



Callitris oblonga subsp. *oblonga*

south esk pine

TASMANIAN THREATENED SPECIES NOTESHEET

Image by Mark Wapstra

Scientific name: *Callitris oblonga* Rich. & A.Rich. subsp. *oblonga*, *Comm. Bot. Conif. Cycad.* 49, t. 18 fig.2 (1826)

Common Name: south esk pine (Wapstra et al. 2005)

Group: vascular plant, gymnosperm, family **Cupressaceae**

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

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

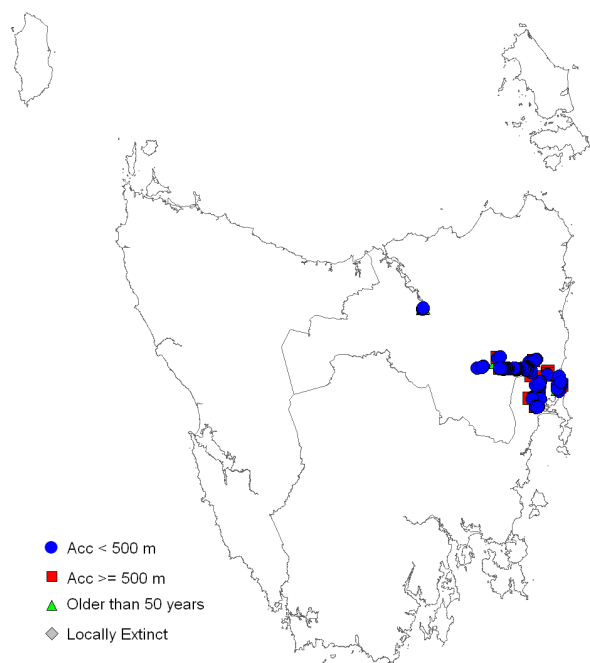


Figure 1. Distribution of *Callitris oblonga* subsp. *oblonga*, showing Natural Resource Management regions



Plate 1. *Callitris oblonga* subsp. *oblonga*: habit (image by Richard Schahinger)

SUMMARY: *Callitris oblonga* subsp. *oblonga* is a small coniferous tree endemic to Tasmania. It occurs in the State's central east on the margins of rivers, including the Apsley, St Pauls and South Esk. The species forms disjunct stands along these rivers. Many subpopulations are small, with the total population estimated to be fewer than 10,000 mature individuals. The species, which is mostly on private land, is subject to a range of historical and contemporary threats (land clearing, habitat modification, climate change), limiting factors (fire regimes) and management issues (weed control), all of which are exacerbated by a variable reservation status. The majority of occurrences would benefit from weed and fire management.

IDENTIFICATION AND ECOLOGY

Callitris oblonga subsp. *oblonga* is an evergreen monoecious conifer. Its life expectancy is unknown, though ages of at least 70 years have been noted (Harris 1989).

Pollen is released from the male cones of *Callitris oblonga* subsp. *oblonga* mostly between January and March, with a peak in February (Harris & Kirkpatrick 1991a). Pollination is effected by wind. The female (seed) cones mature and enlarge over three seasons before becoming strongly woody and ceasing to grow, and they may persist on the tree for decades. Seed is released in response to death or extreme stress, typically due to fire or flood (Harris & Kirkpatrick 1991a). Seed may be transported short distances by wind, the equivalent perhaps of a tree height, and in riparian situations may be propagated downstream by water flow. The species may regenerate from prolific seed fall after fire, though the plants themselves are killed.

Callitris oblonga subsp. *oblonga* is intolerant of shade, but is relatively frost tolerant, it can withstand waterlogging, and is considered to be drought tolerant (Harris & Kirkpatrick 1991a). Its stems are flexible and the seed cones tend to be clustered close to the main stems, features suited to surviving in a flood-prone riparian environment (Harris & Kirkpatrick 1991a).

Callitris oblonga subsp. *oblonga* is highly representative of its phylogenetic lineage in Tasmania, being one of only two native taxa in the *Callitris* genus in Tasmania, the other being *Callitris rhomboidea* (oyster bay pine), and one of six native taxa in the Cupressaceae family, five of which are endemic to the State (Baker & de Salas 2014).

Survey techniques

Surveys for *Callitris oblonga* subsp. *oblonga* can be conducted at any time of year due to its distinctive habit, foliage and fruit.

Description

Callitris oblonga subsp. *oblonga* is a tall shrub to small tree, usually 2 to 4 m high but it can reach up to 10 m with bole diameters of up to 25 cm. The branches are dense and erect, with bluish-green foliage (Plate 1). Juvenile leaves are needle-like, up to 9 mm long and spreading. Adult leaves are in whorls of three. They are scale-like and about 4 mm long, their keeled outer surfaces giving the branchlets an angular appearance. The male cones are solitary or occur in clusters of 2 to 5 near the tips of the foliage. They are ovoid, to 2 mm long, and the cone scales each have 2 to 6 pollen sacs on their under-surface. The female cones usually occur in clusters. They are sessile or on short, thick fruiting branches (Plate 2), ovoid, 18 to 24 mm long and 14 to 22 mm in diameter, with two whorls of thick woody scales, the inner three scales about twice as long as the outer ones. The female cones open to shed numerous (approximately 60) dark brown, two-winged seeds that are about 2 mm wide.

[description based on Curtis & Morris 1975, Harris & Kirkpatrick 1991a, Hill 1998]

Confusing species

Callitris rhomboidea has female cones that are rhomboid rather than ovoid in shape, and is generally much taller and open in habit than *Callitris oblonga* subsp. *oblonga* (Curtis & Morris 1975).



Plate 2. *Callitris oblonga*: female cones after fire
(image by Richard Schahinger)

DISTRIBUTION AND HABITAT

Callitris oblonga subsp. *oblonga* is endemic to Tasmania (Baker & de Salas 2014). It occurs in and adjacent to rivers in the Midlands and the east (Figure 1). The most extensive stands occur on the St. Pauls, Apsley and South Esk Rivers, with smaller stands on the Swan River, West Swan River, Cygnet River, Brushy Rivulet and Wye River. A non-riparian stand occurs on Tertiary ironstone gravels near Cranbrook. This stand may be a remnant of a once greater distribution in this lowland habitat which has been subject to clearance for agriculture (Harris 1989). There is a report of the species on the Meredith River dating to the mid 1800s (Harris 1989), some 5 km south of the nearest confirmed site on the Wye River.

The species occurs in a range of vegetation types, including woodland, scrub and shrubland dominated by *Eucalyptus*, the most common dominants being *Eucalyptus ovata* and *Eucalyptus viminalis*, followed by *Eucalyptus amygdalina* (Harris & Kirkpatrick 1991b). Associated shrubs typical of riparian occurrences include *Leptospermum lanigerum*, *Leptospermum scoparium*, *Hakea microcarpa* and *Acacia mucronata*.

The substrate ranges from recent alluvium, Jurassic dolerite, Permian mudstones and Tertiary sediments. The altitude range of

known sites is 5 to 260 metres above sea level, and the annual mean rainfall about 600 to 700 mm.

Callitris oblonga subsp. *oblonga* is the defining element of *Eucalyptus ovata* – *Callitris oblonga* Forest, an ecological community listed as Vulnerable on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (Threatened Species Section 2011). The species also occurs in three vegetation communities listed as threatened on the Tasmanian *Nature Conservation Act 2002*, viz., *Eucalyptus ovata* forest and woodland, Riparian scrub, and *Eucalyptus amygdalina* inland forest and woodland on Cainozoic deposits.

POPULATION PARAMETERS

The total population of *Callitris oblonga* subsp. *oblonga* was estimated in 1996 to consist of at least 4,000 mature plants in more than 30 stands (Barker & Johnson 1998). A few additional stands have been uncovered in the interim, bringing the total population to perhaps 6,000 mature plants (Table 1). The largest known stands occur on the St Pauls River and support one to two thousand trees each though stands are commonly of one hundred to a few hundred, and stands of just a handful of trees are not unusual.

Callitris oblonga subsp. *oblonga* is known from several river systems, most with one to several sites spread over up to 12 km. Some sites occur in relatively close proximity to one another along the same river system (e.g. those along the St Pauls, Apsley and Swan rivers), while others are geographically isolated from one another by relatively large expanses of unsuitable habitat (mainly cleared land). Taking these factors into account, the species can be considered to occur at about twenty locations (Table 1).

The linear range of the species is 109 km, the extent of occurrence 2,140 km², and the area of occupancy about 80 to 90 ha (Table 1).

Table 1. Population summary for *Callitris oblonga* subsp. *oblonga*

	Site	Tenure	NRM Region	1:25000 Mapsheet	Year last (first) seen	Area occupied (ha)	Number of mature plants
1	Barbers Creek	private	South	Lodi	1987	unknown	unknown
2	Hills Creek	Freycinet National Park	South	Lodi	2014	0.01	c. 600 [#]
3	Apsley River (Coles Bay Road)	private & Bush Heritage *	South	Lodi	2014 (1996)	3.8	1300 [^]
4	Apsley River (Lilla Villa Bridge east)	private	South	Bicheno	1996	0.2	15
5	Apsley River (Lilla Villa Bridge)	private	North	Bicheno	1996	0.2	30 [^]
6	Apsley River (Rosedale Road)	Private	South	Bicheno	1999	unknown	unknown
7	Apsley River (Apsley Gorge)	Douglas-Apsley National Park	South	Henry	1996	0.6	3 [^]
8a	South Esk River (Cataract Gorge - First Basin)	Launceston Council	North	Launceston	2010 (1996)	0.01 0.25	15 12 [^]
8b	South Esk River (Cataract Gorge - Second Basin)	Trevallyn Nature Recreation Area	North	Launceston	2009 (2001)	0.0001 0.0001	1 1
9a	South Esk River ('Llewellyn')	private	North	Hanleth	1996	3.25	48 [^]
9b	South Esk River ('Hanleth')	private	North	Hanleth	1987	20	286 [^]
9c	South Esk River (Bonneys Plains Road bridge)	private	North	Hanleth	1987	0.625	12 [^]
10	South Esk River (Rosiers Creek)	private	North	St Pauls Dome	1996	0.015	19
11a	St Pauls River (causeway)	private	North	St Pauls Dome	2006 (1996)	1.0 2.25	150 83 [^]
11b	St Pauls River (Milford Hole)	private	North	St Pauls Dome	1999 (1996)	0.1	137 119
11c	St Pauls River (China Cup Hills)	private	North	Roys	2006 (1996)	4.5 11	2000 506
11d	St Pauls River ('Glenair' bridge)	private	North	Roys	2006 (1996)	0.25 5.2	97 332 [^]
11e	St Pauls River (W of Baileys Marsh)	private *	North	Roys	2006 (1999)	0.8	900
11f	St Pauls River (Royal George west)	private *	North	Roys	2006 (1999)	2.3 1.5	318 297 [^]
11g	St Pauls River (Royal George east)	private	North	Roys	2006 (1996)	3 3	550 190 [^]
11h	St Pauls River (Graveyard Flat)	private	North	St Pauls Dome	2006 (1996)	2.4 0.72	37 63 [^]
11i	St Pauls River (Smiths Tier)	private	North	Henry	1996	4.25	150 [^]
11j	St Pauls River (Township Flat)	private *	North	Henry & St John	2006 (1999)	10	1500–1600
11k	St Pauls River ('Lochaber' river crossing)	private/road reserve	North	St John	1999 (1996)	0.3	80 50 [^]

	Site	Tenure	NRM Region	1:25000 Mapsheet	Year last (first) seen	Area occupied (ha)	Number of mature plants
11l	St Pauls River (Dickies Ridge)	Dickies Ridge Regional Reserve	North	St John	2006 (1996)	2	4 14 [^]
11m	St Pauls River (Nowhere Else)	private	North	St John	2006 (1996)	0.35	60 25 [^]
12a	Hop Pole Creek (Hop Pole Bottom)	private	South	Henry	1996	0.25	8 [^]
12b	Hop Pole Creek (Old Coach Road)	private	North	Henry	1996	0.01	60 [^]
13a	Swan River (Waters Meeting)	private	South	Apslawn	1996	0.005	10 [^]
13b	Swan River (5 km S of Cranbrook)	private	South	Cranbrook	1991	unknown	'several'
13c	Swan River (Ducketts Creek)	private	South	Apslawn	1996	0.0001	1 [^]
13d	Swan River (Ducketts Creek north)	private	South	Henry	1996	0.03	53 [^]
13e	Swan River (Wallaby Scrub Gully south)	private	South	Henry	1996	0.075	12 [^]
14	West Swan River	private	South	Apslawn	2010	0.001	3
15	Grange Road	private *	South	Cranbrook	2014 (1996)	0.1 0.15	90 300 [^]
16	Cygnets River	private	South	Cranbrook	2012 (1985)		1
17	Brushy River	private	South	Cranbrook	2012 (1980)		1
18	Wye River	private	South	Cranbrook & Swansea	2012 (1980)		4
19	Meredith River	private	South	Swansea	1850s	unknown	unknown

NRM region = Natural Resource Management region; # = all mature plants killed by fire in January 2013
 Sites ordered in upstream direction for river in question; ^ = stand recorded by Barker & Johnson (1997)
 * = covered by a conservation covenant under the Tasmanian *Nature Conservation Act 2002*

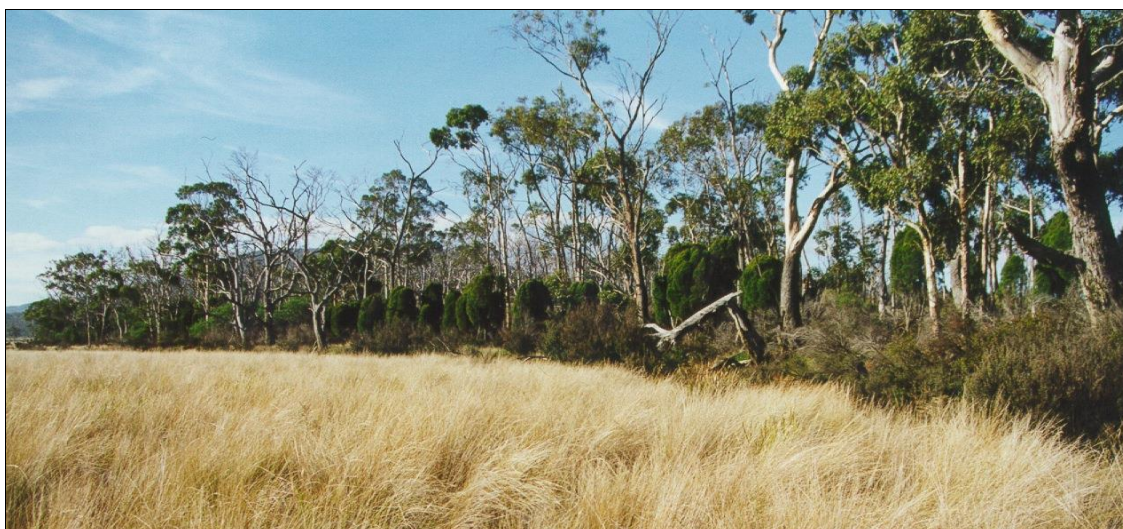


Plate 3. *Callitris oblonga* subsp. *oblonga* under *Eucalyptus orata* at Township Flats 1999
 (image by Andrew Zacharek)

Callitris oblonga subsp. *oblonga* has been relatively well surveyed as part of research projects (Kirkpatrick et al. 1980, Harris 1989), the development and implementation of recovery programs (Askey-Doran 1994, Barker & Johnson 1998, Zacharek 2000), botanical assessments of reserves and conservation covenants (North et al. 1998, North Barker & Associates 2001), as well as part of development proposals (e.g. a proposed dam on the upper reaches of the St Pauls River in 2006–2007).

The likelihood of the current known distribution of *Callitris oblonga* subsp. *oblonga* being its actual distribution is reasonably high. There have been few recent discoveries, and these have usually been minor infillings of the known range. It follows that the likelihood of the current population size estimate being accurate is also reasonably high. It is unlikely that the recording of additional subpopulations (or extensions to existing subpopulations) will alter the estimates of total population numbers by orders of magnitude.

The last census for *Callitris oblonga* subsp. *oblonga* was undertaken in 1996 (Barker & Johnson 1998). For the middle reaches of the South Esk River and the St Pauls River this was based in part on unpublished mapping undertaken by Harris (1989). Surveys to date have provided little information as to stand age or structure, with only the occasional reference to the presence of juveniles or regeneration. In addition, there has been little formal monitoring of the species at sites subject to on-ground management actions.

RESERVATION STATUS

Callitris oblonga subsp. *oblonga* has been recorded from Dickies Ridge Regional Reserve, Douglas-Apsley National Park, Freycinet National Park and Trevallyn Nature Recreation Area. Several private properties that support the species have conservation covenants in place under the *Tasmanian Nature Conservation Act 2002*, including significant stands along the St Pauls River and Apsley River (Table 1).

CONSERVATION ASSESSMENT

Callitris oblonga subsp. *oblonga* was listed as vulnerable on the *Tasmanian Threatened Species Protection Act 1995* in 1995, under the name *Callitris* sp. aff. *oblonga* (A.M. Gray HO 22495). It was assessed in 2015 as meeting criterion C1, having fewer than 10,000 mature individuals and an estimated decline of at least 10% within three generations (to a maximum of 100 years) due to the fire and gorse risk.

THREATS, LIMITING FACTORS AND MANAGEMENT ISSUES

The extent and abundance of *Callitris oblonga* subsp. *oblonga* in Tasmania is believed to have been much reduced since European settlement in the first half of the nineteenth century due to a combination of land clearing and an increased fire frequency (Harris & Kirkpatrick 1991a). Other threats identified at the time of the species' listing under the *Tasmanian Threatened Species Protection Act 1995* in 1995 included habitat degradation due to weed invasion and stock trampling, and inadequate reservation levels. Additional threats include inappropriate fire, hydrological changes at the local and catchment scale and climate change.

Land clearing: Historically, land clearance is believed to have had a major impact on the distribution of *Callitris oblonga* subsp. *oblonga* (Threatened Species Section 2011). The species is largely absent from the lower reaches of the South Esk and other river systems despite suitable climatic and edaphic conditions. This suggests that in the past the species could have been much more widely distributed (Harris 1989), probably reflecting the location of glacial refugia for *Callitris oblonga* subsp. *oblonga* in eastern Tasmania. The lower reaches of the South Esk have been extensively cleared for agriculture and have been subject to adverse fire regimes since European settlement. Land clearance of known sites is considered unlikely given the regulatory measures in place and the species' high profile.

Inappropriate fire: *Callitris oblonga* subsp. *oblonga* may germinate prolifically after fire leading to the production of even-aged stands (Plate 4). The species appears to require 5 to 10 years before it produces seed, and in consequence a fire frequency that kills the

species before it reaches maturity may eliminate it from a site. The most suitable fire regime for the species is one that is infrequent and small scale (Harris & Kirkpatrick 1991a). Fire will kill standing plants but will create open conditions suitable for regeneration. However, fire may also increase the abundance of competitive woody weeds such as gorse (Plate 1). The threat of fire is of most relevance to subpopulations on private property that are infested with invasive woody weeds, where their presence means that landowners may already be using fire as a management tool. Information on the fire history at recorded sites is, however, scant. The Milford Hole site along the St Pauls River was apparently burnt in October 1986, with Harris (1989) noting stags still standing, while there are anecdotal reports of a stand further upstream on the same river being partly burnt in 2012 (Stewart 2014, pers. comm.). Absence of fire from subpopulations in reserves is unlikely to pose a significant threat to the species.



Plate 4. *Callitris oblonga* subsp. *oblonga* at Hills Creek after fire in January 2013 (image from May 2014 by Richard Schahinger)

Weed invasion: The majority of stands have been invaded by weeds (gorse, willow, hawthorn, blackberry), or are vulnerable to invasion by such species. These weeds have the ability to invade habitat to the exclusion of native species. In the event of fire, the abundance of such weeds like gorse will increase and the regeneration success of *Callitris oblonga* subsp. *oblonga* is likely to be reduced (Barker & Johnson 1997). Willow infestations alter river hydrology causing waterlogging,

sediment build-up and problems for the dispersal of native species.

Stock: Stock grazing and trampling constitutes a direct physical threat to seedlings and new plants, as well as to other components of the species' habitat. Stock accessing water may erode riverbanks. Nutrification of soils may occur where stock congregate and weeds may be spread. This threat applies mainly to subpopulations on private property not subject to conservation covenants.

Hydrological changes: *Callitris oblonga* subsp. *oblonga* occurs predominantly in scattered stands within the flood zone of rivers, and hence the risk of destruction or damage to either the plants or the substrate is great though floods also provide opportunities for recruitment. Floodwaters may erode riverbanks and flood-borne debris is capable of wreaking significant damage. Fencing, often is a necessary part of managing the forest community, is also vulnerable to damage from floods. Water storage dams have the potential to destroy significant stands if constructed in or near occurrences. Damage can be from construction and the resultant impoundment, as well as from downstream impacts caused by limiting water availability and altering flows. A dam proposed for the upper reaches of the St Pauls River in 2006/2007, has not proceeded due in part to concerns over its impact on the area's natural values, including *Callitris oblonga* subsp. *oblonga*.

Stochastic risk: Some of the subpopulations occupy relatively small areas, exposing them to the risk of extinction through edge effects and chance events.

Climate change: Threatened Species Section (2011) noted that temperature rise and changes to rainfall and other climatic factors may affect the environmental range of *Callitris oblonga* subsp. *oblonga* in Tasmania, as well as increase the risk of stochastic events such as fire and flood.

MANAGEMENT STRATEGY

Management objectives

The main objectives for the recovery of *Callitris oblonga* subsp. *oblonga* are to prevent the loss or degradation of known subpopulations, improve

the species' quality of habitat and provide opportunities for regeneration.

What has been done?

Recovery programs: Recovery Plans for *Eucalyptus ovata* – *Callitris oblonga* Forest were prepared by Askey-Doran (1994) and Zacharek (2000). Australian Government funded projects managed by DPIPWWE operated from 1998 to 2002 to protect the forest community and its defining species *Callitris oblonga* subsp. *oblonga* where positive management results were deemed to be achievable. The basic aims of these projects were to foster an understanding of management issues with landowners and to undertake on-ground works, including weed control and the erection of stock-proof fencing. Funding specific to the recovery of *Eucalyptus ovata* – *Callitris oblonga* Forest ceased in 2003, though additional weed works have been carried out along the St Pauls River and Apsley River by the Northern and Southern NRM bodies in the interim. The recovery plan for the forest community was updated in 2011 (Threatened Species Section 2011).

Covenants: Several private properties along the St Pauls River that support *Callitris oblonga* subsp. *oblonga* are now covered by conservation covenants under the Tasmanian *Nature Conservation Act 2002*. These were promulgated by DPIPWWE's Private Forests Reserve Program from 2005 to 2007. A covenant is also in place on a property near Cranbrook that supports a stand of *Callitris oblonga* subsp. *oblonga* on ironstone gravels. Each property has prescribed management prescriptions to ensure that habitat for the species is maintained.

Surveys: The species has been relatively well surveyed (see previous discussion).

Seed collection: Seed has been collected from a stand along the Apsley River site (site 3 in Table 1) for long-term conservation storage at the Tasmanian Seed Conservation Centre (Royal Tasmanian Botanical Gardens, Hobart).

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.

- 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 habitat;
- improve the species' reservation status, especially in the upper reaches of the rivers on which it occurs, and/or develop management agreements with private landowners and public land managers;
- implement the Recovery Plan for the supporting vegetation community and incorporate the management requirements of the species into relevant reserve management plans and fire management plans;
- undertake regular monitoring at a selection of subpopulations to better understand the possible impacts of climate change, drought and other factors including fire regime and weed management activities.

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