Isoetopsis graminifolia

grass cushion

TASMANIAN THREATENED SPECIES LISTING STATEMENT

Image by Richard Schahinger

Scientific name: ***Isoetopsis graminifolia*** Turcz., *Bull. Soc. Nat. Musc.* 24: 175 t.3 (1853)
Common name: grass cushion (Wapstra et al. 2005)
Group: vascular plant, dicotyledon, family **Asteraceae**

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

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

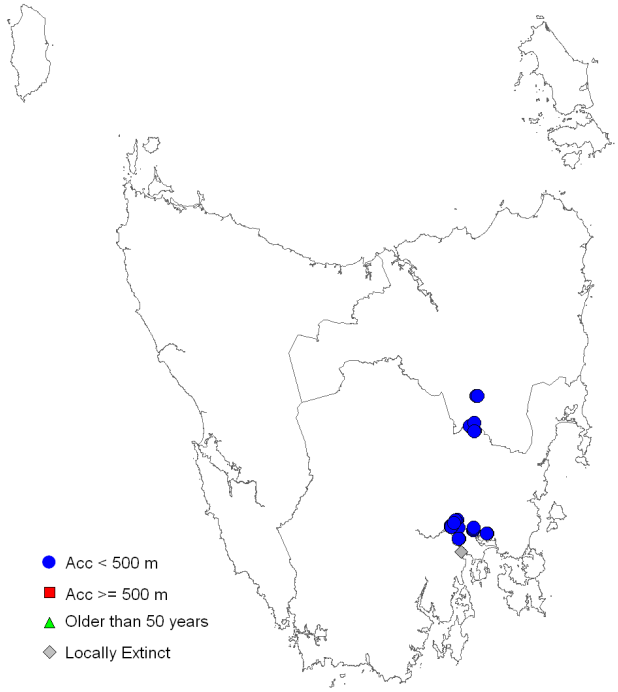

Figure 1. Distribution of *Isoetopsis graminifolia* in Tasmania

Plate 1. Habit of *Isoetopsis graminifolia* (image by Richard Schahinger)

IDENTIFICATION AND ECOLOGY

Isoetopsis graminifolia is a cryptic annual herb in the Asteraceae (daisy) family (Walsh & Entwisle 1999) that grows in native grasslands and on rockplates. Fire or light grazing of the species' grassland habitat may be beneficial, as it will maintain the gaps between tussocks and reduce competition from other plants. Seed of some ephemeral daisy species is known to persist in the soil for many decades. This allows species such as *Isoetopsis graminifolia* to emerge, at times in large numbers, in response to seasonally favourable conditions or the cessation of grazing.

Survey techniques

Surveys for the species should be undertaken during its peak flowering period, September to November. Due to the species' ephemeral nature the precise timing of surveys will be governed by seasonal conditions. This cryptic species can be difficult to detect in its grassland habitat when in low numbers. It may not emerge in drought conditions.

Description

Isoetopsis graminifolia is a tufted stemless annual herb with grass-like leaves to 50 mm long. Its flowers are crowded in heads of 12 to 20 florets at the base of the leaves (Plate 1). Each flower head is surrounded by 10 to 12 oblong floral bracts, which are thin, dry and 4 to 5 mm long. The outermost florets are female or sterile and the inner florets are male or bisexual. The fruit (a cypsela) is small and dry with leathery walls and a covering of long, soft hairs. The fruit is topped by a pappus of 8 to 10 chaffy scales.

[description based on Curtis 1963, Walsh & Entwisle 1999]

Confusing species

None.

DISTRIBUTION AND HABITAT

Isoetopsis graminifolia is found across Australia where it is reportedly widespread and common (Tremont 1995, Walsh & Entwisle 1999). In Tasmania it has a disjunct distribution, with occurrences in the Northern and Southern Midlands (Figure 1). In Tasmania, the species has a linear range of 95 km and an extent of occurrence of about 1,240 km^2. The area of occupancy is in the order of 10 ha (Table 1).

The species grows within native grasslands or rockplates (Plate 2), the underlying substrate being mostly Tertiary basalt or Jurassic dolerite. The elevation range of recorded sites in Tasmania is 20 to 360 m above sea level, with an annual rainfall of about 450 to 600 mm.

Isoetopsis graminifolia occurs within native grassland dominated by *Themeda triandra* (kangaroo grass). This is a facies of the ecological community 'Lowland grasslands of Tasmania' which is listed as Critically Endangered on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. Co-occurring threatened flora species include the nationally listed *Dianella amoena* (grassland flaxlily), *Glycine latrobeana* (clover glycine) and *Pterostylis ziegeleri* (grassland greenhood), and the State listed *Caesia calliantha* (blue-star lily), *Pultenaea prostrata* (silky bushpea), *Teucrium corymbosum* (forest germander) and *Triptilodiscus pygmaeus* (dwarf sunray).

Plate 2. Rockplate habitat of *Isoetopsis graminifolia* at Mt Direction (image by Richard Schahinger)

POPULATION ESTIMATE

Isoetopsis graminifolia has been recorded from fifteen locations in Tasmania, with the total number of plants in a good year likely to be in the millions (Table 1). Natural fluctuations of several orders of magnitude may occur from

Table 1. Population summary for *Isoetopsis graminifolia* in Tasmania

	Subpopulation	Tenure	NRM region	1:25 000 mapsheet	Year last (first) observed	Area of occupancy (ha)	Number of plants
1	Queens Domain	Hobart City Council	South	Hobart	1894 (1893)	presumed extinct	
2	Mt Direction (6 sites over 0.6 km)	Meehan Range Nature Recreation Area, Mt Direction Conservation Area	South	Richmond	2010 (2002)	0.03	10,000
3	Bakers Lane, Orielton	private land	South	Sorell	1992	unknown	unknown
4	Richmond (5 sites over 2 km)	private land	South	Tea Tree, Richmond	2008	0.5 0.003 0.004 0.009 0.050	1,000,000+ 200 150 100 300
5	Glen Quoin, Tea Tree	private land	South	Tea Tree, Richmond	1992	unknown	unknown
6	Brighton Industrial Estate	private land	South	Broadmarsh	2009	0.8	7000–70000
7	Brighton Transport Hub	Crown land (DIER)	South	Broadmarsh, Tea Tree	2009 (1991)	6–7	1,000,000+
8	Horses Head, Brighton	private land	South	Tea Tree	2009	2	4300–11300
9	Ford Road, Pontville	Crown land #	South	Tea Tree	2009 (1991)	0.1	300–400
10a	Pontville	private land	South	Tea Tree	2009 (1996)	unknown	600
10b	Pontville	Commonwealth land	South	Tea Tree	2009 (1996)	0.25	100,000+
11	Tunbridge	Township Lagoon Nature Reserve, private land	South	Tunbridge	2001 (1983)	unknown	50–100
12	One Mile Hill, Tunbridge	private land	North	Tunbridge	1992?	unknown	unknown
13	Tunbridge Tier Road	private land	North	Tunbridge	1995	unknown	unknown
14	Knobby Ridge, Tunbridge	private land *	North	Tunbridge	2005	unknown	10s
15	Merton Vale	private land **	North	Jacobs	2010	1	150–200

Recommended for Nature Reserve status (CLAC Project Team 2006);
* Covered by a conservation covenant under the Tasmanian *Nature Conservation Act 2002*;
** Covered by a vegetation management agreement under the Tasmanian *Nature Conservation Act 2002*;
DIER = Tasmanian Department of Infrastructure, Energy and Resources;
NRM = Natural Resource Management region

year to year in response to varying climatic conditions. There is no information available for several of the sites, and little information to indicate long-term population trends. The species is presumed to be extinct at Queens Domain (Kirkpatrick et al. 1988) and has not been recorded at the Township Lagoon site in recent times.

Several new subpopulations have been discovered in the past few years, most during the course of surveys for development proposals on private land, indicating that additional sites are likely to emerge given a targeted survey effort at the appropriate time of year. This is particularly true for this species, considering its cryptic nature.

RESERVATION STATUS

Isoetopsis graminifolia is reserved in the Meehan Range Nature Recreation Area, Mt Direction Conservation Area and Township Lagoon Nature Reserve. The Ford Road (Pontville) site is on Crown land that been recommended to become a Nature Reserve under the Tasmanian *Nature Conservation Act 1999* (CLAC Project Team 2006). Two of the subpopulations are on private land covered by either a conservation covenant or vegetation management agreement under the Tasmanian *Nature Conservation Act 2002* (Table 1), though note that the latter is for a five-year period only. A large subpopulation in the Brighton area (subpopulation 7 in Table 1) is in the process of being reserved under a provision of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, and another (subpopulation 8) may eventually be covered by a covenant as an offset for losses incurred in the development of an industrial estate near Brighton (which may impact upon part of subpopulation 6).

CONSERVATION ASSESSMENT

Isoetopsis graminifolia was listed as endangered on the Tasmanian *Threatened Species Protection Act 1995* when the Act came into being. At that time the taxon was known in Tasmania from just five or six locations (Table 1), with little in the way of population information.

The species was downlisted to vulnerable in October 2011, meeting criterion B as the area of occupancy is less than 50 ha, and

2c. a continuing decline is observed in area, extent and/or quality of habitat;

3d. there are extreme fluctuations in the number of mature individuals.

THREATS, LIMITING FACTORS AND MANAGEMENT ISSUES

Land clearance for agriculture, light industry and urban expansion poses the greatest threat to the species. The threat to potential habitat is exacerbated by the cryptic and ephemeral nature of the species as plants may not emerge or only emerge in low numbers in unfavourable years, evading detection during impact assessment surveys. Additional threats to the species include over-grazing, weed invasion and a lack of disturbance.

Land clearance: Much of the species' potential native grassland habitat in the Northern and Southern Midlands has been cleared and improved, with the extant subpopulations surviving in just a few remnants, typically in areas that have been too rocky to plough. Urban and light industrial expansion in the Brighton, Pontville and Richmond areas in the past decade continues to threaten the species' habitat.

Stock and weeds: Overgrazing is a potential risk to the species for sites on private land as the species is known to be highly palatable to sheep, and grazed sites are vulnerable to woody weed invasion (gorse, briar rose), posing a threat to several of the known sites (especially in the Brighton–Pontville area).

Lack of disturbance: The species requires open ground to germinate and recruit, which may be prevented if tussock grasses become rank. It is important to note that areas of native vegetation that have supported the species in the past remain potential habitat due to the probable presence of dormant soil-stored seed.

Stochastic events: The small size of some of the subpopulations exposes them to a high risk of extinction due to chance events.

MANAGEMENT STRATEGY

What has been done?

- Covenants and vegetation management agreements have been realised in the past few years for two private properties that support the species. These have been facilitated by the Department of Primary Industries, Parks, Water and Environment's Private Land Conservation Program.
- Areas of private land near Brighton that support the species were acquired by the Crown in 2009 as part of the Brighton Transport Hub development. They are to be managed for their natural values under an agreement between the Department of Infrastructure, Energy and Resources and the Commonwealth.
- Seed has been collected from the Mt Direction subpopulation and lodged for long-term conservation storage at the Tasmanian Seed Conservation Centre at the Royal Tasmanian Botanical Gardens.

Management objectives

The main objectives for the recovery of *Isoetopsis graminifolia* are to prevent the loss or degradation of known subpopulations, gain a better understanding of the species' ecological and management requirements and identify new subpopulations within the range of the species.

What is needed?

- monitor compliance with existing covenants and vegetation management agreements to ensure that prescriptions are appropriate for the species;
- encourage private landowners to consider protection and management of the species' habitat through perpetual covenants under the Tasmanian *Nature Conservation Act 2002*;
- undertake surveys to determine the status of known subpopulations that have not been visited in the past five years, in particular those at Orielton, Tea Tree and in the Tunbridge area;
- monitor known subpopulations for health, recruitment and response to disturbance;
- undertake extension surveys of potential habitat within the species' known range;
- 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 subpopulations and potential habitat.

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