

NSW Threatened Species Scientific Committee

Notice of Preliminary Determination

The NSW Threatened Species Scientific Committee, established under the *Biodiversity Conservation Act 2016* (the Act), has made a Preliminary Determination to support a proposal to remove *Bertya opposens* (F.Muell. ex Benth.) Guymer from the Schedules of the Act by omitting reference to this species from Part 3 of Schedule 1 (Vulnerable species).

How to make a submission

The NSW TSSC welcomes public involvement in the assessment process and places preliminary determinations on public exhibition on the NSW TSSC pages on the Department of Planning, Industry and Environment (DPIE) website. This public exhibition provides an opportunity for the public to comment on this preliminary determination as well as provide any additional information that is relevant to the assessment.

Postal submissions regarding this Preliminary Determination may be sent to:

Secretariat
NSW Threatened Species Scientific Committee
Locked Bag 5022
Parramatta NSW 1481.

Email submissions in Microsoft Word or PDF formats may be sent to:
scientific.committee@environment.nsw.gov.au

Submissions close 15th March 2024.

What happens next?

After considering any submissions received during the public exhibition period the NSW TSSC will make a Final Determination and a notice will be placed on the DPIE website to announce the outcome of the assessment. If the Final Determination is to support a listing, then it will be added to the Schedules of the Act when the Final Determination is published on the legislation website. www.legislation.nsw.gov.au.

Privacy information

The information you provide in your submission may be used by the NSW TSSC in the assessment to determine the conservation status and listing or delisting of threatened or extinct species, threatened populations and threatened or collapsed ecological communities or to assess key threatening processes.

The NSW TSSC may be asked to share information on assessments with NSW Government agencies, the Commonwealth Government and other State and Territory governments to collaborate on national threatened species assessments using a common assessment method and to assist in the management of species and ecological communities.

If your submission contains information relevant to the assessment it may be provided to state and territory government agencies and scientific committees as part of this collaboration.

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If you wish your identity and personal information in your submission to be treated as confidential you must:

- *request your name be treated as confidential*, and
- *not include any of your personal information in the main text of the submission or attachments so that it can be easily removed.*

Senior Professor Kristine French
Chairperson
NSW Threatened Species Scientific Committee

NSW Threatened Species Scientific Committee

Public Exhibition period: 15/12/2023 – 15/03/2024

Preliminary Determination

The NSW Threatened Species Scientific Committee, established under the *Biodiversity Conservation Act 2016* (the Act), has made a Preliminary Determination to support a proposal to remove *Bertya opposens* (F.Muell. ex Benth.) Guymer from the Schedules of the Act by omitting reference to this species from Part 3 of Schedule 1 (Vulnerable species). The omission of species from the Schedules is provided for by Part 4 of the Act.

Summary of Conservation Assessment

The NSW Threatened Species Scientific Committee has found that:

1. *Bertya opposens* (F.Muell. ex Benth.) Guymer (family Euphorbiaceae) is described as a “slender shrub or small tree to 4 m high with a thick, whitish to brown tomentum. Leaves mostly opposite, oblong to oblanceolate or narrow-elliptic, 10–50 mm long, 5–25 mm wide, with an apical gland; margins recurved to revolute, upper surface hairy, becoming scabrous, lower surface densely white-tomentose with prominent midrib; petiole 3–5 mm long. Flowers ± sessile, 1–3 male and female flowers together; bracts 4, conspicuous, narrow, 2–5 mm long, thick, yellowish brown tomentose, 2 inner bracts ± obscure, heavily viscid. Perianth segments 4, broad-ovate, 5–6 mm long, mostly glabrous and viscid; female segments fused towards the base, lobes oblong-ovate. Ovary densely villous; styles 3 or 4, mostly deeply 4-lobed. Capsule ovoid to globose, 8–9 mm long, densely villous” (PlantNet 2023).
2. *Bertya opposens* has a widespread but sparse distribution, ranging from central Queensland (QLD) south into the northwest plains of New South Wales (NSW). The species has a total of 45 recognised subpopulations across its range. In NSW, four subpopulations have been recorded: two on private properties near Coolabah and Cobar respectively, and two to the south of Narrabri, including the largest known subpopulation of the species, in Jacks Creek State Forest (NSW Scientific Committee 2010). The subpopulation near Cobar has not been seen since 1982 and may now be extinct (NSW Scientific Committee 2010). In QLD, *Bertya opposens* is widely distributed. It is bounded roughly by White Mountains National Park in the northwest, Burton in the northeast, Chesterton Range National Park in the central west, St George in the southwest, and Toowoomba in the southeast. *Bertya opposens* is considered to occur within 41 subpopulations in QLD.
3. The total known population of *Bertya opposens* is estimated to be greater than five million individuals (Austen 1999, cited in NSW Scientific Committee 2010). It is not known what proportion of the population comprises mature individuals. Based on the limited estimates for subpopulation sizes available, it is estimated that over 99% of the population occurs in the Jacks Creek subpopulation in NSW. The Jacks Creek subpopulation is on a variety of land tenures and includes an estimated 1,066,930 individuals on land owned by Whitehaven Coal (Eco Logical Australia 2019).

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4. *Bertya opposens* has a widespread geographic distribution but highly restricted area of occupancy (AOO). The extent of occurrence (EOO) is based on a minimum convex polygon enclosing all mapped occurrences of the species, the method of assessment recommended by IUCN (2022) and was measured at 606,408 km². The AOO was calculated using 2 x 2 km grid cells, the scale recommended by IUCN (2022) and was calculated to be 322 km².
5. *Bertya opposens* appears to be positively associated with disturbance, such as fire or mechanical disturbance, which appears to trigger germination and/or suckering (OEH 2023). Individuals are prolific along the edges of the firebreaks and tracks in Jacks Creek State Forest, suggesting physical disturbance of the soil substrate can be beneficial (NPWS 2002; M. Saunders pers. obs. September 2021). The NSW Scientific Committee (2010) states that it is believed that most plants of *B. opposens* are killed by fire; however, the species has been observed to resprout after fire (P. Forster *in litt.* July 2023; C. Eddie pers. comm. July 2023). Observational data of subpopulations in QLD indicate that many of these subpopulations are dominated by mature individuals with limited recruitment evident, possibly due to decreased fire frequencies across the landscape resulting from anthropogenic modifications (C. Eddie pers. comm. July 2023).
6. It is considered likely that *Bertya opposens* is largely wind-pollinated, as the anthers and styles are exposed, and the flowers lack chemical and colour attractants associated with insect-pollination; however, bees have been recorded visiting the flowers of *B. opposens* (NPWS 2002).
7. Investigations into the seed germination cues and seed viability of *Bertya opposens* suggest the species has high seed viability (up to 88%) and a physiological dormancy, possibly related to an environmental cue, such a diurnal temperature shift or seasonal change (G. Phillips *in litt.* July 2023; RBGDT 2023). Smoke water treatment failed to trigger germination and increased heat was inversely related to germination (RBGDT 2023), suggesting that fire triggers germination through mechanisms not related to smoke or heat. Other members of the genus have high seed viability (ca. 97%) and contain conditional seed dormancies, with triggers including heat and/or scarification (Scott and Gross 2004).
8. It is estimated that *Bertya opposens* reaches sexual maturity at 4–5 years and has a maximum lifespan of 25–30 years (P. Forster *in litt.* July 2023).
9. *Bertya opposens* occurs in >10 threat-defined locations when considering the most serious plausible threats of high frequency fire and the clearing and fragmentation of habitat.
10. *Bertya opposens* has been identified as being vulnerable to fires which occur too frequently (Boyes 2004; OEH 2023). Conversely, long absences of fire appear to limit recruitment in *B. opposens*, resulting in subpopulations dominated with mature individuals and few juveniles (C. Eddie pers. comm. July 2023). There is a risk that continued absence of fire could lead to plant senescence and the degradation of the seedbank. Despite climate change projections of increased fire weather and

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more frequent fires (Abatzoglou *et al.* 2019; Dowdy *et al.* 2019; Jones *et al.* 2022; AdaptNSW 2023), the widespread distribution of *Bertya opposens* means that changes to fire regimes are not considered likely to rapidly drive the species to extinction. Although Jacks Creek has had multiple historical fires, these have largely occurred in different sections of the state forest (NPWS 2023). Furthermore, there has not been a significant fire in Jacks Creek since 1991, with only a small fire recorded in 2013. Fire at such frequencies is likely to promote recruitment, while the species' ability to resprout after being burnt reduces the probability of repeat fires causing local extinctions. However, the species is predominantly an obligate seeder with juveniles that are unlikely to resprout after being burnt. Therefore, fire that occurs frequently enough to kill juvenile *B. opposens* prior to seed production is a threat, while low frequency fire has been identified as a causative factor in the low levels of observed recruitment in QLD subpopulations. Although adverse fire regimes are considered the primary threat to *B. opposens*, the threat is attenuated by the wide, sparse distribution of its population.

11. Activities associated with coal and gas mining continue to clear and fragment *Bertya opposens* habitat. A report by Eco Logical Australia (2019) found that land owned by Whitehaven Coal for the Narrabri underground coalmine in the Jacks Creek area supported an estimated 1,066,930 plants of *B. opposens*, with approximately 266,000 of those in areas subject to underground disturbance, and up to 26,654 of those potentially subject to direct impacts. Similarly, the Narrabri Gas Project operated by Santos was found by the Department of Planning, Industry and Environment to be directly impacting 10,309 *B. opposens* plants (DAFF 2020). *Bertya opposens* has also been recorded within the Santos Gladstone Liquefied Natural Gas project footprint in QLD (Santos 2014; DSD 2015).
12. Vegetation disturbance and removal occurs in the Jacks Creek State Forest area along road verges as part of track/firebreak maintenance and to establish sites for apiarists (NPWS 2002). Clearing also occurs for the establishment of tracks associated with gas and coal mining activities in the Jacks Creek State Forest area (M Saunders pers. obs. May 2022) and in the vicinity of several subpopulations in QLD (C. Eddie pers. comm. July 2023). It is likely that similar small-scale clearing for track maintenance may occur at other subpopulations. However, *Bertya opposens* appears resilient to temporary clearing, commonly resprouting after clearing has occurred (NPWS 2002). The geographic spread of *B. opposens* and the proportion of subpopulations that are fully or partially protected means that clearing and fragmentation of habitat is unlikely to drive *B. opposens* to extinction in the medium-term; however, clearing continues to be a threat to subpopulations on non-reserved lands and is contributing to continuing decline in the area, extent and quality of habitat and the number of mature individuals and may be contributing to ongoing decline in the AOO and number of subpopulations. One subpopulation in QLD with only ca. 2 individuals is currently threatened by development (Queensland Herbarium 2023).
13. It is estimated and inferred that continuing decline in the area, extent and quality of habitat, and number of mature individuals is occurring due to clearing and fragmentation of habitat, largely due to activities associated with coal and gas mining, as well as maintenance and establishment of tracks. It is inferred that

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ongoing decline in the number of subpopulations and AOO will occur in the future, due to the existence of extremely small subpopulations comprised of one to two individuals. However, the large population size and widespread distribution of *Bertya opposens* reduces the probability of these threats leading to extinction of the species in the medium-term future.

14. In view of the above, the NSW Threatened Species Scientific Committee is of the opinion that *Bertya opposens* (F.Muell. ex Benth.) Guymer is not eligible to be listed as a critically endangered or endangered species, and is not facing a high risk of extinction in Australia in the medium-term future so is no longer eligible to be listed as a Vulnerable species in Part 3 of Schedule 1 of the Act.

Senior Professor Kristine French
Chairperson
NSW Threatened Species Scientific Committee

Supporting Documentation:

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Phillips G (2023) Personal communication by email 24 July 2023. Project Officer, Threatened Species Assessment, Science, Economics and Insights Division, Department of Planning and Environment, NSW.

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