

# NSW Threatened Species Scientific Committee

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Exhibition period: 30/11/18 – 25/01/19

Proposed Listing date: 30/11/18

## 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 grass *Plinthanthesis rodwayi* (C.E.Hubb.) S.T.Blake as a CRITICALLY ENDANGERED SPECIES in Part 1 of Schedule 1 of the Act and as a consequence, to omit reference to *Plinthanthesis rodwayi* (C.E.Hubb.) S.T. Blake from Part 2 of Schedule 1 (Endangered species). Listing of Critically Endangered species is provided for by Part 4 of the Act.

### Summary of Conservation Assessment

*Plinthanthesis rodwayi* was found to be eligible for listing as Critically Endangered, as the highest threat category met by the taxon across all categories, under Clause 4.3(a) (d) (e i, ii, iii, iv) & f (i, ii, iii) because: i) the species is known from a single location with an area of occupancy of 4km<sup>2</sup> and; and ii) there is a continuing decline in the abundance, geographic distribution and number of locations of the species.

The NSW Threatened Species Scientific Committee has found that:

1. *Plinthanthesis rodwayi* (C.E.Hubb.) S.T.Blake (family Poaceae) was described by PlantNET (2017) as “Caespitose perennial to 0.5 m high. Leaves with ligule, a ciliate rim with hairs c. 0.25 mm long; blade linear, rolled, upper surface and margins scabrous, glabrous. Inflorescence open, 6–8 cm long, 2–5 cm wide; rachis slender, usually flexuous, scabrous. Spikelets 5–6 mm long, gaping to 7 mm wide at maturity, bisexual florets 2, sometimes with 1 reduced floret above; pedicels slender, usually flexuous, 2–10 mm long, scabrous. Glumes 4–5 mm long, 3 nerved, keel minutely scabrous, glabrous. Lemmas 3–3.5 mm long, 8-nerved, awnless or with an awn in the sinus, lower half pilose with hairs <0.25 mm long, margins purplish brown, 2-lobed; lobes <1 mm long, subulate; awn, when present, slender, <0.5 mm long. Palea subequal to lemma, 2-keeled, keel scabrous, lower half pilose with hairs <0.25 mm long. Flowers spring-summer.”
2. *Plinthanthesis rodwayi* is endemic to New South Wales and was only known from the top of two mountains, Mount Budawang and Currockbilly Mountain, within Budawang National Park from the 1930s to the 1970s (NSW Scientific Committee 2002). Label information on some herbarium specimens indicates the species was common but localised.
3. Only one population of *Plinthanthesis rodwayi* is extant. Between 1978 and 2004 no plants were located on either mountain during multiple targeted surveys (NSW Scientific Committee 2009). A single individual was rediscovered on Mount Budawang in 2004 (NSW Scientific Committee 2009) and following the installation of an herbivore-exclusion fence and the removal of the competing shrub layer the population has grown to c. 300 mature individuals. *Plinthanthesis rodwayi* has not been seen on Currockbilly Mountain, on which it previously occurred, since 1978 despite repeated surveys (Le Breton and Auld 2017). The species is believed to be locally extinct at this site (Le Breton and Auld 2017) due to the death of both mature individuals and the depletion of the soil seed bank after a c. 50-year absence of fire, and in response to changes in vegetation structure and grazing by native and exotic herbivores.

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4. The geographic distribution of *Plinthanthesis rodwayi* is very highly restricted. The extent of occurrence (EOO) and area of occupancy (AOO) are both estimated to be 4 km<sup>2</sup>. The AOO is based on one 2 x 2 km grid cell, the scale recommended for assessing AOO by IUCN (2017). The EOO was based on a minimum convex polygon encompassing the sole known location of *P. rodwayi*, the method for assessing EOO recommended by IUCN (2017).
  
5. The main threats to *Plinthanthesis rodwayi* are inappropriate fire regimes and herbivory. Prolonged intervals between fires result in a decline in the creation and persistence of canopy gaps. This results in a transition from open, montane heathlands to dense heath dominated by *Leptospermum*. In dense heath, opportunities for ongoing recruitment from seed are likely to be limited. This mechanism is the most likely explanation for the loss of the Currockbilly Mountain population. Pressure from grazers including macropods, wombats and rabbits (Le Breton and Auld 2017) is likely to reduce the number of plants and limit recruitment. At the Mount Budawang site, the impacts of grazing have been reduced over the past ten years with the erection of herbivore exclusion fences, and an unexplained decline in herbivore pressure outside the fence over the past year has resulted in the population's expansion beyond the fenced area (Le Breton and Auld 2017). Based on the significant population reductions observed in the past, a return to previous drastic declines can be expected for the species in the absence of continuing conservation management of both fire and herbivory. The small population size and limited distribution of the species also place this species at risk from stochastic events. 'Competition and grazing by the feral European Rabbit, *Oryctolagus cuniculus* (L.)' is listed as a Key Threatening Process under the Act.
  
6. *Plinthanthesis rodwayi* (C.E.Hubb.) S.T.Blake 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*:

Clause 4.2 – Reduction in population size of species

(Equivalent to IUCN criterion A)

Assessment outcome: Endangered via Clause 4.2 1(b); (2)(c)

<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:</b>			
	(a)	for <del>critically endangered</del> species	<del>a very large reduction in population size, or</del>
	(b)	for endangered species	a large reduction in population size, or
	(c)	for vulnerable species	a moderate reduction in population size, or
<b>(2) - The determination of that criteria is to be based on any of the following:</b>			
	(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.	

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Clause 4.3 - Restricted geographic distribution of species and other conditions  
(Equivalent to IUCN criterion B)

Assessment Outcome: Critically Endangered via Clause 4.3(a) (d) (e i, ii, iii, iv)

<b>The geographic distribution of the species is:</b>			
	(a)	for critically endangered species	very highly restricted, or
	(b)	for endangered species	highly restricted, or
	(c)	for vulnerable species	moderately restricted,
<b>and at least 2 of the following 3 conditions apply:</b>			
	(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: Endangered via Clause 4.4(b), (e i, iiB)

<b>The estimated total number of mature individuals of the species is:</b>			
	(a)	for critically endangered species	very low, or
	(b)	for endangered species	low, or
	(c)	for vulnerable species	moderately low,
<b>and either of the following 2 conditions apply:</b>			
	(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,

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		(B)	all or nearly all mature individuals of the species occur within one population,
		(C)	<del>extreme fluctuations occur in an index of abundance appropriate to the species.</del>

Clause 4.5 - Low total numbers of mature individuals of species  
 (Equivalent to IUCN criterion D)  
 Assessment outcome: Vulnerable via Clause 4.5(c)

<b>The total number of mature individuals of the species is:</b>			
	(a)	<del>for critically endangered species</del>	extremely low, or
	(b)	<del>for endangered species</del>	very low, or
	(c)	for vulnerable species	low.

Clause 4.6 - Quantitative analysis of extinction probability  
 (IUCN criterion E)  
 Assessment outcome: Data deficient

<b>The probability of extinction of the species is estimated to be:</b>			
	(a)	<del>for critically endangered species</del>	extremely high, or
	(b)	<del>for endangered species</del>	very high, or
	(c)	<del>for vulnerable species</del>	high.

Clause 4.7 - Very highly restricted geographic distribution of species–vulnerable species  
 (Equivalent to IUCN criterion D2)  
 Assessment outcome: Vulnerable via 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.
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Dr Marco Duretto  
 Chairperson  
 NSW Threatened Species Scientific Committee

**References:**

IUCN Standards and Petitions Subcommittee (2017) Guidelines for Using the IUCN Red List Categories and Criteria, Version 12.  
<http://www.iucnredlist.org/documents/RedListGuidelines.pdf>

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Le Breton TD, Auld TD (2017) Conservation assessment for *Plinthanthesis rodwayii*. Unpublished report. NSW Office of Environment and Heritage.

NSW Scientific Committee (2002) Final Determination to list *Plinthanthesis rodwayi* (a grass) as an Endangered species under the *Threatened Species Conservation Act 1995*. <http://www.environment.nsw.gov.au/committee/finaldeterminations.htm> (accessed 7 September 2017).

NSW Scientific Committee (2009) Review of the Schedules of the *Threatened Species Conservation Act 1995*. <http://www.environment.nsw.gov.au/committee/SpeciesReviewReportsFlora.htm>

PlantNET (The NSW Plant Information Network System) (2017) Royal Botanic Gardens and Domain Trust, Sydney <http://plantnet.rbgsyd.nsw.gov.au> (accessed 1 November 2017)