

# NSW Threatened Species Scientific Committee

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## Notice 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 bird, Grey Falcon *Falco hypoleucos* Gould, 1841 as a VULNERABLE SPECIES in Part 3 of Schedule 1 of the Act and, as a consequence, to omit reference to Grey Falcon *Falco hypoleucos* Gould, 1841 from Part 2 of Schedule 1 (Endangered species) 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 Grey Falcon *Falco hypoleucos* Gould, 1841 has been duly assessed by the Commonwealth Threatened Species Scientific Committee under the Common Assessment Method (Commonwealth TSSC 2020). The acceptance of this assessment is provided for by Part 4.14 of the Act.

## Summary of Conservation Assessment

The Threatened Species Scientific Committee accepts the assessment undertaken by the Commonwealth Threatened Species Scientific Committee in its Conservation Advice, *Falco hypoleucos* Grey Falcon (CTSSC 2020).

Grey Falcon *Falco hypoleucos* Gould, 1841 was found to be Vulnerable in accordance with the following provisions in the *Biodiversity Conservation Regulation 2017*: Clause 4.5 (c) because the population of mature individuals is low.

The NSW Threatened Species Scientific Committee has found that:

1. The Grey Falcon is an elusive species endemic to mainland Australia. It is the rarest of six Australian members of the genus *Falco* (Olsen and Olsen 1986; Marchant and Higgins 1993). The Grey Falcon is a medium-sized raptor (400 – 500g) that exhibits reversed sexual dimorphism in body mass, with females weighing on average about 30 percent more than males (Schoenjahn 2011). The Grey Falcon is a compact, pale grey falcon with a heavy thick chest, long wings and dark wing tips (Debus 2019; Schoenjahn 2010). The under-body is pale grey, and the tail has narrow blackish bars. The chin, throat and cheeks are white in colour; adults are pale grey with fine blackish streaks, and juveniles are white with heavy dark streaks. The legs and toes, eye-ring, cere and base of the bill are bright orange-yellow, and the tip of the bill is black (Marchant and Higgins 1993).
2. The species occurs in arid and semi-arid Australia, including the Murray-Darling Basin and Eyre Basin areas of western New South Wales and continuing across central and Western Australia (Marchant and Higgins 1993). The species is mainly found where annual rainfall is less than 500 mm, except when wet years are followed by drought, when the species might become marginally more widespread, although it is essentially confined to the arid and semi-arid zones at all times (Schoenjahn 2018). The species is absent from areas east of the Great Dividing Range in New South Wales (Barrett *et al.* 2003; Schoenjahn 2018).

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3. The geographic distribution of the Grey Falcon is widespread. The extent of occurrence (EOO) is estimated at 6.1 million km<sup>2</sup>, and the area of occupancy (AOO) estimated at 6,000 km<sup>2</sup> (Garnett *et al.* 2011). These figures are based on the mapping of point records from post 1997 species observations, obtained from state governments, museums, CSIRO, and Birdlife Australia. The EOO was calculated using a minimum convex hull, and the AOO calculated using a 2x2 km grid cell method, based on the IUCN Red List Guidelines 2014.
4. The species consists of a single population (Marchant and Higgins 1993) and occurs at low densities across inland Australia (Birdlife International 2019). The total population size is now generally accepted to be <1,000 mature individuals (Schoenjahn 2011, 2018; Garnett *et al.* 2011; BirdLife International 2019; Schoenjahn *et al.* 2020) and considerably scarcer than previously thought (<5,000 individuals, Brouwer and Garnett 1990; Schoenjahn *et al.* 2020). Using data from the first Atlas of Australian Birds (Blakers *et al.* 1984), an estimated 200-350 pairs of Grey Falcons occur across Australia (Schoenjahn 2011). Using data from the second Atlas (Barrett *et al.* 2003), an estimate of some 550-915 pairs can be obtained. The average of the mid-point of the ranges from the two Atlases is about 500 pairs and is considered appropriately precautionary, especially considering the uncertainty of the data and historical declines (Garnett *et al.* 2011), thus the population is estimated at 999 mature individuals. More recent work on the genetic variation of the species is consistent with the <1,000 mature individual estimate (Commonwealth TSSC 2020).
5. The Grey Falcon frequents timbered lowland plains, particularly acacia shrublands that are crossed by tree-lined water courses (Garnett *et al.* 2011; Watson 2011; Schoenjahn 2013, 2018; Janse *et al.* 2015; Ley and Tynan 2016). The species has been observed hunting in treeless areas and frequents tussock grassland and open woodland, especially in winter (Olsen and Olsen 1986; Schoenjahn 2018).
6. While breeding, Grey Falcons feed almost exclusively on birds (Cupper and Cupper 1980, 1981; Harrison 2000; Aumann 2001; Falkenberg 2011; Sutton 2011; Schoenjahn 2013; Janse *et al.* 2015; Ley and Tynan 2016). Prey species include doves, pigeons, small parrots and cockatoos and finches, but a variety of other bird prey species have been recorded (Marchant and Higgins 1993, Hollands 1984; Debus and Rose 2000; Schoenjahn 2013, Cook 2014, Fisher 2015). Non-avian prey recorded by direct observation include small mammals on three occasions (Schoenjahn 2013, Moore 2016) and a lizard (Czechura 1981).
7. Breeding occurs from June to November. Clutch size can vary from 1 – 4 eggs (Olsen and Olsen 1986; Garnett *et al.* 2011; Schoenjahn 2013). Eggs are laid in the old nests of other birds, particularly those of other raptors or corvids. The nests chosen are usually in the tallest trees along watercourses, particularly *Eucalyptus camaldulensis* (River Red Gum) and *E. coolabah* (Coolibah), but falcons also nest in telecommunication towers (Marchant and Higgins 1993; Schoenjahn 2013, 2018; Falkenberg 2011). The incubation period is 34–35 days (Cupper and Cupper 1980; Hollands 1984; Sutton 2011; Ley and Tynan 2016) and the nestling period is variously

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given as 49–52 days (Cupper and Cupper 1980), 41 days (Hollands 1984), 42–49 days (Hollands 2003) and ‘just under 6 weeks’ (Sutton 2011), suggesting that the lower end may be more realistic and in line with other similar-sized Australian falcons. Typically, young Grey Falcons and their parents will stay together for up to at least 12 months after fledging, even when the parents have a new brood (Schoenjahn 2018).

8. Several key threats have been identified as affecting the Grey Falcon (Schoenjahn 2018). The highest risk is posed by predation of both adults and chicks by feral cats (*Felis catus*) (Schoenjahn 2018) and grazing by feral herbivores such as cattle and goats limiting the growth of suitable nesting trees (Garnett *et al.* 2011; Schoenjahn 2018). ‘Predation by feral cats’ is listed in the Act as a Key Threatening Process.
9. Other identified threats which may impact Grey Falcons include increased temperatures in arid Australia affecting the species’ ability to thermoregulate effectively (Schoenjahn 2018), a small population size which is susceptible to demographic and genetic stochastic events, nest shortages through land clearing (Garnett and Crowley 2000; Garnett *et al.* 2011; Schoenjahn 2013, 2018) and removal of artificial structures such as communications towers (Schoenjahn 2018), human disturbance and collisions with traffic, powerlines and fences (Schoenjahn 2011, 2018). Illegal poaching of eggs was formerly also considered a threat (Cupper and Cupper 1981; Hollands 1984; Dennis 1986; SAOA 1992) but the impact of illegal activities such as this appear to be very minor at present (Schoenjahn 2018).
10. No population trend data for the Grey Falcon are currently available. The species occurs at low densities across arid and semi-arid Australia. There is uncertainty about historical declines and recent evidence of declines is lacking (Reid and Fleming 1992; Garnett *et al.* 2011). Garnett *et al.* (2011) considered that past, present or future population declines are unlikely to exceed 20 per cent in any 3-generation period (18.6 years; Garnett *et al.* 2011) and found no evidence to support a continuing population decline or extreme fluctuations.
11. Grey Falcon *Falco hypoleucos* Gould, 1841 is not eligible to be listed as an Endangered or Critically endangered species.
12. Grey Falcon *Falco hypoleucos* Gould, 1841 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*:

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## Assessment against *Biodiversity Conservation Regulation 2017* criteria

The Clauses used for assessment are listed below for reference.

**Overall Assessment Outcome: Vulnerable under Clause 4.5 (c).**

### Clause 4.2 – Reduction in population size of species

**(Equivalent to IUCN criterion A)**

**Assessment Outcome: Clause not met.**

<b>(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:</b>			
	(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.
<b>(2) - The determination of that criteria is to be based on any of the following:</b>			
	(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: Clause not met.**

<b>The geographic distribution of the species is:</b>			
	(a)	for critically endangered species	very highly restricted, or
	(b)	for endangered species	highly restricted, or
	(c)	for vulnerable species	moderately restricted,
<b>and at least 2 of the following 3 conditions apply:</b>			
	(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,
		(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,

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	(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 C)**

**Assessment Outcome: Clause not met.**

<b>The estimated total number of mature individuals of the species is:</b>		
(a)	for critically endangered species	very low, or
(b)	for endangered species	low, or
(c)	for vulnerable species	moderately low,
<b>and either of the following 2 conditions apply:</b>		
(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: Vulnerable under Clause 4.5 (c)**

<b>The total number of mature individuals of the species is:</b>		
(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: Clause 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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Professor Caroline French  
Deputy Chairperson  
NSW Threatened Species Scientific Committee

### Supporting Documentation:

Commonwealth Threatened Species Scientific Committee (2020) Conservation Advice, *Falco hypoleucos* Grey Falcon. Commonwealth Threatened Species Scientific Committee, Canberra.

### References:

Aumann T (2001) An intraspecific and interspecific comparison of raptor diets in the south-west of the Northern Territory, Australia. *Wildlife Research* 28: 379–393.

Barrett G, Silcocks A, Barry S, Cunningham R, Poulter R (2003) The New Atlas of Australian Birds. Birds Australia (Royal Australasian Ornithologists Union), Melbourne.

BirdLife International (2019) Species factsheet: *Falco hypoleucos*. Downloaded from <http://www.birdlife.org> on 07/05/2019.

Blakers M, Davies SJJF, Reilly PN (1984) The atlas of Australian birds. Royal Australasian Ornithologists' Union, Victoria.

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- Brouwer J, Garnett S (eds) (1990) Threatened birds of Australia – an annotated list. RAOU Report No. 68 Royal Australasian Ornithologists' Union, Melbourne.
- Cook D (2014) A tern up for the books. *Australian Birdlife* 3: 62.
- Commonwealth TSSC (2020) Conservation Advice, *Falco hypoleucos* Grey Falcon. Commonwealth Threatened Species Scientific Committee, Canberra.
- Cupper J, Cupper L (1980) Nesting of the Grey Falcon *Falco hypoleucos*. *Australian Bird Watcher* 8: 212–219.
- Cupper J, Cupper L (1981) Hawks in Focus. Jaclin, Mildura Vic., Australia.
- Czechura GV (1981) Some notes on the Grey Falcon. *Australasian Raptor Association News* 2(2): 9–10.
- Debus S (2019) *Birds of Prey of Australia: A Field Guide*, 3rd edn. CSIRO Publishing, Melbourne.
- Debus SJS, Rose AB (2000) Diet of Grey Falcons *Falco hypoleucos* breeding extraliminally in New South Wales. *Australian Bird Watcher* 18: 280–281.
- Dennis T (1986) South Australian area co-ordinator's report for 1985. *Australasian Raptor Association News* 7(2): 24–25.
- Falkenberg ID (2011) Aspects of the ecology of the Grey Falcon *Falco hypoleucos* in the South Australian arid zone. *Corella* 35: 23–28.
- Fisher KD (2015) Grey Falcon eating Australian Pratincole. *Boobook* 33: 51.
- Garnett ST, Crowley GM (2000) *The Action Plan for Australian Birds 2000*. Environment Australia, Canberra.
- Garnett ST, Szabo JK, Dutson G (2011) *The Action Plan for Australian Birds 2010*. CSIRO, Melbourne.
- Harrison R (2000) Observations on the Grey Falcon *Falco hypoleucos*. *Australian Bird Watcher* 18: 267–269.
- Hollands D (1984) *Eagles, Hawks and Falcons of Australia*. Nelson Australia, Melbourne.
- Hollands D (2003) *Eagles, Hawks and Falcons of Australia*, 2nd edn. Bloomings Books, Melbourne.
- Janse I, Kloecker U, Roshier D, Witte I (2015) Breeding diet and behaviour of a pair of Grey Falcons *Falco hypoleucos* and their offspring in north-western New South Wales. *Corella* 39: 46–51.

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- Ley A, Tynan B (2016) Observations on nesting Grey Falcons, *Falco hypoleucos*. South Australian Ornithologist 41: 49–64.
- Marchant S, Higgins PJ (Eds) (1993) Handbook of Australian, New Zealand & Antarctic Birds, Vol. 2: Raptors to Lapwings. Oxford University Press, Melbourne.
- Moore ED (2016) Grey Falcon *Falco hypoleucos* taking a small mammal as prey. Australian Field Ornithology 33: 30–31.
- Olsen PD, Olsen J (1986) Distribution, status, movements and breeding of the Grey Falcon *Falco hypoleucos*. Emu 86: 47–51.
- Reid J, Fleming M (1992) The conservation status of birds in arid Australia. Rangeland Journal 14: 65–91.
- SAOA [South Australian Ornithological Association] (1992) Threatened birds of South Australia. Pp. 6.1–6.11 in Tay, S. P. (Ed.), Threatened species and habitats in South Australia - a catalyst for community action, Conservation Council of South Australia, Adelaide.
- Schoenjahn J (2010) Field identification of the Grey Falcon *Falco hypoleucos*. Australian Field Ornithology 27: 49–58.
- Schoenjahn J (2011) Morphometric data of recent specimens and live individuals of the Grey Falcon *Falco hypoleucos*. Corella 35: 16–22.
- Schoenjahn J (2013) A hot environment and one type of prey: investigating why the Grey Falcon (*Falco hypoleucos*) is Australia's rarest falcon. Emu 113: 19–25.
- Schoenjahn J (2018) Adaptations of the rare endemic Grey Falcon *Falco hypoleucos* that enable its permanent residence in the arid zone of Australia. PhD Thesis. University of Queensland
- Schoenjahn J, Pavey CR, Walter GH (2020) Ecology of the Grey Falcon *Falco hypoleucos* – current and required knowledge. *Emu* **120(1)**: 74-82.
- Sutton AJG (2011) Aspects of the biology of the Grey Falcon *Falco hypoleucos* in the Pilbara region of Western Australia. Corella 35, 11–15.
- Watson C (2011) A failed breeding attempt by the Grey Falcon *Falco hypoleucos* near Alice Springs, Northern Territory. Australian Field Ornithology 28, 167–179.