

Appendix E

Assessments of significance for threatened and migratory species

Introduction

Assessments of significance have been prepared in accordance with the *Threatened species assessment guidelines: The assessment of significance* (DECC 2007) to determine the likely significance of impacts of the proposal on threatened species listed under the NSW *Threatened Species Conservation Act 1995* (TSC Act). The Assessments of Significance have been prepared for those species that that may forage and roost/nest on the site at least on occasion and hence may be impacted by the proposal.

Assessments of significance have been prepared for the following species and populations

- Grey-headed Flying Fox (*Pteropus poliocephalus*) - listed as vulnerable under the TSC Act
- River Red Gum (*Eucalyptus camaldulensis*) – listed as an endangered population in the Hunter Catchment.

References:

- DotE 2015a. OEH Wildlife Atlas database.
- DotE 2015b. Threatened species profiles.
- DotE 2015c National Flying-fox Monitoring Viewer, <http://www.environment.gov.au/webgis-framework/apps/ffc-wide/ffc-wide-help.jsf>
- OEH 2015c *Eucalyptus camaldulensis population in the Hunter catchment species profile* <http://www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=10968>

Grey-headed Flying-fox (*Pteropus poliocephalus*)

The Grey-headed Flying-fox occurs in the coastal belt from Rockhampton in central Queensland to Melbourne in Victoria however, only a small portion of this range is used at any one time, depending on the availability of food. The species is widespread throughout its range in summer, whilst in autumn it occupies coastal lowlands and is uncommon inland (DotE 2015b).

This species requires roosting sites and foraging resources comprising fruit and nectar producing canopy species in a variety of vegetation communities including rainforest, open forest, closed and open woodland, Paperbark (*Melaleuca*) swamps, Banksia woodlands and commercial fruit crops and introduced species in urban environments (DotE 2015b).

Grey-headed Flying-fox were not observed within the proposal site but suitable foraging habitat (in the form of blossom-producing trees) was identified within the proposal site. There are no camp sites or breeding habitat for this species within the proposal site.

The proposal would result in the removal of up to 6.5 hectares of native vegetation identified as providing a suitable foraging resource for the Grey-headed Flying-fox.

EP&A Act Section 5A – Assessment of Significance

Grey-headed Flying-fox (Vulnerable)

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

The Grey-headed Flying-fox was not recorded within the study area. This species roosts communally in large, established camps which may support several thousand individuals. However, the closest recorded roost camp is approximately 60 km south of the study area (DotE 2015c) and would not be affected by the proposal. The species is unlikely to utilise the proposal site for foraging as it generally does not travel more than 50 kilometres from their roost to forage at night. The closest records of the Grey-headed Flying-fox are approximately 10 kilometres south of the proposal site (OEH 2015a) The proposal would remove up to 6.5 hectares of potential foraging habitat for this species, containing known preferred feed trees. The scattered trees to be removed along the alignment are a large distance from a known roost camp and there are large patches of forest closer to the nearest roost camp which is likely to be preferred habitat for the species.

The proposal would lead to an increase in noise, vibration and dust generation during the construction of the proposal. As construction would occur during the day this would not affect the foraging movements of this nocturnal species. The proposal would not isolate any areas of habitat or cause significant habitat fragmentation that would affect the breeding, foraging or dispersive movements of this highly mobile species.

The proposal is unlikely to impact the lifecycle of the species such that viable local population would be placed at risk of extinction.

b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

Not applicable to this threatened species.

c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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

Not applicable to this threatened species.

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

Not applicable to this threatened species.

EP&A Act Section 5A – Assessment of Significance

Grey-headed Flying-fox (Vulnerable)

d) 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

The proposal would not remove any areas of suitable breeding or roosting habitat for this species.

The proposal would remove up to 6.5 hectares of mostly potential habitat for this species including 4.6 hectares of exotic grassland with planted trees and scattered remnant trees and 1.9 hectares of planted native trees. The proposal would remove a number of planted and remnant which may be utilised on occasion as foraging habitat for the species. Given the distance from the closest roost camp (60 kilometres), and the foraging range of the species (50 kilometres) it is unlikely that the species would frequent the area to forage. Furthermore the proposal has been designed to retain large trees where possible. These trees would provide important foraging resources for this species (if present) if food was unavailable elsewhere.

(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

The proposal involves the construction of a bypass that will be constructed to the western side of Scone which would pass through the Bill Rose Sports Complex and a combination of farmland and residential land. Isolated trees would be removed along the alignment. This impact would not prevent movements of this highly mobile, aerial species.

(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

The proposal would remove up to 6.5 hectares of potential foraging habitat for this species. The closest record of the species is 10 kilometres south of the proposal and the nearest known roost camp is 60 kilometres from the proposal site. The species travels up to 50 kilometres to forage (DotE 2015b), so it is unlikely that the trees to be removed could be considered important habitat for the species as it is most likely outside of their home range. It is therefore considered that the removal of habitats as described above would be unlikely to threaten the long-term persistence of this species in the locality.

e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly)

No critical habitat has been listed for these species.

EP&A Act Section 5A – Assessment of Significance

Grey-headed Flying-fox (Vulnerable)

f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan

The draft national recovery plan (DECCW 2009) states that foraging habitat that meets at least one of the following criteria qualifies as critical habitat:

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

Known to support populations of > 30 000 individuals within an area of 50 kilometre radius (the maximum foraging distance of an adult)

Productive during the final weeks of gestation, and during the weeks of birth, lactation and conception (September to May)

Productive during the final stages of fruit proposal and ripening in commercial crops affected by Grey-headed Flying-foxes (months vary between regions)

Known to support a continuously occupied camp.

Vegetation in the study area does not support a continuously occupied roost camp, and is not in a region with significant commercial fruit crops. The study area does not support a population of more than 30,000 individuals, but would contribute to available foraging resources for individuals of the population. While there would be some productivity of foraging resources during winter and spring, the resources present in the study area are limited and over 60 kilometres from the nearest known roost camp for this species. In this context the removal of up to 6.5 hectares of foraging habitat is unlikely to threaten the survival of local populations of this species.

g) whether the action proposed 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 action would contribute to the operation of one KTP of relevance to this species as follows:

Clearing of vegetation – the proposal would remove about 6.5 hectares of vegetation that represents possible foraging habitat for this species.

As previously discussed, the vegetation to be removed is likely to be outside of the species home range, and would therefore represent a minor increase in the operation of this KTP.

Conclusion of Assessment of Significance

The proposal is unlikely to have a significant impact on the Grey-headed Flying-fox, in accordance with section 5A of the EP&A Act, given that:

No breeding or roosting habitat would be removed

Vegetation to be removed is likely to be outside the species home range (as it 60 kilometres from the nearest roost camp) and comprises a negligible proportion of potential foraging habitat present in surrounding areas and the broader locality; and

The proposal would not result in the isolation of potential foraging habitat could affect the foraging or dispersive movements of this species.

River Red Gum (*Eucalyptus camaldulensis*)

The Hunter population occurs from the west at Bylong, south of Merriwa, to the east at Hinton, on the bank of the Hunter River, in the Port Stephens local government area. It has been recorded in the local government areas of Lithgow, Maitland, Mid-Western Regional, Muswellbrook, Port Stephens, Singleton and Upper Hunter (OEH 2015c).

Prior to European settlement, between 10,000 and 20,000 ha of habitat suitable for the River Red Gum occurred in the Hunter catchment. Today only 19 stands are known, occupying at most 100 ha, the largest remnant being 15 - 20 ha in extent. Smaller remnants contain only one to several trees. The total number of individuals is estimated to be between 600 - 1000 mature or semi mature trees (OEH 2015c).

One remnant *Eucalyptus camaldulensis* (River Red Gum) individual was recorded within the proposal site, a number of other planted *Eucalyptus camaldulensis* (River Red Gum) individuals were recorded within the study area, however as these have all been planted and their local provenance is unknown they are not considered to be part of the Hunter Catchment endangered population.

This proposition is supported by historic aerial photos that show that areas containing planted River Red Gums did not contain any trees in 1972. Furthermore the fact that these planted *Eucalyptus camaldulensis* (River Red Gum) occur along the fairway of the Scone Golf course over an exotic groundcover comprised of turf grasses that are regularly mown means there are no opportunities for recruitment of these species.

This of significance has been prepared to assess the significance of impacts of the project on the Hunter Catchment Endangered Population of *Eucalyptus camaldulensis* (River Red Gum).

EP&A Act Section 5A – Assessment of Significance

***Eucalyptus camaldulensis* (Endangered Population)**

a) in the case of a threatened species, whether the action proposed 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

Not applicable to an endangered population.

EP&A Act Section 5A – Assessment of Significance

Eucalyptus camaldulensis (Endangered Population)

b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

The proposal would result in the clearing of one remnant and five planted *Eucalyptus camaldulensis* individuals. The remnant individual is located on private property to the south west of the rail line and planted individual are located on a fairway of the Scone Golf Course. The provenance of these species is unknown. If the plants were to be planted from local provenance seed then they may be contributing to the local gene pool of the population. However there is also potential that if these trees are not derived from local provenance seed that they may in fact be threatening the genetic integrity of the local population. This potential threat from planted individuals of non-local provenance is recognised in the scientific determination for this species.

The planted trees are located on a fairway of a golf course which is regularly mown and maintained. There would therefore be very limited opportunity for any of these individuals to recruit new plants into the population. Within the study area there are approximately 30 other planted *Eucalyptus camaldulensis* individuals that would not be impacted by the proposal. These plants would continue to contribute to the local gene pool (if planted from local provenance).

It is unlikely that the removal of one remnant and five planted trees would have an adverse effect on the life cycle of *Eucalyptus camaldulensis* in the Hunter Catchment such endangered population would be placed at risk of extinction.

c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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

Not applicable to this endangered population

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

Not applicable to this endangered population.

d) 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

The proposal would not remove any areas of suitable habitat for this population as the remnant individual occurs as an isolated paddock tree within a grazed lot, while the planted individuals occurs on a fairway of a golf course that is dominated by exotic and turf species and is regularly mown and maintained. Therefore there would be very limited opportunity for this species to naturally recruit within the proposal area.

(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

One remnant individual and five isolated planted *Eucalyptus camaldulensis* trees would be removed from the fairway of the Scone Golf Course. The proposal would not result in habitat for this species becoming fragmented or isolated as pollinators would still be able to move between the remaining planted *Eucalyptus camaldulensis* individuals that occur within the golf course.

(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

EP&A Act Section 5A – Assessment of Significance

Eucalyptus camaldulensis (Endangered Population)

Habitat that would be removed a result of the proposal would include derived grasslands within grazed paddocks and maintained turf within the Scone Golf Course. It is highly unlikely that any *Eucalyptus camaldulensis* individuals would recruit within the area to be impacted as it is either heavily grazed or regularly mown and maintained and has highly compacted soils.

e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly)

No critical habitat has been listed for these species.

f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan

There is no recovery plan or threat abatement plan for this population

g) whether the action proposed 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 action would contribute to the operation of one KTP of relevance to this species as follows:

Clearing of native vegetation – Clearing of native vegetation has occurred historically within and around the proposal site. This has resulted in a variety of impacts on the remaining native vegetation including increased weed invasion due to soil disturbance and edge effects. This key threatening process would be slightly exacerbated by the removal of up to 8.65 hectares of highly modified native vegetation (derived grassland) within the proposal site.

This grassland is located in the north and south of the study area. One remnant *Eucalyptus camaldulensis* individual was recorded within this patch of derived grassland in the south of the study area.

Conclusion of Assessment of Significance

The proposal is unlikely to have a significant impact on The endangered population of *Eucalyptus camaldulensis*, in accordance with section 5A of the EP&A Act, given that:

- Only one remnant and five planted individuals would be removed.
- The genetic provenance of the planted individuals is unknown.'
- There is currently little opportunity for any of these individuals to contribute to maintenance of the population through requirement as they are located either in a grazed paddock on a fairway of a golf course that is regularly mown.

The proposal would not impact on the ability of pollinators to move between other planted individuals at the golf course that would not be impacted by the proposal.

Grey-headed Flying-fox (Pteropus poliocephalus)

EPBC Act - Assessment of Significance

Grey-Headed Flying-Fox (Vulnerable)

According to the DoE (2013) 'significant impact criteria' for vulnerable species, an action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

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

The Grey-headed Flying-fox has not been previously recorded within the proposal site, however potential foraging habitat for the species occurs within flowering eucalypts present within the remnant and native vegetation at the site. As a precautionary measure an assessment of significance has been undertaken to assess the impact of the proposal.

The estimate for the total Grey-headed Flying-fox population in all national camps was 365,000 animals. In this count 63 per cent of the counted Grey-headed Flying-foxes were in NSW (DoE, 2015). The entire Australian population of the Grey-headed Flying-fox would qualify as an important population according to DoE (2013).

Grey-headed Flying-foxes are a highly mobile species that are capable of traveling large distances in search of food. Radio-tracking, genetic and banding studies indicate that the occurrence of the Grey-headed Flying fox in Australia represents one population, with regular interchange and movement between camps throughout their range (Webb and Tidemann 1996; DoE 2014). This species roosts communally in large, established camps which may support several thousand individuals. According to the National Flying-fox Monitoring Viewer, the nearest camp is about 60 kilometres away.

Individuals of Grey-headed Flying fox could theoretically utilise native vegetation within the proposal site for foraging purposes. However The closest records of the Grey-headed Flying-fox are about 10 kilometres south of the proposal site (OEH 2015). Vegetation within the proposal site may provide seasonal foraging habitat for a few months of the year (while flowering and fruiting) and would only represent a small fraction of the foraging resources available in the locality for this species. The proposal would remove up to 6.5 hectares of potential foraging habitat for this species, containing known preferred feed trees. Given the large home range and migratory habits of this species, it is unlikely that this would lead to a long-term decrease in the size of an important population of the Grey-headed Flying-fox.

Reduce the area of occupancy of an important population

The 6.5 hectares of potential foraging habitat that would be cleared during construction consists primarily of exotic planted vegetation which contains some isolated trees This area of potential foraging habitat is negligible in comparison to the area of occupancy for this species. The proposal is not likely to affect the occupancy of the local camp which is located 60 kilometres away. The proposal would not remove any areas of suitable breeding or roosting habitat for this species.

EPBC Act - Assessment of Significance

Grey-Headed Flying-Fox (Vulnerable)

Fragment an existing important population into two or more populations

The proposal is not likely to fragment an important population of the Grey-headed Flying fox, because:

- This species is highly mobile and therefore vegetation removal within the proposal site to allow construction of the proposal is not likely to affect dispersal or movement of this species.
- The proposal is not likely to have any direct or indirect effects on the permanent roost (camp) sites and therefore any breeding habitat for this species will not be fragmented.
- The minor nature and location of the proposal is unlikely to result in population fragmentation.

On the basis of the above, the proposal will not result in the fragmentation of the population of the Grey-headed Flying-fox into two or more populations.

Adversely affect habitat critical to the survival of a species

About 6.5 hectares of potential foraging habitat for the Grey-headed Flying-fox would be lost as a result of the proposal. While critical habitat for the Grey-headed Flying-fox has not been mapped, the *Draft National Recovery Plan* for the Grey-headed Flying-fox (DECCW 2009) defines habitat critical of the Grey-headed Flying-fox as natural foraging habitat that is:

- Productive during winter and spring, when food bottlenecks have been identified
- Known to support populations of > 30 000 individuals within an area of 50 km radius (the maximum foraging distance of an adult)
- Productive during the final weeks of gestation, and during the weeks of birth, lactation and conception (September to May)
- Productive during the final stages of fruit development and ripening in commercial crops affected by Grey-headed Flying-foxes (months vary between regions)
- Known to support a continuously occupied camp.

Vegetation in the proposal site does not support a continuously occupied roost camp. The proposal site would not support a population of more than 30,000 individuals, but would contribute to available foraging resources for individuals of the wider population. While there would be some productivity of foraging resources during winter and spring, the resources present in the proposal site are limited in comparison to available foraging resources in nearby areas, including protected native vegetation within Towarri National Park and Manobalai Nature Reserve. In this context the removal of 6.5 hectares of potential foraging habitat is unlikely to threaten the survival of local populations of this species.

There is no evidence that vegetation within the proposal site is currently used for foraging by Grey-headed Flying-fox. While the loss of 6.5 hectares of potential foraging habitat contributes to the incremental loss of habitat affecting this species, the proposal is unlikely to adversely affect the survival of the Grey-headed Flying-fox due to the highly mobile nature of the species and the abundance of suitable habitat in the surrounding area.

EPBC Act - Assessment of Significance

Grey-Headed Flying-Fox (Vulnerable)

Disrupt the breeding cycle of an important population

There is no evidence that vegetation within the proposal site is currently used for Grey-headed Flying-fox breeding activities. As noted above, the nearest camp sites for the Grey-headed Flying-fox is located about 60 kilometres away from the proposal. Given the distance from the camp site, the proposal would not affect breeding activities of individuals at the camp.

On this basis, the proposal is highly unlikely to disrupt the breeding cycle of an important population of the Grey-headed Flying-fox.

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

The Grey-headed Flying-fox utilises various vegetation communities including rainforests, open forests, closed and open woodlands, Melaleuca swamps and Banksia woodlands (DECCW 2009). The availability of native fruits, nectar and pollen varies over time and throughout the range of the species. Grey-headed Flying Foxes accommodate this by migrating in response to food availability, sometimes travelling hundreds of kilometres.

About 6.5 hectares of planted and remnant vegetation would be cleared during construction of the proposal. Some of the vegetation to be removed includes potential feed trees for the species. Whilst potential foraging habitat for the Grey-headed Flying-fox is expected to be removed as a result of the proposal, the area of vegetation to be removed is not of high quality and is not likely to cause the species to decline.

Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat

It is possible that the proposal may open up areas for weed invasion and by transmitting weed propagules into the area during construction. However, the CEMP would include measures to prevent the spread of weeds, including hygiene procedures for equipment, footwear and clothing, and weed disposal protocols. This would minimise the potential for invasive species to establish in potential foraging habitat.

The proposal involves the construction of a bypass that will be constructed to the western side of Scone which would pass through the Scone Golf Course, Bill Rose Sports Complex and a combination of farmland and rural residential land. The surrounding landscape consists of urban and rural lands and does not constitute an area of significant habitat. Due to the highly disturbed nature of the surrounding lands, it is considered unlikely that the proposal would lead to an increase in invasive species within Grey-headed Flying Fox habitat.

Introduce disease that may cause the species to decline

The effects of a selection of pathogens, including Australian Bat Lyssavirus, Bat Paramyxovirus and Menangle Pig virus on Grey-headed Flying Fox is unknown, but could, in combination with known threatening processes, be expected to have an adverse impact on the population (Tidemann *et al.* 1999).

The proposal is not likely to cause the introduction of any of any known pathogens of the Grey-headed Flying-fox into the proposal area. Further, the proposal is not likely to introduce a disease that would cause the grey-headed flying fox to decline.

EPBC Act - Assessment of Significance

Grey-Headed Flying-Fox (Vulnerable)

Interfere substantially with the recovery of the species

Given the small area of potential foraging habitat likely to be removed during construction, the absence of any camps sites within the proposal site and the wide-ranging nature of this species, the proposal is not likely to interfere with the recovery of the Grey-headed Flying-fox.

The overall objectives of the *Draft National Recovery Plan* for the Grey-headed Flying-fox (DECCW 2009) are to 'reduce the impact of threatening processes; to arrest decline throughout their range; to conserve their functional roles in seed dispersal and pollination of native plants; and to improve the comprehensiveness and reliability of information available to guide recovery'. Short term objectives aim to 'identify, protect and enhance key foraging and roosting habitat; to substantially reduce deliberate destruction associated with commercial fruit crops; to reduce negative public attitudes and conflict with humans; and to involve the community in recovery actions where appropriate. Further objectives aim to address the impact on the species of artificial structures such as power lines, loose netting and barbed wire fences; and to improve knowledge of demographics and population structure.

While the proposal is unlikely to have a significant impact on the Grey-headed Flying-fox population, the expected removal of potential habitat for this vulnerable species would not be conducive to the recovery of the species, notably the objective to 'reduce the impact of threatening processes' (of which habitat loss is identified as a high priority threat). However, considering the small scale of the proposal impacts and availability of suitable habitat within the proposal locality, it is unlikely the proposal will interfere substantially with the recovery of the Grey-headed Flying-fox.

Conclusion of Assessment of Significance

Consideration of the DotE (2013) 'significant impact criteria' indicates that the proposed works are unlikely to impose a significant impact on the Grey-headed Flying-fox as:

- It is unlikely that this would lead to a long-term decrease in the size of an important population given the large home range and migratory habits of this species.
- No roosting (camp) sites would be impacted by the proposal.
- Large old trees would be avoided where possible
- Breeding habitat would not be impacted by the proposal.
- The proposal is highly unlikely to fragment an existing population as this is a highly mobile species that travel large distances every year.
- There are large areas of alternative native vegetation present within adjoining areas to the proposal site likely to comprise habitat for this species.

Migratory Species

An EPBC Act Protected Matters search was undertaken in August 2015 covering the proposal site plus a 10 kilometre search radius. The search identified 11 migratory species that have either been recorded or are predicted to occur within the search area.

The criteria used to assess likelihood of occurrence for migratory species included:

- Records of the species within the proposal site from previous or current field surveys.
- Recent records within 10 km of the proposal site from the NSW Wildlife Atlas database.
- Known habitat requirements and distributional range of each species.
- Presence, quality (such as levels of weed invasion), and distribution of habitat for listed threatened species within the proposal site, mapping and assessment of habitats from the current field surveys.
- Marine species which are restricted to marine environments only (such as whales, dolphins, sharks and albatross), were excluded from the likelihood of occurrence assessments as no marine habitats occur within or adjacent to the proposal site.

Field surveys did not record the presence of any listed migratory species. The seven migratory species identified as subject species in this report only include those determined as 'moderate', 'high' possibility of occurring' or 'known' to occur within the proposal site.

- *Ardea alba* (Great Egret)
- *Ardea ibis* (Cattle Egret)
- *Merops ornatus* (Rainbow bee-eater).

Migratory species

The Significant Impact Guidelines 1.1 (DotE 2013) lists criteria which are used to determine whether an action is likely to have a significant impact on migratory species. An action is considered likely to result in a significant impact on migratory species if there is a real chance or possibility that it will

Substantially modify and/or destroy an area of important habitat for a migratory species

Habitat that is of critical importance to the species at particular life-cycle stages:

Habitat within the proposal site is not considered critical during the lifecycle of any of the species. The Cattle Egret breeds in colonies, either mono-specific or with other Egrets/Herons. In Australia the principal breeding sites are the central east coast from about Newcastle to Bundaberg. It also breeds in major inland wetlands in north NSW (notably the Macquarie Marshes). Breeding colonies have also been observed at Wyndham, Western Australia to Arnhem Land, Northern Territory. The site would not provide breeding habitat for this species. In Australia, the largest Great Egret breeding colonies, and greatest concentrations of breeding colonies, are located in near-coastal regions of the Top End of the Northern Territory. The Channel Country of south-western Queensland and north-eastern South Australia have at least 12 breeding colonies, and colonies are also known in the Darling Riverine Plains region of NSW and the Riverina region of NSW and Victoria. Minor breeding sites are widely scattered across the species' distribution and include sites in western Cape York Peninsula, the central coast of Queensland, north and north-eastern NSW, south-eastern South Australia, south-western Western Australia, the Kimberley region of Western Australia and the Barkly Tablelands in the Northern Territory. The site would not provide breeding habitat for colonies of Great Egret. Rainbow Bee-eater can breed in coastal NSW, however the likelihood of these species breeding at the proposal site is low, given the highly disturbed nature of the site. These migratory species, if present at the proposal site, would likely be seasonal visitors to the area, only occurring on a transient basis to forage.

The proposal however would reduce this area of potential seasonal foraging habitat by only a very small amount (less than one hectare). The habitat proposed to be cleared is adjacent to a highly modified waterway. There are large areas of alternative native vegetation present within adjoining areas to the proposal site and in the broader locality likely to comprise habitat for these species. The proposal would therefore contribute to the incremental loss of potential seasonal foraging habitat affecting these species at a very small scale.

No aquatic foraging habitat would be cleared or altered by the proposal. The proposal has the potential to indirectly impact aquatic habitat through erosion and sedimentation during construction, although these impacts are likely to be minor and could be managed through the implementation of erosion and sedimentation controls.

Habitat utilised by a migratory species which is at the limit of the species range:

Habitat within the proposal site is not at the limit of species range for any of the migratory species considered in this report. Distribution of habitat for these species extends well beyond (north, south and west) the location of the proposal site throughout all of coastal NSW.

Habitat within an area where the species is declining:

Populations of Rainbow Bee-eater are in decline, while populations of the Cattle Egret and Great Egret are considered relatively stable (DotE 2015). However there is no evidence to suggest that the proposal site contains known habitat for these species (such as recent records of the species). The proposal site contains potential foraging habitat for these species, as broadly suitable habitat occurs, however the value of this habitat is reduced due to highly disturbed nature of the site.

EPBC Act - Assessment of Significance

Migratory species

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

The proposal would not seriously disrupt the lifecycle of an ecologically significant proportion of the population of a migratory species. An ecologically significant proportion of a migratory species has been determined to comprise 0.1% flyway population (i.e. the population that migrates to/from Australia) of the species (EPBC Act Policy Statement 1) (DEWHA 2009b). Habitat within the proposal site is not considered critical during the lifecycle of these species. These migratory species, if present in the proposal site, would be seasonal visitors to the area, likely only occurring on a transient basis to forage only.

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

The proposal is unlikely to introduce invasive species that may prevent migratory species becoming established in the proposal site. The proposed action may also affect the composition of the habitat by opening up areas for weed invasion and by transmitting weed propagules into the area during construction. The CEMP and would include measures to prevent the spread of weeds, including hygiene procedures for equipment, footwear and clothing, and weed disposal protocols. This would minimise the potential for invasive species to establish in potential foraging habitat.

Conclusion of Assessment of Significance

Consideration of the DotE (2013) 'significant impact criteria' indicates that the proposed works are unlikely to impose a significant impact on migratory species as it is unlikely to:

- Substantially modify and/or destroy an area of important habitat for a migratory species. Habitat that occurs within the proposal site, whilst suitable as foraging for the above migratory species, does not constitute important habitat as defined under the EPBC Act Significant Impact Guidelines (DotE 2013)
- Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species. The proposal would not seriously disrupt the lifecycle of an ecologically significant proportion of the population of a migratory species. An ecologically significant proportion of a migratory species has been determined to comprise 0.1% flyway population (i.e. the population that migrates to/from Australia) of the species (EPBC Act Policy Statement 1) (DEWHA 2009b).
- Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species.