

## *Amphibromus pithogastrus* Plump Swamp Wallaby-grass

### Taxonomy

*Amphibromus pithogastrus* S.W.L. Jacobs & Lapinuro

### Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 1992).

Categorised as Endangered in the 2014 Advisory list of rare or threatened flora (DEPI 2014).

### Proposed conservation status

Critically Endangered in Victoria

Criteria A2ce+3ce+4cde

### Species Information

#### Description and Life History

The taxon is a tufted perennial; culms to 1 m high. Leaves glabrous, smooth; blade flat or inrolled, to 20 cm long and 1.5-5 mm wide; ligule truncate to acute, 1.5-5 mm long. Inflorescence a slender, erect panicle, to 25 cm long. Spikelets 2-6-flowered, 8-15 mm long (excluding awns), green; glumes obtuse to acute, often erose at apex, the lower 3-5-nerved, 3-5.5 mm long, the upper 5-7-nerved, 3.5-7 mm long; lemma 4-7.5 mm long, smooth or minutely papillose, swollen in the lower part, gently constricted above the level of the grain, apical teeth 4 but the lateral pair often rudimentary so that the appearance is of 2 shallowly notched lobes, the sinus between them being 0.5-1.5 mm; awn 8-16 mm long, inserted 20-35% of the lemma length from the apex, column 3-5 mm long; palea from one-half to three-quarters as long as lemma. Flowers Oct.-Dec (VicFlora 2015).

#### Generation Length

The generation length of *Amphibromus pithogastrus* is estimated to be 10 to 15 years. This is based on related perennial tussock grasses that have longevity estimated of 10 years. The taxon's recruitment events are likely to be episodic and regeneration has not been studied.

#### Distribution

The taxon is known from near Mansfield and scattered occurrences to the south and west (e.g. Yea, Heathcote, Craigieburn, Beaufort, Dunkeld, Casterton) (VicFlora 2015). Mostly based on herbarium voucher specimens, there are currently 81 records listed on the Atlas of Living Australia (ALA) portal spanning from east of Tamworth in the north eastern tablelands of NSW, to the south eastern tablelands mostly near Goulburn and Canberra, across much of central and south western Victoria and finally the Adelaide Hills.

#### Habitat

The taxon is rare and found in shallow, seasonally inundated depressions (e.g. gilgais) on water-retentive clay soils supporting grasslands and grassy woodlands (VicFlora 2015).

These are typically robust native or exotic graminoids that are associated with wet valleys and soaks but are also tolerant of grazing. Field observations suggest that the taxon is within the restricted areas of suitable habitat (along narrow bands of least modified, wet valley alluvium occupying slightly less wet habitat on the margins of the main

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drainage line soaks); it occupies a niche wet enough to support the species but not too wet to encourage invasion by much larger plants it is excluded by larger, more competitive plants.

The known sites of *A. pithogastrus* generally occur within treeless grassland or sedgeland, but a few of these sites were presumably lightly wooded at European settlement. The habitat includes "gilgai" depressions in seasonally wet *Themeda triandra* dominated grassland; seasonal soaks dominated by *Schoenus apogon* in open grassland; and remnant stands of *Carex tasmanica* (which is considered vulnerable by Gullan et al. 1990).

With one exception the sites are on basalt-derived soils, the other (Creswick) being on fertile outwash slopes of tertiary sediments near the boundary with basaltic terrain. The associated soils range from heavy grey clay to black clays or duplex silty soils.

### Threats

The taxon is threatened by weed invasion, climate change and further possible habitat destruction. The mesic habitat leads to displacement by actively cultivated perennial pasture species like Toowoomba Canary-grass (*Phalaris aquatica*) and similar adventive species like Yorkshire Fog (*Holcus lanatus*) that are robust and aggressive in these wetter valleys." Competition from both exotics and robust natives likely to be fierce. There is uncertainty around conservation management at two known key sites - Dunkeld and Billy Goat Hill. Lack of appropriate management could result in significant weed invasion.

### IUCN Criteria

Criterion A. Population size reduction. Population reduction (measured over the longer of 10 years or 3 generations) based on any of A1 to A4			
	Critically Endangered	Endangered	Vulnerable
A1	≥ 90%	≥ 70%	≥ 50%
A2, A3, A4	≥ 80%	≥ 50%	≥ 30%

  

<p>A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.</p> <p>A2 Population reduction observed, estimated, inferred or suspected in the past where the causes of the reduction may not have ceased OR may not be understood OR may not be reversible.</p> <p>A3 Population reduction, projected or suspected to be met in the future (up to a maximum of 100 years) [(a) cannot be used for A3]</p> <p>A4 An observed, estimated, inferred, projected or suspected population reduction where the time period must include both the past and the future (up to a max. of 100 years in future), and where the causes of reduction may not have ceased OR may not be understood OR may not be reversible.</p>	<p>based on any of the following:</p>	<p>(a) direct observation [except A3]</p> <p>(b) an index of abundance appropriate to the taxon</p> <p>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</p> <p>(d) actual or potential levels of exploitation</p> <p>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</p>
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### Evidence:

#### Eligible under Criterion A2 as Critically Endangered

The population reduction over the past 30 to 45 years is inferred to be 90%, based on (c) and (e) above.

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The past decline is based on records that are suspected to either be extinct or much diminished now. While little is known of the original distribution of *A. pithogastrus*, the vast majority of its potential habitat has been effectively destroyed. Stuwe (1986 cited in SAC 1992) estimated that only 0.16% of the pre-European Western Basalt Plains Grassland remained. Since then, the destruction of remnant grassland has accelerated. Data from rail reserves and a recent survey of the Ballarat region suggest that perhaps in excess of 50% of these grassland sites have been destroyed or severely degraded since the Stuwe survey (SAC 1992). Ephemeral wetlands on heavy (mostly basaltic) soils within former grassland areas are severely depleted in Victoria. The herb-rich floristic variants of seasonal drainage lines of the Werribee Plains appear to face extinction, and relatively intact examples of seasonally wet grassland on gilgai topography are extremely rare on the western volcanic (Frood, 1991 cited in SAC 1992).

The causes of the reduction may not have ceased, be understood or be reversible.

### Eligible under Criterion A3 as Critically Endangered

The population reduction over the next 30 to 45 years is projected to be 80%, based on (c) and (e) above.

This is based on the risks from weed invasion, industrial development or other direct physical habitat destruction, and uncertainty around conservation management at two known key sites - Dunkeld and Billy Goat Hill. Lack of appropriate management could result in significant weed invasion.

### Eligible under Criterion A4 as Critically Endangered

The population reduction over any 30 to 45-year period, including both past and future, is estimated to be 85%, based on (c) and (e) above. The causes of reduction may not have ceased, be understood or be reversible.

Criterion B. Geographic range in the form of either B1 (extent of occurrence) and/or B2 (area of occupancy)			
	Critically Endangered Very restricted	Endangered Restricted	Vulnerable Limited
B1. Extent of occurrence (EOO)	< 100 km <sup>2</sup>	< 5,000 km <sup>2</sup>	< 20,000 km <sup>2</sup>
B2. Area of occupancy (AOO)	< 10 km <sup>2</sup>	< 500 km <sup>2</sup>	< 2,000 km <sup>2</sup>
AND at least 2 of the following 3 conditions:			
(a) Severely fragmented OR Number of locations	= 1	≤ 5	≤ 10
(b) Continuing decline observed, estimated, inferred or projected in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals			
(c) Extreme fluctuations in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals			

### Evidence:

#### Eligible under Criterion B as Endangered

The Area of Occupancy (AoO) is estimated to be 80 km<sup>2</sup>, based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

Any two of (a), (b) or (c) above are also satisfied.

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Criterion C. Small Population size and decline		Critically Endangered	Endangered	Vulnerable
Number of mature individuals		< 250	< 2,500	< 10,000
AND at least one of C1 or C2				
C1	An observed, estimated or projected continuing decline of at least (up to a max. of 100 years in future):	25% in 3 years or 1 generation (whichever is longer)	20% in 5 years or 2 generations (whichever is longer)	10% in 10 years or 3 generations (whichever is longer)
C2	An observed, estimated, projected or inferred continuing decline AND least 1 of the following 3 conditions:			
(a)	(i) Number of mature individuals in each subpopulation	≤ 50	≤ 250	≤ 1,000
	(ii) % of mature individuals in one subpopulation =	90 – 100%	95 – 100%	100%
(b)	Extreme fluctuations in the number of mature individuals			

## Evidence:

### Ineligible under Criterion C

It is inferred that there are 10,000 to 100,000 mature individuals, which exceeds the thresholds for criterion C.

Criterion D. Very small or restricted populations		Critically Endangered	Endangered	Vulnerable
Number of mature individuals (observed or estimated)		< 50	< 250	< 1,000
D2. Only applies to the VU category Restricted area of occupancy or number of locations with a plausible future threat that could drive the species to critically endangered or Extinct in a very short time.		-	-	D2. Typically: AoO < 20 km <sup>2</sup> or number of locations ≤ 5

## Evidence:

### Eligible under criterion D2 as Vulnerable

The taxon is projected to be very restricted.

Criterion E (Quantitative Analysis) was not addressed as the taxon does not have a detailed Population Viability Analysis.

## References

DSE (2009). Action Statement - *Amphibromus pithogastrus*. Plump Swamp Wallaby-grass (No. 109). Department of Sustainability and Environment. Retrieved from: [https://www.environment.vic.gov.au/\\_\\_data/assets/pdf\\_file/0019/32653/Plump\\_Swamp\\_Wallaby-grass\\_Amphibromus\\_pithogastrus.pdf](https://www.environment.vic.gov.au/__data/assets/pdf_file/0019/32653/Plump_Swamp_Wallaby-grass_Amphibromus_pithogastrus.pdf)

DEPI (2014) *Advisory list of rare or threatened plants in Victoria - 2014*. Department of Environment and Primary Industries, Melbourne.



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Foreman, P. W. (2017). Plump Swamp Wallaby-Grass Assessment: Billy Goat Hill Conservation Management Plan, Hayman Property, Gobur. Report prepared for Jonathon and Sue Hayman by Blue Devil Consulting, Castlemaine.

GHD (2013). Wannon Water Dunkeld Water Reclamation Plant Baseline Flora and Fauna Monitoring 2012.

SAC (1992) Scientific Advisory Committee, Flora and Fauna Guarantee. Final Recommendation on a nomination for listing No. 237 *Amphibromus pithogastrus*. Department of Conservation and Natural Resources: Melbourne.

VicFlora (2015). Flora of Victoria, Royal Botanic Gardens Victoria: *Amphibromus pithogastrus*. Retrieved from: <https://vicflora.rbg.vic.gov.au/flora/taxon/1e1b7ab4-dc73-4c92-8741-174521b6d968>