Recovery Plan for *Pterostylis despectans* "Mt Bryan"

(Lowly greenhood)

Endangered Species Program Project ID 6115

Lofty Block Threatened Orchid Project

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National Parks and Wildlife SA
Government of South Australia

In partnership with

Threatened Plant Action Group

THREATENED SPECIES NETWORK 120 Wakefield St Adelaide 5000

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SUMMARY

Current Species Status

Pterostylis despectans (Mt Bryan) is currently seen as a form of *P. despectans*, (D. Jones, pers. comm). *P. despectans* is nationally endangered, 3E (Briggs and Leigh 1996) and has a disjunct distribution in Victoria and South Australia. In both states it is known from very small populations in a limited area and these are under threat. The only known South Australian population at Mount Bryan consisted of 133 individuals in 1999, of which 80 flowered. The extent of occurrence and area of occupancy in South Australia is less than one hectare. In Victoria it is known from only about half a dozen small colonies within a very limited area (Backhouse and Jeanes 1995) and it has recently been estimated that the total Victorian population numbers fewer than 150 plants (J. Todd, reporting from J. Jeanes pers. comm). One population recorded in 1984 (NRE VrotPop database, 1999) is now thought to be extinct.

Fewer than 300 plants of *Pterostylis despectans* are therefore known, from fewer than 7 populations and at least one population has probably become extinct in the past two decades, due to collecting.

According to the IUCN criteria the species may be Endangered depending on demonstrated decline in the Victorian populations, the number of locations and the total population size. (The total population may number fewer than 250 individuals (IUCN EN D) and may exist at no more than five locations (IUCN EN B1)).

Habitat Requirements and limiting factors

Pterostylis despectans (Mt Bryan) habitat is peppermint box woodland with a sparse herbaceous understorey. Such vegetation is generally grazed in the Mid North Region and is a threatened community. In Victoria, *P. despectans* occurs in grassy woodlands in the goldfields region that are similarly threatened by grazing. Urban development, mining and forestry have fragmented these habitats in Victoria.

Overall Recovery Objective

To increase the probability of survival of *Pterostylis despectans* in South Australia. Preventing the extinction of *P. despectans* (Mt Bryan) will help to maintain the national extent of occurrence of *P. despectans*, as will preventing extinction of populations in Victoria.

Specific Objectives

1. Increase the abundance of the species.
2. Maintain or increase the area of occupancy in South Australia.
3. Minimise the loss of genetic variability of the South Australian population.

Recovery Criteria

1. The extant South Australian population of *P. despectans* (Mt Bryan) is increased to at least 250 mature plants within five years.
2. The area of occupancy of the species in South Australia is at least one hectare in five years.
3. Seed from the South Australian population is collected and stored within two years

Actions Needed

1. Hand pollination to increase seed production.
2. Herbivore control to increase survival of seedlings and population of flower stems until pods mature:
   2.1. Fence the Mt Bryan population to exclude stock and kangaroos.
   2.2. Establish trials to determine appropriate management practices.
3. Trials to enhance seedling recruitment.
4. Searching for additional populations.
5. Seed collection and storage to minimise loss of genetic variability.
6. Liaison with Victorian researchers on national recovery plan to include data on habitat, threats and management practices in Victoria.
7. Monitoring at all known sites.
8. Management of the project through the Recovery Team.

Biodiversity Benefits

The habitat at Mount Bryan consists of peppermint box (*Eucalyptus odorata*) woodland with a sparse, mainly herbaceous understorey. This plant community is threatened in the Mount Lofty Ranges Region because it is not conserved and surviving examples are grazed by stock. Trials undertaken on management of *P. despectans* will provide information on the conservation of an example of this community and other associated species in the pastoral context, which will assist in establishing suitable management regimes in other areas of peppermint box woodland. Monitoring the population dynamics of *P. despectans* will assist in understanding the population dynamics of related species of greenhood.

ESTIMATED COST OF RECOVERY ($000'S)

	ACTION									
Year	**1**	**2.1**	**2.2**	**3**	**4**	**5**	**6**	**7**	**8**	**TOTAL**
2000	0.2	4.2	0.6	-	0.5	0.3	0.3	2.0	2.2	**10.3**
2001	0.2	0.1	0.3	0.4	0.5	-	0.3	2.0	2.2	**6.0**
2002	0.2	0.1	0.3	0.4	0.5	-	0.3	2.0	2.2	**6.0**
2003	0.2	0.1	0.3	-	0.5	-	0.3	2.0	2.2	**5.6**
2004	0.2	0.1	0.3	-	0.5	0.3	0.3	2.0	2.2	**5.9**
TOTAL	**1.0**	**4.6**	**1.8**	**0.8**	**2.5**	**0.6**	**1.5**	**10.0**	**11.0**	**33.8**

INTRODUCTION

Description

The *Pterostylis despectans* “Mount Bryan” taxon in South Australia appears to be a form of *P. despectans*. A specimen of the Mount Bryan form has recently been viewed by D. Jones, who concluded that it was *Pterostylis despectans,* possibly with a larger labellum. *Pterostylis* aff. *despectans* is a different form that occurs on the northern Eyre Peninsula in a different habitat type and is more widespread (Bates & Weber, 1990). However it is expected that this Eyre Peninsula form will be published as a separate species (Jones *pers. comm.*).

Pterostylis despectans (Nicholls) M. A. Clements et D. L. Jones is pictured in Backhouse & Jeanes (1995). *Pterostylis despectans* from Mount Bryan is shown in plate 163 of Orchids of SA (Bates & Weber 1990). It is a terrestrial herbaceous orchid that remains dormant underground as a tuber in late summer into early winter. In winter it develops a rosette of six to ten leaves. The flower stem is up to 50 mm tall with scaly bracts and 1-6 flowers produced in November. Flowers are pale, grey green to brownish, up to 15mm long on relatively long, slender, curved pedicels. In *Pterostylis*, the dorsal sepal and petals are combined into a hooded, column-embracing structure, the galea. The *P. despectans* hood and lateral sepals are tapered into long narrow pointed tips, and flowers are placed near the ground due to curvature of the flower stalks. The lateral sepals are joined in the lower part and reflexed against the ovary.

As described in Backhouse and Jeanes (1995), species such as *Pterostylis despectans* are very inconspicuous because they are small plants, with pale coloured flowers and the leaves shrivel up by the time flowers mature.

Distribution

P. despectans has a disjunct distribution in Victoria and South Australia. In both states it is known from very small populations in a limited area. All previous records in South Australia have been from an area of less than one hectare near Mount Bryan in the Northern Lofty Flora Region of South Australia (Figure 1).

In Victoria *Pterostylis despectans* is confined to the western goldfields area where it has been recorded in 4 grid squares (Backhouse & Jeanes 1995) (Figure 1). The species may have become extinct from Region 60 (the Wimmera) but this record is regarded as doubtful.

Population Size

Pterostylis despectans in South Australia is currently only known from one population of 133 plants. Monitoring has indicated that population size has been small in the past decade. Originally only one plant was known, but in September 1993, 6 rosettes were discovered. In 1995, 15 plants were reported (Bates, pers. comm.). In late spring 1997 the site was visited by R. Bates, who found 1 plant, following a dry winter. Searching in 1998, the third dry year in a row in the region, was unsuccessful. However, the low numbers counted in previous years may be a reflection of search effort, due to the difficulty of detecting the species (see description).

In August 1999, D. Bickerton and R. Bates sighted 133 rosettes. Of these, 79 plants were beginning to form inflorescence spikes, which indicates that the majority of the plants seen are mature.

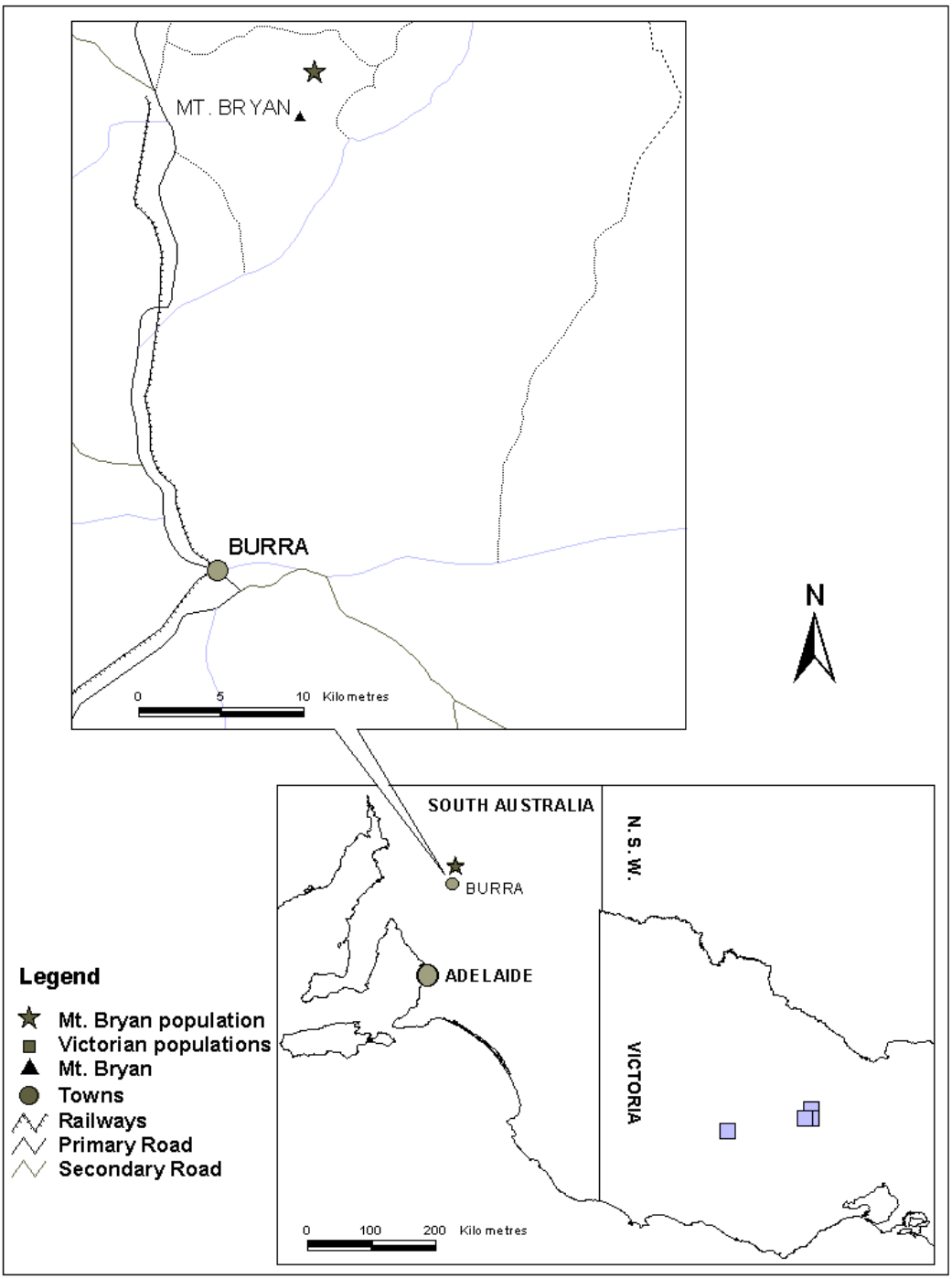

Figure 1: The location of the only known South Australian population of *Pterostylis despectans*, and its Victorian distribution.

Habitat

Pterostylis despectans occurs on gently sloping land north of Mount Bryan in *Eucalyptus odorata* woodland with sparse understorey dominated by native and exotic herbs. The soil is hard loam and the ground is stony with frequent rock outcropping. Co-occurring plants are listed in Appendix 1. NB One documented population of *P. despectans* in Victoria occurred in grazed woodland that is structurally similar, with similar soil attributes (NRE VrotPop database, 1999).

Life history / Ecology

Like other orchid species, *Pterostylis despectans* is believed to live in symbiosis with a mycorrhizal fungus, from which it derives phosphorus (Warcup in Bates & Weber 1990). Mycorrhizae generally invade the embryo or root system of juveniles in the very early stages of development and remain there for the life of the plant. Rosettes develop in winter to early spring; the leaves wither before the flower spike matures. *P. despectans* (Mount Bryan) flowers from late October into summer (Bates & Weber 1990). Flowering plants produced between one and nine buds each in 1999. The development of flowers on any one plant was staggered, so that at any one time usually only one or two flowers would be open. This is typical of multi-flowered *Pterostylis* taxa. Most *Pterostylis* taxa are pollinated by flies or fungus gnats (Bates and Weber 1990) and pollinia are concealed inside protective shells to deter non-pollinators.

This group of greenhood species typically does not form colonies, and plants produce only one replacement tuberoid each season. Therefore reproduction from seed is important.

Backhouse and Jeanes (1995) report that seedlings of *P. despectans* have been raised symbiotically at the Plant Biodiversity Research Centre, Canberra.

Reasons for Conservation Status

In South Australia the species has an extremely restricted distribution (less than one hectare). It is only known from a single population and the total number of plants was only 133 in August 1999.

Current threats

- There appears to be a very low pollination rate in the South Australian population (see table 1).
- ***Herbivory:*** The Mount Bryan population is on cattle and sheep grazing land near a dam. All mature plants were monitored in 1999. Eleven percent was recorded as having been grazed, and over 50% of those seen on the first visit were not found on subsequent visits (see Table 2). It is possible that many of those unaccounted for had also been grazed. Attrition of both plants and flowers was observed throughout the season.

NB Similar threats have been reported from Victoria (Backhouse and Jeanes, 1995), where one documented population of *P. despectans* in Victoria was also threatened by other activities due to its proximity to urban areas (NRE VrotPop database, 1999). Threats listed in Victoria: rabbits, sheep grazing, collecting, off road vehicles and rubbish dumping, mining and soil erosion, alien grasses (*Briza* and *Vulpia*).

Table 1: Stage of development of *P. despectans* flowers monitored near Mt. Bryan in 1999.

Date	Mature Plants	Total No. Buds / Flowers	Buds	Aborted Buds	Flowers	Uncertain	Pollinated	Spent	Eaten
28.10.99	43	154	98	3	43	1	-	5	4
25.11.99	30	79	16	1	17	1	7*	37	-
28.12.99	13	46	-	-	1	-	6	37	2

"Uncertain" indicates that it was unclear whether the flower was spent or pollinated.
**Hand pollination may account for all pollinated flowers.*

Table 2: The number of flowering *P. despectans* at Mt Bryan in August 1999 and on subsequent visits.

Date	Flowering Plants Sighted	Grazed	Not Found	Total
16.8.99	79			79
28.10.99	43*	3	34	80
25.11.99	30	9	41	80
28.12.99	13	1	66	80

* *One plant that had not begun to form an inflorescence at the time of the first visit was flowering by the time of the second visit.*

Existing Conservation Measures

The Mount Bryan population has been monitored in 1993, 1995, 1997 and 1999. One of the two flowering survivors was hand pollinated in 1993 (NOSSA Journal, 1994). Plants were pollinated by hand in 1999 (cross-pollinated). The landowner has been informed of the location of the population. The vicinity has been searched unsuccessfully up to a distance of 200 metres from the population for additional plants.

At the time of print the authors were not familiar with the full extent of conservation measures in Victoria. However it is evident that some populations are being monitored, and it is known that one population is found on land that is under covenant.

Strategy for Recovery

Over the next five years the majority of the known population in South Australia will be enclosed within a fence and management trials will be conducted in collaboration with land managers. These trials will examine the effect of grazing, soil crust and litter levels, weed invasion and hand pollination on population size, area of occupancy and recruitment. Seed will be collected to preserve genetic variability should the species become extinct in the wild in South Australia. The Recovery Team will consider the need to raise seedlings from the seed collected at Mount Bryan. Land managers and community groups will be trained in monitoring to ensure that this is ongoing. Searching for new populations will continue.

RECOVERY OBJECTIVE

To increase the probability of survival of *Pterostylis despectans* in South Australia.

Specific Objectives

1. Increase the abundance of the species.
2. Maintain or increase the area of occupancy in South Australia.
3. Minimise the loss of genetic variability of the South Australian population.

Preventing the extinction of *P. despectans* (Mt Bryan) will help to maintain the overall national extent of occurrence of *P. despectans.* Preventing the extinction of the species in Victoria will also contribute to this objective.

RECOVERY CRITERIA

1. The South Australian population of *P. despectans* (Mt Bryan) is increased to at least 250 mature plants within five years.
2. The area of occupancy of the species in South Australia is at least one hectare in five years.
3. Seed from the South Australian population is collected and stored within two years

RECOVERY ACTIONS

The recovery actions will be directed towards threat abatement to prevent the extinction or decline of the population at Mount Bryan, and trials of appropriate management regimes with the aim of increasing abundance and area of occupancy.

Given that this population appears to be isolated, it cannot be considered to be viable at its current size. To increase abundance and area of occupancy, flowers must survive to be pollinated, pollination must occur, seeds must be produced and survive the summer. Environmental conditions must be suitable for seed germination and seedling establishment. Seedlings must survive to maturity to ensure their replacement. Intervention can take the form of hand pollination to increase seed production, herbivory control to improve the survival of seedlings and flowers, and trials to investigate the conditions required for seedling establishment (e.g. soil scarification, weed control).

Actions Needed

1. Hand pollination

Currently the known size of the Mt Bryan population is 133 plants, of which 80 may be mature and no natural pollination was recorded in 1999. If the population size is to be increased, pollination and seed set must occur. Fragmentation and degradation of suitable habitat for the species may have caused a decline in pollinator numbers. The long-term solution to this problem is to improve habitat quality and thus provide more food sources for the pollinator, and to increase habitat connectivity and thus improve the viability of pollinator populations. However, in the interim a more direct and efficient method for *P. despectans* (Mt. Bryan) is to hand-pollinate a proportion of the flowers. Flowers will be hand pollinated by experienced persons and trained volunteers according to guidelines devised by the Recovery Team.

ACTION 1 – Cost Estimate ($'000s)					
Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
0.2	0.2	0.2	0.2	0.2	1.0

2. Herbivore control

The aim is to minimise the incidence of herbivory on the Mt Bryan population, thereby allowing more flowers to be pollinated and seed set. Although mature *P. despectans* develop up to nine flowers each year, as many as 66 of the 80 mature plants sighted in 1999 were lost and may have been eaten by herbivores (Table 2). Such an impact greatly reduces the opportunities for natural pollination to occur. The population is located in a paddock where sheep graze, but also about 300 kangaroos inhabit the area according to the landholder.

2.1. Fence the Mount Bryan population

The population at Mount Bryan occupies an area of less than one hectare. One exclosure will be established surrounding most of the population to exclude stock and kangaroos. Further liaison with the landholder is required.

ACTION 2.1. – Cost Estimate ($'000s)					
Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
4.2	0.1	0.1	0.1	0.1	4.6

2.2. Establish management trials

Grazing has an impact on the population directly and also indirectly through influencing its habitat. Trials are needed to investigate the impact of grazing on weed competition, litter levels and lichen crust. The herbivore exclosure will be used for such trials.

ACTION 2.2 – Cost Estimate ($'000s)					
Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
0.6	0.3	0.3	0.3	0.3	1.8

3. Trials to enhance seedling recruitment

The Recovery Team will consider the option of collecting seed for recruitment enhancement. Although a *Pterostylis* pod contains many hundreds of seeds, few of them germinate and establish as mature plants. *P. despectans* seeds are released in summer, but do not germinate until the winter rains. In the meantime they face the risk of being eaten or being dispersed by water or wind to unsuitable sites. Two options of will be investigated, and if found suitable, protocols will be produced.

The Recovery Team will investigate (and implement if suitable) the option of collecting seed from developed pods in summer and spreading it in the immediate vicinity of other *P. despectans* individuals in early winter. By waiting until winter to distribute the seed, much less is taken as a food source, or blown or washed away.

Ex situ cultivation may also be considered. *Pterostylis spp.* are considered relatively easy to cultivate (Bates & Weber, 1990) and generally can be propagated either from seed or by tuberoid. Seedlings of *P. despectans* have been raised symbiotically at the Plant Biodiversity Research Centre, Canberra (Backhouse and Jeanes, 1995).

ACTION 3 – Cost Estimate ($'000s)					
Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
-	0.4	0.4	-	-	0.8

4. Search for additional populations

The aim in searching for new populations is to increase the known extent of occurrence of the species. The Project Officer will consult with landowners in the general locality of

Mount Bryan and with Victorian botanists to identify suitable areas of woodland to search for unknown populations of *P. despectans.* The Officer will also consult vegetation association maps produced from the Environmental Database of South Australia. Searches for additional populations will continue as additional information comes to hand.

ACTION 4 – Cost Estimate ($'000s)					
Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
0.5	0.5	0.5	0.5	0.5	2.5

5. Seed collection and storage

The primary aim of this action is to secure the genetic variability of the species. Orchid seed has been known to remain viable for 10-15 years in storage (Warcup in Bates & Weber 1990) therefore seed collected can be used for re-establishment should this extant population become extinct in the near future. Following Recovery Team approval, seed will be collected from a small number of pods immediately prior to dehiscence, and stored at an approved seed storage site such as the Adelaide Plant Biodiversity Centre. In subsequent years, seed will be collected from any newly discovered populations. NB If there are no seedpods for collection in 2000 (following monitoring trials of natural pollination), flowers will be hand pollinated in 2001 for seedpod collection.

ACTION 5 – Cost Estimate ($'000s)					
Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
0.3	-	-	-	0.3	0.6

6. Liaise with Victorian researchers

In order to finalise the national Recovery Plan for *P. despectans*, the recovery and survival of the species across its entire range must be considered and its taxonomy must be clarified. Data on the status of the species in SA must be supplemented by information on the population size, distribution and current status in Victoria, as well as on threats and current conservation actions. Victorian contacts include NRE Bendigo, Jeff Jeanes (MEL), James Todd (ecologist), F&F Statewide Programs, Adrian Moorrees (NRE Melbourne) and Cam Beardsell. The following table does not include the cost of investigations in Victoria.

ACTION 6 – Cost Estimate ($'000s)					
Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
0.3	0.3	0.3	0.3	0.3	1.5

7. Monitor all known sites

In order to gauge the effectiveness of management actions, and also to assess the stability, increase or decline of the Mt Bryan population systematic monitoring will continue. Data from all surveys and monitoring will entered into the Threatened Plant Species Populations Database at DEHAA. The following factors will be monitored:

a) Number of mature plants

b) Number of pollinated flowers

c) Number of flowers forming pods

d) Extent of weed invasion

e) Herbivory

f) The results of any management activities undertaken.

ACTION 7 – Cost Estimate ($'000s)					
Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
2	2	2	2	2	10.0

8. Manage the project through the Recovery Team

The Recovery Team will continue to plan and implement all actions, and monitor the success of the project. In this way, scientific experts and community representatives can regularly review the progress of the project.

The Recovery Team will also have responsibility for ensuring that the recovery of the Mt Bryan *P. despectans* population is integrated with broader biodiversity conservation strategies in the Northern Agricultural region of South Australia. This will enable long term habitat reconstruction measures to target problems of habitat degradation, population isolation, and pollinator limitation. Members of the Recovery Team will promote integration of *P. despectans* conservation grasslands management planning and other major biodiversity initiatives that arise.

The Recovery Team includes the landholder of the property where the population is found and representatives from the Department for Environment, Heritage and Aboriginal Affairs; Threatened Plant Action Group and the Native Orchid Society of SA. There will be administrative costs involved in running a Recovery Team and preparing reports.

ACTION 8 – Cost Estimate ($'000s)					
Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
2.2	2.2	2.2	2.2	2.2	11.0

IMPLEMENTATION SCHEDULE

Task	Task Description	Priority	Feasibility (%)	Responsibility	Cost Estimate ($000s/year)					
					Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
1	Hand pollination	1	80	TPAG, NOSSA	0.2	0.2	0.2	0.2	0.2	**1.0**
2.1	Fencing	1	100	Landholder, TPAG	4.2	0.1	0.1	0.1	0.1	**4.6**
2.2	Grazing trials	2	90	TPAG	0.6	0.3	0.3	0.3	0.3	**1.8**
3	Recruitment trials	3	80	TPAG, DEHAA	-	0.4	0.4	-	-	**0.8**
4	Search for new populations	3	80	TPAG, DEHAA	0.5	0.5	0.5	0.5	0.5	**2.5**
5	Seed collection	1	100	TPAG	0.3	-	-	-	0.3	**0.6**
6	Liaise with NRE (Vic)	2	80	TPAG, DEHAA, NRE (Vic)	0.3	0.3	0.3	0.3	0.3	**1.5**
7	Monitoring	3	100	TPAG, Landholder	2.0	2.0	2.0	2.0	2.0	**10.0**
8	Recovery Team	3	100	TPAG, landholder, DEHAA, NOSSA	2.2	2.2	2.2	2.2	2.2	**11.0**
				TOTAL	**10.3**	**6.0**	**6.0**	**5.6**	**5.9**	**33.8**

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The Threatened Plant Action Group is a partner in the Lofty Block Threatened Orchid Project, and the advice and support given by various members of the group has been invaluable. The Mt Bryan landholder has graciously given permission for entry onto his property, and his willingness to assist where necessary has been appreciated.

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APPENDIX

Plant List for Section 686, Hundred of Hallett

Plants occurring in same peppermint box woodland habitat as *Pterostylis despectans*

		AUS	SA	MU	NL
Arthropodium fimbriatum	nodding vanilla-lily				
**Avena barbata*	bearded oat				
Carex breviculmis	short-stem sedge			K	R
Chenopodium sp.	goosefoot				
Crassula sp.	crassula/stonecrop				
Danthonia auriculata	lobed wallaby-grass			U	
Danthonia caespitosa	common wallaby-grass				
Danthonia setacea var. *setacea*	small-flower wallaby-grass				
**Echium plantagineum*	Salvation Jane				
Einadia nutans ssp. *nutans*	climbing saltbush				
Elymus scabrus var. *scabrus*	native wheat-grass			R	U
Eucalyptus leucoxylon ssp. *Pruinosa*	inland S A blue gum				U
Eucalyptus odorata	peppermint box				
Euphorbia drummondii	caustic weed				
Galium sp.	bedstraw				
Glycine clandestina var. *sericea*	twining glycine				
Goodenia pinnatifida	cut-leaf goodenia		Q	U	U
Lagenifera huegelii	coarse bottle-daisy			R	
Leptorhynchos tetrachaetus	little buttons		U	K	U
**Lolium perenne*	perennial ryegrass				
Maireana enchylaenoides	wingless fissure-plant				
Minuria leptophylla	minnie daisy				
Oxalis perennans	native sorrel				
**Petrorhagia velutina*	velvet pink				
Plantago gaudichaudii	narrow-leaf plantain			T	U
Plantago sp.	plantain				
Ptilotus spathulatus form *spathulatus*	pussy-tails				
Rhodanthe pygmaea	pigmy daisy				
**Romulea* sp.	onion-grass				
Senecio quadridentatus	cotton groundsel				
Sida corrugata	corrugated sida				
**Spergularia* sp.	sand-spurrey				
Stipa blackii	crested spear-grass			T	
Stipa drummondii	cottony spear-grass				
Stipa eremophila	rusty spear-grass				
Stipa nodosa	tall spear-grass				
Stipa scabra group	falcate-awn spear-grass				
Vittadinia gracilis	woolly New Holland daisy				
Wahlenbergia luteola	yellow-wash bluebell				
Wurmbea dioica ssp. *dioica*	early star-lily				

Indigenous species: 34
Alien species: 6
Total number of species: 40
Conservation Ratings: AUS National; SA State; NL Northern Lofty Flora Region & MU Murray Flora Region
Identification code: MT BRYAN SUMNER
Surveyor/Source: M. A. Robertson **Survey date:** 27 November 1998
Vegetation Association: Eucalyptus odorata dominant, E. leucoxylon pruinosa subdominant low woodland with herbaceous understorey
Location: off road between Tooralie and Glenview, 2.2k NNE Mt Bryan
Hundred: HALLETT **Section:** 686 **AMG Map Sheet:** 6631-2
Easting: 312500 **Northing:** 6302300 **Zone:** 54