Conservation Assessment of Lord Howe Pied Currawong *Strepera graculina crissalis* Sharpe, 1877(Artamidae)

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NSW Threatened Species Scientific Committee

Lord Howe Pied Currawong *Strepera graculina crissalis* Sharpe, 1877 (Artamidae)

Distribution: Endemic to Lord Howe Island (NSW)
Current EPBC Act Status: Vulnerable
Current NSW BC Act Status: Vulnerable

Proposed listing on NSW *BC Act* and *EPBC Act*: Endangered (D)

Conservation Advice: Lord Howe Pied Currawong *Strepera graculina crissalis* Sharpe, 1877(Artamidae)

Summary of Conservation Assessment

The Lord Howe pied currawong *Strepera graculina crissalis* was assessed by Carlile *et al.* (2021, in Garnett and Baker 2021) as Endangered and this assessment supports the findings of Carlile *et al.* (2021). The Lord Howe pied currawong *Strepera graculina crissalis* was found to be eligible for listing as Endangered under Criterion D (NSW *BC Act* clause 4.5 b). The reason for this species being eligible is that the total population is between 50–250 mature individuals.

Description and Taxonomy

The Lord Howe pied currawong *Strepera graculina crissalis* Sharp (1877), is a sub-species (endemic to Lord Howe Island) of the pied currawong *Strepera graculina*, there are an additional five sub-species of pied currawong that are recognised as occurring on mainland Australia.

SPRAT (2021) describes the Lord Howe pied currawong as “a large bird about 46 cm in length (Hutton 1991). It is mostly glossy black, but has bright orange irides, a small patch of white on each wing (at the base of the primary feathers), a large patch of white around the undertail coverts, a small patch of white at the base of the tail, and a white tip to the tail (Carlile 2007, pers. comm.; Higgins *et al.* 2006; Hutton 1991). The sexes are alike, but females are slightly smaller than males (Higgins *et al.* 2006; Schodde and Mason 1999). Juvenile and immature birds are similar to the adults, but they have a duller and (especially in juveniles) browner plumage, and juvenile birds also exhibit pale markings on the head, neck, upperbody, breast and wings, and have a yellow gape and, for the first eight months, a yellow tip on the bill (Carlile 2007, pers. comm.; Higgins *et al.* 2006).”

Distribution and Abundance

This species is restricted to Lord Howe Island (and nearby islets), to which it is endemic (Carlile *et al.* 2021; SPRAT 2021). Lord Howe Island (1455 ha, 31.54°S, 159.08°E), is located in the Tasman Sea, 585 km east of Port Macquarie (NSW) and 1550 km north-west of Auckland (New Zealand) (Segal *et al.* 2021). The island is an eroded volcanic remnant, 3 km wide by 11 km long, reaching a maximum height of

875 m (McDougall *et al.* 1981). Land cover is predominantly native vegetation, 75% of the Island is reserved for conservation and the Island is UNESCO world heritage listed (DECC 2007). Lord Howe pied currawongs occur across the Island, with aggregations of birds occurring at lower elevations in autumn and winter (Hutton 1991). Currawongs nest preferentially in close proximity to low elevation gullies in forested areas (Segal *et al.* 2021).

A high proportion (60%) of the islands' currawongs are banded with colour bands (Carlile *et al.* 2021; Segal *et al.* 2021), which has allowed detailed estimates of abundance to be made. The extent of the island and topography impose a limitation on the number of breeding territories, and the number of modelled territories is 84 (Segal *et al.* 2021). In 2006, the population was estimated using mark–recapture methods using 169 banded birds to be 215±11 birds of which 42 juveniles (Carlile and Priddel 2007). As part of a muroid rodent eradication program over 200 currawongs were captured and banded in 2019. A subset (129 currawongs) was held as a captive insurance program during the eradication program and subsequently released. Survival of the >70 wild birds during the eradication program was 65-85% (Carlile *et al.* 2021). The total population appears to have been relatively stable between 2006 and the present. Previous estimates, from the 1970s and 1980s of <100 birds (Recher and Clark 1974; Fullagar *et al.* 1974; Knight 1987; McFarland 1994) have been assessed as the likely result of counting inaccuracy rather than recent population growth (Carlile *et al.* 2021). Carlile *et al.* (2021) state the population is stable, the number of mature individuals is 235 (range 188-282) and there is one sub-population.

Carlile *et al.* (2021) provide a maximum, minimum and best estimate of extent of occurrence (EOO) and area of occupancy (AOO) as well as an indication of reliability. The EOO was estimated to be 26 (24-27) km^2 with a high reliability. The EOO is based on a minimum convex polygon enclosing all known mapped occurrences of the species, the method of assessment recommended by IUCN (2019). AOO was estimated to be 16 (12-17) km^2 with a high reliability, based on the species' occupying four 2 km x 2 km grid cells, the spatial scale of assessment recommended by IUCN (2019). Both AOO and EOO are stable (Carlile *et al.* 2021).

Ecology

This species occurs in all habitat types of Lord Howe Island, although nesting is confined to forested areas, typically tall rainforests and palm forests, near creek lines below ~120 m above sea level (SPRAT 2021; Segal *et al.* 2021). Life expectancy and the age of maturity are unknown however the species is likely capable of living to more than 20 years of age (Higgins *et al.* 2006; SPRAT 2021). Breeding has been recorded from October to December (Hindwood 1940; McAllan *et al.* 2004; McFarland 1994; Mills undated; SPRAT 2021) but possibly commences in in September (McAllan *et al.* 2004) or, even as early as July (Hull 1909).

The nest is cup-shaped and constructed from sticks and twigs, occasionally vines and range from 3 m to 25 m off the ground under a high canopy and within an open vegetation structure of palms (*Howea* spp.) and *Pandanus forsteri* (Forky Tree) (SPRAT 2021; Segal *et al.* 2021). Nest trees reported by Segal *et al.* (2021) included *Cryptocarya triplinervis* (Blackbutt), *Drypetes deplanchei* (Greybark), *Syzygium fullagarii* (Scalybark), *Olea paniculata* (Maulwood) and *Ficus macrophylla columnaris*

(Banyan). Nesting occurs in various vegetation communities including Greybark and Blackbutt rainforest, and Scalybark, Curly Palm (*Howea belmoreana*), Greybark, Cedar (*Guioa coriacea)*, Maulwood and Forky Tree lowland mixed forest (Segal *et al.* 2021). Two to three eggs, which are light-brown to rufous-brown in colour, with darker spots and blotches of brown and grey are laid in the nest and nestling are fed by both parents (Hindwood 1940; Hutton 1991; Carlile *et al.* 2021). Incubation period is 21 days and the young stay with the parents for about two months after fledging (SPRAT 2021; Segal *et al*. 2021). Breeding success was measured in the 2005-2006 breeding season, when five of twelve clutches observed produced at least one fledgeling, and one pair successfully reared two broods (a total of five fledgelings) (Carlile 2007, pers. comm. in SPRAT 2021). Generation length is estimated as 6.3 (range 4.7 - 7.9) years (Bird *et al.* 2020; Carlile *et al.* 2021).

This species is omnivorous and eats a variety of food items including fruits and seeds, insects and other invertebrates, small vertebrates, domestic poultry and the chicks of land and sea birds (Auld *et al*. 2010; Carlile and Priddel 2015; SPRAT 2021). Invertebrates comprise 65% of diet, and vertebrates 21%, with the introduced skink *Lampropholis delicata* the most common vertebrate prey item (Carlile and Priddel 2007; Carlile *et al.* 2021). This species is sedentary and breeding pairs defend a territory year-round, with occasional excursion outside of forested habitats to forage in areas across the island, such as orchards, seabird colonies and bird feeders (Higgins *et al.* 2006; Segal *et al.* 2021). Average territory size ranges between 2.48 ha and 5.23 ha (Segal *et al.* 2021).

Threats

Carlile *et al.* (2021) identified there are no plausible existential threats, but noted the restricted area of occupancy makes the subspecies susceptible to catastrophes, such as the introduction of another predator or disease. The risk is of such catastrophes was assessed by Carlile *et al.* (2021) as low, owing to quarantine procedures that minimise the probability of alien invasions. Historically (until the 1980s) local residents persecuted currawongs for attacking poultry, white terns and woodhens but this is now a rare occurrence (Carlile and Priddel 2015; McAllan and Hutton 2020). Introduced species including black rats *Rattus rattus* (introduced in 1918), and masked owls *Tyto novaehollandiae* (introduced 1920s) (Hindwood 1940; McAllan *et al.* 2004), had no impact on this species and have now been eradicated or are being actively managed Carlile *et al.* (2021).

Assessment against IUCN Red List criteria

For this assessment it is considered that the survey of Lord Howe pied currawong *Strepera graculina crissali* has been adequate and there is sufficient scientific evidence to support the listing outcome.

Criterion A *Population Size reduction*

Assessment Outcome: Not met

Justification: The population appears to be stable, with all breeding habitat occupied and a floating (non-breeding) population present.

Criterion B *Geographic range*

Assessment Outcome: Not met

Justification: The geographic distribution of this species is restricted (Carlile *et al*. 2021 list the AOO as 12-17 km^2 and the EOO as 24-27 km^2) and there is only one location, however, there is no evidence of decline or extreme fluctuation.

In addition to these thresholds, at least two of three other conditions must be met. These conditions are:

a) The population or habitat is observed or inferred to be severely fragmented or there is 1 (CR), ≤5 (EN) or ≤10 (VU) locations.

   Assessment Outcome: 1 location, not severely fragmented

   Justification: The island has a high proportion of forest cover and is not fragmented.

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

   Assessment Outcome: Not met

   Justification: Carlile *et al.* (2021) found the population to be stable over time

Criterion C Small population size and decline

Assessment Outcome: Not met

Justification: The population is small (188-282 mature individuals), but stable (Carlile *et al.* 2021).

At least one of two additional conditions must be met. These are:

C1. An observed, estimated or projected continuing decline of at least: 25% in 3 years or 1 generation (whichever is longer) (CR); 20% in 5 years or 2 generations (whichever is longer) (EN); or 10% in 10 years or 3 generations (whichever is longer) (VU).

   Assessment Outcome: Not met

   Justification: The population is stable (Carlile *et al.* 2021).

C2. An observed, estimated, projected or inferred continuing decline in number of mature individuals.

   Assessment Outcome: Not met

   Justification: The population is stable (Carlile *et al.* 2021).

   In addition, at least 1 of the following 3 conditions:

   a (i). Number of mature individuals in each subpopulation ≤50 (CR); ≤250 (EN) or ≤1000 (VU).

      Assessment Outcome: ≤250 (EN)

Justification: The population is small (188-282 mature individuals) (Carlile *et al.* 2021)

a (ii). % of mature individuals in one subpopulation is 90-100% (CR); 95-100% (EN) or 100% (VU)

Assessment Outcome: Clause met, 90-100% (CR)

Justification: There is only one population, so 100% of individuals are in a single sub-population

b. Extreme fluctuations in the number of mature individuals

Assessment Outcome: Not met

Justification: Carlile *et al.* (2021) found no evidence for extreme fluctuations.

Criterion D Very small or restricted population

Assessment Outcome: Endangered

Justification: The population is small (188-282 mature individuals), but stable (Carlile *et al.* 2021).

To be listed as Vulnerable under D, a species must meet at least one of the two following conditions:

D1. Population size estimated to number fewer than 1,000 mature individuals

Assessment Outcome: D1 met.

Justification: The population is small (188-282 mature individuals), but stable (Carlile *et al.* 2021).

D2. Restricted area of occupancy (typically <20 km^2) or number of locations (typically <5) with a plausible future threat that could drive the taxon to CR or EX in a very short time.

Assessment Outcome: Not met.

Justification: The AOO is >20km^2, the number of locations is 1, however there is no plausible future threat (Carlile *et al.* 2021).

Criterion E Quantitative Analysis

Assessment Outcome: Data Deficient

Justification: No population viability analysis available

Conservation and Management Actions

Conservation objectives

- Stable population (Carlile *et al.* 2021)

Conservation actions under way

- Most habitat conserved as World Heritage Area (Carlile *et al.* 2021)
- Listed as threatened under appropriate legislation (Carlile *et al.* 2021)

- Quarantine procedures that minimise the probability of alien invasions (Carlile *et al.* 2021)
- Rodent eradication completed but awaiting a biosecurity check to be declared successful (Carlile *et al.* 2021)
- Area of forested habitat increasing with plantings by local residents (Carlile *et al.* 2021)

Research required

- Track population recovery following removal of rodents (Carlile *et al.* 2021)

Management actions required

- Maintain quarantine procedures (Carlile *et al.* 2021)

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Experts consulted
Nicholas Carlile

APPENDIX 1

Assessment against *Biodiversity Conservation Regulation 2017* criteria
Overall Assessment Outcome:
The Lord Howe Pied Currawong *Strepera graculina crissalis* was found to be Endangered under Clause 4.5(b)

Clause 4.2 – Reduction in population size of species
(Equivalent to IUCN criterion A)
Assessment Outcome: Not met

(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,
		(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 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: Endangered

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.

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.