TRANSLOCATION PROPOSAL
Western Prickly Honeysuckle
Lambertia echinata subsp. *occidentalis* Keighery (Proteaceae)

1. SUMMARY

Lambertia echinata subsp. *occidentalis* is a recently described member of the endemic Australian genus. It is a shrub to 3 m, much branched at the base and with a few long erect floral branches. There are two types of leaves - vegetative and floral. The vegetative leaves are entire and linear-lanceolate with a pungent tip. The floral leaves, which are smaller than the vegetative leaves, are either entire or lobed with three to five points. Flowers are yellow, 2.3 - 2.6 cm long, with recurved lobes and occur between October and December. Floral bracts are thin and membranous, narrowly obovate with a sharp point at the apex. Inflorescences are 7-flowered and crowded at ends of long floral branches (Keighery, 1997).

It was first found by Bronwen Keighery and Neil Gibson in Oct 1992 when they were undertaking field work for the Swan Coastal Plain survey. Initially it was thought that it was *L. echinata* subsp. *citrina*, with a few differences. However, population genetic studies showed it that warranted further taxonomic work and subsequently it was named as a new subspecies within the *L. echinata* complex (cited in Obbens and CO, 1997).

Despite the scope of the Swan Coastal Plain survey, which covered large areas in the Busselton region where this subspecies might be expected, no other populations were located. Due to the low number of plants, restricted distribution, threats associated with growing in a highly specialised habitat and susceptibility to *Phytophthora cinnamomi*, known to be present in the area, *L. echinata* subsp. *occidentalis* was declared to be Rare Flora in October 1996, and then ranked as Critically Endangered (Stack *et al*. in draft).

Lambertia echinata subsp. *occidentalis* is endemic to the southern ironstones near Busselton. It is found on shallow sandy soils over sheet ironstone, which support rich scrub heath and sedges with scattered Banksias and Marri. The rarity of *L. echinata* subsp. *occidentalis* is probably due to the amount of clearing that has occurred for agricultural purposes in the Whicher Range area in conjunction with the loss of suitable habitat due to the introduction of *Phytophthora* spp. (Stack *et al*. in draft). The death of one plant, of only 17 plants has already been confirmed due to *P. cinnamomi. P. cinnamomi* is considered to be such a serious threat to the survival of the only known population, that translocation to a disease free site is now an urgent priority (D. CO pers. comm, Stack *et al*., in draft).

The aim of this translocation proposal is to conserve the wild genetic stock of the species over a 5 year period by establishing additional populations of *L. echinata* subsp. *occidentalis* at sites with secure tenure and where threats such as dieback and weed invasion have been ameliorated. This will be achieved by restocking the known population and translocating to nearby nature reserves and other suitable lands with appropriate tenure. This translocation proposal outlines the need for translocation of the critically endangered *L. echinata* subsp. *occidentalis*, 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

Lambertia echinata subsp. *occidentalis* is a recently described member of the endemic Australian genus Lambertia (named after the English horticulturist Aylmer Lambert). It is a small genus of ten species, nine of which are from the south west of Western Australia. The name *echinata* is derived from the Latin word meaning hedgehog-like, referring to the prickly nature of the species. The name *occidentalis* is derived from the Latin word meaning western, which refers to the disjunct western occurrence of this subspecies (Keighery, 1997).

Lambertia echinata subsp. *occidentalis* is a shrub to 3 m, much branched at the base and with a few long erect floral branches. There are two types of leaves - vegetative and floral. The vegetative leaves are entire and linear-lanceolate with a pungent tip. The floral leaves, which are smaller than the vegetative leaves, are either entire or lobed with three to five points. Flowers are yellow, 2.3 - 2.6 cm long, with recurved lobes and occur between October and December. Floral bracts are thin and membranous, narrowly obovate with a sharp point at the apex. Inflorescences are 7-flowered and crowded at ends of long floral branches (Keighery, 1997).

It was first found by Bronwen Keighery and Neil Gibson in Oct 1992 when they were undertaking field work for the Swan Coastal Plain survey. Initially it was thought that it was *L. echinata* subsp. *citrina*, with a few differences. However, population genetic studies showed that there was a level of genetic divergence between this new species and *L. echinata* subsp. *citrina,* that warranted further taxonomic work and subsequently it was named as a new subspecies within the *L. echinata* complex (cited in Obbens and CO, 1997).

Despite the scope of the Swan Coastal Plain survey, which covered large areas in the Busselton region where this subspecies might be expected, no other populations were located. Due to the low number of plants, restricted distribution, threats associated with growing in a highly specialised habitat and susceptibility to the effects of *Phytophthora*, known to be present in the area, *L. echinata* subsp. *occidentalis* was declared to be Rare Flora in October 1996, and then ranked as Critically Endangered (Stack *et al*. in draft).

L. echinata subsp. *occidentalis* is considered to be a nonsprouter, as it lacks a lignotuber, is killed by fire, and regenerates solely from seed (Obbens and CO 1997). Initial germination of the seed is high, between 93 and 100% (A. Cochrane pers. comm), which is another characteristic common to nonsprouters.

Like most other members of the genus, it is very susceptible to dieback disease caused by the fungus *Phytophthora cinnamomi.* The only known population of this subspecies is known to be infected with *P. cinnamomi* and a recent plant death has been confirmed to be due to that pathogen.

3.2 Distribution and Habitat

Lambertia echinata subsp. *occidentalis* is confined to an area in the Whicher Range near Busselton. It is found on shallow sandy soils over sheet ironstone, which support rich scrub heath and sedges with scattered Banksias and Marri. It occurs in vegetation described as shrublands on southern ironstones (Gibson et. al 1994), which is a community type listed as critically endangered (English, in prep.)

4. THE TRANSLOCATION

4.1 The Need to Translocate

The rarity of *L. echinata* subsp. *occidentalis* is probably due to the amount of clearing that has occurred for agricultural purposes in the Whicher Range area in conjunction with the loss of suitable habitat due to the introduction of *Phytophthora* spp. (Stack *et al*. in draft). At present there are only seven adult and ten juvenile plants.

P. cinnamomi is such a serious threat to the survival of the only known population, that translocation to a disease free site is now considered a high priority (D. CO pers. comm). The draft Interim Recovery Plan for *L. echinata* subsp. *occidentalis* also recommends that translocation is essential for the survival of this subspecies (Stack *et al*., in draft). Gibson *et al.* (1994) lists the community in which this species occurs as threatened, and

the Interim Recovery Plan lists the community as critically endangered (English, in draft). Therefore the need for translocation of this species is considered to be extreme.

4.2 Translocation Site Selection

The present population (W Road) is proposed as an augmentation site as this clearly has the edaphic and hydrological conditions suitable for this species. This area is designated as State Forest, and is therefore managed by CALM. The security of land tenure combined with the suitable edaphic and hydrological conditions means this is an ideal choice as an augmentation site. This can therefore be considered a restocking or augmentation under the definitions provided by Policy Statement 29 and the Guidelines for Translocation of Threatened Plants in Australia.

The second site (N Block) is listed as Occurrence 2 of the Southern Ironstone Shrubland Association (English, in prep). This site, therefore, also has the same edaphic and hydrological conditions as the known occurrence of *L. echinata* subsp. *occidentalis*. In addition there is a similar collection of associated plant species at W Road and N Block, these are shown in Table 1. This site was recently purchased by CALM and is proposed as an A Class Nature Reserve. The combination of security of land tenure, appropriate edaphic and hydrological conditions and a similar plant assemblage means this is a suitable introduction site for *G. maccutcheonii*. In addition it is only 5.5km from the W Road population. This translocation should be considered an introduction under the definitions provided by Policy Statement 29 and the Guidelines for Translocation of Threatened Plants in Australia, as this species has not previously been recorded from this reserve.

The third proposed site (O Road) is an area of 3.9 hectares of land where the critically endangered ironstone species *Grevillea maccutcheonii* grows. This area was recently purchased by CALM and is likely to be designated an A Class Nature Reserve. It is listed as Occurrence 6 of the Southern Ironstone Shrubland Association (English, in prep) and therefore, has the same edaphic and hydrological conditions as the area where *L. echinata* subsp. *occidentalis presently occurs*. There is a similar assemblage of associated plant species at W Road and O Road, these are shown in Table 1. In addition it is only 4.5km from the W Road population. The security of land tenure combined with the suitable edaphic and hydrological conditions means this is an ideal choice as an augmentation site. As this species has not previously been recorded from this area this translocation can be considered an introduction under the definitions provided in the Guidelines for Translocation of Threatened Plants in Australia. A map of the proposed introduction site in relation to the known population is shown in Appendix 1.

Table 1. A comparison of the associated vegetation at the proposed translocation sites at O Road and N Block with the known population of *Lambertia echinata* subsp. *occidentalis* at W Road.

Associated species at the proposed augmentation site (O Road).	Associated species at the proposed introduction site (N Block).	Associated species of the original population (W Road).
		Adenanthos obovatus
		Banksia grandis
		Banksia meisneri
		Casuarina obesa
Grevillea elongata	*Grevillea elongata*	
		Hemigenia pungens
		Hypolaena exsulca
Kunzea aff. micrantha	*Kunzea aff. micrantha*	*Kunzea* aff. *micrantha*
		Nuytsia floribunda
Pericalyma ellipticum	*Pericalyma ellipticum*	*Pericalymma ellipticum*
		Petrophile lateriticola
		Stirlingia latifolia
Viminaria juncea	*Viminaria juncea*	
		Xanthorrhoea preissii

4.3 Translocation Design

It must, however, be noted that both the N Block and O Road sites are exposed to potential threats such as dieback and weed invasion. Threats will be monitored at each translocation site. Weeds will be sprayed prior to the translocation of plants into the area and the application of weed matting of different types will be trialed where necessary. The control of weeds will therefore be incorporated into the regular maintenance of the site. The presence of Dieback will be monitored regularly by Regional dieback interpreters or soil sampling. If dieback is assessed as being a threat to the translocation aerial or hand application of phosphite will be undertaken.

There are 219 cuttings available for translocation, 19 of these will be planted at the original population (W Road, plot a). No experimental treatments will be tested. 60 cuttings will be planted at the O Road site (plot b). The remaining 140 will be established at Ns Block. Table 2 describes the treatments which will be tested. The limited number of plants and the need to increase the number of sites where *L. echinata* subsp. *occidentalis* occurs has resulted in the need to split the experimental design between sites. As we will not be making statistical comparisons between treatments that are on different sites this was seen as a way of better utilising the limited number of plants. See Appendix three for the layout of the experimental treatments.

Plots will not be cleared of vegetation at the N Block site and the W Road site, instead seedlings 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. There appears to be no reason that there would be adverse effects on the conservation values of this area from this translocation.

Table 2. Description of experimental treatments.

Treatment	Description of Treatment
Watered	Plants will be watered with a set amount of water once a week over the first summer. If it is deemed necessary watering will continue over subsequent summers.
Mounding	Create a raised planting site using local soil to minimise inundation of roots.
Ripping	Shattering the surface layers of ironstone to allow root penetration.
Fertiliser	all plots - every 5th plant fertilised with slow release at time of planting

A metal tag with information pertaining to the individual will be attached to a metal peg next to each individual seedling. Excluding the O Road site, each plant will then be enclosed with rabbit netting to prevent predation of the seedlings by large herbivores such as kangaroos and rabbits. The O Rd site is boundary fenced with rabbit proof netting, individual plant cages will be installed if required.

Monitoring of the translocated population will be undertaken monthly for the first three months post planting then reduced to every third month commencing for a two year period . 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 seed pods, whether second generation plants are present and general health of the plants. A set photo point will be allocated for each plot and a photo will be taken each time monitoring takes place.

Monitoring of the original population (population 1) will coincide with the translocation monitoring. Monitoring will include counting the number of individuals, height and crown width of the individuals, reproductive state, number of flowers and seed pods and general health of the plants.

4.4 Source of Plants

Cutting material was collected from 12 clones between 1995 and 1998. Cuttings are being raised at the accredited nursery at Kings Park and Botanic Gardens.

4.5 Criteria for Success or Failure

Criteria for Success

- Short Term: establishment of translocated cuttings
  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 related species.

Criteria for Failure

- Short Term: failure of translocated cuttings 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
October 1998	Plants raised from cutting material.
January 2000	Translocation sites selected.
May 2000	Translocation proposal submitted for review and approval.
August 2000	Translocation of cuttings into the translocation sites.
August 2000 – August 2001	Three monthly monitoring of translocated plants.
October 2000	Additional plants raised from cutting material.
November 2000	Setting up of irrigation system.
May - June 2001	Further translocation of seedlings into the translocation sites.
August 2001 - August 2005	Once or twice yearly monitoring of translocated plants and soil seed bank and maintenance of translocation sites.
May 2005	Final Report

6. FUNDING

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7. ACKNOWLEDGMENTS

Val English, Robyn Phillimore and Russell Smith are thanked for their input in selecting suitable translocation sites.

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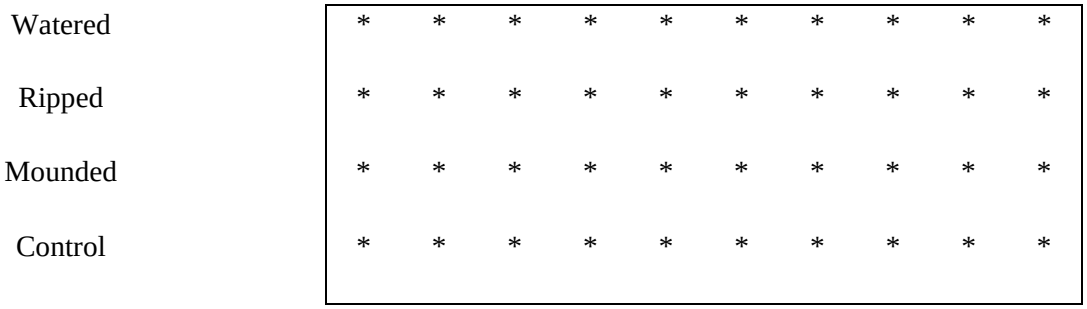
Stack G., Evans R. and English V. (in draft) Western Prickly Honeysuckle (*Lambertia echinata* subsp. *occidentalis*) Interim Recovery Plan. Department of Conservation and Land Management, Perth W.A.

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

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

W Road – Natural Population
19 plants – no treatments tested.

N Block
Replicate 1



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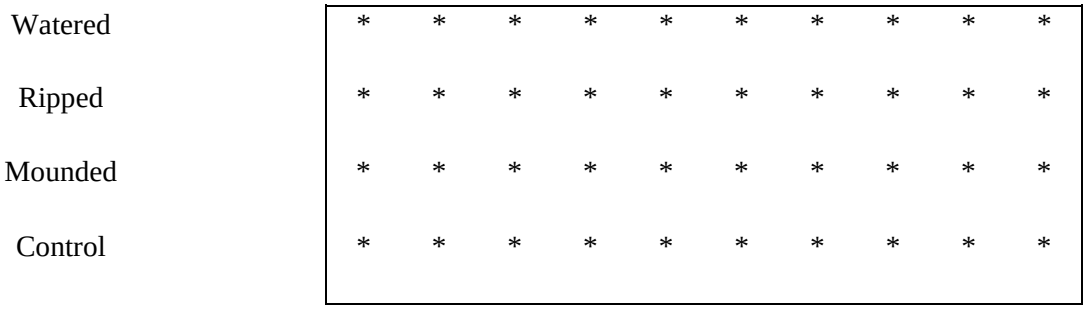

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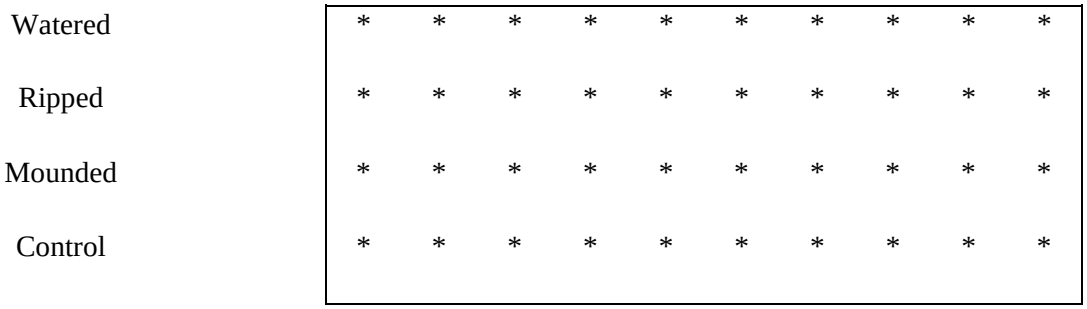
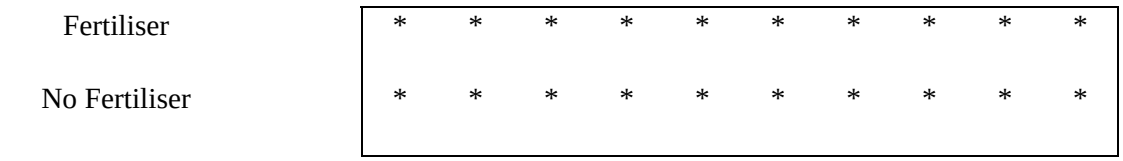


Oats Road

Replicate 1



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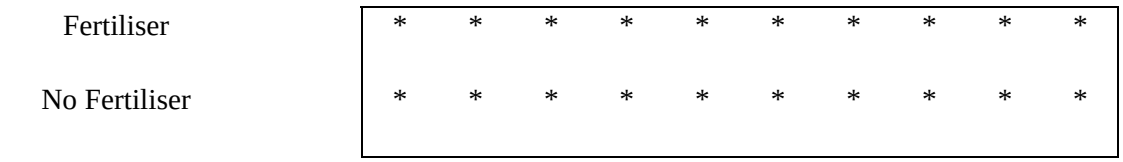

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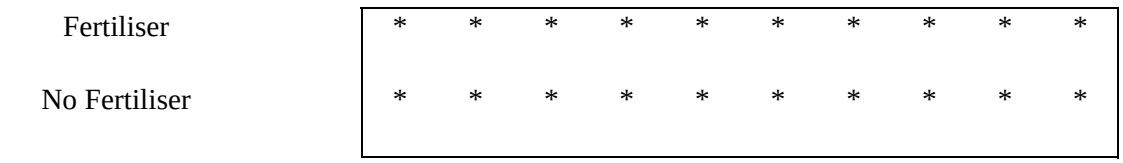

Scale: 1.5 m