

NSW Threatened Species Scientific Committee

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Notice of and reasons for the Final Determination

The NSW Threatened Species Scientific Committee, established under the *Biodiversity Conservation Act 2016* (the Act), has made a Final Determination to list the Blue-winged parrot *Neophema chrysostoma* (Kuhl 1820) as a VULNERABLE SPECIES in Part 3 of Schedule 1 of the Act. Listing of Vulnerable species is provided for by Part 4 of the Act.

The NSW Threatened Species Scientific Committee is satisfied that the Blue-winged parrot *Neophema chrysostoma* (Kuhl 1820) has been duly assessed by the Commonwealth Threatened Species Scientific Committee under the Common Assessment Method, Department of Climate Change, Energy, The Environment and Water (DCCEEW) 2023. The acceptance of this assessment is provided for by Part 4.14 of the Act.

The NSW Threatened Species Scientific Committee accepts the assessment outcome of the Commonwealth Threatened Species Scientific Committee in its Conservation Advice for the Blue-winged parrot *Neophema chrysostoma* of Vulnerable under Criterion 1: A2bc (DCCEEW 2023).

Summary of Conservation Assessment

Neophema chrysostoma (Kuhl 1820) (Psittacidae) was found to be Vulnerable in accordance with the following provisions in the *Biodiversity Conservation Regulation 2017*: Clause 4.2 (1)(c)(2)(b)(c). The main reason for this species being eligible for listing in the Vulnerable category is a moderate reduction in population size based on reporting rates and a contraction of the Area of Occupancy.

The NSW Threatened Species Scientific Committee has found that:

1. *Neophema chrysostoma* is a slender parrot with an olive-green head and upper body, grading into light green on the fore-neck (Higgins 1999). *Neophema chrysostoma* can grow up to 24 cm in length with a weight of less than 50 g (Higgins 1999). The upper tail is green-blue, with yellow sides. The underparts are yellow, and there may be orange in the centre of the belly. A yellow facial patch extends back to the eye (Higgins 1999). A narrow, dark blue band runs from eye to eye across the forehead. *Neophema chrysostoma* gets its name from the large, dark blue patch on the wings. The female is similar to the male, but with slightly duller colours (Higgins 1999).
2. *Neophema chrysostoma* breeds on mainland Australia south of the Great Dividing Range in southern Victoria from Port Albert in Gippsland west to Nelson, and sometimes in the far south-east of South Australia, and the north-western, central and eastern parts of Tasmania (Emison *et al.* 1987; Higgins 1999). A partial migrant, variable numbers of birds migrate across Bass Strait in winter. During the non-breeding period, from autumn to early spring, birds are recorded from northern Victoria, eastern South Australia, south-western Queensland and western New

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South Wales with some birds reaching south-eastern New South Wales and eastern Victoria, particularly on the southern migration (Higgins 1999).

3. The Extent of Occurrence (EOO) for *Neophema chrysostoma* is estimated to be 170,000 km² (range 155,000–190,000 km²) with a stable trend; however, the Area of Occupancy (AOO) is conservatively estimated to be 11,000 km² (range 9,000–19,000 km²) and is contracting (Holdsworth *et al.* 2021). The EOO and AOO for this species was based on all records since 1990 (Holdsworth *et al.* 2021). The EOO was calculated using a minimum convex hull, and the AOO calculated using a 2 x 2 km grid cell method, based on the IUCN Red List Guidelines (2022).
4. While there are no quantitative data available for *Neophema chrysostoma*, there are estimated to be 10,000 mature individuals in the wild. There is a broad agreement from experts that the population has undergone a moderate reduction (30-50%) over three generations (11 years), based on the reporting rates in the core range of Tasmania and Victoria (M Holdsworth, B Green, P Menkhorst, J Starks unpublished cited in Holdsworth *et al.* 2021). In Tasmania, reporting rates from regular 5 km area searches across the north declined by 77% from 2008–2018, and by 75% across the state from 2001–2005 to 2013–2017. At two long-term monitoring sites in north-western Tasmania, reporting rates from 5 km area searches declined by >75% from 1999–2016 (Newman & Ashby 2018) and 64% from 2010–2020 (M Newman unpublished cited in Holdsworth *et al.* 2021). Reporting rates from the breeding range in southern Victoria declined by 59% and 26% for 2 ha 20 min surveys and 500 m area searches, respectively, from 2009–2019 (BirdLife Australia 2020; Cornell Lab 2020). Reporting rates in the non-breeding range of inland New South Wales, South Australia and Queensland are too low for analysis (Holdsworth *et al.* 2021).
5. *Neophema chrysostoma* breed in Tasmania, coastal south-eastern South Australia and southern Victoria. During the breeding season (spring and summer), birds occupy eucalypt forests and woodlands (Higgins 1999). *Neophema chrysostoma* form monogamous pairs and nests are made in hollows, preferably with a vertical opening, in live or dead trees or stumps. Usually 4–6 eggs are laid on a bed of decaying wood (Higgins 1999). The female alone incubates the eggs, leaving the nest at intervals to be fed by the male. Both parents feed the nestlings (Higgins 1999).
6. Before migrating from Tasmania in autumn, *Neophema chrysostoma* congregate on saltmarshes and agricultural land before departing north (Higgins 1999). While on the mainland, mobile flocks feed in saltmarsh and rough pasture in coastal Victoria. *Neophema chrysostoma* are known to move more than 100 km inland during winter to feed in semi-arid chenopod shrubland and sparse grassland (Holdsworth *et al.* 2021).
7. Although there is no clear explanation for the population decline of *Neophema chrysostoma*, declines have likely been caused by habitat loss caused by land clearing, inappropriate fire regimes and habitat degradation caused by domestic livestock. Other threats to *N. chrysostoma* are increased likelihood of extreme weather events, predation, predation by cats and foxes, competition for tree

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hollows, invasive weeds, Psittacine Beak and Feather Disease and in Tasmania - introduced Sugar Gliders.

8. Habitat loss caused by land clearing is a major, likely threat to *Neophema chrysostoma*. Since European settlement over 80% of woodlands in south-east Australia have been cleared (Bradshaw 2012). Remaining remnants are generally isolated and small, and often below the critical size needed to sustain healthy populations of many bird species (Olsen *et al.* 2005). Additionally, as habitats become increasingly fragmented due to clearing, native birds become more vulnerable to the other threats, such as predation by feral species and destructive fires, and lose the ability to recolonise once suitable habitat recovers (Olsen *et al.* 2005). The ongoing fragmentation and degradation of remnant vegetation can also disrupt essential ecosystem processes such as pollination, seed dispersal and regeneration (Jackson *et al.* 2016). Land clearing continues to remove habitat particularly in Tasmania, given that up to 40 ha can now be cleared without a permit (FPA 2020).
9. Adverse fire regimes are a major, likely threat to *Neophema chrysostoma*. Little is known about the appropriate fire regime for *N. chrysostoma*, particularly in fragmented landscapes, the potential for negative outcomes from management actions is high, especially within nesting habitat. Fires destroy key nesting habitat in old large/mature trees). Frequent fires can deplete the soil seed bank, and reduce soil seed viability (Wilson & Bignall 2009), which may contribute to *N. chrysostoma* decline through reduced seed availability leading to food shortages. Fire suppression can be as detrimental as too frequent fires (Wilson & Bignall 2009). Infrequent fire can result in wood thickening and loss of grassy woodlands, granivorous species and general biodiversity (Olsen *et al.* 2005).
10. Habitat degradation caused by domestic livestock grazing presents a major, likely threat to *Neophema chrysostoma*. A reduction or removal of understorey can reduce foraging sites, reduce shelter, and consequently increase the risk of predation (Olsen *et al.* 2005). Unlike native herbivores, most domestic stock are hard-hoofed and cause significantly more damage to soil structure from compaction, and damage to native plants by trampling (Willson & Bignall 2009). Another major impact of livestock grazing is its interaction with weed invasion (Maron & Lill 2005). Livestock grazing can exacerbate weed spread through seed dispersal, soil and vegetation disturbance, and nutrient enrichment (Maron & Lill 2005).
11. The increased likelihood of extreme events, as a result of climate change, is a major, likely threat to *Neophema chrysostoma* and its habitat. *Neophema chrysostoma* is vulnerable to extreme heatwaves that overwhelm their physiological limits (McKechnie *et al.* 2012). Since 1950, the number of record hot days (above 35°C) across Australia has more than doubled and the mean temperature has increased by about 1.4 °C since 1910 (BOM & CSIRO 2020; IPCC 2021). Heatwaves are also lasting longer, reaching more extreme maximum temperatures, and occurring more frequently over many regions of Australia (Perkins-Kirkpatrick *et al.* 2016; Evans *et al.* 2017; Herold *et al.* 2018; BOM & CSIRO 2020). Heatwaves also exacerbate drought, which in turn can increase

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bushfire risk and may also reduce the productivity of coastal saltmarsh and other habitats used by *N. chrysostoma* in the nonbreeding season (Holdsworth *et al.* 2021).

12. While considered a species native to the Australian mainland, Sugar Gliders *Petaurus breviceps* are thought to be introduced to mainland Tasmania (Gunn 1851; Rounsevell *et al.* 1991; Lindenmayer 2002; Hui 2006). Nest predation by introduced *P. breviceps* are inferred to pose a minor, likely threat to *Neophema chrysostoma*, based on research on Swift Parrots *Lathamus discolor* (Stojanovic *et al.* 2014; Heinsohn *et al.* 2015). *P. breviceps* not only prey on nesting young and eggs of *L. discolor*, but also often kill the sitting female (Stojanovic *et al.* 2014; Heinsohn *et al.* 2015).
13. Predation by Feral Cats *Felis catus* (Commonwealth of Australia 2015a, 2015b) and Foxes *Vulpes vulpes* is a minor, likely threat to *Neophema chrysostoma*. As documented by Woinarski *et al.* (2017), the threat of *F. catus* may be amplified by bushfires as they take advantage of recently burnt areas (McGregor *et al.* 2016) and they prefer to hunt in open habitats (McGregor *et al.* 2015). *V. vulpes* may kill some *N. chrysostoma* on the mainland, given the species forages on the ground (Commonwealth of Australia 2008a, 2008b; Holdsworth *et al.* 2021).
14. A minor, likely threat to *Neophema chrysostoma* is the increase of competition for tree hollows. A large proportion of Australian bird species use tree hollows as nesting sites (Newton 1994), and almost all arboreal marsupials use tree hollows (e.g., breeding site or shelter; Lindenmayer *et al.* 1991). As a result, inter-specific competition may be a common occurrence, especially where the abundance of hollows has declined. It is crucial to implement actions to prevent the further loss of hollow-bearing trees in order to minimise the long-term risk of extinction of hollow-dependent species (Manning *et al.* 2013; Le Roux *et al.* 2014), including *N. chrysostoma*.
15. Invasive weeds present a minor, possible threat to *Neophema chrysostoma*. Invasive weeds have the ability to change the floristic and structural characteristics of habitat, thereby changing resource availability (French & Zubovic 1997). Furthermore, some weeds may increase the flammability of the habitat, amplifying bushfire risks (Salvo Aires 2014). More research is required to assess the specific weed species that may impact *N. chrysostoma* feeding and breeding habitats, and the extent of this threat.
16. Psittacine Beak and Feather Disease (Pbfd) is a widespread, lethal parrot disease, typically transferring between adults, nestlings and contaminated nest hollows (DEE 2016). Pbfd is a minor, possible threat to *Neophema chrysostoma*. *N. chrysostoma* are susceptible to Pbfd and with decreasing nesting hollows and intensified competition, it is possible that the likelihood of disease transmission could be greater in the future.
17. *Neophema chrysostoma* (Kuhl 1820) is not eligible to be listed as an Endangered or Critically endangered species.

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18. *Neophema chrysostoma* (Kuhl 1820) is eligible to be listed as a Vulnerable species as, in the opinion of the NSW Threatened Species Scientific Committee, it is facing a high risk of extinction in Australia in the medium-term future as determined in accordance with the following criteria as prescribed by the *Biodiversity Conservation Regulation 2017*:

Assessment against *Biodiversity Conservation Regulation 2017* criteria

The Clauses used for assessment are listed below for reference.

Overall Assessment Outcome: Vulnerable under Clause 4.2 (1)(c)(2)(b)(c)

Clause 4.2 – Reduction in population size of species

(Equivalent to IUCN criterion A)

Assessment Outcome: Vulnerable under Clause 4.2 (1)(c)(2)(b)(c)

(1) - The species has undergone or is likely to undergo within a time frame appropriate to the life cycle and habitat characteristics of the taxon:			
	(a)	for critically endangered species	a very large reduction in population size, or
	(b)	for endangered species	a large reduction in population size, or
	(c)	for vulnerable species	a moderate reduction in population size.
(2) - The determination of that criteria is to be based on any of the following:			
	(a)	direct observation,	
	(b)	an index of abundance appropriate to the taxon,	
	(c)	a decline in the geographic distribution or habitat quality,	
	(d)	the actual or potential levels of exploitation of the species,	
	(e)	the effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites.	

Clause 4.3 – Restricted geographic distribution of species and other conditions

(Equivalent to IUCN criterion B)

Assessment Outcome: Not met.

The geographic distribution of the species is:			
	(a)	for critically endangered species	very highly restricted, or
	(b)	for endangered species	highly restricted, or
	(c)	for vulnerable species	moderately restricted.
and at least 2 of the following 3 conditions apply:			
	(d)	the population or habitat of the species is severely fragmented or nearly all the mature individuals of the species occur within a small number of locations,	
	(e)	there is a projected or continuing decline in any of the following:	
		(i)	an index of abundance appropriate to the taxon,
		(ii)	the geographic distribution of the species,
		(iii)	habitat area, extent or quality,

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	(iv)	the number of locations in which the species occurs or of populations of the species.
	(f)	extreme fluctuations occur in any of the following:
	(i)	an index of abundance appropriate to the taxon,
	(ii)	the geographic distribution of the species,
	(iii)	the number of locations in which the species occur or of populations of the species.

Clause 4.4 – Low numbers of mature individuals of species and other conditions

(Equivalent to IUCN criterion Clause C)

Assessment Outcome: Not met.

The estimated total number of mature individuals of the species is:		
(a)	for critically endangered species	very low, or
(b)	for endangered species	low, or
(c)	for vulnerable species	moderately low.
and either of the following 2 conditions apply:		
(d)	a continuing decline in the number of mature individuals that is (according to an index of abundance appropriate to the species):	
(i)	for critically endangered species	very large, or
(ii)	for endangered species	large, or
(iii)	for vulnerable species	moderate,
(e)	both of the following apply:	
(i)	a continuing decline in the number of mature individuals (according to an index of abundance appropriate to the species), and	
(ii)	at least one of the following applies:	
(A)	the number of individuals in each population of the species is:	
(I)	for critically endangered species	extremely low, or
(II)	for endangered species	very low, or
(III)	for vulnerable species	low,
(B)	all or nearly all mature individuals of the species occur within one population,	
(C)	extreme fluctuations occur in an index of abundance appropriate to the species.	

Clause 4.5 – Low total numbers of mature individuals of species

(Equivalent to IUCN criterion D)

Assessment Outcome: Not met.

The total number of mature individuals of the species is:		
(a)	for critically endangered species	extremely low, or
(b)	for endangered species	very low, or
(c)	for vulnerable species	low.

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Clause 4.6 – Quantitative analysis of extinction probability (Equivalent to IUCN criterion E)

Assessment Outcome: Data deficient

The probability of extinction of the species is estimated to be:			
	(a)	for critically endangered species	extremely high, or
	(b)	for endangered species	very high, or
	(c)	for vulnerable species	high.

Clause 4.7 – Very highly restricted geographic distribution of species– vulnerable species

(Equivalent to IUCN criterion D2)

Assessment Outcome: Not met

For vulnerable species,	the geographic distribution of the species or the number of locations of the species is very highly restricted such that the species is prone to the effects of human activities or stochastic events within a very short time period.
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Senior Professor Kristine French
Chairperson
NSW Threatened Species Scientific Committee

Supporting Documentation:

Department of Climate Change, Energy, the Environment and Water (DCCEEW) (2023). Conservation Advice for *Neophema chrysostoma* (Kuhl 1820).

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