Image by Tim Rudman

Spyridium eriocephalum var. *eriocephalum*

heath dustymiller

TASMANIAN THREATENED SPECIES LISTING STATEMENT

Scientific name: ***Spyridium eriocephalum*** Fenzl in Endl. et al., *Enum. Pl.* 24 (1837) var. ***eriocephalum***

Common name: heath dustymiller (Wapstra et al. 2005)

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

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

Distribution: Endemic status: **Not endemic to Tasmania**
Tasmanian NRM Region: **North & South**

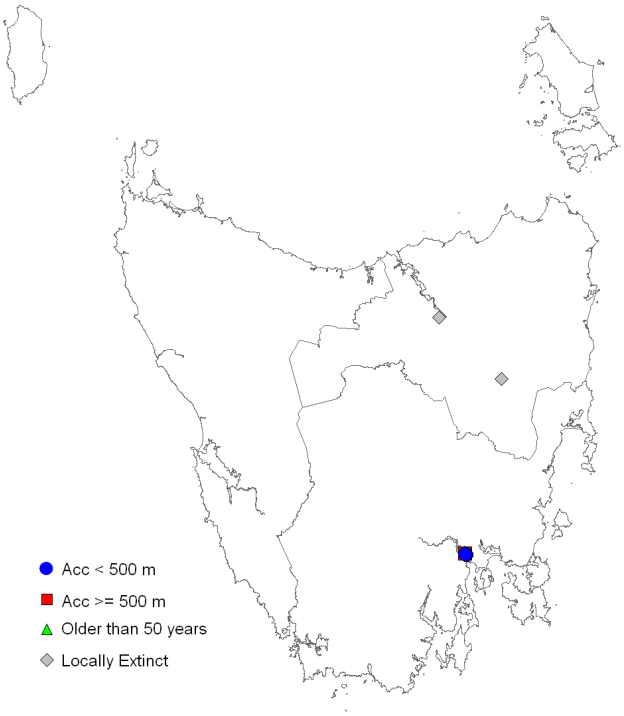

Figure 1. Distribution of *Spyridium eriocephalum* in Tasmania

Plate 1. *Spyridium eriocephalum:* habit (image by Tim Rudman)

IDENTIFICATION AND ECOLOGY

Spyridium eriocephalum var. *eriocephalum* is a small shrub in the Rhamnaceae or buckthorn family (Curtis & Morris 1975). It is known in Tasmania from a single population on the eastern shore of the River Derwent close to the State's capital, Hobart, where it grows in dry shrublands and eucalypt woodlands.

Flowering occurs from October to February. Seed is produced after one season's flowering, develops over winter and is not released until the following year (Visoiu & Wood 2011, pers. comm.), a characteristic shared by the allied taxa *Spyridium lawrencei* and *Stenanthemum pimeleoides* (Coates 1991). Seed is likely to be subject to physical dormancy.

High-level disturbance which affects the whole vegetation community has been suggested as the most appropriate management for rare Rhamnaceae species, with recruitment likely from a soil-stored seedbank, though the species' poor dispersal mechanisms may preclude invasion into undisturbed adjacent vegetation (Coates 1991).

Survey techniques

Surveys for *Spyridium eriocephalum* may be undertaken at any time of year, as the flower heads and floral leaves that serve to distinguish the species from other taxa in the Rhamnaceae family are retained on the plant.

Description

Spyridium eriocephalum var. *eriocephalum* is an erect to spreading shrub to 1.2 m high. Its leaves are spreading, linear, 3 to 14 mm long and 0.5 to 1 mm wide, with the apex tapered abruptly into a short, slightly recurved point. The leaf margins are revolute, hiding the lower surface; the upper leaf surfaces are hairless or slightly rough due to the presence of minute tubercles. Flowers are arranged in terminal, shortly pedunculate spherical heads 0.5 to 1 cm in diameter, the heads subtended by 1 to 3 floral leaves (similar to the stem leaves) and several broad brown papery (somewhat sticky) bracts. Perianth 2 to 3 mm long, white or cream, externally white-woolly. The fruit is a blackish-brown capsule about 2.5 mm long, separating into 1 to 3 one-seeded membranous fruitlets. (Curtis & Morris 1975, Walsh & Entwisle 1999)

Confusing species

None in Tasmania.

DISTRIBUTION AND HABITAT

The genus *Spyridium* is endemic to southeastern Australia, with about 30 species (Walsh & Entwisle 1996). On mainland Australia *Spyridium eriocephalum* var. *eriocephalum* is mostly confined to mallee regions of South Australia, Victoria and New South Wales. In Tasmania it is known to be extant at a single subpopulation within East Risdon State Reserve.

The species was first collected in Tasmania from the River Derwent area in 1804 by Robert Brown (Kellermann 2004), the extant site being less than 2 km from Brown's initial landing place at Risdon Cove. There are also historic collections from Tasmania's north along the South Esk River, including First Basin at Cataract Gorge (Table 1 & Figure 1). Curtis & Morris (1975) described the species' distribution in Tasmania as 'local in dry places at Risdon and in the east, north and north-west', mirroring the distribution cited by Rodway (1903), though there are no known collections to support the purported 'east' and 'north-west' occurrences.

At East Risdon the species grows on Permian mudstones in open shrublands or low open eucalypt woodlands, the two main patches being closely associated with Aboriginal middens, with abundant crushed and burnt shell (Jennings 1983). The dominant eucalypt is generally *Eucalyptus amygdalina* (black peppermint), with *Eucalyptus risdonii* (risdon peppermint) occurring at the small inland site. *Allocasuarina verticillata* (drooping sheoak) is also prominent at one site (Plate 2). Associated species include *Dodonaea viscosa* (broadleaf hopbush), *Bursaria spinosa* (prickly box), *Correa reflexa* (common correa), *Acacia genistifolia* (spreading wattle), the rare *Olearia hookeri* (crimsontip daisybush), *Lomandra longifolia* (sagg), *Dianella* spp. (flaxlilies), *Austrodanthonia* spp. and *Austrostipa* spp. (wallaby and spear grasses) and *Linum marginale* (native flax).

Table 1. Population summary for *Spyridium eriocephalum* var. *eriocephalum* in Tasmania

	Subpopulation	Tenure	NRM Region	1:25000 Mapsheet	Year last (first) seen	Area occupied (ha)	Number of mature plants *
1	East Risdon (4 patches)	State Reserve	South	Hobart	2011 (1804?)	0.003 0.22 0.10 0.0001	8 400±25 1500±200 1
2	Cataract Gorge, South Esk River	Unknown	North	Launceston	1880 (1878)	Presumed extinct	
3	South Esk River ('30 miles from Launceston')	Unknown	North	?	1842 (or earlier)	Presumed extinct	

NRM region = Natural Resource Management region; * area occupied & mature plant numbers are given for the four known patches at East Risdon, ordered from north to south.

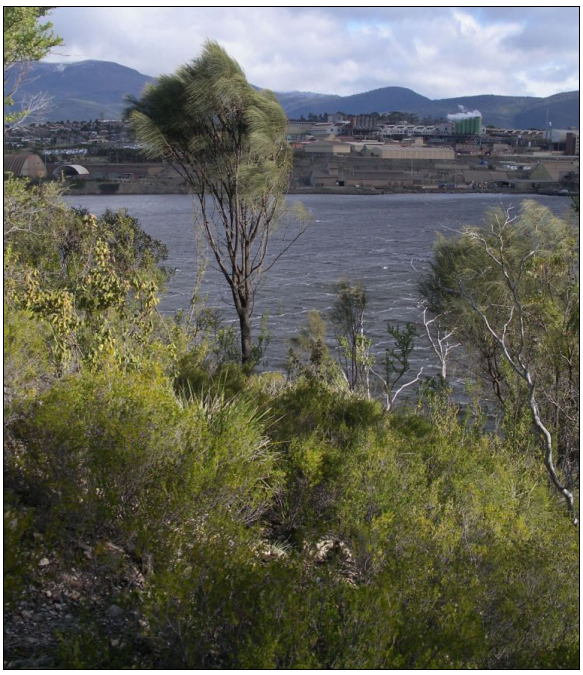

Plate 2. Habitat of *Spyridium eriocephalum* at East Risdon, with the River Derwent in the background (image by Richard Schahinger)

The aspect of the East Risdon sites ranges from west to northwest, the slope from 2 to 25 degrees, elevation above sea level from 5 to 130 m, while the majority of plants are within 150 m of the River Derwent. The mean annual rainfall is about 600 mm (with a winter maximum).

The linear range of the extant sites is 0.9 km, the extent of occurrence 0.27 km^2 (27 ha) and area of occupancy 0.3 to 0.4 ha (Table 1).

POPULATION ESTIMATE

Spyridium eriocephalum var. *eriocephalum* is known from a single population on Hobart's eastern shore at East Risdon. The bulk of the population occurs in two discrete patches about 100 m apart on either side of a small inlet (with c. 400 and 1500 mature plants, respectively), with a third patch of 8 plants some 500 m inland and a solitary plant 700 m to the south at Shag Bay (Table 1). A few seedlings were noted growing in the shelter of mature plants in a census undertaken in September 2011.

It is unclear if the species was more extensive along the banks of the River Derwent than is currently the case. Similar habitat lies to the south at Shag Bay and also Natone Hill, though it is considered likely that any plants in these areas prior to European settlement have been lost due to subsequent land clearance or grazing pressure by stock. Surveys of the greater East Risdon area have been undertaken by a number of botanists in recent years, and in consequence the likelihood of additional colonies being found is considered to be low.

There is no information as to the extent of the historic sites along the South Esk River in Tasmania's north (Table 1). Cataract Gorge has been surveyed extensively in the past decade (e.g., North-Barker Ecosystem Services 2010), with no sign of the species. The Gorge is home to an unusual array of native flora, including two other *Spyridium* species, the Tasmanian endemic *S. ulicinum* and the rare *S. vexilliferum*, the diversity being a presumed consequence of

the gorge's position downstream of the State's largest catchment, and it may be that the 'core' subpopulation of *Spyridium eriocephalum* was some distance upstream. The margins of the South Esk River have been subject to significant land-use changes since European settlement, with extensive areas subject to woody weed invasion (gorse in particular), so the chances of the species surviving are not high.

RESERVATION STATUS

Spyridium eriocephalum var. *eriocephalum* occurs in East Risdon State Reserve.

CONSERVATION ASSESSMENT

Spyridium eriocephalum var. *eriocephalum* was listed as rare on the original schedules of the Tasmanian *Threatened Species Protection Act 1995,* and uplisted to endangered in 2001 as part of the Act's five-year review. It satisfies criterion D2:

- total population with an area of occupancy less than one hectare, and typically in five or fewer locations that provide an uncertain future due to the effects of human activities or stochastic events, and thus capable of becoming extinct within a very short time period.

THREATS, LIMITING FACTORS AND MANAGEMENT ISSUES

Major threats to *Spyridium eriocephalum* include:

Inappropriate management: The species is confined to East Risdon State Reserve, an area of mostly intact native vegetation bounded by the River Derwent to the west and suburbia on the other sides. The reserve currently comprises 88 ha, with an extension to its north of 41 ha of unallocated Crown land likely in the near future (CLAC Project Team 2006). The reserve has long been recognised for its significant conservation values (Brown & Bayly-Stark 1979), supporting threatened vegetation communities listed in Schedule 3a of the Tasmanian *Nature Conservation Act 2002*, viz., *Eucalyptus risdonii* forest & woodland and *Eucalyptus amygdalina* inland forest & woodland on Cainozoic deposits. It also supports several State-listed flora species: *Eucalyptus morrisbyi* (morrisbys gum), *Eucalyptus risdonii*, *Olearia hookeri* and *Pomaderris pilifera* subsp. *talpicutica* (moleskin dogwood). Each of these species is endemic to Tasmania, with *Eucalyptus morrisbyi* also listed as Endangered on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

At present there is no management plan for the reserve. It would be beneficial for the conservation of *Spyridium eriocephalum* and the other listed species and vegetation communities to develop a plan for the Reserve that addresses potential threats to its natural values (as listed below).

Inappropriate fire regimes: The response of the species to fire is poorly known. A few plants at Shag Bay were burnt in March 2006 during a deliberately lit fire, with no sign of resprouting or recruitment from seed in the period since (the latter a possible consequence of the prolonged drought). The longevity of any soil-stored seed is unknown. Preferred fire intervals in the order of 8 to 20 years are considered likely given the dry shrubland-woodland habitat (Pyrke & Marsden-Smedley 2005), frequent low intensity burns being perhaps the greatest threat to the species. Parts of the reserve were burnt in 2003 and 2006, with a relatively high past fire frequencies in parts of the reserve (Brown & Bayly-Stark 1979), but the area supporting the *Spyridium* does not appear to have been burnt for at least 20 years.

Tracks and infrastructure: Two of the three sites at East Risdon are in close proximity to existing walking tracks or fire trails, with the potential for physical trampling and/or inadvertent destruction of plants during track maintenance or fire-fighting activities.

Woody weed invasion: East Risdon State Reserve is, at present, relatively 'clean' in terms of woody weeds. However, the introduced *Chrysanthemoides monilifera* (boneseed) and *Ulex europaeus* (gorse) have demonstrated their capacity to invade dry woodland communities on Hobart's urban fringe, with infestations to the north, east and south of the reserve, and if untreated represent a potential threat to the species.

Climate change: A warmer climate and longer periods of drought may adversely impact the species' habitat through effects such as an

increased frequency and intensity of fire events; the impact of drought in the mid-late 2000s was evident at the largest patch at East Risdon, with 10s of dead plants noted in the 2011 census.

Stochastic events: The localised nature of the species' distribution in Tasmanian means that there is a high risk of local extinction due to chance events, especially so for the southerly patch which occurs at the edge of a walking track.

MANAGEMENT STRATEGY

What has been done?

Survey & monitoring: The East Risdon population has been monitored at irregular intervals for health and signs of disturbance by DPIPWE personnel since about 2001, with a more formal census undertaken in September 2011 by TSS personnel with assistance from volunteers with the group Threatened Plants Tasmania (the census also included the establishment of baseline monitoring at one of the larger patches).

Site management: The site has been identified with the reserve's managers, the Tasmanian Parks and Wildlife Service, as being a priority for protection in the event of wildfire.

Seed collection: Seed was collected from the East Risdon population in 2006 and 2009 and lodged for long-term conservation storage at the Tasmanian Seed Conservation Centre at Hobart's Royal Tasmanian Botanical Gardens; germination and viability trials are underway. Several plants propagated from cuttings are growing in the Gardens' native plant section.

Management objectives

The main objectives for the recovery of *Spyridium eriocephalum* are to maintain the viability of the known subpopulation and promote conditions for the species' successful recruitment, and to increase the number of subpopulations through survey.

What is needed?

- continuation of long-term monitoring at the East Risdon sites to determine population trends and the need for active management;
- determine the species' response to fire and preferred disturbance regime;
- develop and implement a management plan for East Risdon State Reserve, with species-specific fire, track and weed management prescriptions (the latter to include regular checks of existing power line easements, fire trails and walking tracks);
- survey for subpopulations along the South Esk River, focusing on dry scrub or eucalypt woodland remnants on sediments;
- provide information and extension support to relevant Natural Resource Management Committees, local councils, government agencies, development proponents and the local community on the locality, significance and management of the known populations and potential habitat.

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Prepared in 2006 under the provisions of the Tasmanian *Threatened Species Protection Act 1995*. Revised in October 2011.

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

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

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