Publication date: 9 August 2024

Notice of 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 Latham's snipe *Gallinago hardwickii* (J.E. Gray, 1831) as a VULNERABLE SPECIES in Part 3 of Schedule 1 of the Act. Listing of Vulnerable species is provided for by Part 4 of the Act.

The NSW Threatened Species Scientific Committee is satisfied that Latham's snipe *Gallinago hardwickii* (J.E. Gray, 1831) has been duly assessed by the Commonwealth Threatened Species Scientific Committee under the Common Assessment Method, as provided by Section 4.14 of the Act. After due consideration of Commonwealth DCCEEW (2024), the NSW Threatened Species Scientific Committee has made a decision to list the species as Vulnerable.

Summary of Conservation Assessment

Latham's snipe *Gallinago hardwickii* (J.E. Gray, 1831) was found to be Vulnerable in accordance with the following provisions in the *Biodiversity Conservation Regulation 2017*: Clause 4.2 (1)(c)(2)(b) because: 1) the species has undergone a moderate reduction in population size of over 30% (possibly as high as 42%) over the last three generations (11-12 years); and 2) the causes of this reduction, notably drought, adverse fire regimes, and loss of wetland habitat, have not ceased.

The NSW Threatened Species Scientific Committee has found that:

1. Latham's snipe *Gallinago hardwickii* (J.E. Gray, 1831) (family Scolopacidae) is 29–33 cm long, has a wingspan of 50–54 cm, and weighs 150–230 g. It is a medium sized wader with a long, straight bill; rather short, broad, pointed wings; a long tail, and short legs. The species shows no sexual dimorphism and only demonstrates slight seasonal variation in plumage. Juveniles appear slightly different to adults. Latham's snipe has a black-brown crown with a narrow buff median stripe. The sides of the head are pale buff, grading into pale white on the chin. Fine dark streaks run along the lower face. The face also possesses a bold, narrow, dark-brown cheek stripe. A narrow black eye-stripe runs from the eye to the bill. On most individuals, the eye-stripe continues as two short, parallel dark stripes. One runs from the rear of the eye along to the upper border of the ear coverts, and the other runs from beneath the eye to the central ear-coverts. A broad cream or white supercilium extends from the bill to the sides of the nape. It is broad and bulging in front of the eye but much narrower behind the eye. Adult Latham's snipe also possess a thin white eye ring. The hindneck and sides of the neck are light-brown or buff, coarsely streaked black. The sides of the mantle are coarsely streaked cream and black. The rest of the mantle, upper back, and inner scapulars are black with some rufous-brown flecks. A bold buff V is present on the outer mantle, and a second buff V is present on the inner scapulars. The bird's tertials and inner greater-coverts are grey-brown, buff, or cinnamon, irregularly barred black. The lower back, rump and upper tail-coverts are light rufous-brown, finely barred darker and with white tips. The tail appears brightly rufous with a narrow black subterminal band and broader white tip. The throat, fore neck, and upper breast are light-brown

or buff with short dark streaks on the throat and upper fore neck. This grades into dark mottling over the rest of the underbody. The lower breast is white, usually with varying dark barring. The flanks are typically white, boldly barred dark. The vent and undertail coverts are light brown barred dark.

2. Latham's snipe is a migratory species. The species breeds in Hokkaido and highland areas of Honshu in Japan, and in Sakhalin and the nearby Kuril Islands of far eastern Russia (Nechaev 1994; RDBSO 2016). During migration, the species passes south through New Guinea and northern Australia, then remains in southeast Australia for the duration of the boreal winter. The species has been recorded along the east coast of Australia from Cape York Peninsula through to southeast South Australia. The range extends inland over the eastern tablelands in southeast Queensland, and west of the Great Dividing Range in New South Wales (Frith *et al*. 1977; Blakers *et al*. 1984; Barrett *et al*. 2003). Most birds spend the non-breeding period at sites located south of the Richmond River in New South Wales (Frith *et al.* 1977). The species is occasionally recorded at sites located to the west of the core range (e.g., in northwest New South Wales) (Frith *et al*. 1977; Blakers *et al*. 1984; Barrett *et al*. 2003).

3. The extent of occurrence (EOO) of Latham's snipe is estimated to be 3,430,000 km^2 and the area of occupancy (AOO) is estimated to be 13,000 km^2. The species' population is not severely fragmented, and the species is not subject to extreme fluctuations in EOO, AOO, number of subpopulations, locations, or mature individuals (Hansen *et al*. 2021).

4. There were estimated to be 20,300 Latham's snipe on Hokkaido in May 2020 based on counts of displaying males at a stratified sample of sites (Ura and Tajiri 2020). An additional 3,400 to 11,000 occur on Sakhalin, and smaller numbers breed in alpine grassland on Honshu (Hansen *et al*. 2021). The estimate from Hokkaido is 42% less than the estimate of 35,000 in 2018 (Ura *et al.* 2018), which was similar to the only other island-wide estimate of 37,000 in 1986 (Naarding 1986). The dominant cause of sudden population declines on the Japanese breeding grounds was the drought and fire in the Australian non-breeding grounds. The loss of wetlands across eastern Australia is also thought to be contributing to this decline.

5. Counts in Australia tend to be of small numbers from scattered locations, with most birds going undetected (Hansen *et al*. 2016), meaning that monitoring data are not suitable for Australian population estimation at this time. However, trend data from Australia indicates a decline of up to 30% of maximum flock sizes near Newcastle between the 1980s and 2010s (Maddock and Newman 2018). The most recent analysis by Rogers *et al*. (2023) estimated the mean change in the population of Latham's snipe reaching Australia was -3.8% annually (1993-2021) for an estimated total decline in arriving birds of 16% over three generations. This decline is lower than previous reports from Hokkaido. However, given the substantial reduction in population size estimated by the Japanese studies, an overall population reduction of greater than 30% is inferred until population stabilisation can be confirmed.

6. Latham's snipe feeds in soft mudflats or shallow water typically at night, early morning, or evening (BirdLife Australia 2021). The species is omnivorous and feeds on seeds and other plant material and on invertebrates including insects (mainly flies and beetles), earthworms, spiders, and occasionally molluscs, isopods, and centipedes (Frith *et al*. 1977; Todd 2000). The species feeds by thrusting its long bill into mud with an up and down 'sewing machine' action.

7. Latham's snipe can roost singly and in aggregations. They shelter during the day in small wetlands including urban water bodies, saltmarshes, as well as creek edges, where there is adequate shallow flooded or inundated substrate. They also use crops and pasture. They mostly are found among dense cover comprising sedges, grasses, lignum, reeds, and rushes. The bird tends to disperse after dusk to forage over larger areas.

8. Latham's snipe depart their breeding grounds from July to November (Naarding 1985; Higgins and Davies 1996) and arrive in northern Australia from late July to early August onwards (Frith *et al*. 1977; Higgins and Davies 1996). Individuals then move southward, passing along the coastline (Frith *et al*. 1977; Storr 1984) and arriving in southeastern Australia between August and November (Higgins and Davies 1996). Latham's snipe is dispersive during its stay in Australia. The species probably moves in response to rainfall and the availability of food (Frith *et al*. 1977). Most Latham's snipe depart southeastern Australia by late February or early March (Frith *et al*. 1977; Naarding 1982, 1983). Individuals travel north along the coasts of New South Wales and Queensland (Storr 1984) from February to April and arrive in Japan in April (Wolfe 1954; Naarding 1984, 1985), and in Russia in April and May (Higgins and Davies 1996). The species has also been reported to persist in Australia during the southern winter (i.e., the breeding season); these records are probably of immature birds or birds that are incapable of migrating because of being in poor condition (Naarding 1981, 1982).

9. The sudden decline in the population of Latham's snipe is attributed to Australia's extreme drought and large-scale fires during 2010 and 2019/20 (Ura and Tajiri 2020). Extreme drought conditions caused by climate change will likely become a major cause for further population declines. Additional threats in Australia include the drainage and diversion of water from wetlands, as well as urban development within potential Latham's snipe habitat (Higgins and Davies 1996; Hansen *et al*. 2021). 'Anthropogenic climate change', 'High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition', 'Clearing of native vegetation', and 'Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands' are listed as Key Threatening Processes under the Act.

10. Global drought extremes are projected to increase under future warming scenarios. Around Australia, warming of the climate has contributed towards a southward shift in weather fronts from the Southern Ocean, which typically bring rain to southern Australia during winter and spring. As these weather fronts have shifted southwards, rainfall in southern Australia has declined, increasing the risk of drought conditions. The region has also experienced significant warming during the last 50 years, with climate change driving an increase in the intensity and

frequency of hot days and heatwaves in Australia, exacerbating drought conditions (Steffen *et al*. 2018). The survival of Latham's snipe in drought years may be considerably lower than in years of extensive inland rainfall due to increases in physiological stress, fewer food resources, and a reduction in roosting site availability (Lindenmayer *et al*. 2018).

11. Approximately 12% of Latham's snipe habitat burned during the 2019/20 bushfires (Legge *et al*. 2020 in Commonwealth DCCEEW 2024), and these fires are considered a major driver in the sudden population reductions observed on the Japanese breeding grounds in 2020 (Ura and Tajiri 2020). Ongoing climate warming means that droughts in southeast Australia (and elsewhere) are now occurring on a warmer background climate state. As such, very extensive fire events are likely to re-occur in the future (Abram *et al.* 2021), further reducing the population of Latham's snipe.

12. Wetland loss and degradation in Australia has been severe and is still occurring. Approximately 84% of the human population in Australia live within the coastal region (Australian Bureau of Statistics 2002). The continuing population growth within coastal regions results in ongoing negative effects on coastal wetland ecosystems. Alongside direct habitat loss, urbanisation also affects the structure and function of coastal wetlands, mainly through modifying the hydrological and sedimentation regimes, and the dynamics of nutrients and chemical pollutants. In most cases, residential and commercial development in proximity to wetland areas eliminates or reduces habitat suitability for migratory shorebirds. In extreme cases, the complete loss of wetland areas can disrupt migratory pathways for the species (Lee *et al.* 2006). Although most Latham's snipe spend their non-breeding season in southern Australia, the loss of stopover sites further north can have two consequences for migratory shorebird populations: 1) Birds may not be able to store sufficient energy reserves for the ongoing migratory flight, thus failing to arrive at their destination; or 2) birds may arrive at their destination but perform poorly because of the carry over effects of inadequate refuelling during their migration, which could reduce reproductive success (Hua *et al*. 2015 in Commonwealth DCCEEW 2024).

13. High intensity grazing in wetlands can physically damage plants, cause soil disturbance, increase water turbidity, compact the soil, and create bare ground. These processes change the ecological attributes that underpin wetland conditions and often produce environmental conditions that are unsuitable for Latham's snipe (Morris and Reich 2013). For example, increased water turbidity and compacted soil can affect soil organisms and nutrient processing throughout the wetland. This can limit feeding efficiency and prevent successful fuel loading before migration. Furthermore, the creation of bare ground areas removes potential roosting habitat for Latham's snipe - which require low and dense vegetation.

14. Because of the above threats, Latham's snipe is suspected to have undergone a moderate reduction in the number of mature individuals over three generations (c. 11-12 years), possibly as high as 42%, and the causes have not ceased.

15. Latham's snipe *Gallinago hardwickii* (J.E. Gray, 1831) is not eligible to be listed as an Endangered or Critically Endangered species.

16. Latham's snipe *Gallinago hardwickii* (J.E. Gray, 1831) is eligible to be listed as a Vulnerable 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: Vulnerable under Clause 4.2 (1)(c)(2)(b)

Clause 4.2 – Reduction in population size of species
(Equivalent to IUCN criterion A)
Assessment Outcome: Vulnerable under Clause 4.2 (1)(c)(2)(b)

(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 Clause 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: 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: 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 DCCEEW (Department of Climate Change, Energy, the Environment and Water) (2024). Conservation advice for *Gallinago hardwickii* (Latham's snipe). Australian Government, Canberra, ACT.

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