Australian Capital Territory

Nature Conservation (Glossy Black-cockatoo) Conservation Advice 2023

Notifiable instrument NI2023–220

made under the

Nature Conservation Act 2014, s 90C (Conservation advice)

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1 Name of instrument

This instrument is the *Nature Conservation (Glossy Black-cockatoo) Conservation Advice 2023*.

2 Commencement

This instrument commences on the day after its notification day.

3 Conservation advice for Glossy Black-cockatoo

Schedule 1 sets out the conservation advice for Glossy Black-cockatoo (*Calyptorhynchus lathami lathami*).

4 Revocation

The *Nature Conservation (Glossy Black-cockatoo) Conservation Advice 2019* (NI2019-248) is revoked.

Arthur Georges
Chair, Scientific Committee
14 April 2023

Schedule 1

(see s 3)

CONSERVATION ADVICE

GLOSSY BLACK-COCKATOO (SOUTH-EASTERN) – *Calyptorhynchus lathami lathami*

CONSERVATION STATUS

The Glossy Black-cockatoo (south-eastern) sub-species *Calyptorhynchus lathami lathami* (Temminck, 1807) is recognised as threatened in the following jurisdictions:

International	**Vulnerable**, International Union for the Conservation of Nature Red List (species listed)
National	**Vulnerable**, *Environment Protection and Biodiversity Conservation Act 1999*
ACT	**Vulnerable**, *Nature Conservation Act 2014*
NSW	**Vulnerable**, *Biodiversity Conservation Act 2016* (species listed)
QLD	**Vulnerable**, *Nature Conservation Act 1992* (species listed)
VIC	**Critically Endangered**, *Flora and Fauna Guarantee Act 1988* (species listed)

ELIGIBILITY

The Glossy Black-cockatoo (south-eastern) is listed as Vulnerable in the ACT Threatened Native Species List under IUCN Criterion A — A2bc+3b+4bc and Criterion C — C1+C2a(ii) due to a declining population, extent of occurrence (EOO), area of occupancy (AOO), and small population size at the national level (Attachment A). The subspecies has undergone a substantial reduction (30–50%) over the last 12 years (three generations) (Cameron et al. 2021) mostly caused by the 2019–2020 bushfires, and a result of historical and ongoing habitat loss. Both EOO and AOO are contracting, and the estimated total number of mature individuals is 7,500 and is declining rapidly (Cameron et al. 2021).

Glossy Black-cockatoo (Stuart Harris – Canberra Birds)

DESCRIPTION AND ECOLOGY

The Glossy Black-cockatoo is the smallest of the black cockatoos, with an average length of 48 cm, a wingspan of 90 cm and weighing around 425 g. The adult male has dusky blackish-brown plumage on the head, breast and belly and is dull black on the back and tail. The tail has distinctive solid bright red panels. The crest is inconspicuous and the bulbous bill, eye ring and legs are dark grey. The female is similar in appearance to the male except for irregular yellow patches around the neck and head, and orange/red tail panels. Immature birds of both sexes have fine yellow spotting on the face, shoulder and underwing, large spots or bars on the underbody and broad bars in the tail panel. (Forshaw 1989; Crome and Shields 1992; Flegg and Longmore 1994; Higgins 1999; Cameron 2007).

The Glossy Black-cockatoo is a social bird, typically observed in pairs or family groups. These small groups often aggregate to form larger feeding flocks. Diet is highly specialised, with birds feeding almost exclusively on the seeds of a range of she-oak species (Forshaw 1989; Cameron 2007). In the ACT region, their food trees are largely restricted to mature age Drooping She-oaks (*Allocasuarina verticillata*) (Holiday 2004). Feeding is concentrated in larger stands of she-oaks, which reduces the need to move between trees and may offer energy benefits and reduced risk of predation (Cameron et al. 2006). The species is highly selective of both the trees and the cones they favour, often showing fidelity to particular trees in which they have foraged previously (Pepper et al. 2000).

Breeding in the NSW region occurs from March to August and is thought to be timed with the presence of cones on their local feed-tree species (Clout 1989; Crome and Shields 1992; Cameron 2007; Cameron 2009). A single egg is laid and incubated for 30 days, during which time the female usually remains on the nest and is fed by the male (Garnett et al. 1999). The nestling fledges after about 90 days, a longer nestling period than has been recorded for any other parrot

(Garnett et al. 1999). The juvenile associates with its parents for at least the first year following fledging, in which time it learns to forage (Forshaw 1989; Cameron 2007).

DISTRIBUTION AND HABITAT

The Glossy Black-cockatoo (south-eastern) is patchily distributed at low densities across south-eastern Australia (Figure 1) from central Queensland to East Gippsland in Victoria, and inland to the southern tablelands and central-western plains of NSW, with a small population in the Riverina. Their highest densities occur east of the Great Dividing Range with a more scattered distribution inland (Forshaw 1989; Garnett 1992). They are also occasionally recorded well beyond their usual range suggesting that the species moves between different areas when necessary (Garnett and Crowley 2000; Forshaw 2002).

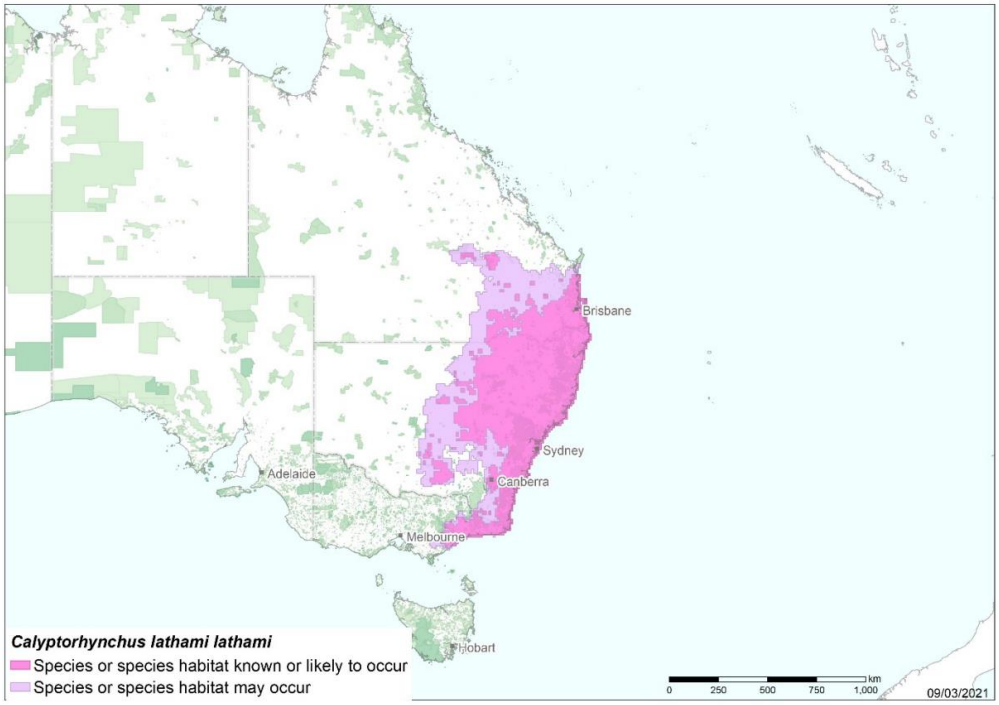
Recent climate adaptation modelling of suitable habitat by the NSW Government and others (Garnett et al 2013; Graham et al. 2019) suggest that while the ACT is currently considered to have low-moderate climate suitability for the sub-species, the whole of the ACT is projected to become more climatically suitable for the Glossy Black-cockatoo under climate change (Rogers et al. 2022).

The first published record of the Glossy Black-cockatoo in the ACT was in 1946 and the species was subsequently recorded occasionally throughout the 1970s and 1980s. The Mount Majura – Mount Ainslie complex is an important local refuge for the species (Holiday 2004). Sightings of the species in the ACT are rare, though a relatively high number of sightings were reported from the Majura Range in 2003 and 2004. The highest single count of the species recorded in the ACT was 16 birds on Majura Range in 2004 (Holiday 2004). The first record of breeding in the ACT was on Mount Majura in 2004 (Lenz et al. 2004). Reporting rates in the ACT region (Figure 2) have dropped in the past decade, with no sightings between 2016 and 2019 and no breeding records since 2010–11 (COG 2018, Dabb 2020).

Records of the species over the last 30 years are sparse, intermittent and are likely individuals travelling further afield when pushed to search for food sources. Despite the very rare breeding record (only five records in the ACT over the past 40 years), it has not been established that a small population is resident in the ACT, and it is possible that only wandering individuals from the main area of the coastal population further east, have been recorded in the ACT (Dabb 2020).

A pair of Glossy Black-cockatoos was seen in the western part of Mount Majura feeding on Drooping She-oak (*Allocasaurina verticillata*) on 29 May 2020 and three Glossy Black-cockatoos were reported feeding in a Drooping She-oak on Mount Ainslie on 2 June 2020 (Canberra Nature Map 2022). Subsequent searches failed to locate the birds and it was noticed that there was a poor production of cones in the area with those seen being generally opened, old or withered (Dabb 2020). A pair was sighted in Stirling in August 2021 feeding on likely planted Drooping She-oaks. A pair of was also recently recorded in Mount Taylor Nature Reserve in December 2021, with three birds flying over Kambah in February 2022 and a pair in and near Mount Majura Nature Reserve in February and September to November 2022 feeding on a good supply of Drooping She-oak cones (Canberra Nature Map 2022).

Figure 1: Modelled Distribution of the Glossy Black-cockatoo (south-eastern) (Source: DCCEEW 2022)

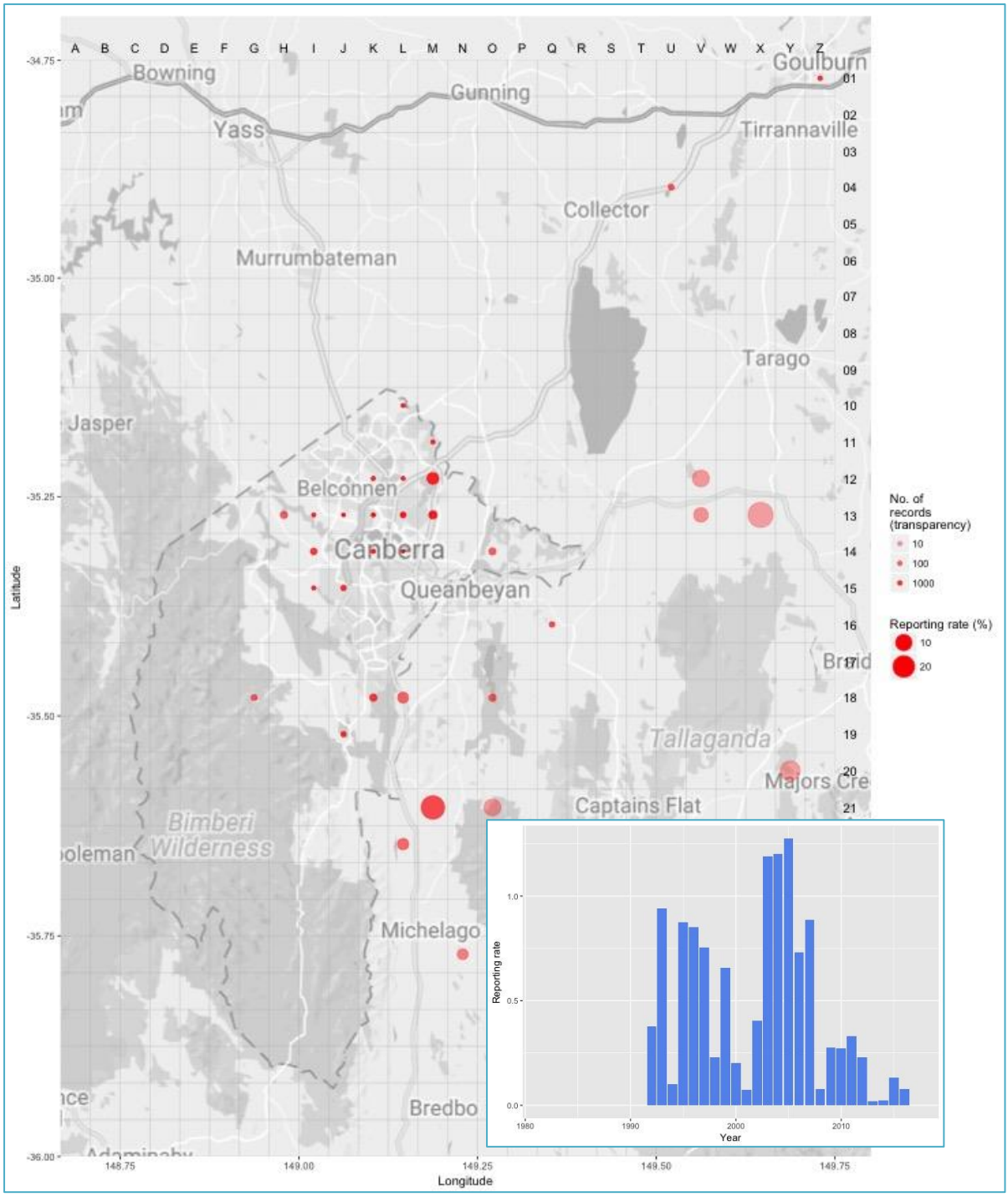


Source: Base map Geoscience Australia; species distribution data Species of National Environmental Significance database.

The Glossy Black-cockatoo nests in hollows in large eucalypts in woodland and open forests up to 1000 metres elevation. They utilise large, high, near-vertical hollows in aging or standing dead eucalypt trees and have been recorded nesting in Blakely's Red Gum in the ACT (Scientific Committee 2018). They nest close to each other, which means they need breeding habitat with a relatively high density of suitably-sized hollows.

Mapping of vegetation communities in 2018 identified 670 ha of high quality foraging habitat of forest dominated by Drooping She-oak (*Allocasuarina verticillata*) for Glossy Black-cockatoos in the ACT and 5,018 ha of moderate quality foraging habitat containing lower densities of Drooping She-oak (ACT Government 2018).

Figure 1: Distribution of Glossy Black-cockatoo records in the ACT region – 1982–2017



Source: Canberrabirds.org.au (2022). Note: Reporting rate (%) is the proportion of all surveys in which the species was present. These data were collected by volunteer birdwatchers using various survey methods and on some occasions more than one person may have recorded bird sightings on the same day, which may skew the data.

THREATS

The main apparent threat to the Glossy Black-cockatoo is the degradation, loss and fragmentation of foraging and breeding habitat. In particular, the loss of canopy seed banks of feed trees by clearing or regular burning, as well as poor regeneration of these trees due to grazing, can significantly reduce available food sources. Loss of hollow-bearing nesting trees

within the proximity of feed tree stands is also likely to be a significant impediment to successful breeding (Garnett and Crowley 2000; Mooney and Pedler 2005; Morgan et al. 2015).

Drooping She-oak (*Allocasuarina verticillata*) is killed by crown fires. In the ACT, vegetation community mapping shows that 67% of all high-quality foraging habitat and 82% of all moderate quality foraging habitat was burnt in the 2003 wildfires. While these areas are regenerating well, it will take a number of years (>25yrs) for the trees to reach their maximum cone-bearing potential resulting in the numbers of Glossy Black-cockatoos not expected to improve in the ACT for some years to come. Improvement focuses on core stepping-stones of habitat with significant plantings of feed trees undertaken across reserves in the ACT.

The areas of habitat in Namadgi National Park, including Mt Tennent and the hills surrounding the Naas Valley, were impacted by the 2020 Orroral fire. Frequent fires and droughts can significantly impact the habitat of the Glossy Black-cockatoo and the likelihood of the species presence in the ACT. The Parks and Conservation Service (PCS) work to protect Drooping She-oak when it undertakes burning activities and these are guided by ecological guidelines (ACT Government 2009, ACT Government 2019b) that call for patchy burning, retention of mature trees and 25-year gaps between planned fires. Protected areas of habitat are identified in the development of Bush Fire Operational Plans (ACT Government 2018).

Predation and competition for nest sites by Brush-tailed Possums (*Trichosurus vulpecula*) severely impacted breeding success of the Kangaroo Island sub-species in the past (Garnett et al. 1999; Mooney and Pedler 2005; Morgan et al. 2015) and has potential to affect birds in the ACT region. Successful protection of nesting trees from possums, in addition to restoration of habitat and provision of nest boxes, has reversed a decline in the Kangaroo Island sub-species (Mooney and Pedler 2005; Morgan et al. 2015). It is unknown to what extent competition for nest hollows from other Psittaciformes, such as Galahs, corellas and Sulphur-crested Cockatoos, may affect Glossy Black-cockatoos.

Illegal harvesting is a potential concern as there is evidence suggesting that Glossy Black-cockatoos from the Riverina district in NSW have been trapped for the illegal bird trade (OEH 2018).

The Glossy Black-cockatoo is also likely to be at risk from the effects of climate change, as the range of its main feed tree species is likely to be altered under high CO_2 emission scenarios (Harris et al. 2012). In a report by the University of Queensland examining impacts of climate change on two cockatoo species, expert elicitation identified extreme fire events as the most severe threat to Glossy Black-Cockatoos in the near and far future scenarios, impacting resources such as: abundance of food trees; abundance of large, hollow-bearing nest trees; proximity of breeding habitat to food resources, food tree age structure, patch size of feeding habitat, and juvenile/fledgling survival. The impact of drought on breeding habitat, the quality of feeding trees, the proximity of breeding habitat to surface water, and on the direct survival of adults and juveniles and fledglings was also identified as a key threat. Habitat loss and degradation, with other threats, will be exacerbated over time without management intervention (Rogers et al. 2022).

Exposure to extreme heat events is also likely to pose an acute risk to the Glossy Black-cockatoo, particularly in the western part of its range, as observed in other species including those of Psittaciformes. For example, during a single heatwave event in south-western WA in 2010, 208

endangered Carnaby's cockatoos (*Calyptorhynchus latirostris*) died, succumbing to heat stress when air temperatures exceeded 47°C, with carcasses recovered at two sites (McKechnie et al. 2012, Saunders et al. 2011). Widespread mortality on extreme hot days, sometimes involving millions of individual birds and other fauna, is not a new phenomenon in Australia (McKechnie et al. 2012). However, the increasing frequency and intensity of extreme heat events represent a novel and growing threat.

MAJOR CONSERVATION OBJECTIVES

The primary objective should be to maintain feeding habitat for Glossy Black-cockatoos in the ACT, to provide potential resources for breeding to occur, and to be responsive to opportunities to improve feeding and breeding habitat based on projections under realistic climate change scenarios.

CONSERVATION PRIORITIES

The conservation actions are detailed in the Action Plan (ACT Government 2013) and progress report (ACT Government 2018). Conservation priorities in the ACT should be to:

- protect (especially mature hollow-bearing trees), manage and monitor habitat, including to minimise inter-specific nest hollow competition
- maintain areas of Drooping She-oak, protecting trees from high intensity and high frequency wildfire and to ensure hazard reduction activities do not impact tree canopy, as per recommendations (ACT Government 2009)
- explore opportunities for planting Drooping She-oak in the urban environment, noting that the species in coastal areas will use remnant food trees after urban development but are thought typically to avoid urban areas (Rogers et al. 2022)
- undertake research to understand the attributes that determine desirable/ideal foraging habitat and specific local factors that determine preference for certain trees and food cones (Rogers et al. 2022)
- gather appropriate data for, and undertake, habitat modelling under reasonable climate change scenarios to predict future likely responses that will impact the species and to allow current management interventions to be responsive to future environmental change; particular attention should be paid to capitalizing on the change in climate that will make the ACT more suitable for breeding populations of this species and the species more resistant to extreme climatic events
- record any sightings, especially potential breeding pairs
- encourage and support the continuation and further development of community-based conservation activities.

OTHER RELEVANT ADVICE, PLANS OR PRESCRIPTIONS

- ACT Glossy Black-cockatoo Action Plan (ACT Government 2013)
- ACT Conservation Advice – Loss of Mature Trees (Scientific Committee 2018)
- ACT Woodland Conservation Strategy (ACT Government 2004)
- ACT Draft Woodland Conservation Strategy (ACT Government 2019a)
- Glossy Black-cockatoo Conservation Guidelines (Glossy Black Conservancy 2010)
- Commonwealth Conservation Advice Glossy Black-cockatoo (south-eastern) (DCCEEW 2022)

- Commonwealth Conservation Advice Glossy Black-cockatoo (Kangaroo Island) (TSSC 2016)

LISTING BACKGROUND

The Glossy Black-cockatoo was listed in the ACT as a Vulnerable species on 23 August 2010 in accordance with section 38 of the *Nature Conservation Act 1980*. The Flora and Fauna Committee (now Scientific Committee) concluded that at that time the assessment satisfied the criteria:

2.2 The species is observed, estimated, inferred or suspected to be at risk of premature extinction in the ACT region in the medium-term future, as demonstrated by:

2.2.4 Seriously fragmented distribution for a species currently occurring over a moderately small range or having a moderately small area of occupancy within its range.

In 2019, the listing was amended from the species to the sub-species (that occurs in the ACT) under the *Nature Conservation Act 2014.*

The Glossy Black-cockatoo (south-eastern) is listed as a Vulnerable subspecies under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), effective 10 August 2022. It is assessed as Vulnerable under Criterion 1 (A2bc+3b+4bc) and Criterion 3 (C1+C2a(ii)) of the EPBC Act.

ACTION PLAN DECISION

An Action Plan for this species is in place in the ACT (ACT Government 2013) under the *Nature Conservation Act 2014* and is being reviewed by the ACT Scientific Committee this year (2023). The Committee will make a recommendation about the continuation of that plan during that review.

The Commonwealth Minister for the Environment made the decision that a National Recovery Plan is required for the sub-species (DCCEEW 2022). In the review of the ACT Action Plan the decision to continue that action plan should be subject to drawing from the National Recovery Plan for this species and subject to any necessary changes highlighted in the second 5-yearly progress report on that action plan (Conservator of Flora and Fauna in prep.) and the review by the Committee.

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FURTHER INFORMATION

Further information on the Action Plan or other threatened species and ecological communities can be obtained from: Environment, Planning and Sustainable Development Directorate (EPSDD). Phone: (02) 132281, EPSDD Website: https://www.environment.act.gov.au/

ATTACHMENT A: LISTING ASSESSMENT (DCCEEW 2022)

THREATENED SPECIES SCIENTIFIC COMMITTEE

Established under the *Environment Protection and Biodiversity Conservation Act 1999*

The Threatened Species Scientific Committee finalised this assessment on 16 November 2021.

Attachment A: Listing Assessment for *Calyptorhynchus lathami lathami*

This assessment follows prioritisation of a nomination from the TSSC.

Assessment of eligibility for listing

This assessment uses the criteria set out in the EPBC Regulations. The thresholds used correspond with those in the IUCN Red List criteria except where noted in criterion 4, sub-criterion D2. The IUCN criteria are used by Australian jurisdictions to achieve consistent listing assessments through the Common Assessment Method (CAM).

Key assessment parameters

Table 4 includes the key assessment parameters used in the assessment of eligibility for listing against the criteria.

Table 4 Key assessment parameters

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
Number of mature individuals	7,500	6,000	10,500	The population estimate is based on the following assumptions: • AOO is twice that recorded (see below); • Density of one mature bird per 200 ha of ideal habitat (Cameron 2009); • 50% of occupied grid cells include ideal habitat; and • The 2019/2020 fire season rendered 30% of the habitat unsuitable for cockatoos for at least ten years, with high percentages in parts of the range (e.g., 55% in Victoria east of Lake Tyers; P Menkhorst unpublished data).
Trend	Decreasing			Cameron et al. (2021).
Generation time (years)	11.9	11.3	13.2	Bird et al. (2020).
Extent of occurrence	470,000 km²	447,000 km²	493,500 km²	EOO is based on all observation since 1990 (Cameron et al. 2021).
Trend	Contracting			Cameron et al. (2021).

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
Area of Occupancy	40,000 km²	21,000 km²	80,000 km²	The minimum AOO is the number of 2x2 km squares within which they have been recorded since 1990 but, given the remoteness of much of the distribution, the actual AOO is assumed to be at least twice that and probably substantially greater. In 2019/2020, 34% of all 1x1 km squares from which birds have been recorded since 1990 were burnt (Cameron et al. 2021), and 25% of its overall distribution was burnt (Legge et al. 2020).
Trend	Contracting			Cameron et al. (2021).
Number of subpopulations	1	1	2	Cameron et al. (2021).
Trend	Stable			Cameron et al. (2021).
Basis of assessment of subpopulation number	Birds in the Riverina in NSW were previously thought to be isolated from the main population, but they are now considered to be connected.			
No. locations	>10	>10	>10	Cameron et al. (2021).
Trend	Not calculated			Cameron et al. (2021).
Basis of assessment of location number	The spatial nature of the threats, although stochastic in space and time, is such that there are >10 geographically or ecologically distinct areas where a single fire could affect all individuals of the subspecies present within a period of three generations. The geographic position of unburnt locations will vary between fires, but there are always likely to be >10 (Cameron et al. 2021).			
Fragmentation	Not severely fragmented (Cameron et al. 2021).			
Fluctuations	No extreme fluctuation in any of the following: i) EOO; ii) AOO; iii) number of locations or subpopulations; and/or iv) number of mature individuals (Cameron et al. 2021).			

Criterion 1 Population size reduction

Reduction in total numbers (measured over the longer of 10 years or 3 generations) based on any of A1 to A4			
	Critically Endangered **Very severe reduction**	**Endangered** **Severe reduction**	**Vulnerable** **Substantial reduction**
A1	≥ 90%	≥ 70%	≥ 50%
A2, A3, A4	≥ 80%	≥ 50%	≥ 30%

A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.

A2 Population reduction observed, estimated, inferred or suspected in the past where the causes of the reduction may not have ceased OR may not be understood OR may not be reversible.

A3 Population reduction, projected or suspected to be met in the future (up to a maximum of 100 years) [*(a) cannot be used for A3*]

A4 An observed, estimated, inferred, projected or suspected population reduction where the time period must include both the past and the future (up to a max. of 100 years in future), and where the causes of reduction may not have ceased OR may not be understood OR may not be reversible.

Based on any of the following

(a) direct observation [except A3]
(b) an index of abundance appropriate to the taxon
(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
(d) actual or potential levels of exploitation
(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites

Criterion 1 evidence

Eligible under Criterion 1 A2bc+3b+4bc **for listing as** Vulnerable

Trend data derived from surveys up to 2019 are not consistent and vary greatly between regions. Reporting rates from 500 m radius area searches (arguably the most reliable of the available survey methods for the species), across their range from 1999 to 2019 showed a 59% decline of the population, which is equivalent to a decline of 79% in three generations (Cameron et al. 2021). However, no significant change in reporting rates were detected between 1977 – 1981 and 1998 – 2001 (Barrett et al. 2002 cited in Cameron et al. 2021), and the 2 ha 20 minutes survey data from 1999 to 2019 was too variable to provide a reliable trend (Cameron et al. 2021). Annual glossy black cockatoo birding day events held since 2010 across south-eastern Queensland and far north-eastern New South Wales show that these populations are stable with no significant decline over from 2010 to 2017 (G Castley unpublished data cited in Cameron et al. 2021).

A structured expert elicitation process was used to estimate the proportional population change for this subspecies from pre-fire levels to immediately after the fire and then out to three generations after the fire, when exposed to fires of varying severity. These results, combined with the spatial analyses of fire overlap, suggest that one year after the fire, the subspecies has experienced an overall decline of 15% from pre-fire levels, but that the decline could be as large as 32% (upper bound of 80% confidence limit). After three generations, the estimate for the overall population decline relative to the pre-fire population is predicted to be 22%, but potentially as much as 46% (upper bound of 80% confidence limit) (Legge et al. 2021). For comparison, experts also estimated the population change over time in the absence of fire; by

three generations after the 2019/2020 bushfires, the overall population of the south-eastern glossy black cockatoo was estimated to be 16% lower than it would have been, had the fires not occurred (Legge et al. 2021). These predictions assume no further extreme drought or extensive fire events, however such events are likely to reoccur over the assessment period of 35.7 years, and therefore using the lower 80% confidence bound for the predicted population change over the next three generations may be more appropriate.

During the Lockyer Uplands Glossy Black Cockatoo Project, through opportunistic sightings, 105 birds and 40 birds were recorded between April 2017 – May 2019 and May 2019 – 2020 respectively, and only 2 birds from March 2020 – June 2021 (G Castley, D Guthrie & T Roselli unpublished data). Although these records were only opportunistic and not bound to transects, the numbers suggest a decrease in the south-eastern glossy black cockatoo in the landscape.

The Committee considers that the subspecies has undergone a substantial reduction in numbers over three generations (35.7 years for this assessment), based on the expert panel estimates and the survey data, and the reduction and the cause of the reduction has not ceased, as the frequency, intensity and extent of future wildfires is expected to increase. Therefore, the subspecies has met the relevant elements of Criterion 1 to make it eligible for listing as **Vulnerable**.

Criterion 2 Geographic distribution as indicators for either extent of occurrence AND/OR area of occupancy

		Critically Endangered Very restricted	Endangered Restricted	Vulnerable Limited
B1.	Extent of occurrence (EOO)	**< 100 km²**	**< 5,000 km²**	**< 20,000 km²**
B2.	Area of occupancy (AOO)	**< 10 km²**	**< 500 km²**	**< 2,000 km²**
AND at least 2 of the following 3 conditions:				
(a)	Severely fragmented OR Number of locations	**= 1**	**≤ 5**	**≤ 10**
(b)	Continuing decline observed, estimated, inferred or projected in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals			
(c)	Extreme fluctuations in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals			

Criterion 2 evidence

Not eligible

The EOO and AOO for the subspecies are 470,000 km² (range 447,000–493,500 km²) and 40,000 km² (range 21,000–80,000 km²), respectively (Cameron et al. 2021). Around 34% of the 1x1 km squares from which birds have been record since 1990 were burnt (G Ehmke unpublished data cited in Cameron et al. 2021), and around 48% of habitat was estimated to be affected by the

2019/2020 bushfires (Legge et al. 2021), but this impact is not enough to reduce the AOO below the threshold for consideration as Vulnerable.

As the subspecies' geographic distribution is not considered as limited, therefore the subspecies does not meet the required elements to be listed as threatened under this criterion.

Criterion 3 Population size and decline

	Critically Endangered Very low	Endangered Low	Vulnerable Limited
Estimated number of mature individuals	< 250	< 2,500	< 10,000
AND either (C1) or (C2) is true			
C1. An observed, estimated or projected continuing decline of at least (up to a max. of 100 years in future)	Very high rate 25% in 3 years or 1 generation (whichever is longer)	High rate 20% in 5 years or 2 generation (whichever is longer)	Substantial rate 10% in 10 years or 3 generations (whichever is longer)
C2. An observed, estimated, projected or inferred continuing decline AND its geographic distribution is precarious for its survival based on at least 1 of the following 3 conditions:			
(a) (i) Number of mature individuals in each subpopulation	≤ 50	≤ 250	≤ 1,000
(a) (ii) % of mature individuals in one subpopulation =	90 – 100%	95 – 100%	100%
(b) Extreme fluctuations in the number of mature individuals			

Criterion 3 evidence

Eligible under Criterion 3 C1 + C2a(ii) **for listing as** Vulnerable

The estimated total number of mature individuals of this subspecies is limited at 7,500 (range 6,000–10,500) mature individuals (Cameron et al. 2021). An estimated decline is ongoing at a substantial rate. Expert predictions suggest a decline over three generations of 22%, and possibly as high as 46% (Legge et al. 2021). Further, the geographic distribution is precarious for the survival of the subspecies as all the mature individuals are considered as one subpopulation.

The estimated total number of mature individuals of this species is limited, an observed and estimated continuing decline is ongoing at a high rate, and the geographic distribution is precarious for the survival of the subspecies as all of mature individuals is considered to be one population. Therefore, the subspecies has met the relevant elements of Criterion 1 to make it eligible for listing as **Vulnerable**.

Criterion 4 Number of mature individuals

	Critically Endangered Extremely low	Endangered Very Low	Vulnerable Low
D. Number of mature individuals	< 50	< 250	< 1,000
D2.[1] *Only applies to the Vulnerable category* Restricted area of occupancy or number of locations with a plausible future threat that could drive the species to critically endangered or Extinct in a very short time			D2. Typically: area of occupancy < 20 km² or number of locations ≤ 5

[1] The IUCN Red List Criterion D allows for species to be listed as Vulnerable under Criterion D2. The corresponding Criterion 4 in the EPBC Regulations does not currently include the provision for listing a species under D2. As such, a species cannot currently be listed under the EPBC Act under Criterion D2 only. However, assessments may include information relevant to D2. This information will not be considered by the Committee in making its recommendation of the species' eligibility for listing under the EPBC Act, but may assist other jurisdictions to adopt the assessment outcome under the *common assessment method*.

Criterion 4 evidence

Not eligible

The total population size for the subspecies is estimated to be around 7,500 mature individuals (range 6,000–10,500), which is not considered to be low. Therefore the subspecies has not met this required element of this criterion.

Criterion 5 Quantitative analysis

	Critically Endangered Immediate future	Endangered Near future	Vulnerable Medium-term future
Indicating the probability of extinction in the wild to be:	≥ 50% in 10 years or 3 generations, whichever is longer (100 years max.)	≥ 20% in 20 years or 5 generations, whichever is longer (100 years max.)	≥ 10% in 100 years

Criterion 5 evidence

Insufficient data to determine eligibility

Population viability analysis has not been undertaken. Therefore, there is insufficient information to determine the eligibility of the species for listing in any category under this criterion.

Adequacy of survey

Although there is sufficient evidence to support the assessment, survey results have been inconsistent, and long-term regional monitoring is lacking for the subspecies. A standardised, range-wide, long-term monitoring program would benefit any conservation planning for the south-eastern glossy black cockatoo.

Public consultation

Notice of the proposed amendment and a consultation document was made available for public comment for 36 business days between 9 July and 27 August 2021.

Listing and Recovery Plan Recommendations

The Threatened Species Scientific Committee recommends:

(i) that the list referred to in section 178 of the EPBC Act be amended by **including** *Calyptorhynchus lathami lathami* in the list in the Vulnerable category.

(ii) that there should be a recovery plan for this species.

Threatened Species Scientific Committee