Image by Richard Schahinger

Epacris moscaliana

seepage heath

TASMANIAN THREATENED SPECIES LISTING STATEMENT

Scientific name: ***Epacris moscaliana*** Crowden, *Muelleria* 25: 127 (2007)
Common name: seepage heath (Wapstra et al. 2005)
Group: vascular plant, dicotyledon, family **Epacridaceae**

Status: *Threatened Species Protection Act 1995*: **rare**
Environment Protection and Biodiversity Conservation Act 1999: **Not listed**

Distribution: Endemic status: **Endemic to Tasmania**
Tasmanian NRM Regions: **North, South**

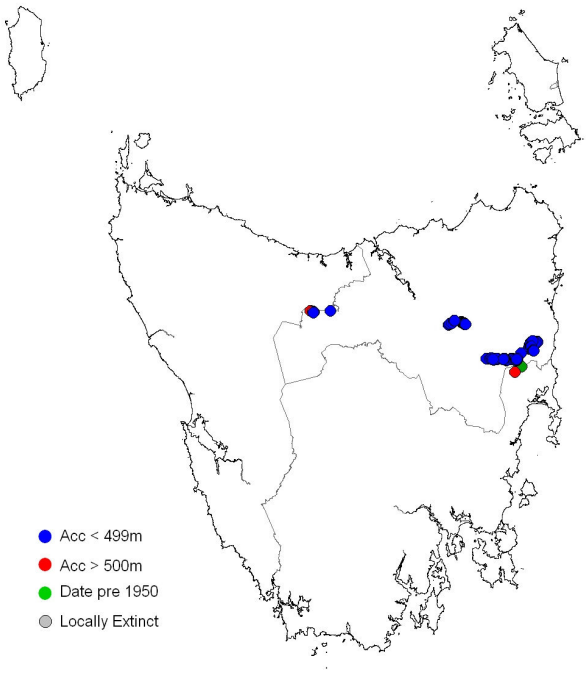

Figure 1. The distribution of *Epacris moscaliana*

Plate 1. *Epacris moscaliana*: flower detail (image by Richard Schahinger)

IDENTIFICATION AND ECOLOGY

Epacris moscaliana is a woody shrub in the Epacridaceae family, endemic to northern Tasmania (Crowden 2007). It grows up to 1.5 m tall and occurs in riparian, woodland, forest and rockplate habitats. The species is best identified during its flowering period, September to November.

Known pollinators of *Epacris* taxa include a variety of adult carrion flies from the families Tabanidae, Muscidae and Calliphoridae (Keith 1998). Fruit production for *Epacris* taxa depends on plant size, fire history and shading by the canopies of neighbouring plants, with up to several thousand seeds produced each year (Keith 1998). Fruit production is substantially reduced in shaded plants, with high rates of abortion among developing fruits. Other fruit losses may result from predation, browsing herbivores and mechanical damage.

Seed release is likely to peak in late summer and be completed by early autumn (Keith 1998). Dispersal is passive, and in non-riparian habitats very few seeds are likely to be dispersed more than a few metres from their parent plant. Seeds of plants in riparian habitat are potentially dispersed several kilometers downstream. The species is likely to produce a fraction of dormant and non-dormant seed each year, and therefore accumulates a persistent seed bank. Germination response to heat shock and smoke derivatives results in seedling emergence being cued to the occurrence of fire. The longevity of seeds is unknown, though Keith (1998) indicates that appreciable numbers of seeds survive for two years after release into the seed bank.

Seedling recruitment in non-riparian habitats is thought to require fire-related cues, whereas recruitment in riparian subpopulations occurs more continuously and may be linked to the occurrence of floods. Plant longevity and age at reproductive maturity have yet to be determined for the species.

Description

Epacris moscaliana is an erect much-branched shrub to 1.5 m high. Its leaves are well spaced on young branches, erect, flat and semi-spreading, 2.1 to 3.5 (–7) mm long, 1.3 to 2.9 mm wide, and range in shape from narrow lanceolate to oblanceolate to ovate or rounded, the apex broadly acute or obtuse with a short mucro. The midrib is very prominent on lower surface. The flowers are clustered in the axils of the top few leaves of the new season's branchlets, and are on long, bract-clothed pedicels, which bend and project the flowers out from the leaves. The flowers are white, tubular, solitary, and scattered along the upper parts of the branches in the leaf axils. The corolla tube is campanulate, 2.0 to 4.7 mm long with the corolla lobes being longer than the tube; the lobes overlap slightly at base, are spreading and have rounded apices. The stigma and anthers protrude from the corolla tube.

[description adapted from Crowden 2007]

Taxonomic issues

Epacris moscaliana encompasses part of the range of the taxon referred to as *Epacris exserta* in the *Recovery Plan – Tasmanian Forest Epacrids 1999–2004* (Keith 1998), as well as plants along the St Pauls River between Royal George and Avoca that were formerly included in *Epacris tasmanica* sens. lat. (Crowden & Menadue 1990, Crowden 2007).

Confusing species

Epacris moscaliana may be distinguished from *Epacris virgata* by the clustering of flowers at the branch tips and by its generally smaller, thickened leaves, and from *Epacris exserta* (Crowden 2003) by its smaller, ovate to rounded, shortly mucronate leaves (Crowden 2007).

DISTRIBUTION AND HABITAT

Epacris moscaliana is known from the headwaters of the St Pauls, Dukes and Coal Rivers in the Eastern Tiers, and also occurs along the mid to upper reaches of the St Pauls River, Swan River, Nile River and Mersey River (Figure 1). The linear range of the species is 160 km, extent of occurrence 2700 km^2 and area of occupancy 15 to 25 ha.

The species has been recorded from the following habitats: (1) the ecotone between wet scrubs and *Eucalyptus pauciflora/dalrympleana* forests in the headwaters of rivers at elevations of 500 to 600 m, as well as rocky (Jurassic dolerite) riparian situations downstream; (2) *Callitris oblonga – Eucalyptus ovata* forest on Quaternary alluvium at elevations of 220–240 m; and (3) moist south-facing rock plates on Ordovician conglomerates and sandstones at elevations of 600 to 700 m above sea level (Gog Range only).

Associated threatened species include *Boronia gunnii* along the upper reaches of the St Pauls River and Dukes River, *Acacia axillaris*, *Boronia hippopala* and *Stonesiella selaginoides* in the Horseshoe Marsh and Dukes Marshes areas, and *Bertya tasmanica* subsp. *tasmanica*, *Callitris oblonga* subsp. *oblonga* and *Spyridium lawrencei* along the middle reaches of the St Pauls River.

POPULATION ESTIMATE

Epacris moscaliana has been recorded from ten subpopulations, with individual subpopulations presumed to be discrete patches separated by discontinuities of at least 1 km (Keith 2000) (Table 1). The total population size is estimated to be between 50,000 and 70,000 mature individuals. The Dukes Marshes and Gog Range subpopulations are by far the largest, each with over 20,000 individuals recorded.

The discovery of three sizeable subpopulations in the past decade indicates that there is a reasonable likelihood that additional sites will be located given a well-resourced and targeted survey effort.

RESERVATION STATUS

Epacris moscaliana is reserved within Alum Cliffs State Reserve, Dogs Head Hill Forest Reserve, River Hill Forest Reserve, Mt Puzzler Forest Reserve and Swan River Forest Reserve.

CONSERVATION ASSESSMENT

Epacris moscaliana was listed as rare on the Tasmanian *Threatened Species Protection Act 1995* in early 2009, meeting criterion 4:

'... total population small or restricted and at risk in the form of 90% of mature individuals occur in 15 or fewer subpopulations or locations and no more than 5 of these occur in an area that is free from sudden processes capable of causing largely irreversible loss of individuals or habitat.'

THREATS, LIMITING FACTORS AND MANAGEMENT ISSUES

Land clearance & weed invasion: Subpopulations along the lower reaches of the Nile and St Pauls River are in areas that have had a long history of agricultural development since European settlement, a result of the areas' relatively rich alluvial soils. The consequence has been a fragmented and heavily weed-infested habitat along the respective rivers, surrounded by areas of improved pasture. Native vegetation remaining along the St Pauls River includes the nationally Vulnerable *Eucalyptus ovata – Callitris oblonga* forest community (Zacharek 2000, Threatened Species Section 2010a), as well as riparian scrub. An unknown number of *Epacris moscaliana* plants are likely to have been lost in these areas as a consequence of land clearance and competition from gorse and willow.

Future clearance of *Eucalyptus ovata – Callitris oblonga* forest and riparian scrub is considered unlikely, as both communities have legal protection under the Tasmanian *Nature Conservation Act 2002* (the former as a facies of '*Eucalyptus ovata* forest and woodland').

Inappropriate fire regimes: Plants in non-riparian habitats are dependent upon an appropriate fire regime for their long-term survival, though there is insufficient data to determine if any subpopulations have been lost to date. At present there are no fire management plans in place for any of the known subpopulations.

Disease: *Epacris moscaliana* has a demonstrated susceptibility to the exotic soil-borne plant pathogen *Phytophthora cinnamomi* in laboratory conditions (Barker 1994), though to date no symptoms have been observed in the field. Subpopulations considered most at risk are those in non-riparian situations.

Table 1. Population summary for *Epacris moscaliana*

	Subpopulation	Tenure	NRM region	1:25 000 mapsheet	Year last (first) seen	Area of occupancy (ha)	Number of mature plants
1	Dogs Head Hill (Mersey River)	Dogs Head Hill Forest Reserve	North	Gog	2007 (1983)	0.03	c. 70
2	Gog Range	Alum Cliffs State Reserve	North	Gog	2002 (2001)	4–5	20,000+
3	Nile River (lower)	Private land*	North	Evandale	2003 (1987)	0.02	c. 270
4	Nile River (upper)	River Hill Forest Reserve & State Forest	North	Stacks	2003 (2002)	1–5	100s–1,000s scattered over a 3.4 km length of river
5	St Pauls River (lower)	Private Land*	North	Roys, St Pauls Dome, Henry, St John	2007 (late 1800s)	1–5	100s–1,000s scattered over a 22 km length of river
6	St Pauls River (upper) & Dukes River	Mt Puzzler Forest Reserve, State Forest	North	St John & Fingal	2007 (1981)	4–5	1,000s scattered over a 9 km length of river
7	Horseshoe Marsh	State Forest	North	Fingal	2007 (1980?)	0.2	c. 7,000
8	Dukes Marshes	State Forest	North	Fingal	2007 (2003)	4–5	20,000+
9	Coal Marsh	State Forest	North	St John	2003 (1996)	0.05	c. 1500
10	West Swan River	Swan River Forest Reserve?	South	Roys	1980 (1980)		

* = part covered by a Conservation Covenant under the Tasmanian *Nature Conservation Act 2002*

Forestry activities: Seven of the ten known subpopulations are either partially or completely within areas managed by Forestry Tasmania and a number of these are within informal streamside reserves or Forest Reserves. Potential impacts from forestry activities that require consideration during planning and implementation include the potential to introduce and/or spread *Phytophthora cinnamomi* and activities in headwaters (particularly of the St Pauls, Dukes and Nile Rivers) that may lead to increased runoff and sediment load impacts on downstream subpopulations

Inundation & regulated river flows: It is likely that the small subpopulation along the Mersey River in Tasmania's central north has been impacted to some degree through the regulation of river flows via construction of the Parangana Dam in the 1970s some 15 km upstream (North Barker & Associates 2003). The subpopulation along the middle reaches of the St Pauls River may be at risk from changes to flow regimes associated with a proposed dam if not appropriately mitigated

MANAGEMENT STRATEGY

What has been done?

Weed control: Gorse eradication has been undertaken along the middle reaches of the St Pauls River and adjacent paddocks since the late 1990s via a number of projects funded by the Australian Government (e.g., 'Threatened Species Habitat Management along the St Pauls and Apsley Rivers'; Zacharek 2000). On-ground work has been carried out by Green Corps

volunteers, field staff of the Department of Primary Industries and Water and private landowners, as well as by volunteers organised by the Threatened Species Network. However, infestations continue to pose a threat to *Epacris moscaliana* and the integrity of the associated *Eucalyptus ovata – Callitris oblonga* forest community.

Disease management: *Phytophthora cinnamomi* management areas have been established at Gog Range and Horseshoe Marsh to protect *Epacris moscaliana* subpopulations (Schahinger et al. 2003). The two areas are managed by the Tasmanian Parks & Wildlife Service and Forestry Tasmania, respectively, the latter area being classified as a 'forest health' Special Management Zone under Forestry Tasmania's Management Decision Classification system (Orr & Gerrand 1998). Any planned developments or activities in these areas are subject to area-specific prescriptions, as well as compliance with established planning procedures (Schahinger et al. 2003). Similar provisions are in place for any proposed mineral exploration activities.

Conservation covenants: The Private Forest Reserves Program has secured conservation covenants under the Tasmanian *Nature Conservation Act 2002* for parts of those subpopulations along the lower Nile River and St Pauls River.

Seed collection: Seed has been collected from the Dukes Marshes subpopulation for long-term storage as part of the Millennium Seedbank (SeedSafe) Conservation Project, a joint project between Kew Gardens, the Royal Tasmanian Botanical Gardens, the Tasmanian Herbarium and the Department of Primary Industries and Water.

Recovery Plan: *Epacris moscaliana* is included in the *Draft Flora Recovery Plan: Threatened Tasmanian Forest Epacrids* (Threatened Species Section 2010b).

Management objectives

The main objectives for the recovery of *Epacris moscaliana* are to prevent the inadvertent destruction of subpopulations, maintain the viability of existing subpopulations, and promote conditions for its successful recruitment.

What is needed?

Recovery actions necessary to decrease the extinction risk to *Epacris moscaliana* include management strategies aimed at mitigating threatening processes such as disease, vegetation clearance, habitat degradation, weed invasion and adverse fire regimes. Proposed recovery actions include the following:

- 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;
- pursue increased security and improved management of subpopulations on private land through private land conservation programs;
- prepare and implement weed management plans for the middle reaches of the St Pauls River and Nile River;
- prepare and implement an ecological burning programme for marshes in the Eastern Tiers that support the species;
- addition of State Forest at Horseshoe Marsh and Dukes Marshes to the adjacent Mt Puzzler Forest Reserve (Barker 1994);
- undertake extension surveys to determine the species' full extent in the Eastern Tiers and the identification of management issues;
- collect seed for long-term conservation storage from all subpopulations;
- research to better understand the species' management requirements, including the significance of fire/smoke as a cue to germination and/or flowering, an examination of the species' life history attributes in its different habitats, the impact of regulated flow regimes on the species, the susceptibility of the species to *Phytophthora cinnamomi* in field conditions;

- undertake biennial monitoring of known subpopulations to determine the level of recruitment and/or plant loss and to better inform management prescriptions.

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

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