallee Cliffs NP (about 0.14%), and an even smaller portion of the 600,000-ha Mungo landscape. Further, safeguards within the REF provide a framework for pre-clearance surveys which would minimise the risk of any fatalities to Yellow-tailed Plain Slider that may be sheltering within or under spinifex clumps and fallen timber at the time of

clearing. These would be relocated to adjacent habitat immediately prior to clearing commencing.

The habitat modification will be minor in the context of the project area: up to about 78 ha of habitat within an area of 58,118 ha (about 0.14%), which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. The narrow, linear nature of most of the proposed clearing (11 m wide) further reduces the likelihood of any significant impact. In addition, the proposed activity would create a 9,570 ha area free of feral cats and foxes. This will be a significant benefit to the long-term viability of the species in Mallee Cliffs NP. Given that large areas of mallee would remain unaffected (including those within the proposed feral-free fenced area), it is unlikely that the proposed habitat modifications could be important to the long-term survival of the species in the locality.

The removal of feral predators and herbivores from within the 9,570 ha proposed feral-free fenced area will deliver substantial benefits for the species. It will provide a significant reduction in the operation of seven KTPs: *Competition and grazing by the feral European Rabbit*, *Competition and habitat degradation by Feral Goats*, *Predation and hybridisation by Feral dogs*, *Predation by the European Red Fox*, *Predation by feral cats*, and *Predation, habitat degradation, competition and disease transmission by Feral Pigs.*

In summary, the proposed activity is *unlikely* to result in the operation of, or significantly increase the impact of, any key threatening process in the project area.

Conclusion

This Assessment of Significance has determined that the proposed activity is *'unlikely'* to have a *'significant effect'* on the Yellow-tailed Plain Slider or its habitats. Indeed, the proposed conservation fence is likely to increase general longevity and reproductive success following the removal of feral predators. Therefore, the proposed activity will not require a Species Impact Statement.

Cobar Greenhood

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

The Cobar Greenhood occurs in eucalypt woodlands, open mallee and cypress pine, on low stony ridges and slopes in skeletal sandy-loam soils (OEH 2017d, Cunningham et al. 2011).

There are no records for the Cobar Greenhood in Mallee Cliffs NP.

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

- Feral goats, rabbits and pigs (grazing, browsing and erosion). Rabbits have been known to dig up the tubers.
- Habitat degradation (the granite ridge and rocky slope habitats are particularly vulnerable to the detrimental impacts of feral goats).
- Weed infestation and competition (may limit the species).
- Climate change as these orchids grow on the arid extreme of known range for orchid species. If the western areas become drier the range of this species may be restricted to the east.
- Lack of information on species locations and population sizes.
- Disturbance by feral pigs.
- Grazing by stock during flowering period is detrimental.
- Weed infestation and competition which degrade the vegetation community.

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%), with the majority of woodland within and adjoining being unaffected. In the context of the woodland that remains unaffected by the proposed activity, the loss of up to about 78 ha within the 58,118 ha Mallee Cliffs NP is minor and inconsequential.

The Cobar Greenhood is likely to benefit from the proposal given the removal of introduced herbivores and improved ecosystem health through the reintroduction of regionally extinct mammals within the proposed 9,570 ha proposed feral-free fenced area.

Key threats from goats, pigs and rabbits would be removed within the 9,570 ha proposed feral-free fenced area should the proposal proceed. This is a significant long-term benefit to the Cobar Greenhood should it occur there.

With consideration of these factors, it is *unlikely* that the proposal could have an adverse effect on the life cycle of the Cobar Greenhood such that a viable local population is likely to be placed at risk of extinction.

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

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

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

The Cobar Greenhood is not listed as an endangered ecological community or critically endangered ecological community at Mallee Cliffs NP.

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

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

(i) The proposed CFAI would result in the removal of up to about 78 ha of native vegetation that the Cobar Greenhood may occur. This is a tiny proportion of the total habitat available to the species within the proposed project area and the broader Mungo landscape.

(ii) The proposal would not isolate the proposed feral-free fenced area from remaining portions of Mallee Cliffs NP given that the proposed fence and clearing would not impede genetic exchange of individuals should they occur there.

(iii) The Cobar Greenhood may potentially occur within the habitats to be removed, but it has not yet been detected within Mallee Cliffs NP. Given that large areas of woodland would remain unaffected (including those within the proposed feral-free fenced area), it is unlikely that the habitat to be directly affected is important to the long-term survival of the Cobar Greenhood in the locality. The proposed activity would create a 9,570 ha area free of pigs, goats and rabbits. This is a significant benefit to the long-term viability of Cobar Greenhood should it occur there.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity – reintroducing extinct mammals – is not recognised as a key threatening process (KTP) under schedule 3 of the BC Act. However, one KTP is relevant to the impacts of the proposed activity: *Clearing of native vegetation*.

The clearing of some vegetation is necessary to create the proposed CFAI, but the amount would be only a tiny proportion of the Mallee Cliffs NP (about 0.14%) which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. In this context, the relatively minor loss of vegetation is considered negligible given the extent of woodland remaining in the locality.

The removal of feral predators and herbivores from within the 9,570 ha proposed feral-free fenced area will deliver substantial benefits for the species. It will provide a significant reduction in the operation of seven KTPs: *Competition and grazing by the feral European Rabbit*, *Competition and habitat degradation by Feral Goats*, *Predation and hybridisation by Feral dogs*, *Predation by the European Red Fox*, *Predation by feral cats*, and *Predation, habitat degradation, competition and disease transmission by Feral Pigs.*

In summary, the proposed activity is *unlikely* to result in the operation of, or significantly increase the impact of, any key threatening process in the project area.

Conclusion

This Assessment of Significance has determined that the proposed activity is *'unlikely'* to have a *'significant effect'* on the Cobar Greenhood or its habitats. Indeed, the proposed conservation fence is likely to increase reproductive success (should they occur there) following the removal of feral herbivores. Therefore, the proposed activity will not require a Species Impact Statement.

Mossgiel Daisy

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

The Mossgiel Daisy is endemic to NSW and occurs predominately in the Riverina Bioregion with the exception of a scattering of records around Willandra Lakes World Heritage Area and north of Menindee (OEH 2017d). Potential habitat within the project area is likely to be confined to herblands.

There are no records for the Mossgiel Daisy in Mallee Cliffs NP (BioNET database).

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

- Population size, habitat requirements and threats are poorly known. The latter may include damage by feral pigs, competition with introduced weeds and changes to fire regime.
- May be affected by changes in agricultural practices, such as cropping.
- Grazing is a potential threat to populations as the species is possibly palatable to stock and feral herbivores such as goats.
- Possible habitat disturbance during road maintenance.

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%). Only the herbland is likely to provide potential habitat for the Mossgiel Daisy. This equates to approximately 6,800 ha within Mallee Cliffs NP. Only 11.9 ha of this potential habitat would be removed for the clearing required for the proposal. This is considered of little consequence given that approximately 6,800 ha remains unaffected, with more than 800 ha of this to be located within the proposed feral-free fenced area.

The Mossgiel Daisy is likely to benefit from the proposal given the removal of introduced herbivores and improved ecosystem health through the reintroduction of regionally extinct mammals within the proposed 9,570 ha proposed feral-free fenced area.

Key threats from goats, pigs and rabbits would be removed within the 9,570 ha proposed feral-free fenced area, including 800 ha of herbland, should the proposal proceed. This is a significant long-term benefit to the Mossgiel Daisy should it occur there.

With consideration of these factors, it is *unlikely* that the proposal could have an adverse effect on the life cycle of the Mossgiel Daisy such that a viable local population is likely to be placed at risk of extinction.

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

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

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

The Mossgiel Daisy is not listed as an endangered ecological community or critically endangered ecological community at Mallee Cliffs NP.

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

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and
(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

(i) The proposed CFAI would result in the removal of about 11.9 ha of potential habitat. This is a tiny proportion of the total habitat available to the species within the proposed project area and the broader Mungo landscape.
(ii) The proposal would not isolate or fragment habitats as some ground cover will remain in the fenceline clearing.
(iii) While the proposal would result in the removal of about 11.9 ha of potential habitat for the Mossgiel Daisy, approximately 6,800 ha would remain. It is likely that the 11.9 ha to be removed is of little importance to the long-term survival. The proposed activity would create a 9,570 ha area free of introduced herbivores, which is a significant benefit to the long-term viability of the Mossgiel Daisy in the Mallee Cliffs project area.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity – reintroducing extinct mammals – is not recognised as a key threatening process (KTP) under schedule 3 of the BC Act. However, one KTP is relevant to the impacts of the proposed activity: *Clearing of native vegetation*.

The clearing of some vegetation is necessary to create the proposed CFAI, but the amount would be only a tiny proportion of the Mallee Cliffs NP (about 0.14%) which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. It is unlikely to increase the impact of clearing on the Mossgiel Daisy population.

The removal of feral predators and herbivores from within the 9,570 ha proposed feral-free fenced area will deliver substantial benefits for the species. It will provide a significant reduction in the operation of seven KTPs: *Competition and grazing by the feral European Rabbit*, *Competition and habitat degradation by Feral Goats*, *Predation and hybridisation by Feral dogs*, *Predation by the European Red Fox*, *Predation by feral cats*, and *Predation, habitat degradation, competition and disease transmission by Feral Pigs.*

In summary, the proposed activity is *unlikely* to result in the operation of, or significantly increase the impact of, any key threatening process in the project area.

Conclusion

This Assessment of Significance has determined that the proposed activity is *'unlikely'* to have a *'significant effect'* on the Mossgiel Daisy or its habitat. Indeed, the proposed conservation fence is likely to increase potential habitat quality following the removal of feral herbivores. Therefore, the proposed activity will not require a Species Impact Statement. Therefore, the proposed activity will not require a Species Impact Statement.

Yellow Swainson-pea

(a) in the case of a threatened species or endangered population, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species

such that a viable local population of the species is likely to be placed at risk of extinction,

The 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, AWC did not identify any individuals of the species that will be affected by the project. However, it may possibly occur in the seed bank within the project area.

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 of Mallee Cliffs NP (up to 0.14%), which itself is embedded in 600,000 ha of the Mungo landscape. The area to be cleared represents a tiny proportion of potential habitat for the species.

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.

With consideration of these factors, it is *unlikely* that the proposal could have an adverse effect on the life cycle of the Yellow Swainson-pea such that a viable local population is likely to be placed at risk of extinction.

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

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

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

The Yellow Swainson-pea is not listed as an endangered ecological community or critically endangered ecological community at Mallee Cliffs NP.

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

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

(i) The proposed CFAI would result in the removal of up to about 78 ha of native vegetation would be removed. This is a tiny proportion of the total habitat available to the species within the proposed project area and the broader Mungo landscape.

(ii) The proposal would not isolate the proposed feral-free fenced area from remaining portions of Mallee Cliffs NP given that the proposed fence and clearing would not impede genetic exchange of individuals should they occur there.

(iii) The Yellow Swainson-pea may potentially occur within the habitats to be removed, but it has not yet been detected within the relevant areas. Given that large areas of woodland would remain unaffected (including those within the proposed feral-free fenced area), it is unlikely that the habitat to be directly affected by the project is important to the long-term survival of the Yellow Swainson-pea in this locality. The proposed activity would create a 9,570 ha area free of pigs, goats and rabbits and will involve targeted fire management. This is a significant benefit to the long-term viability of Yellow Swainson-pea should it occur there.

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

There is no declared area of outstanding biodiversity value as listed under the BC Act within the vicinity of the proposed CFAI.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed activity – reintroducing extinct mammals – is not recognised as a key threatening process (KTP) under schedule 3 of the BC Act. However, one KTP is relevant to the impacts of the proposed activity: *Clearing of native vegetation*.

The clearing of some vegetation is necessary to create the proposed CFAI, but the amount would be only a tiny proportion of the Mallee Cliffs NP (about 0.14%) which is embedded within more than 600,000 ha of continuous habitat across the Mungo landscape. In this context, the relatively minor loss of vegetation is considered negligible given the extent of mallee vegetation remaining in the locality, and the fact that the vast majority of potential habitat for the Yellow Swainson-pea remains unaffected, or is indeed improved inside the proposed feral-free fenced area (in the absence of feral herbivores, and more conducive fire management).

The removal of feral predators and herbivores from within the 9,570 ha proposed feral-free fenced area will deliver substantial benefits for the species. It will provide a significant reduction in the operation of seven KTPs: *Competition and grazing by the feral European Rabbit*, *Competition and habitat degradation by Feral Goats*, *Predation by Feral dogs*, *Predation by the European Red Fox*, *Predation by feral cats*, and *Predation, habitat degradation, competition and disease transmission by Feral Pigs.*

In summary, the proposed activity is *unlikely* to result in the operation of, or significantly increase the impact of, any key threatening process in the project area.

Conclusion

This Assessment of Significance has determined that the proposed activity is *'unlikely'* to have a *'significant effect'* on the Yellow Swainson-pea or its habitat. Indeed, the proposed conservation fence is likely to increase reproductive success (should they occur there) following the removal of feral herbivores and improvements in fire management. Therefore, the proposed activity will not require a Species Impact Statement.

REFERENCES

See Section 10 of main report.