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 climbing herb *Cucumis althaeoides* (Ser.) P.Sebastian & I.Telford 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.

The NSW Threatened Species Scientific Committee has found that:

1. *Cucumis althaeoides* is unlikely to be nationally threatened using the Common Assessment Method (CAM MOU 2015) applied at the national scale (NSW TSSC 2017). Consequently, this species is eligible to be listed as a threatened species on the basis of the risk of extinction in New South Wales (NSW).

2. *Cucumis althaeoides* (Ser.) P.Sebastian & I.Telford (family Cucurbitaceae) is described as a trailing or climbing perennial vine, monoecious, most vegetative parts hispid, sometimes pilose; stems to 3 m long, to 1.6 mm diameter, ribbed, annually sprouting from a perennating rootstock. Tendrils simple, to 15 cm long. Leaves: subsessile or petiole to 38 mm long; lamina ovate or broadly lanceolate in outline, sometimes hastate, 24–75 mm long, 18–70 mm wide, cordate, unlobed or shallowly 3-lobed, rarely 5-lobed, obtuse or acute, mucronate. Inflorescences unisexual. Male flowers in 3–15-flowered fascicles, sometimes in racemes with peduncles to 3 mm long; pedicels to 7 mm long. Female flowers 1 or 2, rarely 3 or 4 per axil; pedicels to 2 mm long; ovary ellipsoidal, ca. 3 mm long, pilose with antrorse hairs. Fruit globose, 8–18 mm diameter, pale green with darker longitudinal markings, at maturity sparsely pilose, red, with 9–25 seeds; fruiting pedicel to 6 mm long. Seeds ovate, 3.8–4.5 mm long, 2.3–2.8 mm wide, buff, the faces convex, verrucose, the margin thickened and raised (adapted from PlantNET 2017).

3. *Cucumis althaeoides* is widespread across northern Australia and in NSW is known from three small populations in Oxley Wild Rivers National Park, approximately 40 km east of Walcha in the New England Tablelands Bioregion. These NSW populations of *C. althaeoides* are disjunct with the nearest known population occurring approximately 400 km to the north in southeastern Queensland (Telford *et al.* 2011). In Oxley Wild Rivers National Park, populations of *C. althaeoides* have been recorded from three sites along the Apsley River and Green Gully Creek (L. Copeland *in litt*. May 2016).

4. *Cucumis althaeoides* is a perennial vine which can be relatively dormant during dry periods and can then grow rapidly from the thickened rootstock during more favourable conditions. It is unclear how long individuals live or how quickly they may reproduce. In NSW, *C. althaeoides* is known to occur on rocky soil in gravel beds along freshwater rivers and streams. The species has been documented in open habitats beneath River Oaks (*Casuarina cunninghamiana*) in association with *Melaleuca bracteata*, *Stephania japonica*, *Cleome viscosa*, *Digitaria sanguinolentis* and *Mitracarpus hirtus* (L. Copeland *in litt*. May 2016). Across its broader Australian range, *C. althaeoides* occurs on coastal sands or riverine alluvium in herbfields and *Casuarina* or *Eucalyptus* woodland (Telford *et al*. 2011).

5. The number of mature individuals of *Cucumis althaeoides* in NSW is estimated to be very or extremely low with only 16 plants known across the three populations (L. Copeland *in litt*. May 2016). Searches of potentially suitable habitat for *C. althaeoides* within the vicinity of known populations by several botanists since 2007 have failed to locate additional populations (L. Copeland *in litt*. May 2016).

6. The distribution of *Cucumis althaeoides* in NSW is very highly restricted. The extent of occurrence (EOO) is estimated as 39 km^2. The EOO is based on a minimum convex polygon enclosing all sites of occurrence of the species, the method of assessment recommended by IUCN (2016). The area of occupancy (AOO) is estimated as 12 km^2 based on 2 x 2 km grid cells, the scale recommended for assessing AOO by IUCN (2016).

7. Threats to *Cucumis althaeoides* in NSW include grazing by feral animals, including horses, goats and cattle, and competition from various weed species, including *Bidens pilosa* (Cobbler's Peg), *B. subalternans* (Greater Beggar's Tick), *Zinnia peruviana*, *Tagetes minuta* (Stinking Roger), *Cuscuta campestris* (Golden Dodder), *Galinsoga parviflora* (Potato Weed) and *Lantana camara* (Lantana) (L. Copeland *in litt*. May 2017). The population's limited extent makes it highly susceptible to localised events such as grazing by feral animals and competition from weeds. 'Competition and habitat degradation by Feral Goats, *Capra hircus* Linnaeus 1758' and 'Invasion, establishment and spread of Lantana (*Lantana camara* L. sens. lat)' are listed as Key Threatening Processes under the Act.

8. *Cucumis althaeoides* (Ser.) P.Sebastian & I.Telford 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 New South Wales in the immediate future as determined in accordance with the following criteria as prescribed by the *Biodiversity Conservation Regulation 2017*:

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

The geographic distribution of the species is:			
	(a)	for critically endangered species	very highly restricted.
and the following 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:	
		(iii)	habitat area, extent or quality,

Clause 4.4 - Low numbers of mature individuals of species and other conditions
(Equivalent to IUCN criterion Clause C)

The estimated total number of mature individuals of the species is:						
	(a)	for critically endangered species			very low.	
and the following condition applies:						
	(e)	both 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)	the following applies:			
			(A)	the number of individuals in each population of the species is:		
				(I)	for critically endangered species	extremely low, or
			(B)	all or nearly all mature individuals of the species occur within one population,		

Clause 4.5 - Low total numbers of mature individuals of species
(Equivalent to IUCN criterion D)

The total number of mature individuals of the species is:			
	(a)	for critically endangered species	extremely low.

Dr Marco Duretto
Chairperson
NSW Threatened Species Scientific Committee

Exhibition period: 27/04/18 – 22/06/18 Proposed Listing date: 27/04/18

References:

CAM MOU (2015) Intergovernmental memorandum of understanding - Agreement on a common assessment method for listing of threatened species and threatened ecological communities. http://www.environment.gov.au/biodiversity/threatened/publications/mou-cam

IUCN Standards and Petitions Subcommittee (2016) Guidelines for Using the IUCN Red List Categories and Criteria. Version 12. Prepared by the Standards and Petitions Subcommittee. http://www.iucnredlist.org/documents/RedListGuidelines.pdf

NSW TSSC (2017) National Assessment of *Cucumis althaeoides.* Report to the NSW Threatened Species Scientific Committee.

PlantNET (The NSW Plant Information Network System) Royal Botanic Gardens and Domain Trust, Sydney. http://plantnet.rbgsyd.nsw.gov.au (accessed 24 April 2017).

Telford IR, Sebastian P, Bruhl JJ, Renner SS (2011) *Cucumis* (Cucurbitaceae) in Australia and eastern Malesia, including newly recognized species and the sister species to *C. melo*. *Systematic Botany* **36**, 376–389.