Australian Government
Department of Agriculture, Water and the Environment

Consultation on Species Listing Eligibility and Conservation Actions

Telopea aspera (Gibraltar Range waratah)

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

1) the eligibility of *Telopea aspera* (Gibraltar Range waratah) 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:
species.consultation@environment.gov.au

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 29 July 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.

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: http://www.awe.gov.au/system/files/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 'Common Assessment Method' (CAM). 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: https://www.awe.gov.au/about/commitment/privacy .

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 TELOPEA ASPERA (GIBRALTAR RANGE WARATAH)

SECTION A - GENERAL

1. Is the information used to assess the nationally threatened status of the species/subspecies robust? Have all the underlying assumptions been made explicit? Please provide justification for your response.

2. Can you provide additional data or information relevant to this assessment?

3. Have you been involved in previous state, territory or national assessments of this species/subspecies? If so, in what capacity?

PART 1 – INFORMATION TO ASSIST LISTING ASSESSMENT

SECTION B DO YOU HAVE ADDITIONAL INFORMATION ON THE ECOLOGY OR BIOLOGY OF THE SPECIES/SUBSPECIES? (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/subspecies not in the current advice?

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

Population size

6. Has the survey effort for this taxon 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? Did the estimates measure relative or absolute abundance? Do you accept the estimate of the total population size of the species/subspecies? 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 species/subspecies (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/subspecies 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:

☐ 1–50 ☐ 51–250 ☐ 251–1000 ☐ >1000 ☐ >2500 ☐ >5000

Level of your confidence in this estimate:

☐ 0–30% - low level of certainty/ a bit of a guess/ not much information to go on

☐ 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

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

9. 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

10. Are you able to provide an estimate of the total population size approximately 150–180 years ago *(at or soon after the start of the most recent three generation period)*? 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/subspecies 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:

    ☐ 1–50 ☐ 51–250 ☐ 251–1000 ☐ >1000 ☐ >2500 ☐ >5000

    Level of your confidence in this estimate:

☐ 0–30% - low level of certainty/ a bit of a guess/ not much information to go on

☐ 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

11. Are you able to comment on the extent of decline in the species' total population size over the last approximately 150–180 years (i.e. three generations period)? 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:

    ☐ 0–30% - low level of certainty/ a bit of a guess/ not much information to go on

    ☐ 31–50% - more than a guess, some level of supporting evidence

    ☐ 51–95% - reasonably certain, suggests this range of decline

    ☐ 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

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

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

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

13. Does the assessment consider the entire geographic extent and national extent of the species/subspecies? If not, please provide justification for your response.

14. Has the survey effort for this species/subspecies been adequate to determine its national distribution? If not, please provide justification for your response.

15. Is the distribution described in the assessment accurate? If not, please provide justification for your response and provide alternate information.

16. 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.

17. 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:

    ☐ <100 km^2 ☐ 100 – 5 000 km^2 ☐ 5 001 – 20 000 km^2 ☐ >20 000 km^2

    Level of your confidence in this estimated extent of occurrence

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

    ☐ 31–50% - more than a guess, some level of supporting evidence

    ☐ 51–95% - reasonably certain, data suggests this range of decline

    ☐ 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:

    ☐ <10 km^2 ☐ 11 – 500 km^2 ☐ 501 – 2000 km^2 ☐ >2000 km^2

    Level of your confidence in this estimated extent of occurrence:

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

☐ 31–50% - more than a guess, some level of supporting evidence

☐ 51–95% - reasonably certain, data suggests this range of decline

☐ 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

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

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

18. Do you consider that the way the historic distribution has been estimated is appropriate? Please provide justification for your response.

19. 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:

    ☐ <100 km^2 ☐ 100 – 5 000 km^2 ☐ 5 001 – 20 000 km^2 ☐ >20 000 km^2

    Level of your confidence in this estimated extent of occurrence

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

    ☐ 31–50% - more than a guess, some level of supporting evidence

    ☐ 51–95% - reasonably certain, data suggests this range of decline

    ☐ 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 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:

☐ <10 km^2 ☐ 11 – 500 km^2 ☐ 501 – 2000 km^2 ☐ >2000 km^2

Level of your confidence in this estimated extent of occurrence:

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

☐ 31–50% - more than a guess, some level of supporting evidence

☐ 51–95% - reasonably certain, data suggests this range of decline

☐ 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

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

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

20. Do you consider that all major threats have been identified and described adequately?

21. To what degree are the identified threats likely to impact on the species/subspecies in the future?

22. Are the threats impacting on different populations equally, or do the threats vary across different populations?

23. Can you provide additional or alternative information on past, current or potential threats that may adversely affect the species/subspecies at any stage of its life cycle?

24. 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/SUBSPECIES? (If no, skip to section I)

25. What planning, management and recovery actions are currently in place supporting protection and recovery of the species/subspecies? To what extent have they been effective?

26. Can you recommend any additional or alternative specific threat abatement or conservation actions that would aid the protection and recovery of the species/subspecies?

27. Would you recommend translocation (outside of the species' historic range) as a viable option as a conservation actions for this species/subspecies?

SECTION I DO YOU HAVE INFORMATION ON STAKEHOLDERS IN THE RECOVERY OF THE SPECIES/SUBSPECIES?

28. 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?

29. Are you aware of any cultural or social importance or use that the species/subspecies has?

30. What individuals or organisations are currently, or potentially could be, involved in management and recovery of the species/subspecies?

31. How aware of this species/subspecies are land managers where the species/subspecies is found?

32. What level of awareness is there with individuals or organisations around the issues affecting the species/subspecies?

    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

33. Do you have comments on any other matters relevant to the assessment of this species/subspecies?

Conservation Advice for *Telopea aspera* (Gibraltar Range Waratah)

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 eligibility of the species for listing and inform conservation actions, further planning and the potential need for a 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.

Note: 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 draft conservation advice and listing assessment for the Gibraltar Range Waratah. It provides a foundation for conservation actions and further planning.

Telopea aspera © Copyright, Sheringham, P. (from New South Wales Department of Planning and Environment)

Conservation status

Telopea aspera (Gibraltar Range Waratah) is proposed to be listed in the Endangered category of the threatened species list under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Telopea aspera was assessed by the Threatened Species Scientific Committee to be eligible for listing as Endangered under criteria 2 and 3. The Committee's assessment is at Attachment A. The Committee's assessment of the species' eligibility against each of the listing criteria is:

- Criterion 1: Insufficient data
- Criterion 2: B1ab(v)+2ab(v) Endangered
- Criterion 3: C2a(ii): Endangered
- Criterion 4: Insufficient data
- Criterion 5: Insufficient data

The main factors that make the species eligible for listing in the Endangered category are restricted distribution and location; projected continuing decline in the number of mature individuals (due to changes in fire frequency and severity, illegal collection and rainfall patterns and temperatures leading to an increase in droughts); and small population size.

There are estimated to be fewer than 2500 mature individuals, which all occur within National Parks, and are primarily threatened by fire regimes that cause declines in biodiversity and illegal collection, with no other major current threats.

Species can also be listed as threatened under state and territory legislation. For information on the current listing status of this species under relevant state or territory legislation, see the Species Profile and Threats Database.

Species information

Taxonomy

Conventionally accepted as *Telopea aspera* (Crisp & Weston 1995), Family: Proteaceae.

This species is one of five species within the genus *Telopea* from south eastern Australia. There are two main branches, with one being the species pair of *Telopea speciosissima* (New South Wales Waratah) and *Telopea aspera* (Gibraltar Range Waratah). The Gibraltar Range Waratah was recognized as a separate species from the New South Wales Waratah in 1991, provisionally called *Telopea* sp. A (Weston & Crisp 1994), and formally described as *Telopea aspera* in 1995.

Speciation

Genetic structure and bio-climatic modelling suggests *Telopea* species lineages resulted from allopatric speciation (genetic isolation from temporal geographical separation) followed by repeated episodes of secondary contact and localised hybridisation (when two divergent lineages come into contact and interbreed), rather than with parapatric speciation (diverging species maintain a zone of contact and do not cease the exchange of genes completely). The Gibraltar Range Waratah is the only *Telopea* species completely separated from its nearest congeners by about 400 km (Rosseto et al. 2012),

Description

The Gibraltar Range Waratah is a large erect shrub up to 3 m in height with one or more stems. It has dull green leaves which are alternate, and are more coarsely-toothed than the New South Wales Waratah, with 3–11 serrations on each leaf margin. Measuring 8–28 cm long and 2–6.5 cm wide, the leaves are tough and leathery with furry under-surfaces. There are prominent veins on both the upper and lower leaf surfaces. The inflorescences, which appear in spring, are large and crimson coloured. They consist of a large domed flowerhead ringed by bracts. There are anywhere from 90 to 250 individual flowers making up the flower head/inflorescence (PlantNet 2021). These are followed by large seed pods which eventually turn brown and split open revealing winged seeds inside. The Gibraltar Range Waratah is distinguished from the New South Wales Waratah by its rough foliage (Crisp & Weston 1995).

Distribution

The Gibraltar Range Waratah is endemic to northern New South Wales (NSW), where it is restricted to the Gibraltar Range, in the New England Tablelands and the NSW North Coast bioregions (IBRA7). The Gibraltar Range includes a group of parks comprised of approximately 70 % declared wilderness and 30 % World Heritage area (DEC 2005) and where the species is known to occur. The Gibraltar Range Waratah can be found in the Gibraltar Range National Park and the granite parts of Washpool National Park and Nymboida National Park (Map 1; DPE 2022. pers comm 10 January). All known occurrences occur on protected tenure.

Population size

Knowledge of the species' population size requires further survey work. However, based on ongoing surveys in the Gibraltar Range National Park and the granite parts of Washpool National Park conducted since 2020, local experts from the NSW Department of Planning and Environment (DPE) identified approximately 774 individuals in a single subpopulation, of which approximately 70 % were considered mature and known to occur evenly in sporadic and scattered clusters of individuals (DPE 2022. pers comm 10 February; 3, 14 March). These surveys were not comprehensive and further unrecorded mature individuals are likely to exist. Despite this, the number of mature individuals is estimated to be fewer than 2500 (DPE 2022. pers comm 20 January).

A previous study conducted in 2020–2021 in the Gibraltar Range National Park surveyed individuals clustered at four survey sites within the subpopulation (Table 1; UNE 2021). The total population size estimated in this study (>2200 including both juveniles and mature individuals; Table 1) suggests the number of mature individuals may be fewer than <2500 (assuming only approximately 70 % of individuals are mature, as reported above). The survey by DPE overlaps with at least three of the sites included in the UNE (2021) study.

Table 1 Population information for the Gibraltar Range Waratah (from UNE 2021)

Site	Number of plants surveyed	Area occupied by subpopulation (ha)	Estimated total population size pre-fire[1]	Estimated total population size post-fire[1]
Tin Ore Creek Trail	10	3	>100	>100
Mulligans Drive south	27	3	>1000	>1000
Anvil Rock walk	25	1	>100	>100
Stockpile site, 6 km from Gibraltar House, Gwydir Hwy South	23	>50	>1000	>1000

[1] 2019-20 bushfires

Note: estimated total population size corresponds to juvenile and mature individuals.

The estimate used in the 2019 IUCN rapid assessment (Keith 2020), prior to the 2019-20 bushfires, was 4000–12,000 mature individuals. This value is now considered to be an overestimate, given field observations (DPE 2022. pers comm 20 January).

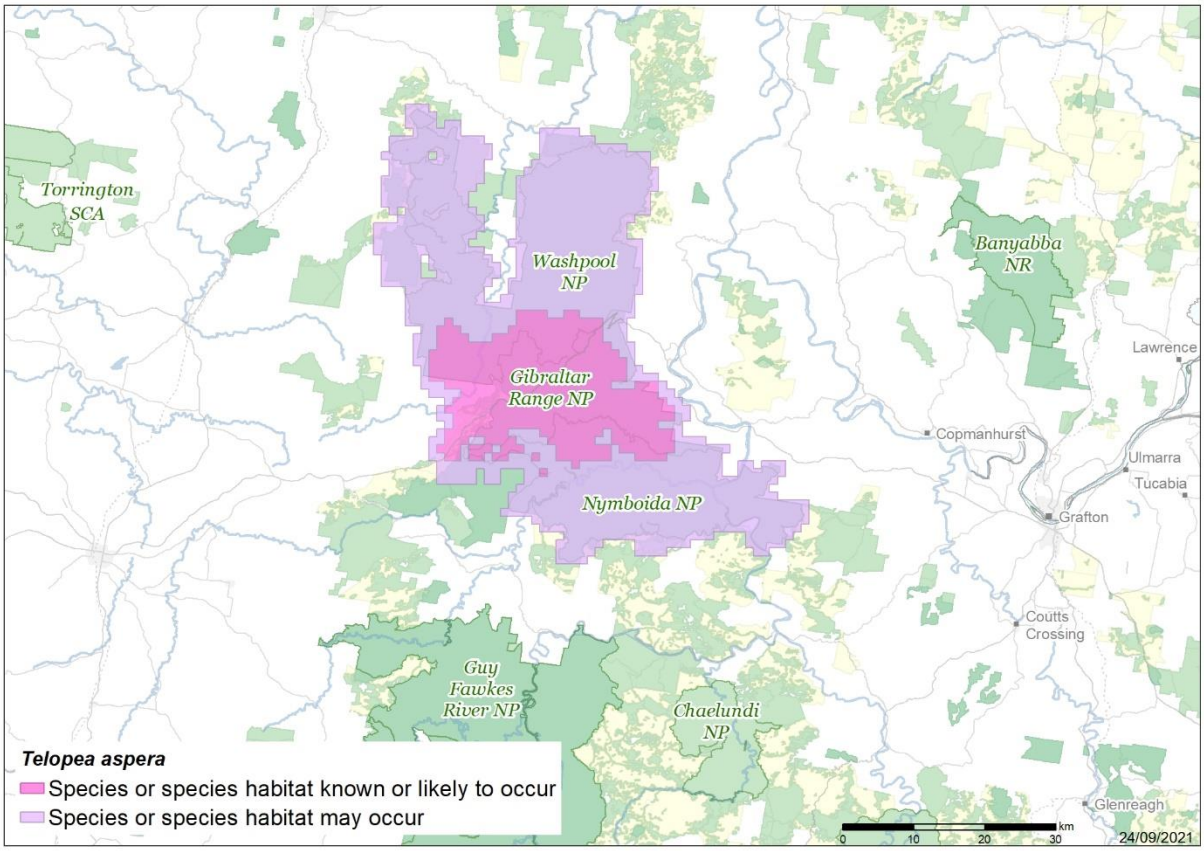
In 1999, a vegetation community mapping survey was conducted in the Gibraltar Range, however no population data for rare species was collected (Hunter & Sheringham 2008; DPE 2022. pers comm 28 January).

The Gibraltar Range National Park and Washpool National Park are part of Gondwana Rainforests of Australia which is listed as World Heritage by UNESCO in 1994. The Gondwana Rainforests is also listed on the NSW State Heritage Register and the National Heritage List.

Ex situ cultivation

The Gibraltar Range Waratah has been cultivated only rarely (although it is possible that it may have been collected and grown as New South Wales Waratah in the past). It has proven difficult to maintain in cultivation at Mount Annan Botanic Gardens within the Sydney Basin, having succumbed in summer. It is not clear if this was due to the summer heat or humidity or heavy soil. However, it has survived much better in the higher altitude botanic gardens at Mount Tomah in the Blue Mountains (ANPSA 2016).

Map 1 Modelled distribution of Gibraltar Range waratah



Source: Base map Geoscience Australia; species distribution data Species of National Environmental Significance 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 habitat or geographic feature that represents to recent observed locations of the species (known to occur) or 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

The cultural, customary and spiritual significance of species and the ecological communities they form are diverse and varied for Indigenous Australians and their stewardship of Country. This section describes some examples of this significance but is not intended to be comprehensive or applicable to, or speak for, Indigenous Australians. Such knowledge may be held by Indigenous Australians who are the custodians of this knowledge and have the rights to decide how this knowledge is shared and used.

The Gibraltar Range Waratah occurs on the lands of the Bundjalung, Gumbaingirri, and Ngarrabul people (DEC 2005), where the rights of Traditional Owners are managed by the Local Aboriginal Land Councils of Glen Innes (DECCW 2010). The Aboriginal place Waratah Sugarloaf Trig, a sacred ceremonial site for the Bundjalung people, is also located in the Gibraltar Range and Washpool National Park (DPIE 2013). There is little published information on how Bundjalung, Gumbaingirri, and Ngarrabul people related to Country in this region and what that may mean for the cultural significance of the Gibraltar Range Waratah. A dreaming story (Morcombe 1969) has been written elsewhere, however due to the uncertainty of adequate permission and consultation prior to reproduction details are not provided here.

Further consultation with the Traditional Owners of these lands will benefit the conservation of the species by providing awareness of traditional knowledge and management practices on Country.

Floral Emblem of NSW

The congeneric *Telopea speciosissima* (New South Wales Waratah) is the floral emblem of NSW since 1962. Therefore, effectively the Gibraltar Range Waratah was also the floral emblem for approximately 30 years until recognized as a separate species.

Relevant biology and ecology

Habitat

Found only in dry sclerophyll forests, the Gibraltar Range Waratah grows in shrubby to open woodland communities found on skeletal to shallow soil on granite within the Gibraltar Range. This contrasts to the congeneric New South Wales Waratah, which is also known to occur in dry sclerophyll forests but grows in sandy soils with clay at shallower depths developed over sandstone (Crisp & Weston 1995).

The Gibraltar Range Waratah is often found in association with *Eucalyptus olida* (Gibraltar ash), *Leptospermum trinervium* (flaky-barked tea-tree, slender tea-tree), *Grevillea acerata, Dampiera stricta, Hibbertia villosa, Hakea laevipes* subsp. *graniticola, Boronia microphylla* (small-leaved boronia), *Gleichenia dicarpa* (pouched coral fern, tangle fern), *Amperea xiphoclada* (broom spurge), *Pimelea linifolia* (slender rice flower) and occurs on ridges and north, intermediate and west-facing slopes but also on flat to undulating areas (Hunter & Sheringham 2008; DPE 2022. pers comm 14 March).

Note: for species with no common name available, none are provided in text above.

Reproductive Ecology

The reproductive ecology of the Gibraltar Range Waratah is not well understood and requires further investigation. The species flowers from October to November (Croft et al. 2006; DPE 2022. pers comm 20 January). The age of senescence or decline of the Gibraltar Range Waratah is unknown, but it is expected to be long-lived, with resprouted adults of the New South Wales Waratah tagged since 1995 remaining alive at least until 2018, i.e., at least for 23 years (DPE 2022. pers comm 19 January). The primary juvenile period of the Gibraltar Range Waratah is also unknown, whilst the secondary juvenile period is estimated to be less than two years (DPE 2022. pers comm 10 January; Clarke et al. 2009).

The pollinators and seed dispersal methods are also unknown. However, the prominent position and striking colour of flowers strongly suggests that Waratahs are adapted to pollination by birds (Nixon 1989), with honeyeaters known to visit Waratah species (Ford et al. 1979; Goldingay & Whelan 1993). All species of Waratah possess woody follicular fruits and winged seeds (Douglas 1995). The presence of winged seeds may facilitate wind dispersal, through passive movement via overland wind or water flows (DPE 2022. pers comm 19 January).

A laboratory study found that Gibraltar Range Waratah seeds (fresh, wild seeds incubated at 20 °C day/night) showed an average 90 % germination after 10–20 days, with 90 % viability and no dormancy (Offord et al. 2012). In the same study, the congeneric New South Wales Waratah germinated over a wide range of temperatures (10–30 °C) and required the presence of light to do so, while also not exhibiting any form of dormancy (Offord et al. 2012). In the wild, New South Wales Waratah seeds are shed in autumn after maturity and do not persist in the soil seed bank, either being quickly predated, germinating, or otherwise deteriorating (Denham & Auld 2002), suggesting the same may happen to Gibraltar Range Waratah seeds.

Fire Ecology

Waratahs have no canopy or soil seed bank, instead they resprout and then flower producing a transient seed bank after fire disturbance (often called obligate flowering resprouters; Auld & Ooi 2008). The Gibraltar Range Waratah resprouts from an underground woody lignotuber (a source of energy and nutrients for rapid growth) if the above-ground parts of the plant are damaged by fire (Croft et al. 2006). This is considered the primary regeneration strategy. Regeneration from seed after disturbance (e.g., fire) is considered a secondary regeneration strategy (Offord et al. 2012).

Following fire, New South Wales Waratah seeds were observed adjacent to the adult plant (i.e., limited dispersal distance), possibly due to considerable regrowth of surrounding vegetation by the time of seed release (Denham & Auld 2002). The New South Wales Waratah can also flower for several years in response to a fire event (Denham & Auld 2002).

The Gibraltar Range Waratah has shown strong signs of recovery after fire through vigorous resprouting but with minimal or no seedling recruitment, including after the 2019-20 bushfires where only 13 seedlings have been observed across the entire species distribution (Croft et al. 2006; DPE 2022. pers comm 10 January, 14 March). Approximately 70 % of resprouting individuals began to flower two years after the 2019-20 bushfires (additional resprouting individuals may flower in the 2022 flowering season) (DPE 2022. pers comm 31 January, 10 February). The Gibraltar Range Waratah is expected to require a minimum fire-free interval of 7–10 years to allow sufficient recovery, including post-fire resprouting and flowering (DPE 2022. pers comm 10 January).

Habitat critical to the survival

The Gibraltar Range Waratah is largely restricted to the Gibraltar Range and is known to occur on low-nutrient granitic soils in dry sclerophyll forests (Croft et al. 2006; DPE 2022. pers comm 14 March 2022) (see Habitat above). Such habitat is likely to be necessary for dispersal activities, long-term maintenance, and evolutionary development of the species.

The habitat critical to the survival of the Gibraltar Range Waratah includes the area of occupancy of the known subpopulation; areas of similar habitat adjoining the known subpopulation, which provide potential habitat for natural range extension; areas of similar habitat that may contain the species or be suitable for translocations; and the local catchment for the surface and/or groundwater that maintains the habitat of the species.

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 a subpopulation (as defined by IUCN 2001), in keeping with the terminology used in the EPBC Act and state/territory environmental legislation.

All populations of the Gibraltar Range Waratah are important for the long-term recovery and survival of this species.

Threats

The Gibraltar Range Waratah is predominately threatened by fire regimes that cause declines in biodiversity and illegal collection (Table 2). The species' restricted distribution may increase its' risk of extinction via stochastic processes.

The species appears to have no other major threats. Although several weeds occur within Gibraltar Range National Park (DEC 2005), the species preferred low-nutrient granite habitat is not impacted by weeds nor weeds have been observed near individuals (DPE 2022. pers comm 14 March). The Gibraltar Range Waratah occurs along pathways and walking tracks (e.g., Boundary Creek to Grassy Creek – World Heritage Walk; Anvil Rock Walking Track; Dandahra Crags Walking Track; The Needles Walking track), however, track maintenance and visitor-related impacts (rubbish, erosion of track, introduction of diseases/weeds via walking boots) are considered to have a negligible impact on the species due to its remote location (DPE 2022. pers comm 14 March).

Threats in Table 2 are noted in approximate order of highest to lowest impact, based on available evidence.

Table 2 Threats

Threat	Status [a]	Evidence
Habitat loss, disturbance and modification		
Fire regimes that cause declines in biodiversity [b]	• Timing: current/future • Confidence: observed • Likelihood: likely • Consequence: major • Trend: increasing • Extent: across the entire range	'Fire regimes that cause declines in biodiversity' is listed as a key threatening process under the EPBC Act (DAWE 2022). The Gibraltar Range Waratah is predominately an obligate flowering resprouter, with no soil or canopy seed bank (Croft et al. 2006; Auld & Ooi 2008). Following fire, a fire-free interval is required to allow new sprouting, flowering and seed release to occur, facilitating new recruitment (Denham & Auld 2002). There are a number of mechanisms by which the fire regime impacts a species with resprouting traits (DAWE 2022). A high-frequency fire regime (<7-10 years; DPE 2022. pers comm 10 January) will likely reduce the population size and health of the Gibraltar Range Waratah through depletion of below ground buds or starch reserves in standing plants (Keith, 1996). It will also limit post-fire seedling establishment, due to seedling mortality from lignotubers not being sufficiently developed to resprout (Bradstock 1995). Consequently, a high fire-frequency regime can lead to reduced reproductive capacity of the species due to loss of regenerative organs. In fact, the Gibraltar Range group of parks have a history of high fire frequency (DEC 2005). The majority of fire events taken place since 2015-2016 have been considered bushfires (NPWS 2021) and approximately 38 % of the Gibraltar Range Waratah's modelled distribution have been burned in the 5 years preceding the 2019-20 bushfires (Gallagher 2022), i.e. less than the expected minimum fire-free interval of 7–10 years required for the species to recover (DPE 2022. pers comm 10 January). Additionally, extreme and extended soil heating from high severity fires can also damage the survival of regenerative organs located below ground (Bowman et al. 2009) and increase soil hydrophobicity (Santin & Doerr 2016). Thus, increasing the threat to vegetative organs, particularly when depth of burial is shallow, fire residence time is high, ground fuel consumption is high and soil moisture is low. As fire frequency and severity are predicted to continue to increase due to climate change (Dowdy et al. 2019; Bureau of Meteorology & CSIRO 2020; van Oldenborgh et al. 2021), the Gibraltar Range Waratah may decline in the future, as fire-free intervals continue to shorten (Enright et al. 2015). Following fire, herbivory of newly formed foliage (Croft et al. 2006) may delay flowering and impact seedling survival under high frequency fire regimes (DPE 2022. pers comm 19 January) (see impacts of herbivory/predation below). The species' restricted distribution may increase its extinction risk, following stochastic events, such as fire, especially when they interact with post-fire drought.

Threat	Status [a]	Evidence
Illegal collection	• Timing: current/future • Confidence: observed/inferred • Likelihood: likely • Consequence: moderate • Trend: static/increasing • Extent: across part of its range	A study conducted in 2020-2021 found evidence the Gibraltar Range Waratah has been extensively harvested in Mulligans Drive south and Stockpile site, Gwydir Highway, before and after the 2019-20 bushfires (UNE 2021). Deliberate cutting of stems in 2020 to stimulate more stems and more flowers in following seasons were also observed (UNE 2021). Since the two biggest flowering events for this species are usually in the two seasons following a fire, the extent of harvesting post-fire meant there was very little fruit and seed production, further impacting any seedling recruitment that might occur (Mackay 2022. pers comm 2 March). Hence, the interaction between fires and illegal harvesting may lead to limited opportunities of flowering and seedling recruitment, and possible decline. The congeneric New South Wales Waratah has also been the target of illegal collection following the extreme flowering after the 2019-20 bushfires and increase in outdoor activities due to COVID-19, impeding any seedling recruitment to occur (Gorrey 2021).

Threat	Status [a]	Evidence
Climate change		
Increased frequency of extreme temperatures, droughts and fire danger weather, and changes in precipitation	• Timing: current • Confidence: projected • Likelihood: likely • Consequence: moderate • Trend: increasing • Extent: across the entire range	From 2017-19, north-eastern NSW experienced severe drought (Bureau of Meteorology 2020, 2021; Nolan et al. 2020), which overlapped with approximately 81% of the Gibraltar Range Waratah's modelled distribution in the 12 months preceeding the 2019-20 bushfires (Gallagher 2022). Post-fire surveys found no evidence of drought effects in the fire-affected population (DPE 2022. pers comm 28 January; Mackay 2022. pers comm 2 March). However, since the majority of Gibraltar Range Waratah individuals were burned during the 2019-20 bushfires, evidence of drought effects may have been harder to identify. Drought events are increasingly likely to occur due to climate change (CSIRO & Bureau of Meteorology 2015). Drought may cause widespread plant mortality in forest ecosystems, as many plants are vulnerable to drought stress and hydraulic failure of their vascular system (Allen et al. 2010; Choat et al. 2012; De Kauwe et al. 2020). Many plants in the family Proteaceae, are expected to decline in range and population size, primarily due to the effect of declining rainfall on seed production and seedling survival (Midgley et al. 2006; Fitzpatrick et al. 2008; Shimizu-Kimura et al. 2017). Furthermore, pre-fire drought can also reduce starch reserves, limiting the resprouting capacity because of poor physiological conditions prior to fire, and thus reducing regenerative responses after fire. Pre-fire drought also reduces fuel moisture, influencing fire spread and severity, and hence the extent of species ranges affected (Enright et al. 2014, 2015). Therefore, changing climate will drive increased pressure on the species via higher fire frequency, while also reducing species resilience to fire via slower rates of maturation and lower fecundity (Enright et al. 2015; Henzler et al. 2018). Given the Gibraltar Range Waratah already has very restricted distribution and low seedling recruitment, it may be at risk of extinction following intense or frequent droughts. Warmer temperatures and changes to precipitation patterns may also favour the spread of *Phytophthora cinnamomi* (Thompson et al. 2014; Homet et al. 2019).

Threat	Status [a]	Evidence
Disease		
Dieback caused by *P. cinnamomi*	• Timing: future • Confidence: suspected • Likelihood: possible • Consequence: major • Trend: unknown • Extent: across the entire range	*Phytophthora cinnamomi* is an introduced soil-borne pathogen, which infects a large range of plant species and may contribute to plant death, especially when other stresses are present, such as waterlogging, drought and fire (DOEE 2018). *Phytophthora cinnamomi* can disperse in water flowing from roots of infected plants to roots of healthy plants and mud clinging to vehicles, animals and walkers (DOEE 2018). Dieback caused by *P. cinnamomi* is listed as a key threatening process under the EPBC Act (DOEE 2018). The disease has been detected in the Gibraltar Range National Park and Washpool National Park (Scarlett et al. 2015). Soil samples collected from *Eucalyptus dissita* (Gibraltar mallee) stands, which grows in damp sites in the Gibraltar Range National Park, tested positive for *P. cinnamomi* (DPE 2022. pers comm 10 January). This is not impacting the health of the mallees and there are no signs of disease in the Gibraltar Range Waratah (DPE 2022. pers comm 10 January). *Proteaceae* is one of the plant families most susceptible to *P. cinnamomi* (DSE 2009). The closely related New South Wales Waratah is also highly susceptible to the pathogen in cultivation (DECC 2008). So, the Gibraltar Range Waratah is likely to be impacted if infected. Additionally, the restricted distribution of the species may increase its extinction risk, following stochastic events, such as disease.
Impacts of herbivory/predation		
Herbivory/seed predation	• Timing: current/future • Confidence: observed/ suspected • Likelihood: possible • Consequence: minor • Trend: unknown • Extent: unknown	A study by Croft et al. (2006) reported increased and heavy herbivory on newly formed foliage post-fire of Gibraltar Range Waratah individuals, however the consequences were minor, as high survival was recorded after fire. The 2020-2022 field surveys conducted by NSW DPE local experts, have only observed herbivory of follicles (fruit) in two individuals (DPE 2022. pers comm 31 January; 10, 16 February). However, if herbivory increases, it may delay flowering and lead to depletion of starch reserves, impacting the long-term survival of the species (Croft et al. 2006). Seed predation by vertebrates, and to a lesser extent invertebrates, may limit post-fire recruitment (Denham 2008; DPE 2022. pers comm 19 January). However, the field surveys of 2020-2022 have not reported seed predation (DPE 2022. pers comm 10 February), though it has been recorded for the congeneric New South Wales Waratah (Denham 2008).

[a]Timing—identifies the temporal nature of the threat
Confidence—identifies the nature of the evidence about the impact of the threat on the species
Likelihood—identifies the likelihood of the threat impacting on the whole population or extent of the species
Consequence—identifies the severity of the threat
Trend—identifies the extent to which it will continue to operate on the species
Extent—identifies its spatial context in terms of the range of the species

[b]Fire regimes that cause declines in biodiversity include the full range of fire-related ecological processes that directly or indirectly cause persistent declines in the distribution, abundance, genetic diversity or function of a species or ecological community. 'Fire regime' refers to the frequency, intensity or severity, season, and types (aerial/subterranean) of successive fire events at a point in the landscape

Each threat has been described in Table 2 in terms of the extent that it is operating on the species. 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; the spatial extent, 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 experts and using available literature.

Table 3 Risk Matrix for the Gibraltar Range Waratah

Likelihood	Consequences				
	Not significant	Minor	Moderate	Major	Catastrophic
Almost certain			Illegal collection		
Likely			Increased frequency of extreme temperatures, droughts and fire danger weather, and changes in precipitation	Fire regimes that cause declines in biodiversity	
Possible		Herbivory/seed predation		Dieback caused by *P. cinnamomi*	
Unlikely					
Unknown					

Risk Matrix legend/Risk rating:

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 –known to have occurred only a few times
Unknown – currently unknown how often the threat 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 stable or declining
Major – population decline is ongoing
Catastrophic – population trajectory close to extinction

Priority actions have then been developed to manage the threats, particularly where the risk was deemed to be 'very high' (red shading) or 'high' (orange shading). For those threats with an unknown or low risk (blue and green shading respectively) research and monitoring actions have been developed to understand and evaluate the impact of the threats, where appropriate.

Conservation and recovery actions

Primary conservation objective

By 2032, the population of the Gibraltar Range Waratah will have increased in abundance or remained stable and EOO/AOO will have increased or remained stable. The species will be sustained in habitats where threats are managed effectively.

Conservation and management priorities

Fire impacts

- Ensure that planned burns do not occur within areas occupied by the Gibraltar Range Waratah before a large enough fire-free interval takes place (>7–10 years) to allow seedling recruitment survival and resprouting of mature individuals to reach a fire-resistant size.
- Develop and implement an evidence-based fire management strategy that optimises the survival of the species during planned burns and bushfires. Avoid planned burns and control the impacts of herbivory and seed predation in recently burnt habitat.
- Provide maps of known occurrences to local and state Rural Fire Services and seek inclusion of mitigation measures in fire risk management plan(s), risk register and/or operation maps, including measures to avoid damage to plants and their habitat during fire suppression and mop-up operations.
- Avoid any use of managed fire research and other activities that impact upon the persistence of the species, unless there is evidence to show there would be a positive and enduring effect on the Gibraltar Range Waratah's persistence.

Disease impacts

- Determine susceptibility of the Gibraltar Range Waratah to *P. cinnamomi.*
- Implement a *P. cinnamomi* management plan to ensure the pathogen is not introduced into areas occupied by Gibraltar Range Waratah and the spread in areas outside of, but adjacent to Gibraltar Range Waratah subpopulations is mitigated (DOEE 2018). Where feasible, close and revegetate roads and tracks to reduce ingress of disease.
- Ensure that appropriate hygiene protocols are adhered to when entering or exiting the known locations of the Gibraltar Range Waratah, such as those outlined in Podger et al. (2001).

Illegal collection impacts

- Maintain the cameras set up by land managers near large numbers of flowering Gibraltar Range Waratahs, particularly near walking tracks to prevent and/or identify illegal harvest activities.

Herbivory/predation impacts

- Install and maintain insect exclusion nets around seedlings and fruiting individuals when herbivory is observed, to protect against herbivory.

Ex situ recovery actions

- To manage the risk of losing genetic diversity due to restricted distribution, undertake appropriate seed collection and storage, and determine the viability of stored seeds, according to Martyn Yenson et al. (2021). If required, investigate the possibility of establishing translocated subpopulations, according to Commander et al. (2018).

Stakeholder engagement/community engagement

- Work with Traditional Owners to divulge any Traditional Knowledge associated with the species ensuring the practices to record, store and share this knowledge are mutually supported.
- Work with Traditional Owners to implement conservation actions, including Indigenous fire management practices and other survey, monitoring and management actions.
- Continue to liaise with government agencies, land managers and stakeholder groups to ensure up-to-date population data and scientific knowledge inform the implementation of conservation actions for this species.
- Promote community awareness of the Gibraltar Range Waratah and identify opportunities for involvement in conservation actions.
- Promote the Gibraltar Range Waratah as the floral emblem of the Gondwana Rainforests World Heritage Property.
- Contribute to impact assessment and planning processes on measures to protect the Gibraltar Range Waratah and its habitat, including park management plans and environmental impact assessments.

Survey and monitoring priorities

- Undertake annual monitoring of known subpopulation, potential habitat, habitat condition/degradation, population stability (expansion or decline), recruitment and longevity.
- Monitor the size, structure and reproductive status of subpopulation at different stages in the fire cycle, taking opportunities to monitor after planned and unplanned fires (where they occur) and improve understanding of the fire response of the species.

Information and research priorities

- Investigate options for linking, enhancing or establishing additional subpopulations.
- Map habitat critical to the survival of the species and identify any critical habitat on Commonwealth land.
- Investigate the ecological requirements of the Gibraltar Range Waratah, that are relevant to persistence, particularly in the context of high fire frequency and climate change:
  - primary and secondary juvenile periods and longevity,
  - population genetic structure, levels of genetic diversity and minimum viable population size,
  - seed dispersal mechanisms and the role of seed predators and various disturbances (including fire), competition and rainfall in germination and recruitment,

  - reproductive strategies, phenology and seasonal growth, and
  - pollinator biology and requirements.

- Map the exposure of the species to climate change using distribution modelling and climate change projections, to locate existing habitat patches and identify future habitat that would be suitable for the species.
- Identify climate refuges suitable for translocation, ensuring some geographically distant enough to increase the number of the locations of the species (see "Ex situ recovery actions") if suitable habitat exists elsewhere. Where translocations are used, monitor all translocated individuals to maturity, seed set and recruitment to ensure they are viable and are contributing to a reduction in the extinction risk for the species.
- Undertake vulnerability assessments of the species sensitivity and adaptive capacity to changing climate conditions which draw from genetic, physiological or ecological evidence.

Links to relevant implementation documents

This Conservation Advice is developed to be able to subsequently inform other planning instruments, such as a Bioregional Plan or a multi-entity Conservation Plan.

Approved NSW Statement of intent for infection of native plants by *Phytophthora cinnamomi* (2008)

Gibraltar Range Group of Parks Plan of Management (2005)

Northern rivers regional biodiversity management plan (2010) Appendix 14: Local aboriginal land councils & Indigenous areas

Threat abatement plan for disease in natural ecosystems caused by *Phytophthora cinnamomi* (2018)

Fire regimes that cause declines in biodiversity (2022)

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The Threatened Species Scientific Committee finalised this assessment on DD Month Year.

Attachment A: Listing Assessment for *Telopea aspera*

Reason for assessment

This assessment follows prioritisation of a nomination from the TSSC following the 2019-20 bushfires.

Assessment of eligibility for listing

This assessment uses the criteria set out in the EPBC Regulations. The thresholds used correspond with those in the IUCN Red List criteria except where noted in criterion 4, sub-criterion 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. The definition of each of the parameters follows the Guidelines for Using the IUCN Red List Categories and Criteria.

Table 4 Key assessment parameters

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
Number of mature individuals	542-2500	542	<2500	Based on surveys in 2020–2022, local experts from the NSW DPE observed 774 individuals (DPE 2022. pers comm 14 March). The number of mature individuals surveyed were approx. 70% of the total surveyed population (DPE 2022. pers comm 10 February), i.e., approx. 542 mature individuals (flowering and fruiting). The estimate used in this assessment is the range between the direct observations of approx. 542 mature individuals and maximum inferred mature individuals of approx. <2500. The minimum plausible value is the direct field observation of approx. 542 individuals. The maximum plausible value is <2500. The maximum plausible value of <2500 is also consistent with total population size estimates from the UNE (2021) study (Table 1). Note: the estimate used in the 2019 IUCN rapid assessment, prior to the 2019-20 bushfires, was 4000-12,000 mature individuals. This value is now considered to be an overestimate, given field observations (DPE 2022. pers comm 20 January).

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
Trend	Stable/projected to decline			Population trends prior to 2019-20 bushfires are considered data deficient. Although 90-95% of individuals surveyed in 2020-2022 were burned, there was no mortality, and vigorous resprouting and post-fire flowering was observed (DPE 2022. pers comm 20 January). This assessment recognises the subpopulation to be stable currently, however changes in fire frequency and severity, exacerbated by interactions with illegal collection and drought (see Criterion 1 and 2) are likely to result in a net loss of mature individuals and an ongoing and non-reversible decline in population size of the species in the coming decades (see Criterion 2).
Generation time (years)	50-60	unknown	unknown	The minimum and maximum plausible values are unknown. The estimate used in this assessment is the estimate used in the IUCN rapid assessment (Keith 2020) (see Criterion 1 for further information).
Extent of occurrence	166 km^2	166 km^2	183 km^2	The estimate used in this assessment is the minimum plausible value and has been calculated using record data from 1962-2021 for the known subpopulation and applying the shortest continuous imaginary boundary which can be drawn to encompass these records, as outlined in the Guidelines for Using the IUCN Red List Categories and Criteria (IUCN 2022). The maximum plausible value is the value from the Gallagher (2022) rapid assessment. Note: the estimate from the IUCN rapid assessment is 177 km^2 (Keith 2020). All values are within the range of the Endangered category of Criterion 2.
Trend	stable			The only known subpopulation occurs within National Parks. The historical distribution of the species is likely to be similar to its current distribution due to its restricted distribution on granitic soils. Accordingly, EOO is considered stable.
Area of Occupancy	80 km^2	68 km^2	116 km^2	The estimate used in this assessment has been calculated using record data from 1962-2021 and applying 2 x 2 km grid cells, as outlined in the Guidelines for Using the IUCN Red List Categories and Criteria (IUCN 2022). The minimum plausible value is the value from the Gallagher (2022) rapid assessment. The maximum plausible value is the value from the IUCN rapid assessment is 116 km^2 (Keith 2020). All values are within the range of the Endangered category of Criterion 2.

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
AOO is a standardised spatial measure of the risk of extinction, that represents the area of suitable habitat known, inferred or projected to be currently occupied by the taxon. It is estimated using a 2 x 2 km grid to enable comparison with the criteria thresholds. The resolution (grid size) that maximizes the correlation between AOO and extinction risk is determined more by the spatial scale of threats than by the spatial scale at which AOO is estimated or shape of the taxon's distribution. It is not a fine-scale estimate of the actual area occupied. In some cases, AOO is the smallest area essential at any stage to the survival of existing populations of a taxon (e.g. breeding sites for migratory species).				
Trend	stable			Using the same reasoning as EOO (above), AOO is considered stable.
Number of subpopulations	1	1	unknown	There is one known subpopulation.
Trend	stable			There is no evidence of loss of any subpopulations (DPE 2022. pers comm 10 January).
Basis of assessment of subpopulation number	Contiguous records are considered part of the same subpopulation.			
No. locations	1	1	1	At the time of this assessment (in 2022), following the 2019-20 bushfires, most individuals were recovering adults (resprouts), with only a small proportion of seedling recruits (DPE 2022. pers comm 10 January). If another threatening event (e.g., fire) was to occur within the next 7-10 years (i.e., the minimal fire-free interval required by the species; DPE 2022. pers comm 10 January), most individuals would be at high risk of poor recovery, resulting in a net loss of individuals. Furthermore, the 2019-20 bushfires rapidly affected 90-95% of individuals (DPE 2022. pers comm 20 January). Given the species restricted distribution (EOO=166 km^2), it is likely that the occurrence of two or more fires in close succession could rapidly affect all individuals. Note: the estimate used in the 2019 IUCN rapid assessment, prior to the 2019-20 bushfires, was 2-4 locations. This value is now considered to be an overestimate, given the field surveys of 2020-2022 (DPE 2022. pers comm 20 January).
Trend	Possibly contracting			The severity, frequency and scale of catastrophic bushfires will likely increase due to climate change. Accordingly, the occurrence of two or more fires in close succession (within <7-10 years) can rapidly affect all individuals within a single location, leading to a contraction of the current location.
Basis of assessment of location number	See justification for number of locations.			

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
Fragmentation	The species is not considered to be severely fragmented. The species occurs within a restricted distribution in northern NSW (see EOO/AOO and Map 1).			
Fluctuations	Population size fluctuates following fire, however, there is no evidence to suggest fluctuations exceed one order of magnitude. There are no known extreme fluctuations in EOO, AOO, number of subpopulations or locations.			

Criterion 1 Population size reduction

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	**Endangered Severe reduction**	**Vulnerable Substantial reduction**
A1	≥ 90%	≥ 70%	≥ 50%
A2, A3, A4	≥ 80%	≥ 50%	≥ 30%

A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.

A2 Population reduction observed, estimated, inferred or suspected in the past where the causes of the reduction may not have ceased OR may not be understood OR may not be reversible.

A3 Population reduction, projected, inferred, or suspected to be met in the future (up to a maximum of 100 years) [(*a) cannot be used for A3*]

A4 An observed, estimated, inferred, projected or suspected population reduction where the time period must include both the past and the future (up to a max. of 100 years in future), and where the causes of reduction may not have ceased OR may not be understood OR may not be reversible.

Based on any of the following

(a) direct observation [except A3]
(b) an index of abundance appropriate to the taxon
(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
(d) actual or potential levels of exploitation
(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites

Criterion 1 evidence

Insufficient data to determine eligibility

Generation time

The age of senescence or decline of the Gibraltar Range Waratah is unknown but the species is expected to be long-lived (DPE 2022. pers comm 19 January). The primary juvenile period of the Gibraltar Range Waratah is also unknown, whilst the secondary juvenile period is estimated to be less than two years (DPE 2022. pers comm 10 January; Clarke et al. 2009). It is estimated that a minimal fire-free interval of 7–10 years (DPE 2022. pers comm 10 January) is necessary for the species to recover from disturbance, including the time required to reach reproductive maturity.

The IUCN rapid assessment estimates the species has a generation length of 50-60 years (Keith 2020). This gives an estimated three-generation period of approximately 150-180 years.

Population trends prior to 2019-20 bushfires

No monitoring data are available for the Gibraltar Range Waratah prior to 2020-2022 field surveys conducted by NSW DPE experts, so population trends prior to this time are considered data deficient.

The IUCN rapid assessment estimated the number of mature individuals to be 4000–12,000 with a stable population trend (Keith 2020). These numbers are now considered to be an overestimate, given field observations (DPE 2022. pers comm 20 January), and therefore cannot be used to determine population reduction.

Extent of 2017-19 drought and 2019-20 bushfires impact on Gibraltar Range Waratah subpopulation

Between 2017 and 2019, north-eastern NSW experienced severe drought (Bureau of Meteorology 2020, 2021), which overlapped with approximately 81 % of the Gibraltar Range Waratah's modelled distribution in the 12 months preceeding the 2019-20 bushfires (Gallagher 2022). Following this drought, catastrophic bushfire conditions resulted in extensive bushfires covering an unusually large area of eastern Australia in 2019-20. Initial estimates suggest the 2019-20 bushfires overlapped with approximately 79 % of the Gibraltar Range Waratah's modelled distribution (Gallagher et al. 2021).

Local experts from NSW DPE estimate approximately 90–95 % of surveyed individuals between 2020-2022 were burnt during the 2019-20 bushfires, however no plant mortality was observed (DPE 2022. pers comm 20 January), and there was no evidence of drought stress on the species at the time of the survey (DPE 2022. pers comm 28 January). Additionally, the species has vigorously resprouted following the fire, with large numbers of resprouting individuals flowering in the second-year post-fire (DPE 2022. pers comm 10 January). This evidence suggests the population size has not declined following the 2019-20 bushfires, and the species appears to be stable and likely to recover if there is no subsequent fire within the tolerable fire interval. There appears to be insufficient evidence to consider the species under A2 and A4 (past reduction).

Future population reduction

The main threats to the Gibraltar Range Waratah are high frequency and severity fires and illegal collection (see Table 2). In 2022, the species did not appear to be substantially impacted by disease (e.g., *P. cinnamomi*), grazing, weeds or recreational activities (DPE 2022. pers comm 10 January).

The species is likely to require a minimum fire-free interval of 7–10 years to allow sufficient post-fire resprouting and flowering (DPE 2022. pers comm 10 January). Due to its' small subpopulation size and restricted distribution, the Gibraltar Range Waratah is likely to be at risk of decline under a high frequency fire regime (Gallagher et al. 2021). High frequency fires would prevent resprouted individuals from reaching a mature size with recuperated buds or starch reserves (Keith 1996) and to a lesser extent, limit post-fire seedling recruitment due to seedling mortality from lignotubers not being sufficiently developed to resprout (Bradstock 1995), thus leading to reduced reproductive capacity of the species due to loss of regenerative organs. Additionally, extreme and extended soil heating from high severity fires can also damage the survival of regenerative organs located below ground (Bowman et al. 2009) and increase soil hydrophobicity (Santin & Doerr 2016). Thus, increasing the threat to vegetative organs particularly when depth of burial is shallow, fire residence time is high, ground fuel consumption is high and soil moisture is low.

As fire frequency and severity are predicted to continue to increase due to climate change (Dowdy et al. 2019; Bureau of Meteorology & CSIRO 2020; van Oldenborgh et al. 2021), the Gibraltar Range Waratah may decline in the future, as fire-free intervals continue to shorten (Enright et al. 2015), and increasing drought events will reduce species resilience to fire via slower rates of maturation and lower fecundity (Enright et al. 2015; Henzler et al. 2018). However, there is insufficient evidence at the time of this assessment to provide a quantitative estimate of projected decline in the Gibraltar Range Waratah under future fire regimes. As such, there appears to be is insufficient evidence to consider the species under A3 (future reduction).

Conclusion

There are currently insufficient data to demonstrate if the species is eligible for listing under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the species' 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 2 Geographic distribution as indicators for either extent of occurrence AND/OR area of occupancy

		Critically Endangered Very restricted	Endangered Restricted	Vulnerable Limited
B1.	Extent of occurrence (EOO)	**< 100 km²**	**< 5000 km²**	**< 20,000 km²**
B2.	Area of occupancy (AOO)	**< 10 km²**	**< 500 km²**	**< 2000 km²**
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)	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 evidence

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

Extent of occurrence and area of occupancy

The extent of occurrence (EOO) is estimated at 166 km² and the area of occupancy (AOO) is estimated at 80 km². These figures are based on the mapping of point records from 1962 to 2021, obtained from state governments, museums and CSIRO. Point records between 1962 and 1999 were included because the species has been poorly surveyed across time and the older records are likely to still represent extant individuals. The year 1962 aligns with Gallagher's estimates (Gallagher 2022). The EOO was calculated using a minimum convex hull, and the AOO calculated using a 2 x 2 km grid cell method, as outlined in the Guidelines for Using the IUCN Red List Categories and Criteria (IUCN 2022).

The species' EOO and AOO appear to meet the requirements for listing as Endangered under B1 (<5000 km²) and B2 (<500 km²).

Severe fragmentation

A single subpopulation can be considered severely fragmented if the subpopulation is too small to be viable because by definition a single subpopulation is isolated (IUCN 2022). However, the Gibraltar Range Waratah subpopulation is considered viable because it seems to currently persist despite of its restricted distribution and estimated <2500 mature individuals post-fire. Therefore, the species does not appear to meet the severe fragmentation requirement for listing under this criterion.

Number of locations

The species is known to occur evenly in one subpopulation, consisting of sporadic and scattered clusters of individuals within the Gibraltar Range (DPE 2022. pers comm 10 January). If another threatening event (e.g., fire) was to occur within the next 7-10 years (i.e., the minimal fire-free interval required by the species, DPE 2022. pers comm 10 January), most individuals would be at high risk of poor recovery since resprouted individuals would not be able to reach a mature size with recuperated buds or starch reserves (Keith 1996). A shorter fire-free interval would also limit any post-fire seedling recruitment that may take place, due to seedling mortality from lignotubers not being sufficiently developed to resprout (Bradstock 1995), thus leading to reduced reproductive capacity of the species due to loss of regenerative organs. As the 2019-20 bushfires overlapped with approximately 79 % of the species' modelled distribution and burned 90-95 % of individuals, it is feasible for a single fire to affect the species' entire distribution. Accordingly, a single threatening event (e.g., fire) would be required within the next 7-10 years for all individuals to be rapidly affected and unable to fully recover.

The number of locations used in this assessment is one. The species' number of locations appears to meet the requirement for listing under this criterion.

Continuing decline (past and current)

There is no available information of historical distribution and number of mature individuals of the Gibraltar Range Waratah prior to the 2020-2022 field surveys conducted by NSW DPE local experts so we cannot infer if bushfires dramatically impacted the species subpopulation size in the past. Additionally, there is currently no evidence of disease (e.g., *P. cinnamomi*) (DPE 2022. pers comm 10 January) and no signs of drought stress as a consequence of the 2017-19 drought were identified in surveyed individuals post 2019-20 bushfires (DPE 2022. pers comm 28 January). Seedling recruitment was also low post 2019-20 bushfires but resprouting from mature individuals is high, and both seedlings and resprouts are healthy (DPE 2022. pers comm 10 January), suggesting there is no past decline. This is also supported by the results from another 2020-2021 study (UNE 2021; Table 1).

Continuing decline (future)

Nonetheless, the Gibraltar Range has a history of high fire frequency (DEC 2005). For example, approximately 52 and 90 % of the Gibraltar Range Waratah's modelled distribution is estimated to have been burned in the 15 and 50 years, respectively, preceding the 2019-20 bushfires (Gallagher 2022).

Additionally, approximately 38 % of the Gibraltar Range Waratah's modelled distribution has been burned in the 5 years preceding the 2019-20 bushfires (Gallagher 2022), i.e. less than the expected minimum fire-free interval of 7–10 years required for the species to recover (DPE 2022. pers comm 10 January). The majority of fire events since 2015–2016 have been bushfires (NPWS 2021; Table 4). However, at least one planned burn occurred in 2014–2015, burning Gibraltar Range Waratah's habitat between Dandahra Creek and Dandahra Swamp (DPE 2022. pers comm 31 January; Table 4).

Table 4 Fire events in the Gibraltar Range from 2014-2015

Fire type	Fire details	Source
Planned burn	2017-18: Gwydir Highway North LMZ	NPWS 2021
	2014-15: Dandahra Creek and Dandahra Swamp	DPE 2022. pers comm 31 January
Bushfire	2019-20: Glen Innes S44 burnt almost the entirety of Gibraltar Range National Park, surrounding reserves and private property. Fires were generally intense, with severe crown scorch on any parts of the reserve with uphill fire runs or under strong winds.	NPWS 2021
	Essentially the only part of the Reserve not burnt was the area burnt in 2018-19 by the Gwydir Highway, Cangai wildfire.	
	2018-19: Gwydir Highway, Cangai. A 5,400ha wildfire that burnt with moderate intensity.	
	2018-19: Gwydir Highway, Jackadgery. A lightning strike that burnt 173ha on reserve and private property with moderate intensity.	
	2017-18: Heffron Lookout Gwydir Highway – Spot fire.	
	2016-17: Middle Creek (Gwydir Highway, Cangai). A 117ha wildfire that burnt with moderate intensity.	
	2015-16: Cangai Road – Spot Fire.	

Projected continuing decline does not have to have commenced at the time of the listing assessment (IUCN 2022). Such projected declines must be justified and there must be high degree of certainty that they will take place (IUCN 2022).

High frequency fires would prevent resprouted individuals from reaching a mature size with recuperated below ground buds or starch reserves (Keith 1996) and to a lesser extent, limit post-fire seedling recruitment due to mortality of immature lignotubers (Bradstock 1995), thus leading to reduced reproductive capacity of the species due to loss of regenerative organs. Additionally, extreme and extended soil heating from high severity fires can also damage the survival of regenerative organs located below ground (Bowman et al. 2009) and increase soil hydrophobicity (Santin & Doerr 2016). Thus, increasing the threat to vegetative organs particularly when depth of burial is shallow, fire residence time is high, ground fuel consumption is high and soil moisture is low.

The Gibraltar Range Waratah is already experiencing a high fire frequency regime (see above). As fire frequency and severity are predicted to continue to increase due to climate change (Dowdy et al. 2019; Bureau of Meteorology & CSIRO 2020; van Oldenborgh et al. 2021), the Gibraltar Range Waratah may decline in the future, due to high severity fires leading to direct mortality of standing plants, but also as fire-free intervals continue to shorten (Enright et al. 2015), feasibly becoming too short to meet the life-history requirements of the Gibraltar Range Waratah.

The interaction between fires and illegal collection may also lead to limited opportunities of flowering and seed production and consequently decrease any seedling recruitment that may occur. Additionally, increasing drought events reduce species resilience to fire via slower rates of maturation and lower fecundity (Enright et al. 2015; Henzler et al. 2018). This is likely to result in a net loss of mature individuals and an ongoing and non-reversible decline in population size of the species in the coming decades (see Criterion 1). Furthermore, projected changes in precipitation and temperature (see climate change threats) may also likely lead to a decline in range and population size, primarily due to the effect of declining rainfall on seed production and seedling survival (Midgley et al. 2006; Fitzpatrick et al. 2008; Shimizu-Kimura et al. 2017).

Accordingly, although the number of mature individuals is unknown in the past, it is projected to undergo continuing decline over the coming decades under higher fire frequency and climate change projections. The species appear to meet the continuing decline requirement for listing under this criterion.

Extreme fluctuations

There are no known extreme fluctuations in EOO, AOO, number of subpopulations, locations or mature individuals. The species does not appear to meet the extreme fluctuations requirement for listing under this criterion.

Conclusion

The species' EOO, AOO and number of locations appear to be restricted; and the number of mature individuals is likely to undergo projected continuing decline.

The data presented above appear to demonstrate that the species is eligible for listing as **Endangered** under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the species' 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**	**< 2500**	**< 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:			
(a) (i) Number of mature individuals in each subpopulation	**≤ 50**	**≤ 250**	**≤ 1000**
(a) (ii) % of mature individuals in one subpopulation =	**90 – 100%**	**95 – 100%**	**100%**
(b) Extreme fluctuations in the number of mature individuals			

Criterion 3 evidence

Eligible under Criterion 3 C2a(ii) for listing as Endangered

Number of mature individuals

Knowledge of the species' population size requires further survey work. However, based on surveys in 2020–2022, local experts from the NSW DPE estimate a total population size of at least 774 individuals, from which approximately 70 % were considered mature (i.e., 542 mature individuals) (DPE 2022. pers comm 14 March). However, surveys were not comprehensive and further unsurveyed mature individuals are likely to exist. Despite this, the number of mature individuals is suspected to be fewer than 2500, based on extrapolation of the field observations in both the DPE and UNE surveys (UNE 2021; DPE 2022. pers comm 20 January) (see 'Distribution' and Table 1 for further information).

Accordingly, the number of mature individuals is limited and appears to meet the requirements for listing as Endangered (<2500).

Continuing decline

As discussed in Criterion 2 (see above), the species is projected to undergo continuing decline in the number of mature individuals. However, the rate of decline is unknown. Accordingly, the species appears to only meet the C2 continuing decline requirement for listing under this criterion and not the C1 continuing decline requirement.

Percentage of mature individuals in one subpopulation
All mature individuals of the Gibraltar Range Waratah, i.e., 100 %, are present in the only known subpopulation.

Accordingly, the percentage of mature individuals appears to meet the requirements for listing as Endangered (95-100 %).

Extreme fluctuations in the number of mature individuals
There is no evidence that the population size of the Gibraltar Range Waratah significantly fluctuated following the 2019-20 bushfires, since no mortality was observed (DPE 2022. pers comm 20 January). The species does not appear to meet the extreme fluctuations requirement for listing under this criterion.

Conclusion
The species' population size appears to be <2500 mature individuals, the number of mature individuals is projected to undergo continuing decline and the percentage of mature individuals in the only subpopulation is 100 %. Therefore, the species is eligible for listing as **Endangered** under this criterion. The purpose of this consultation document is to elicit additional information to better understand the species' 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	< 1000
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 *common assessment method*.

Criterion 4 evidence

Insufficient data to determine eligibility

Number of mature individuals

As per the evidence presented above for Criterion 3, the number of mature individuals is less than 2500. Although extrapolation of the field observations in both the DPE and UNE surveys (UNE 2021; DPE 2022. pers comm 20 January) suggests that the number of mature individuals is likely to exceed 1000, only 542 mature individuals have actually been counted (see 'Distribution' and Table 1 for further information).

Accordingly, there is insufficient evidence to definitively determine if the number of mature individuals is fewer than 1000.

Conclusion

There are currently insufficient data to demonstrate if the species is eligible for listing under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the species' 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 Gibraltar Range Waratah for listing in any category under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the species' status.

Adequacy of survey

The survey effort has been considered adequate and there is sufficient scientific evidence to support the assessment.

Public consultation

Notice of the proposed amendment and a consultation document is made available for public comment for a minimum of 30 business days. Any comments received relevant to the survival of the species are considered by the Committee as part of the assessment process.

Listing and Recovery Plan Recommendations

A decision about whether there should be a Recovery Plan for this species has not yet been made. The purpose of this consultation document is to elicit additional information to help inform the decision.

Cataloguing data

This publication (and any material sourced from it) should be attributed as: Department of Agriculture, Water and the Environment 2022, *Conservation Advice for* Telopea aspera *(Gibraltar Range Waratah),* Canberra. 

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Version history table

Document type	Title	Date [dd mm yyyy]
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