



## Consultation on Species Listing Eligibility and Conservation Actions

### *Almaleea cambagei* (Torrington pea)

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

- 1) the eligibility of *Almaleea cambagei* (Torrington pea) 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.

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:  
[ExpertAssessmentPlans@environment.gov.au](mailto:ExpertAssessmentPlans@environment.gov.au)

Please include species scientific name in Subject field.

or by mail to:

The Director  
Threatened Species and Communities Governance Section  
Department of Climate Change, Energy, the Environment and Water  
John Gorton Building, King Edward Terrace  
GPO Box 3090  
Canberra ACT 2601

**Responses are required to be submitted by Tuesday 18 April 2023.**

<b>Contents of this information package</b>	<b>Page</b>
General background information about listing threatened species	2
Information about this consultation process	3
Consultation questions specific to the assessment	4
Information about the species and its eligibility for listing	6
Conservation actions for the species	13
References cited	16
Listing assessment	19

## **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.dcceew.gov.au/environment/biodiversity/threatened>

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.dcceew.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.dcceew.gov.au/environment/biodiversity/threatened/nominations>

The devastating bushfires that burnt more than 7.7 million hectares across southern and eastern Australia in 2019-20 severely impacted native wildlife and habitat. This created an urgent need for hundreds of species and ecological communities (ECs) to be assessed against EPBC Act criteria for threatened listing status, so that the recovery and future resilience of fire-affected species and ECs could be supported by statutory protection commensurate with their post-fire status, and to ensure EPBC Act lists are as current and accurate as possible, helping improve environmental resilience and preparedness for future fire events. As part of the Australian Government's bushfire response the Department engaged scientific experts to deliver a number of Species Expert Assessment Plans (SEAPs) for groups of species and ECs that were affected by the 2019–20 fires, or could be affected by similar fire events in the future, to enable hundreds of species and ECs to be assessed against EPBC Act criteria for threatened listing status and improve the currency of EPBC Act lists in a timely manner. Information about the SEAPs project is available at: <https://www.dcceew.gov.au/environment/biodiversity/threatened/seap>

This assessment follows evaluation of the conservation status of the species through the SEAPs project.

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.dcceew.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.dcceew.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 *Almaleea cambagei* (Torrington pea)**

### **PART 1 – INFORMATION TO ASSIST LISTING ASSESSMENT**

1. Do you have any additional information on the **ecology or biology** of the species?
2. Can you provide any additional information or estimates on **longevity, average life span or generation length** for the species?
3. Do you have additional information to support an **estimate of the current population size** of mature adults of the species (national extent)?
4. Do you have additional information on **population trends** over 3 generations, or an historic population size for the species (national extent)?
5. Do you have additional information on **current range** (national extent) or **location of populations** for the species?
6. Can you provide additional information on any **change in range or location of populations**, or an **historic range** (national extent)?

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

7. Do you have further information on the historic, current or potential **threats** facing the species?
8. Do you have further information on current or potential **management actions** to support protection and recovery of the species?
9. Do you have further information on current or potential **monitoring or research activities** for the species?
10. Are you aware of **other knowledge** (e.g., traditional ecological knowledge) that may help better understand the threats and management actions to aid recovery of the species?
11. Are you aware of any **cultural importance or use** that the species has?
12. What **individuals or organisations** are currently, or potentially could be, involved in management and recovery of the species?

### **PART 3 – ANY OTHER INFORMATION**

13. Do you have comments on **any other matters** relevant to the assessment of this species.



## Conservation Advice for *Almaleea cambagei* (Torrington pea)

**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 approved Conservation Advice and listing assessment for the species. It provides a foundation for conservation action and further planning.

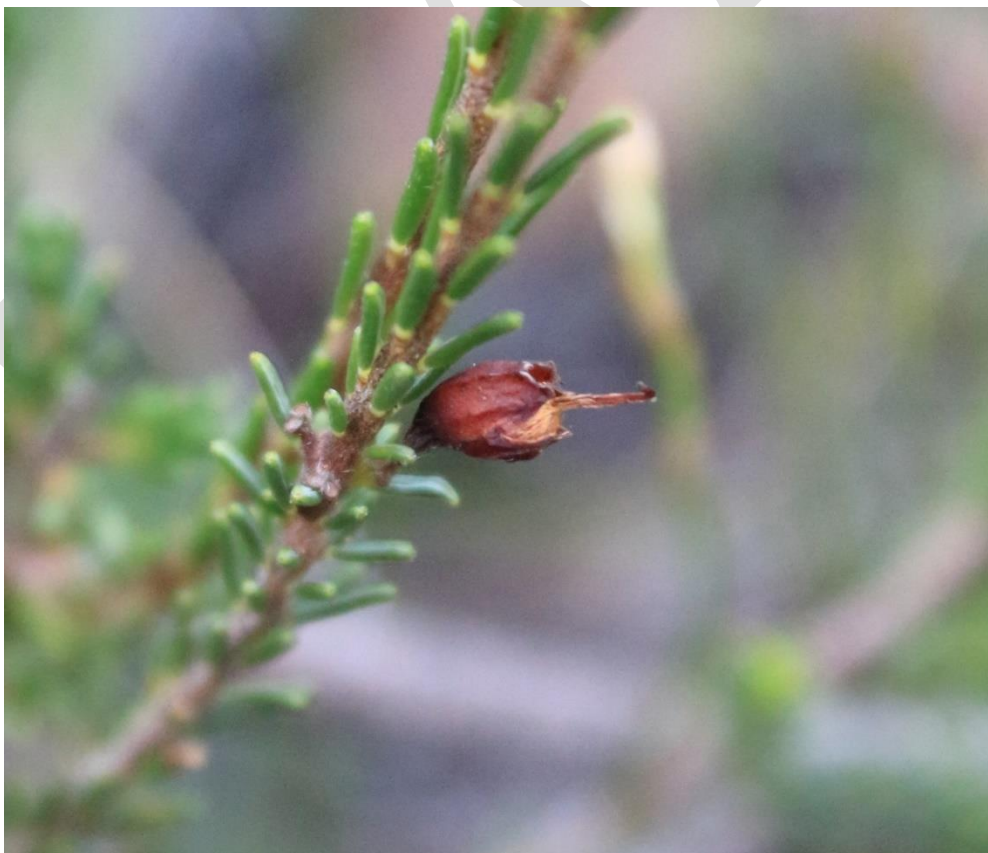


Photo: *Almaleea cambagei* © Copyright Gavin Phillips, NSW Department of Planning and Environment.

## Conservation status

*Almaleea cambagei* (Torrington pea) is listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwth) (EPBC Act). The species was eligible for listing under the EPBC Act at that time as, immediately prior to the commencement of the EPBC Act, it was listed as Endangered under Schedule 1 of the *Endangered Species Protection Act 1992* (Cwlth).

*Almaleea cambagei* is proposed to be transferred from the Vulnerable category to the Endangered category of the threatened species list under the EPBC Act.

*Almaleea cambagei* was assessed by the Threatened Species Scientific Committee to be eligible for listing as Endangered under Criterion 2. The Committee's assessment is at Attachment A. The Committee assessment of the species' eligibility against each of the listing Criteria is:

- Criterion 1: Insufficient data
- Criterion 2: B1ab(iii,v); B2ab(iii,v): Endangered
- Criterion 3: Insufficient data
- Criterion 4: Ineligible
- Criterion 5: Insufficient data

The main factors that make the species eligible for listing in the Endangered category are a restricted geographic distribution, a restricted number of locations and continuing decline due to fire regimes that cause biodiversity decline.

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 Threat Database](#).

## Species information

In this assessment, the word population is used to refer to the concept of 'subpopulation' in IUCN (2022), in keeping with the terminology used in the EPBC Act and state/territory environmental legislation and general ecological usage.

### Taxonomy

Conventionally accepted as *Almaleea cambagei* (Maiden & Betche) Crisp & P.H.Weston, Family: Fabaceae. The species is synonymous with *Pultenaea subumbellata* var. *cambagei* H. Williamson (Crisp & Weston 1991).

### Description

#### Simple description

*Almaleea cambagei* is a shrub to 1 m in height. It flowers from September to November (Quinn et al. 1995). The species has sparsely to densely appressed-pubescent stems, linear to narrow-oblong leaves with leaf margins curved inwards and the lower surface usually tuberculate (Weston & Crisp 1991).

### Formal taxonomic description

*Almaleea cambagei* is described as an “erect shrub to 1 m high; stems sparsely to densely appressed-pubescent. Leaves linear to narrow-oblong, 3–10 mm long, 0.5–1.5 mm wide, concave, obtuse, not incurved; margins incurved to involute; lower surface usually tuberculate, usually pubescent when young, soon glabrescent, usually lacking a central purplish streak. Bracts 2–3 mm long, densely hairy; outer bracts narrow-ovate, inner bracts linear. Pedicels 1–3.5 mm long. Bracteoles densely hairy. Calyx 4–5 mm long; tube and lobes moderately to densely villous. Standard 8–9 mm long. Pod 3–5 mm long” (Weston & Crisp 1991).

### Distribution

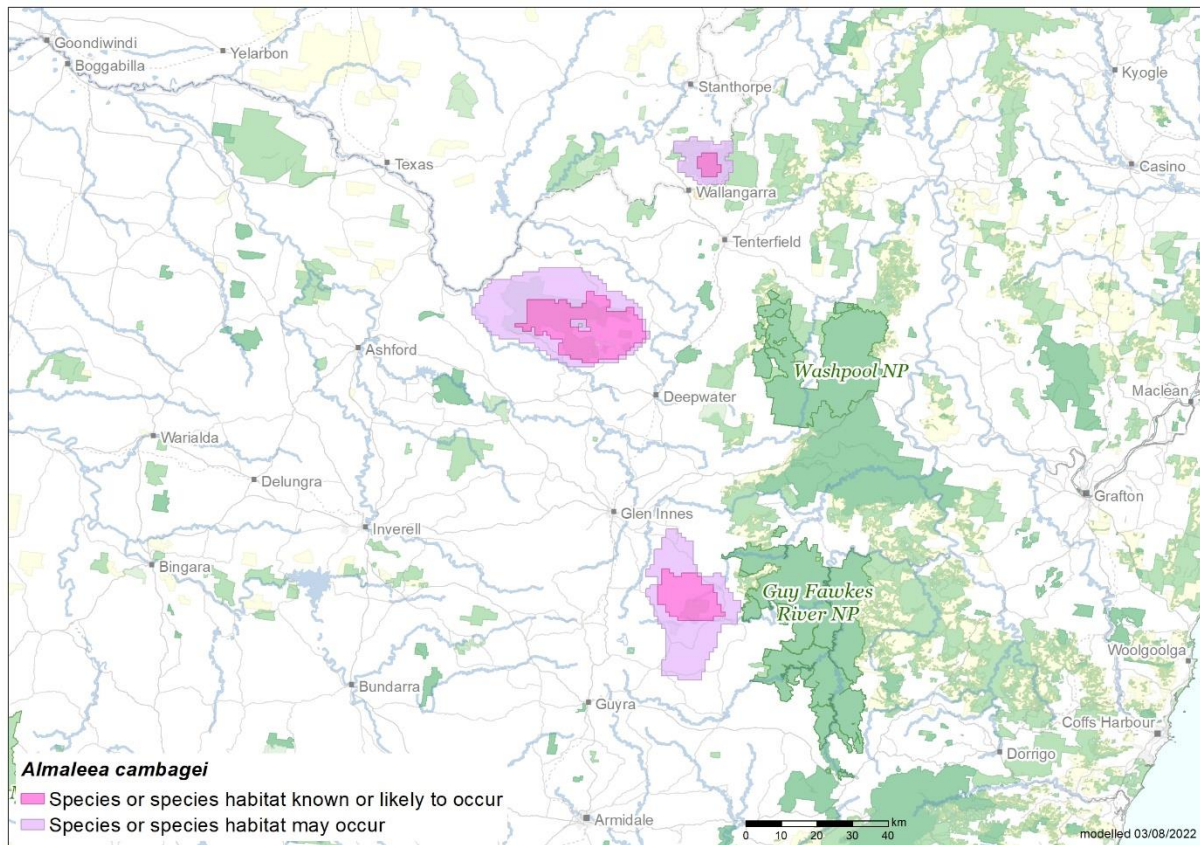
*Almaleea cambagei* is found in northern New South Wales (NSW) in the Torrington area and 60–70 km southeast in the headwaters of the Henry River (Crisp & Weston 1991). It occurs in Torrington State Conservation Area (SCA), Warra National Park (NP), as well as on private land. The species also occurs some 50 km north of Torrington SCA in southern Queensland in the Wallangarra district (Hogbin 2002). This Queensland population occurs within Girraween NP (Department of the Environment, Water, Heritage and the Arts (DEWHA) 2008).

The total number of mature individuals of *Almaleea cambagei* is unknown (see Table 1), however is estimated at less than 10,000. Herbarium records indicate abundance locally as ranging from ‘locally rare’ to ‘occasional’ to ‘locally common, 50–100+ individuals’ to ‘common’ to ‘locally frequent’. Australian Seed Bank Partnership (ASBP) (2022) note 50–100 seedlings at one site in Torrington after the 2019–20 bushfires. Quinn et al. (1995) report that there were >20 plants at one of the Henry River sites based on a 1966 specimen record.

**Table 1 Summary of population estimates for *Almaleea cambagei***

Likely populations	Pre 2019–20 bushfires estimate of mature plants	% plants killed in 2019–20 bushfires	Seedlings post-fire	Summary of impacts of 2019–20 bushfires
Girraween NP, Qld	unknown	Not burnt	NA	Not burnt
Torrington State Conservation Area, NSW	Likely largest population but numbers unknown.	unknown	yes	ASBP (2022) note 50–100 seedlings at one burnt site. Some resprouting likely depending on fire severity. Hunter (2021) estimates up to 5400 plants may be present in Torrington SCA after the 2019–20 fires.
Henry River area, Warra NP, NSW	>20 based on a 1966 herbarium collection	unknown	unknown	Some sites burnt; others not burnt. Impacts unknown.

**Map 1 Modelled distribution of *Almaleea cambagei***



**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 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.

*Almaleea cambagei* occurs on Ngarabal and Gumbainggir land (AIATSIS 1996). It is unknown whether *Almaleea* species have any cultural significance to the Ngarabal and Gumbainggir people. Further consultation with Traditional Owners will benefit the conservation of the species by providing awareness of Traditional Knowledge and management practices on Country.



## Relevant biology and ecology

The species occurs within swamps and along drainage lines (Quinn et al. 1995; Hogbin 2002) and in peaty soils on granite at altitudes above 1000 m (Quinn et al. 1995). Associated species include *Baেকেa omisssa*, *Epacris microphylla* (coral heath), *Callistemon sieberi* (river bottlebrush), *Leptospermum* spp. and *Baloskion* spp. (NSW DPE 2022).

Little is known about the ecology of *A. cambagei*. The species' longevity and length of the primary and secondary juvenile periods are unknown. The response to fire appears to vary depending on fire severity. The species has been reported to resprout after fire (NSW Flora Fire Response Database v 2.1 2014; Clarke et al. 2009), but individuals may be killed by severe fires and then rely on seed germination for re-establishment. Quinn et al. (1995) report that the species is an obligate seeder, as did ASBP (2022) based on observations at Torrington after an extremely high severity fire in 2019–20.

The current recommended minimum fire interval for the species is no less than seven years between fires, however this has been derived from the associated vegetation type and is not specific to the species (NSW RFS Bush Fire Environmental Assessment Code 2022). Given mortality observations in adult resprouting plants as a result of the 2019–20 bushfires, a minimum interval of 15 years is recommended to allow juvenile plants to recover and grow to a size where they have large enough underground organs to be able to resprout after the next fire. The ongoing minimum fire interval for *A. cambagei* will depend on the interaction between future fire frequency and fire severity (in particular the degree of adult mortality that occurs in any one fire) and the time it takes recruits to grow organs capable of resprouting after a fire.

Pollination in *Almaleea* and the closely related *Pultenaea* is by insects, including native bees (Armstrong 1979). Many Fabaceae species produce physically dormant seeds that form persistent soil seed banks (Auld 1996). Closely related *Pultenaea* species are known to have seed germination promoted by heat from the passage of fires (Auld & O'Connell 1991) and this is also likely in *A. cambagei*. Dispersal in *Pultenaea* and *Almaleea* species is predominately by ants (very localised dispersal) (Auld 1996).

## Habitat critical to the survival

As described above, *A. cambagei* occurs within swamps and along drainage lines (Quinn et al. 1995; Hogbin 2002) and in peaty soils on granite at altitudes above 1000 m (Quinn et al. 1995). Until further information is available, all habitat for the species in known extant populations should be considered as habitat critical to the survival of the species. Areas identified as suitable for translocations should also be considered as habitat critical to the survival. Areas of suitable habitat (see Distribution section) where the species is likely to occur or may occur (dark pink and light pink shading in Map 1) should be considered potential habitat for 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

All populations are considered important for the long-term recovery and survival of this species given its limited distribution and small population size.

## Threats

*Almaleea cambagei* is threatened by fire regimes that cause declines in biodiversity, impacts of feral animals and stock, impacts of climate change, changes to hydrology (including clearing and drainage of habitat for agriculture and grazing) and localised site disturbance (Hogbin 2002; NSW NPWS 2003; NSW DPE 2022) (See Table 2 below).

**Table 2 Threats impacting *Almaleea cambagei***

Threat	Status <sup>a</sup>	Evidence
Fire		
Fire regimes that cause declines in biodiversity <sup>b</sup>	<p>Status: historical/current/future                      Confidence: inferred/known                      Likelihood: almost certain                      Consequence: major                      Trend: increasing                      Extent: across the entire range</p>	<p>Fire regimes that cause declines in biodiversity is listed as a Key Threatening Process under the EPBC Act (DAWE 2022). The mechanisms by which fire can impact species are diverse and can be direct or indirect.</p> <p><b>High fire frequency</b></p> <p>Some 88% of the locations of known records of the species were burnt in the 2019–20 bushfires (Gallagher 2020; Auld et al. 2020). Of the known habitat burnt in the 2019–20 bushfires, 36% of AVH occurrences and 50% of the species modelled distribution were burnt in the last 15 years (Gallagher 2020; Auld et al. 2020), i.e., at a shorter interval than a fire interval that is expected to allow juvenile plants to sufficient time to become able to re\sprout after a future fire.</p> <p>The Torrington area has a history of frequent fire. Sites containing habitat for <i>A. cambagei</i> have been burnt with fire return intervals of 10 or 28 years (western Torrington) or 1, 2, 7, 10 and 17 years (central and eastern Torrington area). Additionally, since 2002, some sites have experienced fire intervals of 7, 8, 1 and 1 years, respectively (NSW DPE SEED 2022). In the Henry River area, there were fires in 1990 and 1994 and more recently in 2015–16 and 2019–20. Within Girraween NP, fire intervals of 1, 2, 4, 7 and 24 years have been recorded, with the last major fire in 2018–19.</p> <p>Frequent fire may eliminate recruits before they mature or before they become able to resprout after fire and may reduce adult survival after fire (Keith 1996).</p> <p><b>High severity fire</b></p> <p>Observations after the 2019–20 bushfires suggest that where there was high severity fire, all mature plants were killed (e.g., ASBP 2022) although this may reflect an interaction between pre-fire drought and fire severity rather than high severity fire alone. In such cases, population persistence is now reliant on successful recruitment of post-fire seedlings.</p> <p><b>Interactions between fire and drought</b></p> <p>The high levels of adult plant mortality after the 2019–20 fires (and a lack of resprouting in adult plants) may have been due to an interaction between pre-fire drought and fire severity.</p> <p><b>Interactions between fire and herbivory</b></p> <p>Plants recruiting or resprouting after fire may be susceptible to damage from herbivores (ASBP 2022) (see below in Invasive species).</p>

*Almaleea cambagei* (Torrington pea) Conservation Advice

Threat	Status <sup>a</sup>	Evidence
Invasive species		
Impacts of feral animals and domestic stock	<p>Status: historical/current/future</p> <p>Confidence: inferred/known</p> <p>Likelihood: likely</p> <p>Consequence: major</p> <p>Trend: increasing</p> <p>Extent: across part of its range</p>	<p>The species is threatened by browsing on plants by feral herbivores including feral goats (<i>Capra hircus</i>) and feral deer (<i>Dama dama</i>, <i>Axis axis</i> and <i>Cervus</i> spp.) and by domestic stock.</p> <p>The impacts of feral animals and domestic stock are exacerbated in post-fire conditions and by drought when food resources for animals tend to be scarce (NSW SOS 2022). ASBP (2022) noted the adverse impact of browsing on seedlings seen in field visits after the 2019–20 bushfires. Additionally, as the species occurs adjacent to roads and tracks, it may be damaged via travelling stock routes.</p> <p>Feral pig (<i>Sus scrofa</i>) rooting in swampy areas where the species occurs destroys habitat and disturbs the seed bank for the species (NSW SOS 2022).</p>
Climate change		
Increased frequency of extreme temperatures, droughts and fire danger weather, and changes in precipitation	<ul style="list-style-type: none"> <li>• Status: current/future</li> <li>• Confidence: inferred</li> <li>• Likelihood: almost certain</li> <li>• Consequence: major</li> <li>• Trend: increasing</li> <li>• Extent: across the entire range</li> </ul>	<p>Climate change resulting in an increased likelihood of drought and an increased frequency and severity of fire is considered to be a threat.</p> <p>In south-eastern Australia, climate change is likely to cause an increased frequency and severity of both drought and major bushfires (AdaptNSW 2022; Climate Change in Australia 2022). Severe fire weather is projected to increase across the region by 2070 (AdaptNSW 2022). Time spent in drought is projected, with medium confidence, to increase over the course of the century (Climate Change in Australia 2022).</p> <p>Drought can cause plant mortality, reduce plant growth rates (and therefore increase time to reach sexual maturity) and limit seed production. Increased fire severity and frequency can lead to increased resprouting failure in mature plants in fires and reduced capacity to replenish the soil seed bank and develop underground organs capable of resprouting after a fire.</p>
Clearing/altered hydrology		
Clearing and drainage of habitat for agriculture and grazing	<ul style="list-style-type: none"> <li>• Status: historical/current/future</li> <li>• Confidence: inferred</li> <li>• Likelihood: possible</li> <li>• Consequence: moderate</li> <li>• Trend: unknown</li> <li>• Extent: across part of its range</li> </ul>	<p>Most sites occupied by the species are now in protected areas, but some remain on unreserved land, subject to clearing and draining of swampy areas. Accordingly, the species may be at risk from clearing now and into the future.</p>
Habitat disturbance		
Site disturbance including road and track maintenance and construction, recreational fossicking and camping	<ul style="list-style-type: none"> <li>• Status: historical/current/future</li> <li>• Confidence: inferred/known</li> <li>• Likelihood: likely</li> <li>• Consequence: minor</li> <li>• Trend: increasing</li> <li>• Extent: across part of its range</li> </ul>	<p>A number of sites occur adjacent to roads and tracks. Accordingly, the species may be damaged via vehicle damage, roadworks or trampling, localised rubbish dumping. Additionally, proximity to roads and tracks increases the potential for introduction of pathogens into sites.</p>

<sup>a</sup>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

<sup>b</sup>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

**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

Each threat has been described in Table 2 in terms of the extent that it is operating on the species. The risk matrix (Table 3) 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 experts and using available literature.

**Table 3 Risk matrix**

Likelihood	Consequences				
	Not significant	Minor	Moderate	Major	Catastrophic
Almost certain				Fire regimes that cause declines in biodiversity Increased frequency of extreme temperatures, droughts and fire danger weather, and changes in precipitation	
Likely		Site disturbance		Impacts of feral animals and domestic stock	
Possible			Clearing and drainage of habitat for agriculture and grazing		
Unlikely					
Unknown					

Risk Matrix legend/Risk rating:

Low Risk	Moderate Risk	High Risk	Very High Risk
----------	---------------	-----------	----------------

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 a moderate 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 outcome

Maintenance of individuals, recovery of populations where adult plants were lost in the 2019–20 bushfires and ongoing effective recruitment to allow conservation across the species’ range.

### Conservation and management priorities

#### Fire regimes that cause declines in biodiversity

- Develop and implement an evidence-based fire management strategy that minimises risks of decline and optimises population persistence for the species. The strategy should set out how high frequency fire and repeated high severity fire can be mitigated.

- The current recommended fire interval for the species is no fire more than once every seven years (NSW RFS Bush Fire Environmental Assessment Code 2022), however, given the observation of mortality in adult resprouting plants as a result of the 2019–20 bushfires, a period of 15 years is recommended to allow juvenile plant recovery and growth to a size where they are fire resistant. This means excluding fire from known sites burnt in 2019–20 until 2035.

#### **Impact of feral animals and stock**

- Develop and implement a stock management plan for roadside verges and travelling stock routes.
- Manage known sites on private property to ensure appropriate stock grazing regimes are conducted.
- Prevent grazing pressure at known sites on leased crown land through exclusion fencing or other barriers.
- Develop and implement a management plan for the control and eradication of feral pigs and goats in the local region.

#### **Climate change and severe weather impacts**

- Investigate options for maintaining in situ persistence as the climate changes, for example by minimising other population pressures, enhancing resilience and promoting recruitment or supplementing existing populations.

#### **Habitat loss disturbance and modifications**

- Ensure sites near roads, tracks and trails are managed to exclude habitat disturbance and loss. Appropriate fencing may be required in some locations.
- Control access routes to suitably constrain public access to known sites on public land.
- Suitably control and manage access on private land.
- Minimise adverse impacts from land use at known sites.
- Identify roadside populations to ensure road widening and maintenance activities (or other infrastructure or development activities involving substrate or vegetation disturbance) in areas where *A. cambagei* occurs do not adversely impact on known populations.
- Investigate formal conservation arrangements such as the use of covenants, conservation agreements or inclusion in reserve tenure.

#### **Ex situ recovery actions**

- Develop and implement a targeted seed collection program for ex situ seed banking, with sampling across the full range of the species, following best-practice guidelines (Martyn Yenson et al. 2021).
- If appropriate, investigate the feasibility of establishing translocated populations or enhancing existing populations that will improve the conservation outlook of the species. Translocations should be conducted in accordance with best practice guidelines and procedures (refer to Commander et al. 2018), including monitoring translocated populations through to recruitment to ensure they are viable.

## **Stakeholder engagement/community engagement**

- Inform land owners and managers of sites where there are known populations and consult with these groups regarding options for conservation management and protection of the species.
- Engage with private landholders and public land managers responsible for the land on which populations occur and encourage these key stakeholders to contribute to the implementation of conservation management actions.
- Relevant Traditional Owners should be identified and consulted with on all planned recovery actions. Effort should be made to collaborate with Traditional Owner groups in the implementation of any actions.
- Engage cultural knowledge custodians and land rights holders in conservation actions, including the implementation of Indigenous fire management and other survey, monitoring and management actions. Enable the sharing of knowledge, while ensuring the processes and protocols to record, store, and share any knowledge are agreed and appropriately resourced. Information on the application of cultural burning and integrated Caring for Country practices to protect and enhance habitat is of critical importance.

## **Survey and monitoring priorities**

- Maintain a monitoring program to:
  - Monitor species recruitment and plant health after fire events (including the 2019-20 bushfires).
  - Determine trends in population size, time to flowering in juveniles, time to grow to a size that is fire resistant.
  - Monitor levels of seed production and recruitment.
  - Document post-fire recovery.
  - Conduct targeted population surveys to determine the number of individuals and impacts of 2019-20 bushfires across the species range.
  - Monitor for habitat degradation by recreational activities or other site disturbances.
  - Monitor for any adverse herbivore impacts, especially on seedling recruitment.

## **Information and research priorities**

- Conduct research into the life history and ecology of the species. This includes determining plant longevity, pollinators, recruitment, seed bank viability and dynamics and seed dispersal.
- Continue monitoring post- 2019–20 bushfires and examine seedling survivorship, growth, time to maturity and reaching a stage where they are capable of resprouting, magnitude of fecundity over time once mature, plant longevity, seed viability and seed dispersal.

## Links to relevant implementation documents

[Guidelines for the translocation of threatened plants in Australia \(2018\)](#)

[Plant Germplasm Conservation in Australia: strategies and guidelines for developing, managing and utilising ex situ collections \(2021\)](#)

[Almaleea cambagei \(Torrington pea\)– Saving our Species strategy](#)

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.

## Conservation Advice and Listing Assessment references

AdaptNSW (2022) New England and North West fire projections 2060–2079. Accessed on the internet at: <https://www.climatechange.environment.nsw.gov.au/projections-map>

AIATSIS (1996) The AIATSIS map of Indigenous Australia. Accessed: 10 March 2022. Available at: <https://aiatsis.gov.au/explore/map-indigenous-australia>

Armstrong JA (1979) Biotic pollination mechanisms in the Australian flora — a review. *New Zealand Journal of Botany* 17, 467-508.

Auld TD (1996) The ecology of the Fabaceae in the Sydney region: fire, ants and the soil seedbank. *Cunninghamia* 4(4), 531-551.

Auld TD, Mackenzie BDE, Le Breton T, Keith DA, Ooi MKJ, Allen S & Gallagher RV (2020) *A preliminary assessment of the impact of the 2019/2020 fires on NSW plants of national significance*. Unpublished report NSW Department of Planning Industry and Environment.

Auld TD & O'Connell MA (1991) Predicting patterns of post-fire seed germination in 35 eastern Australian Fabaceae. *Australian Journal of Ecology* 16, 53-70.

Australian Seed Bank Partnership (ASBP) (2022) Australian Seed Bank Partnership Rapid Flora Assessment data for bushfire projects. Australian Seed Bank Partnership

Bachman S, Moat J, Hill AW, de la Torre J & Scott B (2011) Supporting Red List threat assessments with GeoCAT: geospatial conservation assessment tool. *Zookeys* (150): 117–126.

Clarke PJ, Knox KJE, Campbell ML & Copeland ML (2009) Post-fire recovery of woody plants in the New England Tableland Bioregion. *Cunninghamia* 11(2): 221–239.

Climate Change in Australia (2022) Climate change projections for Central Slopes region. Available at: <https://www.climatechangeaustralia.gov.au/en/projections-tools/regional-climate-change-explorer/clusters/?current=CSC&tooltip=true&popup=true>



- Commander LE, Coates D, Broadhurst L, Offord CA, Makinson RO & Matthes M (2018) Guidelines for the translocation of threatened plants in Australia. Third Edition. *Australian Network for Plant Conservation*, Canberra. Accessed: 3 May 2022. Available at: [https://www.anpc.asn.au/wp-content/uploads/2019/03/Translocation-Guidelines\\_FINAL-WEB2.pdf](https://www.anpc.asn.au/wp-content/uploads/2019/03/Translocation-Guidelines_FINAL-WEB2.pdf)
- Crisp MD & Weston PH (1991) *Almaleea* a new genus of Fabaceae from south-eastern Australia. *Telopea* 4(2), 307-311.
- DEWHA (Department of the Environment, Water, Heritage and the Arts) (2008) *Approved Conservation Advice for Almaleea cambagei*. Canberra: Department of the Environment, Water, Heritage and the Arts. Available at: [https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon\\_id=56308](https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=56308)
- Gallagher RV (2020) *National prioritisation of Australian plants affected by the 2019-2020 bushfire season*. Report to the Commonwealth Department of Agriculture, Water and Environment.
- Hogbin P (2002) Review of the *Threatened Species Conservation Act* Flora Schedules: Recommendations to the Scientific Committee. Accessed: 9 May 2022. Available at: <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Scientific-Committee/review-of-the-threatened-species-conservation-act-flora-schedules.pdf?la=en&hash=0868933F1673AFAFA97EFF5C0DE839367647A6B9>
- IUCN (International Union for Conservation of Nature) (2022) *Guidelines for Using the IUCN Red List Categories and Criteria*. Version 15. Prepared by the Standards and Petitions Committee, International Union for the Conservation of Nature. Available at: <http://www.iucnredlist.org/documents/RedListGuidelines.pdf>
- Keith DA (1996) Fire-driven extinction of plant populations: a synthesis of theory and review of evidence from Australian vegetation. *Proceedings of the Linnean Society of New South Wales* 116, 37-78.
- NSW NPWS (2003) *Torrington State Conservation Area Plan of Management*. NSW National Parks and Wildlife Service. Accessed: 9 May 2022. Available at: <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Parks-reserves-and-protected-areas/Parks-plans-of-management/torrington-state-conservation-area-plan-of-management-030126.pdf>
- NSW DPE (Department of Planning and Environment) (2022) *Torrington Pea – profile*. NSW Department of Planning and Environment. Accessed: 9 May 2022. Available at: <https://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10041>
- NSW DPE SEED (2022) SEED the central resource for sharing and enabling environmental data in NSW. Accessed 9 May 2022. Available at: [https://geo.seed.nsw.gov.au/Public\\_Viewers/index.html?viewer=Public\\_Viewers&locale=en-AU#](https://geo.seed.nsw.gov.au/Public_Viewers/index.html?viewer=Public_Viewers&locale=en-AU#)

NSW RFS (Rural Fire Service) Bush Fire Environmental Assessment Code (2022) Rural Fire Service Bush Fire Environmental Assessment Code, Threatened species hazard reduction list – part 1- plants. Accessed: 10 May 2022. Available at: [https://www.rfs.nsw.gov.au/data/assets/pdf\\_file/0017/24335/Web-Version-ThreatenedSpeciesHazardReductionList-Part1-Plants-06-04-2017.pdf](https://www.rfs.nsw.gov.au/data/assets/pdf_file/0017/24335/Web-Version-ThreatenedSpeciesHazardReductionList-Part1-Plants-06-04-2017.pdf)

NSW SOS (Saving Our Species) (2022) NSW Saving Our Species site management plan for *Almaleea cambagei*. NSW SOS database.

PlantNET (The NSW Plant Information Network System) (2022) Royal Botanic Gardens and Domain Trust, Sydney. Accessed: 25 January 2022. Available at: <https://plantnet.rbgsyd.nsw.gov.au/cgi-bin/NSWfl.pl?page=nswfl&lvl=sp&name=Almaleea~cambagei>

Quinn FC, Williams JB, Gross CL & Bruhl JJ (1995) *Report on rare and threatened plants of north-eastern New South Wales*. Report prepared for New South Wales National Parks and Wildlife Service and Australian Nature Conservation Agency.

Weston PH & Crisp MD in Harden GJ (ed.) (1991) *Almaleea*. *Flora of New South Wales* 2, 497-498.

### **Other sources**

JT Hunter (2021) Post Fire Assessments Torrington Summary Table 1: Count of populations found of select flora species of concern, the category of population size and estimated living individuals and projected estimate of the total population that may occur within the Torrington State Conservation Area and Bolivia Hill Nature Reserve. In possession of NSW Department of Planning and Environment, Parramatta.

# THREATENED SPECIES SCIENTIFIC COMMITTEE

Established under the *Environment Protection and Biodiversity Conservation Act 1999*

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

## Attachment A: Listing Assessment for *Almaleea cambagei*

### Reason for assessment

The devastating bushfires that burnt more than 10.3 million hectares across southern and eastern Australia in 2019–20 severely impacted native wildlife and habitat. This created an urgent need for hundreds of species and ecological communities (ECs) to be assessed against EPBC Act criteria for threatened listing status, so that the recovery and future resilience of fire-affected species and ECs could be supported by statutory protection commensurate with their post-fire status, and to ensure EPBC Act lists are as current and accurate as possible, helping improve environmental resilience and preparedness for future fire events.

As part of the Australian Government’s bushfire response the Department engaged scientific experts to deliver a number of Species Expert Assessment Plans (SEAPs) for groups of fire-affected and non-fire affected species and ECs, to enable hundreds of species and ECs to be assessed against EPBC Act criteria for threatened listing status and improve the currency of EPBC Act lists in a timely manner.

This assessment follows evaluation of the conservation status of the *Almaleea cambagei* (Torrington pea) through the SEAP project.

### 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.

**Table 4 Key assessment parameters**

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
<b>Number of mature individuals</b>	Unknown but <10,000	Unknown but <10,000	Unknown but <10,000	There is little available data to estimate total number of mature individuals for this species, although it is likely <10,000.  Herbarium records indicate abundance as ranging from ‘locally rare’ to ‘occasional’ to ‘locally common, 50–100+ individuals’ to ‘common’ to ‘locally frequent’. ASBP (2022) note 50–100 seedlings at one site in Torrington after the 2019–20 bushfires. Quinn et al. (1995) report that there were >20 plants at one of the Henry River sites (see Table 1). Hunter (2021) estimates that there were some 5400 plants in Torrington SRA after the 2019–20 bushfires.

*Almaleea cambagei* (Torrington pea) Conservation Advice

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
<b>Trend</b>	Declining			Due to ongoing risk of high frequency of fire, especially those of high severity, combined with drought. The species is capable of resprouting after fire (NSW Flora Fire Response Database v 2.1 2014; Clarke et al. 2009). Individuals may be killed by severe fires and then rely on seed germination for re-establishment. For example, Quinn et al. (1995) report that the species is an obligate seeder, as did ASBP (2022) based on observations at Torrington after an extremely high-severity fire in 2019–20. High rates of adult mortality were observed after the 2019–20 bushfires in plants that should have been capable of resprouting, suggesting that the number of mature individuals is declining.
<b>Generation time (years)</b>	Unknown	Unknown	Unknown	Generation length is unknown for this species and unable to be estimated due to insufficient data around key parameters such as primary juvenile period, lifespan and seed bank lifespan.
<b>Extent of occurrence</b>	2354 km <sup>2</sup>	2354 km <sup>2</sup>	2354 km <sup>2</sup>	EOO was calculated by fitting a minimum convex polygon around all confirmed records as per IUCN guidelines (IUCN 2022).
<b>Trend</b>	Unknown/declining			May decline due to ongoing risk of fire regimes that cause declines in biodiversity.
<b>Area of Occupancy</b>	104 km <sup>2</sup>	104 km <sup>2</sup>	104 km <sup>2</sup>	AOO was calculated using a 2 x 2 km grid as per IUCN guidelines (IUCN 2022).
<b>Trend</b>	Unknown/declining			May decline due to ongoing risk of fire regimes that cause declines in biodiversity.
<b>Number of populations</b>	3	3	6	There are three areas where the species occurs (Girraween, Torrington and Henry River). Upper bound assumes there are three to four populations within Torrington area, given the limited dispersal ability in the genus (Auld 1996).
<b>Trend</b>	Unknown/declining			May decline due to ongoing risk of fire regimes that cause declines in biodiversity.
<b>Basis of assessment of population number</b>	There are three areas where the species occurs (Girraween, Torrington and Henry River). Upper bound assumes there are three to four populations within Torrington area, given the limited dispersal ability in the genus (Auld 1996).			
<b>No. locations</b>	≤5	2	5	The species has a restricted distribution with plants occurring in at least three discrete populations (and possibly up to six). Considering high frequency fire as the most likely plausible threat and the fire history of the sites, it is estimated all individuals could be impacted by between two and five fires resulting in two to five locations.
<b>Trend</b>	Unknown			May decline due to ongoing risk of fire regimes that cause declines in biodiversity.

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
<b>Basis of assessment of location number</b>	There is considered to be ≤5 locations based on the most plausible threat of threat of high frequency fires. Some 88% of the distribution of the species was burnt in the 2019–20 bushfires (Gallagher 2020; Auld et al. 2020). Of the habitat burnt in the 2019–20 bushfires, 30–50% had previously been burnt in the last 15 years (Gallagher 2020; Auld et al. 2020). All known populations have a history of frequent fire, in particular Torrington and Henry River.			
<b>Fragmentation</b>	A large part of the habitat is in the national reserve estate, but some sites are on private land. The former are all likely to be viable sites. While dispersal is restricted and populations lost to fire regimes that cause declines in biodiversity are not likely to be recovered by seed dispersal, it is unlikely that the species is severely fragmented.			
<b>Fluctuations</b>	Extreme fluctuations are not known in this species. However, where drought and severe fire kill mature plants some fluctuations are possible.			

DRAFT

### 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.		(a) direct observation [except A3]
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.		(b) an index of abundance appropriate to the taxon
A3	Population reduction, projected or suspected to be met in the future (up to a maximum of 100 years) [(a) cannot be used for A3]		(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
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.		(d) actual or potential levels of exploitation
			(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites

Based on any of the following

### Criterion 1 evidence

#### Insufficient data to determine eligibility

There are no available data on population trends over time. The species can resprout after fire, but very severe fires (likely coupled with drought) can kill mature plants, leading to population decline. There are observations suggesting where the 2019–20 bushfires were severe, mature plants were killed and this may have been an interaction between pre-fire drought and fire severity.

The Committee considers that there is insufficient information to determine the eligibility of the species for listing in any category 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 2 Geographic distribution as indicators for either extent of occurrence AND/OR area of occupancy**

	Critically Endangered Very restricted	Endangered Restricted	Vulnerable Limited
<b>B1.</b> Extent of occurrence (EOO)	< 100 km <sup>2</sup>	< 5,000 km <sup>2</sup>	< 20,000 km <sup>2</sup>
<b>B2.</b> Area of occupancy (AOO)	< 10 km <sup>2</sup>	< 500 km <sup>2</sup>	< 2,000 km <sup>2</sup>
<b>AND at least 2 of the following 3 conditions:</b>			
(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 populations; (v) number of mature individuals			
(c) Extreme fluctuations in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or populations; (iv) number of mature individuals			

**Criterion 2 evidence**

**Eligible under Criterion 2 B1ab(iii,v); B2ab(iii,v) for listing as Endangered**

The Kew Geospatial Conservation Assessment Tool (GeoCAT; Bachman et al. 2011) was used to calculate Extent of Occurrence (EEO) and Area of Occupancy (AEO). The EEO is 2354 km<sup>2</sup> based on a minimum convex hull polygon encompassing all cleaned records of the species as recommended by IUCN (2022). The AEO is estimated to be 104 km<sup>2</sup> based on records of the species occupying 26 grid cells (2 x 2 km) as per IUCN Guidelines (2022). *Almaleea cambagei* meets the thresholds for Endangered under both EEO (<5,000 km<sup>2</sup>) and AEO (<500 km<sup>2</sup>), respectively, for both the best estimate and the upper bounds.

In addition to these thresholds, at least two of the following three conditions must be met.

**Severely fragmented and number of locations**

The species is not considered to be severely fragmented (see Table 4 Key assessment parameters).

There is considered to be ≤5 locations based on the most plausible threat of high frequency fires impacting the species. Some 88% of the distribution of the species was burnt in the 2019–20 bushfires (Gallagher 2020; Auld et al. 2020. 2021) and some 30–50% of the known habitat burnt in the 2019–20 bushfires, had previously been burnt in the last 15 years (Gallagher 2020; Auld et al. 2020). All known populations have a history of frequent fire, in particular Torrington and Henry River.

### **Continuing decline**

*Almaleea cambagei* is threatened by fire regimes that cause declines in biodiversity, impacts of feral animals and stock, impacts of climate change, changes to hydrology (including clearing and drainage of habitat for agriculture and grazing) and localised site disturbance (Hogbin 2002; NSW NPWS 2003; NSW DPE 2022) (See Table 2).

Some 88% of the distribution of the species was burnt in the 2019–20 bushfires (Gallagher 2020; Auld et al. 2020, 2021) and some 30–50% of the known habitat burnt in the 2019–20 bushfires, had previously been burnt in the last 15 years (Gallagher 2020; Auld et al. 2020), and there is a risk of fire and drought interactions (Auld et al. 2020) and post-fire impacts of herbivory on recovery (Gallagher 2020, Auld et al. 2020). The species is considered to be a resprouter (NSW Flora Fire Response Database v 2.1 2014, Clarke et al. 2009), although this can vary in response to fire severity (e.g., ASBP 2022 found the species was killed by very high severity fires). There are observations suggesting where the 2019–20 bushfires were severe, mature plants were killed and this may have been an interaction between pre-fire drought and fire severity. Frequent fire will eliminate recruits before they become able to resprout after fire.

The Torrington area has a history of frequent fire. Sites containing habitat for *Almaleea cambagei* have been burnt with fire return intervals of 10 or 28 years in western Torrington and 1, 2, 7, 10 and 17 years, including some sites with past fire intervals since 2002 of 7, 8, 1 and 1 years (NSW DPE SEED 2022). In the Henry River area, there were fires in 1990 and 1994 and more recently in 2015–16 and 2019–20. Within Girraween NP, fire intervals of 1, 2, 4, 7 and 24 years have been recorded, with the last major fire in 2018–19.

Based on this continuing decline is inferred and observed in (iii) area, extent and/or quality of habitat; and (v) number of mature individuals.

### **Extreme fluctuations**

Extreme fluctuations are not known in this species. However, where drought and severe fire kill mature plants some fluctuations are possible.

### **Conclusion**

The Committee considers that the species' EOO and AOO are restricted, and the number of locations is restricted and continuing decline is observed and inferred in extent and quality of habitat and number of mature individuals. Therefore, the species has met the relevant elements of Criterion 2 to make it eligible for listing as Endangered.

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	< 2,500	< 10,000
AND either (C1) or (C2) is true			
<b>C1.</b> An observed, estimated or projected continuing decline of at least (up to a max. of 100 years in future)	<b>Very high rate</b> 25% in 3 years or 1 generation (whichever is longer)	<b>High rate</b> 20% in 5 years or 2 generation (whichever is longer)	<b>Substantial rate</b> 10% in 10 years or 3 generations (whichever is longer)
<b>C2.</b> 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 population	≤ 50	≤ 250	≤ 1,000
(a) (ii) % of mature individuals in one population =	90 - 100%	95 - 100%	100%
(b) Extreme fluctuations in the number of mature individuals			

### Criterion 3 evidence

#### Insufficient data to determine eligibility

The number of mature individuals is unknown but thought to be less than 10,000.

#### C1. Rate of continuing decline

There is no data on the rate of decline in *Almaleea cambagei*.

#### C2. Continuing decline and population abundance/distribution.

*Almaleea cambagei* is threatened by fire regimes that cause declines in biodiversity, impacts of feral animals and stock, impacts of climate change, changes to hydrology (including clearing and drainage of habitat for agriculture and grazing) and localised site disturbance (Hogbin 2002; NSW NPWS 2003; NSW DPE 2022) (See Table 2).

Some 88% of the distribution of the species was burnt in the 2019–20 bushfires (Gallagher 2020; Auld et al. 2020) and some 30–50% of the known habitat burnt in the 2019–20 bushfires had previously been burnt in the last 15 years (Gallagher 2020; Auld et al. 2020). There is also a risk to post-fire recovery from fire and drought interactions (Auld et al. 2020) and post-fire impacts of herbivory on recovery (Gallagher 2020, Auld et al. 2020). The species is considered to be a resprouter (NSW Flora Fire Response Database v 2.1 2014, Clarke et al. 2009). There are observations suggesting where the 2019–20 bushfires were severe, mature plants were killed and this may have been an interaction between pre-fire drought and fire severity. Frequent fire will eliminate recruits before they become able to resprout after fire and may limit the replenishment of a soil seed bank. The Torrington area has a history of frequent fire. Sites containing habitat for *Almaleea cambagei* have been burnt with fire return intervals of 10 or 28 years in western Torrington and 1, 2, 7, 10 and 17 years, including some sites with past fire intervals since 2002 of 7, 8, 1 and 1 years (NSW DPE SEED 2022). In the Henry River area, there were fires in 1990 and 1994 and more recently in 2015-16 and 2019-20. Within Girraween NP, fire intervals of 1, 2, 4, 7 and 24 years have been recorded, with the last major fire in 2018-19.

Based on this, continuing decline is inferred and observed in the number of mature individuals.

The distribution of mature individuals across populations is unknown, as is the number of mature individuals in each population.

#### **Extreme fluctuations**

Extreme fluctuations are not known in this species. However, where drought and severe fire kill mature plants, some fluctuations are possible.

#### **Conclusion**

The Committee considers that there is insufficient information to determine the eligibility of the species for listing in any category 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
<b>D. Number of mature individuals</b>	< 50	< 250	< 1,000
<b>D2.<sup>1</sup> Only applies to the Vulnerable category</b> 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 km <sup>2</sup> or number of locations ≤ 5

<sup>1</sup> 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**

**Not Eligible**

The number of mature individuals is unknown but thought to be <10,000. The AOO is >20 km<sup>2</sup> but the number of locations is <5. Given the species ability to resprout after most fires, it is not likely fire regimes that cause declines in biodiversity can drive the species to Critically Endangered or Extinct in a very short time.

Therefore, the species has not met the required element of 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 5 Quantitative analysis

	Critically Endangered Immediate future	Endangered Near future	Vulnerable Medium-term future
<b>Indicating the probability of extinction in the wild to be:</b>	≥ 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 species for listing in any category 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.

#### 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/subspecies 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 determined. The purpose of this consultation document is to elicit additional information to help inform the decision.

© Commonwealth of Australia 2023



### Ownership of intellectual property rights

Unless otherwise noted, copyright (and any other intellectual property rights) in this publication is owned by the Commonwealth of Australia (referred to as the Commonwealth).

### Creative Commons licence

All material in this publication is licensed under a [Creative Commons Attribution 4.0 International Licence](https://creativecommons.org/licenses/by/4.0/) except content supplied by third parties, logos and the Commonwealth Coat of Arms.

Inquiries about the licence and any use of this document should be emailed to [copyright@dcceew.gov.au](mailto:copyright@dcceew.gov.au).

### Cataloguing data

This publication (and any material sourced from it) should be attributed as: Department of Climate Change, Energy, the Environment and Water 2023, Conservation advice for *Almaleea cambagei*, Canberra.



This publication is available at the [SPRAT profile for \*Almaleea cambagei\*](#)

Department of Climate Change, Energy, the Environment and Water

GPO Box 3090, Canberra ACT 2601

Telephone 1800 900 090

Web [www.dcceew.gov.au/](http://www.dcceew.gov.au/)

The Australian Government acting through the Department of Climate Change, Energy, the Environment and Water has exercised due care and skill in preparing and compiling the information and data in this publication.

Notwithstanding, the Department of Climate Change, Energy, the Environment and Water, its employees and advisers disclaim all liability, including liability for negligence and for any loss, damage, injury, expense or cost incurred by any person as a result of accessing, using or relying on any of the information or data in this publication to the maximum extent permitted by law.

**Acknowledgements:** The Threatened Species Scientific Committee and the Department of Climate Change, Energy, the Environment and Water acknowledge the contributions of Prof. Tony D Auld, University of New South Wales, in preparing this document.

### Version history table

Document type	Title	Date [dd mm yyyy]
Conservation Advice	Approved Conservation Advice for <i>Almaleea cambagei</i>	03 07 2008