TRANSLOCATION PROPOSAL
Rough Emu Bush
Eremophila scaberula R.J. Chinnock (MYOPORACEAE)

1. SUMMARY

Eremophila scaberula was first collected near Moora in 1903. It was named scaberula in reference to the rough protuberances along the leaves and stems (Fitzgerald 1905). It is a small compact shrub between 0.2m and 0.8m in height. The branches are terete, ridged and scabrous. The leaves are sessile, alternate, linear to linear-lanceolate, 8mm long and covered in rough protuberances. The purple to lilac coloured flowers occur singularly in October to November (Brown *et al*. 1998). Viability of the seed ranges from 39 to 70% (A. Cochrane pers. comm.).

E. scaberula is endemic to an area south of Moora where it is known from just three populations with only 448 individuals. It grows on rich loam or clay flats bordering the Moore River. Associated vegetation consists of open low *E. salmonophloia, E. wandoo* and *E. loxophleba* woodland (Beard 1979) over open low scrub of *Scaevola spinescens*, a variety of *Acacia* species, and grasses (Stack and English 1999).

An Interim Recovery Plan has been drafted for this species. Under this plan translocation to a secure site is recommended (Stack and English, 1999). Due to the small number of individuals of this species and the presence of threatening processes such as road and rail maintenance activities around the populations resulting in accidental destruction and the high risk of salinity increasing to harmful levels, the need for translocation is considered to be high.

The aim of this translocation proposal is to conserve the wild genetic stock of the species over a 5 year period by establishing an additional population of *E. scaberula* at a site with a secure tenure. This will be achieved by translocating seedlings to a nearby nature reserve. This translocation proposal outlines the need for translocation of the critically endangered *E. scaberula*, 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

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3. BACKGROUND

3.1 History, Taxonomy and Status

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Eremophila scaberula was first collected by E. Hursthouse near Moora in October 1903. It was named *scaberula* in reference to the rough protuberances along the leaves and stems (Fitzgerald 1905). It is a small compact shrub between 0.2m and 0.8 m in height. The branches are terete, ridged and scabrous. The leaves are sessile, alternate, linear to linear-lanceolate, 8mm long and covered in rough protuberances. The purple to lilac coloured flowers occur singularly in the axil in October to November (Brown *et al.* 1998). Response to fire is unknown. Viability of the seed ranges from 39 to 70% (A. Cochrane pers. comm.).

Extensive surveys were undertaken for *E. scaberula* during the writing of the Moora District Threatened Flora Recovery Plan and the Interim Recovery Plan. During these surveys only one new population of the species was discovered. However, as this new population occurs on the same road and rail verge as the two original populations the species is still considered threatened by road and rail maintenance activities as well as weed invasion.

The species is currently known from just three small populations totalling 448 individuals on Main Roads Department and Westrail road and rail reserves. Population counts in 1996 put the number of individuals at 533. There has, therefore, been a decline of 85 individuals over the last 5 years. Due to the restricted range of the species and its vulnerability to accidental destruction from road and rail maintenance activities and weed invasion, *E. scaberula* was declared as Rare Flora in 1996 and ranked as Critically Endangered in November 1998.

3.2 Distribution and Habitat

E. scaberula is endemic to an area south of Moora where it has a range of just 15km. It grows on rich loam or clay flats bordering the Moore River. Associated vegetation consists of open low *E. salmonophloia, E. wandoo* and *E. loxophleba* woodland (Beard 1979) over open low scrub of *Scaevola spinescens*, a variety of *Acacia* species, and grasses (Stack and English 1999).

4. THE TRANSLOCATION

4.1 The Need to Translocate

E. scaberula is known from just three populations with only 448 individuals (see Table 1). All three populations occur within a range of approximately 15 km on narrow road reserves vested with Main Roads, WA or Westrail.

Table 1. Population details for *Eremophila scaberula*.

Population number	Number of individuals	Land tenure
1	141	MRD road verge and Westrail rail verge
2	137	MRD road verge and Westrail rail verge
3	170	MRD road verge and Westrail rail verge

Road and rail maintenance activities have the potential to impact on the populations of *E. scaberula*. Weed invasion is evident in all populations and chemical drift from fertilisers and pesticides from adjacent farms are considered to be a problem. The species occurs in low-lying flats along the Moore River. This habitat is especially prone to the problems of rising water tables and increasing salinity (Malcolm 1983). Already in Western Australia 1.8 million hectares of land are already affected by salinity and predictions suggest that a further 1.2 million hectares will become saline by 2010 – 2015 (State Salinity Council 2000). Salinity and waterlogging are therefore serious threats to the survival of *E. scaberula*. Translocation of this critically endangered species is considered to be of high priority due to the tenuous nature of the road and rail verges where the populations occur and the high probability of salinity increasing to detrimental levels.

Translocation to a safe site is recommended in the Interim Recovery Plan and is an essential part of the recovery process of this species. Translocation to a new site is considered an important component of the

recovery process as this spreads the risk of a threatening process, such as salinity, causing a significant population decline over a greater number of populations and individuals

4.2 Translocation Site Selection

A search was made of areas around Moora on 19th February 2001 to locate possible translocation sites. An area in the southwestern corner of Reserve # was chosen as a suitable translocation site. As *E. scaberula* has not previously been recorded from this reserve this translocation can be considered an introduction under the definitions provided by Policy Statement 29 and the Guidelines for Translocation of Threatened Plants in Australia. A map of the proposed translocation sites is shown in Appendix one. Endorsement for the use of these sites was received from the Midwest Region (Appendix two).

The vegetation association of *Eucalyptus wandoo* and *E. loxophleba* woodland occurs at the translocation site (Beard 1979), although *E. salomophloia* was also observed (pers. obs). This eucalypt woodland is similar to that at the known populations. The soil type at the translocation site matches that at the known populations – red brown clay loams. In addition there is a similar assemblage of associated plant species at Reserve # (Table 2). The combination of security of land tenure, appropriate edaphic conditions and a similar plant assemblage means this is a suitable introduction site for *E. scaberula.* In addition it is only 4.5km from the closest *E. scaberula* population (population 3).

Reserve # is also free from many of the processes threatening *E. scaberula* at the natural populations. Weed invasion is not evident at the reserve, there is a suitable buffer of vegetation between the translocation site and surrounding farms reducing the risk of spray and fertiliser drift having an impact at the site. Any maintenance activities will be undertaken by the Department of Conservation and Land Management and therefore the risk of accidental destruction is extremely low. Clearly, in attempting to closely match the habitat of *E. scaberula* for the translocation sites, salinity will be an issue in the long term, as it is in the natural populations. It is believed, however, that the translocation sites are at less risk of increasing salinity than some of the natural populations. The site at Reserve # is a sizeable area (152 hectares) dominated by several deep rooted perennial species. It is believed that in the long term this site is less likely to be affected by increasing salinity than many of the natural localities of *E. scaberula*.

Table 2. Associated plant species at the *Eremophila scaberula* populations and the proposed translocation site.

Associated species at *E. scaberula* site	Associated species at Translocation sites
Acacia erinacea	*Acacia erinacea*
Acacia lineolata	
Acacia hemiteles	
	Acacia sp.
	Daviesia divaricata
Eucalyptus loxophleba	*Eucalyptus loxophleba*
Eucalyptus salomophloia	*Eucalyptus salomophloia*
Eucalyptus wandoo	*Eucalyptus wandoo*
Melaleuca adenatos	
Scaevola spinescens	

4.3 Translocation Design

Four plots of 10m x 10m each will be measured. In each of these plots seeds will be buried in 10 rows of 10 where each seed is 1m away from the next seed. The plot will then be divided in half. Within each plot one half, containing buried seed, will be covered in a light layer of leaf litter and burnt. In November the plot will again be divided into half, this time perpendicular to the previous division. Plants in one of the new halves, within each plot, will be assigned to the watering treatment. Table 3 describes the treatments applied. See Appendix 3 for plot layout.

Table 3. Description of experimental treatments.

Treatment	Description of Treatment
Direct seeding with no other treatment	Seed will be buried in the soil.
Direct seeding with watering	Seed will be buried in the soil. For 24 weeks from the start of November to the end of April plants will be watered with a set amount of water once a week to see whether watering over the first summer enhances survival.
Direct seeding with burning (no watering)	Seed will be buried in the soil and then litter on the soil surface above the seeds burnt.
Direct seeding with burning and watering	Seed will be buried in the soil and then litter on the soil surface above the seeds burnt. For 24 weeks from the start of November to the end of April plants will be watered with a set amount of water once a week to see whether watering over the first summer enhances survival.

Monitoring of the translocated population will be undertaken after planting and then at approximately three to six monthly intervals for a two year period. Monitoring will then continue at approximately yearly intervals. 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 (so that crown volume can be calculated), reproductive state, number of flowers and fruit, whether second generation plants are present and general health of the plants. Long term monitoring will also include assessing whether a soil stored seed bank is present. This will be assessed via the collection of soil samples from around the translocated plants and sieving the soil to find any *E. scaberula* seeds.

Monitoring of the original populations will also occur every third month in conjunction with monitoring of the translocated populations. 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 follicles and general health of the plants.

All of the work proposed for this translocation will be undertaken by, or under the direct instruction of, one or both of the project proponents.

4.4 Source of Plants

Seed was collected from approximately 20 adult plants in population two in December 2000.

4.5 Criteria for Success or Failure

Criteria for Success

- Short Term: establishment of seedlings from translocated seed
  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, and a soil stored seed bank has been established.
- The production of guidelines for the establishment of future translocations of this species and other closely related species.

Criteria for Failure

- Short Term: failure of translocated seed to germinate and 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
December 2000	Seed collected
February 2001	Translocation site selected.
March 2000	Translocation proposal submitted for review.
May 2001	Translocation of seed and controlled burn of translocation plots.
May 2001 – May 2003	Three to six monthly monitoring of translocated plants.
November 2001	Setting up of irrigation system.
May - June 2002	Further translocation of seedlings or seed into the translocation site if deemed necessary.
August 2002 – August 2006	Once or twice yearly monitoring of translocated plants and soil seed bank and maintenance of translocation sites.
August 2006	Final Report

6. FUNDING

This project is funded under the Salinity Action Plan Translocation project with some additional funding from National Heritage Trust ESP project number 24333. A total of $32,500 has been provided for the translocation in 2001, which covers all actions outlined in this proposal.

7. ACKNOWLEDGMENTS

Sue Patrick is thanked for her input in selecting suitable translocation sites.

8. REFERENCES

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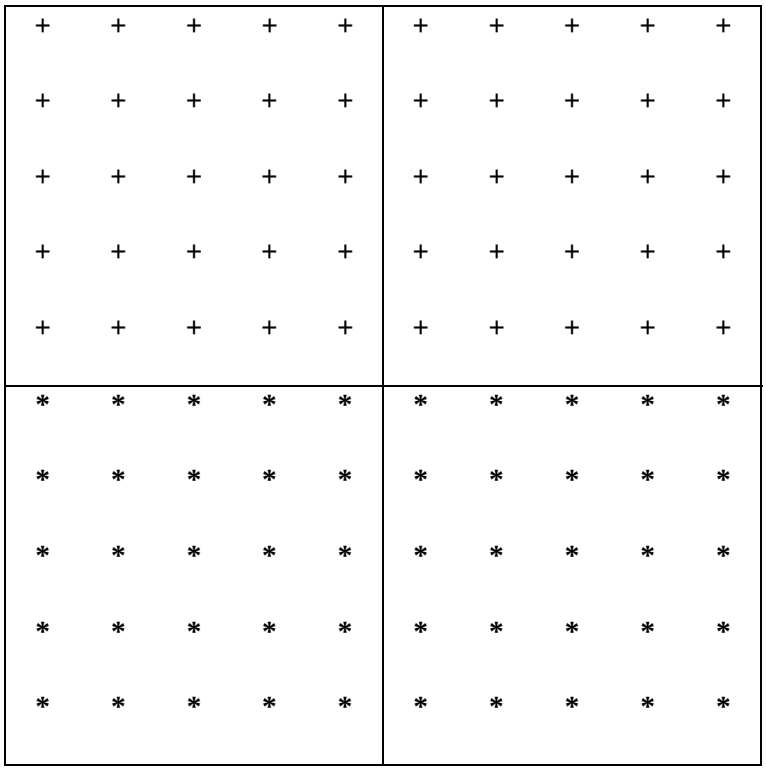
Appendices One, Two and Four may be available on contacting the authors.

Appendix Three.
Diagram of the proposed layout of the treatments and plots.

Legend
+ = watered
* = not watered

Scale: **1 m**

Replicate 1



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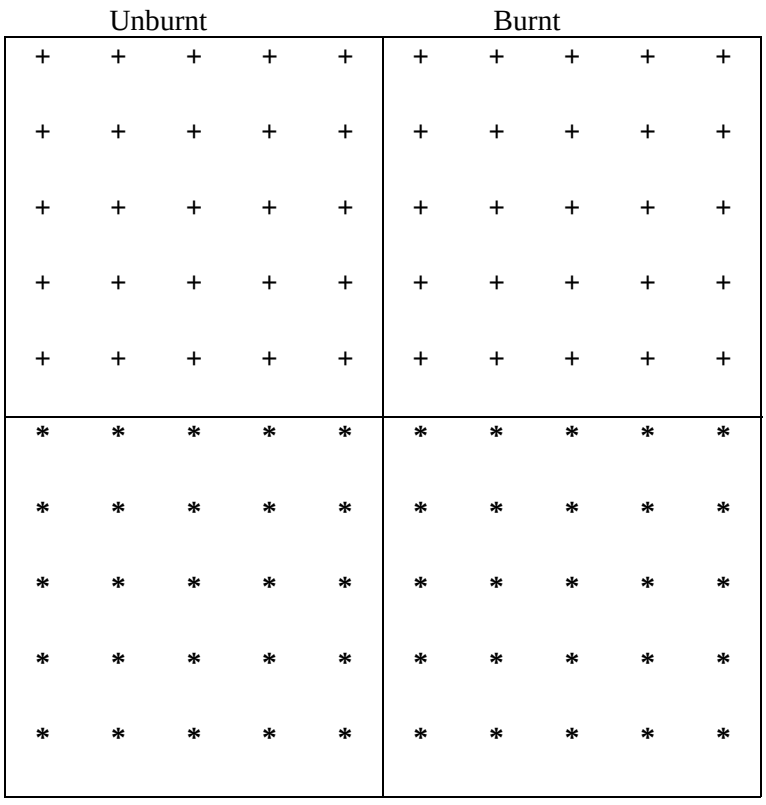

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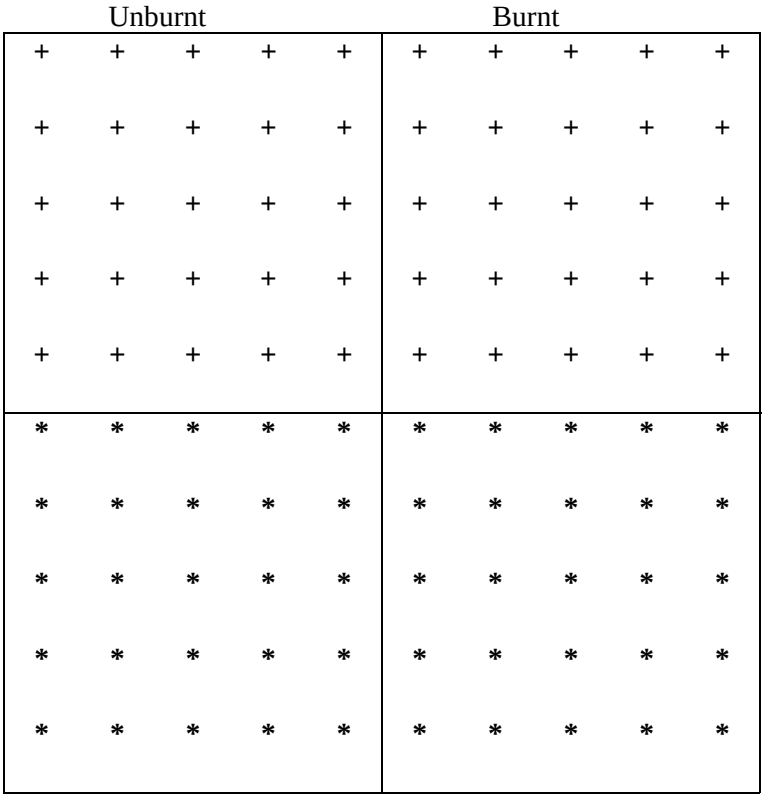

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