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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 Shy Albatross *Thalassarche cauta* Gould, 1840 as an ENDANGERED SPECIES in Part 2 of Schedule 1 of the Act; and as a consequence, to omit reference to the Shy Albatross *Thalassarche cauta* Gould, 1840 from Part 2 of schedule 1 (Vulnerable species) of the Act. Listing of Endangered species is provided for by Part 4 of the Act.

The NSW Threatened Species Scientific Committee is satisfied that Shy Albatross *Thalassarche cauta* Gould, 1840 has been duly assessed by the Commonwealth Threatened Species Scientific Committee under the Common Assessment Method. The acceptance of the Common Assessment Method is provided for in section 4.14 of the Act.

Summary of Conservation Assessment

The Shy Albatross *Thalassarche cauta* Gould, 1840 was found to be Endangered in accordance with the following provisions in the *Biodiversity Conservation Regulation 2017: Clause* 4.3 (b)(d) (e, i) because the Area of Occupancy of the species is highly restricted; there is a restricted number of locations; there is a projected continuing decline in the number of mature individuals for the Albatross Island subpopulation, and inferred declines in number of mature individuals for the Pedra Banca and Mewstone subpopulations.

The NSW Threatened Species Scientific Committee has found that:

1. The Shy Albatross is the only albatross species endemic to Australia. It is a medium-sized albatross measuring 90-100 cm in length with a wingspan of 2.1-2.6 m. The species is generally white with black upper wings, black margins and a dark tab intruding into the base of the underwing, and grey-black tail. The head has a distinctive white cap and contrasting pale grey face with dark eyebrow. The bill is relatively long and pale grey-yellow with a yellow tip, and yellow at the base of the upper beak. Immature birds have darker grey wash on the head and sides of the neck, with a grey bill with a darker tip (Pizzey & Knight 2012).

2. The species has breeding colonies on three small islands off Tasmania: Albatross Island in western Bass Strait, the Mewstone and Pedra Branca island in southern Tasmanian waters (Brothers *et al*. 1997). The two southern subpopulations are relatively proximate (50 km apart) and are separated from Albatross Island by 400 km and 450 km, respectively (Alderman *et al*. 2011). Adult Shy Albatrosses predominately occur in waters adjacent to Tasmania and southern Australia (Abbott *et al.* 2006a). The range of juvenile birds extends however across the Indian Ocean to southern Africa and potentially the south-western Atlantic Ocean (Barton 1979; Alderman 2012; Jiménez *et al*. 2015).

3. The geographic distribution of the Shy Albatross is restricted. The area of occupancy (AOO) has been defined as the total area of occupied breeding colonies. Multiplying the number of breeding locations (three) by the minimum grid size (2 x 2 km) gives an AOO of approximately 12 km^2. The number of locations upon which the AAO is based (three) is also restricted (Garnett *et al.* 2011; DoEE 2019c). High breeding site fidelity limits the capacity for the species to establish new breeding sites.

4. The Shy Albatross is a long-lived species with a generation length of at least 22 years (known aged individuals live up to 40-45 years), characterised by low annual adult mortality (<0.1 per cent), annual breeding, long-term pair-bonding, and low fecundity (one egg per breeding attempt) (Alderman *et al.* 2011; BirdLife International 2018; IUCN 2019; Garnett *et al*. 2011). The total population in 2017-18 was estimated at about 30 000 mature individuals (Alderman 2018).

5. Shy Albatross forage singly and take prey predominately from the sea surface but may dive to three metres and swim to over seven metres in depth (ACAP 2012). Their diet consists mainly of fish and cephalopods, with secondary foods including tunicates and crustaceans (Hedd & Gales 2001; Hedd *et al.* 2001). The species follows fishing vessels with fish processing discharges accounting for a significant portion of the diet (Brothers *et al.* 1998; Gales 1988; Marchant & Higgins 1990).

6. Shy Albatross are a colonial species (DSEWPC 2011a). The breeding cycle is about eight months long, although birds are present at the colonies year-round (ACAP 2012). The nests are a semi-permanent conical mound up to 30 cm in height composed of soil and a variety of organic material (MacDonald & Green 1963). Egg laying occurs predominately in September, with chicks hatching in December, and fledging commencing in April, when the birds are about four and a half months old, although there are minor variations between colonies (Abbott *et al.* 2006b). During incubation, and for the first three to four weeks after hatching, the parents alternate at the nest, with the chicks thereafter provisioned, but left unattended until fledging occurs (Brooke 2004; Hedd & Gales 2005). Breeding site fidelity is high for Shy Albatross (Abbott *et al.* 2003). Immature birds return to their breeding colony at least three years after fledging and commence breeding when at least five to six years old, with an average breeding age of nine years (Brothers *et al*. 1998; Hedd & Gales 2005; Alderman 2012).

7. Threats that have been identified for the Shy Albatrosses are that they remain vulnerable to injury and death associated with commercial fishing, particularly pelagic longline fishing, demersal longline fishing, demersal trawl, and mid-water trawl (Alderman *et al*. 2010; Alderman *et al*. 2011).

8. Climate change threats identified for the Shy Albatrosses include warmer air temperatures during the breeding season that are predicted to lead to declining breeding success on Albatross Island. The increased number of extreme heatwaves days cause mortality in surface nesting birds reducing breeding success. Heavier rainfall and increased storm surges during the breeding season and increases in sea surface temperatures that could result in declining ocean productivity reducing their ability to forage (Thomson *et al*. 2015).

9. Other threats which may impact on the Shy Albatross include the increased risk of disease, such as *Ixodes eudyptidis* (Tick) borne *Phlebovirus* (Hunter Island Group virus I) (Woods 2004; Wang *et al*. 2014; Uhart *et al*. 2018). This avian poxvirus clinically affects over 40 percent of pre-fledging chicks (Alderman 2018). Competition for nesting habitat, notably by *Morus serrator* (Australasian Gannet) and marine plastics ingestion and its associated chemical impacts.

10. The number of Shy Albatross breeding pairs on Albatross Island increased from 1998 to 2005, decreased from 2005 to 2017, and increased in 2018-19 due to a recruitment pulse. Despite the fluctuations in the empirical data on the number of breeding adults, the population model (and another model by Thompson *et al*. 2015) predicts a decline in the number of breeding females in the Albatross Island subpopulation of over 30 per cent in three generations (Carlyon 2019, pers comm, 19 July 2019, 10 October 2019). There are noted discrepancies between the model's predictions and the most recent empirical data. Although population models suggest a future decline, there is uncertainty around the extent of this decline.

11. Shy Albatross *Thalassarche cauta* Gould, 1840 is eligible to be listed as an Endangered 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:*

Assessment against *Biodiversity Conservation Regulation 2017* criteria
The Clauses used for assessment are listed below for reference.
Overall Assessment Outcome: Endangered under Clause 4.3 (b)(d) (e, i)

Clause 4.2 – Reduction in population size of species
(Equivalent to IUCN criterion A)
Assessment Outcome: Clause 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: Clause met for 4.3 (b)(d) (e, i)

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: Clause 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: Clause not met

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: 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.

Senior Professor Kristine French
Chairperson
NSW Threatened Species Scientific Committee

Supporting Documentation:

Commonwealth Threatened Species Scientific Committee (2020) Conservation Advice, *Thalassarche cauta* Shy Albatross. Commonwealth Threatened Species Scientific Committee, Canberra.

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