

Conservation Advice

Prostanthera clotteniana

Taxonomy

Conventionally accepted as *Prostanthera clotteniana* (F.M.Bailey) A.R Bean (Bean, 2000).

Conservation status

Critically endangered: Criterion 2 B1, B2,(a),(b)(iii); Criterion 3 B,(a),(b)(iii)

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

<http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>

Reason for conservation assessment by the Threatened Species Scientific Committee

Prostanthera clotteniana was listed as extinct under the predecessor to the *Environmental Protection and Biodiversity Conservation Act (1999)* (EPBC Act) the *Environment Protection Act* and transferred to the EPBC Act in June 2000. The assessment arises from the transfer of this species from the extinct category of the EPBC Act (where it was listed in 2000 as a transfer from the previous Act) to the critically endangered category in 2011 following its rediscovery in 1999. This is an assessment to determine its current conservation status and provision of conservation advice.

Description

Prostanthera clotteniana is a shrub to approximately 1m high with leaves that are opposite or in three-leaved whorls, the branchlets are whitish to hairy. The leaves are 12–35 mm long and 4–9 mm in width. Flowers are pale lilac to purplish-pink in colour and two-lipped, to 17 mm long, dilated at the throat, the upper lip broad and emarginate, the lower lip divided into 3 lobes. The outer part of the flower (calyx) is two-lipped, enlarged in fruit, the upper lip somewhat three lobed, to 13 mm long, and purplish with conspicuous veins; the lower lip ovate to orbicular, about half the length of the upper lip (Bailey, 1904; Bean, 2000; Conn, 2003; Queensland Herbarium, 2009 cited in DEHP, 2014).

Distribution

Prostanthera clotteniana is confined to the rocky, rhyolite areas in the drier woodlands on steep hills west of the Atherton-Ravenshoe area of north-east Queensland (Bean, 2004). *Prostanthera clotteniana* was thought to be extinct prior to its rediscovery in 1999. The species has only been identified at seven sites. All of these sites have been affected by one or more wildfires in recent years. Surveys have been undertaken at four of the sites within the last 12 months, only finding approximately twenty two juveniles at one site (McDonald, pers. comm., 2014a). The land tenure where the species has been identified includes state land, forest reserve, regional park and freehold land.

Cultural Significance

It is unknown whether the species has cultural significance for indigenous groups within Australia.

Relevant Biology/Ecology

Prostanthera clotteniana occurs in very rocky areas, with shallow acidic soil. All recorded sites are on rhyolite of the Glen Gordon and Walsh Bluff Volcanics (Donchak and Bultitude, 1998) in

the upper Walsh and Herbert River catchments. The sites are located in the drier woodlands on steep, rocky hills west of the Wet Tropics rainforests and tall wet forests. The locations and habitat straddle the interface of the Wet Tropics and Einasleigh Uplands Bioregions (Bean, 2004).

There is limited information about the ecology of this species, but it is possible to extrapolate from the general characteristics of the genus *Prostanthera*. *Prostanthera* spp. are perennial shrubs, usually living for 5–15 years. They are acid-loving plants that grow on sandstone, rhyolite and other acidic rocks that weather to coarse sandy soils. Few species are known to resprout after fire, and even moderate intensity fires will kill mature plants outright (Bean, 2004). *Prostanthera cryptandroides*, for example, is known to be fire sensitive, with recruitment occurring from the soil seed bank. It is thought to reach reproductive maturity at 3–5 years of age (Anon., 2000). Most species occur in temperate parts of Australia, and north of the Tropic of Capricorn. They are increasingly confined to high-altitude or sheltered rocky areas (Bean, 2004). Generation length for the species is estimated at between 4 to 10 years.

Prostanthera clotteniana is an obligate seed regenerator (Bean, 2004). Obligate seeding species are vulnerable to localised extinction if fire regimes fall outside their range of tolerance in terms of time to maturity, adult longevity and seed-bank persistence (Parker and Kelly, 1989). If fires are too frequent, sufficient seed banks do not have time to establish. The region in which *Prostanthera clotteniana* occurs has been subject to very frequent wildfires in recent years (McDonald, pers. comm., 2014b).

Survey and Population Data

The following table is a summary of the population data collected since 1997. Population size has only been recorded since 1997. The blanks in the table indicate no survey was undertaken at that site in the given year.

Site	1997	1999	2001	2002	2003	2004		2008		2009	2010	2012	2013	2014	
1	3					4	0 Juv	0			6				
2		1		0		0	0 Juv	2	1 Juv			2	1		
3						12	0 Juv	29	36 Juv						
4		7	2	2	0	0	0 Juv							0	2 Juv possible
5		1			0	0	0 Juv							0	0
6						4	35 Juv	64	54 Juv	1 seen @ this location . 20-30 plants occur c. 300m west of this location			0	0	22 Juv
7			0			0						56	0		

Threats

Current known threats to *Prostanthera clotteniana* include inappropriate fire regimes, habitat loss caused by mining, illegal collection and weed invasion (Bean, 2004, McDonald, pers. comm., 2014b).

How judged by the Committee in relation to the EPBC Act Criteria and Regulations

Criterion 1: Reduction in numbers (based on any of A1 – A4)

- A1. An observed, estimated, inferred or suspected population very severe $\geq 90\%$, severe $\geq 70\%$ substantial $\geq 50\%$ size reduction over the last 10 years or three generations, whichever is the longer, where the causes of the reduction are clearly reversible AND understood AND ceased, based on (and specifying) any of the following:
 - (a) direct observation
 - (b) an index of abundance appropriate to the taxon
 - (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
 - (d) actual or potential levels of exploitation
 - (e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.
- A2. An observed, estimated, inferred or suspected population very severe $\geq 80\%$, severe $\geq 50\%$ substantial $\geq 30\%$ size reduction over the last 10 years or three generations, whichever is the longer, where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.
- A3. A population size reduction very severe $\geq 80\%$, severe $\geq 50\%$ substantial $\geq 30\%$, projected or suspected to be met within the next 10 years or three generations, whichever is the longer (up to a maximum of 100 years), based on (and specifying) any of (b) to (e) under A1.
- A4. An observed, estimated, inferred, projected or suspected population size reduction very severe $\geq 80\%$, severe $\geq 50\%$ substantial $\geq 30\%$ over any 10 year or three generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, and where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

<p>Evidence</p> <p>Not applicable: The species has been identified at a total of seven sites.</p> <p>Between 2004 and 2014, a number of surveys have been undertaken providing data on location and numbers of individuals, however, the 2004 survey has been the only comprehensive survey providing total numbers for the species for a point in time. Subsequent surveys have indicated changes in subpopulation size at sites, including decreases and increases that appear to relate to fire events (McDonald, pers. comm., 2014b). However, there is no clear evidence of any change to extent of occurrence, area of occupancy, or number of individuals for the whole species over this period.</p> <p>The comprehensive survey of all known sites undertaken in 2004 (Bean, 2004) found that only three of the seven known sites were found to have extant specimens and a total of 20 individuals were estimated to have been present at that time (Bean, 2004).</p> <p>The maximum number of mature individuals recorded at any time was 95 mature individuals in 2008 (McDonald, 2008), however records of population size have only been recorded since 1997. This number of individuals at 2008 does not represent the total number for the species at this time, as this was not a comprehensive survey.</p> <p>Surveys undertaken at four sites between 2013 and 2014, found approximately 22 juveniles at two of these sites (McDonald, pers. comm., 2014b, McDonald, pers. comm., 2014c).</p> <p>The species is currently threatened by inappropriate fire regimes, habitat loss caused by mining, illegal collection and weed invasion (Bean, 2004; McDonald pers. comm., 2014b). The causes of reductions have not ceased and are not reversible.</p>
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While the species' population size appears to be adversely affected by inappropriate fire regimes and other threats, there are insufficient data to provide a rate of decline, observed, suspected or inferred over a three generation period. Therefore, as the species has not been demonstrated to have met any of the elements of Criterion 1, it is not eligible for listing in any category under this criterion.

Criterion 2:

Geographic distribution (based on either of B1 or B2)

B1. Extent of occurrence estimated to be very restricted <100 km², restricted <5000 km² or limited < 20 000 km²

B2. Area of occupancy estimated to be very restricted <10 km², restricted <500 km² or limited <2000 km²

AND

Geographic distribution is precarious for the survival of the species,
(based on at least two of a–c)

- a. Severely fragmented or known to exist at a limited location.
- b. Continuing decline, observed, inferred or projected, in any of the following:
 - (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 the following:
 - (i) extent of occurrence
 - (ii) area of occupancy
 - (iii) number of locations or subpopulations
 - (iv) number of mature individuals

Evidence

Eligible for listing as critically endangered:

The extent of occurrence has been calculated as approximately 13 km², taking into consideration the disjunct distribution (Department of the Environment, 2014). Area of occupancy has been calculated to be less than 2 km² (Department of the Environment, 2014). Consequently, the geographic distribution is very restricted.

The geographic distribution is fragmented and known to exist at a limited location, confined to the rocky, rhyolite areas in the drier woodlands on steep hills west of the Atherton-Ravenshoe area of north Queensland (Bean, 2004).

Only three of the seven known sites were extant in 2004 (Bean, 2004) and surveys have been undertaken at four of the sites between 2013 and 2014, only finding approximately 22 juveniles at two sites (McDonald, pers. comm., 2014b; McDonald, pers. comm., 2014c).

It can be inferred that the area, extent and quality of habitat is expected to further decline as a result of threats (e.g. inappropriate fire regimes, illegal collection and weed invasion) and potential threats from land use pressures (e.g. habitat loss caused by mining) have not ceased (Bean, 2004; McDonald, pers. comm., 2014b).

Criterion 3: The estimated total number of mature individuals is very low <250, low <2500 or limited <10 000; **and** either of (A) or (B) is true

- (A) evidence suggests that the number will continue to decline at a very high (25% in 3 years or 1 generation (up to 100 years), whichever is longer), high (20% in 5 years or 2 generations (up to 100 years), whichever is longer) or substantial (10% in 10 years or 3 generations years), whichever is longer (up to 100) rate; or
- (B) the number is likely to continue to decline and its geographic distribution is precarious for its survival (based on at least two of a – c):
 - a. Severely fragmented or known to exist at a limited location.
 - b. Continuing decline, observed, inferred or projected, in any of the following:
 - (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 the following:
 - (i) extent of occurrence
 - (ii) area of occupancy
 - (iii) number of locations or subpopulations
 - (iv) number of mature individuals

Evidence

Eligible for listing as critically endangered:

Bean (2004) estimated that the total population of mature individuals in 2004 was 20 individuals which is very low (<250 mature individuals). Surveys have been undertaken at four of the sites between 2013 and 2014, only finding approximately 22 juveniles at two sites (McDonald, pers. comm., 2014a; McDonald, pers. comm., 2014c).

The geographic distribution is fragmented and known to exist at a limited location. As described for criterion 2 it can be inferred that the area, extent and quality of habitat is expected to further decline as a result of threats (e.g. inappropriate fire regimes, illegal collection and weed invasion) and potential threats from land use pressures (e.g. habitat loss caused by mining) have not ceased (McDonald, pers. comm., 2014b).

Criterion 4: Estimated total number of mature individuals:

- (a) Extremely low < 50
- (b) Very low < 250
- (c) Low < 1000

Evidence

Eligible for listing as endangered:

A comprehensive survey of all known sites has not been undertaken since 2004 (20 mature individuals recorded) (Bean, 2004) however the maximum number of mature individuals recorded since data collection records began in 1997 was 95 mature individuals in 2008 (McDonald, 2008) which is very low (<250 mature individuals). Surveys have been undertaken at four of the sites between 2013 and 2014, only finding approximately 22 juveniles at two sites (McDonald, pers. comm., 2014a; McDonald, pers. comm., 2014c).

Criterion 5: Probability of extinction in the wild based on quantitative analysis is at least:

- (a) 50% in the immediate future, 10 years or three generations (whichever is longer); or
- (b) 20% in the near future, 20 year or five generations (whichever is longer); or
- (c) 10% in the medium-term future, within 100 years.

Evidence

Not applicable:

No evidence. Population viability analysis has not been undertaken. The species therefore appears to be **ineligible** for listing under this criterion.

Public Consultation

Notice of the proposed amendment was made available for public comment for 30 business days between 7 May 2014 and 20 June 2014. Any comments received that are relevant to the survival of the species have been considered by the Committee.

Recovery Plan

There should not be a recovery plan for *Prostanthera clotteniana* as the approved conservation advice for the species provides sufficient direction to implement priority actions and mitigate against key threats.

Recovery and Impact avoidance guidance

Primary Conservation Objectives

1. Increase the number and size of wild populations.
2. Manage to reduce, and where possible, eliminate threats to the species.
3. Maintain and enhance habitat.
4. Enable recovery of additional sites and/or populations.
5. Investigate options for linking, enhancing or establishing additional populations.
6. Raise awareness of *Prostanthera clotteniana* within the local community.
7. Effectively administer the recovery effort.

Important populations

This species is currently only known from two sites in the Atherton-Ravenshoe area of north-east Queensland. Every population *Prostanthera clotteniana* is considered important.

Important habitat for the survival of the species

Unknown.

Information required and research priorities

1. 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/or seed germination).
2. Design and implement a monitoring program of the known occurrences of the species.
3. Undertake survey work in suitable habitat and potential habitat to locate any additional populations.
4. More precisely assess population size, distribution, ecological requirements and the relative impacts of weeds.

5. Undertake seed germination and/or vegetative propagation trials to determine the requirements for successful establishment.

Management actions required

1. Undertake fire management prevention burns of surrounding vegetation (where appropriate) to prevent or ameliorate frequency of wildfires to reduce the potential of the species being burnt at too frequent intervals.
2. Monitor populations to identify key threats.
3. Manage sites to identify, control and reduce the spread of invasive species.
4. Control access routes to suitably constrain public access to known sites on public land and manage access on private land and other land tenure.
5. Collect seeds and cuttings for propagation at the Lake Eacham nursery, as a safeguard against future catastrophes. Make these collections from all known populations to maintain genetic diversity.
6. Investigate formal conservation arrangements such as the use of covenants, conservation agreements or inclusion in reserve tenure.
7. Monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them if necessary.

Recommendations

- (i) The Committee recommends that there be no change to the list referred to in section 178 of the EPBC Act **retaining** on the list in the critically endangered category:

Prostanthera clotteniana

AND

- (ii) The Committee recommends that there should not be a recovery plan for this species.

Threatened Species Scientific Committee

3/9/2014

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