

Project DE003

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Dear Marty,

Targeted survey for threatened species and weed species at Kanmantoo Mine

1. Introduction

Hillgrove Resources is currently exploring mineral deposits at the site of the Kanmantoo Mine. A review of the native vegetation management at the site identified four plant species that would benefit from further management (Ecological Associates 2006).

Two species of state conservation significance that occur in the exploration area should be avoided:

- *Diuris behrii*; and
- *Ptilotus erubescens*.

Two weed species have a high risk of spread associated with any soil disturbance:

- *Asparagus asparagoides*; and
- *Disa bracteata* (formerly *Monadenia bracteata*).

The scope of work for this project was to conduct a targeted search for these species in sites affected by exploration activities, and to mark their locations so that they may be avoided.

2. Methods

A search of the Biological Database of South Australia (BDSA) was conducted for the two threatened species within a search area including the mining and exploration lease area. The co-ordinates bounding the search area were 6117000 mN, 6114000 mN, 317000 mE and 319000 mE (Zone 54 GDA94 Datum). Other

sites potentially supporting *Diuris behrii*, and *Disa bracteata* were sourced from a vegetation report of the site (Seager and Symonds 2006).

A search for the four species was undertaken on 21 September 2006. The searches focussed on locations where the species had been previously recorded. The search areas were extended across the exploration areas, concentrating on habitats suitable for each species. The survey search area is shown in Figure 1. The sites where species were located was marked with flagging tape and AMG co-ordinates recorded.

The orchid species (*Diuris behrii* and *Disa bracteata*) were not flowering at the time of the survey. These species are difficult to detect when not in flower and they may occur in other sites not recorded during this survey.

3. Results

Sites

Table 1 summarises all labelled sites in the survey area where plants were found. The locations of these sites are shown in Figure 2.

Table 1. Locations of plant populations

Species	Site label	Easting	Northing	Description
Bridal Creeper	BC-1	318108	6115513	Patch 1 m ² beneath tree canopy
Bridal Creeper	BC-2	318041	6115324	Patch 4 m ² beneath tree canopy
Bridal Creeper	BC-3	318096	6115338	Small plant under tree canopy
Bridal Creeper	BC-4	318081	6115301	Scattered plants under tree canopy
<i>Diuris</i> sp.	DB-1	318297	6115378	9 plants on rocky knoll adjacent to old mine shaft
<i>Diuris</i> sp.	DB-2	318295	6115390	5 plants in 8 m ² area approx. 5 m north of DB-1
<i>Diuris</i> sp.	DB-3	318322	6115403	1 plant east of DB-2
<i>Diuris</i> sp.	DB-4	318346	6115402	4 plants east of DB-2
<i>Diuris</i> sp.	DB-5	318351	6115398	1 plant near DB-4
<i>Diuris</i> sp.	DB-6	318348	6115393	2 plants near DB-4 and DB-5
<i>Diuris</i> sp.	DB-7	318344	6115412	2 plants north of DB-6
<i>Diuris</i> sp.	DB-8	318320	6115423	8 plants in 16 m ² area near DB-7
<i>Diuris</i> sp.	DB-9	318168	6115260	20 plants in mallee woodland in open area with native grasses and shrubs
<i>Diuris</i> sp.	DB-10	318174	6115253	15 plants south-east of DB-9
<i>Diuris</i> sp.	DB-11	318178	6115253	10 plants approx. 5 m from DB-10
<i>Diuris</i> sp.	DB-12	318181	6115252	8 plants near DB-11
Monadenia	MB-1	318298	6115517	10 plants in gully with mallee woodland near track along eastern boundary
Monadenia	MB-2	318455	6114994	One plant on rocky slope in <i>Callitris gracilis</i> woodland north of entry gate

Diuris behrii

Diuris behrii (Behr's Cowslip Orchid), is listed under Schedule 8 of the *NPW Act 1972* as vulnerable in South Australia. This species has been recorded from several sites in the exploration area in *Lomandra effusa* grassland and *Eucalyptus odorata* woodland (Seager and Symonds 2006). There are no BDSA records for *D. behrii* in the search area.

Diuris plants were found at one site where it was previously recorded by Seager and Symonds in *E. odorata* woodland (DB1-DB2). As the plants had finished flowering they could not positively be identified as *Diuris behrii*. The plants had 5 – 7 leaves, which is characteristic of the species *D. behrii* and *D. chryseopsis*. Only *D. behrii* has been recorded at the site previously (Playfair 2004), therefore it is likely that these plants were *D. behrii*. *Diuris* sp. was also found in another area in *E. odorata* woodland where it has not previously been recorded.

The sites where *Diuris* occurred were open sites in regrowth mallee woodland with *Acacia pycnantha* and a groundlayer of small shrubs and herbs including *Goodenia robusta*, *Eutaxia microphylla*, *Gonocarpus elatus* and the fern *Cheilanthes austrotenuifolia*. The sites had very few weeds. One site (DB9-DB12) had been disturbed, though not recently, by heavy machinery. The sites had an easterly or south-easterly aspect.

The plant was not found in sites in *Lomandra effusa* grassland searched along the top of the mine pit and in the exploration area to the south of the mine pit. These areas may provide suitable habitat for *D. behrii*, especially sites with a south-easterly aspect and a low weed cover. *Diuris behrii* has previously been recorded from one site in native grassland to the south of the current exploration lease and at the Paringa Mine site. A thorough search of these sites did not locate any plants although the plant may have been overlooked as it is difficult to detect when not in flower.



Plate 1. *Diuris* sp. with withered flowers, Site DB-1.



Plate 2. *Diuris* habitat Site DB-1.

Ptilotus erubescens

Ptilotus erubescens (Hairy-tails) is listed under Schedule 9 of the *NPW Act 1972* as rare in South Australia. There is one BDSA record for this species in the survey area, dating from 1994. The location occurs in an open area of *E. odorata* woodland where there is a groundlayer of native grasses. A 100 m search area surrounding the location of this record was comprehensively searched but the plant was not found. *Ptilotus erubescens* is a herbaceous perennial with a woody rootstock and was expected to be detectable during the time of the survey, if present.

Disa bracteata

Disa bracteata (Monadenia) is an introduced tuberous orchid that occurs throughout the southern Mount Lofty Ranges although it is not a proclaimed species. The tubers are dormant most of the year and produce a rosette of leaves in early spring. A flowering stem develops in October. The flowers are self-pollinated and produce numerous very fine, wind-dispersed seeds.

Plants were present as rosettes of leaves at the time of the survey and were difficult to detect. Plants were found in two locations in open mallee woodland near the eastern boundary of the study area. One site (MB-1) was in a weedy gully and the other site (MB-2) was in an area of regrowth vegetation on a steep south-easterly facing slope.



Plate 3. Immature *Disa bracteata* (Monadenia) with flowering stalk starting to develop (Site MB-1).

Asparagus asparagoides

Asparagus asparagoides (Bridal Creeper) is an introduced perennial herb. Leaves are produced from underground tubers in winter. Fruit appears in spring and the leaves die down in summer. The fruits are bird-dispersed, consequently plants are typically found beneath tree canopies where perching birds have deposited the seeds. The species is proclaimed in South Australia.

Bridal Creeper was found at four sites in *E. odorata* woodland. The plant was found under the canopies of large, old *E. odorata* trees where other weed species were also common. The plant is not common at the site but may occur beneath other large, old tree canopies in the *E. odorata* woodlands at the site.



Plate 4. Bridal Creeper, Site BC-4.

4. Management recommendations

Diuris behrii

The two sites supporting populations of *Diuris* (which may be *D. behrii*) should be protected by temporary fencing. The plants are sparsely scattered over a small area and are highly susceptible to damage by trampling or disturbance from machinery or vehicles. Field staff should be made aware of the significance of the fenced areas.

Ptilotus erubescens

As this plant could not be located in the survey area there are no specific recommendations for avoidance. The species habitat is likely to be open areas of

native grassland in *E. odorata* woodland. Disturbance of these areas should be minimised by confining access along existing tracks.

Bridal Creeper

This species appears to be restricted to sites beneath the canopies of large, old trees in *E. odorata* woodland. Current management practices that avoid disturbance to trees in woodlands should be sufficient to avoid disturbance to Bridal Creeper. Field staff should be alerted to the significance of marked sites and should be instructed in the identification of this plant so that it can be avoided. As the spread of this species is facilitated by disturbance, control of this plant should be through herbicides rather than grubbing out plants. It is recommended that plants at marked sites are controlled immediately to prevent further spread.

Monadenia

Monadenia plants were difficult to detect during the survey and may occur at more locations than are reported here. The plants found during this survey should be controlled immediately before they develop flowering stalks. As ground disturbance promotes the spread of this species, plants are best controlled by herbicides. The area surrounding site MB-1 should be protected by temporary fencing to minimise disturbance and hence increases in the population at this site. Field staff should be made aware of the significance of this fencing.

5. References

Ecological Associates (2006). Review of native vegetation management actions for exploration activities at Kanmantoo Mine. Draft report prepared for Hillgrove Resources by Ecological Associates, Highgate, South Australia.

Playfair, R. (2004). Native Vegetation Management Recommendations for Kanmantoo Mine Site. Report prepared for Hillgrove Gold Ltd by RMP Environmental Pty Ltd, Daw Park, South Australia.

Seager, H. and Symonds, B. (2006). Significant Vegetation Areas. Draft report prepared for Hillgrove Resources Limited by Harry Seager and Ben Symonds.

Yours faithfully,
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