

Conservation Advice

Prostanthera marifolia

Seaforth mintbush

Taxonomy

Conventionally accepted as *Prostanthera marifolia* R.Br. (Brown, 1810).

Conservation status

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

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

The Seaforth mintbush was transferred from the extinct category to the critically endangered category on 9 September 2011 as a result of its re-discovery in 2001. As per section 192 of the EPBC Act, advice from the Threatened Species Scientific Committee (the Committee) does not need to be sought to transfer a species from the extinct category to another category if it has been definitely located in nature since it was last listed as extinct. At the time of transfer, a commitment was made that this action would be followed by a detailed assessment and conservation advice for the species. The Seaforth mintbush was included in the 2013 Finalised Priority Assessment List with a completion date of 30 March 2015.

Description

Prostanthera marifolia (Seaforth mintbush) is an erect, openly branched shrub that grows to approximately 30 cm high. Its branches are sparsely to moderately hairy with mostly straight, spreading or slightly retrorse hairs. Its leaves are green in colour, sparsely to moderately hairy and oval to almost elliptic in shape with a very short leaf stalk. It has faintly aromatic foliage and delicate purple to mauve flowers. Its fruits are 1.5–1.8 mm (Conn, 2007).

Distribution

The Seaforth mintbush is endemic to NSW. It was first described in 1810 and was recorded from around Middle Harbour in northern Sydney and on Mangrove Mountain, 100 km north of Sydney (Conn, 1992, 2007; NSW Scientific Committee, 2008). Early records from south of Sydney that had been identified as the Seaforth mintbush were later re-identified as *P. densa* (NSW Scientific Committee, 2008). Attempts to re-collect this species were unsuccessful and due to an absence of records over a number of decades, the species was presumed to be extinct (Conn, 2007).

The Seaforth mintbush was rediscovered in 2001 near the suburb of Seaforth in northern Sydney (Conn, 2007; Department of the Environment, 2013). It is known to occur in an area of four square kilometres (NSW Scientific Committee, 2008). The NSW Scientific Committee notes that prior to urbanisation, it was probably a single population. However the population is now considered to be severely fragmented into three sub-populations due to the small size and relative isolation, as they are partially separated by developed areas

(NSW Scientific Committee, pers. comm. 2014). Two sub-populations occur within the Manly local government area (LGA) and one in the Warringah LGA (NSW Scientific Committee, 2008).

One site consists of one plant within Garigal National Park, where it is close to the boundary and a cleared area. A second site is adjacent to a main arterial road, while the remaining site is next to a golf course (NSW Scientific Committee, 2008). It is possible that a persistent seed bank is present in the soil. Two surveys were conducted in 2001 and 2004 and found between 70–104 and 56–96 individuals respectively across the two larger sub-populations (NSW Scientific Committee, pers. comm. 2014). A third survey, conducted in 2005, found the population consisted of approximately 90–130 individual plants across the three sub-populations, with the largest sub-population consisting of 76–83% of individuals (NSW Scientific Committee, 2008). The most recent survey was carried out in 2009 / 2010 at the largest sub-population. This survey found 131 individual plants, suggesting the total population lies between 157-172 individual plants.

Cultural Significance

Cultural significance of the Seaforth mintbush is unknown.

Relevant Biology/Ecology

The Seaforth mintbush occurs on clay-loam soils associated with ironstone and scattered shale lenses, a soil type that only occurs on ridge tops and has been extensively urbanised (NSW Scientific Committee, 2008). The species occurs in close proximity to the Duffys Forest Ecological Community, which is listed as an Endangered Ecological Community under the NSW *Threatened Species Conservation Act* 1995 (NSW Scientific Committee, 2008). Conn (2007) notes that it is found in woodland dominated by silvertop ash (*Eucalyptus sieberi*) and red bloodwood (*E. gummifera*).

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 and one species, *Prostanthera cryptandroides*, is thought to reach reproductive maturity at 3–5 years of age (Anon., 2000; Bean, 2004).

The Seaforth mintbush has been recorded flowering in spring (Conn, 1992), although flowering may occur throughout much of the year (Conn, 2007). Generation length is therefore estimated at between 4 and 10 years. The Seaforth mintbush's response to fire is unknown (Conn. pers. comm., in NSW Scientific Committee, 2008). Another member of the genus, *P. cryptandroides*, is known to be fire sensitive, with recruitment occurring from the soil seed bank (Bean 2004).

Threats

The threats facing the Seaforth mintbush include habitat fragmentation, habitat loss and habitat degradation.

Habitat loss is a threat faced by the two large sub-populations. Conn et al. (2013) note that the species has undergone local extinctions caused by urban development in central metropolitan Sydney. The species has been fragmented by urbanisation and is currently threatened by habitat loss due to small-scale clearing (NSW Scientific Committee, 2008). The loss of habitat as a result of the development of mountain bike tracks is also a threat. Unauthorised tracks are closed when detected but pressure to create new tracks is ongoing (Warringah Council, pers. comm. 2014).

Habitat degradation as a result of adjacent urbanised areas that pose threats include compaction of soil, soil disturbance, urban stormwater run-off and seepage, fertiliser and herbicide drift, weed invasion, extensive human traffic and rubbish dumping (NSW Scientific Committee, 2008; NSW OEH, 2013a; Warringah Council, pers. comm. 2014).

One site is adjacent to a main arterial road and therefore habitat loss and degradation from road widening and maintenance activities are a potential threat for this population. A second site is adjacent to a golf course, and the golf course maintenance activities are a potential threat. (NSW Scientific Committee, 2008).

Other potential threats that face the Seaforth mintbush are infection from the plant pathogen *Phytophthora dieback* (*Phytophthora cinnamomi*), inappropriate fires regimes and encroachment of exotic turf grasses (NSW OEH, 2013a). Parts of one sub-population are located within a Strategic Fire Advantage Zone and are subject to altered fire regimes which are moderately variable, depending on Rural Fire Service resources and weather patterns allowing for hazard reduction burning (Warringah Council, pers. comm. 2014). Fire intervals at this sub-population are estimated between three and nine years since 1992. No population count has been undertaken since a hazard reduction burn in 2011 and population increase or decrease since the burn is unknown (Warringah Council, pers. comm. 2014). These risks are increased given the species' highly fragmented condition and the small number of plants.

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.

Evidence

Not applicable: There are insufficient data available to judge whether the species has undergone, is suspected to have undergone or is likely to undergo a reduction in numbers.

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 Seaforth mintbush is known from a single population in an area of four square kilometres (NSW Scientific Committee, 2008) and therefore has an extent of occurrence less than 100 km² and an area of occupancy of less than four square kilometres which is a very restricted distribution.

The geographic distribution is precarious for the survival of the species because:

- a. The population is severely fragmented into three sites (NSW Scientific Committee, 2008) and exists in a limited location (within an area of four square kilometres).
- b. Given the risk of habitat loss and degradation as a result of occurring in a highly urbanised area, there is a projected decline in the area, extent and/or quality of habitat and number of locations or sub-populations and/or individuals for the Seaforth mintbush.

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:

The only comprehensive survey was conducted in 2005. This survey estimated number of individual plants to be very low (90–130), with 73-86% of individuals occurring in one population (NSW Scientific Committee, 2008). A survey of this largest population in 2009 / 2010 found 131 individual plants (Warringah Council, pers, comm. 2014), suggesting the total population lies between 157-172 individual plants. Although no information is available as to how many of these individuals are mature plants, the total number is less than 250 and therefore the estimated total number of mature individuals is very low.

B) The number of individuals is likely to continue to decline and its geographic distribution is precarious for its survival based on:

a. The population is severely fragmented into three sites (NSW Scientific Committee, 2008) and exists in a limited and very restricted location (within an area of four square kilometres (NSW Scientific Committee, 2008)).

b. Given the risk of habitat loss and degradation as a result of occurring in a highly urbanised area, there is a projected decline in the area, extent and/or quality of habitat and number of locations or sub-populations and/or individuals for the Seaforth mintbush.

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:

In the survey conducted in 2005 the estimated number of individual plants was very low (90–130), with 73-86% of individuals occurring in one population (NSW Scientific Committee, 2008). A survey of this largest population in 2009 / 2010 found 131 individual plants (Warringah Council, pers. comm. 2014), suggesting the total population lies between 157-172 individual plants. Although no information is available as to how many of these individuals are mature plants, the total number is less than 250 and therefore the estimated total number of mature individuals falls within either the extremely low or very low category.

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: population viability analysis has not been undertaken

Public Consultation

Notice of the proposed amendment was made available for public comment for 45 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 the Seaforth mintbush 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
<ol style="list-style-type: none">1. Maintain and increase in situ populations to ensure the long-term preservation of the species in the wild.2. Maintain and enhance existing and potential habitat.3. Abate identified threats where possible.4. Establish a healthy population at a new site and investigate options for linking, enhancing or establishing further populations.5. Raise awareness of the Seaforth mintbush within the local community.6. Effectively administer the recovery effort.7. Establish an ex-situ seed collection as an insurance policy and to aid in establishing additional populations.

Important populations

Every occurrence of *Prostanthera marifolia* is considered important.

Important habitat for the survival of the species

Important habitats are known habitats of current occurrence of the species and potential occurrence of the species. The species occurs on clay-loam soils associated with ironstone and scattered shale lenses, a soil type that only occurs on ridge tops (NSW Scientific Committee, 2008). It occurs in close proximity to the Duffys Forest Ecological Community, which is listed as an Endangered Ecological Community under the NSW *Threatened Species Conservation Act 1995* (NSW SC, 2008), and Conn (2007) notes that it is found in woodland dominated by silvertop ash (*Eucalyptus sieberi*) and red bloodwood (*E. gummifera*).

The NSW Government has designated the Seaforth mintbush as a site-managed species under its new Saving our Species program (NSW OEH, 2013b). As a result of this program, the site at Manly Dam in the Warringah Local Government Area, has been proposed as an important management site (NSW OEH, 2013b). The NSW Government has also identified the potential to establish a translocation site.

Information required and research priorities

1. More precisely assess population size (including number of mature individuals), distribution, ecological requirements and the relative impacts of threatening processes.
2. Undertake survey work in suitable habitat and potential habitat to locate additional populations/occurrences/remnants.
3. Design and implement a monitoring program.
4. Undertake research into the possibility of collecting seeds for banking to establish an ex-situ seed bank for conservation and restoration purposes. Undertake seed germination and/or vegetative propagation trials to determine the requirements for successful re-establishment.
5. Undertake genetic analyses to determine the degree of connectivity between fragments.
6. Identify optimal fire regimes for regeneration (vegetative regrowth and/or seed germination), and response to other prevailing fire regimes.

Management actions required

1. Raise awareness of land managers of the presence of the species and the need for appropriate practices when undertaking maintenance (e.g., roadworks) and other activities within proximity to these sites.
2. Manage sites to identify, control and reduce the spread of weeds.
3. Control access routes to suitably constrain public access to known sites on public land and manage access on private land and other land tenure.
4. Manage the populations to maintain genetic diversity.
5. Implement an appropriate fire management regime for protecting key habitat.
6. Implement suitable hygiene protocols to protect known populations from outbreaks of phytophthora dieback.
7. Monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them if necessary.
8. If practicable undertake seed collection and germination and / or vegetative propagation to establish an ex-situ conservation collection that can be used conservation and restoration purposes.

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 marifolia

AND

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

Threatened Species Scientific Committee

03/09/2014

References cited in the advice

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