

# NSW SCIENTIFIC COMMITTEE

## Final Determination

The Scientific Committee, established by the Threatened Species Conservation Act, has made a Final Determination to REJECT a proposal to remove *Haloragis exalata* F.Muell. subsp. *exalata*, the Square Raspwort, from Part 1 of Schedule 2 (Vulnerable species) of the Act.

The Scientific Committee has found that:

1. Following the public exhibition of a Preliminary Determination in November 2008 to support a proposal to delist the Square Raspwort, *Haloragis exalata* F.Muell. subsp. *exalata*, as a Vulnerable species from Schedule 2 of the Act, additional information received, re-examination of specimens and the results of DNA sequence analysis have led the Committee to conclude that the current data do not support the delisting of the species.
2. *Haloragis exalata* F. Muell. subsp. *exalata* (family Haloragaceae) is a robust perennial forb to 1.5 m high with more or less square stems, opposite toothed leaves, and small inconspicuous flowers, 3–15, in a dichasial inflorescence (Wilson 2002). *Haloragis exalata* subsp. *exalata* is divided into two varieties: var. *exalata*, which has scabrous stems and leaves, 3–7-flowered dichasia and a scabrous ovary; and var. *laevis*, which has glabrous stems and leaves, 7–15-flowered dichasia and glabrous ovary (Wilson 2002).
3. *Haloragis exalata* subsp. *exalata* occurs on the NSW south coast from Durras Lake north of Batemans Bay to the northern Illawarra. Populations recorded historically from western Sydney and the Hunter Valley are thought no longer to exist, targeted surveys are needed to confirm this. Collections from the Blue Mountains, Shoalhaven River and Bungonia Creek have been checked and redetermined as the morphologically similar taxon *Haloragis serra* (Miles & Cameron 2007); similarly, a record from Marramarra Creek has also been shown to be *H. serra* (P Wilson, pers. comm. Sep 2013).
4. A recently discovered population of plants in the Southern Tablelands at Geehi in Kosciuszko National Park was considered by Miles & Cameron (2007) to represent a disjunct occurrence of *Haloragis exalata* subsp. *exalata*, albeit with a number of distinct morphological features. This population has been the subject of further research using DNA sequence data and the results indicate that the Geehi plants are genetically distinct from *H. exalata*, based on comparison of data from a number of samples of this species as well as other species of *Haloragis* (P Wilson, pers. comm. Sep 2013).
5. On the South Coast, *Haloragis exalata* subsp. *exalata* occurs on the margins of coastal water bodies, such as lakes and lagoons, primarily those which are closed to the sea for lengthy periods (Miles 2008). The plants occur along the shoreline in low-lying areas that are subject to occasional flooding, but have also been observed further from the shoreline in canopy gaps created by fallen trees. *Haloragis exalata* subsp. *exalata* can also be found along small creeks, both in the salt or brackish sections where these enter lakes, and upstream in the creek bed and on banks in areas subject to flooding. The buoyant fruits appear to be dispersed by water and colonise disturbed areas following flood events (Miles 2008).

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6. *Haloragis exalata* subsp. *exalata* also appears to be differentiated from similar taxa on the basis of habitat. The disjunct Geehi populations are found growing within dense wet sclerophyll forest (Miles & Cameron 2007, Miles 2008). Other anomalous records attributed to *Haloragis exalata* subsp. *exalata*, from Tumut and Wee Jasper, occur on rocky ground or limestone, habitats more commonly associated with *H. serra*.
7. Large fluctuations in the population size and area of occupancy in *Haloragis exalata* subsp. *exalata* occur in response to natural disturbance events in their habitat. Around coastal lakes, the disturbance is mostly due to flooding. Monitoring of the population around Cuttagee Lake, south of Bermagui, over a 4 year period, has shown a large variation in the population size. Four subpopulations were monitored 3 to 6 times, and a 10-fold difference in plant numbers from one monitoring visit to the next was not uncommon (Miles 2008). For example, the number of plants at one site varied from more than 30 plants at the first visit, to more than 100, to 10, to 5, to more than 150 at a subsequent visit. Although disturbance by fire is rare in coastal habitats, there is evidence of seedling regeneration following one fire event (Miles 2008).
8. The total extent of current occurrence of *Haloragis exalata* subsp. *exalata*, excluding the previously included Geehi populations and the anomalous Tumut and Wee Jasper records, is estimated to be 11 900 km<sup>2</sup>. The area of occupancy within this extent is estimated to be 136 km<sup>2</sup> based on 34 (2 x 2 km) grid cells, the spatial scale recommended by IUCN (2011) for assessing areas of occupancy.
9. *Haloragis exalata* subsp. *exalata* is currently known from five conservation reserves managed by the NSW National Parks and Wildlife Service. These include Eurobodalla, Gulaga, Kooraban, and Murramarang National Parks and Berkely Nature Reserve. Weed invasion is a potential threat to *H. exalata* subsp. *exalata*, as many species of weeds are also known to favour disturbed areas (Miles 2008). Weeds are, however, primarily a threat to the freshwater populations, as few weed species tolerate the more saline conditions of the lake shores that support large populations of *H. exalata* subsp. *exalata* (Miles 2008). Climate change is projected to raise sea levels (IPCC 2013), which may adversely affect this species where it occurs in low-lying coastal habitats. 'Invasion of native plant communities by exotic perennial grasses' and 'Anthropogenic climate change' are listed as Key Threatening Processes under the NSW *Threatened Species Conservation Act 1995*.
10. The Committee is of the opinion that *Haloragis exalata* F.Muell. subsp. *exalata* is eligible to be listed as a Vulnerable species on the basis of its restricted geographical distribution and a projected or continuing decline. The Committee considers *Haloragis exalata* subsp. *exalata* should be retained as a Vulnerable species.

Professor Michelle Leishman  
Chairperson  
Scientific Committee

Exhibition period: 30/05/04 – 25/07/14

Proposed Gazettal date: 30/05/14

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## References:

IPCC (2013) Climate Change 2013. The Physical Science Basis. Report prepared for Intergovernment Panel on Climate Change.

IUCN Standards and Petitions Subcommittee. 2011. Guidelines for Using the IUCN Red List Categories and Criteria. Version 9.0. Prepared by the Standards and Petitions Subcommittee.

Miles J (2008) 'Conservation status of *Haloragis exalata* subsp. *exalata* F. Muell. (Haloragaceae) in New South Wales.' Report to the Scientific Committee, Sydney.

Miles J, Cameron S (2007) Observations on the ecology and conservation status of *Haloragis exalata* subsp. *exalata* (Haloragaceae) in southern New South Wales. *Cunninghamia* **10**, 263–272.

Wilson PG (2002) Haloragaceae. In 'Flora of New South Wales. Volume 2. (2nd edn.)' (Ed. GJ Harden) pp. 244-255. (University of NSW Press: Kensington)