Bejoording Road Fauna Report Goomalling

CARNABY'S COCKATOO ASSESSMENT

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Contents

GLOSSARY OF TERMS

SLK	Straight line kilometer
AOO	Area of occupancy
colluvial	Loose sediments deposited by water
DEWHA	Department Environment, Water, Heritage & Arts
DoE	Department of the Environment
DPaW	Department of Parks and Wildlife
EOO	Extent of occurrence
EPBC	Environment Protection and Biodiversity Conservation Act 1999
IBRA	Interim Biographical Regionalization for Australia
SoG	Shire of Goomalling
SEWPAC	Department for Sustainability, Environment, Water, Population & Communities
SPRAT	Species Profile & Threats database
TSSC	Threatened Species Scientific Committee

EXECUTIVE SUMMARY

This report was undertaken to assess the Bejoording Road roadside remnant vegetation in relation to the presence of Salmon gum (*Eucalyptus salmonophloia)* and Wandoo *(Eucalyptus wando*o), recognizing those of a diameter equal to, or greater than 50cm at 1.5m from the ground, which are thought utilized by the black Carnaby's cockatoo (*Calyptorhynchus latirostris).* The purpose was to evaluate preparatory to a Shire program to widen the road and the removal of a number of trees with potential nesting hollows.

A vegetation assessment for overall condition referenced the Shire of Goomalling's technical report (2006) *Roadside Vegetation and Conservation Values in the Shire of Goomalling* to provide a framework for assessment of the conservation value. Dawn and dusk surveys for roosting birds was undertaken on consecutive days, preceded by a detailed roadside verge assessment for signs of occupation or use by the three species of black cockatoos endemic to the wider region, and specifically the Carnaby's cockatoo.

The scope of the study revealed there had been no sightings other than one sighting in 1999 in the surrounding areas, despite the availability of nesting hollows and water sources. The conclusion was the single sighting had not been repeated and the absence of adequate foraging species and possibly the high number of competitor avian species was the determining factor in the absence of the Carnaby's cockatoo from the locality.

NexusENV is of the opinion that the proposed roadworks and verge clearing of Bejoording Road will not adversely affect the distribution and viability of the Carnaby's cockatoo.

1.0 INTRODUCTION

1.1 Background

This report has been prepared by NexusENV on behalf of the Shire of Goomalling to undertake a fauna assessment of 1.25 SLK of Bejoording Road roadside remnant vegetation for the present of the Carnaby's Cockatoo *(Calyptorhynchus latirostris).* The Shire has scheduled 1.25 SLK of roadworks to upgrade the pavement and clear the shoulders by 2.5 meters, which will entail the removal of some large trees with the potential for Carnaby's habitats. The area proposed to be cleared is 1,727m2 and work is scheduled to commence on the 1st February 2016.

Bejoording Road is an important agricultural linkage route from the north, carrying traffic from Shires of Victoria Plains and Toodyay to the Avon grain storage complex in Northam and to Great Eastern Highway. Traffic pressure has increased considerably in recent years with improved yields, the closure of the Tier 2 and 3 rail links and the move to larger haulage vehicles. In 2015 the Bejoording Road, Goomalling-Toodyay Road intersection was upgraded to address the increased demand and the Bejoording Road works will complete the program.

A photographic Verge Vegetation Assessment was undertaken for the Clearing Permit (CPS 6717/1) on the 2nd and 3rd February 2015 (Munns & Kirby) with GPS positioning of trees to be removed and those supporting hollows recorded. Trees to be removed were marked with a cross and those with hollows marked 'H'. The Department of Environment Regulation further requested subject to their Management Conditions a fauna survey to identify trees being utilized by the Carnaby's Cockatoo. This report addresses the subsequent flora review and fauna assessment requested by the Department as undertaken on 27 and 28 January 2016.

1.2 Scope of Works

The brief was to supply a report to meet the Part II Management Conditions (7) of Clearing Permit CPS 6717/1 (10/01/2016 – 10/1/2021) of the section of Bejoording Road (coloured yellow) according to Plan 6717/1 *(CPS 6717/1 p.3).*

The scope is defined by Condition 7a. as a survey of two tree species (*Eucalyptus salmonophloia and Eucalyptus wando*o) recognizing those of a diameter equal to, or greater than 50cm at 1.5m from the ground, which are thought to be utilized by the black Carnaby's cockatoo (*Calyptorhynchus latirostris).* The assessment is to be expanded to include sufficient surrounding area as to place the Permit Area into local context, should trees be identified under Condition 7a. of the Permit.

1.3 Site Assessment

The survey area lies in the sub-bioregion of the Avon Wheatbelt 2 (AW2) of the Avon Wheatbelt (AW) province in the Southwest Botanical Province (IBRA) classification. The Southwest Botanical Province is internationally renowned for its high biodiversity with 5,710 native species, 70% which are endemic and found nowhere else. The AW2 sub-bioregion is described as;

> '*colluvial processes are active. Soil formed in colluvium or in-situ weathered rock. Includes woodland of Wandoo, York Gum and Salmon Gum with Jam and*

Casuarina (Beecham 2001).'

The portion of Bejoording Road under assessment was 1.25 SLK in length from the Goomalling-Toodyay Road intersection and ended proximal to the Wongamine Reserve on the western side of the road. The area was surrounded by slightly undulating cleared agricultural land, with the portion of Bejoording Road under consideration relatively flat, other than a slight downhill gradient mid-section and a bend at the distal northern end. The roadside verge under evaluation was 2.5 meters in width, 1.25SLK long and approximately 15cm higher that the road.

Several small dams occupied the surrounding agricultural land. Wongamine Brook was approximately 1.25 km due east and roughly parallel to Bejoording Road. No water was visible within the Brook from Goomalling-Toodyay Rd although heavy rain had been received in the week preceding the assessment.

2.0 LEGISLATIVE OVERVIEW

2.1 Commonwealth

Governing Commonwealth legislation for all native flora and fauna is the *Environment Protection and Biodiversity Conservation Act* 1999. This act is Australia's overarching environmental legislation and provides the framework to protect and manage nationally and internationally important flora and fauna, ecological communities and heritage places. Carnaby's cockatoo is listed as Endangered under the Act.

Assessment of eligibility for listing under the *EPBC Act 1999* and *EPBC Regulations 2000*, is undertaken by the Threatened Species Scientific Committee and listed by the *Action Plan for Australian Birds 2010*, which provides a national overview of the conservation status of all birds in Australian territory evaluated against the IUCN Red List Status categories. The Committee guided but not bound by the Red Book, defined the Carnaby's status for the Action Plan (reviewed 2010) as;

Carnaby's cockatoo as EN (Endangered) (A1abc+2abc).

Endangered, as defined by Criterion A1 as having suffered a population decline of at least 50% over the past three generations or 45 years (generation time estimated to be 15 years). This trend is based on direct observation (Criteria A2a), a noted decline in the number of birds (Criteria A2b) and the quality of habitat (Criteria A2c).

2.2 Western Australia

The Western Australian *Wildlife Conservation Act* 1950 (Wildlife Conservation Act) and the *Environmental Protection Act* 1986 (EP Act) provide the State direction. Under this legislation permits are required prior to interference with any native flora and fauna, including all clearing of native vegetation unless it is for an exempt purpose. Schedule 6 of the EP Act and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* lists exemptions and referring Acts.

Road reserve management is subject to further State Acts which define activities within transport corridors and must be considered within the context of the planned activity. Clearing roadside vegetation for a road widening program requires a *purpose* permit with the requirements and clearing principles detailed within the *Environmental Protection (Clearing of Native Vegetation) Regulations* 2004.

The legislative responsibility in Western Australia to manage and protect all native flora and fauna is delegated to the Department of Parks and Wildlife (DPaW). Threatened flora or rare species, are gazetted under subsection 2 of Section 23F of the *Wildlife Conservation Act* 1950 and afforded special protection, with the Carnaby's cockatoo as a species considered 'likely to become extinct'.

A range of policies, strategies and plans relevant to the Carnaby's cockatoo management were available and have been included in the appendices. Particular guidance was available through the *EPBC Act 1999 referral guidelines for three threatened Black Cockatoo species* and the *Carnaby's Cockatoo (Calyptorhynchus latirostris) Recovery Plan.*

2.3 Regional

Regional protection of biodiversity is incorporated into the *Avon Arc Sub-Regional Strategy 2001* and the *Wheatbelt Strategic Framework 2012* through strategic policy frameworks. The Avon Arc Sub-Regional Strategy (2.3) action statement is clear that '*Clearing of remnant vegetation should be supported only for safety or for specific development requirements that would not threaten the presence of rare and threatened flora, fauna and ecological communities'*.

2.4 Local Government

The Shire of Goomalling supports the regional objectives through the Technical Report *Roadside Vegetation and Conservation Values in the Shire of Goomalling* (2006) which assessed the Roadside Conservation Value (RCV) of 92.7%, of the Shire's 688.5 km of roads and provides roadside management guidance to retaining the optimum roadside conservation.

3.0 OVERVIEW OF SURVEY

3.1 Literature & Database Review

A number of guidance documents were sourced in the preparatory to the site assessment, in particular the DEWHA and DoE, and Survey Guidelines, in particular the EPBC Act referral guidelines, the EPA Guidance Statement No 33 and the TSSC 'Threatened Species' guidelines. Access was undertaken to the Species Profile and Threats (SPRAT) database through the Department of the Environment, the IUCN Red Book. The preparatory work for the Significant Impact evaluation was undertaken through the direction of the EPBC Act Policy Statement 1.1 and further direction obtained through the National recovery plans for the black cockatoos and DPaW's Carnaby's cockatoo recovery plan.

Departmental advice was sought through DPaW's Land for Wildlife coordinator for Land for Wildlife registered in the vicinity and Birdlife Australia for Carnaby's sightings relevant to the assessment area. Historical records of sighting of Carnaby's were sought from the DPaW Threatened and Priority Database, R. Johnstone Curator of Ornithology at the WA Museum, the Toodyay Naturalist Club and the Shire of Toodyay's Reserve Management officer, all rich sources of knowledge of the Avon valleys and Wongamine Reserve flora and fauna.

3.2 Regional Context

Although the report was undertaken primarily to identify the presence of the Carnaby's cockatoo *(Calyptorhynchus latirostris)* and its possible use of two roadside tree species (*Eucalyptus salmonophloia and Eucalyptus wando*o), the cockatoo is one of three endemic black cockatoo species known within the wider region listed as threatened under the EPBC Act.

Listed threatened species and ecological communities are matters of national environmental significance under the EPBC Act and Bejoording Road lies within the known range of the Carnaby's cockatoo. Thirty kilometers to the west in the vicinity of Morangup and Wundowie, is the modelled distribution 'likely to occur' of the Forest Red-tailed black cockatoo (vulnerable) *Calyptorhynchus banksia naso* and Baudin's black cockatoo (vulnerable) *Calyptorhynchus baudinii* (EPBC 2012). Consideration was therefore given to the three species of black cockatoos within the scope of the report, due to the foraging distances engaged by these birds and uncertainty of distribution.

The two closest known Carnaby's populations at Julimar Forest and Morangup, both in the Shire of Toodyay are approximately 30km equidistant from the Bejoording Road site. Sightings of Carnaby's have been photographed at Hoddyswell (Toodyay Shire) approximately 20 km west.

3.3 Black Cockatoos

Black cockatoos are endemic to the south west of Western Australia. Distribution patterns of occurrence are similar, however the Carnaby's range extends further north (to Kalbarri) and east (Dowerin) compared to the northern range of the Red-tailed and Baudin's cockatoos around Gingin.

Habitually the birds display strong pair bonds and appear to mate for life. Long-lived and slow breeding, these three species utilize deep hollows of aged trees, with girths requiring up to 200 years of growth. Foraging patterns and species favoured are similar among the three species,

particularly Marri *(Corymbia calophylla),* Jarrah *(Eucalyptus marginata)* and the Proteaceous species. The decline of the overall populations of all three species is largely attributed to large scale clearing of native vegetation since the middle of the 20th century resulting in fragmentation and loss of a significant proportion of their habitat.

3.4 Carnaby's Black Cockatoo *(Calyptorhynchus latirostris)*

Taxonomically the Carnaby's cockatoo was originally considered as a subspecies of Baudin's cockatoo by Ivan Carnaby in 1948 (*Calyptorhynchus baudinii latirostris*; Carnaby 1948) until reclassified in 1979 as a subspecies of the yellow-tailed black cockatoo (*C. funereus latirostris*; Saunders 1979a).

Since European settlement extensive clearing of native vegetation within the Wheatbelt has removed approximately 56% of the Carnaby's habitat (DPaW 2013), resulting in a 30% reduction in range particularly in drier areas and the central Wheatbelt where the population has declined by 50% (EPBC 2012).

The birds are distinctive in appearance being large, mostly black to grey black with large white cheek patches, solid white panels on the tail and a fine dull white margin to the feathers giving a scalloped appearance. The bill is pronounced with a flaky texture. Differences between the sexes is notable by bill colour and eye ring, females having a light grey bill and blue-grey eye-ring and males a black bill and pink eye-ring (DPaW 2013). The bird has a distinctive drawn out call compared to other black cockatoos and is heard as a shrill 'whistle' when passing overhead.

DPaW's Carnaby Recovery Plan identified that the '*long-term survival of a robust population of Carnaby's cockatoos depends on the availability of suitable woodland breeding habitat and tree hollows, and foraging habitat capable of providing enough food to sustain the population*'.

The difficulty in determining the extent of occupancy (EOO) or the area of occupancy (AOO) of the cockatoo lays with the highly mobile and adaptive nature of the bird which utilizes resources over a relatively large area and can seasonally migrate with breeding and foraging (EPBC 2012).

Habitat

Carnaby's cockatoo favours *Eucalyptus* woodlands that provide nest hollows, nearby foraging vegetation and watering sources. Previously used sites can be revisited provided water and foraging is within close proximity although the specie can range up to 6 to 12 km.

Foraging

Foraging birds show a distinct preference for native shrublands, Kwongan heathlands and woodlands dominated by *Eucalypts* (particularly Marri), *Hakea, Grevillea, Allocasarina* and the *Proteacea, Pinus* spp and Callistemon. Seed, flower and nectar availability defines the species movement in the landscape. Migration occurs towards the higher rainfall coastal region during the non-breeding season (January to July) but not all populations migrate. Within the Bejoording Road site there was little of the preferred foraging species present in the landscape. Carnaby's are opportunistic foragers and they have adapted to domestic and agricultural crop species such as Canola, olive and nut crops and wild radish, fruits and Erodium spp (EPBC 2012). None of these species were noted

in the vicinity of Bejoording Road site in any useful quantity although grain cropping occurred in the surrounding properties.

Signs of foraging are distinctive in the Carnaby's removal of the rim of Marri nuts to access seed, tearing of bark and branches to obtain insect larvae and decimated flower heads.

Roosting

Night roosting is determined by the vegetation that provides adequate shelter, food resources and nearby water. Carnaby's do not roost far from a water source.

Breeding

Nesting occurs in the hollows of live or dead eucalypts, mainly the smooth-barked Salmon Gum and Wandoo (DoE 2010) following breeding between late July and December. Sites are defined by the age of trees with suitable hollows 2.5 – 12m above the ground with an entrance of 23-30cm and a depth of 1-2.5m. Breeding mostly occurs in the drier areas of the Carnaby's distribution with annual average rainfall between 300 and 750 mm (DPaW 2013). While migration is a significant feature of the Carnaby's there are a number of populations that remain close to their breeding sites throughout the year along the Swan Coastal Plain and its periphery (BirdLife Australia, *pers. comm*. 2016).

Currently there is insufficient information to determine with certainty across the species range, which habitat could be lost without having a significant adverse impact on the cockatoo's population in the long term

3.5 Method

The method undertaken was defined by the time available to undertake the survey and the time of year. A targeted survey was undertaken for foraging and roosting birds as the breeding season, the optimal time for a survey had effectively finished in December.

The aim was to detect the presence, numbers and extent of the black cockatoos including contiguous offsite access. The survey undertaken was a systematic assessment of both sides of the roadside verges and vegetation for feathers, signs of cockatoo foraging detritus, significant sources of droppings indicative of a roost and the presence of occupied tree hollows through 'sounding' the trucks of all trees marked H.

The roadside examination was thorough, methodical and covered the entire verged area to the fence. All evidence was bagged, photographed and recorded against the vegetation assessment of (Munns & Kirby). Verbal anecdotes were included of possible observations by persons skilled in the correct identification of black cockatoos and recordings of Carnaby's cockatoo from the NexusENV library were also used to confirm cockatoo calls.

This method was undertaken due to the tight timeframe of two days on the outer edge of the breeding season and was designed to incorporate two hours at dusk and dawn for roosting or foraging birds. The survey was undertaken for signs of occupation or presence from 5:30 am to 7:30 pm on the 27 January including the full site survey and again for presence on the 28 January. Both onsite visits looked for black cockatoos by sight and sound, particularly Carnaby's.

The design focused on the maximum effort to obtain the required data with such time limited restraints and included sourcing nearby residents and persons experienced in the local knowledge and identification of flora and fauna in this locality.

3.6 Limitations

This report has been prepared for the benefit of the Shire of Goomalling for the expressed purpose. The report was based on the best available information at the time of compiling and in part on various assumptions and predictions. While measures were taken to ensure reputable sources for data obtained, the author has not verified the accuracy or completeness of this data and will not be liable in relation to incorrect conclusions should any of the data relied upon be incorrect or incomplete for whatever reason.

Limitations to the accuracy of the report were the short duration of the survey over two days and the time of year which did not capture the breeding season. Particular note is made of the EOO within guideline documentation due to these limitations, given *'the effort for obtaining records is not evenly distributed across space, the species is highly mobile, and their range is divided into breeding and non-breeding areas'* (DPaW 2013).

Within the scope of this report the survey and identification were undertaken and performed with due diligence in accordance with generally accepted practices. No other warranty, express or implied, is made.

4.0 SURVEY RESULTS

4.1 Vegetation Community, Condition & Distribution

The Shire of Goomalling has little (4.6%) original native vegetation remaining (RCC 2006) and is considered ecologically endangered and in need of protection and restoration by the *National Objectives and Targets for Biodiversity Conservation 2001-2005* (Environment Australia, 2001).

The Shire through the Goomalling Landcare in liaison with the Roadside Conservation Committee (RCC) conducted roadside flora surveys of 92.7% of the Shire's 688.5km roadsides in 2005 for their conservation value. The resultant technical report (2006) *Roadside Vegetation and Conservation Values in the Shire of Goomalling* included records and maps of salt affected roadsides and recognition of roads with potential to be declared Flora Roads.

Vegetation Condition was rated using the scales developed within the Technical Report (2006). Conservation values were calculated on 6 attributes, each given a score ranging from 0 to 2 points. The combined score provided a conservation value score ranging from 0 to 12.

The conservation value of the surveyed section of Bejoording Road was assessed by the Roadside Conservation Committee as medium-low (5 – 6) being of;

Med-low	Roadsides are those with a score between 5 and 6, and generally have the following characteristics: ▪ natural structure disturbed, i.e. one or more vegetation layers absent; ▪ extent of native vegetation between 20 and 80%; ▪ medium to low diversity of native flora, i.e. between 0 and 5 species; ▪ half to mostly weeds, i.e. between 20-80% of total plants; and ▪ medium to low value as a biological corridor.

The dominant association was York Gum *(Eucalyptus loxophelba)* and Jam *(Acacia acuminata*) woodland with Wandoo, which was more dominant near the Wongamine Reserve. Salmon gum was interspersed and is associated with the eastern extension of the York Gum/Jam tree woodland. The trees appeared in good condition without overt evidence of disease and insect attack. Most trees had reached maturity and there was very little recruitment.

The site assessment confirmed the roadside vegetation was of low conservation value. The original vegetation community had been severely disturbed with the loss of mid and lowers structure layers, no evidence of fire scarring was apparent and only a thin layer of litter lay beneath trees and shrubs. Species diversity was limited to several *Hakea preissii*, a few small acacias and the occasional group of immature *Maireana,* Density of shrubs and herbs was low and restricted to distinct localities. The densest vegetation occurred on the eastern verge at the (1.0 – 1.25 SLK) mark adjacent to the Wongamine Reserve (VCA1A, SoG). There was heavy colonization of exotic grasses, mainly *Avena* species and overall very low species diversity throughout. The roadside was fenced from the adjacent farm lands.

4.2 Presence of Foraging Species & Water

The presence of water was noted in a number of small farm dams within a kilometer of the survey site and the proximity of the Wongamine Brook. Although heavy rain had occurred and water was

not evident within the brook, it is possible pools existed beyond the line of sight. There appeared to be very little foraging resources available other than some Hakea and the Eucalyptus fruits. A line of Eucalypts along the brook could be heard to be active with birdlife but the calls were of smaller species and not the black cockatoos. Grain crops may be seasonally utilized as a food source as may the fruiting specimens of *Maireana* but this had not been reported by landowners.

4.3 Corridors & Buffers

The Wongamine Reserve provided well preserved established woodlands, but the absence of a foraging understorey made the site an unlikely habitat as were the road reserves. There was a mosaic of pockets of native vegetation surrounding the Reserve but they were isolated within the landscape and without close linkage to other bushland areas. There were narrow woodrow corridors to the east and along the Wongamine Brook running north south, with strong bird activity but the presence of black cockatoos was not detected although the woodrows ran through the property of a Land for Wildlife observer.

4.4 Temperature & Wind Conditions

Temperatures on the survey days were overcast and cool on the 27 January (33^{o}C - 21^{o}C) while searching for evidence of foraging and occupation and warmer on the 28 January (34^{o}C - 18^{o}C) while observing for birds. There was a light wind blowing from the southeast turning to southwest in the afternoon. The site was quiet until large flocks of Galahs and Australian Ringnecks arrived at dusk to roost or left in the morning to forage. Sound was clear and carried a considerable distance.

4.5 Evidence of Carnaby's Cockatoo

The roadside examination was thorough and methodical as stated and all evidence of the presence of avian species was bagged, photographed and recorded against the vegetation assessment of (Munns & Kirby). Care was taken to sight identify as many bird calls as possible using the library recordings just prior to the dusk and dawn surveys to ensure confidence in identification.

Feathers & Droppings

No feathers of black cockatoos and specifically the Carnaby's or Baudin's cockatoo were found.

Numerous feathers were found beneath the trees and the distribution pattern of the feathers was pronounced and localized to particular clusters of trees clearly used as roosts. The Australian Ringneck parrot *(Barnardius zonarius)* dominated the feathers collected along the roadside overall. The Galah *(Eolophus roseicapilla)* was not as apparent in feathers collected, almost exclusively at the northern end of the road. Three feathers of the Australian Raven *(Corvus coronoides)* were found mid-section and a single small feather, considered possibly the Southern Boobook (*Ninox boobook*) was beneath a large York Gum tree with hollows, south of the main farm gate.

Bird droppings were surprisingly limited beneath the trees and those found on detritus were of a small seed eating species. Although strong weather was recorded in the week before the survey and may have accounted for the absence of faeces beneath roosting trees, those faeces since deposited were clearly not of larger species such as the black cockatoos.

To ensure the hollows did not contain late season fledglings or occupiers, the trucks of all trees displaying hollows were scrapped robustly to facilitate a response. Only a startled Galah was noted.

Foraging Detritus

No foraging detritus which could be apportioned to the black cockatoos was discovered.

No evidence was found of chewed nuts, bark, branches or other objects. The small branches of Eucalypt nuts found did not display signs of being bitten off and were considered wind damage from the heavy rainstorm which had occurred a few days before.

Sightings

No sightings were observed during the full onsite day or the periods of watch while on site. There were large numbers of Ringneck parrots and Galahs, a pair of Ravens and numerous smaller species. No black cockatoos were observed at all.

One sighting by the WA Naturalist Club occurred during a day outing in the Wongamine Reserve on the 10 October 1999, as reported in the DPaW Threatened and Priority Database.

The Toodyay Naturalist Club had no recorded sightings in the vicinity despite numerous surveys over thirty plus years of the Wongamine Reserve nor had the Reserves Management Officer knowledge of their presence in the area.

The WA Museum Ornithology Curator was not aware of sightings in the vicinity.

The owners of the two Land for Wildlife properties close to the intersection of Bejoording Road and the Goomalling-Toodyay Rd, were contacted by the DPaW Land for Wildlife officer.

Their response to questions as to whether they had seen Carnaby's on their property were;

> LFWr 1 – Have seen around Toodyay, but not on his property, and he's pretty observant; likes birds. He has trees that could be good for nesting, but not cockatoos.
>
> LFWr 2 - Has never seen them this side of the shire (of Toodyay); more on the west. Over near Extracts Weir for example. Not this way though; not even flying overhead. Maybe because don't get Wandoo or Marri over this way? Never seen them in Wongamine either.

The Officer noted that both persons clearly knew the bird and named areas they had seen them, and judged them to be knowledgeable observers.

The volunteers at Birdlife Australia (phoned 29 January) had no record of Carnaby's for this locality. It was their opinion there was insufficient foraging species to account for their presence.

Vocalisation

No calls distinctive to the black cockatoos were noted during the dusk and dawn watches nor during the roadside survey. The observer was very familiar with the calls of the Black cockatoos having lived in the area for 18 years and was refreshed prior to the survey from archived recordings of a local population.

5.0 SIGNIFICANT IMPACT ASSESSMENT

Using Table 3: *Referral guidelines of the EPBC Act referral guidelines for three threatened black cockatoos,* the site was clearly of low risk of significant impacts, due to the absence of noted, known or anecdotal use of the site as a cockatoo habitat or for foraging. Further referencing of other guidelines supported this conclusion.

6.0 CONCLUSION & RECOMMENDATIONS

Although the scope of the survey was severely limited by time, all effort and due diligence was expended to establish if the presence of the black cockatoos, specifically the Carnaby's cockatoo was known in the area of the Bejoording Road clearing site. Despite numerous contacts and a comprehensive survey for the time allowed, it was clearly apparent that these species did not utilize the area and in fact had historically, with the single exception in 1999, not been seen even passing through. The conclusion drawn was the absence of adequate foraging species and possibly the high number of competitor avian species was influencing the absence of the Carnaby's cockatoo from the locality.

Although one of the indirect effects of broad-scale clearing for agriculture in the Wheatbelt is that it has impeded recruitment of nesting trees, and the trees recorded on the proposed clearing site display suitable nesting hollows, the safety factor of a busy heavy haulage route must be weighed. Particularly against the close proximity of similar trees available in the Wongamine Reserve and along the eastern woodrows and Wongamine Brook. Additionally, the wisdom of having nesting hollows and roosts along such a busy intercourse must be considered in the context of avian mortality from vehicle strikes.

The scope of the study revealed there had not been current or historical occupation of the site nor the surrounding areas despite the availability of nesting hollows and water sources. The single sighting in 1999 is insufficient to define occupancy or use in light of the lack of further sightings.

In conclusion the removal of the marked trees whilst contributing to an overall decline in suitable nest hollows for many species, will encourage migration to the adjacent corridors and a lower risk setting than Bejoording Road for nesting avian species and would not adversely impact on the Carnaby's cockatoo.

7.0 PERSONNEL PROFILE

Ro Madacsi as the principle scientist of NexusENV undertook the roadside survey.

Ro holds a Bachelor of Environmental Science and has worked independently within the Avon and Wheatbelt regions for 3 years with NexusENV following more than 30 years' experience as a naturalist throughout the Pilbara, Northern Territory, Goldfields and Wheatbelt.

A resident of the Toodyay Shire, she has worked and lived in the region for 18 years actively involved with local flora and fauna surveys and was a member of the Toodyay Friends of the River, Avon Clean and Green and the Shire of Toodyay's environmental advisory committee. Ro is very familiar with the fauna of the region and actively works to strengthen its profile.

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8.0 REFERENCES

Department of the Environment (DoE) (2016) Species Profile and Threats (SPRAT) Database. Accessed January 2016. http://www.environment.gov.au/cgi-bin/sprat/public/publicthreatenedlist.pl Commonwealth of Australia

Department of the Environment, Water, Heritage and the Arts (2010) *Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the EPBC Act.* Accessed January 2016. http://www.environment.gov.au/system/files/resources/107052eb-2041-45b9-9296-b5f514493ae0/files/survey-guidelines-birds.pdf Commonwealth of Australia

Department of the Environment (2013) *Matters of National Environmental Significance - Significant impact guidelines 1.1*. Accessed January 2016 http://www.environment.gov.au/system/files/resources/42f84df4-720b-4dcf-b262-48679a3aba58/files/nes-guidelines_1.pdf

Department of Parks and Wildlife. *Policy Statement No. 33 - Conservation of Threatened and Specially Protected Fauna in the Wild* (CALM 1991)

Department of Parks and Wildlife. *Carnaby's Cockatoo (Calyptorhynchus latirostris) Recovery Plan - Western Australian Wildlife Management Program No. 52* (2013)

Department of Sustainability, Environment, Water, Population and Communities. *EPBC Act referral guidelines for three threatened black cockatoo species:* Carnaby's cockatoo (endangered) *Calyptorhynchus latirostris*, Baudin's cockatoo (vulnerable) *Calyptorhynchus baudinii* and Forest red-tailed black cockatoo (vulnerable) *Calyptorhynchus banksia naso* (2012a).

Garnett S., Szabo J, & Dutson G. (2011) *The Action Plan for Australian Birds 2010.* 3rd Edition, CSIRO Publishing

Johnstone, R.E. and Storr, G.M. (1998). *Handbook of Western Australian Birds, Volume I, Non-passerines (Emu to Dollarbird)*. Western Australian Museum, Perth.

Roadside Conservation Committee (2006) *Roadside Vegetation and Conservation Values in the Shire of Goomalling,* Shire of Goomalling Technical Report.

Saunders, D.A. (1990). Problems of survival in an extensively cultivated landscape: the case of Carnaby's cockatoo *Calyptorhynchus funereus latirostris*. *Biological Conservation*. 54: 277-290.

Shire of Goomalling (2015) Bejoording Rd – Record Photos of Verge Vegetation Assessment for Clearing Permit