



## **Consultation Document on Listing Eligibility and Conservation Actions**

### ***Prostanthera albohirta***

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

- 1) the eligibility of *Prostanthera albohirta* for inclusion on the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) threatened species list in the Critically Endangered category; and
- 2) the necessary conservation actions for the above species.

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 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 either by email to:  
[species.consultation@environment.gov.au](mailto:species.consultation@environment.gov.au)

or by mail to:

The Director  
Terrestrial Species Conservation Section  
Wildlife, Heritage and Marine Division  
Department of the Environment  
PO Box 787  
Canberra ACT 2601

**Responses are required to be submitted by 1 August 2016.**

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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: <http://www.environment.gov.au/biodiversity/threatened/index.html>.

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.environment.gov.au/biodiversity/threatened/pubs/guidelines-species.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: <http://www.environment.gov.au/biodiversity/threatened/nominations.html>.

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: <http://www.environment.gov.au/biodiversity/threatened/recovery.html>.

## **Information about this consultation process**

Responses to this consultation can be provided electronically or in hard copy to the contact address 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.

# *Prostanthera albohirta*

## Taxonomy

Conventionally accepted as *Prostanthera albohirta* C.T.White

## Species Information

### Description

*Prostanthera albohirta*, of the family Lamiaceae, is an erect, densely foliated, shrub (White 1936) which grows to approximately 1–2.5 m in height (Conn & Wilson 2015). The species has thin branches covered in white hairs. The leaves are roughly oval in shape, and both sides possess a few long white hairs (White 1936). The leaf mid-rib is prominent on both sides (White 1936) and the leaves are aromatic and dark green in colour (Conn & Wilson 2015). The leaves are 7–8 mm long and 5–6 mm wide, with a broadly-toothed margin. The leaf-stalks are 1–1.5 mm long. The flowers are lavender in colour, with a smooth flower-stalk which is 1–1.5 mm in length. The bracts (modified leaves) beneath the flower are hairy. The 1 cm long petals have two lips - an upper lip with two lobes and a lower lip with three lobes. The sepals also possess two lips, with the upper lip longer than the lower lip. The flowers have four stamens and the anthers are approximately 2 mm long (White 1936).

### Distribution

The genus *Prostanthera* is endemic to Australia. *Prostanthera albohirta* was described in 1932 from a single collection from the summit of Mount Demi, West of Mossman in northern Queensland (White 1936). Between 1932 and 2013, attempts to re-collect this species were unsuccessful and the species was considered to be extinct. The species was rediscovered in 2013, at elevations above 900 m in the Mount Emerald area, west of Tolga in North Queensland (Ford & Conn 2013).

Fewer than 50 individual plants are known to occur on Mount Emerald, in an area less than 100 m<sup>2</sup>. Searches of surrounding areas have failed to find additional occurrences, despite there being many areas between (and north of) Mount Demi and Mount Emerald which appear to be suitable habitat for this species (Ford & Conn 2013).

The species' extent of occurrence and area of occupancy are both estimated to be 4 km<sup>2</sup> (DotE 2016a). The extent of occurrence was calculated using a minimum convex hull, and the area of occupancy was calculated using a 2x2 km grid cell method, based on the IUCN Red List Guidelines 2014.

Both localities where the species has been found are within the Cook botanical district and the Wet Tropics IBRA (Interim Biogeographic Regionalisation for Australia) Bioregion (DotE 2016b).

### Relevant Biology/Ecology

While there is limited information about the ecology of this species, it is possible to extrapolate from the general characteristics of the genus *Prostanthera*. *Prostanthera* species generally grow on sandstone, rhyolite and other acidic rocks that weather to coarse sandy soils, and are confined to high-altitude or sheltered rocky areas (Bean 2004). *Prostanthera* species are perennial shrubs, which may live for up to approximately 30 years.

*Prostanthera albohirta* is known to have occurred 'on an exposed cliff face' at an altitude of 3000 feet on Mount Demi (White 1936). The vegetation occurring on Mount Demi is predominantly tropical upland rainforest (Ford & Conn 2013). On Mount Emerald, the species is known to occur in a small area within a protected gully dominated by stunted *Syncarpia glomulifera*, with a dense understorey of shrubs including *Acrotriche aggregata*, *Bertya polystigma*, *Pittosporum revolutum* and *Pomaderris argyrophylla*. Twenty metres from this location, the species occurs in a grassy woodland, containing *Entolasia* and *Panicum* species, with a similar understorey of

shrub species (Ford & Conn 2013). The species is known to occur at elevations of 900–1100 metres. *Prostanthera albohirta* has been recorded flowering in January (White 1936).

Fire regimes are likely to play a role in determining the structure and persistence of populations of *P. albohirta*. Ford and Conn (2013) note that plants occurring within a sheltered gully on Mount Emerald have become openly branched and poorly formed in response to a lack of fire (or other disturbance) in this area for many years. Plants occurring in a nearby gully that were at least 11 years old were killed as a result of a fire in 2009, with no sign of coppice growth (new growth from the stump or roots). However, healthy plants are thriving nearby in a much more open and sunny community. From their observations, Ford and Conn (2013) concluded that the species is likely to be an obligate seeder. The age that plants become reproductive is unknown (Ford & Conn 2013).

## Threats

Table 1 – Threats impacting upon *P. albohirta* in approximate order of severity of risk, based on available evidence.

Threat factor	Threat type	Threat status	Evidence base
Fire			
High frequency of fires	suspected	current	Based on their observations, Ford and Conn concluded that the species is likely to be an obligate seeder (Ford & Conn 2013). Obligate seeding species are vulnerable to localised extinction if fire regimes fall outside their range of tolerance in terms of the time required to reach maturity, adult longevity and seed-bank persistence. Frequent fires interrupt seedbank accumulation (Parker & Kelly 1989).
Absence of fire	suspected	current	Long-term fire exclusion is a suspected threat to the species as it may suppress recruitment.
Invasive species			
Weed invasion	suspected	current	Weed invasion has been identified as a threat to <i>Prostanthera clotteniana</i> (Bean 2004; TSSC 2015) which occurs within 10 km of <i>P. albohirta</i> on Mt Emerald (Ford & Conn 2013). It is possible that weed invasion may also be impacting upon <i>P. albohirta</i> .
Habitat loss, disturbance and fragmentation			
Habitat loss caused by land clearance	suspected	potential	Habitat loss caused by land clearance has been identified as a threat to <i>P. clotteniana</i> (Bean 2004; TSSC 2015) which occurs within 10 km of <i>P. albohirta</i> on Mt Emerald (Ford & Conn 2013). It is possible that land clearance also impacts upon <i>P. albohirta</i> .

Illegal collection	suspected	current	Illegal collection has been identified as a threat to <i>P. clotteniana</i> (Bean 2004; TSSC 2015) which occurs within 10 km of <i>P. albohirta</i> on Mt Emerald (Ford & Conn 2013). It is possible that illegal collection could also impact upon <i>P. albohirta</i> .
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**Assessment of available information in relation to the EPBC Act Criteria and Regulations**

<b>Criterion 1. Population size reduction (reduction in total numbers)</b>			
Population reduction (measured over the longer of 10 years or 3 generations) based on any of A1 to A4			
	<b>Critically Endangered Very severe reduction</b>	<b>Endangered Severe reduction</b>	<b>Vulnerable Substantial reduction</b>
<b>A1</b>	≥ 90%	≥ 70%	≥ 50%
<b>A2, A3, A4</b>	≥ 80%	≥ 50%	≥ 30%
<p>A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.</p> <p>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.</p> <p>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]</p> <p>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.</p>	<p>based on any of the following:</p> <ul style="list-style-type: none"> <li>(a) direct observation [except A3]</li> <li>(b) an index of abundance appropriate to the taxon</li> <li>(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat</li> <li>(d) actual or potential levels of exploitation</li> <li>(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites</li> </ul>		

**Evidence:**

*Prostanthera albohirta* was described from a single collection in 1932 from the summit of Mount Demi in northern Queensland (White 1936). As attempts to re-collect this species were unsuccessful, the species was considered to be extinct until a population, consisting of fewer than 50 plants, was rediscovered in the Mount Emerald area of North Queensland in 2013. Searches of nearby areas have failed to discover additional occurrences (Ford & Conn 2013). Given the above scenario, there are insufficient data to provide a rate of decline, observed, suspected or inferred over a three generation period.

The data presented above appear to be insufficient 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.

<b>Criterion 2. Geographic distribution as indicators for either extent of occurrence AND/OR area of occupancy</b>			
	<b>Critically Endangered Very restricted</b>	<b>Endangered Restricted</b>	<b>Vulnerable Limited</b>
B1. Extent of occurrence (EOO)	< 100 km <sup>2</sup>	< 5,000 km <sup>2</sup>	< 20,000 km <sup>2</sup>
B2. Area of occupancy (AOO)	< 10 km <sup>2</sup>	< 500 km <sup>2</sup>	< 2,000 km <sup>2</sup>
AND at least 2 of the following 3 conditions indicating distribution is precarious for survival:			
(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			

### Evidence:

The species' extent of occurrence has been calculated to be 4 km<sup>2</sup>, and the species' area of occupancy has been calculated to be 4 km<sup>2</sup> (DotE 2016a). Consequently, the species' geographic distribution is very restricted. The species is known to occur at only one location and it can be inferred that its area of occupancy, extent of occurrence, quality of habitat, number of locations and number of individuals is likely to further decline as a result of threats (including inappropriate fire regimes, illegal collection and weed invasion).

The data presented above appear to demonstrate that the species is **eligible for listing as Critically Endangered** under this criterion (B1,B2(a)(b)). 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.

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

**Evidence:**

In 2013, Ford and Conn (2013) estimated that the total population of mature individuals was fewer than 50 which is very low (<250 mature individuals). Additional survey work in suitable habitat failed to locate any additional plants (Ford & Conn 2013).

The species' geographic distribution is precarious given there are fewer than 50 individual plants within the population (Ford & Conn 2013) and, as described under criterion 2, it can be inferred that a continuing decline in the species' area of occupancy, extent of occurrence, quality of habitat, number of locations and number of individuals is likely as a result of threats (including inappropriate fire regimes, illegal collection and weed invasion).

The data presented above appear to demonstrate that the species is **eligible for listing as Critically Endangered** under this criterion (C2a(i)). 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 4. Number of mature individuals			
	Critically Endangered Extremely low	Endangered Very Low	Vulnerable Low
Number of mature individuals	< 50	< 250	< 1,000

**Evidence:**

After conducting surveys in 2013, Ford and Conn (2013) reported that the total population of mature individuals was fewer than 50 which is very low (<250 mature individuals). Additional survey work in suitable habitat failed to locate any additional plants (Ford & Conn 2013).

The data presented above appear to demonstrate that the species is **eligible for listing as Critically 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 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

**Evidence:**

Population viability analysis appears not to have been undertaken, there are 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.

## **Conservation Actions**

### **Recovery Plan**

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 this decision.

### **Primary Conservation Objectives**

1. No individuals lost or destroyed
2. Increase the number and size of wild populations
2. Reduce, and where possible, eliminate threats to the species
3. Maintain and enhance habitat.

### **Conservation and Management Priorities**

#### Fire

- Develop a fire management strategy to determine fire control measures and optimum fire frequency. Fires must be managed to ensure that prevailing fire regimes do not disrupt the life cycle of *P. albohirta*, that they support rather than degrade the habitat necessary to the species, that they do not promote invasion of exotic species.
- Ensure that fires do not occur before the accumulation of a seedbank large enough to replace the number of fire-killed standing plants.
- Provide maps of known occurrences to local and state Rural Fire Services and seek inclusion of mitigation measures in bushfire risk management plans, risk register and operation maps. Fire management authorities and land management agencies should install field markers to avoid damage to the species.
- Undertake appropriate weed control following fire events in the area (both planned and unplanned).

#### Invasive species

- Identify weeds in the area that could become a threat to *P. albohirta*, and undertake weed control using appropriate methods.

#### Habitat loss disturbance and modifications

- Ensure land managers are aware of the species' occurrence and provide protection measures against key and potential threats.

#### Stakeholder Engagement

- Raise awareness of *P. albohirta* within the local community to promote its protection and aid in the discovery of new populations through means such as: producing an information sheet which includes a description of the species, its habitat type, threats and management actions; and encouraging formal links with local environmental groups and interested individuals.
- Land managers (including private land managers, the Tablelands Regional Council, and local indigenous communities) should be given information about managing fire for the benefit of *P. albohirta*.
- Liaise with local land managers (especially managers of private land and the Tablelands Regional Council) to ensure the known population of *P. albohirta* is not

damaged or destroyed accidentally, and to encourage these key stakeholders to contribute to the implementation of conservation management actions.

#### Breeding, propagation and other exsitu recovery action

- Collect seeds and cutting material for propagation of the species, potentially through the Queensland Herbarium.
- Propagate plants in readiness for translocation to suitable habitat in secure tenure, and undertake translocation in accordance with the national translocation protocols of Vallee et al., (2004). Monitor the translocation, especially during the establishment phase.

#### Survey and Monitoring priorities

- Undertake survey work in potential habitat to locate any additional plants / populations.
- Monitor the known population to assess the population trends, to identify key threats to the species and ascertain the relative impacts of threatening process.
- Keep precise fire history records for areas where the species occurs.
- Monitor the size and structure and reproductive status of populations 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.
- Assess the impact of illegal collection (if any) through monitoring the known population.
- Monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them if necessary.

#### Information and Research priorities

- Assess the species' ecological requirements relevant to the persistence of the species such as the species' reproductive strategies (such as pollination biology) and timing of flowering and growth.
- Identify the species' tolerance ranges to fire, including consideration of time to maturity, adult longevity and seed-bank persistence and optimal fire regimes for regeneration (vegetative regrowth and seed germination) and identify optimal fire regimes for regeneration and response to other prevailing fire regimes.
- Develop understanding and research on fire responses among related or functionally similar species to develop fire management strategies for conservation.
- Identify which weed species may be currently impacting upon the species, or may become a threat to the species in the future.
- Investigate options for establishing additional populations.
- Undertake seed germination and vegetative propagation trials to determine the requirements for successful establishment.

### **References cited in the advice**

- Bean, A.R. (2004). Report on a survey of the Endangered plant *Prostanthera clotteniana*. Unpublished report AR Bean, Senior Botanist, Queensland Herbarium.
- Conn, B.J. & Wilson, T.C. (2015). *Prostanthera* (Lamiaceae) from far-north Queensland, Australia. *Telopea Journal of Plant Systematics* 18, 1–11.
- Department of the Environment (DotE) (2016a). Area of Occupancy and Extent of Occurrence for *Prostanthera albohirta*. Unpublished report, Australian Government Department of the Environment, Canberra.
- Ford, A. & Conn, B. (2013). Rediscovery of *Prostanthera albohirta* C.T.White (Lamiaceae). *Telopea* 15, 107–110.
- Parker, V.T. & Kelly, V.R. (1989). Seed banks in California chaparral and other Mediterranean climate shrublands. In *Ecology of Soil Seed Banks* (eds MA Leck, VT Parker and RL Simpson). Academic Press. New York pp. 231–255.
- Vallee, L., Hogbin, T., Monks, L., Makinson, B., Matthes, M. & Rossetto, M. (2004). Guidelines for the translocation of threatened plants in Australia, 2<sup>nd</sup> edition. Australian Network for Plant Conservation, Canberra.
- White, C.T. (1936). Contribution to the Queensland Flora, No. 5. *Proceedings of the Royal Society of Queensland* 47, 74.

### **Other sources cited in the advice**

- Department of the Environment (DotE) (2016b). Australia's Bioregions (IBRA). Available on the Internet at: <http://www.environment.gov.au/land/nrs/science/ibra>
- Threatened Species Scientific Committee (TSSC) (2015). Approved Conservation Advice for *Prostanthera clotteniana*. Available on the Internet at: <http://www.environment.gov.au/biodiversity/threatened/species/pubs/76165-conservation-advice.pdf>

## **Collective list of questions – your views**

### **Biological information**

1. Can you provide any additional information or estimates on longevity, average life span and generation length?
2. Can you provide any information regarding the general requirements for recruitment? In particular, can you provide information about the species' tolerance ranges to fire / optimal fire regimes for regeneration?

### **Population size and current distribution**

3. What is the tenure of the land on which the species is known to occur?
4. Has the survey effort for this species been adequate to determine its national population size and its national distribution? If not, please provide justification for your response.
5. Do you consider the way the population size has been derived to be appropriate? Are there any assumptions and unquantified biases in the estimates? Do you accept the estimate of the total population size of the species? If not, please provide justification for your response.
6. Please provide (if known) any additional evidence which shows the population is stable, increasing or declining.

### **General**

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

### **Threats**

8. Do you agree that the threats listed are correct and that their effect on the species is significant? Specifically:
  - Do you consider land clearance to be a past or potential threat to this species?
  - Can you identify which weed species are, or are likely to become, a threat to this species?
  - Do you consider illegal collection to be a past or potential threat to this species?
9. To what degree are the identified threats likely to impact on the species in the future?
10. Can you provide additional or alternative information on threats, past, current or potential that may adversely affect this species at any stage of its life cycle?

### **Management**

11. What planning, management and recovery actions are currently in place supporting protection and recovery of the species? To what extent have they been effective?
12. Can you recommend any additional or alternative specific threat abatement or conservation actions that would aid the protection and recovery of the species?
13. What individuals or organisations are currently, or potentially could be, involved in management and recovery of the species?