



1. Application details

1.1. Permit application details

Permit application No.: 7869/1
Permit type: Purpose Permit

1.2. Applicant details

Applicant's name: Shire of Cuballing
Application received date: 14 November 2017

1.3. Property details

Property: ROAD RESERVE (PIN 11560568), CONTINE
ROAD RESERVE (PIN 11560570), CONTINE
Colloquial name: Wandering-Narrogin Road
Local Government Authority: SHIRE OF CUBALLING
Localities: CONTINE

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	Purpose category:
0.924		Mechanical Removal	Road construction or upgrades

1.5. Decision on application

Decision on Permit Application: Granted
Decision Date: 12 October 2018

Reasons for Decision: The clearing permit application has been assessed against the clearing principles, planning instruments and other matters in accordance with section 51O of the *Environmental Protection Act 1986*. It has been concluded that the proposed clearing is at variance to Principles (d), (e) and (f), may be at variance to Principles (b) and (h), and is not likely to be at variance to the remaining Principles.

It has been determined that the proposed clearing will result in the following significant residual impacts:

- loss of approximately 0.28 hectares of the 'Eucalypt Woodlands of the Western Australian Wheatbelt' (Wheatbelt Woodlands) threatened ecological community (TEC); and
- loss of 0.924 hectares of significant remnant native vegetation in an area that has been extensively cleared.

The proposed clearing includes vegetation growing in an environment associated with a watercourse, however, no significant impacts to the environmental values of the watercourse are expected given its highly modified nature and the relatively minimal extent of clearing required at its crossing.

It is noted that upgrades to the road will provide a public benefit including improved road safety. It is considered that the significant residual impacts can be counterbalanced through the conservation of 2.6 hectares of Crown Reserve 2556 as an offset.

It has also been determined that the proposed clearing may result in the following:

- impacts to Carnaby's cockatoo, forest red-tailed black cockatoo and red-tailed phascogale individuals if they are found to be utilising the application area for habitat; and
- indirect impacts to adjacent portions of the Wheatbelt Woodlands TEC, State Forest 53 and Crown Reserve 27141 through weed and dieback introduction/spread.

It is considered that inspecting potential habitat trees, delaying clearing until no longer in use (where identified as being occupied), and installing artificial hollows or nesting boxes to replace confirmed habitat trees will adequately mitigate any impacts to Carnaby's cockatoo, forest red-tailed black cockatoo and red-tailed phascogale. It is considered that implementing appropriate hygiene management actions will adequately mitigate the risk of impacts to adjacent portions of the Wheatbelt Woodlands TEC, State Forest 53 and Crown Reserve 27141.

Given the above, the Delegated Officer decided to grant a clearing permit subject to avoid/minimise, offset, fauna management and dieback and weed management conditions.

2. Site information

Clearing Description

The application is for the clearing of 0.924 hectares of native vegetation within a 2.49 kilometre stretch of the Wandering-Narrogin Road reserve (PINs 11560568 and 11560570), Contine, for the purpose of road upgrades and road safety. The road reserve is approximately 20 metres wide and the application area encompasses the full width of the road reserve on both sides of the existing road (Figure 1). The applicant proposes to widen the road seal to a 7.2 metre bitumen seal.

Vegetation Description

The application area is mapped as Beard vegetation association 1023, described as Medium woodland; York gum (*Eucalyptus loxophleba*), wandoo (*Eucalyptus wandoo*) and salmon gum (*Eucalyptus salmonophloia*) (Shepherd et al., 2001).

Officers of the Department of Water and Environmental Regulation (DWER) conducted a site inspection on 16 May 2018 (DWER site inspection). The DWER site inspection identified that the vegetation within the application area predominantly comprises wandoo and *Allocasuarina* spp. woodland (DWER, 2018a).

Vegetation Condition

The vegetation within the application area is in the following condition:

- Good: Vegetation structure significantly altered by very obvious signs of multiple disturbance; retains basic structure or ability to regenerate (Keighery, 1994); and
- Degraded: Basic vegetation structure severely impacted by disturbance; scope for regeneration but not to a state approaching Good condition without intensive management (Keighery, 1994).

The condition of the vegetation within the application area was determined from the DWER site inspection (DWER, 2018a). Approximately 1.66 kilometres (60 per cent) of the application area is located adjacent to remnant vegetation to the north in State Forest 53. The northern portion of the road reserve is considered to be in Good condition for this section. The southern portion of the road reserve and the remainder of the application area is considered to be in Degraded condition. The understorey of the entire application area is largely devoid of native vegetation.

Soil type

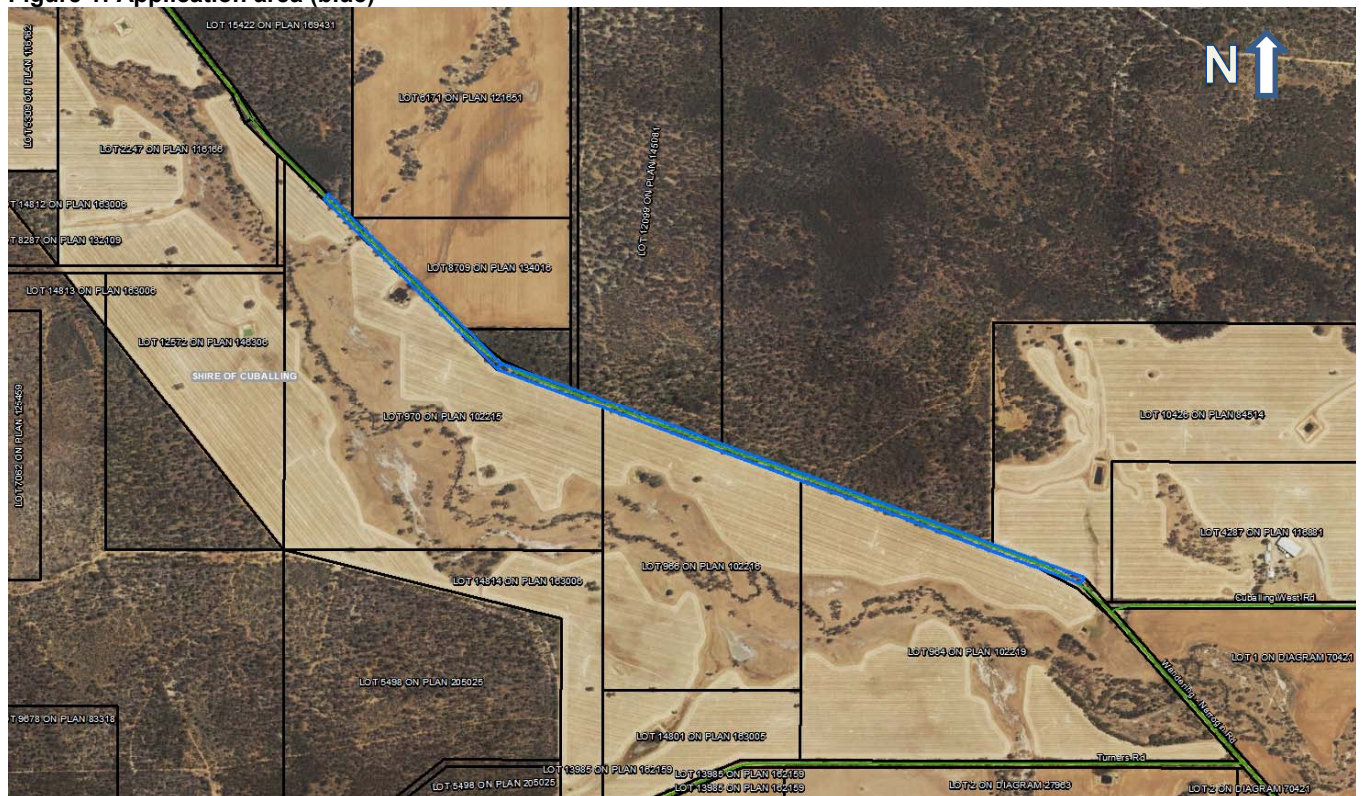
The soils within the application area are mapped as the following subsystems:

- Noombling Subsystem (Dryandra) 257DyNB, described as long gentle and undulating hillslopes and divides. Colluvium / weathered granite, gneiss and some dolerite; yellow/brown and grey deep sandy duplexes, brown deep loamy duplexes, sandy gravels and shallow duplexes (approximately 50 per cent of the application area); and
- Biberkine Subsystem (Dryandra) 257DyBK, described as valley floors and footslopes with gently undulating rises and low hills; alluvium and colluvium over granite etc; yellow brown sandy duplexes, wet and semi-wet soils and brown deep loamy duplexes (approximately 50 per cent of the application area) (Department of Primary Industries and Regional Development, 2018).

Comment

The local area considered in the assessment of this application is defined as a 10 kilometre radius measured from the perimeter of the application area. The local area retains approximately 30 per cent (approximately 11,000 hectares) vegetation cover.

Figure 1: Application area (blue)



3. Assessment of application against clearing principles

(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

Proposed clearing is not likely to be at variance to this Principle

The DWER site inspection determined that the vegetation within the application area ranged from Good (Keighery, 1994) to Degraded (Keighery, 1994) condition (DWER, 2018a).

According to available databases, one rare and 12 priority (P) flora species have been recorded within the local area. The priority flora species are discussed below; rare flora are discussed further under Principle (c).

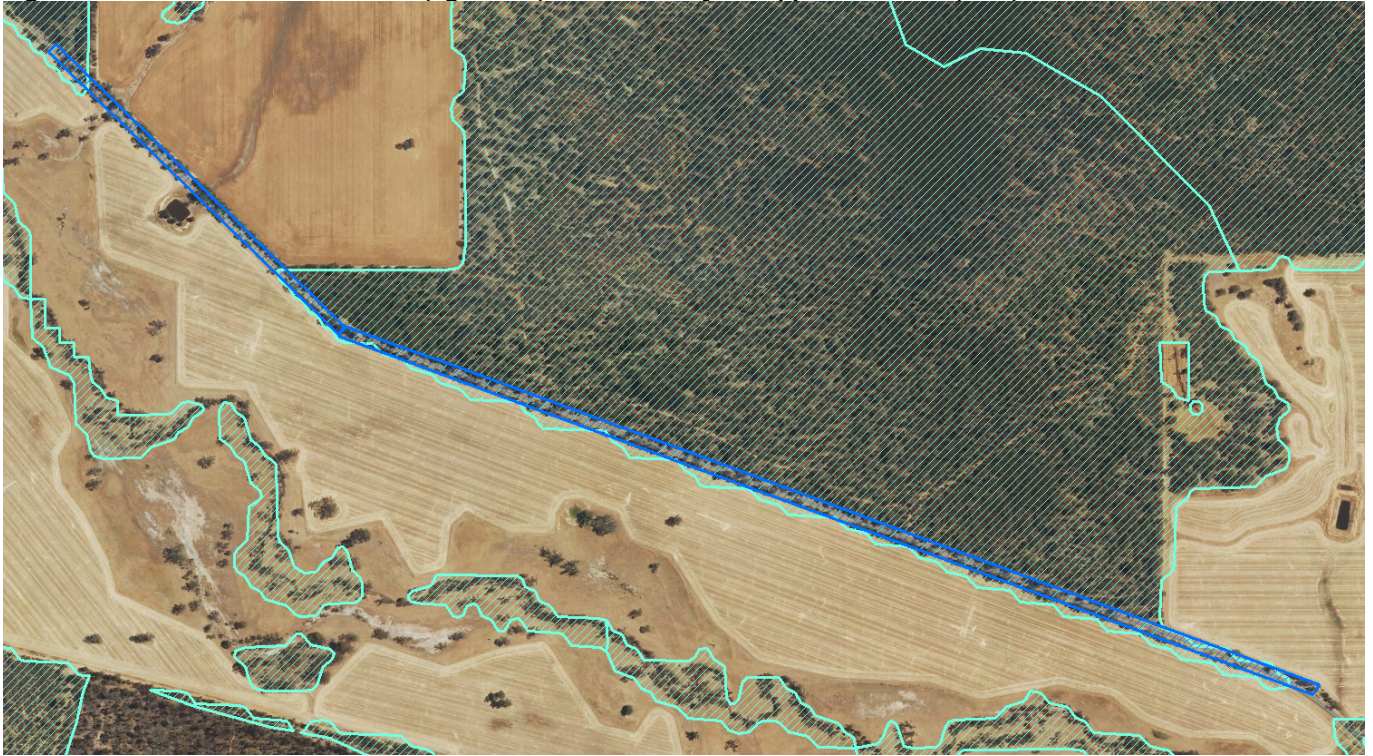
- *Andersonia carinata* (P2) has been recorded approximately 7.3 kilometres from the application area. This species is known from 25 records from the southern Avon Wheatbelt and adjacent portions of the Esperance Plains and Mallee bioregions, and is typically associated with white sand or gravelly lateritic soils on plains (Western Australian Herbarium, 1998-).
- *Asterolasia hyalina* (P2) has been recorded approximately 9.7 kilometres from the application area. This species is known from seven records from the Shires of Albany, Cuballing, Narrogin and Wandering, and is typically associated with sandy loams (Western Australian Herbarium, 1998-).
- *Banksia subpinnatifida* var. *subpinnatifida* (P2) has been recorded approximately 5.2 kilometres from the application area. This species is known from 20 records in the Shires of Cuballing, Narrogin, Pingelly and Wandering, and is typically associated with gravelly loams (Western Australian Herbarium, 1998-).
- *Leucopogon darlingensis* subsp. *rectus* (P2) has been recorded approximately 3.1 kilometres from the application area. This species is known from 22 records from the Shires of Cuballing, Narrogin and Williams, and is typically associated with yellow or brown sandy or gravelly loams over laterite (Western Australian Herbarium, 1998-).
- *Persoonia hakeiformis* (P2) has been recorded approximately 6.2 kilometres from the application area. This species is known from 10 records from the Shires of Cuballing, Kent, Kulin, Lake Grace, Nannup and Pingelly, and is typically associated with gravelly clay loam or sand over laterite on lateritic ridges (Western Australian Herbarium, 1998-).
- *Acacia deflexa* (P3) has been recorded approximately 6.1 kilometres from the application area. This species is known from 42 records from the Jarrah Forest, Avon Wheatbelt and Mallee bioregions, and is typically associated with yellow and gravelly lateritic sand and gravelly sandy loam on plains (Western Australian Herbarium, 1998-).
- *Amanita carneiphylla* (P3) has been recorded approximately 7.6 kilometres from the application area. This species is known from 28 records from the Avon Wheatbelt, Jarrah Forest and Swan Coastal Plain bioregions, and is typically associated with sandy soils (Western Australian Herbarium, 1998-).
- *Banksia cynaroides* (P4) has been recorded approximately 1.3 kilometres from the application area. This species is known from 33 records predominantly from the southern Avon Wheatbelt bioregion, and is typically associated with gravelly sand or clay loam over laterite (Western Australian Herbarium, 1998-).
- *Darwinia* sp. *Dryandra* (P4) has been recorded approximately 4.6 kilometres from the application area. This species is known from 16 records from the north-eastern Swan Coastal Plain and western Avon Wheatbelt bioregions, and is typically associated with gravelly clays on lateritic ridges (Western Australian Herbarium, 1998-).
- *Gastrolobium ovalifolium* (P4) has been recorded approximately 3.6 kilometres from the application area. This species is known from 26 records from the south-western Avon Wheatbelt and Jarrah Forest bioregions, and is typically associated with sandy clays on gravelly hills (Western Australian Herbarium, 1998-).
- *Gastrolobium stipulare* (P4) has been recorded approximately 7.7 kilometres from the application area. This species is known from 13 records from the Shires of Brookton, Cuballing, Narrogin, Pingelly, Wagin and Williams, and is typically associated with yellow-grey sand, gravelly clay loam and laterite (Western Australian Herbarium, 1998-).
- *Hibbertia montana* (P4) has been recorded approximately 4.5 kilometres from the application area. This species is known from 93 records from the central Avon Wheatbelt, northern Jarrah Forest and eastern Swan Coastal Plain, and is typically associated with loam over granite, lateritic soils and gravel on granite rocks, lateritic ridges, boulders and hills (Western Australian Herbarium, 1998-).

The vegetation within the application area predominantly consists of wandoos and *Allocasuarina* spp. woodland with the understorey largely devoid of native vegetation (DWER, 2018a). Based on the DWER site inspection, the application area is not likely to comprise of habitat for priority or rare flora species.

As discussed under Principle (b), nine fauna species listed under Schedules 1 to 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2017* have been recorded within the local area (Department of Parks and Wildlife, 2007). The application area may contain significant habitat for indigenous fauna of conservation significance, including Carnaby's cockatoo, forest red-tailed black cockatoo and red-tailed phascogale.

According to available databases, two mapped occurrences of the 'Eucalypt Woodlands of the Western Australian Wheatbelt' (Wheatbelt Woodlands) threatened ecological community (TEC) intersect the application area (Figure 2). The western occurrence predominantly aligns with Crown Reserve 27141 and the eastern occurrence predominantly aligns with State Forest 53. It is estimated that the proposed clearing will result in the loss of approximately 0.28 hectares of the TEC. No other TECs or priority ecological communities are expected to occur within the application area. TECs are discussed further under Principle (d).

Figure 2: Wheatbelt Woodlands TEC (light blue) intersected by the application area (blue)



The application area is considered to contain 0.28 hectares of the Wheatbelt Woodlands TEC and may contain significant fauna habitat. However, the application area contains minimal floristic diversity when compared to adjacent areas which exhibit similar vegetation types but better vegetation condition. Therefore the application area is not likely to comprise a high level of biological diversity. The proposed clearing is not likely to be at variance to this Principle.

(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

Proposed clearing may be at variance to this Principle

According to available databases, nine fauna species listed under Schedules 1 to 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2017* have been recorded within the local area (Department of Parks and Wildlife, 2007-):

- woylie (*Bettongia penicillata ogilbyi*) (Schedule 1 – critically endangered);
- numbat (*Myrmecobius fasciatus*) (Schedule 2 – endangered);
- Carnaby's cockatoo (*Calyptorhynchus latirostris*) (Schedule 2 – endangered);
- Baudin's cockatoo (*Calyptorhynchus baudinii*) (Schedule 2 – endangered);
- forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*) (Schedule 3 – vulnerable);
- malleefowl (*Leipoa ocellata*) (Schedule 3 – vulnerable);
- chuditch (*Dasyurus geoffroyi*) (Schedule 3 – vulnerable);
- bilby (*Macrotis lagotis*) (Schedule 3 – vulnerable);
- red-tailed phascogale (*Phascogale calura*) (Schedule 6 – conservation dependent fauna);

According to available databases, five fauna species listed as priority (P) fauna by the Department of Biodiversity, Conservation and Attractions have also been recorded within the local area (Department of Parks and Wildlife, 2007-):

- southern death adder (*Acanthophis antarcticus*) (P3);
- masked owl (*Tyto novaehollandiae* subsp. *novaehollandiae*) (P3)
- quenda (*Isoodon obesulus* subsp. *fusciventer*) (P4)
- Tammar wallaby (*Macropus eugenii* subsp. *derbianus*) (P4)
- Western brush wallaby (*Macropus irma*) (P4).

Woylie

The woylie is known from four surviving populations (Perup, Kingston, Dryandra Woodland and Tutanning Nature Reserve) and has been translocated to several additional locations including locations in South Australia and New South Wales (Yeatman and Groom, 2012). The application area is located adjacent to State Forest 53 which forms part of Dryandra Woodland.

According to the Recovery Plan, woylies appear to persist in the following habitat where there is adequate introduced predator (fox and cat) control or exclusion:

- tall eucalypt forest and woodland;
- dense myrtaceous shrubland; and
- kwongan (proteaceous) or mallee heath. (Yeatman and Groom, 2012)

The application area contains suitable habitat for the woylie based on the vegetation type present, however, the DWER site inspection observed that the understorey is largely devoid of native vegetation (DWER, 2018a). It is considered that the woylie is not likely to utilise the application area given the lack of refuge provided by the vegetation present and the proximity of the road and associated traffic. Although the clearing will result in a wider road corridor, the application area is restricted to the road reserve and additional traffic lanes are not proposed. The extent of widening proposed is not likely to result in a substantially greater deterrent to use of the remaining adjacent habitat by the woylie.

The application area occurs on the edge of State Forest 53 (i.e. does not dissect State Forest 53). Additional areas of Dryandra Woodland (i.e. State Forest 51) are located approximately 700 metres southwest. The proposed clearing of a few metres in width is not considered likely to result in significant impacts to the ability of the woylie to move between State Forest 51 and 53.

Given the above, the application area is not likely to contain significant habitat for the woylie.

Numbat

The numbat is known from two surviving subpopulations (Dryandra Woodland and Upper Warren) and has been translocated to 12 different sites within the former range of the species (Department of Parks and Wildlife, 2017). The application area is located adjacent to State Forest 53 which forms part of Dryandra Woodland.

According to the Recovery Plan, the key habitat requirements of the numbat include:

- presence of termites in sufficient abundance;
- sufficient cover – adequate cover near ground level is required to provide refuge from raptors – cover may be provided by thickets or a combination of thickets and hollow logs;
- sufficient openness – although a degree of cover is required for refuge from predators, a sufficiently open understorey is required for feeding sites – a combination of an open understorey interspersed with thickets and hollow logs is ideal; and
- presence of eucalypt species – the majority of sites where numbats occur and were recorded in the past are characterised by the presence of eucalypt species thus providing logs and hollows and possibly higher termite densities. (Department of Parks and Wildlife, 2017)

The DWER site inspection did not identify hollow logs or thickets within the application area (DWER, 2018a). The application area may provide foraging habitat for the numbat if termites are present but the proximity of the road and associated traffic is likely to act as a deterrent to use of the area. Although the clearing will result in a wider road corridor, the application area is restricted to the road reserve and additional traffic lanes are not proposed. The extent of widening proposed is unlikely to result in a substantially greater deterrent to use of the remaining adjacent habitat by the numbat.

The application area occurs on the edge of State Forest 53 (i.e. does not dissect State Forest 53). Additional areas of Dryandra Woodland (i.e. State Forest 51) are located approximately 700 metres southwest. The application area is separated from State Forest 51 by farmland. Numbats have been known to cross farmland but this appears to be rare with artificial movement of individuals and translocations currently considered necessary for achieving genetic transfer and recolonization (Department of Parks and Wildlife, 2017). Therefore the application area is not likely to provide significant ecological linkage values for the numbat.

Given the above, the application area is not likely to contain significant habitat for the numbat.

Black cockatoos

Carnaby's cockatoo nests in hollows in live or dead trees of wandoo, York gum, salmon gum, powderbark wandoo (*Eucalyptus accedens*), marri (*Corymbia calophylla*), jarrah (*Eucalyptus marginata*), flooded gum (*Eucalyptus rudis*), tuart (*Eucalyptus gomphocephala*) and karri (*Eucalyptus diversicolor*) (Commonwealth of Australia, 2012). Two large wandoo trees containing hollows were observed within the application area and may provide suitable nesting habitat for the species (Figure 3) (DWER, 2018a).

Common foraging items for Carnaby's cockatoo include seeds, flowers and nectar of Proteaceous plant species, *Eucalyptus* spp. and *Callistemon* spp. (Commonwealth of Australia, 2012). The DWER site inspection noted the dominance of wandoo within the application area (DWER, 2018a). The application area may contain suitable foraging habitat for Carnaby's cockatoo.

The application area is located near the north-eastern boundary of the modelled distribution of Baudin's cockatoo and forest red-tailed black cockatoo (Commonwealth of Australia, 2012).

Baudin's cockatoo primarily feeds on marri (*Corymbia calophylla*) which was not observed in the application area during the DWER site inspection (DWER, 2018a). The application area is not located within the predicted breeding range of the species (Commonwealth of Australia, 2012). Therefore no significant impacts to Baudin's cockatoo are expected from the proposed clearing.

Forest red-tailed black cockatoo primarily forages in jarrah (*Eucalyptus marginata*) and marri forest but may also forage in wandoo (Commonwealth of Australia, 2012). Therefore the application area may contain suitable foraging habitat for forest red-tailed black cockatoo. The species is also known to nest in wandoo (Commonwealth of Australia, 2012). Two large wandoo trees containing hollows were observed within the application area and may provide suitable nesting habitat for the species (Figure 3) (DWER, 2018a).

The application area may contain suitable foraging and nesting habitat for both Carnaby's cockatoo and forest red-tailed black cockatoo. The proposed clearing has the potential to result in significant impacts to these species if the application area is used for nesting.

Malleefowl

Malleefowl continue to persist in several conservation areas across Western Australia including Dryandra Woodland, Fitzgerald River National Park, Stirling Range National Park, Kalbarri National Park, and Mount Manning – Helena and Aurora Ranges Conservation Park, and have been reintroduced to Francois Peron National Park in Shark Bay (Department of Parks and Wildlife, 2016). The application area is located adjacent to State Forest 53 which forms part of Dryandra Woodland.

One of the key habitat requirements for malleefowl is abundant leaf litter and a sandy substrate for the successful construction of nest mounds (Department of Parks and Wildlife, 2016). No nest mounds were observed in the application area during the DWER site inspection (DWER, 2018a). The application area is not expected to represent a suitable area for malleefowl to construct nest mounds. The application area may provide foraging habitat for the species but the proximity of the road and associated traffic is likely to act as a deterrent to use of the area.

Although the clearing will result in a wider road corridor, the application area is restricted to the road reserve and additional traffic lanes are not proposed. The extent of widening proposed is unlikely to result in a substantially greater deterrent to use of the remaining adjacent habitat by malleefowl.

The application area occurs on the edge of State Forest 53 (i.e. does not dissect State Forest 53). Additional areas of Dryandra Woodland (i.e. State Forest 51) are located approximately 700 metres southwest. The proposed clearing of a few metres in width is not considered likely to result in significant impacts to the ability of malleefowl to move between State Forest 51 and 53.

Given the above, the application area is not likely to contain significant habitat for malleefowl.

Chuditch

The chuditch requires adequate den resources (hollow logs, burrows or rock crevices), adequate prey resources and areas of large intact habitat to survive (Department of Environment and Conservation, 2012). Given the application area borders substantial areas of remnant vegetation (i.e. State Forest 53), the chuditch may occur in the area. No large hollow logs, burrows or rock crevices were observed in the application area during the DWER site inspection (DWER, 2018a) and therefore the species is only likely to opportunistically utilise the application area for foraging.

Given the size of clearing proposed, and the narrow linear shape of the application area, the potential loss of foraging habitat proposed to be cleared is not expected to be significant.

The application area occurs on the edge of State Forest 53 (i.e. does not dissect State Forest 53). Substantial additional areas of remnant vegetation are located approximately 700 metres southwest. The proposed clearing of a few metres in width is not considered likely to result in significant impacts to the ability of the chuditch to move between these areas.

Given the above, the application area is not likely to contain significant habitat for the chuditch.

Bilby

Historically the bilby occupied a vast area of Australia with records from all states except Victoria and Tasmania. In Western Australia, the distribution of the bilby extended from the Dampier Peninsula in the north to the Wheatbelt in the southwest. The species is now restricted to the Pilbara and Kimberley in Western Australia, the Tanami, Great Sandy and Gibson deserts in the Northern Territory, and an isolated population in southwest Queensland (Pavey, 2006). The application area does not occur within the current distribution of the bilby and therefore no impacts to the species are expected.

Red-tailed phascogale

The preferred habitat of the red-tailed phascogale is *Allocasuarina* spp. woodlands with hollow-bearing *Eucalyptus* spp.. The application area includes *Allocasuarina* species and two large eucalypt trees containing hollows were observed (Figure 3) (DWER, 2018a). Noting this, the application area may contain suitable daytime refuge or nesting habitat for the red-tailed phascogale.

The proposed clearing has the potential to result in significant impacts to the red-tailed phascogale if trees used for daytime refuge or nesting are present in the application area.

Priority and other indigenous fauna

Given the size of clearing proposed, the narrow linear shape of the application area, and the fact that the understorey of the application area is largely devoid of native vegetation, the proposed clearing is not expected to result in significant impacts to any other indigenous fauna species.

Summary

Given the above, the application area may contain significant habitat for Carnaby's cockatoo, forest red-tailed black cockatoo and red-tailed phascogale. The proposed clearing may be at variance to this Principle.

Figure 3. Two large trees with hollows within the application area



(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.

Proposed clearing is not likely to be at variance to this Principle

According to available databases, one rare flora species has been recorded within the local area; *Darwinia carnea*.

Darwinia carnea has been recorded approximately 7.1 kilometres from the application area. This species is known from 20 records from the Shires of Cranbrook, Cuballing, Gingin, Narrogin and Victoria Plains, and is typically associated with lateritic loam and gravel.

The vegetation within the application area predominantly consists of wandoo and *Allocasuarina* spp. woodland with the understorey largely devoid of native vegetation (DWER, 2018a). Based on the DWER site inspection, no rare flora species are expected to be present.

The application area is not likely to include, or be necessary for the continued existence of, rare flora. The proposed clearing is not likely to be at variance to this Principle.

(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.

Proposed clearing is at variance to this Principle

As discussed under Principle (a), according to available databases, two mapped occurrences of the Wheatbelt Woodlands TEC intersect the application area (Figure 2). The western occurrence predominantly aligns with Crown Reserve 27141 and the eastern occurrence predominantly aligns with State Forest 53.

Based on the DWER site inspection, the northern portions of the road reserve adjacent to Crown Reserve 27141 and State Forest 53 are considered to form part of the TEC. The remaining vegetation within the application area, including the vegetation on the opposite side of the road along the length of Crown Reserve 27141 and State Forest 53, occurs in patches of up to four metres in width. The condition thresholds for the TEC outlined in the '*Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) Approved Conservation Advice (including listing advice) for the Eucalypt Woodlands of the Western Australian Wheatbelt*' for this TEC states that roadside patches must be 5 metres or more in width to qualify as the TEC (Threatened Species Scientific Committee, 2015). Therefore the TEC is not likely to be present within the remainder of the application area.

The proposed clearing will result in the loss of approximately 0.28 hectares of the Wheatbelt Woodlands TEC. The total number of occurrences of the TEC as mapped by the Commonwealth Department of the Environment and Energy is 87,224, with a total area of about 633,914 hectares. The TEC extends from Pindar to Takalarup, a distance of about 700 kilometres. All mapped occurrences require ground-truthing (Department of Biodiversity, Conservation and Attractions, 2018).

Given the above, the proposed clearing is at variance to this Principle.

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

Proposed clearing is at variance to this Principle

The National Objectives and Targets for Biodiversity Conservation 2001-2005 include a target to have clearing controls in place that prevent clearance of ecological communities with an extent below 30 per cent of that present pre-1750 (i.e. pre-European settlement) (Commonwealth of Australia, 2001). This is the threshold level, below which species loss appears to accelerate exponentially.

In assessing the risk of further loss and subsequent cumulative effects, consideration has been given to the extent of native vegetation remaining and what is currently managed as conservation estate:

- as indicated in Table 1, the current vegetation extents for the bioregion, and mapped Beard vegetation association are all below the 30 per cent recommended threshold;
- as indicated in Table 1, less than two per cent of the pre-European extent of the mapped Beard vegetation association is contained in conservation estate; and
- the local area retains approximately 30 per cent (approximately 11,000 hectares) pre-European native vegetation cover.

As discussed under Principle (b), the application area may contain significant habitat for indigenous fauna of conservation significance. As discussed under Principle (d) the application area contains 0.28 hectares of the Wheatbelt Woodlands TEC.

Given the above, the application area is considered to be a significant remnant within an area that has been extensively cleared.

The proposed clearing is at variance to this Principle.

Table 1: Vegetation extent remaining statistics (Government of Western Australia, 2018)

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed lands (ha)	Extent remaining in all DBCA managed lands (proportion of Pre-European extent) (%)
IBRA Bioregion					
Avon Wheatbelt	9,517,110	1,761,227	18.5	174,961	1.8
Beard vegetation association					
1023	1,601,606	172,944	10.8	18,907	1.2
Beard vegetation association in IBRA Bioregion					
1023 (Avon Wheatbelt)	1,522,680	165,193	10.8	17,258	1.1

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

Proposed clearing is at variance to this Principle

According to available databases, three minor non-perennial watercourses intersect the application area. Two of these watercourses are mapped as flowing into 14 Mile Brook located on the property to the south of the application area. The third is also mapped as flowing towards 14 Mile Brook but is intercepted by a farm dam.

According to available databases, no wetlands occur within the application area.

The DWER site inspection recorded evidence of one watercourse and no wetlands within the application area (DWER, 2018a). The watercourse identified is located at the western end of the application area in one of the areas mapped as a watercourse. It was not flowing at the time of inspection. It is considered that the other two mapped watercourses are likely to represent low points in the landscape rather than actual watercourses.

No distinctive riparian vegetation was recorded during the DWER site inspection, however vegetation was present in the road reserve where the single watercourse was identified. Therefore the proposed clearing is at variance to this Principle.

No significant impacts to the environmental values of the watercourse are expected given its highly modified nature and the relatively minimal extent of clearing required at its crossing.

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

Proposed clearing is not likely to be at variance to this Principle

As outlined in Section 2, the soils within the application area are mapped as yellow/brown and grey deep sandy duplexes, yellow brown sandy duplexes, brown deep loamy duplexes, sandy gravels, wet and semi-wet soils and shallow duplexes.

Groundwater salinity within the application area has been mapped as saline at between 7,000-14,000 milligrams per litre total dissolved solids (TDS), being saline.

Noting the extent of the proposed clearing, the linear shape of the application area and its location along an existing road, any land degradation impacts are not likely to be appreciable.

Given the above, the proposed clearing is not likely to be at variance to this Principle.

(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

Proposed clearing may be at variance to this Principle

The application area is located adjacent to State Forest 53 (Montague State Forest) and Crown Reserve 27141 (a C class reserve for the land use of "Conservation" and "Timber").

The proposed clearing may impact on the environmental values of the adjacent Montague State Forest and Crown Reserve 27141 through increased edge effects and the introduction and spread of weeds and dieback. The proposed clearing may be at variance to this Principle.

(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

Proposed clearing is not likely to be at variance to this Principle

As discussed under Principle (f), a single watercourse intersects the application area. No significant impacts to the environmental values of the watercourse are expected given its highly modified nature and the relatively minimal extent of clearing required at its crossing.

As discussed under Principle (g), groundwater salinity mapped within the application area is between 7,000-14,000 milligrams per litre TDS.

Noting the extent of the proposed clearing, the linear shape of the application area and the nature of the soils present, the proposed clearing is not likely to cause deterioration in the quality of surface or underground water.

The proposed clearing is not likely to be at variance to this Principle.

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

Proposed clearing is not likely to be at variance to this Principle

As discussed under Principle (f), a single watercourse intersects the application area.

Noting the extent of the proposed clearing, the linear shape of the application area and the nature of the soils present, the proposed clearing is not likely to cause or exacerbate the incidence or intensity of flooding.

The proposed clearing is not likely to be at variance to this Principle.

Planning instruments and other relevant matters.

The clearing permit application was advertised on the DWER website on 22 December 2017 with a 21 day submission period. No public submissions have been received in relation to this application.

4. Applicant's submissions

On 16 August 2018, DWER wrote to the applicant outlining that impacts to the Wheatbelt Woodlands TEC and significant remnant vegetation were identified during the assessment as well as potential impacts to fauna and conservation areas. The applicant was invited to provide additional advice regarding proposed measures to avoid and minimise impacts and offset unavoidable impacts. Advice was also sought whether the applicant could avoid the two trees with hollows identified during the DWER site inspection. On 23 August 2018 a response was received from the applicant advising:

- the Wandering-Narrogin Road is a road of regional significance linking the regional town of Narrogin with Perth and having traffic counts of 413 vehicle movements per day;
- the Wandering-Narrogin Road is the main access to the significant Dryandra Woodlands tourist attraction;
- a 7.2 metre wide road is the minimum width for a road of this standard and this section of Wandering-Narrogin Road is currently 6.2 metres wide;
- the proposed clearing is one stage of an ongoing project to widen the entirety of the road;
- the application is for the minimum area of clearing to complete the project;
- the two large trees with hollows are proposed to be cleared because widening the road without removing the trees will:
 - place the trees in the road maintenance zone and present a danger to road users – the trees are currently three metres from the bitumen seal and less than 1.5 metres from the bottom of the constructed roadside drain;
 - see the root systems of the two trees impacting on the road surface resulting in road safety issues over time and reducing the life of this section of the road;
 - see the roadside drain become closer to the trees meaning the Shire will not be able to complete effective road maintenance;
 - undermine the trees when constructing the new roadside drainage closer to the trees which may result in them becoming unstable over time and leaning over or falling towards the road.
- it is possible to use a different road alignment that widens the road only on the western side and avoid the two large trees with hollows, however, this would increase the total amount of clearing required;
- the Shire is prepared to provide the installation and ongoing maintenance of artificial habitat for Carnaby's cockatoo, forest red-tailed black cockatoo and red-tailed phascogale in the adjacent State Forest or Crown Reserve 27141;
- the Shire is prepared to relinquish a portion of Crown Reserve 2556 as an offset for the clearing by amending the reserve purpose from "Gravel" to "Conservation";
- to limit the risk of introduction and spread of dieback the Shire proposes to utilise gravel sourced from a site adjacent to Dryandra Woodland that is located within two kilometres of the proposed clearing; and
- the Shire will continue to actively manage roadside weeds after construction as part of normal ongoing road maintenance where weeds are controlled during winter.
(Shire of Cuballing, 2018a)

On 10 September 2018, DWER met with the applicant on site to further consider avoidance of the two large trees with hollows. It was ultimately determined that avoiding the two trees by clearing a larger area on the western side of the road was not the preferred option.

5. Consideration of variances following applicant's submissions / further information

Given no changes to the application area were proposed by the applicant, the variances against the clearing principles were not updated.

It is noted that upgrades to the road will provide a public benefit including improved road safety.

It is considered that the proposed impacts to the Wheatbelt Woodlands TEC and significant remnant vegetation are of a scale that can be offset through the conservation of a portion of Crown Reserve 2556 as proposed by the applicant. Further details on the offset are provided in Section 6.

In relation to potential impacts to Carnaby's cockatoo, forest red-tailed black cockatoo and red-tailed phascogale, it is considered that inspecting potential habitat trees, delaying clearing until no longer in use (where identified as being occupied), and installing artificial hollows or nesting boxes to replace confirmed habitat trees will adequately mitigate any impacts. Crown Reserve 27141 is considered a suitable location for the installation of artificial hollows and nest boxes being directly adjacent to the application area meaning any impacted fauna would not have to travel far to find the intended replacement habitat.

It is considered that standard hygiene management practices are appropriate to mitigate the risk of dieback and weed spread/introduction.

6. Suitability of proposed offset

The offset site is located approximately 30 kilometres northeast of the application area. The offset site is mapped as the same Beard vegetation association as the application area. A site inspection of the offset site identified that it is also dominated by wandoo and *Allocasuarina* spp. (DWER, 2018b). It is considered that the offset site contains environmental values that relate to those being lost.

To determine what offset size would be adequately proportionate to the significance of the environmental values being impacted, DWER undertook a calculation using the Commonwealth Offsets Assessment Guide. The calculation indicated that the conservation of 2.6 hectares is required. The applicant has agreed to relinquish a 2.6 hectare portion of Crown Reserve 2556 (Shire of Cuballing, 2018b).

Given the above, the conservation of 2.6 hectares of Crown Reserve 2556 is considered adequate to counterbalance the significant residual impacts of the proposed clearing consistent with the *WA Environmental Offsets Policy September 2011*.

7. References

- Commonwealth of Australia (2001) National Objectives and Targets for Biodiversity Conservation 2001-2005, Canberra.
- Commonwealth of Australia (2012) EPBC Act referral guidelines for three threatened black cockatoo species, Canberra.
- Department of Biodiversity, Conservation and Attractions (2018) TEC advice received in relation to clearing permit application CPS 7870/1, received 21 March 2018. Department of Biodiversity, Conservation and Attractions, Western Australia (DWER Ref: A1673052).
- Department of Environment and Conservation (2012) Chuditch (*Dasyurus geoffroii*) National Recovery Plan. Wildlife Management Plan No. 54. Department of Environment and Conservation, Bentley, Western Australia
- Department of Parks and Wildlife (2007-) NatureMap: Mapping Western Australia's Biodiversity. Department of Parks and Wildlife. URL: <http://naturemap.dpaw.wa.gov.au/> (accessed 27 February 2018).
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- Department of Primary Industries and Regional Development (2018). NRInfo Digital Mapping. Department of Primary Industries and Regional Development. Government of Western Australia. URL: <https://maps.agric.wa.gov.au/nrm-info/>.
- Department of Water and Environmental Regulation (DWER) (2018a) Site Inspection Report for CPS 7869/1. Department of Water and Environmental Regulation. Western Australia (DWER ref. A1705283).
- Department of Water and Environmental Regulation (DWER) (2018b) Site Inspection Report for CPS 7870/1. Department of Water and Environmental Regulation. Western Australia (DWER ref. A1677070).
- Government of Western Australia. (2018) 2017 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of December 2017. WA Department of Biodiversity, Conservation and Attractions.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
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- Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) Native Vegetation in Western Australia, Extent, Type and Status. Resource Management Technical Report 249. Department of Agriculture, Western Australia.
- Shire of Cuballing (2018a) Additional information provided in relation to CPS 7869/1. Received 23 August 2018 (DWER ref: A1713874).
- Shire of Cuballing (2018b) Additional information provided in relation to CPS 7869/1. Received 10 October 2018 (DWER ref: A1727914).
- Threatened Species Scientific Committee (2015) Approved Conservation Advice (including listing advice) for the Eucalypt Woodlands of the Western Australian Wheatbelt. Department of the Environment, Canberra. Available from: <http://www.environment.gov.au/biodiversity/threatened/communities/pubs/128-conservation-advice.pdf>.
- Western Australian Herbarium (1998-) FloraBase - The Western Australian Flora. Department of Biodiversity, Conservation and Attractions. <https://florabase.dpaw.wa.gov.au/> (accessed 25 July 2018).
- Yeatman, G.J. and Groom, C.J. (2012) National Recovery Plan for the woylie *Bettongia penicillata*. Wildlife Management Program No. 51. Department of Environment and Conservation, Perth.

GIS Databases:

- Department of Biodiversity Conservation and Attractions, Tenure
- Groundwater salinity
- Hydrography – Inland Waters
- Wetlands of the wheatbelt
- NLWRA, Current Extent of Native Vegetation
- SAC Bio Datasets (Accessed 25 July 2018)
- Soils, Statewide
- Topographic contours