Image: DPIW

clubmoss bushpea

Stonesiella selaginoides

TASMANIAN THREATENED FLORA LISTING STATEMENT

Scientific name: ***Stonesiella selaginoides*** (Hook.f.) Crisp & P.H.Weston, *Taxon* 48(4): 711 (1999)

Family: Fabaceae

Common Name: clubmoss bushpea (Wapstra *et al.* 2005)

Name history: *Pultenaea selaginoides*

Status: *Threatened Species Protection Act 1995*: **endangered**

Environment Protection and Biodiversity Conservation Act 1999: **Endangered**

Tasmanian Regional Forest Agreement 1997: **Priority species**

Distribution: Endemic status: **Endemic to Tasmania**

Tasmanian NRM Region: **North & South**

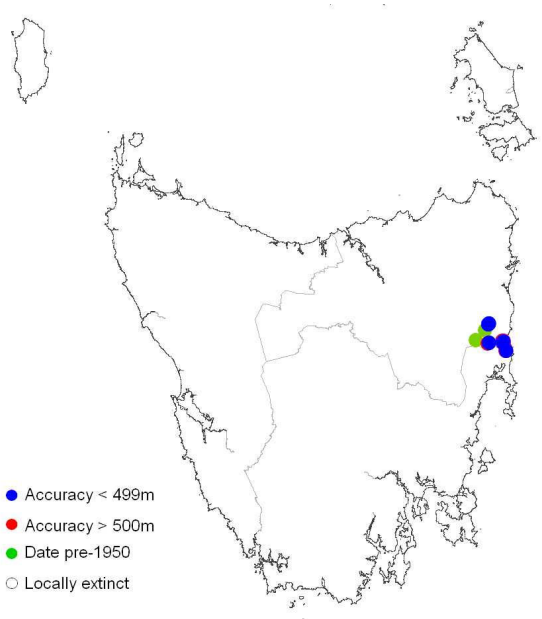

Figure 1. Distribution of *Stonesiella selaginoides*.

Plate 1. *Stonesiella selaginoides* (Image by H&A Wapstra).

IDENTIFICATION AND ECOLOGY

Stonesiella selaginoides is a slender woody shrub in the Fabaceae (pea) family. It has crowded oblong-shaped leaves to 1 cm long, and flowers clustered in leafy heads near the ends of the branches (Plate 1). The flowers are bright yellow with reddish markings (Curtis & Morris 1975).

Surveys should be conducted during the peak flowering period from September to November, when the species is most easily identifiable.

Stonesiella selaginoides generally flowers between mid-October to early December, with seed fall in mid-January to early February (Lynch 1993). Beetles are thought to be the primary pollinators (Lynch 1999). Seed is produced in large quantities, and is known to have a high viability and dormancy typical of leguminous species (Lynch 1999, Barker 1996a). Experimental germination trials indicate that both heat treatment and scarification promote germination (Lynch 1999). Regeneration is predominantly from the soil-stored seed bank after fire. The species is known to resprout or coppice after disturbance (fire or flood damage).

Description

Stonesiella selaginoides is a slender, erect, glabrous shrub up to 2.5 m high. The leaves are numerous and crowded, oblong to heart-shaped, 3 to 10 mm long, thick, flat or somewhat concave, with the midrib showing only on the lower surface towards the base and the apex is either blunt or with a short, thick point. The stipules are minute. The flowers are on short stalks in the leaf axils at or near the ends of the branches. The axis continues to grow after the flowers have matured but branches also arise in pseudo-whorls below the flower heads. The floral bracts are small, lanceolate and inserted near the base of the calyx. The calyx is about 4 mm long with lobes about as long as the tube and ciliolate. The upper and largest petal, known as the standard, is shortly clawed with an orbicular blade almost twice as long as the calyx and is bright yellow with reddish markings radiating from above the claw. The lateral petals, known as wings, are yellow. The ovary is covered in long soft hairs, while the seed is green (Curtis & Morris 1975, Lynch 1993).

Confusing Species

The species is similar in appearance to the fabaceous shrub, *Almaleea subumbellata,* the distinguishing characteristics of *Stonesiella selaginoides* being its larger and hairless leaves (young leaves of *Almaleea subumbellata* are slightly hairy), and the extension of the stem through the flowerhead. In *Almaleea subumbellata* new growth occurs in a whorl below the flowerheads (Kirkpatrick *et al.* 1980).

DISTRIBUTION AND HABITAT

Stonesiella selaginoides is endemic to Tasmania, occurring in the central East Coast region (Figure 1). The species has a linear range of 24 km, an extent of occurrence of 126 km^2, and an area of occupancy of about 3 to 4 ha.

Stonesiella selaginoides occurs on dolerite soils, in two distinct habitats: (1) tall open heath in the ecotone between riparian scrub and open eucalypt forest, and (2) open dry scrub dominated by the endemics *Leptospermum grandiflorum* and *Hakea megadenia*. The elevation range is 20 to 520 m asl, and the annual rainfall 625 to 1000 mm (Lynch 1993 & 1999).

POPULATION ESTIMATE

The total population size for *Stonesiella selaginoides* is estimated to be in the order of 2,600 to 2,700 mature individuals with approximately 2,100 in the largest subpopulation (Barker 1996a, data held by the Threatened Species Section, DPIW, Hobart, see Table 1).

The species is known from four extant subpopulations (Table 1). One subpopulation on private land had declined in the early 1990s from six to two individuals (Barker 1996a, Lynch 1999), while a subpopulation recorded in the 19th century is presumed to be extinct as a result of land clearance and grazing (Barker 1996a).

Table 1. Population summary for *Stonesiella selaginoides*.

	Subpopulation	Tenure	NRM Region *	1:25000 Mapsheet	Year last seen	Area occupied (ha)	Number of mature plants	Specific Threats
1	Horseshoe Marsh (St Pauls River)	State Forest	North	Fingal	2007	0.2	400–500	Lack of fire, changes to hydrology
2	Hardings Falls (Swan River)	Hardings Falls Forest Reserve	South	Henry	1996	1.0	100	Lack of fire, changes to hydrology
3	Blindburn Creek	Douglas-Apsley National Park	North & South	Bicheno	2007	2.5	2,100	Lack of fire
4	Lilla Villa Bridge (Apsley River)	Private Land	South	Bicheno	1996	'small'	2	Weeds, clearance, lack of fire, changes to hydrology
5	Nowhere Else (St Pauls River)	Private Land	North	St John	19th century	Presumed extinct		

* NRM region = Natural Resource Management region.

RESERVATION STATUS

Reserved within Douglas-Apsley National Park and Hardings Falls Forest Reserve.

CONSERVATION ASSESSMENT

Stonesiella selaginoides is listed as endangered on the Tasmanian *Threatened Species Protection Act 1995*. It qualifies under criterion B as it extends less than 500 km^2, it occupies less than 10 ha, it occurs in no more than 5 locations and there is an observed and projected continuing decline in the quality of habitat and a projected loss of one location. The species was originally listed as vulnerable in 1995 and was uplisted to endangered in 2008 following a review of its status as part of a Species Information Partnership between the Australian and Tasmanian Governments.

The species is listed as Endangered on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

Stonesiella selaginoides is a priority species requiring consideration under the *Tasmanian Regional Forest Agreement* between the Commonwealth of Australia and the State of Tasmania (RFA 1997, DPIWE 1998).

THREATS AND LIMITING FACTORS

Land clearance: Barker (1996a) noted that land clearance and grazing appear to have led to the demise of the *Stonesiella selaginoides* subpopulation at Nowhere Else on the St Pauls River (Table 1). Occurrences on private land remain at risk from clearance or benign neglect.

Inappropriate fire regimes: As recruitment is primarily from the soil seed bank following fire, *Stonesiella selaginoides* is likely to be supplanted by other species as vegetation succession proceeds in the absence of fire, perhaps in as little as 20 years (Barker 1996a). Conversely, frequent cool fires may result in the slow attrition of occurrences. The period since last fire for the four extant subpopulations is as follows: (1) Horseshoe Marsh, 26 years, (2) Hardings Falls, 30 years, (3) Blindburn Creek, 13 to 43 years, (4) Lilla Villa Bridge, 30 years (Barker 1996a). All but the Blindburn Creek subpopulation may therefore be considered to be in decline. The Lilla Villa Bridge subpopulation was considered to be non-viable in the early 1990s (Lynch 1999).

Hydrological changes: Any activities that alter the natural flood regime of the St Pauls, Swan and Apsley rivers, such as dams or channel improvement, have the potential to impact upon *Stonesiella selaginoides*. The

headwaters of the St Pauls and Swan rivers are both within areas of State Forest and inappropriate logging activities have the potential to lead to increased runoff and sediment loads, with deleterious downstream impacts upon two of the known subpopulations.

Weeds: Gorse and blackberry threaten the species' habitat at Lilla Villa Bridge. In addition, the proposed use of fire at this site to stimulate recruitment of *Stonesiella selaginoides* from any soil-stored seedbank will heighten the risk of woody weeds spreading into the site from nearby roadside infestations.

Phytophthora cinnamomi: *Stonesiella selaginoides* is known to be resistant to *Phytophthora cinnamomi* (Barker 1994), though the species does co-occur with highly susceptible plants such as *Epacris apsleyensis* (Schahinger *et al.* 2003). Therefore the pathogen is considered to be a threat to the integrity of plant communities supporting *Stonesiella selaginoides*, with an unknown long-term impact on the species itself. Scattered infestations of the pathogen are known to occur in and around the Blindburn Creek site, and close to the Hardings Falls site.

Stochastic Risk: the species' localised distribution exposes it to the risk of extinction due to unforeseen human activities or stochastic events.

MANAGEMENT STRATEGY

The main objective for the recovery of *Stonesiella selaginoides* is to ensure that there is no decline in any of the subpopulations.

What has been done?

A multi-species Recovery Plan for selected Tasmanian forest-associated plants, including *Stonesiella selaginoides,* was prepared by Forestry Tasmania in 1998 (Barker & Johnson 1998). The Commonwealth did not formally adopt this plan, though sections of the Plan have been implemented by various Tasmanian agencies. The *Draft Greater Freycinet Region Threatened Species Recovery Plan 2006–2010* (Threatened Species Section 2006) expanded upon Barker & Johnson (1998).

The following progress has been made towards the recovery objectives of the aforementioned plans:

Improved formal reservation: The species' reservation status has been improved with the proclamation of Hardings Falls Forest Reserve. Barker (1996a) concluded that the subpopulations at Blindburn Creek and Horseshoe Marsh offered the best opportunities for conservation management. The latter remains unreserved despite calls for its inclusion in the adjacent Mt Puzzler Forest Reserve (Barker 1994, Schahinger 2004). However, most mature plants within this subpopulation occur within a 100 m wide Wildlife Habitat strip forming part of Forestry Tasmania's Informal Reserve System.

Conservation on private land: Approaches to the landowners of the Lilla Villa Bridge subpopulation by the Private Forest Reserves Program (DPIWE) regarding a conservation covenant have been unsuccessful. However, the site has been fenced to exclude stock and some weed control has been undertaken.

Fire management: The Blindburn Creek subpopulation in Douglas-Apsley National Park is subject to a fire management plan that aims to maintain levels of biodiversity and foster the long-term survival of threatened species (Parks & Wildlife Service 1998). An attempt by PWS to undertake an ecological burn of the Blindburn Creek catchment in the spring of 2007 did not impact on the *Stonesiella selaginoides* subpopulation.

Monitoring & ecology: Barker (1996a & b) and Lynch (1999) undertook detailed studies of the four known subpopulations in the early to mid-1990s.

Phytophthora management: The sub-populations at Horseshoe Marsh and Blindburn Creek occur within designated *Phytophthora cinnamomi* Management Areas (Schahinger *et al.* 2003). While *Stonesiella selaginoides* is considered to be resistant to *Phytophthora cinnamomi* (Barker 1994), the species will benefit indirectly through any habitat management. Any planned development or activity in the two areas requires the submission of a formal project proposal, and must be endorsed by DPIW's

Biodiversity Conservation Branch (Schahinger *et al.* 2003).

Seed storage: Seed has been collected from the Horseshoe Marsh and Blindburn Creek subpopulations as part of the Tasmanian Seed Safe project set up under the Millennium Seed Bank project being conducted under the auspices of the Royal Botanic Gardens Kew (joint partners in Tasmania include DPIW, the Royal Tasmanian Botanical Gardens and the Tasmanian Herbarium).

What is needed?

Recovery actions necessary to decrease the extinction risk to *Stonesiella selaginoides* include:

- Provision of adequate information and extension services to relevant Government Agencies, Natural Resource Management Committees, Local Councils, and the local community on the locality, significance and management of known subpopulations and the management of potential habitat of *Stonesiella selaginoides*
- Establishment of permanent survey plots at all subpopulations to monitor mortality and recruitment. Undertake monitoring every two years to guide any ecological burning program.
- Ecological burns are required at all subpopulations. Those on land managed by Forestry Tasmania, ie Horseshoe Marsh and Hardings Falls, should be considered for inclusion within Forestry Tasmania's *Tactical Fire Management Project*.
- Management for revival of the Lilla Villa Bridge subpopulation needs to be undertaken in consultation with the private landowner. Required actions include weeding, an ecological burn and follow-up monitoring.
- Undertake extension surveys of potential habitat on both private and public land. Surveys in wet conditions should be avoided to minimise the risk of spreading *Phytophthora cinnamomi.*

BIBLIOGRAPHY

Barker, P.C.J. (1994). Phytophthora cinnamomi: *The susceptibility and management of selected Tasmanian rare species.* Forestry Tasmania and Australian Nature Conservation Agency.

Barker, P. (1996a). *Selecting viable populations of threatened plants for conservation management.* Forestry Tasmania and Australian Nature Conservation Agency.

Barker, P. (1996b). *Extension surveys and long term monitoring plots for selected species threatened by* Phytophthora cinnamomi. Forestry Tasmania and Australian Nature Conservation Agency.

Barker, P.C.J., and Johnson, K.A. (1998). *Recovery Plan for Selected Tasmanian Forest Associated Plants*. Forestry Tasmania, Hobart.

Curtis, W.M., and Morris, D.I. (1975). *The Student's Flora of Tasmania. Part 1 (Second Edition).* Government Printer, Hobart.

DPIWE (1998). *Strategic plan for the private land component of the CAR reserve system.* Department of Primary Industries, Water and Environment, Hobart.

Lynch, A.J.J. (1993). *Conservation Biology and Management of 16 Rare or Threatened Fabaceae Species in Tasmania*. Australian National Parks and Wildlife Service, Endangered Species Program Project No. 4, Parks and Wildlife Service, Hobart.

Lynch, A.J.J. (1999). Distribution, ecology and rarity of the nationally vulnerable species *Pultenaea selaginoides* (Fabaceae*). Australian Journal of Botany.* 47: 865–876.

Parks and Wildlife Service (1998*). Douglas-Apsley National Park Fire Management Plan.* Department Of Environment and Land Management, Tasmania.

RFA (1997). *Tasmanian Regional Forest Agreement*. Commonwealth of Australia and the State of Tasmania.

Schahinger, R. (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). A Report for the Threatened Species Unit, Department of Primary Industries, Water and Environment, Hobart.

Schahinger, R., Rudman, T. and 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.

Threatened Species Section (2006). *Draft Greater Freycinet Region Threatened Species Recovery Plan 2006–2010.* Department of Primary Industries, Water and Environment, Hobart.

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

Prepared in February 2008 under the provisions of the Tasmanian *Threatened Species Protection Act 1995*. Reviewed January 2009.

Cite as: Threatened Species Section (2009) *Listing Statement for* Stonesiella selaginoides *(clubmoss bushpea)*, Department of Primary Industries & Water, Tasmania.

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http://www.dpiw.tas.gov.au/threatenedspecieslists

Contact details: Threatened Species Section, Department of Primary Industries & Water, GPO Box 44, Hobart, Tasmania, Australia 7001. Ph (03) 6233 6556; fax (03) 6233 3477.

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