



Boronia hippopala

velvet boronia

TASMANIAN THREATENED SPECIES LISTING STATEMENT

Image by Anne Chuter

Scientific name: *Boronia hippopala* Duretto, *Muelleria* 17: 84 (2003)

Common Name: velvet boronia (Wapstra et al. 2005)

Group: vascular plant, dicotyledon, family **Rutaceae**

Status: *Threatened Species Protection Act 1995*: **vulnerable**
Environment Protection and Biodiversity Conservation Act 1999: **Vulnerable**

Distribution: Endemic status: **endemic to Tasmania**
Tasmanian NRM Region: **North, South**

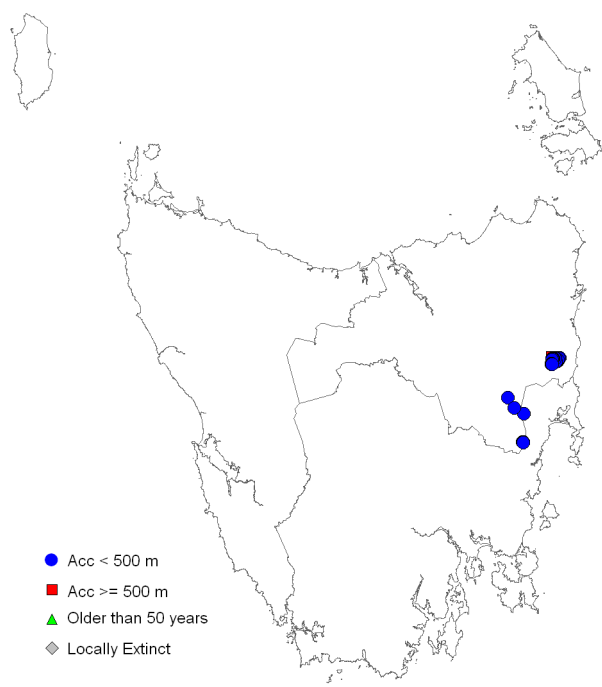


Figure 1. Distribution of *Boronia hippopala*, showing NRM regions



Plate 1. *Boronia hippopala* (image by Anne Chuter)

SUMMARY: *Boronia hippopala* (velvet boronia) is an aromatic woody shrub that occurs in wet heath/scrub and on their forest margins. It has a restricted distribution with a linear range of about 62 km and is known only from 8 subpopulations in 5 locations in north eastern Tasmania. The total number of mature individuals is estimated at fewer than 15,000. The species is at risk from inappropriate fire regimes and impacts of climate change that may reduce the potential for recruitment from the soil seed store. Predation of seed by insects is an issue for the species and may increase with outbreaks associated with changed environmental conditions. Planning considerations will alleviate potential indirect impacts from adjacent forestry activities and the species will also benefit from proposed forest reserves.

IDENTIFICATION AND ECOLOGY

Boronia hippopala has been observed in flower from October to January with fruit ripening by mid summer. The species is believed to be an obligate out-crosser, with pollination effected by range of insects (Hingston & McQuillan 2000). Field observations indicate that *Boronia hippopala* is an obligate seeder, with evidence of mass germination from a soil-stored seed-bank following fire (Chuter 2006). Individual plants may live in excess of 20 years (Chuter 2006), with plants reaching reproductive maturity in perhaps 5 to 6 years. Seed predation by insects is often a feature of closely related species in the Rutaceae family, with considerable predation of seed of *Boronia hippopala* restricting the collection of seed from Dukes Marshes in 2012 (James Wood, pers. comm.). There is no information as to the longevity of the soil-stored seed-bank. There is no information as to the longevity of the soil-stored seed-bank. The species has a strong aromatic citrus odour.

Survey techniques

Surveys for *Boronia hippopala* can be conducted at any time of the year, though is more practical and efficient when the species is in flower (October to January) and plants are easier to detect.

Description

Boronia hippopala is an erect woody shrub to 1.8 m tall. The branchlets are slightly to obviously glandular tuberculate and hispidulous (covered with stiff short hairs), with the hairs distributed evenly around the stem. The pinnate leaves are arranged opposite each other, with 3 to 7 leaflet pairs, and are 6 to 10 mm long by 6 to 14 mm wide. The leaflets are linear to narrowly elliptic to narrowly obovate and 1 to 8 mm long and 0.75 to 1.25 mm wide. They are densely hispidulous all over or sometimes mainly on the portion closest to the stem. The flowers occur in clusters of 1 to 3 in the upper leaf axils. The flowers occur in four parts, with the sepals and petals free, and eight stamens. The sepals are narrowly triangular to deltate and 1 to 2 mm long, with a variously hispidulous outer surface. The petals are white to pink and 3.5 to 6.5 mm long. The fruit is a hispidulous capsule.

[description based on Duretto 2003 & 2009]

Confusing species

Boronia bemichiton can be distinguished from the closely-allied *Boronia hippopala* by its leaflets being hispidulous (covered with stiff short hairs) all over (rather than on the proximal portion only), and its fruit which is hispidulous (rather than glabrous) (Duretto 2003). However, Duretto (2009) notes that the two species can at times be hard to distinguish, but plants from the Elizabeth River and Flagstaff Marsh have been ascribed to *Boronia hippopala* despite their somewhat intermediate nature.

DISTRIBUTION AND HABITAT

Boronia hippopala is endemic to Tasmania, occurring in the Eastern Tiers in marshes in the upper catchment of the St Pauls River, at Mount Puzzler, Flagstaff Marsh near Tooms Lake and sites on the Elizabeth River (Figure 1, Table 1). It occurs at elevations of 455 to 580 m.

The species grows in wet heaths dominated by species such as *Melaleuca virens*, *Melaleuca squamea*, *Melaleuca gibbosa*, *Epacris gunnii*,

Table 1. Population summary for *Boronia hippopala*

	Subpopulation	Tenure	NRM Region	1:25000 Mapsheet	Year last (first) seen	Area occupied (ha)	Number of individuals
1	Dukes Marshes ¹	State forest*	North	Fingal	2012 (2003)	10	2000–5000
2	Alberts Marsh (1 km north) ¹	State forest	North	Fingal	2004	5	100s
3.1	Horseshoe Marsh (on Valley Road) ¹	State forest*	North	Fingal	2005 (2004)	2	200+
3.2	Horseshoe Marsh (on St Pauls River) ¹	State forest*	North	Fingal	2005 (1996)	10	1000–2000
4	Mount Puzzler ²	Mount Puzzler Forest Reserve	North	St John	2013 (2003)	10	4000–5000
5	Elizabeth River (southeast of Chimney Hill) ³	private land	North	Snow	2004	unknown	100+
6	Elizabeth River (west of Lake Leake) ³	private land	North	Leake	2013 (2008)	0.1	50–100
7	Lost Falls Road ⁴	State forest	South	Leake	2005 (2004)	0.0001	1 (not seen in recent years)
8	Flagstaff Marsh ⁵	Tooms Lake Forest Reserve	North	Tooms	2013 (2005)	c. 1?	500–1000?

NRM Region = Natural Resource Management Region

* proposed for reservation under the *Tasmanian Forests Agreement 2013*

¹⁻⁵ = location number



Plate 2. Wet heath/scrub habitat of *Boronia hippopala* at Flagstaff Marsh (image by Anne Chuter)

Leptospermum lanigerum and *Gabnia grandis*, with occasional eucalypts such as *Eucalyptus rodwayi* (Plate 2), as well as in adjacent *Eucalyptus pauciflora–dalrympleana* woodland in which *Micranthemum hexandrum*, *Leptospermum scoparium*,

Banksia marginata, *Epacris moscaliana* and *Hibbertia serpyllifolia* may be prominent (Schahinger 2004, Chuter 2006). The underlying substrate is Jurassic dolerite, while drainage is typically moderate to poor.

POPULATION PARAMETERS

Boronia hippopala is known from eight subpopulations from five broad locations (Table 1). The total population is believed to be in the order of 10,000 to 15,000 mature individuals. The species has a linear range of 62 km, extent of occurrence of 715 km², and area of occupancy of about 40 ha.

The likelihood of additional subpopulations being detected is considered relatively low based on the extent of botanical surveys within the current predicted range of the species (Schahinger 2004, Chuter 2006 & 2010). Minor range infillings and extensions within the same wet heath/scrub and adjacent forest fringe are possible as some less accessible patches of potential habitat remain unsurveyed for the species, and stands that are very limited in their

extent and abundance can easily be missed (such as those along the Elizabeth River and in the Lost Falls area).

RESERVATION STATUS

Boronia hippopala occurs in the Mount Puzzler Forest Reserve and Tooms Lake Forest Reserve.

CONSERVATION ASSESSMENT

Boronia hippopala was listed as vulnerable on the Tasmanian *Threatened Species Protection Act 1995* in 2005, meeting criterion B:

- extent of occurrence estimated to be less than 50 ha, known to exist at no more than five locations, and a continuing decline inferred, observed or projected in area, extent and/or quality of habitat.

THREATS, LIMITING FACTORS AND MANAGEMENT ISSUES

Boronia hippopala is most at risk from factors that influence its potential for recruitment following fire, particularly those that influence input into and viability of the soil-stored seed bank. As such, an inappropriate fire regime is the most important threat, and the species is susceptible to the potential impacts of climate change on recruitment. Consideration of the species when planning forestry activities in areas adjacent to stands will alleviate indirect impacts. Inundation is a potential threat for a very small proportion of the population.

Inappropriate fire regime: *Boronia hippopala* is killed by fire, with subsequent regeneration from soil-stored seed, and flowering after about five year's growth. Fires at a shorter interval would prevent seed production, while a prolonged period between fires, say greater than 25 years, runs the risk of plants senescing and soil-stored seed losing its viability. Active fire management of the species' habitat is required, with a preferred mosaic burn approach at intervals of about 12 to 20 years (Schahinger 2004, Chuter 2010). The northern part of the Flagstaff Marsh subpopulation was burnt in 2003, and the southern part in the mid to late 1980s (Chuter 2006), while most of the

Dukes Marshes subpopulation was burnt by wildfire in January 2013.

Climate change: A warmer climate, longer periods of drought and a change in rainfall patterns may impact deleteriously on *Boronia hippopala* and its habitat, through a detrimental increase in fire frequency, a reduction in recruitment following fire, and an increase in insect outbreaks leading to decreased input to the soil seed bank due to increased predation of seed. The risk to the species is exacerbated by its restricted distribution.

Forest management: *Boronia hippopala* occurs largely on State forest in areas managed for wood production. The preferred habitat is unlikely to be directly impacted as it is essentially non-commercial in terms of timber production. However, the species can occur in the marsh-forest ecotone (Chuter 2006), extending into the fringes of the marshes which are sometimes used as fire breaks, or into a forest habitat that may be impacted by timber harvesting operations. While direct impacts are tightly regulated, Chuter (2006 & 2010) considers that it is essential for *Boronia hippopala* to be taken into account when planning forestry operations immediately adjacent to stands to avoid indirect impacts by associated roading, culverted crossings of marsh drain points and fuel reduction activities in marshes. These impacts may operate through the introduction and spread of weeds and disease, and modification to hydrology. Proposed reservation under the *Tasmanian Forests Agreement 2013* will largely alleviate this risk, improving the reservation status of the species by an estimated 68% (Independent Verification Group 2012).

Inundation: The subpopulations along the Elizabeth River were first detected in 2004 during assessment surveys for a proposed dam. Additional plants were located subsequently, less than 500 m downstream of (the artificial) Lake Leake, suggesting that the river course prior to damming probably supported some individuals, though the number of plants lost is unknown.

MANAGEMENT STRATEGY

Management objectives

The main objectives for the recovery of *Boronia hippopala* are to prevent the inadvertent destruction of subpopulations, maintain the viability of existing subpopulations, and promote conditions for its successful recruitment.

What has been done?

Survey and monitoring: The extent of the extant subpopulations has been determined, in the main, by targeted surveys (Schahinger 2004, Chuter 2006).

Susceptibility to *Phytophthora cinnamomi*:

As several members of the Rutaceae family in Tasmania are known to be susceptible to the introduced soil-borne plant pathogen *Phytophthora cinnamomi* (Podger et al. 1990), laboratory trials were conducted in 2007 to 2008 to determine the susceptibility of *Boronia hippopala*. The species was found to be resistant to the pathogen, although it may act as a host (Rudman et al. 2008).

***Ex situ* conservation:** An *ex situ* living plant collection has been established at the Royal Tasmanian Botanical Gardens in Hobart. Seed has been collected from the Dukes Marshes subpopulation for long-term conservation storage at the Tasmanian Seed Conservation Centre based at the Royal Tasmanian Botanical Gardens. However, as the level of insect predation of seed was very high, and insufficient seed could be collected in 2012, plants were treated with a systemic insecticide to enable sufficient seed to be harvested in 2013.

What is needed?

Agencies, groups or individuals may assist with some or all of the following recovery actions. Coordinated efforts may achieve the best and most efficient results.

- ensure that the areas supporting the species are subject to an appropriate fire regime;
- monitor the species' response to disturbance such as fire and monitor levels

of seed predation to guide future recovery work;

- update the status of subpopulations not seen since 2004/5;
- provide information and extension support to relevant Natural Resource Management committees, local councils, government agencies, the local community and development proponents on the locality, significance and management of known subpopulations and potential;
- develop management agreements with private landowners and public land managers, and ensure that current priorities for the species are incorporated into the Private Land Conservation Program's (DPIPWE) reservation strategies.

BIBLIOGRAPHY

- Chuter, A. (2006). *Distribution and Ecology of Three Threatened Boronia Species*. Report to the Conservation Planning Section, Forestry Tasmania. Forest Practices Authority, Hobart.
- Chuter, A.E. (2010). Distribution and ecology of three threatened tasmanian endemic species of *Boronia*. *The Tasmanian Naturalist* 132: 63–77.
- Duretto, M.F. (2003) Notes on *Boronia* (Rutaceae) in eastern and northern Australia. *Muelleria* 17: 19–135.
- Duretto, M.F. (2009). *87 Rutaceae, version 2009:1*. In M.F. Duretto (Ed.) *Flora of Tasmania Online*. 26 pp. (Tasmanian Herbarium, Tasmanian Museum & Art Gallery: Hobart). ISBN 978-1-921599-26-2 (PDF). www.tmag.tas.gov.au/floratasmania
- Hingston, A.B. & McQuillan, P.B. (2000). Are pollination syndromes useful predictors of floral visitors in Tasmania? *Austral Ecology* 25: 600–609.
- Independent Verification Group (2012) *Validation of the ENGO proposed reserves for the conservation of priority flora species on public forest*. Unpublished report of the Independent Verification Group for the Tasmanian Forest Agreement, Hobart.

Podger, F., Palzer, C. & Wardlaw, T. (1990). A guide to the Tasmanian distribution of *Phytophthora cinnamomi* and its effects on native vegetation. *Tasforests* 2: 13–20.

Rudman, T., Iowski, M. & Schahinger, R. (2008). *The Susceptibility to Phytophthora cinnamomi of the Threatened Species Boronia gunnii, Boronia hemichiton, Boronia hippopala and Philotheca freyciana*. Nature Conservation Report 08/05, Biodiversity Conservation Branch, Department of Primary Industries and Water, Hobart.

Schahinger, R.B. (2004). *Distribution & Conservation Status of the Tasmanian Endemic Shrubs Boronia gunnii, Boronia hemichiton and Boronia hippopala (with brief notes on other newly described Boronia species)*. Report to the Threatened Species Unit, Department of Primary Industries, Water and Environment, Hobart.

Schahinger, R., Rudman, T. & Wardlaw, T. (2003). *Conservation of Tasmanian Plant Species & Communities Threatened by Phytophthora cinnamomi*. *Strategic Regional Plan for Tasmania*. Technical Report 03/03, Nature Conservation Branch, Department of Primary Industries, Water and Environment, Hobart.

Wapstra, H., Wapstra, A., Wapstra, M. & Gilfedder, L. (2005, updated online annually). *The Little Book of Common Names for Tasmanian Plants*. Department of Primary Industries, Water & Environment, Hobart.

Prepared in January 2013 under the provisions of the Tasmanian *Threatened Species Protection Act 1995*. Approved by the Secretary and published in April 2014.

Cite as: Threatened Species and Marine Section (2014). *Listing Statement for Boronia hippopala (velvet boronia)*. Department of Primary Industries, Parks, Water and Environment, Tasmania.

View:

www.dpipwe.tas.gov.au/threatenedspecieslists

Contact details: Threatened Species and Marine Section, Department of Primary Industries, Parks, Water and Environment, GPO Box 44 Hobart Tasmania Australia 7001. Ph. (03) 61654340; fax (03) 62333477; threatenedspecies.enquiries@dpipwe.tas.gov.au

Permit: It is an offence to collect, disturb, damage or destroy this species unless under permit.