

NSW SCIENTIFIC COMMITTEE

Philotheca ericifolia (A. Cunn. ex Endl.) Paul G. Wilson (Rutaceae)

Review of Current Information in NSW

June 2008

Current status:

Philotheca ericifolia is currently listed as Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act). The NSW Scientific Committee recently determined that *Philotheca ericifolia* does not meet criteria for listing in NSW under the *Threatened Species Conservation Act* 1995 (TSC Act), based on information contained in this report and other information available for the species.

Species description:

Weston and Harden (2002, p. 294) describe *Philotheca ericifolia* as follows: "Spreading shrub 1-2 m high; stems sparsely glandular-warty, finely pubescent. Leaves needle-like, 4-8 mm long, about 0.5 mm wide, narrow-grooved above, sparsely glandular-punctate, glabrous or sparsely and finely pubescent; petiole short, stipules small, black. Flowers 1-6 in sessile clusters; pedicels 2-5 mm long, minutely bracteolate at base. Petals elliptic, about 9 mm long, purple to pink, glandular warty, slightly white-tomentose inside and on outside except for thick glandular midrib. Stamens free; filaments pilose; anthers glabrous. Cocci erect, about 5 mm long, abruptly attenuate into a subulate pilose apex."

Taxonomy:

Philotheca ericifolia was originally described under the name *Eriostemon ericifolius* (Bentham 1863-78). With the taxonomic review of the genera *Philotheca* and *Eriostemon*, the majority of species in the latter genus were transferred to *Philotheca* (Wilson 1998). The species is very similar to some forms of *Philotheca salsolifolia*, from which it may be distinguished apart from staminal characters by the narrow-triangular sepals. *Philotheca ericifolia* also has similarities with *Eriostemon difformis*, from which it may be distinguished by the acicular leaves (Wilson 1970). The specific epithet describes the heath-like leaves of the plant.

Distribution and number of populations:

Philotheca ericifolia has a restricted distribution in NSW, occurring in the upper Hunter Valley and Pilliga to Peak Hill districts of Central Tablelands, Central Western Slopes and North Western Plains botanical subdivisions. The 65 known records representing approximately 42 populations are scattered across a range of over 400 km between West Wyalong and the Pilliga, with the distribution centred near Dubbo (NSW Herbarium Records, PlantNET NSW, Atlas of NSW Wildlife, Australia's Virtual Herbarium). Site localities include Pilliga East State Forest, Goonoo State Forest near Mogriguy, Hervey's Range, Peak Hill, Toongi, Denman, Rylstone district and Kandos Weir. More recent collections include large populations at Bidson and

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Lincoln State Forests near Gilgandra, Mt Nangar Lookout and Dunn's Swamp in Wollemi National Park (Western Conservation Alliance 2004, expert advice).

Ecology:

Key habitat requirements

Philotheca ericifolia grows chiefly in dry sclerophyll forest and heath on damp sandy flats and in gullies. The species has been collected from a variety of habitats including open woodland, heathland, dry sandy creek beds and rocky ridge and cliff tops. Preferred soils have a sandy, gravelly or rocky component. An environmental profile prepared for the species summarises its habitat as heath, woodland or open forest on sandstone lithologies at an altitude range of 100 to 450 m and mean average rainfall of 200 to 600 mm (Gross & Mackay 1998).

Associated species at sites include *Melaleuca uncinata*, *Acacia triptera*, *Eucalyptus crebra*, *Corymbia trachyphloia*, *Acacia burrowii*, *Beyeria viscosa* and *Philotheca australis* with *Philotheca ericifolia* occurring mostly in open heath areas. It is also recorded growing in association with *Eucalyptus rossii*, *Eucalyptus punctata*, *Leucopogon muticus*, *Calytrix tetragona*, *Leptospermum parvifolium*, *Leptospermum arachnoides*, *Grevillea evansiana*, *Dillwynia rudis*, *Persoonia* and *Patersonia* species (NSW Herbarium Records, Gross & Mackay 1998). It appears to favour moist sites, including a soakage area in the Hervey's Range and a dry creek bed in alluvial deposits amongst coarse gravel. The species may tolerate some level of disturbance, with records from a recently burnt site (wildfire) and a regeneration zone resulting from clearing. Plants in the Pilliga East State Forest population were observed resprouting from rootstock in a site recently burnt by wildfire (NSW Herbarium Records).

Life history

Flowering time of *Philotheca ericifolia* is cited as occurring in the spring during September, however flowering is also recorded from August to December and May to October. Fruits are produced from November to December (NSW Herbarium Records). Little is known of the reproductive biology of the species, however flowers have been observed being pollinated by Honey Bees. Seeds are probably released ballistically from fruits at maturity, followed by secondary seed dispersal primarily by ants. There is a high level of seed dormancy at release in the Rutaceae, and members are likely to have persistent seedbanks with germination linked to fire (Auld 2001).

Number of mature individuals:

There are limited data on population sizes amongst the records for the 42 estimated populations of *Philotheca ericifolia*. Abundances are highly variable, with plants described as scattered to locally common or frequent in populations. Counts ranging from three to 400 individuals have been made at the various sites in NSW (Table 1). Information suggests that some populations are substantial - those in Pilliga State Forest are said to consist of hundreds or thousands of individuals. In one of several known populations in Lincoln State Forest near Gilgandra, the species is described as a common understorey plant covering at least 10 hectares (expert advice).

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Extrapolating from the available data, it is likely that at least 10 000 mature individuals of *Philothea ericifolia* remain in nature in NSW. The total number is likely to be in the range of 10 000 to 20 000 plants, taking into account the variable sizes of existing populations and the likelihood that many records of abundances are incidental or localised numbers only. Numbers could be much higher, considering the potentially large and undocumented populations in the Pilliga and Gilgandra areas.

Table 1. Location of *Philothea ericifolia* sites in NSW with data or comments recorded on population size and plant abundance (22 records ordered chronologically by most recent collection date) (NSW Herbarium Records, Atlas of NSW Wildlife).

Location	Date of Record	Population Size /Description	No. Plants
Mt Nangar (CWS)	November 2006	50 plants	50
Dunn's Swamp, Wollemi NP (CT)	October 2005	locally frequent, seeds coll. from 20+ plants	20+
Pilliga State Forest (NWP)	May 2004	300 plants	300
Pilliga State Forest (NWP)	May 2004	400 plants	400
Pilliga State Forest (NWP)	June 2002	many individuals	-
Pilliga State Forest (NWP)	May 2002	many plants	-
Peak Hill area (CWS)	February 2002	scattered population, approx. 20 plants	20
Goonoo SF (CWS)	February 2002	scatt. population, two records of 20 plants each	40
Goonoo SF (CWS)	February 2002	several plants, two records of three & five plants each	8
Goonoo SF (CWS)	February 2002	large popn in locality, two records of 10 plants	20+
Dowd's Hill near Toongi (CWS)	October 2001	colony of six to 10 plants, more may be present	6-10+
Pilliga East State Forest (NWP)	June 1998	locally common subshrub	-
N of Salisbury Trig, Wingen Maid NR (CWS)	October 1997	over 200 shrubs seen	200+
Wingen Maid NR (CWS)	October 1993	three plants in coll. area, scattered elsewhere	3+
Botobolar Rd (CWS)	September 1993	locally frequent	-

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Coomore Creek SF (NWS)	August 1993	10 plants seen in area of 30 m diameter	10
Kandos Weir area (CT)	December 1988	locally frequent	-
Goonoo State Forest (CWS)	October 1977	rare in heath	-
Clear Ridge Rd, N of Wyalong (CWS)	September 1974	uncommon, also seen at 2 other sites nearby	-
Dubbo-Mendooran, Goonoo SF (CWS)	September 1951	locally occasional	-
Hervey's Range (CWS)	November 1905	locally frequent	-
Hervey's Range, Peak Hill (CWS)	October 1905	a fairly common plant on the sides of a spur	-

Threats:

Vegetation clearing and habitat disturbance have been extensive in the region of distribution of *Philothea ericifolia* and this may have contributed to a possible decline of the species. Large areas of *Eucalyptus crebra* and *Callitris glaucophylla* forests and woodlands around Dubbo and the central wheat belt area have been cleared for agriculture and forestry. However it appears that the species may have been overlooked and under-collected in the past, with new and large populations coming to light as formal and systematic survey and mapping of forested areas is carried out. Altered fire regimes, particularly where fire is suppressed to preserve the White Cypress Pine source may also pose a threat to populations. 'Clearing of native vegetation' and 'High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition' are listed as Key Threatening Processes under the TSC Act in NSW.

Extreme fluctuations:

Area of distribution of *Philothea ericifolia* does not vary widely, with populations concentrated in central-western districts of NSW with no known outlying or widely disjunct populations. Recent information on population sizes indicates that the species is often locally common to frequent, comprising hundreds to possibly thousands of mature individuals. Early records indicate some smaller numbers, however these appear to describe plant numbers in the local vicinity and may not be a true estimate of whole population size. Larger populations recorded in recent times in the Pilliga, Goonoo and state forests around Gilgandra are likely to be reasonably stable, given the longevity and perennial life history of the species. Any variation in counts over the years may simply reflect the paucity of available data in combination with sampling error, providing no real evidence of extreme fluctuations in population size or area of distribution.

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Population reduction and continuing declines:

There is currently no evidence of a population reduction of *Philothea ericifolia* throughout its range, in fact new populations appear to be on the increase as new discoveries are made with systematic survey of forested areas in the central west. It is likely that smaller populations have been reduced elsewhere as the broader area has been extensively cleared, but there are no data available to substantiate this. Given the few direct or ongoing threats to the species, it is reasonable to infer no projected decline in the future. Altered fire regimes may have an impact on population size in some populations, especially where fire is used as a management tool to control Cypress Pine in forest habitats.

Extent of Occurrence (EOO) & Area of Occupancy (AOO):

The EOO of *Philothea ericifolia* is calculated at 60 000 km² based on the known records scattered over a geographic range of 400 km latitudinally and 150 km longitudinally (Figures 1 and 2). A conservative estimate of the AOO given the lack of data on population areas is about 200 km², if it is assumed that 50 populations exist and occupy an average area of 4 km² or 400 hectares each. An upper bound estimate may be as high as 500 km² if potential unexplored habitat within the EOO is considered. It is apparent that large populations of *Philothea ericifolia* and areas of habitat are undocumented, requiring targeted survey in order to obtain an accurate AOO figure as well as other vital population data.

Severe fragmentation:

Given that large areas of the habitats occupied by *Philothea ericifolia* on the western slopes have been cleared for agriculture and forestry, it is reasonable to assume that populations have been fragmented to some extent. Most populations occur within forested refuges or as very small remnants surrounded by cleared areas. Records are scattered throughout the area of distribution within remnant habitat, lending sufficient evidence to infer that populations have undergone some fragmentation. Given the high probability of the existence of more populations, it is unlikely that the degree of fragmentation is severe enough to have resulted in genetic isolation. Phylogenetic studies would be useful to get a better understanding of the genetic integrity, diversity and extent of interaction in existing populations.

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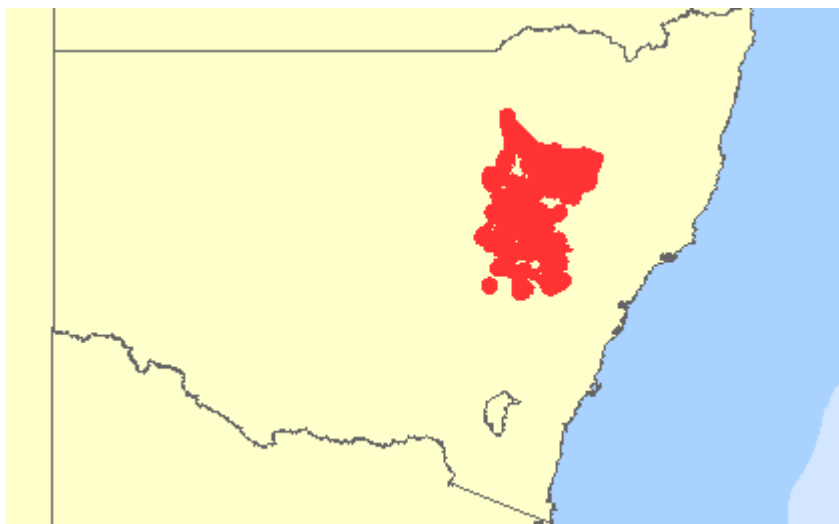


Figure 1. Distribution of *Philotheca ericifolia* in New South Wales showing site clusters and extent of occurrence (Department of the Environment, Water, Heritage and the Arts 2008).

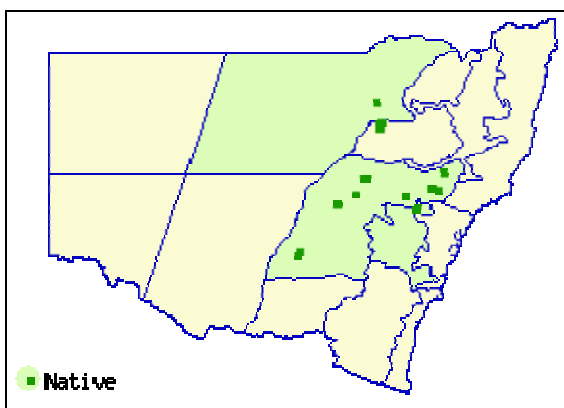


Figure 2. Distribution of *Philotheca ericifolia* in New South Wales, showing locations of known collection sites (PlantNET NSW 2008).

References:

- Atlas of NSW Wildlife (2008) <http://www.environment.nsw.gov.au/wildlifeatlas/about.htm>
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- Weston PH, Harden GJ (2002) *Philothea*. In 'Flora of New South Wales. Volume 2. Revised Edition' (Ed. GJ Harden) pp. 292-299. (University of New South Wales Press: Sydney).
- Wilson PG (1970) A taxonomic revision of the genera *Crowea*, *Eriostemon* and *Phebalium* (Rutaceae). *Nuytsia* **1**, 28-29.
- Wilson PG. (1998) A taxonomic review of the genera *Eriostemon* and *Philothea* (Rutaceae: Boronieae). *Nuytsia* **12**, 251.

Explanatory note

Between 2007 and 2009 the NSW Scientific Committee undertook a systematic review of the conservation status of a selection of plant and animal species listed under the Threatened Species Conservation Act. This species summary report provides a review of the information gathered on this species at the time the Review was undertaken.

The Scientific Committee's report on the Review of Schedules project and final determinations relating to species that were either delisted or had a change in conservation status can be found on the following website: www.environment.nsw.gov.au .

The Committee gratefully acknowledges the past and present Committee members and project officers who ably assisted the Committee in undertaking the Review of Schedules Project. Information on the people involved in the project can be found in the Acknowledgement section of the project report entitled "Review of the Schedules of the Threatened Species Conservation Act 1995. A summary report on the review of selected species" which is available on the abovementioned website.

This species summary report may be cited as:

NSW Scientific Committee (2008) *Philothea ericifolia* Review of current information in NSW. June 2008. Unpublished report arising from the Review of the Schedules of the Threatened Species Conservation Act 1995. NSW Scientific Committee, Hurstville.