Threatened Species Assessment

Neophema chrysogaster
Orange-bellied Parrot

Taxonomy

Neophema chrysogaster (Latham, 1790)

Current conservation status

Listed as Critically Endangered under the *Environment Protection and Biodiversity Conservation Act 1999*.

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 1991).

Categorised as Critically endangered in the 2013 Advisory list of threatened vertebrate fauna in Victoria (DSE 2013).

Proposed conservation status

Critically Endangered in Victoria

Criterion D

Species Information

Description and Life History

The Orange-bellied Parrot is a small (approx. 45g) ground-feeding parrot which migrates between distinct breeding and non-breeding ranges. Breeding occurs in south-west Tasmania between November and March, and the birds overwinter on the coast of south-east mainland Australia between April and October (OBPRT 2006b). The migration route follows the west coast of Tasmania, and at least some birds stop on King Island during the northward migration in autumn (Holdsworth 2006).

Most known breeding activity occurs within 10 km of Melaleuca Lagoon, south-west Tasmania. The birds nest in natural hollows or man-made nest-boxes in tall Eucalypt forest and rainforest adjacent to moorland and sedgeland plains. Females usually lay 4-6 eggs and most nests produce fledglings. Pairs very rarely produce more than one brood in a breeding season. Long-term mean annual survival rates (measured at return to the breeding site) were 65% for adults and 56% for juveniles (Holdsworth et al. 2011). However, survival rates reported since 2010 have been much lower for both adult females and juveniles of both sexes; as low as 15% for in some years. Breeding participation of females is not always 100%, and the reasons for this are unknown. More significantly, in recent years (since 2010), annual survival of females has fallen well below long term averages and male survival, creating a strong sex bias in returns to the breeding site.

The birds appear to be semi-nomadic in winter, moving between food sources and locations, presumably in response to changing food availability (Ehmke and Tzaros 2009). The species appears to avoid areas with human developments and high disturbance rates (Ehmke 2009).

Generation Length

The generation length of the Orange-bellied Parrot is estimated to be 3.9 years. This was derived from Holdsworth et al. (2011), based in the average breeding age of birds monitored during the 2017 breeding season. Longevity is up to 9 years and juvenile survival is 15-30%.

Distribution

The Orange-bellied Parrot is endemic to south-eastern Australia. Breeding birds are currently restricted to an area around Melaleuca, south-west Tasmania (Holdsworth 2006). The migration route includes the coast of western Tasmania and King Island (Holdsworth 2006). Non-breeding birds are usually found along the coast of South Australia and Victoria, with well-supported records in the last 10 years limited to between Goolwa, South Australia and Corner Inlet, Victoria (BirdLife Australia unpubl. data). The non-breeding range also includes New South Wales, however sightings in that state are very rare, with the most recent sightings being two reports of single birds in 2003 (at Shellharbour and Maroubra beach).

As the population has become very small (estimated at less than 50 wild individuals (including immature individuals) for most of the period from 2010 to 2019), sightings in the non-breeding range have become rarer, with confirmed sightings in South Australia since 2013. Only a small proportion of the presumed total wild population is sighted in Victoria in any year, despite the probability that most of the population is over-wintering in Victoria.

Habitat

Non-breeding Orange-bellied Parrots feed on the seeds and flowers of low shrubs or prostrate vegetation, and roost in dense shrubs, usually within 10 km of the coast. Migrating birds are found in vegetated sand dunes, heathland, grasslands, saltmarsh and nearby pasture, usually within 5 km of the coast of west and north-west Tasmania (including offshore Islands) (M. C. Holdsworth unpubl. data). On the mainland, birds are usually found in locations associated with coastal saltmarshes and adjacent pastures, close to free-standing water bodies. The habitat preferences and food plant species used by the species appears to have become narrower in recent decades (Ehmke and Tzaros 2009, Ehmke et al. 2009).

Within saltmarshes, most birds forage on Beaded Glasswort, Austral Seablight (*Sueda australis*), and Shrubby Glasswort (*Tecticornia arbuscula*), usually within 50 m of a waterbody (Ehmke and Tzaros 2009). Throughout the non-breeding range Orange-bellied Parrots are also observed feeding on pastures, usually within 500 m of saltmarshes and 200 m of a water body (Ehmke and Tzaros 2009). In some cases the birds may feed in irrigated crops (Ehmke et al. 2009). Introduced food plant species include Wireweed (*Polygonum aviculare*), Capeweed *(Arctotheca calendula),* Fat Hen *(Chenopodium* spp.), and Plantain *(Plantago* spp.) (Ehmke *et a*l. 2009).

Threats

The historic decline of the Orange-bellied Parrot has been attributed largely to habitat degradation and loss. In the non-breeding range and migration route this is largely through development and land use change, inappropriate (altered) hydrological regimes, inappropriate grazing regimes, invasive weeds and direct disturbance from humans. In the breeding range habitat degradation is largely attributed to inappropriate fire regimes, as the species prefers feeding vegetation aged less than 8 years since fire. It is also assumed that introduced predators and competitors, and stochastic environmental events (e.g. the millennium drought) have had some impact on the population. It is possible part of the contraction of the breeding range was due to predation by sugar gliders, however the distribution of sugar gliders in the historic breeding range is poorly understood. This predator is not present at the last known breeding location. Other threats, for which there is less evidence for the impact include barriers to migration and movement, hybridisation with blue-winged parrots, and consumption of toxic food plants.

As the population has been very small (< 50 adults) since 2010, it is likely that additional factors are now having a more significant impact on recovery. In particular; loss of genetic diversity, allele effects (highly likely to be impacting the species in the more dispersed non-breeding range); and continued inappropriate fire regimes in the now limited breeding range are considered major current threats. In addition, there is some evidence that the smaller population is more exposed to risk from diseases, with the only documented year with significant losses of nestlings to Psittacine Beak and Feather Disease occurring during this period.

The species is also at risk due to climate change. There is some anecdotal evidence that heat waves during the breeding season may increase nestling mortality, and this may become more common with climate change. In addition, there is modelled evidence of the impacts of the millennium drought on non-breeding habitat extent, and events such as this are also likely to become more common with climate change.

IUCN Criteria

Criterion A. Population size reduction.
Population reduction (measured over the longer of 10 years or 3 generations) based on any of A1 to A4

	Critically Endangered	Endangered	Vulnerable
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 A2 as Endangered

The population reduction over the past 12 years is estimated to be 30 to 60%, based on (a) and (b) above.

The total population size has not varied significantly since 2010 when estimates became much more accurate. However, the number of wild adult females (naturally migrating) has decreased markedly, from close to parity in the returns group to the current very strong bias towards males in the returning birds. The situation has definitely worsened since 2010 despite a similar total population size. This is due to sharp declines in female survival and also declines in juvenile survival.

Criterion B. Geographic range in the form of either B1 (extent of occurrence) and/or B2 (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:

Eligible under Criterion B as Vulnerable

The Area of Occupancy (AoO) is estimated to be 572 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas (VBA).

The taxon is considered to occur in one location, as all key identified threats apply across its range in Victoria and can rapidly affect all individuals of the taxon present.

It has a continuing decline in (i), (ii) and (iii) above. There is a continuing decline in habitat quality at Lake Connewarre (hydrological changes) and Swan Island (changes to food availability and increased disturbance), and continued pressure from development on the Bellarine Peninsula. Also, there is a high likelihood that climate change may reduce habitat extent, and work by White et al. (2016) shows the vulnerability of habitat to drought (i.e. it results in temporary loss).

Criterion C. Small Population size and decline				
		Critically Endangered	Endangered	Vulnerable
Number of mature individuals		< 250	< 2,500	< 10,000
AND at least one of C1 or C2				
C1	An observed, estimated or projected continuing decline of at least (up to a max. of 100 years in future):	25% in 3 years or 1 generation (whichever is longer)	20% in 5 years or 2 generations (whichever is longer)	10% in 10 years or 3 generations (whichever is longer)
C2	An observed, estimated, projected or inferred continuing decline AND 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:

Ineligible under Criterion C

It is estimated that there are 6 to 40 mature individuals, but other thresholds under this criterion have not been met.

Criterion D. Very small or restricted population			
	Critically Endangered	Endangered	Vulnerable
Number of mature individuals (observed or estimated)	< 50	< 250	< 1,000
D2 Only applies to the VU 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: AoO < 20 km2 or number of locations ≤ 5

Evidence:

Eligible under Criterion D as Critically Endangered

The taxon is estimated to have 6 to 40 mature individuals. About 20 mature individuals are expected to return to the last known breeding site in most years (16 counted as of 2nd November 2018), however only three wild birds were females and the remaining wild males are likely to pair with recent captive released females (44 birds were released in the 2018-19 season, with a bias towards females).

A program began in 2013 supplementing Melaleuca birds. Some remained in the wild, but since about 2016 as many released adult females as possible have been "ranched" i.e. taken into captivity over winter for security at Healesville and the privately run Moonlit sanctuary near Pearcedale. They are then re-released at breeding sites in spring. In all, there may be 16 pairs which are participating in reproduction, and possibly likely a few surplus males. This includes some released captive-bred birds. But if the totally captive-bred birds, and the wild birds that will pair with the captive bred are excised from this count, then there are only 6 mature individuals.

Criterion E (Quantitative Analysis) was not addressed as the taxon does not have a detailed Population Viability Analysis.

References

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