

Consultation on Species Listing Eligibility and Conservation Actions

Pomaderris gilmourii var. gilmourii

You are invited to provide your views and supporting reasons related to:

1) the eligibility of *Pomaderris gilmourii* var. *gilmourii* for inclusion on the EPBC Act threatened species list in the Endangered category; and

2) the necessary conservation actions for the above species.

The purpose of this consultation document is to elicit additional information to better understand the status of the species and help inform on conservation actions and further planning. As such, the below draft assessment should be considered to be **tentative** as it may change following responses to this consultation process.

Evidence provided by experts, stakeholders and the general public are welcome. Responses can be provided by any interested person.

Anyone may nominate a native species, ecological community or threatening process for listing under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) or for a transfer of an item already on the list to a new listing category. The Threatened Species Scientific Committee (the Committee) undertakes the assessment of species to determine eligibility for inclusion in the list of threatened species and provides its recommendation to the Australian Government Minister for the Environment.

Responses are to be provided in writing by email to: <u>species.consultation@awe.gov.au</u>. Please include species scientific name in Subject field.

or by mail to:

The Director Bushfire Affected Species Assessments Section Department of Agriculture, Water and the Environment John Gorton Building, King Edward Terrace GPO Box 858 Canberra ACT 2601

Responses are required to be submitted by 5 January 2022.

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General background information about listing threatened species

The Australian Government helps protect species at risk of extinction by listing them as threatened under Part 13 of the EPBC Act. Once listed under the EPBC Act, the species becomes a Matter of National Environmental Significance (MNES) and must be protected from significant impacts through the assessment and approval provisions of the EPBC Act. More information about threatened species is available on the department's website at: https://www.awe.gov.au/environment/biodiversity/threatened/recovery-plans.

Public nominations to list threatened species under the EPBC Act are received annually by the department. In order to determine if a species is eligible for listing as threatened under the EPBC Act, the Threatened Species Scientific Committee (the Committee) undertakes a rigorous scientific assessment of its status to determine if the species is eligible for listing against a set of criteria. These criteria are available on the Department's website at: https://www.awe.gov.au/sites/default/files/env/pages/d72dfd1a-f0d8-4699-8d43-5d95bbb02428/files/tssc-guidelines-assessing-species-2021.pdf.

As part of the assessment process, the Committee consults with the public and stakeholders to obtain specific details about the species, as well as advice on what conservation actions might be appropriate. Information provided through the consultation process is considered by the Committee in its assessment. The Committee provides its advice on the assessment (together with comments received) to the Minister regarding the eligibility of the species for listing under a particular category and what conservation actions might be appropriate. The Minister decides to add, or not to add, the species to the list of threatened species under the EPBC Act. More detailed information about the listing process is at: https://www.awe.gov.au/environment/biodiversity/threatened/nominations.

To promote the recovery of listed threatened species and ecological communities, conservation advices and where required, recovery plans are made or adopted in accordance with Part 13 of the EPBC Act. Conservation advices provide guidance at the time of listing on known threats and priority recovery actions that can be undertaken at a local and regional level. Recovery plans describe key threats and identify specific recovery actions that can be undertaken to enable recovery activities to occur within a planned and logical national framework. Information about recovery plans is available on the department's website at: https://www.awe.gov.au/environment/biodiversity/threatened/recovery-plans.

Privacy notice

The Department will collect, use, store and disclose the personal information you provide in a manner consistent with the Department's obligations under the Privacy Act 1988 (Cth) and the Department's Privacy Policy.

Any personal information that you provide within, or in addition to, your comments in the threatened species assessment process may be used by the Department for the purposes of its functions relating to threatened species assessments, including contacting you if we have any questions about your comments in the future.

Further, the Commonwealth, State and Territory governments have agreed to share threatened species assessment documentation (including comments) to ensure that all States and Territories have access to the same documentation when making a decision on the status of a potentially threatened species. This is also known as the <u>'Common Assessment Method' (CAM)</u>. As a result, any personal information that you have provided in connection with your comments may be shared between Commonwealth, State or Territory government entities to assist with their assessment processes.

The Department's Privacy Policy contains details about how respondents may access and make corrections to personal information that the Department holds about the respondent, how respondents may make a complaint about a breach of an Australian Privacy Principle, and how the Department will deal with that complaint. A copy of the Department's Privacy Policy is available at: <u>https://www.awe.gov.au/about/commitment/privacy</u>.

Information about this consultation process

Responses to this consultation can be provided electronically or in hard copy to the contact addresses provided on Page 1. All responses received will be provided in full to the Committee and then to the Australian Government Minister for the Environment.

In providing comments, please provide references to published data where possible. Should the Committee use the information you provide in formulating its advice, the information will be attributed to you and referenced as a 'personal communication' unless you provide references or otherwise attribute this information (please specify if your organisation requires that this information is attributed to your organisation instead of yourself). The final advice by the Committee will be published on the department's website following the listing decision by the Minister.

Information provided through consultation may be subject to freedom of information legislation and court processes. It is also important to note that under the EPBC Act, the deliberations and recommendations of the Committee are confidential until the Minister has made a final decision on the nomination, unless otherwise determined by the Minister.

CONSULTATION QUESTIONS FOR POMADERRIS GILMOURII VAR. GILMOURII

SECTION A - GENERAL

- 1. Is the information used to assess the nationally threatened status of the *Pomaderris gilmourii* var. *gilmourii*? Have all the underlying assumptions been made explicit? Please provide justification for your response.
- 2. Can you provide additional data or information relevant to these assessments?
- 3. Have you been involved in previous state, territory or national assessments of this species? If so, in what capacity?

PART 1 – INFORMATION TO ASSIST LISTING ASSESSMENT

<u>SECTION B</u> DO YOU HAVE ADDITIONAL INFORMATION ON THE ECOLOGY OR BIOLOGY OF THE SPECIES? (If no, skip to section C)

Biological information

4. Can you provide any additional or alternative references, information or estimates on longevity, average life span and generation length?

5. Do you have any additional information on the ecology or biology of the species not in the current advice?

<u>SECTION C</u> ARE YOU AWARE OF THE STATUS OF THE TOTAL NATIONAL POPULATION OF THE SPECIES? (If no, skip to section D)

Population size

- 6. Has the survey effort for the *P. gilmourii* var. *gilmourii* been adequate to determine its national adult population size? If not, please provide justification for your response.
- 7. Do you consider the way the population size has been derived to be appropriate? Are there any assumptions and unquantified biases in the estimates? Do you accept the estimate of the total population size of the variety? If not, please provide justification for your response.
- 8. If not, can you provide a further estimate of the current population size of mature adults of the variety (national extent)? Please provide supporting justification or other information.

If, because of uncertainty, you are unable to provide a single number, you may wish to provide an estimated range. If so, please choose one of the ranges suggested in the table below of possible species numbers, and also choose the level of confidence you have in this estimate:

Number of mature individuals is estimated to be in the range of:

□ 0-10 □ 10-50 □ 50-100 □ >100 □ >500 □ >1 000

Level of your confidence in this estimate:

- \Box 0–30% low level of certainty/ a bit of a guess/ not much information to go on
- \Box 31–50% more than a guess, some level of supporting evidence
- □ 51–95% reasonably certain, information suggests this range
- 95–100% high level of certainty, information indicates quantity within this range
- 99–100% very high level of certainty, data are accurate within this range
- 9. Do you consider the single population of Grey Deua Pomaderris to be extinct?

<u>SECTION D</u> ARE YOU AWARE OF TRENDS IN THE OVERALL POPULATION OF THE SPECIES? (If no, skip to section E)

10. Does the current and predicted rate of decline used in the assessment seem reasonable? Do you consider that the way this estimate has been derived is appropriate? If not, please provide justification of your response.

Evidence of total population size change

11. Are you able to provide an estimate of the total population size during the early 1980s for *P. gilmourii* var. *gilmourii* (at or soon after the start of the most recent three generation)? Please provide justification for your response.

If, because of uncertainty, you are unable to provide a single number, you may wish to provide an estimated range. If so, please choose one of the ranges suggested in the table below of possible species numbers, and also choose the level of confidence you have in this estimate.

Number of mature individuals is estimated to be in the range of:

□ 0-10 □ 10-50 □ 50-100 □ >100 □ >500 □ >1000

Level of your confidence in this estimate:

- \Box 0–30% low level of certainty/ a bit of a guess/ not much information to go on
- \Box 31–50% more than a guess, some level of supporting evidence
- □ 51–95% reasonably certain, information suggests this range
- 95–100% high level of certainty, information indicates quantity within this range
- 99–100% very high level of certainty, data are accurate within this range
- 12. Are you able to comment on the extent of decline in the taxon's total population size over the last approximately 20 years (i.e. three generations)? Please provide justification for your response.

If, because of uncertainty, you are unable to provide an estimate of decline, you may wish to provide an estimated range. If so, please choose one of the ranges suggested in the table below of ranges of decline, and also choose the level of confidence you have in this estimated range.

Decline estimated to be in the range of:

□ 1–30% □31–50% □51–80% □81–100% □90–100%

Level of your confidence in this estimated decline:

- \Box 0–30% low level of certainty/ a bit of a guess/ not much information to go on
- \Box 31–50% more than a guess, some level of supporting evidence
- \Box 51–95% reasonably certain, suggests this range of decline
- \Box 95–100% high level of certainty, information indicates a decline within this range

99–100% - very high level of certainty, data are accurate within this range

13. Please provide (if known) any additional evidence which shows the population is stable, increasing or declining.

<u>SECTION E</u> ARE YOU AWARE OF INFORMATION ON THE TOTAL RANGE OF THE SPECIES? (If no, skip to section F)

Current Distribution/range/extent of occurrence, area of occupancy

- 14. Does the assessment consider the entire geographic extent and national extent of the variety? If not, please provide justification for your response.
- 15. Has the survey effort for this variety been adequate to determine its national distribution? If not, please provide justification for your response.
- 16. Is the distribution described in the assessment accurate? If not, please provide justification for your response and provide alternate information.
- 17. Do you agree that the way the current extent of occurrence and/or area of occupancy have been estimated is appropriate? Please provide justification for your response.
- 18. Can you provide estimates (or if you disagree with the estimates provided, alternative estimates) of the extent of occurrence and/or area of occupancy?

If, because of uncertainty, you are unable to provide an estimate of extent of occurrence, you may wish to provide an estimated range. If so, please choose one of the ranges suggested in the table below of ranges of extent of occurrence, and also choose the level of confidence you have in this estimated range.

Current extent of occurrence is estimated to be in the range of:

 \Box <100 km² \Box 100 – 5 000 km² \Box 5 001 – 20 000 km² \Box >20 000 km²

Level of your confidence in this estimated extent of occurrence

- \Box 0–30% low level of certainty/ a bit of a guess/ not much data to go on
- \Box 31–50% more than a guess, some level of supporting evidence
- □ 51–95% reasonably certain, data suggests this range of decline
- \Box 95–100% high level of certainty, data indicates a decline within this range
- 99–100% very high level of certainty, data is accurate within this range

If, because of uncertainty, you are unable to provide an estimate of area of occupancy, you may wish to provide an estimated range. If so, please choose one of the ranges

suggested in the table below of ranges of area of occupancy, and also choose the level of confidence you have in this estimated range.

Current area of occupancy is estimated to be in the range of:

 \Box <10 km² \Box 11 – 500 km² \Box 501 – 2 000 km² \Box >2 000 km²

Level of your confidence in this estimated extent of occurrence:

 \Box 0–30% - low level of certainty/ a bit of a guess/ not much data to go on

- \Box 31–50% more than a guess, some level of supporting evidence
- □ 51–95% reasonably certain, data suggests this range of decline
- \Box 95–100% high level of certainty, data indicates a decline within this range
- 99–100% very high level of certainty, data is accurate within this range

<u>SECTION F</u> ARE YOU AWARE OF TRENDS IN THE TOTAL RANGE OF THE SPECIES? (If no, skip to section G)

Past Distribution/range/extent of occurrence, area of occupancy

- 19. Do you consider that the way the historic distribution has been estimated is appropriate? Please provide justification for your response.
- 20. Can you provide estimates (or if you disagree with the estimates provided, alternative estimates) of the former extent of occurrence and/or area of occupancy?

If, because of uncertainty, you are unable to provide an estimate of past extent of occurrence, you may wish to provide an estimated range. If so, please choose one of the ranges suggested in the table below of ranges of past extent of occurrence, and also choose the level of confidence you have in this estimated range.

Past extent of occurrence is estimated to be in the range of:

 \Box <100 km² \Box 100 - 5 000 km² \Box 5 001 - 20 000 km² \Box >20 000 km²

Level of your confidence in this estimated extent of occurrence

- \Box 0–30% low level of certainty/ a bit of a guess/ not much data to go on
- \Box 31–50% more than a guess, some level of supporting evidence
- □ 51–95% reasonably certain, data suggests this range of decline
- \Box 95–100% high level of certainty, data indicates a decline within this range
- \Box 99–100% very high level of certainty, data is accurate within this range

If, because of uncertainty, you are unable to provide an estimate of past area of occupancy, you may wish to provide an estimated range. If so, please choose one of the ranges suggested in the table below of ranges of past area of occupancy, and also choose the level of confidence you have in this estimated range:

Past area of occupancy is estimated to be in the range of:

 \Box <10 km² \Box 11 – 500 km² \Box 501 – 2 000 km² \Box >2 000 km²

Level of your confidence in this estimated extent of occurrence:

- \Box 0–30% low level of certainty/ a bit of a guess/ not much data to go on
- \Box 31–50% more than a guess, some level of supporting evidence
- \Box 51–95% reasonably certain, data suggests this range of decline
- \Box 95–100% -high level of certainty, data indicates a decline within this range
- \Box 99–100% very high level of certainty, data is accurate within this range

PART 2 – INFORMATION FOR CONSERVATION ADVICE ON THREATS AND CONSERVATION ACTIONS

<u>SECTION G</u> DO YOU HAVE INFORMATION ON THREATS TO THE SURVIVAL OF THE SPECIES? (If no, skip to section H)

- 21. Do you consider that all major threats have been identified and described adequately?
- 22. To what degree are the identified threats likely to impact on the variety in the future?
- 23. Are the threats impacting on different localities or subpopulations equally, or do the threats vary across different localities and/or subpopulations?
- 24. Can you provide additional or alternative information on past, current or potential threats that may adversely affect the taxon at any stage of its life cycle?
- 25. Can you provide supporting data/justification or other information for your responses to these questions about threats?

SECTION H DO YOU HAVE INFORMATION ON CURRENT OR FUTURE MANAGEMENT FOR THE RECOVERY OF THE SPECIES? (If no, skip to section I)

- 26. What planning, management and recovery actions are currently in place supporting protection and recovery of the variety? To what extent have they been effective?
- 27. Can you recommend any additional or alternative specific threat abatement or conservation actions that would aid the protection and recovery of the variety?
- 28. Would you recommend translocation (outside of the taxons' historic range) as a viable option as a conservation actions for this variety?

<u>SECTION I</u> DO YOU HAVE INFORMATION ON STAKEHOLDERS IN THE RECOVERY OF THE SPECIES?

- 29. Are you aware of other knowledge (e.g. traditional ecological knowledge) or individuals/groups with knowledge that may help better understand population trends/fluctuations, or critical areas of habitat?
- 30. Are you aware of any cultural or social importance or use that the variety has?
- 31. What individuals or organisations are currently, or potentially could be, involved in management and recovery of the variety?
- 32. How aware of P. gilmourii var. gilmourii are land managers where the taxon is found?
- 33. What level of awareness is there with individuals or organisations around the issues affecting the variety?
 - a. Where there is awareness, what are these interests of these individuals/organisations?
 - b. Are there populations or areas of habitat that are particularly important to the community?

PART 3 – ANY OTHER INFORMATION

34. Do you have comments on any other matters relevant to the assessment of *P. gilmourii* var. *gilmourii*?

Conservation Advice for Pomaderris gilmourii var. gilmourii

This draft document is being released for consultation on the species listing eligibility and conservation actions

The purpose of this consultation document is to elicit additional information to better understand the status of the species and help inform conservation actions, further planning and a potential recovery plan. The draft assessment below should therefore be considered **tentative** at this stage, as it may change as a result of responses to this consultation process.

<u>Note</u>: Specific consultation questions relating to the below draft assessment and preliminary determination have been included in the consultation cover paper for your consideration.

This document combines the approved conservation advice and listing assessment for the taxon. It provides a foundation for conservation action and further planning.



Photo of Pomaderris gilmourii var. gilmourii © Copyright, Jackie Miles (from Plants of South-Eastern NSW)

Conservation status

Pomaderris gilmourii var. gilmourii (P. gilmourii var. gilmourii) is proposed to be listed in the Endangered category of the threatened species list under the *Environment Protection and Biodiversity Conservation Act 1999*.

- Criterion 1: Insufficient data
- Criterion 2: B1ab(iii)+2ab(iii) Endangered
- Criterion 3: Insufficient data
- Criterion 4: Insufficient data
- Criterion 5: Insufficient data

The main factors that make the taxon eligible for listing in the Endangered category are restricted geographic range, a low number of locations and continuing decline.

Species can also be listed as threatened under state and territory legislation. For information on the current listing status of this taxon under relevant state or territory legislation, see the <u>Species Profile and Threat Database</u>.

Species information

Taxonomy

There are two varieties of *P. gilmourii*, *P. gilmourii* var. *gilmourii* N.G.Walsh (no common name) and *P. gilmourii* var. *cana* N.G.Walsh (grey deua pomaderris) (Walsh 1989). The grey deua pomaderris is restricted to a single recorded population that has not been seen since 1987 (although the locality is inaccessible, and the taxon may still occur there). It co-occurs with the more widespread *P. gilmourii* var. *gilmourii*, which is confirmed to be still extant at that locality. Both taxa are assessed separately at the taxon level.

This conservation advice is for *P. gilmourii* var. *gilmourii* conventionally accepted as *Pomaderris gilmourii* var. *gilmourii* N.G. Walsh.

Description

The following description for *Pomaderris gilmourii* var. *gilmourii* has been adapted from Walsh (1989), DECC (2008), and Wood (2019). *Pomaderris gilmourii* var. *gilmourii* is a shrub to 4 m high, in the family Rhamnaceae. Leaves are elliptical, to 35 mm long by 4-13 mm wide and alternate up the stem. A superficial layer of fine silky woolly hairs on the lower surface of the leaves, leaf stalks and branchlets give the leaf its characteristic 'shiny' appearance (Wood 2019). The leaf margins are thickened and smooth giving the leaf a 'border edge' appearance which is particularly evident on the under surface. Leaves are hairless on the upper surface, except for a line of minute hairs along the midvein. The small five lobed flowers are creamish to yellow, lack petals and form in clusters (2–5 cm diameter at the ends of branchlets) that are shorter than the leaves. Flowers fall early. The lobes of the flower (sepal) are approximately 1.5 mm long and the style is smooth above the point of division. The fruit is unknown, but in other species of *Pomaderris* it is a 3-chambered capsule.

Pomaderris gilmourii var. *gilmourii* differs from the rarer variety, the *Pomaderris gilmourii* var. *cana* (grey deua pomaderris) in the following morphological characteristics. The grey deua pomaderris appears dull and grey in colour because superficial hairs on the under surface of the leaf are lacking, and it has an absence of a 'smooth border edge' because the leaf margin is not thickened (Wood 2019). The sepal length is also shorter in the grey deua pomaderris, c. 1 mm long (Walsh 1989).

Distribution

Pomaderris gilmourii var. *gilmourii* is known to occur on rhyolite outcrops, cliffs and scree slopes within Deua National Park (DNP) in NSW (Table 1) throughout the east (in the vicinity of Coondella Trig and Mt Donovan) and west (in the vicinity of Bendethera) ranges (Map 1).

The localities in the eastern ranges of DNP are known locally as the 'mountains of the moon' because the steep terrain is covered by numerous rhyolite rocky outcrops (J Miles 2021. pers comm 3 August; C Howard 2021. pers comm 18 August). These localities, particularly those north of Coondella Trig, have been surveyed the most frequently and appear to harbour a larger number of subpopulations (and probably individuals) than occur in the western ranges of DNP (ten site visits, Table 1). Subpopulation estimates exist for some of these localities, with one estimate of 31 individuals at the subpopulation 2 km north of Coondella Trig in 2015 and another of >50 individuals at the subpopulation data has been recorded for this taxon at any other locality. In the western ranges of DNP, the subpopulation is noted as being occasional in 1985 and 1993. These localities support dry sclerophyll forests and rocky outcrops are less numerous. It is likely that the subpopulations to the north of Coondella Trig, have the largest number of individuals in the population.

It is highly likely that other subpopulations exist for this taxon, particularly in the region of the 'mountains of the moon', however they are inaccessible because of steep terrain (J Miles 2021. pers comm 3 August).

The taxon is found within the Interim Biogeographic Regionalisation of Australia (IBRA) region of the South East Coastal Ranges (OEH 2019).

Region	Subpopulation no. and locality	Date/s	Habitat	Elevation	Notes	Reference
Deua National Park east (Coondella Trig)	1a. Approx. 1 km north of Coondella Trig, c. 16 km west- southwest from Moruya	15/02/1984 25/11/1985 07/12/1987 01/2007 10/01/2010 04/2012 22/10/2015	Growing in dense low shrubland community above cliffs on skeletal soil on rhyolite outcrop. Aspect includes north, north- northeast, east, and east- southeast.	450-500	In 1984, fertile, 2m high. In 1985, common. In 1987, c. 4 m high with buds. In 2010, c. 2 m tall. Common in this habitat. In 2015, 31 plants, in bud. Additional comments: In 2021, this locality appeared to evade heavy burn from a vantage point of <1 km away	AVH 2021ab; K McDougall 2021. pers comm 5 August

Table 1 Distribution of P. gilmourii var. gilmourii

Region	Subpopulation no. and locality	Date/s	Habitat	Elevation	Notes	Reference
	1b. Approx. 1 km north of Coondella Trig, near Kiora	23/01/1991 03/11/1996 17/06/2021	Growing on rim of cliffs on rocky outcrops, steep slope, west aspect. Skeletal soils.	540-570	In 1991, in flower and fruit. Undisturbed site. Plant occurs in more sheltered sites, in clefts. In 1996, 2 m in height. In 2021, common (pop>50 individuals), large plants in early bud, seeds present, area of coverage for subpopulation (1,000 sq. metres). Additional comments: In 2021, patchy burn and no impact to locality from 2019–20 fires, ridges around outcrop heavily affected but petered out at top.	AVH 2021b; G Phillips 2021. pers comm 23 July
	1c. Approx.1.5 km north of Coondella Trig	10/01/2010	Rocky outcrop. Shrubland at edge of isolated rocky hill.	300	Approx. 2 m tall. Common in this habitat.	AVH 2021b
	2. Approx. 1.8 km northeast of summit along ridge, c.20 km WNW of Moruya	28/03/1985	Escarpment, top of steep rocky ridge, flat. Skeletal soil on rhyolite.	540	Fertile, single stemmed shrub to 2 m. Occasional.	AVH 2021b
	3. Approx. 1.9 km west- southwest from Coondella Trig in Diamond Creek catchment	03/01/1991	Growing on rhyolite outcrop in shrubland	390	Fairly common. Flowers and fruit seen.	AVH 2021b
	4. Approx. 3 km due west of	01/01/1993	Growing in shrubland-low open forest.	600	Flowers and buds seen.	AVH 2021b

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Region	Subpopulation no. and locality	Date/s	Habitat	Elevation	Notes	Reference
	Bundogeran Hill		Skeletal substrate.			
Deua National Park west (Bendethera)	5. Approx. 6 km north of Bendethera, near Bendethera caves area	28/03/1985	Growing on rocky slope, in gully, southeast aspect. Skeletal soil on rhyolite.	610-700	Seen occasionally.	AVH 2021b
	6. Approx. 1.3 km directly north of Bendethera Mountain along narrow ridge leading northwest from knoll.	30/12/1993	Growing at top of cliff, exposed, west aspect. Brown clay and humus in crevice of rhyolite rock	980	Seen occasionally. In flower.	AVH 2021b



Map 2 Modelled distribution of P.gilmourii var. gilmourii

Source: Base map Geoscience Australia; species distribution data <u>Species of National Environmental Significance</u> database. **Caveat**: The information presented in this map has been provided by a range of groups and agencies. While every effort has been made to ensure accuracy and completeness, no guarantee is given, nor responsibility taken by the Commonwealth for errors or omissions, and the Commonwealth does not accept responsibility in respect of any information or advice given in relation to, or as a consequence of, anything containing herein.

Species distribution mapping: The species distribution mapping categories are indicative only and aim to capture (a) the specific habitat type or geographic feature that represents recent observed locations of the species (known to occur) or preferred habitat occurring in close proximity to these locations (likely to occur); and (b) the broad environmental envelope or geographic region that encompasses all areas that could provide habitat for the species (may occur). These presence categories are created using an extensive database of species observations records, national and regional-scale environmental data, environmental modelling techniques and documented scientific research.

Cultural and community significance

This section describes some published examples of this significance but is not intended to be comprehensive, applicable to, or speak for, all Indigenous people. Such knowledge may be only held by Indigenous groups and individuals who are the custodians of this knowledge.

The cultural significance of *P. gilmourii* var. *gilmourii* is not well understood. However, Indigenous people have had a long and continuous association with country including DNP and the south coast more broadly (DECC 2009). Areas where the taxon has been recorded are located within the region of the Yuin people, according to the Map of Indigenous Australia (AIATSIS 1996). Further work should determine whether the *P. gilmourii* var. *gilmourii* is of significance to the Indigenous community and seek opportunities for awareness of this taxon.

Relevant biology and ecology

Habitat

There is very limited information about the ecology of the *P. gilmourii* var. *gilmourii*. The population is located on skeletal soils derived from rhyolite which was formed as part of the Comerang Volcanic Series (DECC 2008). The population is confined to rocky outcrops, knolls, steep cliffs and scree at elevations greater than 300 m above sea level. One subpopulation, however, is located in a gully (Bendethera locality, Table 1). The taxon occurs in a shrubland environment with a variety of associated species (AVH 2021b), including *Eucalyptus stenostoma* (jillaga ash), *Hakea dactyloides* (finger hakea), *Acacia subtilinervis* (net-veined wattle), *Leptospermum deuaense* (tea tree species), *Platysace lanceolata* (shrubby platysace), grey deua pomaderris, *Prostanthera porcata* (mintbush species), *Westringia saxatilis, Melaleuca hypericifolia* (hillock bush), *Eriostemon trachyphyllus* (rock waxflower), and *Leucopogon setiger* (beard heath species).

Reproductive Ecology

There is very limited information about the reproductive strategies, seedling recruitment, soil seedbank dynamics, longevity, fecundity, and seed germination requirements of *P. gilmourii* var. *gilmourii*. However, other species in the *Pomaderris* genus are known to produce elaiosomes, which are oil-rich structures thought to be an adaptation to dispersal by ants (Berg 1975; Lengyel et al. 2010; Patykowski et al. 2014), suggestive of short-distance seed dispersal (Patykowski et al. 2014). The pollinators of *P. gilmourii* var. *gilmourii* are unknown, although insects may be the primary pollinators of *Pomaderris* generally (Patykowski et al. 2014). Seed set is highly variable in *Pomaderris*, with asexual reproduction common, potentially a result of low mate availability, pollinator limitation or stress-induced seed abortion in situ (Chen et al. 2019). Flowers and buds of the *P. gilmourii* var. *gilmourii* have been recorded throughout the year (AVH 2021b). Dense shade is known to reduce flowering and growth in other *Pomaderris* species (Patykowski et al. 2014).

The generation length and time to reproductive maturity for the *P. gilmourii* var. *gilmourii* is unknown. However, the generation length of other *Pomaderris* species is estimated to range from 8–30 years: 10–30 years (*P. cotoneaster* (cotoneaster pomaderris) and *P. brunnea* (rufous pomaderris), DELWP 2020ab), and 8–20 years (*P. sericea* (bent pomaderris), DELWP 2020c). Time to reproductive maturity is estimated at 2–6 years for other *Pomaderris* (Maryott-Brown & Wilks 1993; Patykowski et al. 2014). The longevity of *Pomaderris* species ranges between 20–50 years (DELWP 2021ac). However, the lifespan of *P. vacciniifolia* (round-leaf pomaderris) is known to be longer at higher elevations (>300 m) which is considered to provide optimum growing conditions (Patykowski et al. 2014). Thus, *P. gilmourii* var. *gilmourii* could exceed the average species longevity as it is found at elevations between 300 to 980 m.

Population Genetics

Although limited information on population genetics exists for the *P. gilmourii* var. *gilmourii*, asexual seed production (apomixis) is common within the genus (Chen et al. 2019). If confirmed for *P. gilmourii*, it may indicate that many individuals in a population are genetically identical and incapable of adaptive change. However, many apomictic species still possess a normal sexual reproductive pathway which provides opportunity for genetic diversification (Hand & Koltunow 2014). Apomixis may also facilitate the persistence of *Pomaderris* populations at small

numbers (Chen et al. 2019). Further, the *P. gilmourii* var. *gilmourii* appears to be most closely related, biogeographically, to *P. virgata* (upright pomaderris) within the *Pomaderris* genus (Nge et al. 2021). Therefore, the *P. gilmourii* var. *gilmourii* could also share similar traits of polyploidy with that species, which may explain its apparent reproductive isolation from var. *cana* with which it grows.

Fire Ecology

The fire-response of *P. gilmourii* is not well understood. The longevity of the soil seed bank for the *P. gilmourii* var. *gilmourii* is unknown, however seeds of *Pomaderris vacciniifolia* (round-leaf pomaderris) is estimated to survive for at least 20 years in the soil (Patykowski et al. 2014). Seeds of other *Pomaderris* species are physically dormant and germination is cued by heat shock (Le Breton et al. 2020). Post-fire responses of *P. adnata* (sublime point pomaderris) and *P. walshii* (Carrington falls pomaderris) revealed that both species require high temperature fires to break seed dormancy, indicating that higher severity fires would produce the greatest germination response (Natale 2016). Dormant seeds in the soil were also shown to be exhausted following rainfall after one post-fire event (Natale 2016).

Although most *Pomaderris* species are thought to be obligate seeders (Patykowski et al. 2016), the sublime point pomaderris was found to resprout after fire, although the presence of resprouting was positively correlated with trunk diameter at breast height and only occurred in 34 percent of mature trees (Natale 2016). This could indicate a low (but not negligible) level of resilience to low severity fire among adult plants. Limited fire resistance of the sublime point pomaderris. to low-severity fires has been shown elsewhere (Le Breton et al. 2020).

Habitat critical to the survival

The *P. gilmourii* var. *gilmourii* grows on skeletal soils on rocky outcrops, knolls, steep cliffs and scree at elevations >300 m in DNP. Given the very restricted distribution of the taxon, habitat critical to the survival includes the area of occupancy of all subpopulations, areas of similar habitat (i.e. rhyolite outcrops) in the vicinity of these subpopulations (as these areas provide potential habitat for pollinators or biota essential to the continued existence of the taxon and enable the movement of pollinators between subpopulations), areas of similar habitat that may contain subpopulations of the taxon or be suitable sites for future conservation translocations, and the local catchment for the surface and/or groundwater that maintains the habitat of the taxon.

No Critical Habitat as defined under section 207A of the EPBC Act has been identified or included in the Register of Critical Habitat.

Important populations

In this section, the word population is used to refer to subpopulation, in keeping with the terminology used in the EPBC Act and state/territory environmental legislation.

There is sufficient evidence through the taxon's eligibility for listing, to declare all populations/the national population as important populations of this taxon under particular pressure of survival and which therefore require protection to support the recovery of the taxon.

Threats

The main identified threats to the *P. gilmourii* var. *gilmourii* are inappropriate fire regimes, feral animal herbivory, and stochastic events (Table 2). The *P. gilmourii* var. *gilmourii* is restricted to confined areas, placing the subpopulations at risk of localised loss from a single threatening event, despite its reservation within a national park.

Threat	Status and severity a	Evidence
Habitat loss, disturbance	e, and modification (including fire)	·
Inappropriate fire regimes	 Timing: future Confidence: suspected Consequence: major Trend: unknown Extent: across part of its range 	The sensitivity of the <i>P. gilmourii</i> var. <i>gilmourii</i> to fire is unknown but may be inferred from other species in the genus. Most species within the genus are obligate seeders (Patykowski et al. 2016), although one species was observed to resprout after fire (sublime point pomaderris; Natale 2016). Post-fire recruitment is likely important for many <i>Pomaderris</i> species with high severity fires resulting in a greater recruitment response in some species immediately following fire (Natale 2016). Deua National Park is incorporated in a fire management strategy that uses prescribed burns to reduce fuel reduction and minimise the impact
		to reduce fuel reduction and minimise the impact of bushfire (DPIE 2011). There have potentially been up to seven fires that have occurred in the region/s where the taxon occurs, including four wildfires (1968-69, 1980- 81, 2001-02 and 2019-2020) and three prescribed burns (1977-78, 1985-86 and 1993-94) (DPIE 2010). However, it is unknown if the exact locations where the taxon has been found were burnt during any of these fire events. The 2019-2020 bushfires burnt through much of the habitat of the taxon at high severity (Gallagher 2020). However, recent surveys to the subpopulation north of Coondella Trig suggest that the <i>P. gilmourii</i> var. <i>gilmourii</i> may be less impacted by the 2019-20 fire than model predictions suggest (Table 1). Surveys to this locality in June 2021, observed no impact to mature plants, with large mature plants appearing healthy and in early bud (G Phillips 2021. pers comm 23 July), despite the ridges around the outcrop being heavily affected by fire. Bushfire has historically been observed to burn in patches throughout DNP and particularly within the mountains of the moon landscape because of the limited vegetation on the exposed rocky outcrops and steep cliffs (C Howard 2021. pers comm 18 August). Therefore, it is not clear if the taxon is as reliant on fire-stimulated recruitment as other <i>Pomaderris</i> species.
		It is possible that given the frequent fire history in the region, soil-stored seed could have already been utilised in some subpopulations or localities. However, it is equally possible that the taxon has evaded previous burns in some/all subpopulations and soil-stored seed remains intact and viable. In this case, future frequent fires in multiple fires in rapid succession could exhaust

Table 2 Threats impacting P. gilmourii var. gilmourii

Threat	Status and severity ^a	Evidence
		soil-stored seed reserves (Natale 2016) and prevent plants from reaching maturity (DECC 2008). The risks of such events may be exacerbated by prescribed burning, particularly if prescribed burns add to an increasing frequency of bushfire due to climate change (Clarke 2015; Dowdy et al. 2019; BOM & CSIRO 2020). Therefore, high fire frequency could cause further decline to the taxon in the future (DECC 2008).). In contrast, a lack of frequent fire could also be a threat. Other potential fire-related threats include fire-drought, fire-herbivore and possibly fire- disease interactions (see below).
Climate Change		
Increased frequency and severity of drought	 Timing: current/future Confidence: observed Consequence: major Trend: increasing Extent: across the entire range 	Future climate change predictions for southeast Australia in the temperate forested region, where <i>P. gilmourii</i> var. <i>gilmourii</i> occurs, include an increase in the number of days of elevated temperatures and an increase in the Forest Fire Danger Indices (FFDI) (Clarke 2015; Dowdy et al. 2019; BOM & CSIRO 2020), which are useful indicators of drought. Conditions which contribute to successful germination and seedling establishment post-fire, such as sufficient rainfall (Vickers et al. 2021), may be negatively affected by increased post-fire
		droughts due to climate change (Clark 2015; Dowdy et al. 2019). Pre-fire droughts, as occurred in 2019, could also limit population persistence by reducing health and reproductive output of standing plants.
Limited long-term adaptive ability due to allee effects and low genetic diversity	 Timing: future Confidence: inferred Consequence: major Trend: unknown Extent: across the entire range 	Many small, isolated subpopulations are subject to the effects of low genetic diversity (Frankham et al. 2014). A predominance of asexual reproduction is also likely to limit the long-term adaptive ability of the taxon and may also limit translocation success (Chen et al. 2019). There are only eight known subpopulations of <i>P. gilmourii</i> var. <i>gilmourii</i> and asexual seed production is likely utilised by the taxon (Chen et al. 2019). Therefore, despite species with restricted distributions and specific habitat requirements persisting for long periods, their ability to adapt to future changing conditions associated with climate change, is limited by low genetic exchange and recombination. Therefore, P. <i>gilmourii</i> var. <i>gilmourii</i> is likely to be at risk of the negative consequences associated
		with low genetic diversity in a future changing climate.
Herbivory and disturban	ce from feral herbivores	
Browsing by feral herbivores	 Timing: current/future Confidence: suspected Consequence: moderate Trend: unknown Extent: across part of its range 	Browsing by feral herbivores is a potential threat to <i>P. gilmourii</i> var. <i>gilmourii</i> . Browsing by goats and deer is identified as a threat to other <i>Pomaderris</i> species (DPIE 2020) and can lead to considerable impacts to <i>Pomaderris</i> in some areas. For example, <i>Pomaderris</i> species are preferentially browsed by <i>Rusa unicolor</i> (sambar deer) in Victoria, often to the output that and during in victorial.

Threat	Status and severity a	Evidence
		prevented (N Walsh 2021. pers comm 13 August). Despite this, browsing activity from herbivores does not have a consistent impact across the landscape where other <i>Pomaderris</i> species occur. For example, in some areas where more palatable species co-occur, <i>Pomaderris</i> species are not heavily browsed (N Walsh 2021. pers comm 13 August).
		Populations of feral goats are known occur in other reserves connected to DNP (DPIE 2019) and anecdotal sightings exist within DNP (C Howard 2021. pers comm18 August). Deer numbers are increasing yearly in some areas within DNP (C Howard 2021. pers comm18 August).
		The impacts of goats in the Parks are considered substantial because of direct impacts to native plants from grazing and trampling, as well as contributing to erosion and spreading of weeds (DPIE 2019). Goats are considered a greater threat to the taxon than deer, as goats are capable of accessing the steep terrain where the taxon occurs. The impacts of feral goats have been listed as a Key Threatening Process under the EPBC Act (DEWHA 2008). Deer have also been listed as an emerging threat in the Far South Coast Escarpment Parks Plan of Management which includes DNP (ECCW 2019).
		Although there is a lack of obvious browsing impacts in the areas where the subpopulations occur (N Walsh & J Miles 2021. pers comm 13 August; G Phillips 2021. pers comm 14 August), browsing is likely to increase if populations of herbivores increase.
Habitat damage by feral pigs	 Timing: future Confidence: suspected Consequence: minor Trend: unknown Extent: across part of its range 	Populations of feral pigs are known to occur in reserves adjacent to, and within DNP (DPIE 2019; ECCW 2019). Pigs cause damage by rooting for food which causes erosion and introduces weeds, and selective feeding on native plants (DEE 2017). Feral pigs are listed as a key threatening process (KTP) under the EPBC Act (DEE 2017).
		Although pigs are more commonly seen associated with wetter areas within DNP, such as bogs, rivers, creeks and swamps (ECCW 2019), they have been observed to cause damage to habitat in rocky outcrops in DNP (G Phillips 2021. pers comm 14 August).
		Although direct damage to the taxon from feral pigs has not been observed (G Phillips 2021. pers comm 14 August; C Howard 2021. pers comm 18 August), pigs could potentially be a threat to the taxon in the future.
Disease		
Dieback caused by Phytophthora cinnamomi	 Timing: current/future Confidence: suspected Consequence: unknown Trend: unknown Extent: across part of its range 	The <i>P. gilmourii</i> var. <i>gilmourii</i> may be susceptible to the invasive soil-borne water mould, <i>Phytophthora cinnamomi. Phytophthora</i> <i>cinnamomi</i> spreads through water runoff, transportation of infected soil by humans and animals and root-to-root contact spreading both uphill and downhill (Shearer & Tippet 1989). <i>Phytophthora cinnamomi</i> is now widespread in

Threat	Status and severity a	Evidence
		coastal forests in NSW including at higher elevations (DPIE 2019).
		There have been limited studies on the impact of <i>P. cinnamomi</i> in <i>Pomaderris</i> species. <i>Pomaderris halmaturina</i> subsp. <i>halmaturina</i> (Kangaroo Island pomaderris) has shown moderate susceptibility to the pathogen with 40% of plants surviving ex situ inoculation trials (Kueh et al. 2012). The <i>P. gilmourii</i> var. <i>gilmourii</i> is not considered to be at risk to the <i>P.cinnamomi</i> infestation according to NSW Government (DPIE 2019). However, observations of dead <i>Xanthorrhoea australis</i> (Grass Tree) during site visits to the area in 2012 (J Miles 2021. pers comm 5 August) suggest that <i>P. cinnamomi</i> may have infected some localities where <i>P. ailmourii</i> yar. <i>gilmourii</i> occurs although
		the presence of the pathogen is yet to be confirmed.

Status—identify the temporal nature of the threat;

Confidence—identify the extent to which we have confidence about the impact of the threat on the species; Consequence—identify the severity of the threat;

Trend—identify the extent to which it will continue to operate on the species;

Extent—identify its spatial content in terms of the range of the species.

Each threat has been described in Table 2 in terms of the extent that it is operating on the taxon. The risk matrix (

Table) provides a visual depiction of the level of risk being imposed by a threat and supports the prioritisation of subsequent management and conservation actions. In preparing a risk matrix, several factors have been taken into consideration, they are: the life stage they affect; the duration of the impact; and the efficacy of current management regimes, assuming that management will continue to be applied appropriately. The risk matrix and ranking of threats has been developed in consultation with in-house expertise using available literature. Threats with unknown consequences (dieback caused by *P. cinnamomi*) have not been included in Table 3, although if confirmed that the taxon is susceptible to this pathogen, it would likely represent major threat to the species (i.e. very high risk).

Tab	le 3	Pomaa	lerris g	ilmouri	i var. <i>g</i>	ilmourii	risk	matrix

Likelihood	Consequences				
	Not significant	Minor	Moderate	Major	Catastrophic
Almost certain	Low risk	Moderate risk	Very high risk	Very high risk Increased frequency and intensity of bushfires	Very high risk
Likely	Low risk	Moderate risk	High risk	Very high risk Inappropriate fire regimes from planned burns Low genetic diversity	Very high risk

Likelihood	Consequences				
	Not significant	Minor	Moderate	Major	Catastrophic
Possible	Low risk	Moderate risk Habitat damage by feral pigs	High risk Browsing and disturbance from feral herbivores	Very high risk	Very high risk
Unlikely	Low risk	Low risk	Moderate risk	High risk	Very high risk
Unknown	Low risk	Low risk	Moderate risk	High risk	Very high risk

Categories for likelihood are defined as follows:

Almost certain – expected to occur every year

Likely – expected to occur at least once every five years

Possible – might occur at some time

Unlikely – such events are known to have occurred on a worldwide bases but only a few ties

Unknown - currently unknown how often the incident will occur

Categories for consequences are defined as follows:

Not significant – no long-term effect on individuals or populations

Minor - individuals are adversely affected but no effect at population level

Moderate – population recovery stalls or reduces

Major – population decreases

 ${\it Catastrophic-population\ extirpation/extinction}$

Priority actions have then been developed to manage the threat particularly where the risk was deemed to be 'very high' or 'high'. For those threats with an unknown or low risk outcome it may be more appropriate to identify further research or maintain a watching brief.

Conservation and recovery actions

Primary conservation outcome

By 2030, the *P. gilmourii* var. *gilmourii* subpopulations have increased in abundance and are sustained in habitats in which high risk threats are managed effectively. By 2030, a viable ex-situ collection of *P. gilmourii* var. *gilmourii* is maintained to allow for conservation translocation in the event of future threatening events.

Conservation and management priorities Habitat loss, disturbance, and modification (including fire)

- Develop and implement a fire management strategy that optimises the survival of *P. gilmourii* var. *gilmourii*.
 - Avoid planned burns in *P. gilmourii* habitat until it is established that the taxon requires fire to regenerate.
 - Take the likelihood of increasingly frequent bushfires into account when developing planned burning programs, to avoid excessive, frequent burning of any subpopulations.
 - Provide maps of known occurrences to local and State Rural Fire Services.
 - Avoid application of fire retardants in the vicinity of the population during fire suppression operations.

Climate Change and Fire

• Identify current and future habitat likely to remain or become suitable habitat due to climate change and ensure impacts of other threats to this habitat are minimised.

• Spread the risk to the species associated with climate change and fire by establishing multiple translocated populations in suitable habitat.

Herbivory

• If there is evidence of browsing by feral herbivores (e.g., goats, deer and pigs), reduce the impacts of feral herbivory through well-maintained fencing (e.g. Mackenzie & Keith 2009), where suitable, and/or through ongoing control programs.

Disease

- Minimise the spread and mitigate the impact of *P. cinnamomi*, to *P. gilmourii* var. *gilmourii* by following the guidance as described in the *Threat abatement plan for disease in natural ecosystems caused by Phytophthora cinnamomi* (DEE 2018).
- If there is evidence that *P. cinnamomi* is impacting the *P. gilmourii* var. *gilmourii*, implement mitigation measures including, but not limited to, the application of a biodegradable, systemic fungicide such as phosphite (or other alternatives); noting the potential deleterious effects as a fertiliser with prolonged usage.

Ex situ recovery actions

- Manage the risk of losing genetic diversity, undertake appropriate seed collection and storage in long term custodial collections until no longer needed and determine viability of stored seed. Best practice seed storage guidelines and procedures should be adhered to, to maximise seed viability and germinability. Seeds from all plants to be collected and stored, where possible.
- Establish plants in cultivation or collect and maintain plant cuttings in appropriate institutions such as Botanic Gardens.
- Mitigate the threat of high fire frequency, by undertaking conservation translocations of propagated individuals in suitable habitat with secure land tenure, to increase the abundance or number of subpopulations of *P. gilmourii* var. *gilmourii*, in accordance with the *Guidelines for the Translocation of Threatened Plants in Australia* (Commander et al. 2018).

Stakeholder engagement/community engagement

- Engage with the Indigenous community to identify Indigenous management responsibilities and cultural connections to the *P. gilmourii* var. *gilmourii*. Identify and encourage collaboration opportunities and awareness of this taxon.
- Raise awareness of the threat of *P. cinnamomi* with the Rural Fire Service, other fire and land management agencies, and the general public, to minimise the risk of spread.
- Engage with researchers prior to conducting surveys and developing a monitoring program to obtain the most up-to-date advice on the taxon.

Survey and monitoring priorities

- Conduct surveys in other areas of suitable habitat, to identify other subpopulations of *P. gilmourii* var. *gilmourii*.
- Establish and maintain a monitoring program to:

- o confirm the presence of all subpopulations,
- determine subpopulation sizes and trends,
- o identify threats and their impacts, and
- monitor the effectiveness of management actions and the need to adapt them, if necessary.
- Monitor the incidence and impacts of *P. cinnamomi*.
- Monitor the activity and impact of feral herbivores (deer, goats and pigs) in *P. gilmourii* var. *gilmourii* habitat.

Information and research priorities

- Undertake genetic research to determine the phylogenetic relationships within the *P. gilmouri* group and to create a resource for understanding the genetic ability for adaptive change.
- Undertake research into the taxa's fire ecology, including seedling survival post-fire and the fire interval required to allow plants to reach reproductive maturity and establish a soil seed bank.
- Investigate the taxon's susceptibility to *Phytophthora cinnamomi*.
- Undertake research into the taxon's reproductive ecology including reproductive strategies, seedling recruitment, soil seedbank dynamics, longevity, fecundity, and seed germination requirements. Improve understanding of the impacts of climate change on population viability, including the impacts of increased bushfire frequency and change in rainfall.

Recovery plan decision

No recovery plan is in place for *Pomaderris gilmourii* var. *gilmourii*. This consultation document will elicit the additional information needed to inform the requirement of a Recovery Plan for the species.

Links to relevant implementation documents

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Attachment A: Listing Assessment for *Pomaderris gilmourii* var. *gilmourii*

Reason for assessment

This assessment follows prioritisation of a nomination from the TSSC.

Assessment of eligibility for listing

This assessment uses the criteria set out in the <u>EPBC Regulations</u>. The thresholds used correspond with those in the <u>IUCN Red List criteria</u> except where noted in criterion 4, subcriterion D2. The IUCN criteria are used by Australian jurisdictions to achieve consistent listing assessments through the Common Assessment Method (CAM).

Key assessment parameters

Table 4 includes the key assessment parameters used in the assessment of eligibility for listing against the criteria.

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
Number of mature individuals	Unknown	>50	Unknown	The number of mature individuals has only been recorded for the subpopulations located north of Coondella Trig in 2015 (31 plants) and in 2021 (>50 plants). No other population data has been recorded for this taxon. Therefore, there are insufficient data to ascertain population size.
Trend	Unknown			The population trajectory of the species is unknown due to the lack of post-fire surveys across all known subpopulations and a limited understanding of post-fire recovery.
Generation time (years)	8-30	8	30	The generation length for the <i>P. gilmourii</i> var. <i>gilmourii</i> is unknown. However, the generation length of other <i>Pomaderris</i> species is estimated at 10–30 years (cotoneaster pomaderris and rufous pomaderris (DELWP 2020ab)), and 8–20 years (bent pomaderris (DELWP 2020c)). It is likely that a similar generation length is estimated for the <i>P. gilmourii</i> var. <i>gilmourii</i> . The minimum and maximum values reported here present the known generation range for other <i>Pomaderris</i> species.
Extent of occurrence	182 km²	182 km²	364 km ²	This minimum plausible value and estimate used in the assessment of EOO was attained by mapping point records from 1985–2021, obtained from state governments, museums, and CSIRO. The EOO was then calculated using a minimum convex hull (IUCN 2019). The maximum value for this taxon could be up to 364 km ² if additional unknown subpopulations exist in suitable habitat across the species' modelled range (Map 1).

Table 4 Key assessment parameters

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
Trend	Unknown			The population trajectory of the species' EOO is unknown due to the lack of post-fire surveys across all known populations and a limited understanding of post-fire recovery.
Area of Occupancy	40 km ²	40 km ²	80 km²	This minimum plausible value and estimate used in the assessment is based on the mapping of point records from 1985–2021 obtained from state governments, museums and CSIRO. The AOO was calculated using a 2x2 km grid cell method, based on the IUCN Red List Guidelines (IUCN 2019). The maximum value for this taxon could be up
				to 80 km ² if additional unknown subpopulations exist in suitable habitat across the species' modelled range (Map 1).
Trend	Unknown			The trajectory of the taxon's AOO is unknown due to the lack of post-fire surveys across all known populations and a limited understanding of post-fire recovery.
Number of subpopulations	6	2	>8	There is little information on gene flow within <i>Pomaderris</i> . Due to the probable dependence of insects for pollination (Patykowski et al. 2014) and limited seed dispersal ability, subpopulations separated by a distance of ~ 1 km may be considered as separate subpopulations. This indicates there are plausibly six subpopulations.
				If gene flow occurs across larger distances (i.e. 2–5 km) it is possible for the minimum plausible number of subpopulations to be 2, based on the regions inside DNP where the taxon occurs close together (Map 1, Table 1). The maximum number of subpopulations for this taxon could be upwards of eight if the localities north of Coondella Trig are determined to be separate subpopulations and
				due to the inaccessibility of its habitat and possible existence of other subpopulations in suitable habitat elsewhere.
Trend	Unknown			The trajectory of the varieties AOO and EOO is unknown due to the lack of post-fire surveys across all known populations and a limited understanding of post-fire recovery.
Basis of assessment of subpopulation number	There are eight unique localities for this taxon in DNP recorded on AVH (2021ab). However, using a distance of 1 km to define separate subpopulations, as pollination and dispersal is likely limited, especially if ants are the primary seed dispersers, localities within 1 km and adjacent to each other are considered to be within a range that could potentially share genetic material (through pollination or seed dispersal). This indicates that there are six likely subpopulations for this taxon. However, given the vast size of DNP, the many inaccessible areas, and areas of potential suitable habitat elsewhere, it is possible for other subpopulations to occur.			

No. locations	2-3	1-2	8	The most plausible threat to the taxon is high fire frequency. While the taxon may have soil- stored seed that can survive and germinate after fire, multiple fires in rapid succession, not allowing time for germinated plants to reach reproductive maturity, could cause rapid declines (DECC 2008; Gallagher et al. 2021). Further, the post-fire response of the taxon is not known and it is unclear if <i>P.</i> <i>gilmourii</i> var. <i>gilmourii</i> is reliant on fire for regeneration given the stronghold for the population is located in an area that appears to have some natural protection from fire due to its steep, low vegetated, rocky terrain (C Howard 2021, pers comm 18 August)
				The taxon has a restricted geographic distribution meaning that a single bushfire can impact the entire range of the taxon, as occurred in 2019-20 (Gallagher 2020). However, the taxon occupies steep, rocky habitats that affords its subpopulations some protection from fire. This is supported by post- fire observations following the 2019-20 bushfire that showed only parts of some subpopulations were burnt (G Phillips 2021. pers comm 23 July). Therefore, it is unlikely that a single fire event would affect all individuals of the taxon. Accordingly, the estimated number of locations reflects that multiple fire events would likely be required to impact the majority of individuals of <i>P.</i> <i>gilmourii</i> var. <i>gilmourii</i> .
				Future projections for this region include an increased risk of more frequent and intense fires (Clarke 2015; Dowdy et al. 2019). This presents a considerable risk to this taxon due to its possible long-life span (which may be 50+ years) and likely time to reproductive maturity of two to six years (Maryott-Brown & Wilks 1993; Patykowski et al. 2014; DELWP 2020a,b,c).
				Further, if fire events are followed by drought (Auld et al. 2020) or herbivory (Regan et al. 2003) that impact seedling recruitment, then the population could be at risk of decline. The population is also threatened by browsing from feral goats (DEWHA 2008), deer (DPIE 2020) and pigs (G Phillips 2021. pers comm 14 August), and infection by <i>Phytophthora</i> <i>cinnamomi</i> (Kueh et al. 2012), the impacts of which are currently unclear, but which have the potential to cause a rapid decline in the population.
				The most plausible maximum value is based on the number of known localities, being eight because all individuals occur within confined habitat within each locality (rocky knolls and outcrops).
				The most plausible minimum value is based on the historic spread of bushfires in which either all (2001–02, 2019-20 fires) or half of the known localities were impacted (1968–69, 1980–81) (DPIE 2010).

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
Trend	Decreasing			Future projections for this region include an increased risk of bushfire weather, which is an elevated FFDI and an increase in temperature (Clarke 2015; Dowdy et al. 2019). Accordingly, the number of locations may be decreasing.
Basis of assessment of location number	The most plau stored seed th allowing time (DECC 2008; C and it is uncle stronghold for from fire due to The taxon has the entire ran occupies steep supported by some subpopt that a single fin number of loc majority of ind Future project (Clarke 2015; possible long- two to six year Further, if fire 2003) that im population is a and pigs (G PH (Kueh et al. 20 cause a rapid	The number of locations may be decreasing. The number of locations may be decreasing. The most plausible threat to the taxon is high fire frequency. While the taxon may have soil- stored seed that can survive and germinate after fire, multiple fires in rapid succession, not allowing time for germinated plants to reach reproductive maturity, could cause rapid declines (DECC 2008; Gallagher et al. 2021). Further, the post-fire response of the taxon is not known, and it is unclear if <i>P. gilmourii</i> var. <i>gilmourii</i> is reliant on fire for regeneration given the stronghold for the population is located in an area that appears to have some natural protection from fire due to its steep, low vegetated, rocky terrain (C Howard 2021. pers comm 18 August). The taxon has a restricted geographic distribution meaning that a single bushfire can impact the entire range of the taxon, as occurred in 2019-20 (Gallagher 2020). However, the taxon occupies steep, rocky habitats that affords its subpopulations some protection from fire. This is supported by post-fire observations following the 2019-20 bushfire that showed only parts of some subpopulations were burnt (G Phillips 2021. pers comm 23 July). Therefore, it is unlikely that a single fire event would affect all individuals of the taxon. Accordingly, the estimated number of locations reflects that multiple fire events would likely be required to impact the majority of individuals of <i>P. gilmourii</i> var. <i>gilmourii</i> . Future projections for this region include an increased risk of more frequent and intense fires (Clarke 2015; Dowdy et al. 2019). This presents a considerable risk to this taxon due to its possible long-life span (which may be 50+ years) and likely time to reproductive maturity of two to six years (Maryott-Brown & Wilks 1993; Patykowski et al. 2014; DELWP 2020a,b,c). Further, if fire events are followed by drought (Auld et al. 2020) or herbivory (Regan et al. 2003) that impact seedling recruitment, then the population could be at risk of decli		
Fragmentation	The population is not considered severely fragmented due to insufficient information on gene flow among subpopulations and the size of subpopulations.			
Fluctuations	There are no l mature indivi	known extreme f duals.	luctuations in EO	0, A00, number of subpopulations, locations or

Criterion 1 Population size reduction

Red	Reduction in total numbers (measured over the longer of 10 years or 3 generations) based on any of A1 to A4					
		Critically Endangered Very severe reduction	Endanger Severe re	red eduction	Vulnerable Substantial reduction	
A1		≥ 90%	≥ 70%		≥ 50%	
A2, A	A3, A4	≥ 80%	≥ 50%		≥ 30%	
A1 A2 A3 A4	Population reduction observed, estimate past and the causes of the reduction are understood AND ceased. Population reduction observed, estimate past where the causes of the reduction be understood OR may not be reversible Population reduction, projected or susp to a maximum of 100 years) [(<i>a</i>) cannot An observed, estimated, inferred, projec- reduction where the time period must if future (up to a max. of 100 years in futu- reduction may not have ceased OR may be reversible.	red, inferred or suspected in e clearly reversible AND red, inferred or suspected in may not have ceased OR ma e. vected to be met in the futur t be used for A3] cted or suspected populatio nclude both the past and th ure), and where the causes o not be understood OR may	the the y not e (up f n e f not	(a (l) Based on (a ony of the following (a	 direct observation [except A3] an index of abundance appropriate to the taxon a decline in area of occupancy, extent of occurrence and/or quality of habitat actual or potential levels of exploitation the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites 	

Criterion 1 evidence Insufficient data to determine eligibility

Generation length

The generation length for the *P. gilmourii* var. *gilmourii* is inferred to be 8–30 years, based on estimates for other *Pomaderris* species of 10–30 years (cotoneaster pomaderris and rufous pomaderris (DELWP 2020ab)), and 8–20 years (bent pomaderris (DELWP 2020c)), giving a three-generation period of 32–90 years.

Population size

The number of mature individuals has only been reported from two subpopulations, with 31 and >50 individuals. There are no estimates of other subpopulations, and no estimate of the overall population size. There is also no temporal data (i.e., repeated monitoring) to show population trends for any subpopulation.

Therefore, there are insufficient data to demonstrate if the taxon is eligible for listing under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the varieties status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

		Critically Endangered Very restricted	Endangered Restricted	Vulnerable Limited	
B1.	Extent of occurrence (EOO)	< 100 km ²	< 5,000 km ²	< 20,000 km ²	
B2.	Area of occupancy (AOO)	< 10 km ²	< 500 km ²	< 2,000 km ²	
AND	AND at least 2 of the following 3 conditions:				
(a)	Severely fragmented OR Number of locations	= 1	≤ 5	≤ 10	
(b) Continuing decline observed, estimated, inferred or projected in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals					
(c)	(c) Extreme fluctuations in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals				

Criterion 2 Geographic distribution as indicators for either extent of occurrence AND/OR area of occupancy

Criterion 2 evidence Eligible under Criterion 2 B1ab(iii)+2ab(iii) for listing as Endangered

Extent of occurrence (EOO) and area of occupancy (AOO)

The most plausible extent of occurrence (EOO) and area of occupancy (AOO) of the *P. gilmourii* var. *gilmourii* are estimated at 182 km² (182 km²–364 km²) and 40 km² (40 km²–80 km²), respectively. The estimate of EOO was attained by mapping point records from 1985–2021, obtained from state governments, museums, and CSIRO. The EOO was then calculated using a minimum convex hull (IUCN 2019). The AOO was calculated using a 2x2 km grid cell method, based on the IUCN Red List Guidelines (IUCN 2019). The estimates meet the thresholds for Endangered under B1 (EOO < 5 000 km²) and Endangered under B2 (AOO < 500 km²).

All available records (i.e. 1985–2021) were used for the AOO and EOO estimates. Despite surveys throughout the taxon's range (16 unique records in AVH (2021ab)), *Pomaderris* species are notoriously difficult to identify taxonomically, and other subpopulations could exist inside DNP, particularly on steep inaccessible rocky outcrops and cliffs. In spite of this, new subpopulations of the taxon are unlikely to increase the AOO and EOO estimates beyond the relevant thresholds that support the varieties listing as Endangered. This is because the habitat suitable for *P. gilmourii* var. *gilmourii* has a restricted extent confined to rocky outcrops, knolls, steep cliffs and scree. Accordingly, until targeted surveys detect additional subpopulations, the current AOO and EOO are considered the most plausible estimates of habitat known to contain the taxon.

Number of locations

The most plausible threats to the taxon are high fire frequency and fire-drought or fireherbivory interactions. While the taxon may have soil-stored seed that can survive and germinate after fire, multiple fires in rapid succession and recruitment failure caused by postfire drought or herbivory could deplete the seed bank, could result in rapid declines (DECC 2008; Gallagher et al. 2021). Further, the post-fire response of the taxon is not known, and it is unclear if *P. gilmourii* var. *gilmourii* is reliant on fire for regeneration given the stronghold for the population is located in an area that appears to have some natural protection from fire due to its steep, rocky terrain (C Howard 2021. pers comm 18 August).

The taxon has a restricted geographic distribution meaning that a single bushfire can impact the entire range of the taxon, as occurred in 2019-20 (Gallagher 2020). However, the taxon occupies steep, rocky habitats that affords its subpopulations some protection from fire. This is supported by limited post-fire observations from nearby sites following the 2019-20 bushfire that suggested that only parts of some subpopulations were burnt (G Phillips 2021. pers comm 23 July). Therefore, although it is possible that a single fire event during severe conditions could burn the entire population of *P. gilmourii* var. *gilmourii*, it is probably more likely that multiple fire events would be required to affect all individuals of the taxon, due to the patchy impacts observed during the 2019-20 bushfires. Accordingly, the most likely number of locations is estimated at two to three. The maximum plausible number of locations could possibly be as large as eight, if each subpopulation is impacted by small, mild fires that burn patchily across the landscape during benign conditions.

Future projections for this region include an increased risk of more frequent and intense fires (Clarke 2015; Dowdy et al. 2019). This presents a considerable risk to a taxon with a possible long-life span (could be 50+ years) and likely time to reproductive maturity of at least six years (Maryott-Brown & Wilks 1993; Patykowski et al. 2014; DELWP 2020a,b,c).

Further, if fire events are followed by drought (Auld et al. 2020) or herbivory (Regan et al. 2003) that impact seedling recruitment, then the population could be at risk of decline.

Therefore, the taxon's number of locations is likely to be two to three, meeting the threshold for Endangered under subcriterion (a).

Severe fragmentation

There is insufficient information on gene flow among subpopulations and the size of subpopulations to determine whether the population of this taxon is severely fragmented.

Continuing decline

There is an inferred continuing decline in habitat quality caused by herbivory from feral goats, pigs and deer, and projected declines in habitat quality due to increased fire frequency as a result of climate change, and potential infection by *Phytophthora cinnamomi*.

Populations of feral goats are known to occur in reserves connected to DNP (DPIE 2019). They have also been incidentally sighted in DNP (C Howard 2021. pers comm 18 August). The impacts of goats in the surrounding reserves are considered substantial because of direct impacts to native plants from grazing and trampling, as well as contributing to erosion and spreading of weeds (DPIE 2019). *Pomaderris gilmourii* var. *gilmourii* located in the area of the 'mountains of the moon' are particularly susceptible to herbivory by goats because goats are capable of accessing the steep and rugged terrain and could cause considerable damage to subpopulations (C Howard 2021. pers comm 18 August). *Pomaderris* species are also preferentially browsed by

Rusa unicolor (Sambar Deer) in Victoria, often to the extent that seed production is reduced to zero (N Walsh 2021. pers comm 13 August). Feral pigs have been observed to cause damage to habitat in rocky outcrops in DNP (G Phillips 2021. pers comm 14 August). Feral pigs cause damage by rooting for food which causes erosion and introduces weeds, and selective feeding on native plants (DEE 2017).

Future climate change predictions for southeast Australia in the temperate forested region, where var. *gilmourii* occurs, include more dangerous bushfire conditions in Spring and Summer because of an increase in the number of days of elevated temperatures and an increase in the Forest Fire Danger Indices (FFDI) (Clarke 2015; Dowdy et al. 2019; BOM & CSIRO 2020). Fires that occur at intervals shorter than the minimum tolerable fire frequencies could deplete the soil-seed bank and kill immature plants before they reach maturity (Natale 2016; Gallagher et al. 2021). Therefore, increasing fire frequency is projected to contribute to a decline in habitat quality for *P. gilmourii* var. *gilmourii*.

There have been limited studies on the impact of *P. cinnamomi* in *Pomaderris* species and the impacts on var. *gilmourii* are unknown. Kangaroo Island pomaderris has shown moderate susceptibility to the pathogen with 40% of plants surviving ex situ inoculation trials (Kueh et al. 2012). Observations of dead Grass Trees during site visits to the area in 2012 (J Miles 2021. pers comm 5 August) suggest that *P. cinnamomi* may have infected some localities where *P. gilmourii* var. *gilmourii* occurs, and this threat is therefore projected to contribute to a decline in habitat quality.

The taxon appears to meet the continuing decline requirements for listing as Endangered under subcriterion (b).

Extreme fluctuations

There are no known extreme fluctuations in EOO, AOO, number of subpopulations, locations or mature individuals.

Conclusion

The Committee considers that the taxon's EOO and AOO are restricted, and continuing decline is estimated in the quality of habitat due to threats posed by increased fire frequency, herbivory and disease.

Therefore, the taxon has met the relevant elements of Criterion 2 to make it eligible for listing as Endangered. However, the purpose of this consultation document is to elicit additional information to better understand the varieties status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

Criterion 3 Population size and decline

	Critically Endangered Very low	Endangered Low	Vulnerable Limited
Estimated number of mature individuals	< 250	< 2,500	< 10,000
AND either (C1) or (C2) is true			
C1. An observed, estimated or projected continuing decline of at least (up to a max. of 100 years in future)	Very high rate 25% in 3 years or 1 generation (whichever is longer)	High rate 20% in 5 years or 2 generation (whichever is longer)	Substantial rate 10% in 10 years or 3 generations (whichever is longer)
C2. An observed, estimated, projected or inferred continuing decline AND its geographic distribution is precarious for its survival based on at least 1 of the following 3 conditions:			
(i) Number of mature individuals in each subpopulation	≤ 50	≤ 250	≤ 1,000
(ii) % of mature individuals in one subpopulation =	90 - 100%	95 - 100%	100%
(b) Extreme fluctuations in the number of mature individuals			

Criterion 3 evidence Insufficient data to determine eligibility

Population size

The number of mature individuals has only been reported from two subpopulations, with 31 and >50 individuals. There are no estimates of other subpopulations, and no estimate of the overall population size. There are also no temporal data (i.e. repeated monitoring) to show population trends for any subpopulation.

There are insufficient data to demonstrate if the taxon is eligible for listing under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the varieties status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

Criterion 4 Number of mature individuals

	Critically Endangered Extremely low	Endangered Very Low	Vulnerable Low
D. Number of mature individuals	< 50	< 250	< 1,000
D2. ¹ Only applies to the Vulnerable category Restricted area of occupancy or number of locations with a plausible future threat that could drive the species to critically endangered or Extinct in a very short time			D2. Typically: area of occupancy < 20 km² or number of locations ≤ 5

¹ The IUCN Red List Criterion D allows for species to be listed as Vulnerable under Criterion D2. The corresponding Criterion 4 in the EPBC Regulations does not currently include the provision for listing a species under D2. As such, a species cannot currently be listed under the EPBC Act under Criterion D2 only. However, assessments may include information relevant to D2. This information will not be considered by the Committee in making its recommendation of the species' eligibility for listing under the EPBC Act, but may assist other jurisdictions to adopt the assessment outcome under the <u>common</u> <u>assessment method</u>.

Criterion 4 evidence Insufficient data to determine eligibility

Number of mature individuals

The number of mature individuals is unknown. Additionally, the *P. gilmourii* var. *gilmourii* is not eligible for listing as Vulnerable under sub-criterion D2 as the AOO is >20 km² (estimated at 40 km²).

There are insufficient data to demonstrate if the taxon is eligible for listing under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the varieties status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

Criterion 5 Quantitative analysis

	Critically Endangered Immediate future	Endangered Near future	Vulnerable Medium-term future
Indicating the probability of extinction in the wild to be:	≥ 50% in 10 years or 3 generations, whichever is longer (100 years max.)	≥ 20% in 20 years or 5 generations, whichever is longer (100 years max.)	≥ 10% in 100 years

Criterion 5 evidence Insufficient data to determine eligibility

Population viability analysis has not been undertaken. Therefore, there is insufficient information to determine the eligibility of the taxon for listing in any category under this criterion.

Adequacy of survey

Surveys have been conducted from 1984 to 2021 by staff from the Department of Planning, Industry and Environment, Royal Botanic Gardens and Domain Trust, Australian National Botanic Gardens and Royal Botanic Gardens Victoria, including but not limited to, Neville Walsh, Phil Gilmour, Gavin Phillips, Keith McDougall, Graeme Errington, Richard Johnstone, Jackie Miles, Chris Howard and Dave Albrecht (Table 1). The search areas include the localities within the east DNP ranges (mountains of the moon), and within the Bendethera locality as well as accessible rocky outcrops and habitat in the vicinity of these localities within DNP. There are 16 unique occurrence records on AVH (AVH 2021b). Consequently, survey effort has been considered adequate and there is sufficient scientific evidence to support the assessment. © Commonwealth of Australia 2021



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