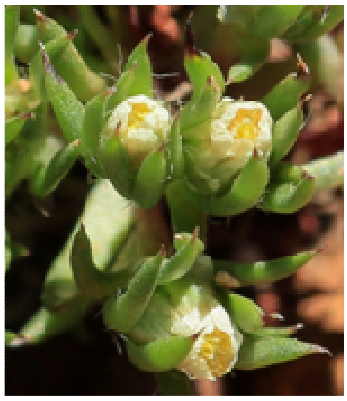

Image by Tim Rudman

Hyalosperma demissum

moss sunray

TASMANIAN THREATENED SPECIES LISTING STATEMENT

Scientific name: ***Hyalosperma demissum*** (A.Gray) Paul G.Wilson, *Nuytsia* 7: 85 (1989)
Common name: moss sunray (Wapstra et al. 2005)
Group: vascular plant, dicotyledon, family **Asteraceae**
Name history: *Helipterum demissum* (A.Gray) Druce

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 Regions: **North, South**

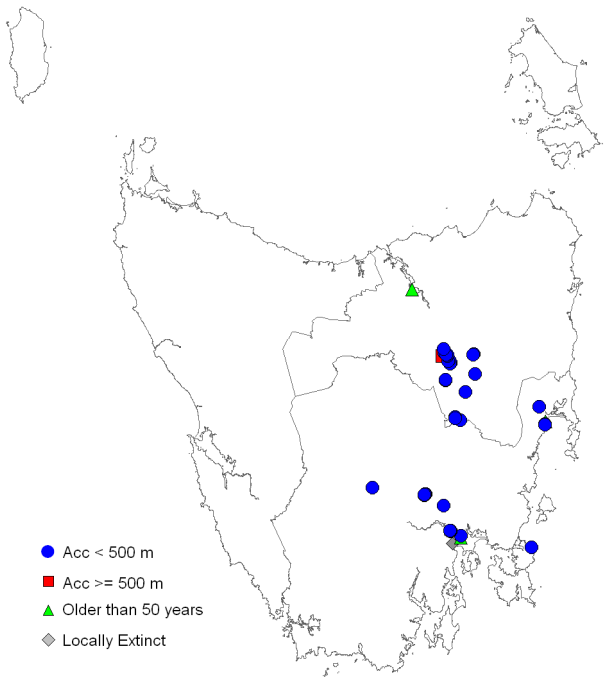

Figure 1. Distribution of *Hyalosperma demissum* in Tasmania, showing NRM regions

Plate 1. *Hyalosperma demissum* in flower (image by Tim Rudman)

SUMMARY: *Hyalosperma demissum* (moss sunray) is an annual herb in the Asteraceae (daisy) family. In Tasmania it occurs in small localised patches, growing on rock pavements, shallow stony soils and in dry sandy places, mostly in inland areas in the Northern and Southern Midlands. The species is likely to have been impacted in the past through agricultural expansion, while current threats include stock grazing/trampling, weed invasion and road construction. Given its ephemeral nature, the species is likely to have been overlooked during impact assessment surveys leading to loss of potential habitat. Grazing management would prevent the degradation of the habitat of some of the known occurrences.

IDENTIFICATION AND ECOLOGY

The persistence of an annual herb such as *Hyalosperma demissum* at a given site is dependent upon its soil-stored seed-bank and the availability of bare ground (Kirkpatrick & Bridle 2007). Bare ground may be maintained by the combination of skeletal soils and drought, with fire and browsing levels also contributing factors. Natural fluctuations in numbers of several orders of magnitude may occur from year to year, with germination, growth, flowering and fruiting likely to be reliant on the timing and intensity of autumn and winter rains. The length of flowering is also dependent upon seasonal conditions. The longevity of the soil-stored seed-bank is unknown, but given the species' observed persistence at sites through extended periods of drought, it is considered likely to be at least several years. The species is a known coloniser of disturbed areas such as tracks.

Survey techniques

Surveys for *Hyalosperma demissum* should be undertaken during its peak flowering period, late September to late October or early November. Due to the species' ephemeral nature the precise timing of surveys will be governed by seasonal conditions. The species can be difficult to detect when in low numbers, and it may not emerge during drought conditions.

Description

Hyalosperma demissum is a much-branched rounded annual herb, 5 to 20 mm high. Its leaves are opposite to alternate, linear-triquetrous, about 5 mm long and 0.2 mm wide, and acuminate (Plate 1). The flower heads are terminal, cup-shaped, about 3 mm long and glabrous. The involucral bracts occur in 3 to 4 series and are ovate to broadly oblong, the outermost ones 2 to 2.5 mm long, pale green to straw-coloured, and glossy. The 15 to 25 florets are bisexual. The corollas are narrow cylindrical and are very shortly 3- or 4-toothed. They are about 1.5 mm long including the anthers. The achenes (fruit) are obovoid, about 0.7 mm long and warty. There are about 10 pappus bristles which are equal in length to the corolla and plumose throughout.

[description based on Harden 1992, Walsh & Entwisle 1999]

Confusing species

Hyalosperma demissum may be confused with another diminutive annual daisy, *Siloxerus multiflorus* (small wrinklewort). The flowers of the latter species tend to be densely clustered so that they resemble a small cauliflower, and its fruit are surmounted by conspicuous white pappus scales rather than plumose bristles.

DISTRIBUTION AND HABITAT

Hyalosperma demissum is endemic to Australia, being found in New South Wales, South Australia, Tasmania, Victoria and Western Australia (Walsh & Entwisle 1999). In Tasmania the species is known from the Northern and Southern Midlands and the upper Derwent Valley, with outlying sites near the central east and southeast coasts (Figure 1).

Hyalosperma demissum grows on rock pavements or shallow sandy soils in some of Tasmania's driest regions (Plates 2 & 3), and also in scalded patches in *Eucalyptus amygdalina* heathy-grassy woodland. The underlying substrate is mostly Jurassic dolerite, with occasional occurrences on Triassic sandstone and also Cainozoic sediments with a laterite lag. The elevation range of recorded sites in Tasmania is 30 to 470 m above sea level, with an annual rainfall

range of about 450 to 600 mm. The species often co-occurs with other listed ephemeral species.

POPULATION PARAMETERS

Hyalosperma demissum has been recorded from 20 locations in Tasmania. While numbers may vary by several orders of magnitude from year to year in response to environmental conditions, the total number of plants in a favourable year is likely to be in the tens if not hundreds of thousands (Table 1). Little information is available to indicate population trends. Subpopulations tend to consist of small localised patches, making area occupied a better indication of extinction risk than plant numbers. The total area of occupancy is likely to be small (probably less than 10 ha) though reliable estimates are unavailable due to the patchy nature of occurrences. The species has a linear range in Tasmania of 146 km and an extent of occurrence of about 10,000 km^2 (Table 1).

Hyalosperma demissum was thought to be extinct in Tasmania as recently as the late 1980s (Kirkpatrick et al. 1988), known collections at that time being limited to the Meehan Range (1898) and Queens Domain (1908) in the State's south, Bradys Lookout (late 1800s) in the north, and Swansea in the central east (1881). Plants have been recorded at two of these sites in recent times, Swansea in 2007 and the Meehan Range in 2013, but despite numerous surveys since the mid 1980s it has not been relocated at Queens Domain (Table 1).

Several sites were discovered in the early 1990s during targeted surveys of rock pavements across Tasmania (Gilfedder et al. 1997). Ten of the 20 known sites have been discovered since the species' listing in 1995 and the discovery in 2013 of subpopulations on sandstone rock pavements in the Elderslie area has broadened the area of potential habitat for the species. As such, it is considered highly likely that additional sites will emerge given a well-resourced and targeted survey effort at the appropriate time of year.

Plate 2. *Hyalosperma demissum*: rock pavement habitat at Tom Gibson Nature Reserve (image by Richard Schahinger)

Plate 3. *Hyalosperma demissum*: rock pavement habitat at Mt Direction (image by Richard Schahinger)

Plate 4. *Hyalosperma demissum*: habit at Mt Direction (image by Richard Schahinger)

Table 1. Population summary for *Hyalosperma demissum* in Tasmania

	Subpopulation	Tenure	NRM region	1:25 000 mapsheet	Year last (first) seen	Area occupied (ha)	Number of mature plants
1	Bradys Lookout	unknown	North	Exeter	late 1800s	unknown	unknown
2	Powranna (north)	Powranna Nature Reserve	North	Nile	2012	0.01	100–300
3	Powranna (south)	private land	North	Nile & Cleveland	2009 (1991)	3 patches over 1.3 km	220–250
4	Hummocky Hills	private land	North	Delmont	1991	unknown	unknown
5a	Epping Forest (north)	Tom Gibson Nature Reserve (& private land*)	North	Cleveland	2013 (2012)	numerous patches over 5ha/2 km	10,000s
5b	Epping Forest (shearing sheds)	Tom Gibson Nature Reserve	North	Cleveland	2011 (late 1980s)	c. 1	1000–10000
6	Kingston Road	private land	North	Stanhope	2005	3 patches over 500 m	c. 1400
7	Blanchards Creek	private land*	North	Diamond	1999	0.1	20–30
8	Maitland	private land*	North	Conara	1999	unknown	unknown
9	Fosterville	private land	North	Jacobs	1995	unknown	unknown
10	Annandale	private land*	North	Tunbridge	1992	unknown	unknown
11	Tunbridge Tier Road (east)	private land	North	Tunbridge	1995	<0.001	unknown
12	Bluemans Creek	private land*	South	Cranbrook	2003	<0.001	500–1000
13	Swansea	road reserve (Crown)	South	Swansea	2007 (1881) #	unknown	100
14	Cluny Lagoon	private land	South	Ouse	1989	unknown	a few
15	Glovers Hill	private land	South	Tea Tree	2009	0.8	c. 700
16a	Heathy Hills (north)	Heathy Hills Nature Reserve	South	Elderslie	2013	numerous patches over 1ha/300 m	10,000s
16b	Heathy Hills (south)	Heathy Hills Nature Reserve	South	Elderslie	2013	0.03	1000s
17	Mount Direction	Mount Direction Conservation Area	South	Richmond	2013 (1995)	numerous patches over 1 ha/600 m	10,000s
18	Lagoon Bay	private land	South	Dunalley	2010 (1995)	0.06	100–1000
19	Meehan Range	private land	South	Hobart	2013 (1908)#	0.01	500–1000
20	Queens Domain	Hobart City Council	South	Hobart	1898	presumed extinct	

NRM Region = Natural Resource Management region
* covered by a conservation covenant under the Tasmanian *Nature Conservation Act 2002*
# recent records may not be from the same site but from the same locality

RESERVATION STATUS

Hyalosperma demissum is reserved within Heathy Hills Nature Reserve, Mount Direction Conservation Area, Powranna Nature Reserve and Tom Gibson Nature Reserve. Several subpopulations are on private land covered by conservation covenants under the Tasmanian *Nature Conservation Act 2002* (Table 1).

CONSERVATION ASSESSMENT

Hyalosperma demissum was listed as endangered on the original schedules of the Tasmanian *Threatened Species Protection Act 1995* following assessment by the Flora Advisory Committee (1994). A reassessment of the species' conservation status may be warranted, as the number of recorded sites has doubled since listing, with the three largest known sites in formal reserves and free of obvious threats. However, in the first instance surveys are required to determine the status of sites that have not been revisited in the past ten years, including plant numbers, area of occupancy, habitat condition and threats.

THREATS, LIMITING FACTORS AND MANAGEMENT ISSUES

Subpopulations of *Hyalosperma demissum* in Tasmania are subject to a wide range of threatening processes, including historical and contemporary depletion and modification of habitat through urban and industrial sprawl and agricultural expansion, inappropriate disturbance regimes from stock grazing and mechanical disturbance, road construction and maintenance, competition with weeds, changing climatic conditions, and stochastic events. The threat to potential habitat is exacerbated by the species' ephemeral nature, as plants may not emerge or only emerge in low numbers in unfavourable years, hampering detection during impact assessment surveys.

Stock and weeds: Trampling and grazing by stock represents a risk to the species for sites on private land, as does invasion by herbaceous weeds.

Road construction & maintenance: Two subpopulations were uncovered during surveys for proposed roads (13 & 15 in Table 1), and will require sensitive planning to ensure that the species' habitat is not directly or indirectly impacted. Indirect impacts include a likely increase in competing weeds and physical disturbance.

Climate change: The effects of climate change potentially threaten the species, with increased temperatures and an increase in extreme events possibly leading to a diminution of habitat and reduction in germination opportunities.

Stochastic events: The localised and ephemeral character of subpopulations exposes them to a high risk of extinction due to inadvertent or chance events.

Management objectives

The main objectives for the recovery of *Hyalosperma demissum* 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 has been done?

- Targeted surveys have been undertaken for the species in the period 2009 to 2013, with the discovery of new sites at Epping Forest to Powranna, Heathy Hills and the Meehan Range.
- Conservation covenants have been realised in the past decade for several private properties that support the species and other conservation values.
- Seed has been collected and lodged for long-term conservation storage at the Tasmanian Seed Conservation Centre based at the Royal Tasmanian Botanical Gardens in Hobart. Sampled sites include Mt Direction (2007), Epping Forest (2009) and Lagoon Bay (2010).

What is needed?

- undertake surveys to determine the status of subpopulations that have not been assessed in the past ten years;
- 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;
- monitor a subset of known subpopulations for health, recruitment and response to disturbance;
- undertake extension surveys of potential habitat within the species' known range;

- monitor compliance with existing covenants 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*.

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