

**TRANSLOCATION PROPOSAL**  
**White Feather flower**  
***Verticordia albida* A.S. George (Myrtaceae)**

**1. SUMMARY**

*Verticordia albida* was first collected in 1961 by Fred Lullfitz. It was described as a new species in 1991. The species name, *albida*, is derived from the latin word meaning “whitish” and refers to the colour of the flowers.

*V. albida* is a tall (1- 3m) straggly shrub, which grows between 0.6 and 2m wide. Stem and floral leaves are elliptic, concave, 3-6mm in length and 2-3mm in width. The flowers occur in November to January and are arranged in spike-like clusters. The flowers are scented and white in colour (sometime pale pink) (George 1991, George and Peroni 2002). Response to fire is unknown, although the species is known to respond to aerosol smoke application. Seed viability ranges from 10 to 87% and there are approximately 13,400 seeds in long term storage at the Threatened Flora Seed Centre (A. Crawford pers. comm.).

*V. albida* is known from three small populations with a combined total of just over 1500 individuals. The species grows in grey to yellow or yellow to white sand over gravel. It occurs in shrubland or banksia woodland.

The species was Declared as Rare Flora in August 1994, due to poor regeneration and threats from weed competition, inappropriate fire regimes, rabbits, chemical drift and road, rail and firebreak maintenance activities. It was ranked as Critically Endangered in September 1995 due to the threats described above as well as the continuing decline in the area, extent and quality of the species habitat.

The aim of this translocation proposal is to conserve the wild genetic stock of the species by establishing at least one more viable population of *V. albida*. This will be achieved by establishing one new population in a secure site with appropriate habitat. This translocation proposal outlines the need for translocation of the critically endangered *V. albida*, the site selection process, the design of the translocation site and the provisions for monitoring. In addition it outlines the criteria for success or failure of this proposed translocation.

**2. PROPONENTS**

Leonie Monks  
Research Scientist  
Dept. Conservation and Land Management  
KENSINGTON WA 6151  
(08) 9334 0495

Gina Broun  
Conservation Officer  
Dept. Conservation and Land Management  
JURIEN BAY WA 6516  
(08) 9652 1911

**TABLE OF CONTENTS**

1. SUMMARY .....	1
2. PROPONENTS .....	1
3. BACKGROUND .....	3
3.1 History, Taxonomy and Status .....	3
3.2 Distribution and Habitat .....	3
4. THE TRANSLOCATION .....	3
4.1 The Need to Translocate .....	3
4.2 Translocation Site Selection .....	4
4.3 Translocation Design .....	4
4.4 Source of Plants .....	5
4.5 Criteria for Success or Failure .....	5
5. TIMETABLE .....	6
6. FUNDING .....	6
8. REFERENCES .....	6
Appendix Three .....	10, 11
Appendix Two .....	9

### 3. BACKGROUND

#### 3.1 History, Taxonomy and Status

*Verticordia albida* was first collected in 1961 by Fred Lullfitz. It was originally considered to be a form of *V. spicata*, then *V. chrysostachys* before being described in 1991 as a new species. The species name, *albida*, is derived from the latin word meaning “whitish” and refers to the colour of the flowers.

*V. albida* is a tall (1- 3m) straggly shrub, which grows between 0.6 and 2m wide. Stem and floral leaves are elliptic, concave, 3-6mm in length and 2-3mm in width. The flowers occur in November to January and are arranged in spike-like clusters. The flowers are scented and white in colour (sometime pale pink) (George 1991, George and Peroni 2002).

Response to fire is unknown. The species does not have a lignotuber (George and Peroni 2002) and Ginger (1999) speculates that the species is a nonsprouter. Ginger (1999) also showed that *V. albida* had a seed bank that persisted in the soil for at least nine months and that its seed responded to aerosol smoke application. Seed viability ranges from 10 to 87% and there are approximately 13,400 seeds in long term storage at the Threatened Flora Seed Centre (A. Crawford pers. comm.).

The species was Declared as Rare Flora in August 1994, due to poor regeneration and threats from weed competition, inappropriate fire regimes, rabbits, chemical drift and road, rail and firebreak maintenance activities. It was ranked as Critically Endangered in September 1995 due to the threats described above as well as the continuing decline in the area, extent and quality of the species habitat.

#### 3.2 Distribution and Habitat

*V. albida* is known from three small populations with a combined total of just over 1500 individuals (Table 1). The species grows in grey to yellow or yellow to white sand over gravel. It occurs in shrubland or banksia woodland.

Table 1. Number of individuals and land status of *Verticordia albida* populations

Population Number	Number of plants	Land Status
1	~ 1500	Shire Road Reserve and Private Property
2	3	Shire Road Reserve
3	Presumed extinct (last seen in 1967)	National Park
4	6	Shire Road Reserve and Rail Reserve

### 4. THE TRANSLOCATION

#### 4.1 The Need to Translocate

There are just three extant populations of this species and whilst there are over 1500 individuals, there are several threatening processes at these sites. Population 3 was found to have been damaged during road maintenance in 1999, despite Rare Flora Markers being in place. Populations 1 and 2 also occur adjacent to road verges and are therefore also vulnerable to accidental destruction during maintenance activities.

Successional changes are considered to be having a detrimental effect on this species (Ginger 1999). The larger, co-occurring, *Actinostrobos arenarius* and *Banksia prionotes* are out-competing *V. albida* for light, space and nutrients. Anecdotal evidence suggests that population 2 has not been burnt in over 45 years (Ginger 1999). However imposing a disturbance regime, such as fire, as a management option is not considered suitable due to the high probability that this will lead to massive weed invasion. This is particularly the case for populations 2 and 4 where competition from weeds is listed as a major threatening process (Ginger 1999).

Limited recruitment has occurred at the natural populations in recent years. Whilst it is encouraging that some natural recruitment has occurred, the number of plants has still declined from 50 to three in population 2 and from 16 to six in population 4 between 1997 and 2002 (no corresponding accurate count of population 1 has been made). Augmentation of these populations is not considered the best option due to the difficulty in controlling weeds on a narrow road verge.

Translocation to another site is therefore considered a better option and is recommended by Ginger (1999). The Interim Recovery Plan for this species also recommends translocation to other suitable sites (Phillimore *et al.* 2001). The difficulty in successfully managing the threats at the natural sites leads us to believe that translocation will aid in the recovery of this species.

#### 4.2 Translocation Site Selection

A search for suitable habitat for *V. albida* was made of areas west of Three Springs in December 2003 and February 2004. An area of remnant vegetation on private property owned by Bruce and Vicky Eva was chosen as the translocation site. A map of the proposed translocation site in relation to the known populations is shown in Appendix one.

The proposed translocation site was chosen as it has similar soil and associated vegetation to the natural population. The natural populations of *V. albida* occur on deep yellow to white-yellow sands. These sites have an underlying geology of alluvial and colluvial (soils found at the foot of a slope) deposits, residual deposits of sand, clay and duricrust and Sandplain (Baxter and Lipple 1985). Similar soils of white-yellow sand are found at the proposed translocation site. The underlying geology is also the same as the natural population - residual deposits of sand, clay and duricrust (Baxter and Lipple 1985). Both the translocation site and the existing population occur in scrub heath or thicket on sandplain (Beard 1976) and have many associated species in common (Table 1). No Declared Rare plant species were found at the proposed translocation site.

Table 1. A comparison of the associated vegetation at the proposed translocation site with the known population of *Verticordia albida*

Associated species at the proposed translocation site	Associated species at the natural populations of <i>Verticordia albida</i>
<i>Acacia scirpifolia</i>	<i>Acacia scirpifolia</i>
<i>Actinostrobos arenarius</i>	<i>Actinostrobos arenarius</i>
	<i>Adenanthos cygnorum</i> subsp. <i>cygnorum</i>
	<i>Allocasuarina campestris</i>
<i>Banksia prionotes</i> .	<i>Banksia prionotes</i>
<i>Eremaea</i> sp.	<i>Eremaea</i> sp.
<i>Eucalyptus todtiana</i>	<i>Eucalyptus todtiana</i>
<i>Grevillea amplexans</i>	<i>Grevillea amplexans</i>
	<i>Grevillea eriostachya</i>
<i>Jacksonia floribunda</i>	<i>Jacksonia floribunda</i>
	<i>Jacksonia hakeoides</i>
	<i>Patersonia occidentalis</i>
	<i>Verticordia densiflora</i> var. <i>densiflora</i>
	<i>Verticordia drummondii</i>
<i>Verticordia muelleriana</i> subsp. <i>muelleriana</i>	<i>Verticordia muelleriana</i> subsp. <i>muelleriana</i>

This proposed site is free from weed invasion and is fenced to prevent stock entering the area. The site is proposed to be located at least 50m from the adjoining paddock, therefore, the associated vegetation will act as a buffer against any chemical and spray drift.

Significant areas of Unallocated Crown Land with suitable habitat for *V. albida* occur to the south of the natural populations. However a previous request to use a site located in the Unallocated Crown Land that adjoins the Evas' remnant vegetation was refused by the Department of Land Administration due to their desire to convert the land tenure to a nature reserve. Another potential site was located to the north of the proposed translocation site, however the site was located adjacent to a drainage line that was showing signs of salinisation. The site proposed on Evas' property represents the best match for soil and associated vegetation combined with absence

of threatening processes. The Evas' are interested in the conservation of this species and are therefore willing to offer long term security of the site (see Appendix 3).

#### 4.3 Translocation Design

It is aimed to raise 100 plants of *V. albida* for planting in 2004 and similar numbers in 2005. Stock plants will be held back in the nursery during 2004 to provide material for the 2005 translocation, to avoid the need to collect further cutting material from the wild. Cutting material will be propagated at the accredited nursery at Kings Park and Botanic Gardens and therefore is considered disease free. All equipment used during seedling planting will be maintained under strict disease hygiene.

In 2004 five replicates of 4m x 3m each will be measured at the proposed translocation site. Each replicate will be divided into a grid of 20 holes, arranged in four rows of five, with 1m between each hole and a border of 1m on each side of the plot. Plots will not be cleared of vegetation; instead plants will be planted in gaps in the vegetation, adhering as close as possible to the grid pattern presented in this proposal. In this way there will be minimal disturbance to the natural vegetation.

A total of two treatments will be tested: watered and not watered (see Table 2). Treatments will be randomly assigned to individual plants (see Appendix two for site diagram). An irrigation system will be set up in November 2004 to water weekly those plants assigned to the watering treatment (see Table 2).

Table 2. Description of experimental treatments.

Treatment	Description of Treatment
Control	Plants not given any treatment.
Watered	Plants will be watered once a week from the start of November to the end of April to see whether watering over the first summer enhances survival.

Each plant will be permanently tagged so that each individual will always be identifiable. A small cage of rabbit netting will be placed around each plant to prevent large herbivores from eating the plants.

Monitoring of the translocated population will be undertaken every six months commencing after the planting out of the cuttings. Monitoring will include counting the number of surviving plants, height of the surviving plants, width of the crown of the surviving plants in two directions, reproductive state, number of inflorescences and nuts, whether second generation plants are present, general health of the plants and whether pollinators are visiting the population.

Monitoring of the original populations will also occur every six months in conjunction with monitoring of the translocated population. This will provide essential baseline data for assessing the performance of the translocated population. Monitoring will include counting the number of individuals, height and crown width of the individuals, reproductive state, number of inflorescences and nuts, general health of the plants and present and identity of pollinators.

In 2005 five replicates of 8m x 6m each will be measured at the proposed translocation site. Each replicate will be divided into a grid of 20 holes, arranged in four rows of five, with 1m between each hole and a border of 1m on each side of the plot. The plots will be divided into half and half of each plot will have leaf litter from the site added and then the area will be burnt. It is proposed to undertake the burning in autumn 2005. In winter 2005 each plot will be planted with plants, such that 10 plants will be planted into the unburnt half of the plot and 10 plants will be planted into the burnt half. Each plant will be tagged and monitored in the same way as proposed for the 2004 planting.

#### 4.4 Source of Plants

Cutting material has been collected from population 1 and 2. Ten clones were sourced from population 1 and 12 clones were sourced from population 2. It is hoped to raise around 100 plants from this material. These plants are currently being raised at the accredited nursery at Kings Park (Botanic Gardens and Parks Authority).

#### 4.5 Criteria for Success or Failure

Criteria for Success

- Short Term: establishment of translocated plants

production of flowers and seed

after one generation the number of individuals is sustained by natural recruitment

- Long Term: after two or more generations the number of individuals is sustained by natural recruitment
- Successful project outcomes:  
Management techniques for *Verticordia albida* are refined through experimental treatments implemented under this translocation proposal.

#### Criteria for Failure

- Short Term: failure of translocated plants to establish  
failure of plants to produce flowers and seed
- Long Term: there is a significant decline in the size of the translocated population due to lack of natural recruitment.

## 5. TIMETABLE

Time	Action
January 2003	Cutting material collected and sent to Kings Park for propagation.
February 2004	Translocation site selected
April 2004	Translocation proposal submitted for review.
June - July 2004	Planting.
July 2004- June 2005	Monitoring and maintenance of translocation site.
November 2004	Setting up of irrigation system.
November 2004	Further propagation of cuttings at the Kings Park nursery.
Autumn 2005	Experimental burn in preparation for winter planting
June - July 2005	Planting.
June 2005 - May 2007	Monitoring and maintenance of translocation site.
May 2007	Final Report

## 6. FUNDING

This project is funded for one year by the WA Threatened Species and Communities Unit, Department of Conservation and Land Management. One of the proponents, Gina Broun, has ongoing funding for her position as Conservation Officer based at Jurien Bay. The proponents are therefore willing to make a commitment to monitor the translocation beyond the availability of the funding.

## 7. REFERENCES

- Baxter J.L. and Lipple S.L. (1985) Perenjori Western Australia 1:250 000 Geological Series - Explanatory Notes. Geological Survey of Western Australia. Perth Western Australia.
- Beard J.S. (1976) The vegetation of the Dongara area. Vegmap Publications. Perth, Western Australia.
- George A.S. (1991). New taxa, combinations and typifications in *Verticordia* (Myrtaceae: Chamelaucieae). *Nuytsia* 7(3). pp 231-394.
- George E.A. and Peroni M. (2002). *Verticordia*, Turner of Hearts. University of Western Australia Press Perth Western Australia. Pp 386.
- Ginger D. (1999). The effects of habitat fragmentation on two rare and endangered *Verticordias*. Honours Thesis. Curtin University of Technology. Bentley, Western Australia.
- Phillimore R., Papenfus D. and English V. (2001). White featherflower (*Verticordia albida*). Interim recovery plan, 2001-2004. Department of Conservation and Land Management. Perth, Western Australia.

Appendices One and Three may be available on contacting the authors



## Appendix Two.

### Site Diagram for Proposed Translocation of *Verticordia albida*

The aim is to propagate a total of 100 plants of *Verticordia albida*.

These will be planted as shown in the diagram below, with one plant at each point marked with an asterisk (\*).

The two treatments of watered and not watered will be assigned as per the diagram below.

