

NSW Threatened Species Scientific Committee

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 shrub *Leionema lamprophyllum* subsp. *fractum* S.A.J.Bell as a CRITICALLY ENDANGERED SPECIES in Part 1 of Schedule 1 of the Act and, as a consequence, to omit reference to the population of *Leionema lamprophyllum* (F. Muell.) Paul G. Wilson subsp. *obovatum* F.M. Anderson in the Hunter Catchment from Part 2 of Schedule 1 (Endangered populations) 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. *Leionema lamprophyllum* subsp. *fractum* S.A.J.Bell (family Rutaceae) is described in Bell and Walsh (2015) as a “Shrub to 1.5 m tall. Branchlets terete or angular when very young due to leaf decurrencies, prominently glandular-verrucose, densely pilose with simple or 2–8-rayed stellate hairs, leaf-decurrencies moderately- to densely stellate, glabrescent with age; branchlets becoming glabrous with age. Leaves alternate. Petiole mostly 0.5–1.3 mm long, sparsely stellate-hairy. Lamina strongly and pleasantly aromatic when crushed; rhomboidal or obtrullate, 6.0–9.0 mm long, 3.0–5.0 mm wide, glabrous but midrib usually sparsely stellate-hairy at least in the lower half, leaf base shortly attenuate to cuneate, margin usually crenate to dentate with 2–6 blunt teeth or shallow rounded lobes on each side in distal half but sometimes erose, apex obtuse; adaxial surface glossy and prominently glandular-punctate, wrinkled on drying, midrib impressed with simple or stellate hairs in lower half, lateral veins not visible; abaxial surface paler and prominently glandular-punctate. Inflorescences of 2–4-flowered umbellate cymes in upper axils or terminal, occasionally reduced to a single flower and sometimes the cymes apparently lacking a peduncle. Peduncle (0.5–)1.4–3.5 mm long, flattened or angular, prominently glandular-verrucose, moderately to densely stellate-hairy. Pedicel 1.5–3.7 mm long, angular and prominently glandular-verrucose, moderately to densely stellate-hairy. Flower buds obovoid, yellow to yellowish-green, sometimes with rusty infusions. Sepals deltoid, concavo-convex, mostly 0.5–0.8 mm long, glandular-verrucose, margins and lower half prominently but minutely and densely simple- or stellate-haired. Petals narrow-elliptic, 2.3–3.1 mm long, white but sometimes with tips pink-infused, caducous, glandular-punctate on abaxial surface, glabrous, apex inflexed, midrib prominent. Stamens shorter than or slightly exceeding petals, filaments slender and terete to flattened, tapering distally, 2.5–3.0 mm long, glabrous; anthers cordate-ovate, mostly 0.4–0.6 mm long, dorsifixed and versatile, pale yellow. Gynophore short-cylindrical, 0.3–0.5 mm long, reddish-brown, glabrous, slightly narrower than ovary. Ovary sub-spherical to cylindrical, 0.8–1.0 mm long, green, glabrous. Style terete, glabrous, 1.5–2.0 mm long, glabrous, gynobasic, usually shorter than stamens. Fruiting cocci mostly 1 or 2 (rarely to 4) per flower, spreading, 2.0–4.0 mm long, obliquely ovoid, sparsely glandular-punctate, outer edge minutely apiculate to shortly rostrate, beak 0.5–1.0 mm long. Seed ovoid, 2.0–2.2 mm long, raphe basal, testa smooth and minutely punctate, glossy black, aril cream-coloured”.
2. *Leionema lamprophyllum* subsp. *fractum* is endemic to New South Wales (NSW) and is currently known from a single population near Pokolbin in the Hunter Valley. It was previously considered to be included in *L. lamprophyllum* subsp. *obovatum*, a taxon that occurs in southeastern NSW, predominantly south of the Tidbinbilla Range, and in Victoria. A small and disjunct population of *L. lamprophyllum* subsp. *obovatum* in the Hunter Catchment, was listed as an Endangered population in 2007. In 2015, the Hunter Catchment population was deemed

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to be a different taxon and was described as a new subspecies, *L. lamprophyllum* subsp. *fractum* (Bell and Walsh 2015). As a consequence, the population of *L. lamprophyllum* subsp. *obovatum* in the Hunter Catchment is no longer eligible to be listed under the Act as an Endangered population. This listing of *L. lamprophyllum* subsp. *fractum* as a Critically Endangered species includes all the Hunter Catchment plants previously included in the Endangered population listing.

3. *Leionema lamprophyllum* subsp. *fractum* is currently known from the Broken Back Range in Pokolbin State Forest, in the Hunter Valley. It was also known from Munghorn Gap near Mudgee from a single collection in 1986 (Bell and Walsh 2015), but there have been no subsequent records from this location. Searches of the Munghorn Gap area were carried out in August 2015 (Bell and Walsh 2015) and in October 2016 (S. Clarke *in litt.* October 2016) but no individuals could be found. Possible reasons for not relocating the population include that all mature plants may have senesced (the area has not been burnt since 1951), grazing by goats may have impacted on mature plants and seedlings, road maintenance and related disturbances may have impacted on the plants or the population is very small and was missed in the survey. However, a soil seedbank may still be present and may enable regeneration following a disturbance such as fire. Hence, at this stage, the loss of *L. lamprophyllum* subsp. *fractum* at Munghorn Gap cannot be assumed.
4. The population of *Leionema lamprophyllum* subsp. *fractum* at Broken Back Range is found on a rocky cliff line at 515 m a.s.l. elevation in sparse heathland to open eucalypt woodland (Bell and Walsh 2015). Common co-occurring species include *Corymbia maculata*, *Eucalyptus sparsifolia*, *Pultenaea spinosa*, *Leptospermum trinervium*, *Acacia parvipinnula*, *Dillwynia sieberi*, *Persoonia linearis*, *Leucopogon muticus*, *Astrotricha* sp. Quorrobolong (S. Lewer 40), *Correa reflexa* var. *reflexa*, *Patersonia sericea*, *Entolasia stricta*, *Cleistochloa rigida*, *Pomax umbellata*, *Lepidosperma gunnii* and *Lomandra confertifolia* subsp. *rubiginosa* (Bell and Walsh 2015). Flowering has been observed in September with fruits maturing in December (Bell and Walsh 2015). The response of *L. lamprophyllum* subsp. *fractum* to fire is unknown but it is thought to be an obligate seeder with the plants killed by fire (S. Bell *in litt.* June 2016) and regeneration from a persistent soil seedbank.
5. The number of mature *Leionema lamprophyllum* subsp. *fractum* individuals is extremely low. Fewer than 50 plants were found when the population was surveyed in 2015. This count included mature, juvenile and seedling plants. Whilst much of the surrounding area was searched, the rocky terrain precludes access to many areas of similar habitat where the taxon may occur.
6. The geographic distribution of *Leionema lamprophyllum* subsp. *fractum* is very highly restricted. The extent of occurrence (EOO) is 4 km² for the known extant population at Broken Back Range or 140 km², if both the Broken Back Range and Munghorn Gap are included. The EOO estimate is based on a minimum convex polygon enclosing all mapped occurrences of the taxon, the method of assessment recommended by IUCN (2016). The area of occupancy (AOO) of the known extant distribution at Broken Back Range is 4 km², equivalent to a single 2 x 2 km grid square, the scale recommended for assessing AOO by IUCN (2016). If the Munghorn Gap record is included, the taxon would then be estimated to occur in two 2 x 2 km grid squares, equivalent to an AOO of 8 km².

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7. Direct threats to *Leionema lamprophyllum* subsp. *fractum* at Broken Back Range appear to be minimal. Since the terrain is rocky, forestry activities are unlikely to impact the taxon and the proximity of the known population to a track does not currently appear to be adversely affecting the plants (Bell and Walsh 2015) and occasionally used for camping which appears to have damaged the population (*in litt.* S. Bell Oct 2017). However, the very low number of plants in the Broken Back Range population predisposes it to threats associated with environmental and demographic stochasticity. For example, a single stochastic event such as land slide or cliff collapse could lead to the loss of the entire known population, as it occurs within a very small area. The potential *L. lamprophyllum* subsp. *fractum* population at Munghorn Gap, is likely to be threatened by an inappropriate fire regime (i.e., currently a lack of fire for regeneration), road maintenance activities and associated disturbances and feral goat grazing.
8. *Leionema lamprophyllum* subsp. *fractum* S.A.J.Bell 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 4.3 - 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:	
		(i)	an index of abundance appropriate to the taxon,
		(ii)	the geographic distribution of the species.

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 conditions apply:			
	(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
		(B)	all or nearly all mature individuals of the species occur within one population.

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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: 01/12/17 – 26/01/18

Proposed Gazettal date: 01/12/17

References:

Bell SAJ, Walsh NG (2015) *Leionema lamprophyllum* subsp. *fractum* (Rutaceae); a new and highly restricted taxon from the Hunter Valley of New South Wales. *Telopea* **18**, 505–512.

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>.