NSW SCIENTIFIC COMMITTEE

Preliminary Determination

The Scientific Committee, established by the *Threatened Species Conservation Act 1995* (the Act), has made a Preliminary Determination to support a proposal to list the shrub *Leionema lamprophyllum* subsp. *fractum* S.A.J.Bell as a CRITICALLY ENDANGERED SPECIES in Part 1 of Schedule 1A 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 2 of the Act.

The 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 currently known to be extant from a single population near Pokolbin in the Hunter Valley. It was previously considered to be within *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 under the Act in 2007 as an Endangered population. In 2015,

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the Hunter Catchment population was deemed to be a different taxon and was described as a new subspecies, *L. lamprophyllum* subsp. *fractum* (Bell & 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 Polkobin State Forest, in the Hunter Valley. It was also known from Munghorn Gap near Mudgee from a single record collected 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 &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 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; the population is very small and was missed in the survey. However, a soil seedbank may still be present and enable regeneration following a disturbance such as fire. Hence, at this stage, the loss of *Leionema 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 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 seed bank.

5. The number of *L. lamprophyllum* subsp. *fractum* plants is extremely low. Less 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 had been 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 area of occupancy (AOO) of the known extant distribution at Broken Back Range is 4 km^2, equivalent to one 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 2x2 km grid squares, equivalent to an AOO of 8 km^2. The extent of occurrence (EOO) is 4 km^2 for the known extant distribution at Broken Back Range or 140 km^2, for the distribution of the taxon at both Broken Back Range and Munghorn Gap. 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).

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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 their vicinity to a track does not currently appear to be adversely affecting the plants (Bell and Walsh 2015). 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 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 *Threatened Species Conservation Regulation 2010*:

Clause 9 Low number of mature individuals of species
The total number of mature individuals of the species is observed, estimated or inferred to be:
(a) extremely low.

Dr Mark Eldridge
Chairperson
NSW Scientific Committee

Exhibition period:10/03/2017 – 05/05/2017 Proposed Gazettal date:10/03/2017

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. Downloadable from http://www.iucnredlist.org/documents/RedListGuidelines.pdf.

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