NSW SCIENTIFIC COMMITTEE

Scientific Committee
Determination Advice – Number 13/02

The Scientific Committee has made the following Determination:

Species/ Population/ Community/KTP	Type of Determination	Proposed Date to be Gazetted	Notices will be Published in the Following Newspaper(s)	Date of Publication
Black Falcon *Falco subniger*	Final	12/04/13	Barrier Daily Truth	12/04/13
			Border Mail	12/04/13
			Central Coast Express	
			Advocate	12/04/13
			Grafton Examiner	12/04/13
			Illawarra Mercury	12/04/13
			Newcastle Herald	12/04/13
			Northern Star	12/04/13
			Sunraysia Daily	12/04/13
			The Rural	12/04/13
			Coffs Coast Advocate	13/04/13
			Tweed Daily News	13/04/13
			Country Leader	15/04/13
			North West Magazine	15/04/13
			South East Town and	
			Country Magazine	15/04/13
			Southern Weekly Magazine	15/04/13
			Western Magazine	15/04/13
			Macarthur Chronicle	16/04/13
			Blue Mountains Gazette	17/04/13
			Daily Telegraph	17/04/13
			Hawkesbury Gazette	17/04/13
			Mid Coast Observer	17/04/13
			Port Macquarie Express	17/04/13
			Sydney Morning Herald	17/04/13
			Byron Shire News	18/04/13
			Scone Advocate	18/04/13
			Taree Manning Great Lakes	18/04/13
			Extra	
			The Land	18/04/13

Please make this Notice and Determination available for public inspection at Office of Environment and Heritage (NPWS) Area Offices/Visitor Centres from 12th April, 2013 to 7th June, 2013.

Sue Chate
Executive Officer
Scientific Committee
(02) 9585 6940

Office of Environment and Heritage (NPWS) Area Offices and Visitors Centres are requested to place a copy of Scientific Committee Determinations on Public Display

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NSW SCIENTIFIC COMMITTEE

Notice of Final Determination

The Scientific Committee has made a Final Determination to list the following in the relevant Schedule of the Threatened Species Conservation Act.

Vulnerable Species (Part 1 of Schedule 2)
Black Falcon *Falco subniger* G.R. Gray, 1843

A copy of the Determination, which contains the reasons for the determination, may be obtained free of charge on the Internet www.environment.nsw.gov.au, by contacting the Scientific Committee Unit, PO Box 1967 Hurstville BC 1481. Tel: (02) 9585 6940 or Fax (02) 9585 6606, or in person at the Office of Environment and Heritage Information Centre, Level 14, 59-61 Goulburn Street, Sydney. Copies of the determination may also be obtained from National Parks and Wildlife Service Area Offices and Visitor Centres, subject to availability.

Associate Professor Michelle Leishman
Chairperson
Scientific Committee

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NSW SCIENTIFIC COMMITTEE

Final Determination

The Scientific Committee, established by the Threatened Species Conservation Act, has made a Final Determination to list the Black Falcon *Falco subniger* G.R. Gray, 1843 as a VULNERABLE SPECIES in Part 1 of Schedule 2 of the Act. Listing of Vulnerable species is provided for by Part 2 of the Act.

The Scientific Committee has found that:

1. The Black Falcon *Falco subniger* G.R. Gray 1843 (family Falconidae), is a large (45-55 cm in length), very dark falcon with pale grey cere, eye-rings and feet. It is uniformly dark brown to sooty black, with a pale throat and an indistinct black streak below each eye. Some individuals have faint, narrow barring under the wings and tail. The dark form of the Brown Falcon *Falco berigora* is sometimes mistaken for the Black Falcon. However the Brown Falcon can be distinguished by its double cheek-mark, longer legs, bicoloured, barred underwings and comparatively slow flight (Debus 1998).

2. The Black Falcon is widely, but sparsely, distributed in New South Wales, mostly occurring in inland regions. Some reports of 'Black Falcons' on the tablelands and coast of New South Wales are likely to be referable to the Brown Falcon. In New South Wales there is assumed to be a single population that is continuous with a broader continental population, given that falcons are highly mobile, commonly travelling hundreds of kilometres (Marchant & Higgins 1993). The Black Falcon occurs as solitary individuals, in pairs, or in family groups of parents and offspring. Individuals may congregate at food sources (*e.g.* after fires which expose prey, when there are irruptions of quail or button-quail, or during locust plagues).

3. The Black Falcon inhabits woodland, shrubland and grassland in the arid and semi-arid zones, especially wooded watercourses and agricultural land with scattered remnant trees. The Black Falcon is usually associated with streams or wetlands, visiting them in search of prey and often using standing dead trees as lookout posts. Habitat selection is generally influenced more by prey densities than by specific aspects of habitat floristics or condition, although in agricultural landscapes the Black Falcon tends to nest in healthy, riparian woodland remnants with a diverse avifauna (Debus *et al.* 2005). Much of the best habitat of the Black Falcon in New South Wales is likely to occur on private land (*i.e.* agricultural or pastoral land), rather than in reserves (*e.g.* Debus *et al.* 2005; Debus & Olsen 2011; Debus & Tsang 2011).

4. The Black Falcon feeds mostly on other birds, especially flocking, ground-feeding granivores such as pigeons and parrots, but also some small mammals, large insects and occasionally carrion (*e.g.* road kill) (Marchant & Higgins 1993; Debus *et al.* 2005; Debus & Olsen 2011; Debus & Tsang 2011). Some of its key avian prey are strongly affected by farming practices, with the abundance of terrestrial grassland birds including quail, button-quail, pipits, larks and songlarks being sensitive to the intensity of livestock grazing pressure (Marchant & Higgins 1993). In agricultural areas the Black Falcon sometimes consumes introduced Common Starlings *Sturnus vulgaris* and Rock Doves *Columba livia*, which may lead to the bioaccumulation of pesticide residues in the Black Falcon (Olsen 1990; Olsen *et al.* 1993). Rock Doves may also be a vector for disease (*e.g.* trichomoniasis, which infects raptors via their prey) (Olsen 1990). In inland New South Wales, most of the former native mammalian prey species of the Black Falcon are now extinct ('critical weight range' terrestrial mammals of rabbit size or smaller, *e.g.* large rodents: Van Dyck & Strahan 2008). The European Rabbit *Oryctolagus cuniculus*, has historically formed a high proportion of the Black Falcon's diet by biomass, but following the spread of rabbit calicivirus after its release in 1996, and the consequent decline in rabbit numbers by 65-85% in the arid and semi-arid zones, the Black Falcon is now likely to be increasingly dependent on native prey, especially other birds (Marchant & Higgins 1993; Falkenberg *et al.* 2000; Sharp *et al.* 2002; Debus *et al.* 2005; Debus & Olsen 2011; Debus & Tsang 2011).

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5. Breeding pairs of Black Falcons defend their nesting territories against other predators and competitors, and use the same breeding territories in successive years. The Black Falcon's home range is undetermined, but is likely to be larger than that of the comparable Peregrine Falcon *Falco peregrinus* in the temperate zone (*i.e.* more than 100 km^2) (Marchant & Higgins 1993). Nesting densities are variously one pair per 15 km^2 (four pairs in 60 km^2, with 4-5 km between nests) in arid-zone floodplain woodland during good seasons, and one pair in 134 km^2 during average to dry years in the sheep-wheat belt (Marchant & Higgins 1993). Black Falcons nest in old stick nests, typically built by corvids or sometimes other raptor species, in the top of emergent trees in woodland, particularly riparian woodland. A clutch of three or four eggs is laid between winter and late spring. The incubation period is five weeks, the nestling period six to seven weeks, and the post-fledging dependence period lasts at least three weeks. Generation length is unknown for Black Falcons but is estimated as six years for the similar Grey Falcon *Falco hypoleucos* (Garnett *et al.* 2011) and seven years for the Peregrine Falcon (Garnett *et al.* unpublished data).

6. The national population size of the Black Falcon was estimated in the 1990s to be in the upper thousands to possibly 10,000 or more birds (Ferguson-Lees & Christie 2001). This estimate was made before the reduction in rabbit prey associated with the release of rabbit calicivirus, and more recent surveys suggest that the species has undergone decline. A population estimate of between 3,000 and 5,000 mature individuals in New South Wales was made by P. McDonald (*in litt.* 2008), based on the low encounter rate of the species, especially breeding birds, in the second national bird atlas (Barrett *et al.* 2003a). While there is considerable uncertainty associated with these population estimates, and no published estimates are available for New South Wales, it is likely that the population size of the Black Falcon in New South Wales is moderately low, numbering fewer than 10,000 individuals.

7. Five lines of evidence from broad-scale surveys are also indicative of a decline in the population size of the Black Falcon since 1980. Firstly, at a national scale, Barrett *et al.* (2003b) flagged the Black Falcon as among those grassland bird species showing a 30-50% national decline during the preceding 20 years (approximately three generations), with declines greatest in south-eastern Australia. Secondly, in the eastern sheep-wheat belt of Australia, a statistically significant between-atlas decline in reporting rate of 38% over three generations was identified (Debus 2009). Thirdly, the species was reported in 59 one-degree grids in New South Wales in the first national bird atlas in 1977-1981, at mostly moderate to high reporting rates (11-40%) (Blakers *et al.* 1984), and 55 one-degree grids in the second national bird atlas in 1998-2002, at low reporting rates (10-20%) (Barrett *et al.* 2003a). This represents an apparent decline of 19% in New South Wales in the 20 year period between the two atlases (Barrett *et al.* 2007). However, this decline was not statistically significant, at least partly because of low statistical power, and the model was flagged as unstable and possibly inaccurate (Barrett *et al.* 2007). Between-atlas comparisons for some species also need to be interpreted cautiously because of changes in methodology between atlases, although this may not be such an issue for the Black Falcon, given that an ecologically similar species with a larger sample size (Australian Hobby *Falco longipennis*, a bird-eating falcon of open habitats), was shown to have equal detectability in the two bird atlases (Barrett *et al.* 2003a). Fourthly, a separate data set collected by the New South Wales Bird Atlassers, is also indicative of a continuing decline in Black Falcon abundance in New South Wales. These data were collected using consistent methods over time and are based on continuous survey records which allow a more statistically powerful analysis of trends. A linear regression fitted through yearly reporting rates from 1977 to 2006 indicates a significant reduction of 43% in the reporting rate over the 29 year period (approximately four generations). Finally, recent data confirm that on the New South Wales Southern Tablelands, the decline in frequency of sightings has continued over the last two to three decades (Debus & Olsen 2011). While the magnitude of decline of a rare species determined from broad-scale reporting rates must be interpreted with caution, the available data strongly suggest a continuing decline in abundance of Black Falcons in New South Wales.

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8. The main threats to Black Falcons are thought to be the clearing of habitat in the semi-arid zone, and the degradation of habitat by overgrazing, with likely effects on the Black Falcon's foraging habitat, nest sites and food supply (Marchant & Higgins 1993). Of particular concern is the loss of breeding populations after destruction of their riparian nest trees (Olsen 1990) as a result of clearing and degradation of riparian woodlands (Debus 2012). 'Clearing of native vegetation' and the 'Removal of dead wood and dead trees' are listed as Key Threatening Processes in New South Wales under the *Threatened Species Conservation Act* 1995.

9. The Black Falcon may also be threatened by human disturbance to nest sites, pesticide accumulation, and collisions with power lines and wind turbines. A potential threat to the falcon's breeding productivity in the agricultural zone is competition for, and interference at nests by overabundant ravens and cockatoos (Debus & Tsang 2011). A new potential threat is an outbreak of Newcastle disease (paramyxovirus) in domestic and feral pigeons, which is killing some bird-eating raptors in Victoria, and is likely to spread through the native pigeon and raptor population (V. Hurley pers. comm. March 2012).

10. The Black Falcon *Falco subniger* G.R. Gray, 1843 is not eligible to be listed as an Endangered or Critically Endangered species.

11. The Black Falcon *Falco subniger* G.R. Gray, 1843 is eligible to be listed as a Vulnerable species as, in the opinion of the Scientific Committee, it is facing a high risk of extinction in New South Wales in the medium-term future as determined in accordance with the following *c*riteria as prescribed by the *Threatened Species Conservation Regulation* 2010:

Clause 8 Low numbers of mature individuals of species and other conditions

The estimated total number of mature individuals of the species is:
(c) moderately low,
and:
(d) a projected or continuing decline is observed, estimated or inferred in either of the key indicators:
  (a) an index of abundance appropriate to the taxon or,
  (b) the geographic distribution, habitat quality or diversity, or genetic diversity of the species.

Associate Professor Michelle Leishman
Chairperson
Scientific Committee

Proposed Gazettal date: 12/04/13
Exhibition period: 12/04/13 – 07/06/13

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