



THREATENED SPECIES LISTING STATEMENT

Davies' wax flower, *Phebalium daviesii*

Hook.f. 1859

Status

Tasmanian *Threatened Species Protection Act 1995*

.....endangered

Commonwealth *Environment Protection and Biodiversity*

Conservation Act 1999.....Critically Endangered



Hans & Annie Wapstra



Description

Davies' wax flower is a shrub or small tree which grows up to five metres tall. It flowers between late September and mid January with seed developing from January to February. It grows in the riparian strip and major regeneration events appear to be associated with fire and floods.

The leaves of Davies' wax flower are fine, 2 to 3 cm long, parallel but widening at the ends and becoming distinctively bilobed. The upper leaf surface is dark green with a row of glands along each side. The underside is silvery, having a close covering of small scales. The small flowers are cream coloured and occur in clusters of 5 to 8 flowers. The five petals have brown glands on their backs. Stamens are about twice as long as the petals and protrude from the flower.

Davies' wax flower belongs to the family Rutaceae. It can be readily distinguished from related taxa by its non-fleshy leaves with a bilobed tip and silvery underside covered in small scales.

Distribution and Habitat

Davies' wax flower is endemic to Tasmania. It is currently restricted to 3 naturally occurring patches along 4.5 km of the George River near St Helens. These patches occupy only 0.03 hectares in total. The species was thought to be extinct until rediscovered in 1990. Several plantings have been made for conservation purposes in recent years using material propagated from cuttings. When fully established and self-perpetuating, these will extend the distribution of the species.

Davies' wax flower grows in a narrow valley in the flood zone close to the river. It occurs in riparian *Eucalyptus viminalis* woodland with an understorey of heath and wet sclerophyll species on generally

poor, coarse, granitic sands. The habitat is subject to occasional fires.

Important Locations

Pop No.	Sub pop No.	NVA id	Locality	1:25,000 mapsheet	Year last seen	Area (ha)	Number of mature plants
1	1.1	1020	George River near St Helens	St Helens	2007	0.5	12
	1.2	1021	George River near St Helens	St Helens	2007	0.5	1
	1.3	1040	George River near St Helens –	St Helens	2007	0.5	1
2		1041	Constable Creek, Georges Bay	St Helens, Pyengana	1892	Extinct	0

Threats, Limiting Factors and Management Issues

Despite dedicated searches for the species, Davies' wax flower is now known only from an extremely low number of individuals at one location (George River). The species is now extinct at Constable Creek and the George River population has declined from 55 mature individuals discovered since the early 1990s to only 23. The extreme rarity of the species coupled with a continuing decline makes the species extremely vulnerable to extinction. Despite the low number of individuals, the genetic diversity in the population remains relatively high, aided by the fact that flowers do not self-pollinate.

Several plantings have been made in recent years to reduce the risk of extinction by increasing the number of plants in existence and increasing the range of the species. As well as supplementing numbers on the George River in 1997 and 1998, the species was introduced into 3 new catchments in suitable habitat (Golden Fleece Creek, Bearhs Creek and Banticks Creek). These plantings cannot yet be considered to be established and the Bearhs Creek and Banticks Creek are suffering from browsing by native animals. The Golden Fleece Creek planting is close to Constable Creek from which the species was known in the late 19th century.

On the George River, most plants of Davies' wax flower occur on private land in two patches 200 m apart on opposite sides of the river. The patch on the western bank is adjacent to pasture and in the past, cattle have been a problem by trampling plants, restricting seedling development, affecting nutrient levels, and compacting soil. This is now fenced and a conservation covenant is in place to

restrict activities detrimental to the species. Exotic plant species are present in part of the habitat and the absence of stock may allow weeds like blackberries, (*Rubus fruticosus*) and gorse, (*Ulex europaeus*) to present a future threat. Weed management is an ongoing requirement at this site. The eastern side of the river is forested. Plants in this patch are not usually subjected to stock damage and the site is unfenced. The property is currently for sale and Davies' wax flower is at risk of a detrimental change in land use with change of ownership. A single plant was discovered several kilometres upstream in 2001.

Davies' wax flower produces large amounts of seed though little is known about germination requirements. Age estimates of mature plants are suggestive of major regeneration events after fire and as the habitat is subject to flooding, this process may stimulate germination as well as dispersal of seed. Flooding also causes significant direct damage to plants as well as undercutting and soil removal. The dramatic decline in plant numbers in 2001 appeared to be the result of plants being washed away in floods as well as significant storm damage caused by falling trees. This disturbance may lay the way for significant germination in the next few years and the population will need to be monitored closely. The population was last burnt in 1983 with the previous fire in about 1969.

Davies' wax-flower has been shown to be susceptible to the introduced soil-borne pathogen *Phytophthora cinnamomi* ('root rot') in laboratory conditions. Root rot is not evident in the population at present and care will need to be taken to avoid introduction. Any activities that involve the deliberate or inadvertent movement of soil will increase the risk of the pathogen being introduced to the site; e.g., firewood collection, weed control,

population monitoring. In addition, any clearance of riparian vegetation will allow soil temperatures to rise, thus increasing the likelihood of root rot expression.

As part of a community awareness program many plants of Davies' wax flower were planted in St Helens. A number of plants have also been distributed for planting in private gardens around the state as part of the conservation strategy.

Conservation Assessment

Population Estimate

A maximum of 55 mature plants of Davies' wax flower have been found since the rediscovery of the species on the George River in 1990 though numbers have now declined to 23 in 2001. Some immature seedlings can be generally found, ranging from approximately 60 in 1999 to 3 in 2001. The population will continue to be monitored closely in anticipation of germination stimulated by recent flood and storm disturbance. Three patches are known, currently with one mature plant several kilometres upstream from patches on the western bank and eastern banks of the river now holding 2 and 20 mature plants respectively.

Numbers on the western bank were supplemented with plants propagated from cuttings and planted in 1977 and 1998. Of these, 98 were alive in 2001. In similar plantings at 3 other sites, 224 plants have survived in total. These plants will be regarded as established once they are shown to be self-perpetuating.

Reservation Status

Davies' wax flower is not reserved. A conservation covenant is in place on one property title to protect the species.

Assessment Criteria

Davies' wax flower meets the criteria for listing as endangered on the Tasmanian *Threatened Species Protection Act 1995* because

- there are less than 250 mature individuals in total
- it is severely restricted, extending over an area of less than 500 square kilometres and occupying less than 10 hectares
- it occurs in only 1 location
- there is a continuing decline

It qualifies as Critically Endangered using the 1994 IUCN (World Conservation Union) Red List criteria.

Recovery Program

Objectives

- extend the known distribution and increase numbers through translocation and survey
- protect habitat from threats posed by grazing, weeds, fire and *Phytophthora cinnamomi*
- promote community awareness and develop mechanisms to manage populations in the long term

Existing Management

Implementation of the Recovery Plan for Davies' wax flower commenced in 1994 and is ongoing.

Actions Needed

- pursue management options with landowners/managers to protect populations against possible changes in land use that would be detrimental to the species
- continue monitoring for threats and declines and for an improved understanding of the recruitment process
- continue monitoring the progress of conservation plantings
- continue weed management in the wild and planted sites
- establish a mechanism to ensure management intervention when required
- further survey

Information Needed

- determine conditions favourable for recruitment and whether fire is required
- determine whether there are any more populations in existence

Management Advice

For the land owner/land manager

- regulate degradation to riparian vegetation
- minimise the risk of infection with *Phytophthora cinnamomi*
- consider some form of long-term protection, e.g. private nature reserve, management agreement or covenant, etc.

For everyone

- search for new populations, particularly in September and October when the plants are in peak flower
- help us to monitor the known and planted populations

Further Information

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

Specialist Advice: Mick Iłowski, Threatened Species Unit, Department of Primary Industries, Water and Environment

Source Material

References

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Prepared by: Mick Iłowski and Wendy Potts

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