Allocasuarina duncanii

conical sheoak

TASMANIAN THREATENED FLORA LISTING STATEMENT

Images by Richard Schahinger

Scientific name: ***Allocasuarina duncanii*** L.A.S.Johnson & D.I.Morris, *Telopea* 5: 793 (1994)

Common Name: conical sheoak (Wapstra et al. 2005)

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

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

Environment Protection and Biodiversity Conservation Act 1999: **Not listed**

Distribution: Endemic: **Tasmanian endemic**

Tasmanian NRM Regions: **South**

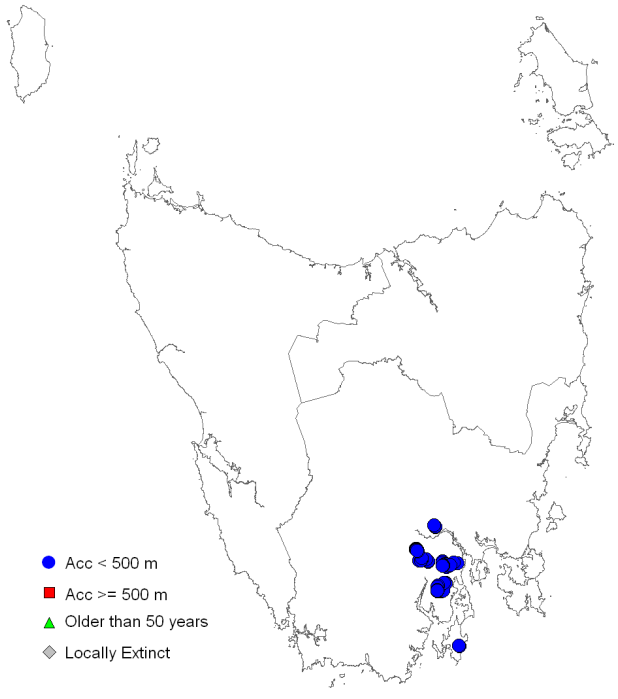

Figure 1. Distribution of *Allocasuarina duncanii*, showing Natural Resource Management regions

Plate 1. *Allocasuarina duncanii*: habit

SUMMARY: *Allocasuarina duncanii* is a small erect evergreen tree with needle-like foliage and woody seed-bearing cones, endemic to southern Tasmania. The species typically grows on shallow soils over dolerite at altitudes above 500 m, usually in association with *Eucalyptus delegatensis* or *Eucalyptus coccifera,* but may also form almost monotypic scrubs on rock pavements. The main threat to the species is an inappropriate fire regime (too frequent or a prolonged absence), though the fire history of sites supporting the species suggest that the risk is relatively low.

ECOLOGY AND IDENTIFICATION

Allocasuarina duncanii is a dioecious species, flowering mainly from late January to April, with pollination effected by wind. The species is serotinous, with fruit being held in the canopy in woody cones. Most fruit is released after the parent plant dies from the effects of fire, old age or disease, with a small proportion released continuously during the life of the plant. The fruit have winged appendages to assist in their dispersal, though most is likely to fall within the equivalent of one or two tree-heights of the parent plant. Plants tend to occur in even-aged stands as a result of mass germination after fire in ash-bed conditions, though patchy recruitment may also occur as a result of physical disturbance, for example, along tracks or where plants have been wind-thrown.

Survey techniques

Allocasuarina duncanii can be identified at any time of year.

Description

Allocasuarina duncanii is a dioecious small tree to 8 m high, erect and generally conifer-like in habit, with thin smooth bark (Plate 2). Its branchlets are stiffly ascending to 20 cm long; articles are 4 to 17 mm long, 0.9 to 1.4 mm diameter, smooth, furrows glabrous; phyllichnia flat, rounded or bluntly angled, leaves ('teeth') 7 to 9, appressed to slightly spreading, 0.8 to 1.5 mm long. Male plants have catkin-like flower spikes at the ends of the branchlets (Plate 3); the spikes are 7.5 to 25 mm long, with 6 to 8 whorls per cm, anthers c. 1 mm long. Female plants bear globular reddish flowers along the trunk and branches, followed by cylindrical woody cones, 1.5 to 6.5 cm long, 1.2 to 2.5 cm diameter, on peduncles 4 to 10 mm long (Plate 4); bracteoles obtuse, protuberances slightly shorter than the bracteole body. Fruit a winged nut ('samara'), 6 to 10 mm long, dark brown to black. (description from Johnson & Morris 1994, Schahinger 2002, Morris 2009)

Confusing Species

Allocasuarina duncanii may be confused with *Allocasuarina monilifera*. The latter species is mostly monoecious and lacks the conifer-like habit of *Allocasuarina duncanii*

Plate 2. *Allocasuarina duncanii:* trunk character

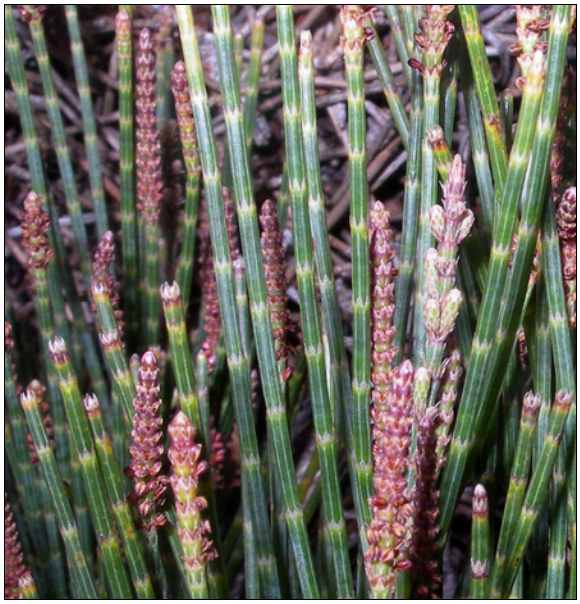

Plate 3. *Allocasuarina duncanii:* male flower spikes

DISTRIBUTION AND HABITAT

Allocasuarina duncanii is endemic to southern Tasmania (Johnson & Morris 1994). It is known from Mount Dromedary, the Wellington Range, Snug Tiers and South Bruny Island (Figure 1).

The species grows on shallow soils over dolerite, typically in association with *Eucalyptus delegatensis* or *Eucalyptus coccifera,* with two of the smaller sites on sandstone (Schahinger 2002). The species may also form almost monotypic scrubs on dolerite rock pavements, e.g., Billy Brown Falls, Mount Lloyd. Associated plants include *Acacia riceana, Banksia marginata, Epacris acuminata, Hakea lissosperma, Pultenaea juniperina, Pentachondra involucrata, Spyridium ulicinum* and *Westringia angustifolia.*

Allocasuarina duncanii has been recorded from sites 230 to 1000 m above sea level, though most sites occur above 500 m.

Plate 4. *Allocasuarina duncanii*: female plant with woody cones

POPULATION PARAMETERS

There are estimated to be 150,000 to 200,000 mature individuals in 12 subpopulations (Table 1). The linear range of the species is 82 km, the extent of occurrence 1060 km^2 (which includes areas of sea), and the area of occupancy 130 to 140 ha (Table 1).

Minor extensions to known subpopulations have been recorded since the census of Schahinger (2002), and new subpopulations have been discovered at Mt Lloyd and Mount Dromedary, the former at the western end of the Wellington Range, the latter the first known occurrence north of the River Derwent. It is highly likely that additional plants will be uncovered within the species' current extent of occurrence, with South Bruny Island in particular warranting a targeted survey effort.

RESERVATION STATUS

Mount Dromedary Conservation Area, Mount Midway Conservation Area, Russell Ridge Conservation Area, Snug Tiers Nature Recreation Area, Wellington Park.

CONSERVATION ASSESSMENT

Allocasuarina duncanii was listed as rare on the original schedules of the Tasmanian *Threatened Species Protection Act 1995*. At that time the species was known from only Snug Tiers, and was not known from any formal reserve.

THREATS, LIMITING FACTORS AND MANAGEMENT ISSUES

The main threat to *Allocasuarina duncanii* is an inappropriate fire regime, represented by either two fires in quick succession or the prolonged absence of fire.

Inappropriate fire regimes: The fruit of *Allocasuarina duncanii* is held in woody cones in the canopy until fire causes their release. Plants recruiting after fire may take several years to replenish the canopy-stored seed-bank, so that a second fire within say ten years of the first may limit further recruitment opportunities and lead to a decline in the population.

The fire history in areas supporting the species would suggest that this is an unlikely scenario: the last fire to have any substantive impact at Snug Tiers was in 1982 (Johnson & Morris 1994), while most of the others sites may not have been burnt since at least 1967. The exception is Mount Dromedary: plants on the mountain's western flanks were burnt in the Broadmarsh wildfire of 2002.

Table 1. Population summary for *Allocasuarina duncanii*

	Subpopulation	Tenure	NRM region	1:25 000 mapsheet	Year last (first) seen	Area occupied (ha)	Number of mature plants
1	Nicholls Rivulet (Snug Tiers)	Snug Tiers Nature Recreation Area	South	Cygnet	2012 (1993)	58.5	105 000 – 126 000
2a	Pelverata Falls (Snug Tiers)	Snug Tiers Nature Recreation Area	South	Huonville	2005 (1994)	12.1	4 500 – 6 000
2b	Slippery Creek Falls (Snug Tiers)	Snug Tiers Nature Recreation Area	South	Huonville	2012 (2012)	0.5	100s
3a	Perrins Ridge (Snug Tiers)	Snug Tiers Nature Recreation Area	South	Huonville	2001 (2001)	6.2	1 000 – 2 000
3b	East of Perrins Ridge	Private land	South	Huonville	2009 (2009)	unknown	7
4	Billy Browns Falls (Western Wellington Range)	Russell Ridge Conservation Area	South	Lonnavale	2001 (1999)	5.1	4 000 – 5 000
5	White Timber Mountain (Western Wellington Range)	Russell Ridge Conservation Area	South	Collinsvale	2001 (2001)	0.5	c. 1 000
6a	Long Marsh (Western Wellington Range)	Wellington Park	South	Longley	2013 (2001)	0.5	c. 100
6b	Halls Creek	Private land *	South	Longley	2009 (2008)		2
7	Cathedral Rock – Mt. Montagu (Eastern Wellington Range)	Wellington Park	South	Longley	2013 (1997)	11.7	4 500 – 6 500
8	Neika (Eastern Wellington Range)	Private land	South	Longley	2008 (1995)	0.1	13 – 15
9	Ridgeway	Private land	South	Taroona	1997 (1997)		2
10	South Bruny Island	Mount Midway Conservation Area	South	Fluted Cape	2001 (1995)		2
11	Mt Lloyd	Russell Ridge Conservation Area (& private land)	South	Lloyd	2014 (2013)	40 – 50	10,000s
12	Mt Dromedary	Mount Dromedary Conservation Area	South	Broadmarsh	2013 (2013)	1 – 2	100s – 1000s

Note: Subpopulations are defined as occurrences separated by distances of more than 1 km; each population may consist of more than one discrete stand (Schahinger 2002). Plant number estimates based on Schahinger (2002) unless specified.
* covered by a conservation covenant under the Tasmanian *Nature Conservation Act 2002*.

In the long-term absence of fire, say longer than 50 to 60 years, it is anticipated that plants may senesce and recruitment may be insufficient for population persistence. Recruitment may occur in areas subject to physical disturbance, for example along tracks and around tree-falls, but such recruitment is relatively minor compared with the mass recruitment events that follow fire.

Drought: Plants associated with rock pavements are susceptible to extended periods of drought, with stands at several sites affected during period 2005–2008 (eg, Mt Lloyd).

Dam construction: The damming of the upper reaches of Nicholls Rivulet in the 1990s led to the inundation of an unknown number of plants.

Climate change: Predicted climatic trends for the 21st century in areas supporting *Allocasuarina duncanii* include warmer temperatures and more extreme events (Grose et al 2010). The impact on the species is

difficult to quantify, though changes to fire frequencies may prove to be to its detriment.

MANAGEMENT STRATEGY

The main objectives for the recovery of *Allocasuarina duncanii* are to prevent the inadvertent destruction of populations, maintain existing populations, and promote conditions for successful recruitment.

What has been done?

Census: Extension surveys were conducted between 1999 and 2001 to determine the species' distribution and abundance (Schahinger 2002).

Seed collection: Seed has been collected from subpopulations at Snug Tiers and Mount Lloyd for long term storage at the Tasmanian Seed Conservation Centre (Royal Tasmanian Botanical Gardens, Hobart).

What is needed?

Recovery actions necessary to decrease the extinction risk to *Allocasuarina duncanii* include:

- 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 the known *Allocasuarina duncanii* subpopulations and areas of potential habitat;
- undertake surveys for additional subpopulations, focusing in particular on South Bruny Island (eg, rockplates inland of East Cloudy Head);
- investigate the species' recruitment needs and the relationships between stand structure and fire, in order to inform fire management of its habitat.

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