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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 the common greenshank *Tringa nebularia* (Gunnerus, 1767) as an ENDANGERED SPECIES in Part 2 of Schedule 1 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 the common greenshank *Tringa nebularia* (Gunnerus, 1767) 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 the DCCEEW (2024), the NSW Threatened Species Scientific Committee has made a decision to list the species as Endangered.

Summary of Conservation Assessment

The common greenshank *Tringa nebularia* (Gunnerus, 1767) was found to be Endangered in accordance with the following provisions in the *Biodiversity Conservation Regulation 2017*: Clause 4.2 (1)(b)(2)(b) because: (1) the species is estimated to have undergone a large reduction in population size of up to 60.5% over the last three generations (11-20 years); and (2) the causes of this reduction, notably the loss of wetland habitat in Australia and overseas, have not ceased.

The NSW Threatened Species Scientific Committee has found that:

1. The common greenshank *Tringa nebularia* (Gunnerus, 1767) (family Scolopacidae) is 30–35 cm long, has a wingspan of 55–65 cm, and weighs approximately 170 g. They are a large and heavily built wader with a long and slightly upturned bill. The species shows no sexual dimorphism but does exhibit some seasonal variation in plumage. Juveniles are distinct from adults. The head and neck of breeding adults is white, heavily streaked black. They have an indistinct white fore-supercilium and a diffuse dark loral stripe that continues behind the eye. The bird also has a narrow white eye-ring. The feathers of the mantle, scapulars, and tertials vary. Some feathers are brownish-grey with white fringes and thin black shaft-streaks, others are black and are fringed or notched white, which tends to form untidy longitudinal black lines on the sides of the mantle or the scapulars. The inner wing coverts are mostly brownish-grey with white fringes, grading to black on the leading edge of the wing. The underbody is white with fine black streaks on the chin and throat. Heavier streaks are present on the fore neck and sides of the neck. Bold black chevrons are present on the breast and flanks. The underwing is white with faint brownish barring on the coverts. The bill is bluish-grey or greenish-grey on the basal half but grades to black at the tip. The legs and feet are pale greyish-green, sometimes greenish-yellow. The head and neck of non-breeding adults is paler than that of breeding adults. Non-breeding adults also have an incomplete loral stripe. Juveniles appear similar to non-breeding adults, but their head and neck is slightly darker with heavier, darker streaking.

2. The common greenshank has extensive breeding grounds across northern Europe and Siberia. Outside of its breeding range, the species is widespread. It is found in

Europe, Africa, Asia, Melanesia, and Australasia. In Australia, the common greenshank is widespread in coastal regions, occurs in all types of wetlands, and has one of the widest distributions of any shorebird in Australia (Higgins and Davies 1996). Individuals or small parties of common greenshanks occur on wetland habitats across the country (Weller *et al*. 2019). About 36% of the population visiting Australia are estimated to occur on inland wetlands, the remainder on the coast (Hansen *et al*. 2016 in DCCEEW 2024; Clemens 2017). Aside from on the coast in New South Wales (NSW), the species has been observed west of the Great Dividing Range, especially between the Lachlan and Murray Rivers and the Darling-Baaka River drainage basins, including the Macquarie Marshes and north-west regions (Higgins and Davies 1996).

3. The Australian extent of occurrence (EOO) of the common greenshank is estimated to be 10,200,000 km^2 and the Australian area of occupancy (AOO) is estimated to be 13,000 km^2.The number of mature common greenshanks in Australia is estimated to be 23,700 (range 16,300–33,400) mature individuals. Several studies have recorded declines in the common greenshank, with the following change over three generations (11–20 years): −32% (Clemens *et al*. 2016), −22% (Clemens 2017), −31% (Waterbird meta-analysis; Clemens *et al*. 2019) and −50% (Clemens *et al*. 2019). The most recent analysis by Rogers *et al*. (2023) estimated the mean change in population was -4.5% annually (1993-2021) for an estimated total decline of 60.5% over three generations. The mean annual change in the last 10 years (2012-2021) was -8.6%, suggesting the decline may have accelerated in recent times (Rogers *et al*. 2023).

4. The common greenshank forages at the edge of wetlands, in soft mud on mudflats, in channels, or within shallows around the edge of waterbodies. These locations are often situated near or among mangroves or other sparse, emergent or fringing vegetation such as sedges or saltmarsh. The bird occasionally feeds amongst seagrass beds. Its diet consists primarily of insects and their larvae (especially beetles), crustaceans, annelids, molluscs, amphibians (del Hoyo *et al*. 1996), small fish (mullet, clinids and tilapia; Hockey *et al*. 2005), and occasionally rodents (del Hoyo *et al.* 1996; BirdLife Australia 2021). The species feeds by picking from the surface, probing, sweeping, and lunging at the edges of mudflats or shallows. Common greenshanks may walk along the shoreline and even chase small fish in shallow water (BirdLife Australia 2021).

5. Common greenshanks roost both on the coast and inland, in estuaries and mudflats, mangrove swamps and lagoons, and in billabongs, swamps, sewage farms, and flooded crops (BirdLife Australia 2021).

6. The common greenshank is a migratory species and breeds in the Palaearctic and flies south to non-breeding areas for the boreal winter (Cramp and Simmons 1983). The species arrives in Australia from August, passing mainly through West Australia (Lane 1987), and also passing through the Torres Strait (Draffan *et al*. 1983). The common greenshank starts moving southwards from November onwards (Lane 1987), with numbers increasing slowly at most inland and coastal sites during August and September. The largest increases at some scattered sites are reported in October and November (Alcorn 1988). During non-breeding

season, most birds do not seem to move long distances within Australia, although dispersive movements may occur (Higgins and Davies 1996). Northward migration occurs from March onward and mostly in April, when numbers start declining at sites throughout Australia. The common greenshank overwinters at a few selected sites, which reach the expected wintering numbers in late April and early May (Alcorn 1988).

7. Common greenshanks that spend the non-breeding season in Australia are dependent on multiple areas of habitat throughout the East Asian - Australasian Flyway (EAAF) at different points in time. A reduction in the extent or quality of habitat in one part of the Flyway can have far-reaching consequences for the species, even if other habitats remain in good condition (Dhanjal-Adams *et al*. 2019 in DCCEEW 2024; Jackson *et al*. 2019 in DCCEEW 2024). Moreover, events affecting the species during one stage of its annual cycle can carry-over to subsequent stages (Murray *et al*. 2014). As such, population changes experienced in Australia may be driven by processes occurring thousands of kilometres away and during different life stages for the species (Murray *et al*. 2014).

8. Within Australia, the common greenshank is threatened by wetland loss and degradation due to residential and commercial development, habitat loss due to industrial aquaculture, and disturbance at feeding and roosting sites. '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.

9. Wetland loss and degradation in Australia has occurred mainly due to competing land uses and ignorance of the value of wetlands (Geoscience Australia 2021 in DCCEEW 2024). It is estimated that since European settlement, approximately 50 percent of Australia's non-tidal wetlands have been converted to other uses (Finlayson 2000 in DCCEEW 2024). Due to the distribution of the human population, estuaries and permanent wetlands of the coastal lowlands have experienced most habitat loss, especially in the southern parts of the continent (Lee *et al*. 2006). Shoreline development and changes in local hydrology are the biggest driver of wetland habitat loss. Specific threats to these habitats include: landfill or reclamation associated with industrial, housing, or port developments, road construction, marinas, canals and resorts. Additional threats include clearing areas of saltmarsh for solar salt production; damage of wetland areas by rubbish dumping and storm water draining; and damage of wetlands from the run-off from urban areas which alters the natural salinity regime of wetland areas (Geoscience Australia 2021 in DCCEEW 2024).

10. Australia's coastal environment has undergone rapid changes over the last three decades as the aquaculture industry expands and intensifies to meet the rising demand for seafood products (Ayyam *et al*. 2019; Ahmed and Thompson 2019; Commonwealth of Australia 2020 in DCCEEW 2024). Direct and indirect effects may arise from activities including aquaculture, intertidal oyster farming, bait harvesting, the compaction of sediments by vehicles, nutrient enrichment, and the dumping of rubbish or debris (Fuller *et al.* 2019 in DCCEEW 2024). Any structural modification of soft-sediment feeding habitat may considerably affect deep-probing

shorebirds such as the common greenshank, and may inhibit successful shorebird foraging (Fuller *et al*. 2019 in DCCEEW 2024).

11. Visitation to many common greenshank roosting sites such as sandflats, beaches, bays, and estuaries is increasing. The resultant increase in development and human recreation is likely to disturb common greenshanks, which are notoriously wary so may be more sensitive to disturbance than most other shorebird species. Disturbance from human activities, including recreation, shellfish harvesting, fishing and aquaculture is likely to increase significantly in the future (Barter 2005; Davidson and Rothwell 1993), with disturbance from off-leash dogs being particularly problematic (Weston and Stankowich 2013). Anthropogenic disturbance at roost sites on the species' non-breeding grounds causes birds to stop feeding and fly around. This may force birds away from traditional roosting and feeding sites (Lilleyman *et al.* 2014) and reduce fat/energy reserves. This can affect an individual's ability to complete the northward migration back to their breeding grounds and may negatively affects survival or reproductive success. Frequent disturbances may place additional and unsustainable pressures on populations already experiencing major declines (Lilleyman *et al*. 2014).

12. Outside Australia, the main threats are changes to coastal stopover locations, particularly along the coast of the Yellow Sea. The Yellow Sea is affected by rapid development for aquaculture and industry; invasion by cordgrass *Spartina alterniflora*; pollution from domestic, industrial and aquaculture discharges, oil and pesticides; and hunting and incidental drowning in fishing nets and traps. The habitat area is also shrinking because of restricted inflow of sediments from increasingly dammed rivers (Murray *et al.* 2014; Melville *et al*. 2016; Naves *et al*. 2019) and sea level rise (Iwamura *et al*. 2013), with sea walls at many sites excluding suitable habitat.

13. Because of the above threats, the common greenshank is estimated to have undergone a large reduction in the number of mature individuals over three generations (*c*. 11–20 years), possibly as high as 60.5%, and the causes have not ceased.

14. The common greenshank *Tringa nebularia* (Gunnerus, 1767) is not eligible to be listed as a Critically Endangered species.

15. The common greenshank *Tringa nebularia* (Gunnerus, 1767) 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 4.2 (1)(c)(2)(b)

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

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Supporting Documentation:

DCCEEW (Department of Climate Change, Energy, the Environment and Water) (2024). Conservation advice for *Tringa nebularia* (common greenshank). Australian Government, Canberra, ACT.

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