Notice of Preliminary Determination

The NSW Threatened Species Scientific Committee, established under the *Biodiversity Conservation Act 2016* (the Act), has made a Preliminary Determination to support a proposal to list *Austrochloritis kippara* Stanisic, 2010 as a CRITICALLY ENDANGERED SPECIES in Part 1 of Schedule 1 of the Act. Listing of Critically Endangered species is provided for by Part 4 of the Act.

How to make a submission

The NSW TSSC welcomes public involvement in the assessment process and places preliminary determinations on public exhibition on the NSW TSSC pages on the NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) website. This public exhibition provides an opportunity for the public to comment on this preliminary determination as well as provide any additional information that is relevant to the assessment.

Postal submissions regarding this Preliminary Determination may be sent to:
Secretariat
NSW Threatened Species Scientific Committee
Locked Bag 5022
Parramatta NSW 2124.

Email submissions in Microsoft Word or PDF formats to:
scientific.committee@environment.nsw.gov.au

Submissions close 27 May 2026

What happens next?

After considering any submissions received during the public exhibition period the NSW TSSC will make a Final Determination and a notice will be placed on the NSW DCCEEW website to announce the outcome of the assessment. If the Final Determination is to support a listing, then it will be added to the Schedules of the Act when the Final Determination is published on the legislation website. www.legislation.nsw.gov.au.

Privacy information

The information you provide in your submission may be used by the NSW TSSC in the assessment to determine the conservation status and listing or delisting of threatened or extinct species, threatened populations and threatened or collapsed ecological communities or to assess key threatening processes.

The NSW TSSC may be asked to share information on assessments with NSW Government agencies, the Commonwealth Government and other State and Territory governments to collaborate on national threatened species assessments using a common assessment method and to assist in the management of species and ecological communities.

If your submission contains information relevant to the assessment it may be provided to state and territory government agencies and scientific committees as part of this collaboration.

If you wish your identity and personal information in your submission to be treated as confidential you must:

- *request your name be treated as confidential*, and
- *not include any of your personal information in the main text of the submission or attachments so that it can be easily removed.*

Professor Angela Moles, FRSN
Chairperson
NSW Threatened Species Scientific Committee

Public exhibition period: 27/02/2026 – 27/05/2026

Preliminary Determination

The NSW Threatened Species Scientific Committee, established under the *Biodiversity Conservation Act 2016* (the Act), has made a Preliminary Determination to support a proposal to list *Austrochloritis kippara* Stanisic, 2010 as a CRITICALLY ENDANGERED SPECIES in Part 1 of Schedule 1 of the Act. Listing of Critically Endangered species is provided for by Part 4 of the Act.

Summary of Conservation Assessment

Austrochloritis kippara Stanisic, 2010 was found to be Critically Endangered in accordance with the following provisions in the *Biodiversity Conservation Regulation 2017*: Clause 4.3(a)(d)(e i,iii) because: 1) the species has a very highly restricted geographic distribution with an extent of occurrence and area of occupancy of 16 km^2; 2) the population is found within one threat-defined location; and 3) there is an inferred continuing decline in the area, extent, and quality of habitat, and the number of mature individuals. This is due to adverse fire regimes, namely high severity and high frequency fire, drought, and native forest timber harvesting.

The NSW Threatened Species Scientific Committee has found that:

1. *Austrochloritis kippara* Stanisic, 2010 (Camaenidae), the Kippara forest bristle snail, is described based on shell characters and external colour only, as follows: “Shell medium-sized, dark brown, depressedly turbinate; whorls subangulate, sutures impressed; protoconch sculpture of pustules and rugose radial ridges, teleoconch with widely spaced, broad and curled, strap-like setae, microsculpture of wavy periostracal ridgelets; umbilicus moderately open; diameter 14 mm” (Stanisic *et al.* 2010).

2. *Austrochloritis kippara* is currently known from Kippara and Mount Boss State Forests (Stanisic *et al*. 2010; Foon *et al*. 2022), located approximately 45 km northwest of Port Macquarie in northern New South Wales (NSW). The species is only known from nine collection events at six sites (Foon *et al*. 2022; F. Köhler and J.K. Foon *in litt.* February 2023; ALA 2024a; Foon *in litt*. October 2024).

3. Current survey data are insufficient to assess the abundance of *Austrochloritis kippara* (Foon *et al*. 2022; F. Köhler and J.K. Foon *in litt.* February 2023) or the number of mature individuals. Only 45 individuals have ever been collected (F. Koehler and J.K. Foon *in litt*. February 2023; ALA 2024a; J.K. Foon pers. obs).

4. *Austrochloritis kippara* has a very highly restricted geographic distribution. The Extent of Occurrence (EOO) is estimated to be 16 km^2 and was calculated to match the Area of Occupancy (AOO), as recommended by IUCN (2024) when the original EOO is smaller than AOO. The AOO is estimated to be 16 km^2 based on 2 x 2 km grid cells, the scale recommended by IUCN (2024).

5. *Austrochloritis kippara* was originally recorded from “dry vine thickets on rocky outcrops, associated with microhabitats such as rocks and logs” (Stanisic *et al*. 2010), but a later survey by Foon *et al*. (2022) also found the species in Eucalypt woodland and forest. The species generally occurs in closed canopy forest (F. Köhler and J.K. Foon *in litt.* February 2023; J.K. Foon *in litt*. October 2024). Individuals have also been found in other microhabitats including deep leaf litter and buried in the ground (F. Köhler and J.K. Foon *in litt.* February 2023).

6. Little is known about behaviour and life history. *Austrochloritis kippara* is likely to be most active at night after rain because it has been found aestivating during dry and warm weather in the abovementioned sheltered microhabitats (F. Köhler and J.K. Foon *in litt*. February 2023). The species is inferred to move < 200 m in its entire lifetime due to its relatively small size (F. Köhler and J.K. Foon *in litt*. February 2023). *Austrochloritis kippara* is inferred to be a detritus feeder, feeding on various ground substrate items such as fungi and/or organic decaying matter (Foon *et al*. 2022; F. Köhler and J.K. Foon *in litt*. February 2023). As with all pulmonates, the species is hermaphroditic and lays eggs (F. Köhler and J.K. Foon *in litt*. February 2023), but no further reproductive information is known.

7. The primary threat to *Austrochloritis kippara* is adverse fire regimes, particularly high severity and high frequency fire. Drought in combination with fire, and native timber harvesting also threaten the species. ‘High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition’ is listed as a Key Threatening Process under the Act.

8. *Austrochloritis kippara* is highly susceptible to direct mortality from fire and associated heat due to its small, soft body and fragile, thin shell that provide minimal protection *(*Stanisic and Ponder 2004; Decker *et al*. 2023). Furthermore, the species’ poor dispersal ability prevents escape from fires (Stanisic and Ponder 2004) and likely delays post-fire recovery as the species’ capacity to recolonise previously burnt sites is limited (Foon *et al*. 2022; F. Köhler and J.K. Foon *in litt*. February 2023). Analyses immediately after the 2019–2020 bushfires identified *A*. *kippara* as a priority species for urgent post-fire conservation management, including recommendations for on-ground rapid surveys (DAWE 2020; Legge *et al*. 2021). Post-fire ground surveys by Foon *et al*. (2022) found *A. kippara* at only one site, which had high burn severity in the leaf litter, understorey and canopy layers, although there were variable burn severities across the species’ total known distribution (DPIE 2020; Foon *et al*. 2022; F. Köhler and J.K. Foon *in litt*. February 2023). Foon *et al*. (2022) inferred a > 50% total population decline due to: 100% of the species’ distribution overlapping with the 2019–2020 bushfires fire zone (Hyman *et al*. 2020), increased mortality during the fires, and increased indirect mortality from post-fire habitat loss and degradation (*i.e*. snail desiccation caused by reduced humidity, ground shelter and canopy cover). Overall, high and moderate-severity fires were observed to cause significant declines in land snail abundance in southeastern Australia following the 2019–2020 bushfires (Decker *et a*l. 2023). A similarly significant decline is therefore inferred for *A*. *kippara*. A slight annual increase in severe fire weather days is projected for the NSW North Coast region by 2079 due to climate change (Adapt NSW 2024). Similarly, a harsher fire-weather climate is projected for the region in the future, but the

magnitude of the change is uncertain (CSIRO and BOM 2024). It is inferred that these changes will lead to more frequent and severe fires, further threatening the *Austrochloritis kippara* population in the future.

9. *Austrochloritis kippara* is inferred to be threatened by drought, particularly drought in combination with fire. Most Australian land snails are reliant on at least partial environmental moisture availability (Stanisic and Ponder 2004*;* Stanisic and Window 2020; Foon *et al*. 2022). Foon *et al*. (2022) suggested that extreme drought preceding the 2020–2021 bushfires, worsened by climate change (Abram *et al*. 2021), may have caused high mortality in eastern Australian land snails. Pre-fire drought and low vegetation fuel moisture content were considered the main causes of the 2019–2020 bushfire's heightened severity and scale (Nolan *et al*. 2020; Abram *et al*. 2021). High or moderate severity fire, or high frequency fire, exacerbate drought impacts by destroying or degrading moisture-retaining habitat. Drought also reduces habitat and food resources pre- and post-fire (Keith *et al*. 2022).

10. There is an inferred decline in the area, extent and quality of habitat for *Austrochloritis kippara* caused by native forest timber harvesting. The species' current known distribution is entirely within Kippara and Mount Boss State Forests (Stanisic *et al*. 2010; Foon *et al*. 2022), where native forest timber harvesting has occurred historically (*e.g*. Forests NSW 2012; Forestry Corporation of NSW 2014a, 2014b; EPA 2015) and relatively recently (*e.g*. EPA 2014, 2015, 2019). Selective harvesting may also continue in the future (*e.g*. FCNSW 2024a, b). Some harvesting, as with fire (Foon *et al*. 2022) temporarily opens the forest canopy, thereby creating drier and hotter microhabitats (F. Köhler and J.K. Foon *in litt*. February 2023). This in turn potentially increases the risk of snail desiccation (F. Köhler and J.K. Foon *in litt*. February 2023). These threats, however, are now mitigated by modern forestry practices that require complex restrictions on harvesting including various habitat buffer zones (Slade and Law 2018; FCNSW 2024b).

11. *Austrochloritis kippara* is known from one threat-defined location based on the threat of adverse fire regimes. Analyses have already shown that 78–100% of the species' distribution was burnt during the 2019–2020 bushfires (Hyman *et al*. 2020; Marsh *et al*. 2021). The species' geographic distribution remains very highly restricted, and with the projected future increase in fire weather due to climate change (Abram *et al*. 2021; Adapt NSW 2024, CSIRO and BOM 2024), it is highly plausible that a single fire event could adversely affect the species across its entire distribution within a very short time frame.

12. *Austrochloritis kippara* Stanisic, 2010 is eligible to be listed as a Critically Endangered species as, in the opinion of the NSW Threatened Species Scientific Committee, it is facing an extremely high risk of extinction in Australia in the immediate 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:

Austrochloritis kippara was found to be Critically Endangered under Clause 4.3(a)(d)(e i,iii).

Clause 4.2 – Reduction in population size of species
(Equivalent to IUCN criterion A)
Assessment Outcome: Data Deficient

(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 criterion 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: Critically Endangered under Clause 4.3(a)(d)(e i,iii)

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: Data Deficient

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: Data Deficient

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: Vulnerable under Clause 4.7

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.

Professor Angela Moles, FRSN
Chairperson
NSW Threatened Species Scientific Committee

Supporting Documentation:

Portway, C (2025) Conservation Assessment of *Austrochloritis kippara* Stanisic, 2010. New South Wales Department of Climate Change, Energy, the Environment and Water.

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