The Minister approved this conservation advice on 5 May 2016; and confirmed this species 16 July 2000 inclusion in the Vulnerable category.

Conservation Advice

Polytelis swainsonii

superb parrot

Taxonomy

Conventionally accepted as *Polytelis swainsonii* (Desmarest, 1826).

Summary of assessment

Conservation status

Vulnerable: Criterion 1 A4(a)(c)

The highest category for which *Polytelis swainsonii* is eligible to be listed is Vulnerable.

Polytelis swainsonii has been found to be eligible for listing under the following listing categories:

Criterion 1: A4(a)(c): Vulnerable

Species can be listed as threatened under state and territory legislation. For information on the listing status of this species under relevant state or territory legislation, see http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl

Reason for conservation assessment by the Threatened Species Scientific Committee

The superb parrot was listed as Endangered under the predecessor to the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) the Endangered *Species Protection Act 1992* and transferred to the EPBC Act in June 2000.

This advice follows assessment of information provided by public nomination to change the listing status of *Polytelis swainsonii.*

Public Consultation

Notice of the proposed amendment and a consultation document was made available for public comment for greater than 30 business days between 17 November 2014 and 9 January 2015. Any comments received that were relevant to the survival of the species were considered by the Committee as part of the assessment process.

Species Information

Description

The superb parrot is a medium-sized (36–42 cm long; 133–157 g weight) slender, long-tailed green parrot. Adult males are bright green above and below, with a bright yellow forehead, throat and cheeks, and a narrow red band separating the yellow throat from the green breast. Adult females are green all over, somewhat duller than the males, and lacking the male's yellow

and red head and throat markings. Immature birds are similar to females, with young males being a slightly brighter green (Pizzey & Knight, 1997; Higgins, 1999).

Distribution

The core range of the superb parrot is west of the Great Dividing Range in New South Wales (NSW) from Canberra (Australian Capital Territory, ACT), Goulburn and as far west as Nyngan and Swan Hill. In Victoria, the species is now largely confined to Barmah forest area with sightings south to Shepparton and east to Wangaratta and Corryong along the Murray River. Superb parrots disappeared from central and southern Victoria in the early 1900s, and from most of northern Victoria by 1930 (Webster & Ahern, 1992), and are absent from large parts of the Riverina and northern Victoria that are climatically optimal (Manning et al*.,* 2005). There are three main breeding areas: an area of the south-west slopes bounded by Molong, Rye Park, Yass, Coolac, Cootamundra and Young (NSW); along the Murrumbidgee River, between Wagga Wagga and Toganmain Station, and farther north at Goolgowi (NSW); and along the Murray and Edward Rivers, from east of Barmah and Millewa State Forest to south of Taylors Bridge (NSW and Victoria) (Baker-Gabb, 2010). Local abundance outside the breeding season has a strong positive relationship with plant productivity, but this can vary from year to year. Therefore, a general winter movement into northern NSW is not necessarily a regular migration (Manning et al*.,* 2007).

Relevant Biology/Ecology

In the Riverina, the superb parrot nests in loose colonies in large, living or dead trees with many hollow branches, typically near a watercourse. On the inland slopes, they use at least six species of eucalyptus (Webster, 1988), but have a particular reliance on Blakely's red gum *E. blakelyi* (Manning et al., 2006). An assumed reliance on white box (*E*. *albens)* and yellow box (*E. melliodora)* (Webster 1988) remains unproven (Manning et al., 2006). Most nest sites are within 10 km of box-gum woodland and are sometimes within it (Manning et al., 2004). In Canberra, they also nest in semi-urban environments where old trees have been retained. The same nest hollows are used in successive years, although it is not known if it is always by the same pair (Webster & Ahern 1992; Davey 1997; Manning et al., 2004). After breeding, superb parrots use a variety of woodland types and other habitat types (Webster 1988), including artificial habitats such as crops and recreation reserves. They mostly feed on the ground, where they take a variety of native and introduced seeds, but also in shrubs and trees on seeds and blossom (Webster, 1988). A generation time of 7.5 years (BirdLife International 2011) is derived from an age at first breeding of 1.0 year and a maximum longevity in the wild of 14.0 years (Baker-Gabb 2011).

Threats

The major threats to superb parrots are:

Loss and degradation of habitat: There has been widespread habitat loss across the superb parrot range, primarily involving the destruction or degradation of box-dominated woodlands for agricultural purposes (Webster 1988; Baker-Gabb 2011). Estimates suggest that in some parts of the range, such as the NSW south western slopes, over 90 percent of the suitable habitat has been cleared with remaining patches occurring mostly along roadsides or in small scattered remnant patches on private land (Baker-Gabb 2011). Manning et al. (2013) has also shown the loss of large hollow bearing trees will continue to decline into the future unless urgent action is taken. The loss of old, hollow-bearing trees is of particular concern as it is thought that it takes at least 120 years – but likely much longer - before trees can form hollows suitable for superb parrot nests (Manning et al., 2004).

Live nest trees are also threatened by logging for production forestry and for firewood collection, and by artificially high water levels as a result of irrigation. Much of the remnant habitat is also degraded, with regeneration of nest trees prevented by overgrazing by stock and rabbits (*Oryctolagus cuniculus)*, and by inappropriate fire regimes (Webster & Ahern 1992).

Competition for nest hollows: With a dearth of potential nest sites, competition with other species, particularly the common starling (*Sturnus vulgaris*), galah (*Eolophus roseicapilla*) and the little (*Cacatua sanguinea*) and long-billed corella (*C. tenuirostris*) may become a problem (Webster 1988). There are also anecdotal reports of feral honey bees taking over superb parrot nesting hollows, although the significance and level of impact on the species is not known.

Road kills: Superb parrots are often killed in collisions with vehicles as they frequently use remanent habitat found along road sides. The impacts of this are compounded in rural areas due to the propensity for the parrots to feed in flocks and their willingness to forage on spilled grain. In these instances, many individuals may be killed in a single incident.

Illegal removal of wild birds: There are many wild caught birds held in captivity in Australia (Garnett 1992). Although accurate estimates are not available, it is believed that in the past many thousands of wild caught birds have illegally entered the aviculture trade (Baker-Gabb 2011). The extent of this problem remains unknown.

Psittacine beak and feather disease (PBFD): Superb parrots are susceptible to PBFD, a fatal disease confined to old and new world parrots. PBFD is typically transferred between adults and nestlings. The ongoing loss of nest hollows is likely to intensify competition and use of nest trees, and thus may increase the likelihood of transmission of the disease.

Climate change: Bioclimatic modelling has shown that the superb parrot is highly sensitive to climate change (Manning et al.., in review). Recent modelling using the BIOCLIM climatic predictive model (Nix 1986, Busby 1991, Nix and Switzer 1991, Xu and Hutchinson 2013) has shown the bioclimatic range of the superb parrot will decline by around 47 percent by 2050 and by 75 percent by 2070. The future bioclimatic core range of the superb parrot will likely focus around the ACT and an area to the immediate north. This has implications for long-term superb parrot conservation as this area is already highly modified and other work (Manning et al., 2013) has demonstrated that nest trees are continuing to decline in this region and that, under a 'business as usual' scenario, are likely to decline by a further 38 percent from current levels by 2050 (Manning et al., 2013, Manning et al., in review).

How judged by the Committee in relation to the EPBC Act Criteria and Regulations

Criterion 1. Population size reduction (reduction in total numbers)
Population reduction (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

Evidence:

Eligible under Criterion 1 A4(a)(c) for listing as Vulnerable

The 'State of Australia's Birds 2015' (SOAB) report (Birdlife Australia 2015) provides a comprehensive analysis of the broad trends in Australian bird numbers between 1999 and 2013. Based on more than 8,000 surveys (2 ha 20 minute standardized method), the SOAB report shows that there was no overall change in the reporting rate for the superb parrot during this period. The analysis reveals that a statistically significant increase in reporting during the period 2001 to 2006 was met with a statistically significant decline during the period 2006-2011, with the peak reporting rate occurring in 2006. Overall, the superb parrot trend pattern was one of weak (non-significant) decline, indicating that the 2013 mean predicted reporting rate for the superb parrot was likely lower than in 2000, when the species was originally listed as Vulnerable under the EPBC Act.

Ellis and Taylor (2014) undertook a long-term study in the central western plains of NSW, looking at changes in the abundances of bird species between the drought years of 2005-2009 and the post-drought period of 2010-2013. This study showed that reporting rates for superb parrots declined by approximately 50 percent between the two time periods. This finding is consistent with the SOAB report, as the first survey period used by Ellis and Taylor coincides with the peak reporting rates for superb parrots in SOAB report. Both studies then showed consistent declines in superb parrot reporting rates between 2010 and 2013.

Additional evidence suggesting ongoing declines in superb parrot numbers over recent times comes from unpublished data provided by Manning et al. (unpublished data). Manning et al., (2006) surveyed 81 sites in 2001 across an area of 23,000 km^2 to determine habitat use. In follow-up to that research, 14 sites were randomly selected and re-surveyed in 2013 and again in 2014. The raw data from those surveys indicated a decline in superb parrot numbers of 67.2 percent between 2001 and 2014. Using a hierarchical generalised linear model to determine the trend resulted in a modelled decline of 53.2 percent over the 13 year period (Manning et al., unpublished data).

The loss of tree hollows for nesting has been raised as a significant long-term concern for superb parrots and it has been speculated that the loss of nest trees will lock in future declines (Manning et al., 2013). However, the IUCN recently down listed superb parrots from Vulnerable to Least Concern (Birdlife International 2015) partly because they did not consider there was sufficient evidence of a link between decline in tree hollow availability and parrot abundance, such that declines in parrot numbers would exceed 30 percent over a three generation period. While no studies have explicitly linked tree hollow abundance to superb parrot breeding success across their range, superb parrots are obligate hollow breeders and there has been extensive loss of hollow bearing trees from within their range, and that loss is ongoing (Manning et al., 2013). Work by Manning et al., (2004) also suggests that it will take at least 120 years (and up to 220 years) for hollows to form in any newly planted trees that would be suitable for superb parrots, indicating that the past, current and future declines in hollow bearing trees will likely negatively impact on superb parrot numbers well into the future, although the extent of that impact is currently unknown.

In addition to the loss off hollow-bearing trees, research by Manning et al. (in review), has shown dramatic declines in superb parrot habitat may occur as a result of climate change. Modelling, using the BIOCLIM modelling package, showed a range contraction of up to 47 percent by 2050. The modelling also showed the core range of the superb parrot will likely be around the ACT and the areas to the immediate north. This part of the superb parrot range is already highly modified and previous work by Manning et al. (2013) has predicted ongoing declines in the number of nesting trees in this region as a result of current clearing practices. This will likely compound the impacts of climate change on this species.

Based on the information available there is sufficient evidence to support listing the superb parrot as Vulnerable under Criterion 1A4 (a)(c) as there are data showing declines across a substantial portion of their range from a number of sources over recent history (Birdlife Australia 2015; Ellis & Taylor 2014; Manning et al. unpublished data) and sufficient evidence to suspect that the population will continue to decline into the future due to the ongoing loss of woodland habitat, particularly of mature hollow-bearing trees, and the impacts of climate change which will likely lead to a range contraction for the species over the coming decades.

Criterion 2. Geographic distribution is precarious 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			

Evidence:

Not Eligible

The extent of occurrence for superb parrots was estimated to be approximately 81,200 km^2 and the area of occupancy estimated to be 1000 km^2 in the Bird Action Plan 2000 (Garnett and Crowley 2000). More recent estimates (using the IUCN 2x2km grid method) suggest the AOO is approximately 5,360km^2 and the EOO (using the convex hull method) is approximately

317,104 km^2 (ERIN 2015). The more recent estimates are beyond the range that would make the species eligible for listing under this criterion.

The information presented above demonstrates that the species is not eligible for listing under this criterion, as it does not have a limited extent of occurrence or area of occupancy.

Criterion 3. Small 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 3 years or 1 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**
	(ii) % of mature individuals in one subpopulation =	**90 – 100%**	**95 – 100%**	**100%**
(b)	Extreme fluctuations in the number of mature individuals			

Evidence:

Insufficient data to determine eligibility

There are no current agreed population estimates for the superb parrot. While the Action Plan for Australian Birds 2000 estimated the total population as approximately 6,500 adult birds and declining (Garnett & Crowley, 2000), the re-assessment of the species for the Action Plan for Australian Birds 2010 (Garnett et al., 2011) concluded that the number may be substantially greater than 10,000 with no evidence of recent declines. The IUCN Red List report, which was based on the unpublished data from the Action Plan for Australian Birds 2010 assessment, suggests there were between 10,000 and 20,000 mature individuals at the time of the 2010 assessment (Birdlife International 2012). The 2010 Action Plan estimates are also not generally agreed as accurate, as they were based primarily on an extrapolation from a 2001 study that found nearly 1,500 parrots in 53 out of 81 sites across an area of 23,000 km^2 (Manning et al., 2006) and that study was designed to determine habitat use and not to estimate population size or abundance. Potential difficulties in using that study to estimate overall population size are that the study site was selected as it was a key breeding area and the surveys were undertaken in the breeding season, which would have concentrated birds. Also, as part of that study, areas of high abundance were deliberately double-sampled in order to ensure enough birds were encountered to determine habitat use, thus likely inflating the densities further. The authors of that study did not provide a population estimate.

Considering the uncertainties around the Bird Action Plan 2000 population estimate, additional analysis and surveying are required before an assessment based on population size can be made under this Criterion.

Criterion 4. Very small population			
	Critically Endangered Extremely low	**Endangered Very Low**	**Vulnerable Low**
Number of mature individuals	**< 50**	**< 250**	**< 1,000**

Evidence:

Not eligible

While there is uncertainty over size of the adult population, no current estimates would suggest the population is as low as 1,000 individuals.

The information presented above appears to demonstrate that the species is not eligible for listing under this criterion, as the number of mature individuals is not extremely low, very low or low.

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**

Evidence:

Insufficient data to determine eligibility

A population viability analysis has not been undertaken for this species, therefore there is insufficient information to assess against this criterion.

Conservation Actions

Recovery Plan

There is a current national recovery plan for the superb parrot (Baker-Gabb 2011). This recovery plan identifies conservation actions to minimise the probability of extinction of the superb parrot in the wild, and to increase the probability of important populations becoming self-sustaining in the long term. This recovery plan should continue to be the focus of superb parrot conservation efforts. The recovery actions detailed below are consistent with the Recovery Plan.

Primary Conservation Action

Conservation of woodland habitats, with particular focus on protecting mature, hollow-bearing trees for nesting.

Conservation and Management Actions

- Place all areas of public land that provide, or potentially provide, nesting or foraging habitat for the species under secure conservation management, particularly those in timber reserves, transport corridors and local government land.
- Promote ecological management of woodland remnants on private land as well as the protection of old, hollow-bearing trees in paddocks.

- Using appropriate incentives, encourage landholders to engage in appropriate regeneration of potential future nest trees and foraging trees.
- Identify and revegetate critical breaks in flight corridors.
- Control and reduce firewood collection from areas occupied by the species, promoting wood-lot development close to markets, and reduce grazing densities under trees where necessary.
- Ensure measures are in place to eliminate grain spills along roadways in order to reduce the incidence of accidental deaths that arise from birds feeding off spilled grain.

Survey and Monitoring Priorities

- Develop and implement comprehensive monitoring strategy to determine population size, structure and trend.
- Map and monitor known nesting colonies and survey for new nesting sites.

Information and Research Priorities

- Survey and map areas of River Red Gum forest in the Riverina and woodlands on the NSW/ACT slopes and tablelands with high potential to support breeding colonies.
- Investigate the foraging ecology of the superb parrot.
- Identify and map all areas with high potential to be used for foraging during the breeding season, and areas used for foraging during the non-breeding season.
- Identify and map potential flight corridors between breeding colonies and potential or known foraging areas, and corridors used in the non-breeding season.

Recommendations

(i) The Committee recommends that *Polytelis swainsonii* should retain its current listing status of Vulnerable under the EPBC Act.

(ii) The Committee recommends that the current recovery plan should be maintained and updated as required.

Threatened Species Scientific Committee

01/03/2016

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