



Australian Government

Department of the Environment and Energy

Revised draft referral guideline for three threatened black cockatoo species:

Carnaby's Cockatoo (Endangered) *Calyptorhynchus latirostris*

Baudin's Cockatoo (Vulnerable) *Calyptorhynchus baudinii*

**Forest Red-tailed Black Cockatoo (Vulnerable)
*Calyptorhynchus banksii naso***



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Guideline Summary

This guideline applies to the three Western Australian black cockatoos (known hereafter as black cockatoos) listed as threatened species under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act):

- Carnaby's Cockatoo (*Calyptorhynchus latirostris*): Endangered.
- Baudin's Cockatoo (*Calyptorhynchus baudinii*): Vulnerable.
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*): Vulnerable.

This guideline outlines important information and requirements for proponents, particularly on habitat quality, survey expectations, standards for mitigating impacts and significant impacts. This advice is consistent with the nationally adopted recovery plans for these species. The following points and the diagram in Figure 1 summarise this guideline:

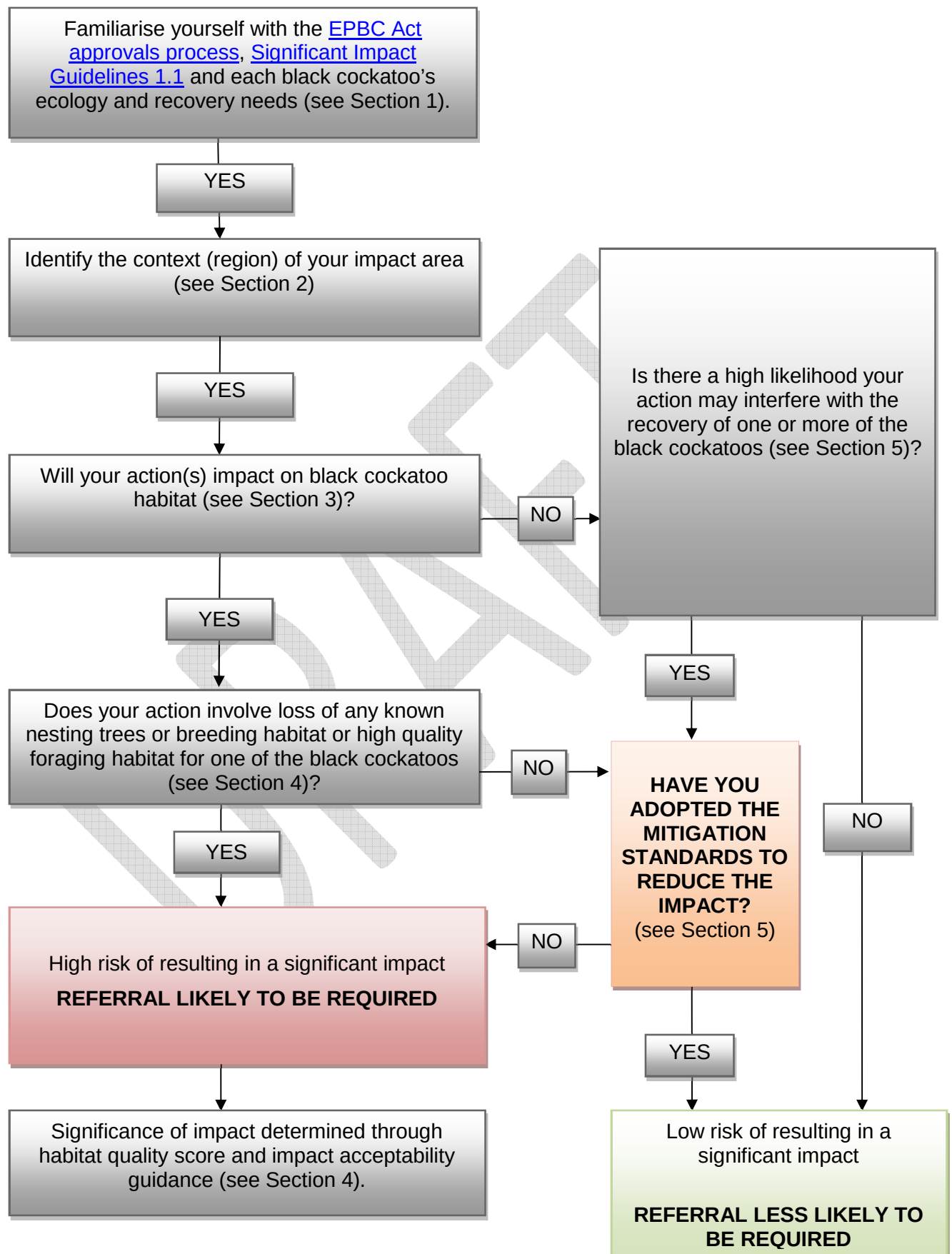
- Currently, the overall population trend for all three black cockatoo species is declining.
- The clearing of one or more known nesting trees is highly likely to have a significant impact.
- The clearing of breeding habitat is highly likely to have a significant impact.
- The clearing of foraging habitat scoring ≥ 7 using the foraging habitat scoring tool is likely to have a significant impact on black cockatoos (see section 4).
- The clearing of foraging habitat scoring ≤ 4 using the foraging habitat scoring tool is less likely to have a significant impact on black cockatoos (see section 4).
- Actions with indirect or facilitated impacts on black cockatoos, but where there is a commitment to the mitigation objectives and priorities in this guideline, are less likely to have a significant impact on black cockatoos (see section 5).

In most cases, avoiding impacts to breeding habitat and very high to high quality foraging habitat, and aligning with the mitigation objectives outlined in this guideline will reduce the risk of a significant impact and therefore the need to refer the action for EPBC Act approval.

If you believe your action is likely to have a significant impact, considering and conforming with this guideline should help to streamline the assessment of your action.



Figure 1: Summary of the referral guideline for black cockatoo species.



Definitions (terms appear in bold for their first occurrence in the main text)

Impact area: The area likely to be impacted by the action (in hectares). This includes the project site and any additional areas likely to be impacted, either directly or indirectly. That is, anywhere on or off site where the physical (clearing of vegetation and construction) and other effects (light, noise, dust etc.) of the proposed action would be felt. Habitat and/or populations may, and often will, extend beyond the development site boundaries. Therefore, the impact area should extend as far as necessary to take all potential impacts, including off site impacts, into account. This is the area that the person proposing an action must survey.

Breeding habitat: Defined in these referral guidelines as species of trees known to support breeding (see Table 1) within the range of the species which either have a suitable nest hollow OR are of a suitable diameter at breast height (DBH) to develop a nest hollow. For most species of trees, suitable DBH is 500 mm. For salmon gum and wandoo, suitable DBH is 300 mm. Note that any species of tree may develop suitable hollows for breeding. Information on known nesting trees within or near the area of an action is available from the Western Australian Department of Parks and Wildlife and the Western Australian Museum.

Foraging habitat: Defined in these referral guidelines as plants of species known to support foraging (see Table 1) within the range of each of the species.

Known nesting trees: Any existing tree in which breeding has been recorded or suspected i.e. showing evidence of use through scratches or feathers. Information on known nesting trees within or near the area of an action is available from the Western Australian Department of Parks and Wildlife and the Western Australian Museum.

Known night roosting site: A group or larger scattering of trees, where there are records or recent evidence of night roosting.

Maintain: Maintaining habitat, including hollows, through periodic actions to ensure the continued functioning of that habitat for black cockatoos, for the duration of the impact.

Protection: Establishing a legal mechanism to prevent clearing of habitat.

Quality: A measure of how functional and useful black cockatoo habitat is in providing what is needed to enable black cockatoos to recover and persist into the future, including proximity and availability of foraging, breeding and roosting resources.

Rehabilitation: Additional plantings, as well as weed and pest management, and fencing, to improve low quality habitat, so that it becomes higher quality habitat.

Residual impact(s): Unavoidable impact(s) that remain after avoidance and mitigation measures have been applied to an action.

Revegetation: Re-planting habitat in an area where no or limited habitat currently exists. In the Wheatbelt, this is known as **restoration**.

Roosting habitat: Defined as a suitable tree (generally the tallest) or group of tall trees, native or introduced, usually close to an important water source, and within an area of quality foraging habitat (see Table 1) within the range of the species.

Suitable nest hollow: Any hollow that appears to be deep enough and with an opening large enough to be used by black cockatoos. Usually this will be a natural

hollow, but artificial hollows may also be suitable in some circumstances (for example, where the artificial hollow has been specifically designed for use by black cockatoos).

Introduction

This guideline does not remove your obligation to consider whether you need to make a referral to the Commonwealth Environment Minister (the Minister) under the EPBC Act. Although this guideline provides information to help you decide whether to refer your action, the possible impacts of your proposed action will depend on the particular circumstances of that action. These circumstances may include the proximity of the action to habitat, indirect impacts, and impact avoidance and mitigation measures.

Although this guideline is developed based on the most up-to-date scientific information available at the time of writing, a referral will be assessed by the Department on the basis of the most up-to-date scientific information available at the time of referral, which may build upon the information reflected in this guideline.

Relationship to Local and State Government Frameworks

This guideline does not provide guidance on requirements under state and local government laws. Information on Western Australian (WA) state and local government legislative requirements can be obtained from the [Western Australian Environmental Protection Authority](#) and local government agencies.

Wherever possible, this guideline has been prepared in a manner that allows for alignment of definitions and assessment processes with those required under the relevant state and local government frameworks. This should allow the information gathered for local and state assessment purposes to be appropriate for decision-making under the EPBC Act, with little or no modification. Despite best efforts, the Department recognises that some inconsistency may occur due to differences in jurisdictions' statutory requirements and decision-making processes.

The objectives of this guideline

The objectives of this guideline are to:

- Promote avoidance and mitigation of impacts on black cockatoos;
- Promote a clear, consistent and transparent approach for making decisions on whether an action is likely to result in a significant impact on black cockatoos;
- Promote streamlined decision-making and approval processes; and
- Promote proper application of the assessment and approval process under the EPBC Act to minimise interference with the recovery black cockatoos.

How to use this guideline

This guideline is designed to be read from the perspective of a person proposing to take an action that may have a significant impact on black cockatoos. Many parts of the guideline contain information that requires a developed understanding of the EPBC Act regulatory framework, the ecology of black cockatoos, as well as broader ecological concepts. Proponents should seek assistance from suitably qualified or experienced people when applying this guideline to a particular action. There is an expectation that the self-assessment process would be carried out by (or be informed by) people with a reasonable level of knowledge and experience in these matters.

Prior to reading this guideline, you must be familiar with the [Significant Impact Guidelines 1.1 – Matters of National Environmental Significance](#), which explain the concept of a 'significant impact'.

This guideline applies in areas where black cockatoos or black cockatoo habitat occurs in WA. If you propose to take an action that has, will have or is likely to have a significant impact on black cockatoos, you must refer the proposed action to the Minister prior to commencing the action. The Minister will then decide within 20 business days whether assessment is required under the EPBC Act. When making a decision on whether a proposed action requires assessment, the Minister must consider all relevant information and act in a manner consistent with natural justice and procedural fairness obligations.

An action that will have or is likely to have a significant impact on black cockatoos must not commence until the Minister makes an approval decision. Substantial penalties apply for undertaking such an action without Commonwealth approval (civil penalties up to \$8.5 million or criminal penalties including up to seven years imprisonment). More information on the referral, assessment and approval process is available at www.environment.gov.au/epbc/assessments/index.html. Information on compliance and enforcement of the EPBC Act can be found at www.environment.gov.au/epbc/compliance/index.html.

The criteria used to judge significant impact for Vulnerable and Endangered threatened species are listed in the [Significant impact guidelines 1.1](#). The criteria in the significant impact guidelines refer to 'populations' and 'important populations'. These terms have not been defined for black cockatoos, due to the mobile and widely-dispersed nature of these species, and the variation in flock compositions (for example, between breeding and non-breeding seasons). For black cockatoos, it is more appropriate to consider significance in terms of impacts on habitat and individuals rather than a resident population.

The decision tree in Figure 1 and the rest of this guideline are designed to assist you in determining whether your action needs to be referred.

If you are uncertain about the need to refer, you should refer your proposed action for legal certainty, or contact the Department to discuss your proposed action by emailing epbc.referrals@environment.gov.au.

National recovery plans

National recovery plans are in place for [Baudin's and Forest Red-tailed Black Cockatoos](#) and [Carnaby's Cockatoo](#). These plans provide more detailed information on ecology, threats, recovery objectives and actions.

The Commonwealth environment minister must not make an approval decision that is inconsistent with a national recovery plan.

This referral guideline has been developed to be consistent with the nationally adopted recovery plans for these species and provides guidance to minimise interference with the recovery black cockatoos.

Possible exceptions to the need to refer

Certain actions are exempt from the requirement for assessment and approval under the EPBC Act. These include lawful continuations of land use that started before 16 July 2000 or actions that were legally authorised before 16 July 2000 (sections 43A and 43B of the EPBC Act). There are a number of criteria that must be satisfied to rely on any such exemptions. More information on exemptions under the EPBC Act is available at www.environment.gov.au/epbc/publications/exemptions.html.

Actions already underway at the time a species is listed may still require approval under the EPBC Act, depending on a number of factors. Advice is available at <http://www.environment.gov.au/resource/epbc-act-policy-statement-listing-events-under-epbc-act>.

Part 3 of the EPBC Act – “Requirements for environmental approvals” – does not apply to forestry operations undertaken in a Regional Forestry Agreement (RFA) Region, where an RFA is in place, unless the operation is being undertaken in a property on the World Heritage List, in a Ramsar wetland, or is incidental to another action whose primary purpose does not relate to forestry. There are clauses within RFAs regarding continuous improvement in threatened flora and fauna management, taking recovery plans into account and establishing a comprehensive, adequate and representative reserve system that are intended to meet the objectives of the EPBC Act. Persons carrying out forestry operations outside of an RFA region must consider their obligations under the EPBC Act.

Bushfire hazard reduction techniques conducted in accordance with state law are typically exempt from EPBC Act approval requirements. National environmental law generally does not restrict responses required to manage bushfire emergencies, nor does it regulate measures taken to fight fires. However, any clearing required to create or maintain buffers as part of a proposed action must be included in an assessment of the impacts.

Where to get more information

The species profiles for [Baudin's Cockatoo](#), [Carnaby's Cockatoo](#) and the [Forest Red-tailed Black Cockatoo](#) in the Department's Species Profile and Threats (SPRAT) database provide additional information on these species.

Other EPBC Act policy statements and guidelines are available to help you understand the EPBC Act and your obligations. These are available from the Department's website at www.environment.gov.au/epbc/guidelines-policies.html or by contacting the community information unit by email at ciu@environment.gov.au or by phone on 1800 803 772.

There may be other matters of national environmental significance to consider when assessing your proposed action, including, but not limited to, other threatened species, threatened ecological communities, Ramsar wetlands or heritage places. The Protected Matters Search Tool, available on the Department's website at www.environment.gov.au/epbc/pmst/index.html, is a good starting point for determining the likelihood of other matters of national environmental significance occurring in the proposed action's **impact area**. State government agencies may also hold relevant information including species distribution and habitat information.

Although offsets are not a relevant consideration at the referral stage of an action, they may be relevant if a referral receives a '[controlled action](#)' decision and moves into the assessment stage (see section 4 for more information). The [EPBC offsets policy](#) is the key document for guiding proponents and decision-makers on identifying suitable offsets.

1: What do black cockatoos need to survive and recover?

Black cockatoos are long-lived, slow-breeding birds that display strong pair bonds and probably mate for life. All three species nest in tree hollows, with trees likely to take up to 200 years to develop **suitable nest hollows**.

Black cockatoos forage over a large area, feeding on a variety of native and introduced vegetation species. Not all suitable native vegetation will produce good foraging resources each year, so that black cockatoos will vary their foraging strategy depending upon availability. Black cockatoos rely upon the availability of foraging resources across their range, particularly to build condition in the post-breeding period.

Black cockatoos will forage up to 12 km from breeding hollows during the breeding season and rely on this proximity of foraging resources to breeding hollows to successfully raise chicks. During the non-breeding period, black cockatoos will forage an average of up to 20 km from a communal night roosting site, though in some cases, foraging distances can be greater. Black cockatoos rely upon the availability of suitable night roosting sites in proximity to foraging resources, and particularly on access to water, which are usually within 2 km of the roost. Connecting corridors of vegetation between foraging resources, **breeding habitat** and night roosting sites are also essential to enable black cockatoos to access resources across their range.

These characteristics exacerbate the effects of population decline and habitat loss, and make population recovery very slow.

Currently, the overall population trend for all three black cockatoo species is declining. The decline of black cockatoos has been due primarily to the loss and fragmentation of habitat as a result of clearing native vegetation, particularly in the Wheatbelt and increasingly across the Swan Coastal Plain. A major contributor to declines in populations of black cockatoos is the loss of breeding habitat, containing suitable breeding hollows, in proximity to sufficient **foraging habitat** and the mortality of individual birds, particularly the mortality of individual birds through vehicle strike, intentional shooting or poaching.

National Recovery Plan Objectives

[Baudin's cockatoo and the forest red-tailed black cockatoo:](#)

- stop further decline in the breeding populations and to ensure their persistence throughout their range in the south-west of Western Australia (WA DEC 2008).

[Carnaby's cockatoo:](#)

- stop further decline in the distribution and abundance by protecting the birds throughout their life stages and enhancing habitat critical for survival throughout their breeding and non-breeding range, ensuring that the reproductive capacity of the species remains stable or increases (WA DPaW 2013).

The recovery actions in the recovery plans emphasise reducing the threats upon black cockatoos and their habitat, including threats from competitors for nesting

hollows; threats from vehicle strike, shooting and poaching; protecting and maintaining night roosting sites and sufficient foraging resources in proximity to breeding habitat across the range; preventing habitat degradation from altered fire regimes and hydrological changes; ensuring monitoring to inform management actions; and information sharing and communication with stakeholders to enable good decision making.

For black cockatoos to survive and recover, the effects of these threats must be addressed. Further loss, fragmentation and degradation of black cockatoo habitat must be avoided and measures implemented to mitigate and manage impacts that are likely to interfere with the recovery of black cockatoos. These actions need to be complemented by best-practice planning for development proposals to bolster the species' chance of survival and recovery.

Further information on black cockatoo survival needs, recovery needs, and biology and ecology is in the species' profiles in the Department's [SPRAT](#) database, and the national recovery plans for [Carnaby's Cockatoo](#), [Baudin's Cockatoo](#) and the [Forest Red-tailed Black Cockatoo](#).



2. Are you considering your action in the right context?

A 'significant impact' is an impact which is important, notable, or of consequence, having regard to its context or intensity. In relation to black cockatoos, the Department considers 'having regard to its context' as being an important factor and consideration in determining significance.

Four regions (see Map 1) have been identified in this guideline to ensure context is being considered in determining significance on black cockatoos (Section 5) and also for identifying the best mitigation measures and offsets to meet recovery objectives (Section 6). A high resolution map showing the different regions is also available in Appendix A and on the Department's webpage for this guideline.

Each region has habitat that is used by black cockatoos in a different way, providing a key function for the different species at different times of the year. Determining if your action will have a significant impact, and what the best mitigation and offset measures are, depends upon the key functions of each region for the relevant black cockatoo species.

For example, the Swan Coastal Plain is a critical foraging area for Carnaby's Cockatoo during the non-breeding season. If your action is likely to impact foraging habitat on the Swan Coastal Plain, you would consider avoiding this habitat and or adopting mitigation measures to reduce the impact on foraging habitat for that region.

Regions across the black cockatoo range

Swan Coastal Plain

The Swan Coastal Plain is used by black cockatoos primarily for foraging resources, with some small patches of breeding habitat. The area is dominated by banksia spp and tuart (*Eucalyptus gomphocephala*) woodlands on sandy soils, as well as marri (*Corymbia calophylla*), with jarrah (*Eucalyptus marginata*) occurring in the east. A key focus for this region is the ongoing viability of foraging resources for black cockatoos, particularly Carnaby's Cockatoo. Some parts of this region meet the definition for ecological communities in the EPBC Act list of threatened ecological communities, including [Banksia Woodlands of the Swan Coastal Plain ecological community](#), which is listed as Endangered.

Wheatbelt

The Wheatbelt contains open woodlands including york gum (*Eucalyptus loxophleba*), wandoo (*Eucalyptus wandoo*), salmon gum (*Eucalyptus salomophloia*) and flooded gum (*Eucalyptus rudis*) used by Carnaby's Cockatoo for breeding. This region extends north of the traditional Wheatbelt area, given the presence of york gum and kwongan heath foraging resources accessed by Carnaby's Cockatoo. Some parts of this region includes breeding habitat for Baudin's Cockatoo and the Forest Red-tailed Black Cockatoo on the eastern margins of the jarrah forest, and meet the definition for the [Eucalypt Woodlands of the Western Australia Wheatbelt](#) ecological community, which is listed as Critically Endangered in the EPBC Act list of threatened ecological communities. All areas of breeding habitat are critical to black cockatoos, as are the associated foraging areas that support breeding.

Jarrah Forest

This region is characterised by jarrah and marri forest, with marri-wandoo (*C. calophylla* and *E. wandoo*) woodlands towards the eastern edge. All three black

cockatoo species breed in this region and Baudin's Cockatoo has key foraging and wintering areas here. Marri (*C.calophylla*) is a primary foraging species for Baudin's and the Forest Red-tailed Black Cockatoo. Foraging areas associated with breeding are critical for all species.

South Coast

The South Coast supports jarrah-marri forest, as well as karri (*Eucalyptus diversicolor*), and areas of low heath, including banksia species, and scrub. This region provides foraging resources for all black cockatoo species, as well as some key breeding areas for Carnaby's Cockatoo and Baudin's Cockatoo. Some foraging species are associated with the [Eastern Stirling Range Montane Heath and Thicket](#) ecological community and the [Proteaceae Dominated Kwongkan Shrublands of the southeast coastal floristic province of Western Australia](#) ecological community, both of which are listed as endangered in the EPBC Act list of threatened ecological communities. Black cockatoos rely on this region to provide a range of foraging resources, including those in association with breeding habitat.



3: Have you surveyed for black cockatoo habitat?

There is an expectation that surveys will require fieldwork, considering the three black cockatoo species use different areas of habitat across their range at different times of the year, and in different ways. Surveys should be done by a suitably qualified person with experience in surveys of black cockatoo habitat and account for uncertainty and error (false presence and absences). Contact the Western Australian Department of Parks and Wildlife or the WA Museum to confirm if your impact area contains, or is in proximity to, a known roosting site or breeding location.

Distribution maps for the three black cockatoos which are based on habitat modelling are included in Appendix A and available on the Department's webpage from where this guideline was accessed.

These maps are based on the best available information at the time of publication and remain a static product. For the most up-to-date report of whether black cockatoos occur in your impact area, use the [Protected Matters Search Tool](#).

Some black cockatoo habitat may be in threatened ecological communities which are separately protected under the EPBC Act and relevant state legislation. Information regarding listed ecological communities is provided on the Department's website at www.environment.gov.au/biodiversity/threatened/communities.html and in the [Protected Matters Search Tool](#).

Habitat assessment

Habitat assessment is the primary technique used to inform decisions on significant impact for black cockatoos and is aimed at identifying habitat used for foraging, breeding or roosting.

A scoring tool has been developed to help you determine if the impact area contains **quality** foraging habitat (see section 4). The elements of the scoring tool require surveys to provide information on:

- The presence of all plant species that provide foraging, including non-native food sources used by black cockatoos;
- The presence of tree species used for breeding;
- Use as a roosting site;
- The vegetation present in the surrounding area, i.e. at least 12 km from the impact area, including proximity to any breeding habitat, roosting sites or watering points;
- Breeding habitat, such as an estimate of the number of trees with a diameter at breast height (1.3 metres from the ground) of 500 mm, or 300 mm if salmon gum or wandoo;
- Numbers of any **known nesting trees**; and
- Presence of disease, such as *Phytophthora cinnamomi* or marri canker (*Quambalaria coyrecup*).

Habitat surveys must be sufficient to complete the scoring tool and provide a score and justification for foraging habitat quality.

Additional information can be determined by searching for signs of use by black cockatoos. Signs of use include chewed hollows, feeding signs or feeding debris, and sighting records. The presence of black cockatoo droppings and feathers, or 'chewed' banksia or pine cones or marri nuts, as well as broken or scattered flowers, can indicate feeding by black cockatoos (including, if possible, the [identification of](#)

[bite patterns](#) to indicate which black cockatoo species fed there). This can be assessed at any time of year, as cones can remain on the ground for up to two years. Signs of use should be identified by a person with at least three years' experience surveying for black cockatoos.

Details on the habitat types used by each species for breeding, foraging and night roosting are listed in Table 1, including common food items for each species.

Table 1: Habitats used by black cockatoos

Habitat	Baudin's	Carnaby's	Forest Red-tailed
Breeding ¹	Generally in woodland or forest ² , but may also breed in partially cleared woodland or forest, including isolated trees. Nest in hollows in live or dead trees (any tree species may provide suitable hollows), particularly karri (<i>Eucalyptus diversicolor</i>), marri (<i>Corymbia calophylla</i>), jarrah (<i>E. marginata</i>), wandoo (<i>E. wandoo</i>), bullich (<i>E. megacarpa</i>) and tuart (<i>E. gomphocephala</i>).	Generally in woodland or forest, but also breeds in partially cleared woodland or forest, including isolated trees. Nest in hollows in live or dead trees (any tree species may provide suitable hollows), particularly salmon gum (<i>E. salmonophloia</i>), wandoo, tuart, jarrah, flooded gum (<i>E. rudis</i>), york gum (<i>E. loxophleba</i> subsp. <i>loxophleba</i>), powderbark (<i>E. accedens</i>), karri and marri.	Generally in woodland or forest, but may also breed in partially cleared woodland or forest, including isolated trees. Nest in hollows in live or dead trees (any tree species may provide suitable hollows), particularly marri, karri, wandoo, bullich, blackbutt (<i>E. patens</i>), tuart and jarrah.
Night roosting	Generally in or near riparian environments or other permanent water sources. Any tall trees may provide suitable roosting, but particularly jarrah, flooded gum, blackbutt, tuart and introduced eucalypts (blue gum (<i>E. globulus</i>), lemon scented gum (<i>C. citriodora</i>)).	Generally in or near riparian environments or natural and artificial permanent water sources. Any tall trees may provide suitable roosting, but particularly flat-topped yate (<i>E. occidentalis</i>), salmon gum, wandoo, marri, karri, blackbutt, tuart, introduced eucalypts and introduced pines.	Any tall trees may provide suitable roosting, but particularly tall jarrah, marri, blackbutt, tuart and introduced eucalypt trees or large trees on the edges of forests.
Foraging and common food items	Primarily seeds of marri and jarrah in woodlands and forest, and seeds of native proteaceous plant species (for example, <i>Banksia</i> spp., <i>Hakea</i> spp. and <i>Dryandra</i> spp.). During the breeding season feed primarily on native vegetation, particularly	Native shrubland, kwongan heathland and woodland on seeds, flowers and nectar of native proteaceous plant species (<i>Banksia</i> spp., <i>Hakea</i> spp., <i>Dryandra</i> spp., and <i>Grevillea</i> spp.), as well as <i>Callistemon</i> spp. and marri. Also seeds of introduced species	Primarily seeds of jarrah and marri in woodlands and forest, and edges of karri forests, including wandoo and blackbutt. Forages on <i>Eucalyptus caesia</i> , <i>E. erythrocorys</i> , <i>Allocasuarina</i> cones, fruits of snottygobble (<i>Persoonia longifolia</i>) and mountain marri

¹ See definitions.

² For definitions see for example the CSIRO *Australian soil and land survey field handbook*.

	marri (seeds, flowers, nectar and grubs). Also insects and insect larvae; pith of kangaroo paw (<i>Anigozanthos flavidus</i>); juice of ripe persimmons; tips of <i>Pinus</i> spp.; and seeds of apples and pears.	including <i>Pinus</i> spp., <i>Erodium</i> spp., wild radish, canola, almonds and pecan nuts; insects and insect larvae; occasionally flesh and juice of apples and persimmons.	(<i>Corymbia haematoxylon</i>). Also some introduced eucalypts such as river red gum (<i>E. camaldulensis</i>) and flooded or rose gum (<i>E. grandis</i>). On the Swan Coastal Plain, often feeds on introduced Cape lilac (<i>Melia azedarach</i>).
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Additional surveys

Where an action is likely to have a significant impact, and therefore determined to be a controlled action under the EPBC Act, additional surveys are likely to be required during assessment, particularly where high levels of uncertainty exist.

Additional survey effort is likely to be required if loss of breeding habitat is proposed to occur, to establish the presence or absence of breeding birds. Where possible, undertaking additional surveys prior to referral may help to streamline the assessment of your action, including any offset obligations. These surveys should be carried out during the preferred time periods outlined in Table 2 and the results submitted in the referral.

Where the presence or absence of breeding birds needs to be established, information must be provided concerning the use of hollows. Surveyors should look for and document evidence of chewing around the entrance of hollows and the presence of feathers at the base of the tree. Knocking on or raking the tree (scratching the tree trunk with a pole) can elicit a response from a female who may be incubating eggs however this must be done during the day before mid-afternoon, as the female will leave the nest to be fed by the male. Where breeding is likely and there is evidence of presence, it is recommended that hollows be inspected directly.

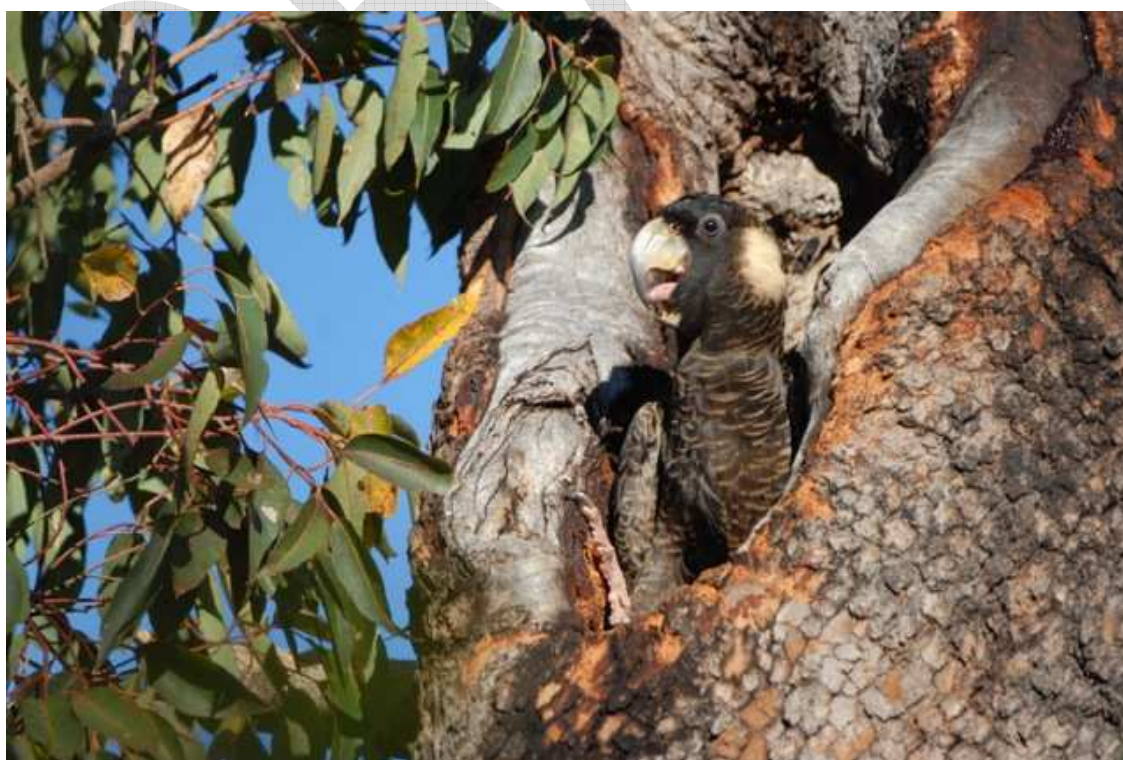
Surveys to determine presence or absence of breeding birds should always be undertaken by suitably experienced person(s).

Important note

The mortality of individual birds is a key driving factor in population declines given the slow reproductive cycles of each species. This can happen through vehicle strike, crop protection measures, including shooting, or poaching of eggs and birds or injuries sustained through vegetation clearing. Avoiding bird mortality is extremely important to the recovery of all three species. Where breeding habitat is present in the impact area and approval is granted, pre-clearance surveys are expected, along with stop work triggers if breeding birds are present.

Table 2: Timing for surveys for black cockatoos

	Baudin's Cockatoo	Carnaby's Cockatoo	Forest Red-tailed Black Cockatoo
Swan Coastal Plain	March to September – foraging habitat; may occur in breeding areas of southern Swan Coastal Plain	January to July – foraging habitat; night roosts; may occur after July if breeding in local areas (e.g. Lake Clifton)	Any time of the year – foraging habitat; night roosts; may be found breeding in some locations containing suitable breeding tree species
Wheatbelt	Possible presence on margins during breeding season (October to March); breeding habitat and foraging habitat in proximity	July to February/March – breeding habitat and foraging habitat in proximity	Possible presence on margins, depending upon resource availability - breeding habitat and foraging habitat in proximity
Jarrah forest	February/March to September – foraging resources; October to January – breeding habitat and foraging habitat in proximity	Possible presence during breeding season (July to late February/early March); breeding habitat and foraging habitat in proximity	Breeding may occur at any time of the year, with peaks in April to June and August to October – breeding habitat and foraging habitat in proximity
South Coast	March to September – foraging habitat; may occur in breeding areas of South Coast	January to July – foraging habitat; night roosts; may occur after July if breeding in local areas	Presence depending upon resource availability - breeding habitat and foraging habitat in proximity



4: Could your action have a significant impact on black cockatoos?

An action that will or is likely to result in a significant impact will require referral to the Australian Government.

Known nesting trees and breeding habitat

Clearing of known nesting trees or breeding habitat is likely to result in a significant impact.

This is because trees take up to 200 years to develop suitable nest hollows for black cockatoos, and a range of threats are reducing the availability of these hollows, for example, because of competition for hollows from other species, including introduced feral honey bees, inappropriate fire regimes and a lack of recruitment of trees that will go on to form hollows. A lack of suitable nest hollows means more nest failures for species that are already showing significant declines in populations.

All known nesting trees and breeding habitat is critical to the species' survival.

Roosting habitat

Complete clearance of roost sites that are close to high quality foraging habitat and water resources in non-breeding areas is likely to result in a significant impact.

Roost sites provide shelter during the heat of the day and safe resting places at night. Black cockatoos will favour roost sites that are close to water sources and in proximity to foraging resources. Roost sites that provide access to required resources provide a critical function in maintaining populations of black cockatoos, particularly in non-breeding areas.

Very high to high quality foraging habitat

Clearing very high to high quality foraging is likely to result in a significant impact (see below for determining high quality).

Black cockatoos rely on foraging resources to provide sufficient energy for their movements across their range. Availability of foraging habitat plays a particularly critical role in the post-breeding period, when birds need to build condition after breeding, and are teaching juveniles where these foraging resources are located. Losing foraging resources across the range increases the likelihood that birds won't regain condition after breeding, and won't breed again the following season, and that juveniles won't survive to become part of the adult population.

Determining the quality of foraging habitat

The quality of foraging habitat varies depending upon how black cockatoos use that habitat in that location. For example, some foraging habitat is also breeding habitat for black cockatoos, such as marri and jarrah, while *Banksia* spp. are used only for foraging. The quality of foraging habitat can also be assessed in relation to its function within the landscape, i.e. proximity to other elements, such as roosting and water. There is often greater uncertainty in determining the quality of foraging habitat than there is for assessing the quality of breeding habitat. This can make it difficult to determine if impacts are likely to be significant.

A scoring tool has been developed to assist you in determining the quality of foraging habitat in your impact area and, therefore, whether your action is likely to have a significant impact on a black cockatoo (see Table 3). The tool should be used for

referrals, during an assessment (if required) and to determine the quality of an offset (see below).

The scoring tool considers the key attributes of foraging habitat for each black cockatoo species, taking into account connectivity and proximity, as well as the threats that can reduce the functionality of that habitat for black cockatoos. The quality of the foraging habitat will depend upon its importance to each species in that location, as well the role that it plays in relation to other components of the range, such as roosting and breeding.

When applying the tool you should begin at one of the starting scores of 1, 5, 7 or 10 depending on the form of habitat in your impact area. You should then apply all the context adjustors which will add or reduce value to your score and provide you with a foraging habitat quality score. *It is important to note that the tool has a maximum possible score of 10 and can therefore also be used in conjunction with the offsets policy.*

If your site has more than one kind of vegetation type, for example, Banksia woodland and heath, introduced eucalyptus trees and some planted pines, use the highest scoring habitat for your starting score and include the reasoning for this in your justification. In this example, Banksia woodland and heath is the highest value foraging habitat, so the starting score would be at least 7.

In most cases, scores will vary in different locations, depending upon the key threats specific to that area.

What is high quality foraging habitat?

High quality foraging habitat, particularly in proximity to roosting sites and/or breeding sites, demands protection. Foraging habitat with a score of 7 or above is considered high quality and is important for the long-term survival and recovery of black cockatoos. Impacts to high quality foraging habitat should be referred.

How do I use the foraging habitat scoring tool?

The scoring tool is to be applied once to the entire impact area of your proposed action and completed for each black cockatoo occurring within your impact area. However, if your impact area includes more than one location, the scoring tool should be applied to each location, e.g. one score for a road or rail line and a second score for a development site. It is your responsibility to define the impact area and consider downstream or facilitated impacts on black cockatoos and include these areas in the definition of your impact area (see definitions).

On a case by case basis there is potential for users of the tool to over- or under-value habitat in the impact area. To support your habitat score, you should provide an overall appraisal of the habitat to justify and complement the score.

If you have insufficient evidence to determine what score a particular habitat attribute meets, you should either:

- Carry out additional surveys (see section 2 of these guidelines); or
- Apply the precautionary principle and assume that the impact area contains very high quality foraging habitat for black cockatoos.

The foraging habitat scoring tool and the offsets assessment guide

The habitat quality scoring tool for black cockatoos has been developed to assist with the [EPBC Act Environmental Offsets Policy](#). It is focused on foraging habitat as this is the habitat type subject to most clearing applications and where uncertainty around quality exists.

For the purposes of the offsets assessment guide, breeding habitat is allocated a score of 10 no matter what the context, region or circumstances. This scoring tool will help you determine 'habitat quality' referred to in the offset calculator.

The scoring tool below should be used in place of the three generic habitat quality categories found in the [Offsets Assessment Guide](#) and be applied to the entire area of habitat being offset. More than one score may be required if the impact area occurs in more than one location (see above). Table 3 can also be used to calculate the starting quality of a proposed offset site and to estimate the future quality, with and without the proposed offset/management intervention. As mentioned in the introduction of this guideline, offsets are not a relevant consideration at the referral stage of an action; the above advice is provided for use in the case of a 'controlled action' decision on a referral.

Significant impact and acceptability guidance

The diagram below provides a visualisation of how the quality score for black cockatoo foraging habitat is assessed.

- Impacts on *higher quality* foraging habitat are likely to have a significant impact, with a lower acceptability of loss in hectares; your action should be referred.
- Impacts on *low quality* foraging habitat is more likely to be acceptable. Committing to priority mitigation actions in the relevant region means your action is less likely to result in a significant impact and require referral.
- Impacts on foraging habitat that is *valued*, with a score of 4 to 6, may still require referral, depending upon how much habitat is being impacted, the location and what measures are proposed to avoid and/or mitigate that impact.

Habitat quality score

10	9	8	7	6	5	4	3	2	1
Very high quality			High quality		Quality		Low quality		

Corresponding acceptability of loss (ha)

0	5	>10
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Table 3: Foraging habitat scoring tool

Starting Score	Foraging habitat for Carnaby's Cockatoo	Foraging habitat for Baudin's Cockatoo	Foraging habitat for Forest Red-tailed Black cockatoo
10 (Very high quality)	Foraging habitat that is being managed for black cockatoos such as habitat that is the focus of successful rehabilitation , and/or has some level of protection from clearing, and/or is quality habitat described below with attributes contributing to meet a score of ≥ 10 .	Foraging habitat that is being managed for black cockatoos such as habitat that is the focus of, successful rehabilitation , and/or has some level of protection from clearing, and/or is quality habitat described below with attributes contributing to meet a score of ≥ 10 .	Foraging habitat that is being managed for black cockatoos such as habitat that is the focus of successful rehabilitation , and/or has some level of protection from clearing, and/or is quality habitat described below with attributes contributing to meet a score of ≥ 10 .
7 (High quality)	Native shrubland, kwongan heathland and woodland dominated by proteaceous plant species such as <i>Banksia</i> spp. (including <i>Dryandra</i> spp.), <i>Hakea</i> spp. and <i>Grevillea</i> spp., as well as native eucalypt woodland and forest that contains foraging species, including along roadsides. Does not include orchards, canola, or areas under a RFA.	Native eucalypt woodlands and forest, and proteaceous woodland and heath, particularly marri, including along roadsides. Does not include orchards or areas under a RFA.	Jarrah and marri woodlands and forest, and edges of karri forests, including wandoo and blackbutt, within the range of the subspecies, including along roadsides. Does not include areas under a RFA.
5 (Quality)	Pine plantation or introduced eucalypts.	Pine plantation or introduced eucalypts.	Introduced eucalypts as well as the introduced Cape lilac (<i>Melia azedarach</i>).
1 (Low quality)	Individual foraging plants or small stand of foraging plants.	Individual foraging plants or small stand of foraging plants.	Individual foraging plants or small stand of foraging plants.
Additions	Context adjustor - attributes improving functionality of foraging habitat	Context adjustor - attributes improving functionality of foraging habitat	Context adjustor - attributes improving functionality of foraging habitat
+3	Is within the Swan Coastal Plain (important foraging area).	Is within the known foraging area (see map).	Jarrah and/or marri show good recruitment (i.e. evidence of young trees).
+3	Contains trees with suitable nest hollows.	Contains trees with suitable nest hollows.	Contains trees with suitable nest hollows.
+2	Primarily comprises marri.	Primarily contains marri.	Primarily contains marri and/or jarrah.
+2	Contains trees with potential to be used for breeding (dbh ≥ 500 mm or ≥ 300 mm dbh for salmon gum and wandoo).	Contains trees with potential to be used for breeding (dbh ≥ 500 mm or ≥ 300 mm dbh for salmon gum and wandoo).	Contains trees with potential to be used for breeding (dbh ≥ 500 mm or ≥ 300 mm dbh for salmon gum and wandoo).
+1	Is known to be a roosting site.	Is known to be a roosting site.	Is known to be a roosting site.
Subtractions	Context adjustor - attributes reducing functionality of foraging habitat	Context adjustor - attributes reducing functionality of foraging habitat	Context adjustor - attributes reducing functionality of foraging habitat quality
-2	No clear evidence of feeding debris.	No clear evidence of feeding debris.	No clear evidence of feeding debris.
-2	No other foraging habitat within 6 km.	No other foraging habitat within 6 km.	No other foraging habitat within 6 km.
-1	Is > 12 km from a known breeding location.	Is > 12 km from a known breeding location.	Is > 12 km from a known breeding location.
-1	Is > 12 km from a known roosting site.	Is > 12 km from a known roosting site.	Is > 12 km from a known roosting site.
-1	Is > 2 km from a watering point.	Is > 2 km from a watering point.	Is > 2 km from a watering point.
-1	Disease present (e.g. <i>Phytophthora cinnamomi</i> or marri canker).	Disease present (e.g. <i>Phytophthora cinnamomi</i> or marri canker).	Disease present (e.g. <i>Phytophthora cinnamomi</i> or marri canker).

Examples of foraging habitat scoring and justification to be provided in any referral

Final Score	Habitat summary for Forest Red-tail Black Cockatoo foraging habitat* *note this is also habitat for Carnaby's Cockatoo and Baudin's Cockatoo; a separate score should be generated for these species)
10	Starting score: Impact area has native eucalypt woodland and forest that contains foraging species, including marri (<i>Corymbia calophylla</i>) and jarrah (<i>Eucalyptus marginata</i>) (score of 7); attributes improving functionality of foraging habitat - Impact area contains trees known to be used for breeding, i.e. marri and jarrah (add 3); - Impact area primarily contains marri and/or jarrah (add 2); - Impact area contains trees with potential to be used for breeding (dbh ≥500mm) (add 2); attributes reducing functionality of foraging habitat - No clear evidence of feeding debris in the impact area (subtract 2); - Impact area is > 12 km from a known breeding location (subtract 1); and - Impact area is > 12 km from a known roosting site (subtract 1).
Final Score	Habitat summary for Carnaby's foraging habitat* *note this is also habitat for Baudin's Cockatoo and the Forest Red-tailed Black Cockatoo; separate scores should be generated for these species)
7	Starting score: Impact area has Banksia woodland, i.e. woodland dominated by proteaceous plant species (score of 7); attributes improving functionality of foraging habitat - Impact area is within the Swan Coastal Plain (add 3); attributes reducing functionality of foraging habitat - No clear evidence of feeding debris in the impact area (subtract 2); and - Some areas showing presence of disease (<i>Phytophthora cinnamomi</i>) (subtract 1).
Final Score	Habitat summary for Baudin's Cockatoo foraging habitat* *note this is also habitat for Carnaby's Cockatoo and the Forest Red-tailed Black Cockatoo; separate scores should be generated for these species)
5	Starting score: Impact area has primarily low heath with Banksia spp. and some karri (<i>Eucalyptus diversicolor</i>), i.e. heath and woodland dominated by proteaceous plant species, as well as native eucalypt woodland (score of 7); attributes improving functionality of foraging habitat - Impact area contains trees known to be used for breeding, i.e. karri (add 3); - Impact area contains trees with potential to be used for breeding (dbh ≥500mm) (add 2); attributes reducing functionality of foraging habitat - No clear evidence of feeding debris in the impact area (subtract 2); - No other foraging habitat within 6 km of the impact area (subtract 2); - Impact area is > 12 km from a known breeding location (subtract 1); - Impact area is > 12 km from a known roosting site (subtract 1); and - Impact area is > 2 km from a watering point (subtract 1).
Final Score	Habitat summary for Carnaby's Cockatoo foraging habitat* *note this is also habitat for Baudin's Cockatoo and the Forest Red-tailed Black Cockatoo; separate scores should be generated for these species)
1	Starting score: Impact area contains a small stand of foraging plants, i.e. Banksia spp. (score of 1); attributes improving functionality of foraging habitat - Impact area is within the Swan Coastal Plain (add 3); attributes reducing functionality of foraging habitat - Impact area is > 12 km from a known breeding location (subtract 1); - Impact area is > 2 km from a watering point (subtract 1); and - Some areas showing presence of disease (<i>Phytophthora cinnamomi</i>) (subtract 1).

5: Is there a high likelihood that your action will interfere with the recovery of one or more of the black cockatoos and therefore have a significant impact?

Actions that are designed to avoid habitat loss can still have a significant impact if they result in an indirect, or facilitated, impact. This is where mitigation becomes an important part of your action.

Actions are likely to be significant if they:

- Adversely affect black cockatoo habitat quality and function through changes in hydrology, altered fire regimes, increase in weeds or increase in nest competitors, or
- Result in mortality of a single black cockatoo through vehicle strike, crop protection measures, including shooting, or poaching of eggs and birds.

Important information about measures proposed to compensate for significant impacts on black cockatoos

The EPBC Act does not allow for compensatory measures (such as rehabilitation of individuals) or positive impacts (such as offsets) to be considered at the referral stage. At the referral stage, significance is based on the impact of the proposed action only, once all reasonable avoidance and mitigation measures have been considered.

Mitigation measures should be applied to minimise the above types of impacts and be undertaken and/or managed and maintained for the duration of the impact, wherever possible.

- For actions that will widen or create roads, consider if a buffer to nearby foraging habitat is needed, or if signage and speed limits can be applied, to reduce the likelihood of vehicle strike. Conversely, where low speed limits apply (60 km/h or lower), additional plantings of foraging plants can provide food for black cockatoos where vehicle strike is less likely.
- For actions that can spread pests, weeds or disease, ensure best practice hygiene protocols are followed during construction to protect black cockatoo habitat from degradation. Ongoing management of black cockatoo habitat to ensure pests, weeds and disease are not spread and/or are reduced can improve habitat quality.
- For areas where fire is likely, manage vegetation reduction burns to reduce the likelihood of frequent, hot fires that destroy breeding habitat, e.g. cool burns that leave large trees intact.
- For actions concerning seed, fruit or nut crops, ensure loads are covered, unwanted nuts or fruit are removed after harvesting, and crop trees are protected with netting.
- For actions that will degrade habitat through water drawdown (cone of depression is likely to be at least 2km), including watering points used by black cockatoos, consider measures that concentrate drawdown in low quality habitat, rather than high quality habitat, as well as measures to reduce drawdown and/or top-up water availability for habitat.
- For actions close to breeding areas, ensure the protection of these trees where black cockatoos, chicks and eggs can be at risk of poaching, e.g. erect signs to

ensure poachers are aware the area is protected and install fencing and security cameras to deter illegal access.

Table 4 provides regionally based mitigation objectives to help guide you in avoiding significant impacts. Commitment to the objectives and actions in Table 4 in conjunction with well managed and maintained mitigation will ensure your action is consistent with the recovery of black cockatoos. Non-conformance with these objectives can increase the likelihood of a significant impact occurring.

You should keep in mind that rehabilitating low quality habitat is likely to be more cost-effective than re-vegetating or restoring habitat where it has been completely cleared. Where breeding habitat will be lost, re-vegetation and restoration efforts will contribute to the recruitment of hollows in the future.

If you wish to apply mitigation measures other than those identified in this guideline, evidence that they are equally effective in achieving the mitigation objectives should be provided. Measures should support the recovery planning process, including ongoing management of habitat areas, including offset sites, where appropriate.



Table 4: Priority mitigation options

Species	Regional mitigation and/or offset* direction			
	Swan Coastal Plain	Wheatbelt	Jarrah forest	South Coast
Carnaby's Cockatoo	<i>Objective:</i> To improve the security of tenure and management, and the condition of habitat throughout the non-breeding range	<i>Objective:</i> To improve the condition and management of breeding habitat and associated foraging habitat, including increasing hollow availability	<i>Objective:</i> To improve the condition and management of breeding habitat and associated foraging habitat, including increasing hollow availability	<i>Objective:</i> To improve the security of tenure and management, and the condition of habitat throughout the non-breeding range
Priority 1	Rehabilitate foraging habitat	Restore breeding habitat	Rehabilitate breeding habitat	Rehabilitate foraging habitat
Priority 2	Maintain night roosting sites and associated watering points	Maintain and/or create hollows	Rehabilitate foraging habitat	Maintain night roosting sites and associated watering points
Priority 3	Rehabilitate/maintain/revegetate corridors between foraging and roosting	Rehabilitate foraging habitat	Reduce/eradicate competition from other nest competitors	Rehabilitate/maintain/revegetate corridors between foraging and roosting
Baudin's Cockatoo	<i>Objective:</i> To improve the condition and management of breeding habitat in proximity to foraging habitat	<i>Objective:</i> To improve the condition and management of breeding habitat in proximity to foraging habitat	<i>Objective:</i> To improve and manage breeding habitat, including increasing hollow availability, and reduce conflicts with orchardists	<i>Objective:</i> To improve the condition and management of breeding habitat in proximity to foraging habitat
Priority 1	Rehabilitate foraging habitat in proximity to breeding habitat	Maintain hollows in breeding habitat areas	Reduce conflict with orchardists through netting of fruit crops	Rehabilitate foraging habitat in proximity to breeding habitat
Priority 2	Rehabilitate/maintain/revegetate corridors between foraging and breeding habitat	Rehabilitate foraging habitat in proximity to breeding habitat	Reduce/eradicate competition from other nest competitors	Rehabilitate/maintain/revegetate corridors between foraging and breeding habitat
Priority 3	Maintain hollows in breeding habitat areas	Reduce/eradicate competition from other nest competitors	Rehabilitate breeding habitat	Maintain hollows in breeding habitat areas

Forest Red-tailed Black Cockatoo	Objective: To improve the management and the condition of foraging and roosting habitat, as well as breeding habitat where they occur	Objective: To improve and manage habitat resources for breeding habitat and in proximity to breeding where it occurs	Objective: To improve and manage breeding habitat and foraging resources, including increasing hollow availability	Objective: To improve the management and the condition of foraging and roosting habitat, as well as breeding habitat where they occur
Priority 1	Rehabilitate foraging habitat	Rehabilitate foraging habitat in proximity to breeding habitat	Rehabilitate breeding habitat	Rehabilitate foraging habitat
Priority 2	Rehabilitate/maintain/revegetate corridors between foraging and roosting, and breeding where it occurs	Rehabilitate/maintain/revegetate corridors between foraging and roosting, and breeding where it occurs	Reduce/eradicate competition from other nest competitors	Rehabilitate/maintain/revegetate corridors between foraging and roosting, and breeding where it occurs
Priority 3	Maintain night roosting sites and associated watering points	Maintain night roosting sites and associated watering points	Rehabilitate foraging habitat in proximity to breeding habitat	Maintain night roosting sites and associated watering points

*Although offsets cannot be considered at the referral stage, the options presented here can be considered as proposed offsets if there is a controlled action decision.

6: Referring your action because of impacts to black cockatoos

As the person proposing to take an action, it is your responsibility to decide whether or not to refer your action. If your action will have or is likely to have a significant impact on black cockatoos, you are legally obliged to refer the action to the Minister. If you remain uncertain as to whether your action will have a significant impact on black cockatoos you can refer your action for legal certainty or contact the Department to discuss your uncertainty.

Your decision as to whether your proposed action will have or is likely to have a significant impact on black cockatoos will come down to three key considerations outlined in this guideline:

- Any loss of nesting or breeding habitat,
- Any loss of very high to high quality foraging habitat
- Your mitigation commitments which reduce the likelihood of your action interfering substantially with the recovery of a black cockatoo

Avoiding these impacts as far as possible and implementing mitigation to further reduce the overall impact will help you reduce your risk of a significant impact and therefore your need to refer your action. Generally speaking, conformance with these guidelines will ensure that you are best placed for a streamlined assessment of your action, and for achieving the assessment decision and outcomes you are seeking when you refer your action. Conformance with the principles within these guidelines will also help minimise your offset obligations under the EPBC Act if assessment is required.

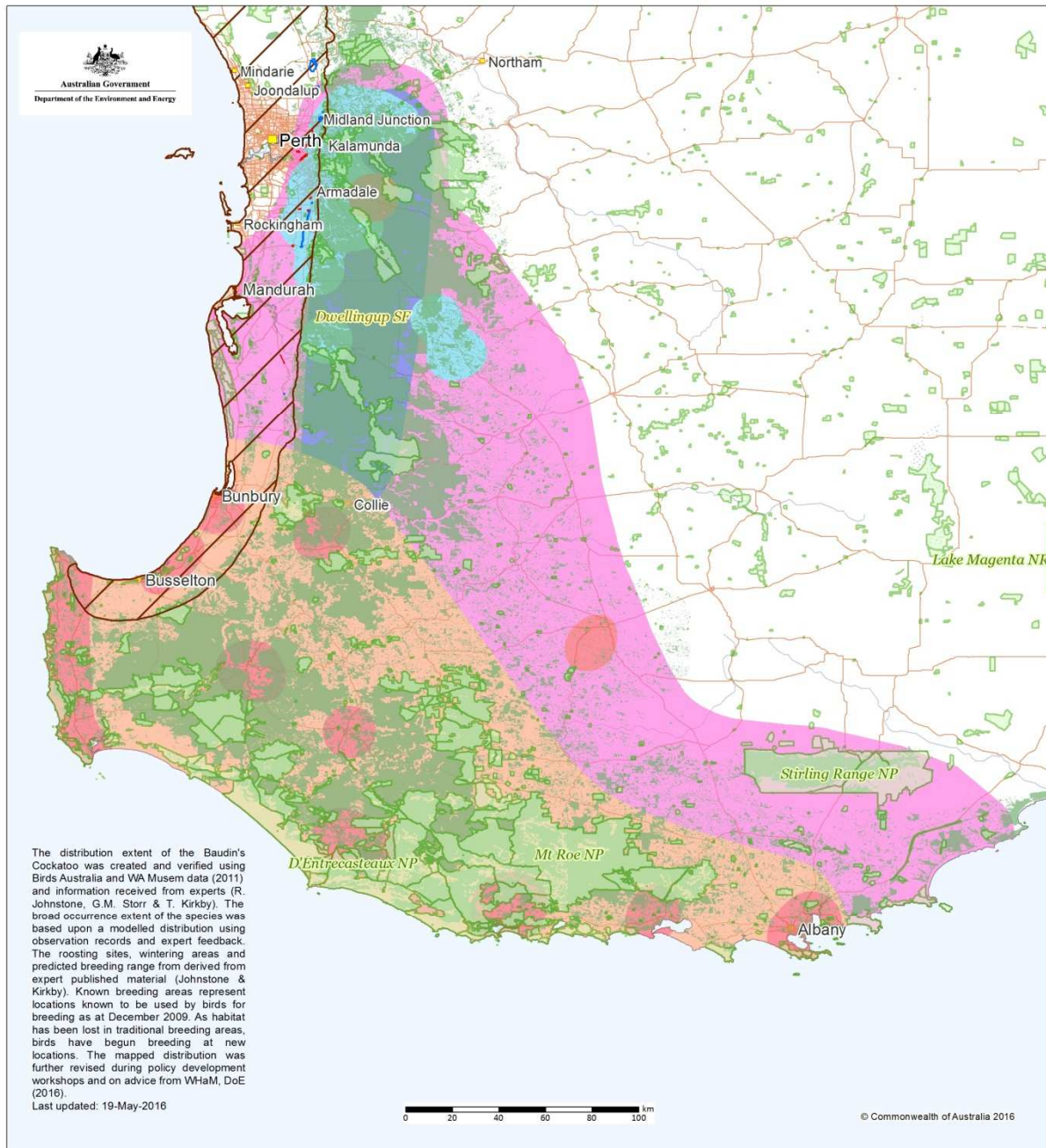
If you decide a referral is required for a significant impact on black cockatoos, you should provide adequate information to the Department so that a timely and well-informed decision can be made on the referral. Notwithstanding the requirement to adequately complete all questions on the Department's [referral form](#), the following information is considered desirable in the initial referral package to the Department:

- i. Detailed map/s defining the impact area and any additional study area, e.g. out to at least 12 km, particularly where this area includes black cockatoo habitat;
- ii. Information from the desktop and on-ground surveys undertaken;
- iii. Calculations of total area of black cockatoo habitat in the impact area and study area in hectares;
- iv. An assessment of foraging habitat quality for the relevant black cockatoo species using the black cockatoo foraging habitat scoring tool;
- v. Detailed information on impact avoidance, as well as the design, management and monitoring of proposed mitigation measures;
- vi. An analysis and forecast of the magnitude and duration of impacts; and
- vii. Detailed assessment of the significance of impacts on any other relevant matters of national environmental significance, such as other threatened species, ecological communities, Ramsar wetlands, heritage places, etc.



Appendix A – Distribution maps for the three black cockatoos

Map 2: Modelled distribution for Baudin's Cockatoo
(*Calyptorhynchus baudinii*)



Produced by:
Environmental Resources Information Network 2016

Contextual data source:
National Vegetation Information System (NVIS 4.2) 2016
Interim Biogeographic Regionalisation for Australia (IBRA) version 7 2012
Collaborative Australian Protected Area Database (CAPAD) 2014
Geoscience Australia GEODATA TOPO 250K Topographic Data Series 3 2006

Projection: Geographic
Datum: GDA94

Ecological Communities

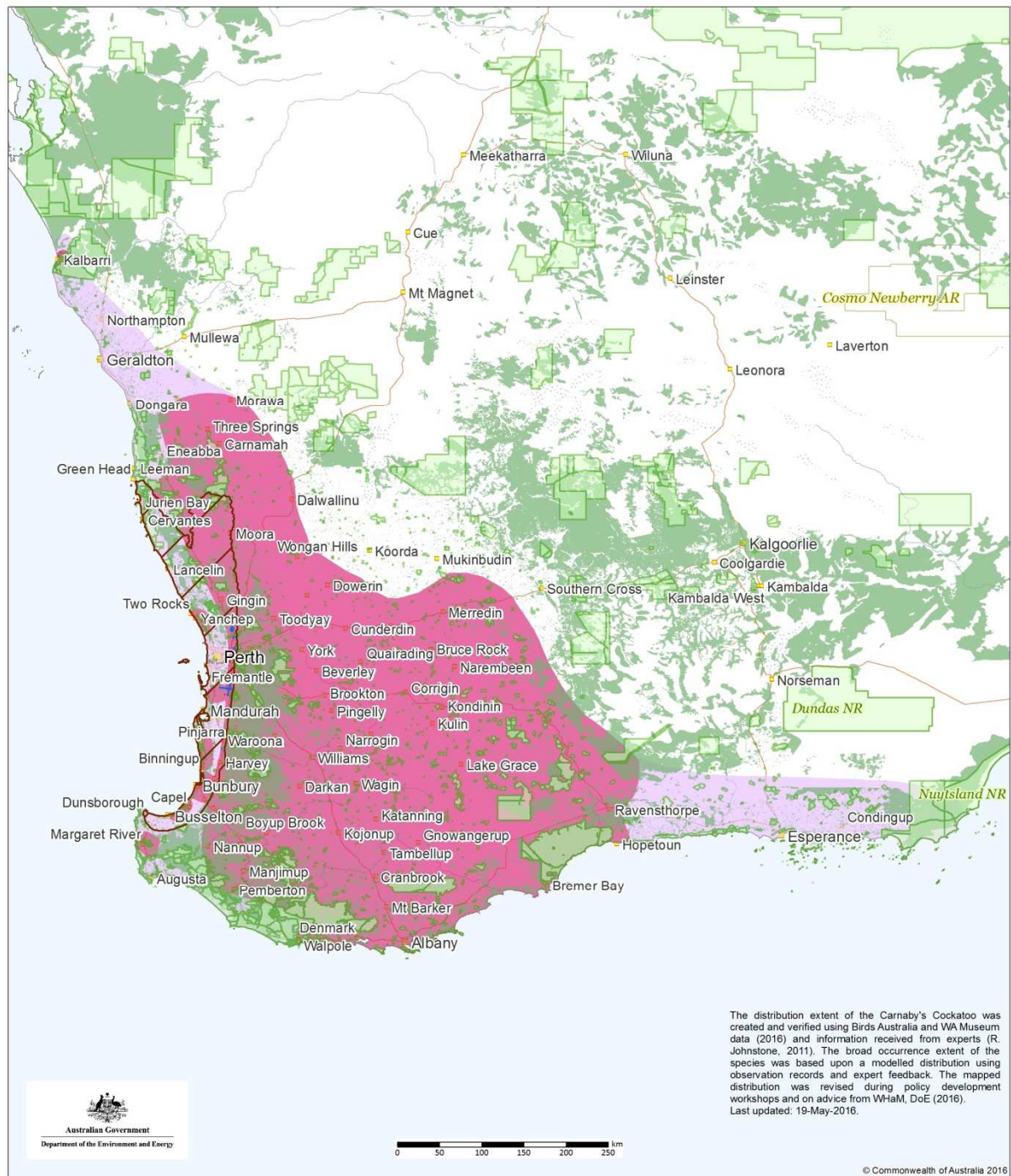
- Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands of the Swan Coastal Plain
- Corymbia calophylla - Kingia australis woodlands on heavy soils of the Swan Coastal Plain
- Banksia Woodlands of the Swan Coastal Plain
- Conservation Areas
- Jarrah, Karri and Marri (NVIS 4.2)

Species

- Known Breeding Areas
- Predicted Breeding Range
- Known Foraging Areas
- Main Wintering Area
- Species Likely to Occur

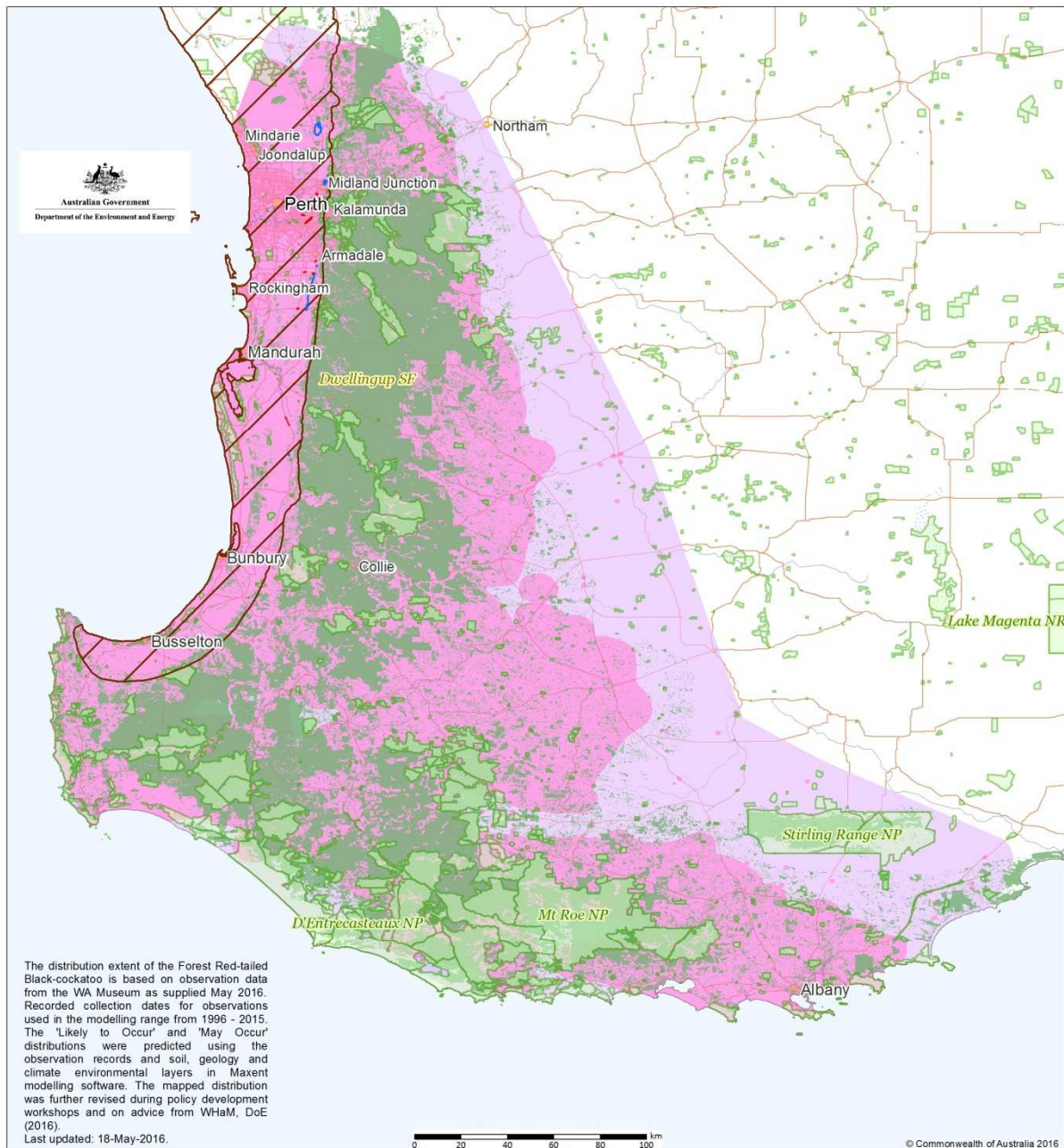
- Cities & Towns
- Roads (sealed)
- Roads (unsealed)
- State Border
- Major Rivers
- Lakes/Reservoirs
- Non-perennial Lakes

Map 3: Modelled distribution for Carnaby's Cockatoo
(*Calyptorhynchus latirostris*)



INDICATIVE MAP ONLY: For the latest departmental information, please refer to the Protected Matters Search Tool and the Species Profiles & Threats Database at <http://www.environment.gov.au/biodiversity/threatened/index.html>

Map 4: Modelled distribution for Forest Red-tailed Black-Cockatoo
(*Calyptorhynchus banksii naso*)



INDICATIVE MAP ONLY: For the latest departmental information, please refer to the Protected Matters Search Tool and the Species Profiles & Threats Database at <http://www.environment.gov.au/biodiversity/threatened/index.html>

Produced by:
Environmental Resources Information Network 2016

Contextual data source:
National Vegetation Information System (NVIS 4.2) 2016
Interim Biogeographic Regionalisation for Australia (IBRA) version 7 2012
Collaborative Australian Protected Area Database (CAPAD) 2014
Geoscience Australia GEODATA TOPO 250K Topographic Data Series 3 2006

Projection: Geographic
Datum: GDA94

Conservation Areas
Jarrah, Karri and Marri (NVIS 4.2)

Species
Likely to Occur
May Occur

Ecological Communities

Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands of the Swan Coastal Plain
Corymbia calophylla - Kingia australis woodlands on heavy soils of the Swan Coastal Plain
Banksia Woodlands of the Swan Coastal Plain

Cities & Towns
Roads (sealed)
Roads (unsealed)
State Border
Major Rivers
Lakes/Reservoirs
Non-perennial Lakes

Map 5: Individual regions for black cockatoo referral guideline

