Image by Louise Gilfedder

Polyscias sp. Douglas-Denison

ferny panax

TASMANIAN THREATENED FLORA LISTING STATEMENT

Scientific name:	***Polyscias* sp. Douglas-Denison** (R.Schahinger HO526133) Tas Herbarium
Common name:	ferny panax (Wapstra et al. 2005)
Group:	vascular plant, dicotyledon, family **Araliaceae**
Name history:	*Polyscias sambucifolia*, *Polyscias* aff. *sambucifolia*
Status:	*Threatened Species Protection Act 1995*: **endangered** *Environment Protection and Biodiversity Conservation Act 1999*: **Not Listed**
Distribution:	Endemic status: **Endemic to Tasmania?** Tasmanian NRM Regions: **North & South**

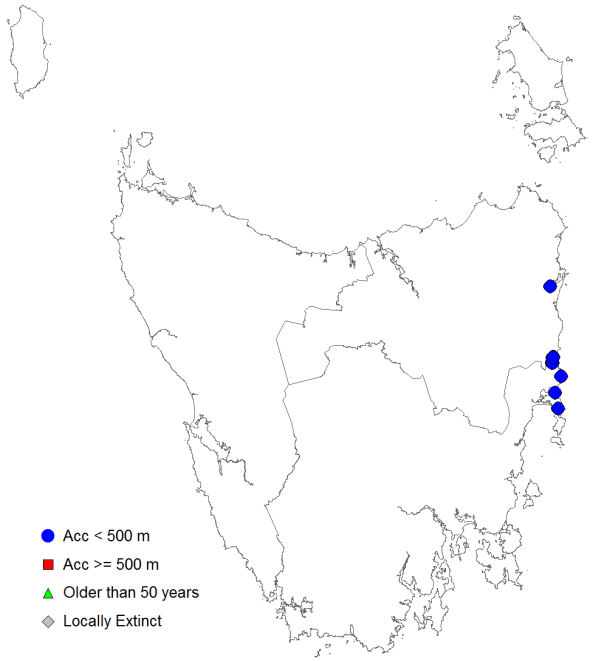

Figure 1. Distribution of *Polyscias* sp. Douglas-Denison, showing Natural Resource Management regions

Plate 1. *Polyscias* sp. Douglas-Denison (image by Richard Schahinger)

IDENDIFICATION AND ECOLOGY

Polyscias sp. Douglas-Denison is a small evergreen tree in the Araliaceae family (Baker & Duretto 2011). It is known in Tasmania from six sites on the central east coast where it grows in damp sclerophyll forest.

Polyscias sp. Douglas-Denison is capable of vigorous spread via root suckering, especially after fire. It flowers sparingly, from about mid-December to February, but does not develop seed. Henwood (1986) and Gillespie & Henwood (1994) indicate that the allied *Polyscias sambucifolia*, a taxon of mainland Australian states, is self-incompatible. This feature has not been examined for *Polyscias* sp. Douglas-Denison, though the lack of seed and its suckering character suggest that individual stands may be wholly clonal in origin and/or pollinators may be lacking.

Survey techniques

The taxon may be identified at any time of year due to its distinctive foliage.

Description

Polyscias sp. Douglas-Denison grows up to 6–8 m, with stem diameters to 12 cm. The stem is erect and when broken reveals a spongy pith surrounded by a fibrous wood layer. Leaves are alternate and clustered towards the end of branches, are once divided and up to 20 cm in length. Each leaf is composed of 2 to 7 leaflet pairs and a terminal leaflet (Plate 2). The upper leaflet pairs are sessile, while the lower pairs are petiolate. Leaflets are 2 to 7 cm long, dark green above and light green below, with weakly indented venation. Leaflets are variable in form, ranging from strongly lobed to regular with serrated margins. Stipels, very small leaflets, are sometimes present at the base of the leaflet pairs. The inflorescence is a compound panicle up to 9 cm long, with several umbels, each containing up to 40 flowers and arranged racemosely along the branches (occasionally reduced to a simple umbel). The flowers have five yellowish-green petals about 4 mm long, while the calyx is reduced to a rim with five minute teeth. There are two (or three) free styles and the ovary has two (or three) locules, with each locule containing a single pendulous ovule. Fruit are laterally compressed succulent drupes, about 4 mm long, bluish-green or steel-blue in colour.

Confusing Species

Forms of *Polyscias sambucifolia* have been in cultivation in Tasmanian gardens since the late 1800s, with some escapees now considered to be naturalised (Rodway 1903, Curtis 1963, de Salas & Baker 2016). Most of the naturalised material held by the Tasmanian Herbarium has leaflets with entire margins (an exception being a dissected form from Bridport); the leaflets of *Polyscias* sp. Douglas-Denison tend to be strongly lobed, with an apparent north-south trend to more finely-divided leaves (Plate 2).

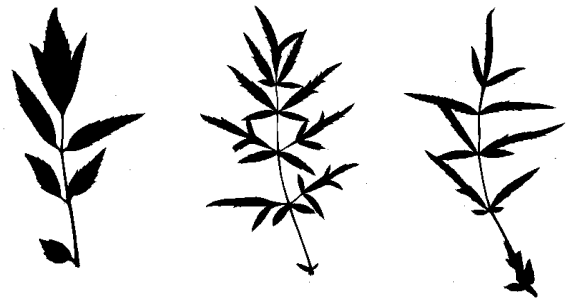

Plate 2. *Polyscias* sp. Douglas-Denison: leaves from Mt Allen, Denison Rivulet and Mt Peter

Plate 3. *Polyscias* sp. Douglas-Denison: fruit (image by Phil Collier)

TAXONOMIC ISSUES

Polyscias sp. Douglas-Denison is most similar to *Polyscias sambucifolia* subsp. A (Henwood et al. 1999), a taxon known from Victoria, New South Wales and Queensland. *Polyscias sambucifolia* is though to consist of at least three morphologically distinct entities within a continuum of leaf forms. The status of these forms is under review by M.J. Henwood of the University of Sydney.

DISTRIBUTION AND HABITAT

Polyscias sp. Douglas-Denison is known from six sites in Tasmania's central east coast region between Coles Bay and Scamander (Figure 1). The sites mostly occur on seaward-facing middle slopes within a few km of the coast, with an overall altitude range of 50 to 220 m above sea level.

A *Polyscias* specimen, described as a 'Shrub 10 to 12 feet', was collected from the Douglas River area in August 1850 by Joseph Milligan (specimen held at the National Herbarium of Victoria, MEL 2248346; referred to by Bentham 1866). No further collections of indigenous *Polyscias* were made in Tasmania until early 1991, when a small stand was found on the seaward slopes of Mt Allen, 2 to 3 km south of the Douglas River. The taxon has since been discovered at another five sites, four to the south and one to the north (Table 1).

Sites supporting *Polyscias* sp. Douglas-Denison are characterised by a high rock cover (Jurassic dolerite, Devonian granite or Mathinna sediments), and range from steep-sided gullies to more gentle slopes. The vegetation is usually a shrubby eucalypt forest: sites on granite are dominated by *Eucalyptus tenuiramis* (silver peppermint), sites on dolerite may include mixes of *Eucalyptus amygdalina* (black peppermint), *Eucalyptus globulus* (tasmanian blue gum), *Eucalyptus viminalis* (white gum) and *Eucalyptus sieberi* (ironbark), while the solitary site on Mathinna sediments is dominated by *Eucalyptus sieberi*. Typical species in the small-tree/tall-shrub stratum include *Allocasuarina littoralis* (black sheoak), *Bursaria spinosa* (prickly box), *Acacia melanoxylon* (blackwood) and *Callitris rhomboidea* (oyster bay pine). *Lomandra longifolia* (sagg) dominates a generally sparse ground layer in the rockier areas, while the ferns *Pteridium esculentum* (bracken) and *Calochlaena dubia* (rainbow fern) may be prominent where slopes are gentler and soils deeper.

POPULATION PARAMETERS

As plants tend to sucker from underground rhizomes, it is very difficult to estimate the total number of individual plants. Instead the number of stems has been estimated for each subpopulation. The total number of stems estimated across known subpopulations in 2004 was about 6,000 (Table 1); fires in 2006 and 2007 are known to have killed > 95% of these standing stems, though post-fire suckering has occurred to varying degrees.

The species has a linear range of 85 km, an extent of occurrence of about 240 km^2, and an area of occupancy of about 6 ha

There is a reasonable likelihood of additional stands occurring within the taxon's known range. However, the survey effort is likely to be considerable due to the taxon's preference for mid-slope shrubby environments, and a more likely scenario is one in which the taxon is uncovered opportunistically during the course of ecological surveys.

RESERVATION STATUS

Polyscias sp. Douglas-Denison occurs within Freycinet National Park and Douglas-Apsley National Park, with approximately 50% of the total number of stems occurring in reserves.

CONSERVATION ASSESSMENT

Polyscias sp. Douglas-Denison was listed as vulnerable on the original schedules of the Tasmanian *Threatened Species Protection Act 1995* (under the name *Polyscias sambucifolia*), and up-listed to endangered in early 2008 as part of the Act's five-year review. At that time the species qualified for endangered under criterion B:

Area of occupancy estimated to be less than 10 hectares, and:

- known to exist at no more than five locations;

Table 1. Population summary for *Polyscias* sp. Douglas-Denison

	Subpopulation	Tenure	NRM region *	1:25 000 mapsheet	Year last (first) seen	Area of occupancy (ha)	Number of stems
1	Coles Bay	Public Reserve	South	Coles Bay	2014 (2007)	0.00001	12
2	Mt Peter	Freycinet National Park	South	Friendly	2015 (1998)	0.005	3 (100–200 in 2004)
3	Cape Lodi	Freycinet National Park	South	Lodi	2014 2008 (1995)	0.2	c. 550 (in 1999)
4	Denison Rivulet	Private land under covenant (& Douglas-Apsley National Park)	South & North	Bicheno	2015 2008 (1991)	2.2	c. 3,000 (in 1999)
5	Mt Allen (Douglas River)	Douglas-Apsley National Park	North	Seymour	2008 ^ (1991)	2.6	c. 2,500 (in 2004)
6	Scamander	Future Potential Production Forest (Crown)	North	St Helens	2017	0.5	c. 150

* NRM region = Natural Resource Management region; ^ taxon first recorded in the Douglas River area in 1850.

- a continuing decline inferred in area and quality of habitat and number of mature individuals due to ongoing threats.

THREATS, LIMITING FACTORS & MANAGEMENT ISSUES

Over-frequent fire and drought pose the greatest threat to *Polyscias* sp. Douglas-Denison, with land clearance a minor threat at one of the known sites.

Over-frequent fire & drought: The taxon is capable of regenerating vigorously after fire from root suckers, but few if any 'mature' stems survive even the coolest fire due to the taxon's thin bark. Colonies might be expected to decline when fire is more frequent than the time need for the adequate recovery of its resprouting organs, especially if compounded by drought.

The Mt Peter colony, the least mesic of those recorded to date, was burnt in early 2006, with just 5 of the original 100 to 200 stems surviving the fire itself. A flush of suckering followed but most of these died within two years due to drought, with just 1 sucker observed in early 2011 (c. 150 in 2007) and only 2 of the original stems (Plate 1).

The three largest colonies occur in areas that may be considered fire-protected, and it appears likely that colonies in more xerophytic environments may have been lost as a result of a relatively high fire frequency since European settlement in the early 1800s.

The fire history at the known sites is as follows: Coles Bay, April 2014, April 2005 and August 1994; Mt Peter, January 2006; Cape Lodi: January 2013, October 2004 and October 1993; Denison Rivulet: September 2007 and October 1994); Mt Allen: September 2007 with no fires recorded in at least the previous 30 years; Scamander: September 2007 (fire history data: www.thelist.tas.gov.au).

Land clearance: About half of all the known plants occur on private land to the south of Denison Rivulet, in an area that was under threat in the early 2000s from land clearance due to subdivision. This population is now protected by a Conservation Covenant under the Tasmanian *Nature Conservation Act 2002*.

Climate change & stochastic events: Any reduction in rainfall associated with climate change has the potential to exacerbate the taxon's already precarious hold at the two southerly sites (Mt Peter and Coles Bay). The low number of stems at these sites exposes the species to a high risk of local extinction due to chance events.

MANAGEMENT STRATEGY

What has been done?

The current fire management plans for Douglas-Apsley and Freycinet National Parks include provisions to manage for biodiversity, with particular reference to threatened species such as *Polyscias* sp. Douglas-Denison (Parks and Wildlife Service 1998, 2002).

That part of the Denison Rivulet population in Douglas-Apsley National Park is included within a priority fire suppression zone, as well as being off-limits to earth-moving equipment (Parks and Wildlife Service 1998). The rest of the Denison Rivulet population is on private property covered by a conservation covenant under the Tasmanian *Nature Conservation Act 2002*.

In early 2004 officers with the Tasmanian Parks & Wildlife Service and DPIPWE's Biodiversity Conservation Branch established a fire monitoring transect within the Mt Allen subpopulation. A transect was also established at the Mt Peter site in early 2006, the latter has been monitored at about two-yearly intervals in the period since.

Management Objectives

The main objectives for the recovery of *Polyscias* sp. Douglas-Denison are to prevent the inadvertent destruction of subpopulations, maintain the viability of subpopulations, and promote conditions for its successful recruitment.

What is needed?

Recovery actions necessary to decrease the extinction risk to *Polyscias* sp. Douglas-Denison include:

- liaise with the Tasmanian Parks and Wildlife Service's fire management section and Northern District to ensure the taxon's location and management requirements are known to field staff;
- give stands of *Polyscias* sp. Douglas-Denison priority protection in the event of wildfire;
- monitor known sites at five-yearly intervals to gauge the level of recruitment and/or plant loss;
- determine the taxon's reproductive capacity to inform future management prescriptions;
- monitor compliance with the Denison Rivulet conservation covenant and amend management prescriptions as required;
- survey for additional subpopulations in the Scamander/Douglas-Apsley/Freycinet area;
- provide information and extension support to relevant Natural Resource Management committees, local councils, Government agencies and the local community on the location, significance and management of known subpopulations and areas of potential habitat.

BIBLIOGRAPHY

Bentham, G. (1866). *Flora Australiensis: a description of the plants of the Australian territory. Volume III Myrtaceae to Compositae*. Lovell Reeve & Co., London.

de Salas, M.F. & Baker, M.L. (2016). *A Census of the Vascular Plants of Tasmania, including Macquarie Island.* (Tasmanian Herbarium, Tasmanian Museum and Art Gallery, Hobart) www.tmag.tas.gov.au

Gillespie, L.H., & Henwood, M.J. (1994). Temporal changes of floral nectar-sugar composition in *Polyscias sambucifolia* (Sieb. Ex DC.) Harms (Araliaceae). *Annals of Botany* 74: 227–231.

Henwood, M.J. (1986). The breeding system of the polymorphic *Polyscias sambucifolia* (Sieber ex DC.) Harms (Araliaceae). In: Williams, E.G., Knox, R.B., and Irvine, D., eds. *Pollination '86*. University of Melbourne, Melbourne: School of Botany, 70–78.

Henwood, M.J., Makinson, R.O., & Maling, K.L. (1999). 'Araliaceae', in N.G. Walsh & T.J. Entwisle (eds), *Flora of Victoria. Volume 4. Dicotyledons: Cornaceae to Asteraceae*, Inkata Press, Melbourne.

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

Parks and Wildlife Service (2002). *Freycinet Reserves Fire Management Plan.* Department of Primary Industries, Water and Environment, Hobart.

Rodway, L. (1903). *The Tasmanian Flora.* Government Printer, Hobart.

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

Prepared in 2007 under the provisions of the Tasmanian *Threatened Species Protection Act 1995*. Reviewed in April 2011 and July 2017.

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View:
www.dpipwe.tas.gov.au/threatenedspecieslists
www.threatenedspecieslink.tas.gov.au/

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

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