RARE WESTERN AUSTRALIAN PLANTS

2.

Lambertia rariflora

D. HALFORD

1980

DEPARTMENT OF
FISHERIES AND WILDLIFE,
108 ADELAIDE TERRACE,
PERTH

UNPUBLISHED REPORT

Rare Western Australian Plants

2: LAMBERTIA RARIFLORA

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Department of Fisheries and Wildlife

Western Australia.

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2: LAMBERTIA RARIFLORA

by

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ABSTRACT

The distribution and abundance of the species Lambertia rariflora Meissn. was surveyed on the Donnybrook Sunklands between Yoganup and the Brockman Highway during February 1980.

A total of eight populations were located which were restricted to an area around the Whicher Range on the banks of ephemeral creeks in heavy clay soils. One population was found in an area intended for the conservation of flora and fauna. Another three populations are in an area set aside for pine plantations, while the remaining four populations were in areas for hardwood production. A total of 813 individual plants were counted in these populations.

L. rariflora is considered to be a species at risk of disappearing from the wild state if casual factors are allowed to continue and it is recommended that the species be proclaimed rare. A more intensive investigation should be carried out in the creeks around the Whicher Range.

INTRODUCTION

Lambertia rariflora (Proteaceae) was first described by Meisner (1848) from a specimen collected by Drummond on his second expedition. The exact locality of this collection site is unknown.

Since the original collection, the species has only been collected from two other sites which are less than 1 km apart and 18 km west of Jarrahwood in the South West Botanical District of Menzies (Table 1).

The species is a perennial erect shrub 1 - 7 metres high; its leaves being shortly petiolate, linear and mostly 4 - 8 cm long. The flowers are green, solitary and terminal with the perianth approximately 2.5 cm long (Figs 1 & 2).

Label details on herbarium specimens indicate that the species flower in the months January to March and grows in heavy clay in dense scrub with Bullich (Eucalyptus megacarpa) on creek banks.

The conservation status of L. rariflora has been researched by three groups of authors who considered it to be a poorly known species and that more information was needed on its distribution (Table 2). L. rariflora was under consideration by the Department of Fisheries and Wildlife as a species to be gazetted as rare on proclamation of the amended Wildlife Conservation Act early in 1980.

The purpose of this study was to present recommendations for the management and conservation of L. rariflora through a survey of the distribution of the species and obtaining information on the locations of existing populations, the number of plants within each population, the habitat in which they occurred and the reproductive biology of the species.

Table 1 Data of specimens of *L. rariflora* in W.A. Herbarium, Perth, as at January 1980.

Collector & Collection No.	Date Collected	Locality
D.F. McKinnell 420	21 March 1973	Jarrahwood FW 3151
G.S. McCutcheon 561	21 January 1975	Jarrahwood FX 3169
G.S. McCutcheon 562	21 January 1975	Jarrahwood FX 3169
L. Drummond 312	2nd collection	Unknown

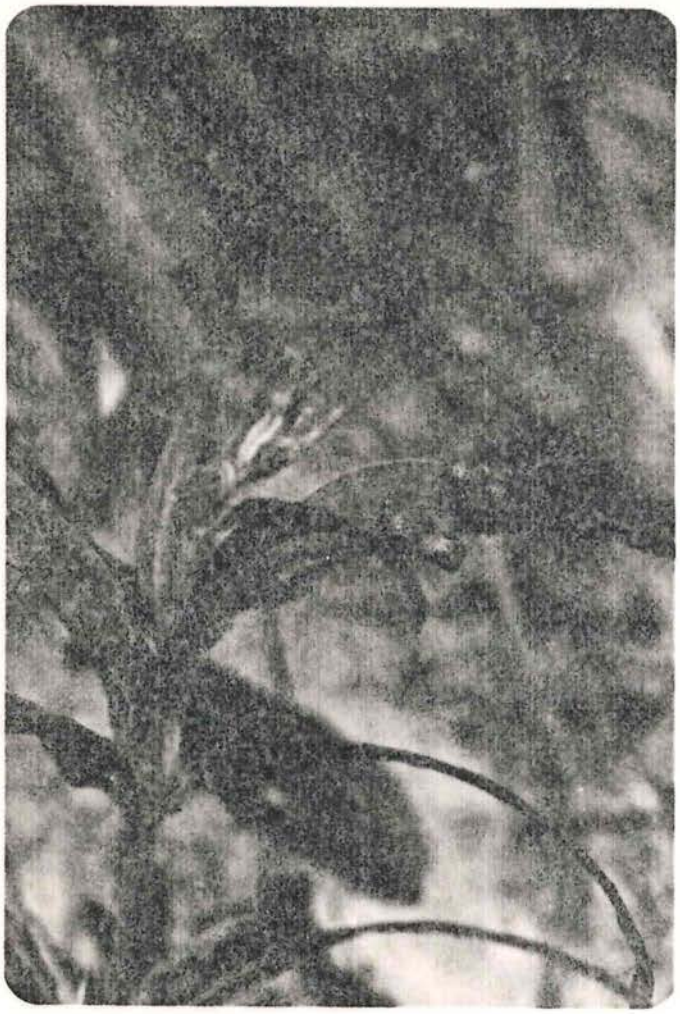
Figure 1

Lambertia rariflora (3.3 metres high)
Scale right side of figure 1 metre high.
(Population 2)

Figure 2 Flowers of L. rariflora approx. 2.5 cm in length (Population 4)

a) Mature

b) Senescent



(a)

(b)

Table 2 Conservation status of *L. rariflora* as categorized in three independent studies.

Author(s)	Code	Comments
Specht et al. (1974)	5	Species known only from original collection (more information needed on their distribution)
Marchant and Keighery (1979)	D	Poorly collected. Less than 5 collections in Western Australian Herbarium. Rarity is not implied.
Hartley and Leigh (1979)	2n	2 - Restricted endemics whose known populations are limited in range (Normally less than 100 km in maximum range) n - Species not known to occur in National Parks and other declared reserves

METHODS AND MATERIALS

The diagnostic morphological features and geographical distribution of L. rariflora were investigated through examining specimens at the Western Australian Herbarium. In the field, L. rariflora was distinguishable at a distance by its long linear leaves.

An area of approximately 2200 km^2 was investigated during the period 2 - 11 February 1980. The area extended around the collection site near Jarrahwood, from Yoganup in the north to south of the Brockman Highway. The west-east boundaries were Margaret River and Greenbushes respectively. Accessible road tracks and fire-breaks in the area were traversed (Fig 3). It was apparent that L. rariflora was restricted to areas on creek banks and moist depressions. All creeks crossed were thoroughly surveyed for at least 300 metres along their length.

When a plant was sighted, the surrounding area was investigated. Descriptions of the vegetation at the sites were made by using Muir's (1977) classification. The dominant species for the lower shrub layer were listed, but no attempt was made to produce a full list of species present.

Soil colour was based on Fujihira Revised Standard Soil Color Charts (Frank McCarthy Color Pty. Ltd.). Data on the number of individuals in a population, height range and reproductive stages were also recorded. Latitude and longitude coordinates and information on land status came from Western Australian Forestry Maps 80 chains to an inch.

All information was recorded on Field Sheets which are presented in Appendix 1

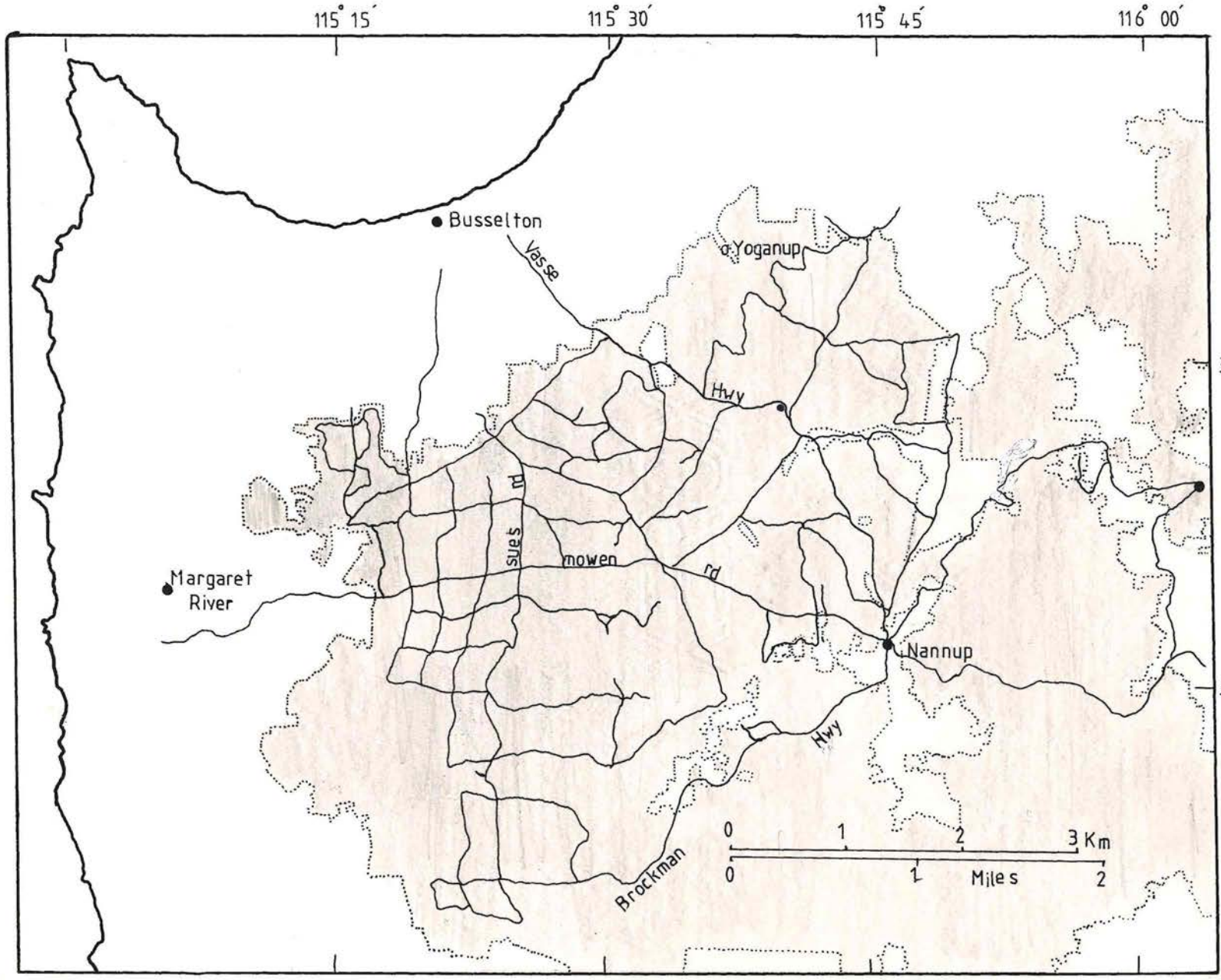


Figure 3 Roads tracks and firebreaks surveyed.

RESULTS

From the survey eight populations of L. rariflora were recorded (Fig 4). The populations were within an area of 62 km^2 around the Whicher Range. Three of these populations (Nos. 1, 2 7) had been previously sited by G.S. McCutcheon, Forestry Dept., Busselton (personal communication).

The sites are within a geomorphological region termed the 'Donnybrook Sunklands' (Fig 5). This is a low plateau consisting of lateritic uplands and incised valleys with some areas covered by recent sands. Open flats and numerous ephemeral creeks occurred throughout the area. Seven populations were found on the banks of the ephemeral creeks in heavy clay soil which ranged in colour from a dull yellow to bright reddish-brown. Population No. 8 was found in a moist depression in light gray clay suggesting a more heavily leached soil (Tables 3 & 4).

A proposed forest land use plan which was published in 1975 (Forest Focus No 16) has zoned 283000 hectares of Donnybrook Sunklands into management priority areas (M.P.A's) with priorities given to recreation, flora and fauna, ecology, pine plantations and hardwood production. The Whicher M.P.A. is an area intended to conserve flora and fauna. One population of L. rariflora (Population No. 2) was in this block. Three populations (Nos. 1, 3, 4) are in an area set aside for pine plantations. Within these areas the native forest is left along the drainage lines. Populations Nos. 3 and 4 had areas surrounding the creek already cleared for the planting of pine trees. The remaining four populations were in areas of hardwood production (Fig 4).

Sizes of the populations range from 19 to 451 with six of them having less than 50 individuals in a population. The total number of plants recorded was 813 (Table 4).

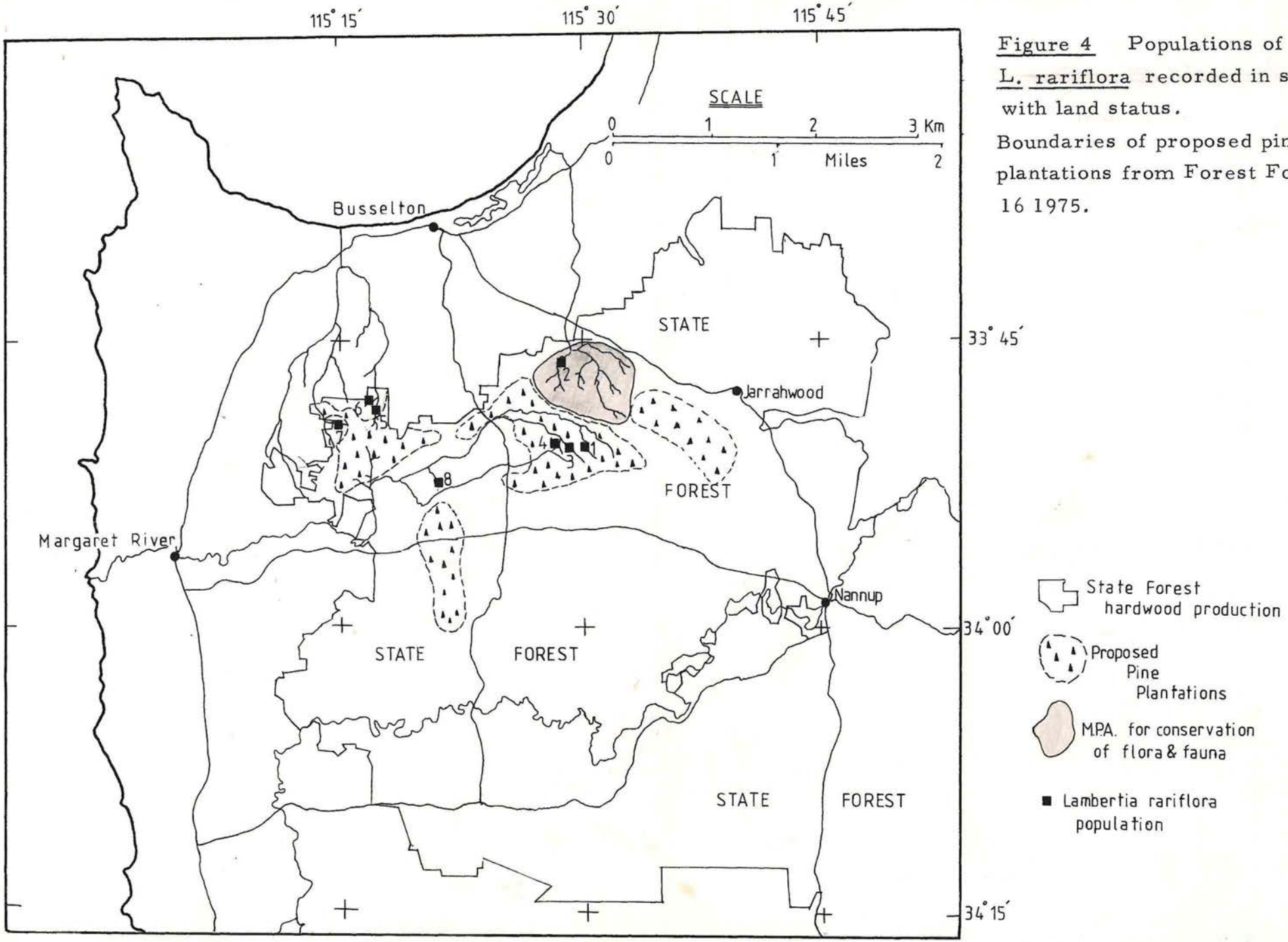


Figure 4 Populations of L. rariflora recorded in survey with land status.
Boundaries of proposed pine plantations from Forest Focus No. 16 1975.

Figure 5 Geomorphology of S.W. corner of Western Australia

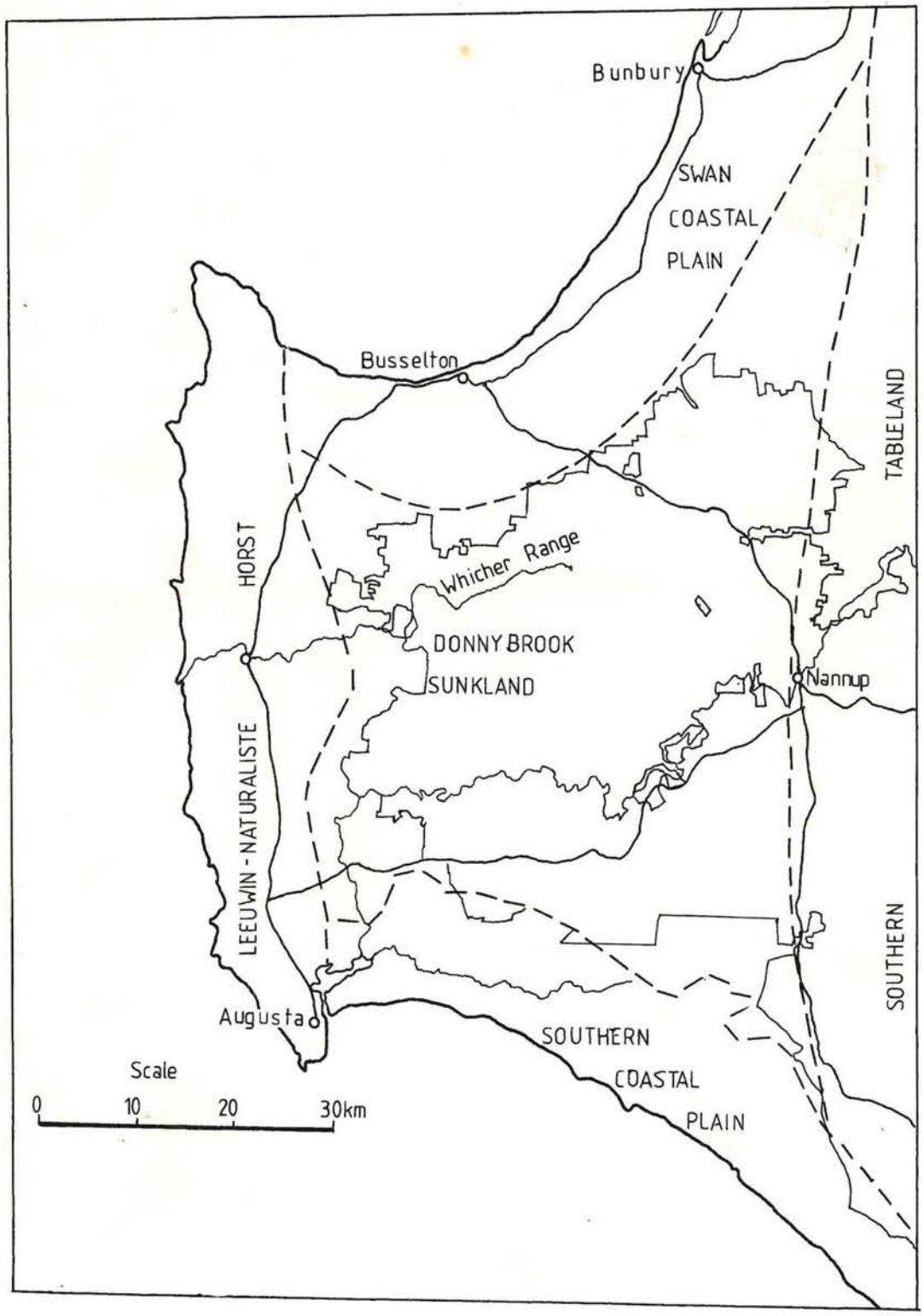


Table 3 Geomorphological region and soil description of population sites.

Population Number	Geomorphological Region	Soil Description
1	Donnybrook Sunkland	Dull yellow clay
2	Donnybrook Sunkland	Bright reddish-brown clay (depth 4 ft) over laterite
3	Donnybrook Sunkland	Dull yellow clay
4	Donnybrook Sunkland	Brown clay
5	Donnybrook Sunkland	Reddish-brown clay (depth 4 ft) over laterite
6	Donnybrook Sunkland	Dull-brown clay
7	Donnybrook Sunkland	Reddish-brown clay (depth 3 ft) over laterite
8	Donnybrook Sunkland	Light gray clay (at least 6ft in depth

Table 4 Presents data on population size land status and habitat.

Population Number	Number of Plants	Land Status	Habitat
1	198	S.F. 33	Banks of ephemeral creek
2	26	S.F. 33[1]	Banks of ephemeral creek
3	27	S.F. 33	Banks of ephemeral creek
4	451	S.F. 33	Banks of ephemeral creek
5	34	S.F. 32	Banks of ephemeral creek
6	37	S.F. 32	Banks of ephemeral creek
7	21	S.F. 32	Banks of ephemeral creek
8	19	S.F. 32	Low swampy flat ground

S.F. = State Forest

1 = Management Priority Area for Conservation of Flora and Fauna

L. rariflora was associated with forest and woodlands of Jarrah (Eucalyptus marginata), Bullich (Eucalyptus megacarpa) with some Marri (Eucalyptus calophylla) and Blackbutt (Eucalyptus patens). At one site (No. 2) a dense low forest of L. rariflora was observed. A dense thicket of L. rariflora, Agonis linearifolia and Hakea sp. frequently occurred in a number of sites. The shrub layer was a variable heath formation with species of Hypocalymma, Thomasia, Anigozanthos, Agonis and Boronia represented (Figs 5 & 6, Table 5).

Although the populations were in areas which had been severely affected by dieback (Phytophthora cinnamomi) there appeared to be no effect on L. rariflora. A number of seedlings of L. rariflora and other species were observed to have recently died. From their position on the creek bank it would appear that they had not reached a sufficient water supply to survive the summer drought.

During the period from 2nd - 11th February, all populations were observed to be flowering. Flowering appeared to be a continuous process of developing, mature and senescing flowers. A few ants and European bees were observed collecting nectar from flowers (Table 6).

Figure 5

Jarrah Forest over dense low forest of Lambe rtia rariflora.
A dense heath of Thomasia sp. and Angiozanthos sp.
(Population No. 2)
← Lambertia rariflora

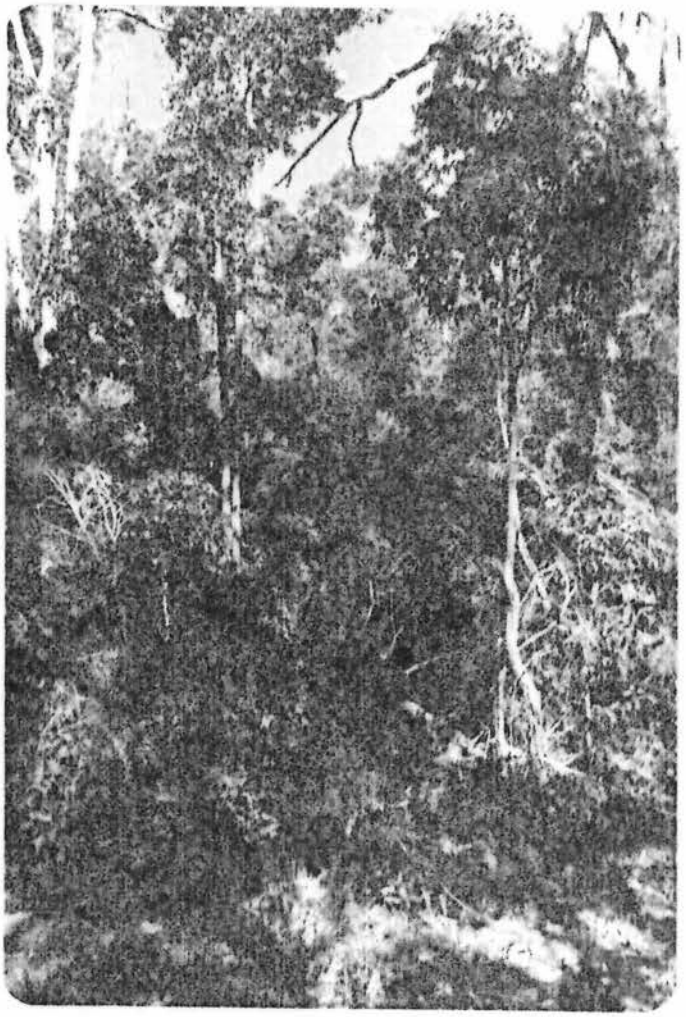


Figure 6

Jarrah woodland over dense heath of Agonis parviceps and L. rariflora with low heath of Pineapple Bush (Dasypogon Hookeri), Hypocalymma sp. (Population 3).

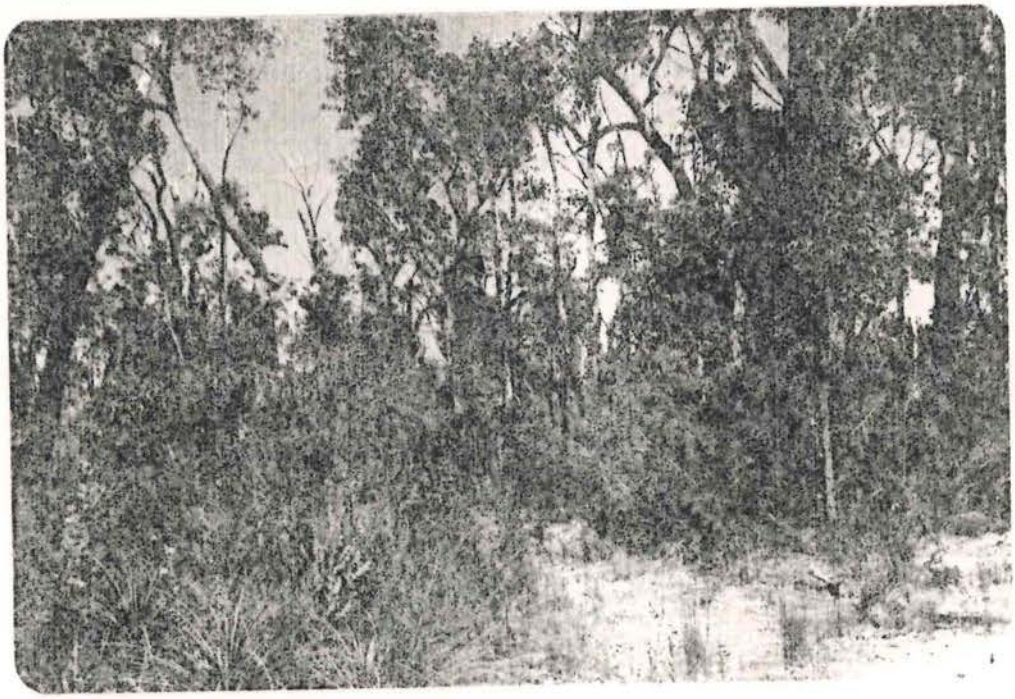


Table 5

Description of the vegetation at L. rariflora population sites

	1	2	3	4	5	6	7	8
Woodland	*		*			*		
Forest		*		*	*		*	
Dense Low Forest A		*						
Low Forest A								*
Dense Thicket	*			*	*	*		
Dense Heath A			*					
Dense Heath B		*						
Heath A & B							*	
Dense Low Heath C & D	*							
Low Heath D			*			*		

Table 6 Data on reproductive stage of plants in populations

Population Number	Date	Reproductive Stage	Fauna Activity
1	2.2.80	Flowering	-------
2	8.2.80	Flowering	Ants collecting nectar from flowers
3	8.2.80	Flowering	---------
4	8.2.80	Flowering	European bee, two ant species collecting nectar
5	9.2.80	Flowering	
6	9.2.80	Flowering	
7	9.2.80	Flowering	
8	10.2.80	Flowering	

DISCUSSION

From the survey, it would appear that Lambertia rariflora has a restricted distribution to an area around the Whicher Range. Because of the small number of individuals recorded, all populations should be protected from any factors which may affect the survival of the species in the habitat.

It is considered that L. rariflora is a species at risk of disappearing from the wild state if casual factors are allowed to continue, and it is recommended that the species be proclaimed as rare.

The effects of clearing of vegetation adjacent to the creeks on the Lambertia population is not known. L. rariflora populations in these areas should be monitored for signs of deterioration.

A more intensive investigation should be carried out in the creeks around the Whicher Range and the Whicher M.P.A. block. Also, it would be worthwhile to research the effects of dieback as being a serious threat to the survival of L. rariflora.

REFERENCES

Forest Focus (1975) No. 16. Sunklands multiple use land management. Forest Dept. of W.A.

Hartley, W. and Leigh, J.H. (1979). Plants at risk in Australia. Australian National Parks and Wildlife Service, Occasional Paper No. 3. Commonwealth ofAustralia, Canberra, 80 pp.

Marchant, N.G. and Keighery, G.J. (1979). Poorly collected and presumably rare vascular plants of Western Australia. Kings Park Research Notes - No. 5. June 1979.

Meisner, C.F. (1848). Plantae Preissianae. ii pp 263.

Specht, R.L., Roe, E.M. and Boughton, V.H. (1974). Conservation of major plant communities in Australia and Papua New Guinea. Australian Journal of Botany. Supp. No. 7 pp. 667.

APPENDIX 1

Sheet No. 1

Taxon Lambertia rariflora Population No. 1

Observer's Name D. Halford Date 2 / 2 / 1980

LOCALITY Specific Description

0.4 km east from Charles Road along Terry Road.
0.4 km north from Terry Road along firebreak.

(Grid reference FW 3151)

Latitude 33° 49' Longitude 115° 28' Resolution

Map Used Forestry Map. Busselton 80

Direction West Air Distance 17.7 km To Nearest Named Place Jarrahwood

Shire Name Augusta-Margaret R. Code 201

Land Status State Forest 33 (if Reserve - Code class)

HABITAT

Land form description Banks of ephemeral creek

Soil description Heavy dull yellow (2.5 Y 6/3) clay.

Vegetation Structure (Muir 1977)

Woodland of Bullich (Eucalyptus megacarpa), Blackbutt (Eucalyptus patens)

Dense thicket of Agonis linearifolia, Hakea sp., Lambertia rariflora.

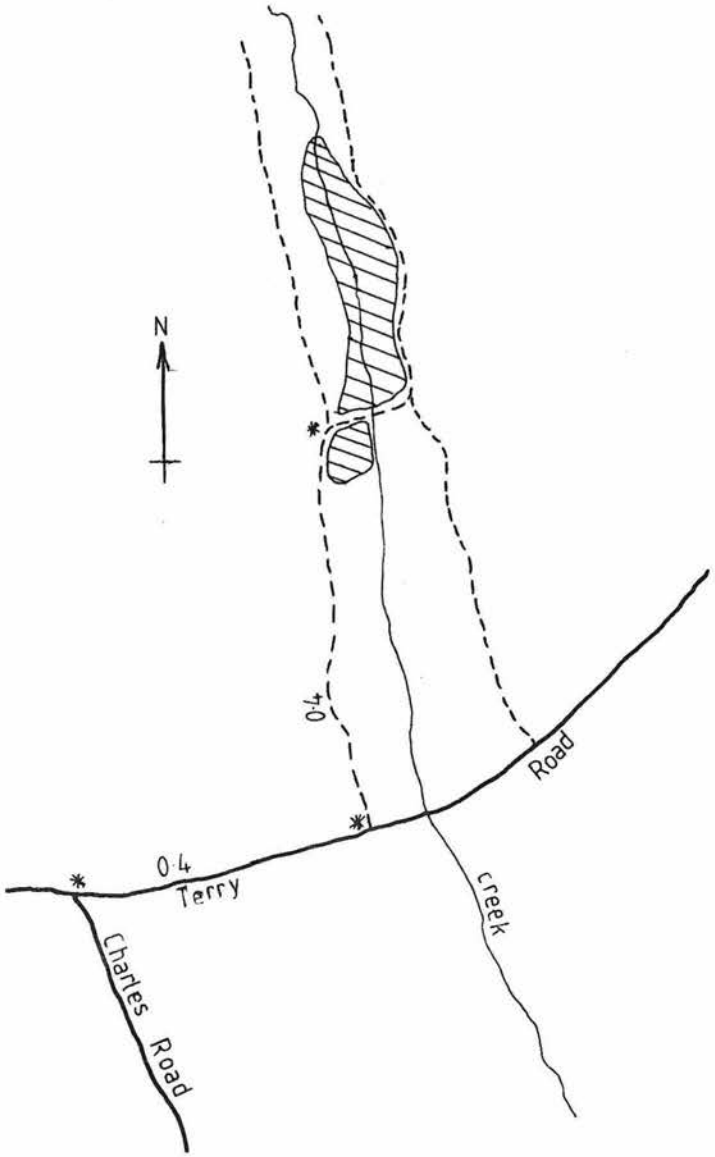
Low dense heath of Boronia sp., Hibbertia sp., Lepidospermum sp.

Other Comments

Population Data

Population size	198 plants
Area Surveyed	10 hectares on creek banks
Age structure	0.3 - 3.0 high
Reproductive stage	flowering.

Other Comments


N
4·0
Road
0·4
Terry
creek
Charles Road

Sheet No. 1

Taxon Lambertia rariflora Population No. 2

Observer's Name D. Halford Date 8 / 2 / 1980

LOCALITY Specific Description

3.6 km north east from Ridge Road along Sabina Road.
0.6 km south east from Sabina Road.

(Grid reference FT 2965)

Latitude 33° 46' Longitude 115° 26' Resolution

Map Used Forestry Map Busselton 80

Direction S.E. Air Distance 16.1 km To Nearest Named Place Busselton

Shire Name Busselton Code 205

Land Status S.F. 33 (if Reserve - Code class)

Management priority Area 1.1 Whicher Conservation of Fauna and Flora

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HABITAT

Land form description Banks of ephemeral creek

Soil description Heavy bright reddish-brown (5YR 5/6) clay (depth 4ft) over laterite

---

Vegetation Structure (Muir 1977)

Forest of Jarrah (Eucalyptus marginata)

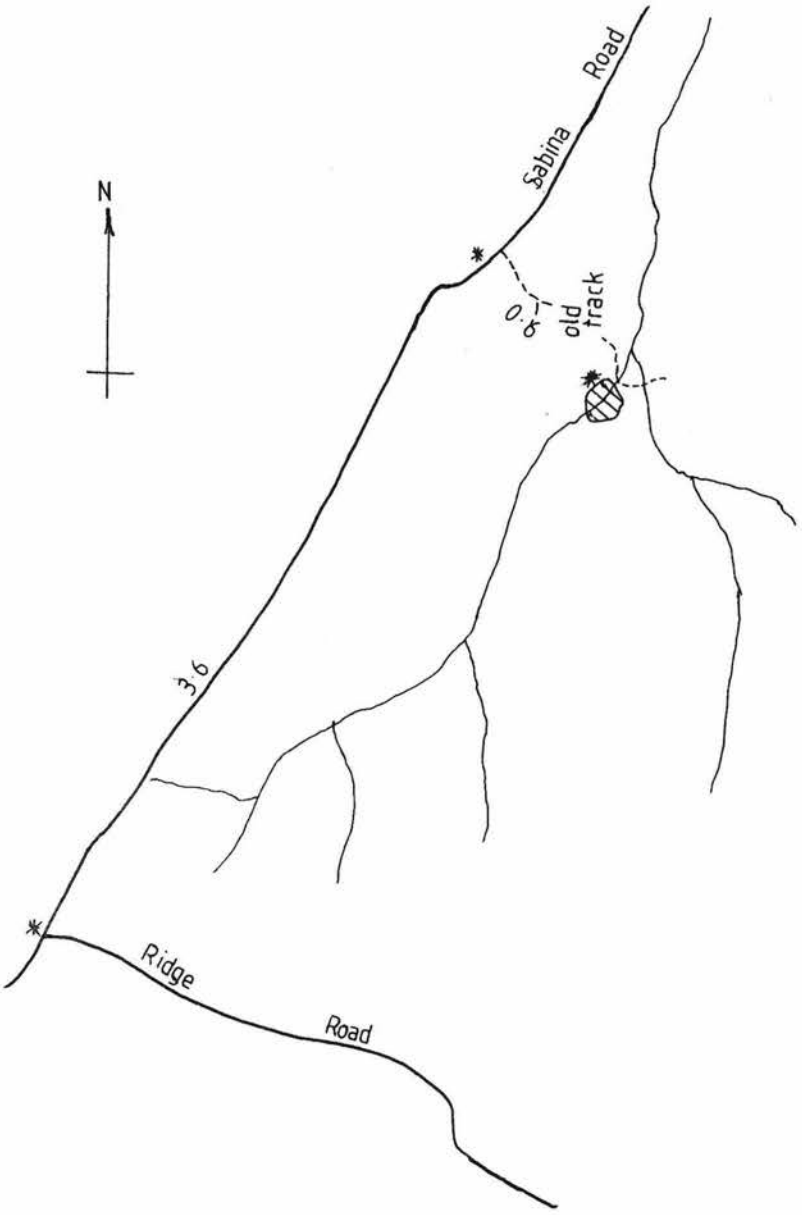
Dense low Forest A of Lambertia rariflora

Dense heath B of Thomasia sp., Anigosanthos sp.

Other Comments

Population Data

Population size	26 plants in area of 2 hectares
Area Surveyed	10 hectares
Age structure	0.1 - 7.0 metres
Reproductive stage	Flowering
Other Comments	Ants collecting nectar from flowers.


N
Sabina Road
0.4
old track
3.6
Ridge Road

Sheet No. 2

Taxon Lambertia rariflora

Population No. 3

Observer's Name D. Halford Date 8 / 2 / 1980

LOCALITY Specific Description

0.4 km west from John Road along Terry Road.
0.2 km south of Terry Road.

(Grid reference F W 3051)

Latitude 33° 49' Longitude 115° 27' Resolution

Map Used Forestry Map. Busselton 80

Direction West Air Distance 19.3 km To Nearest Named Place Jarrahwood

Shire Name Augusta-Margaret R. Code 201

Land Status S.F. 33 (if Reserve - Code class)

HABITAT

Land form description Banks of ephemeral creek

Soil description Heavy dull yellow (2.5Y 6/3) clay.

Vegetation Structure (Muir 1977)

Woodland of Jarrah (Eucalyptus marginata)

Dense Heath A. Agonis parviceps, Lambertia rariflora.

Low Heath D, Hypocalymma sp.

Other Comments

Population Data

Population size 27 plants

Area Surveyed 7 hectares

Age structure 0.2 - 1.5 m high

Reproductive stage Flowering

Other Comments


John
Road
Vegetation
0.4
Terry
Road
Charles
Road
0.2
Cleared
creek
N

Sheet No. 3

Taxon Lambertia rariflora Population No. 4

Observer's Name D. Halford Date 8 / 2 / 1980

LOCALITY Specific Description

Junction of Terry and King Roads.

(Grid reference F W 2964)

Latitude 33° 49' Longitude 115° 26' Resolution

Map Used Forestry Map. Busselton 80

Direction S.E. Air Distance 20.3 km To Nearest Named Place Busselton

Shire Name Augusta-Margaret R Code 201

Land Status S.F. 33 (if Reserve - Code class)

HABITAT

Land form description Banks of ephemeral creek

Soil description Heavy brown (7YR 4/6) clay.

Vegetation Structure (Muir 1977)

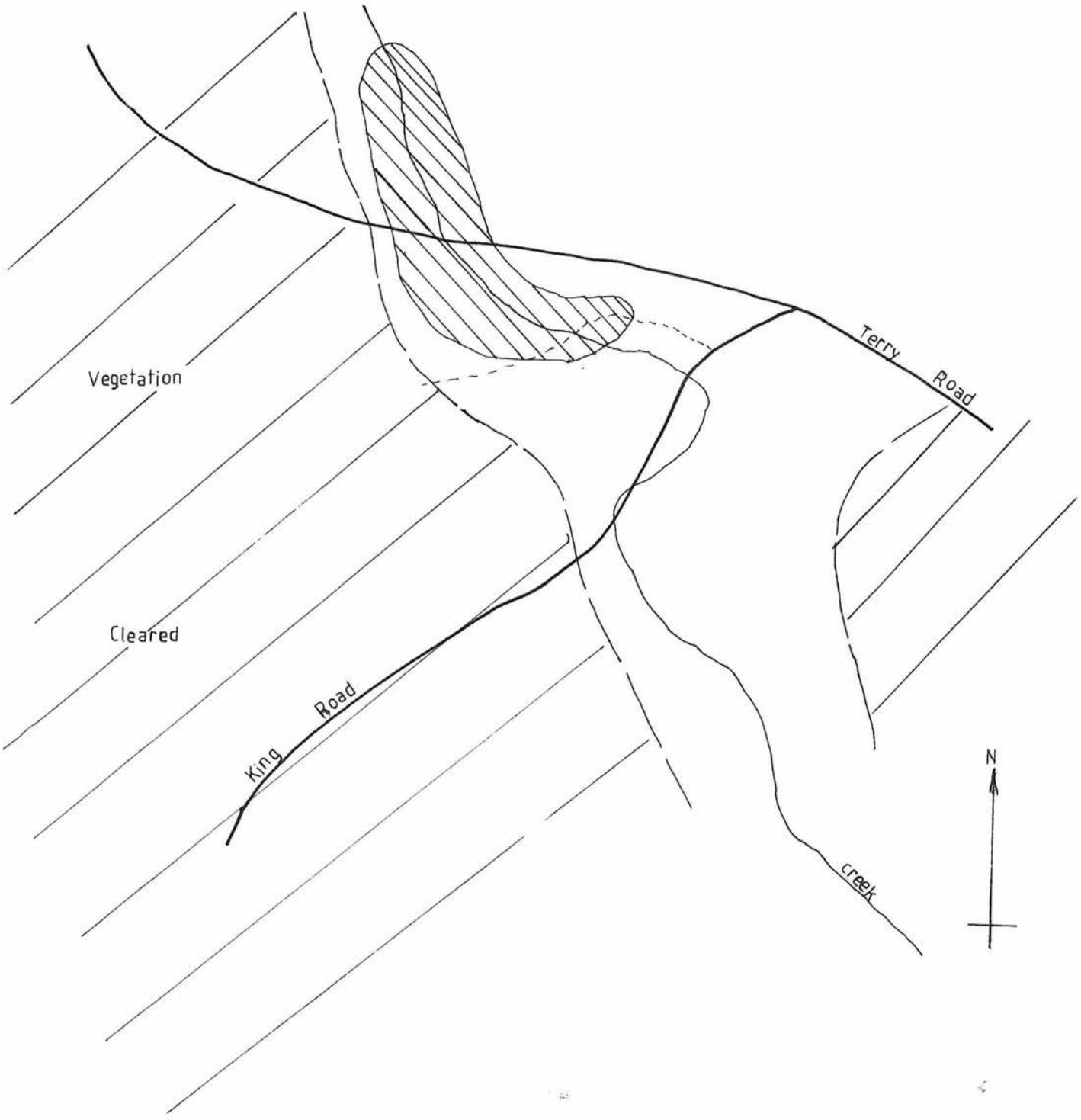
Forest of Bullich (Eucalyptus megacarpa), Marri (Eucalyptus calophyla), Jarrah (Eucalyptus marginata).

Dense thicket of Lambertia rariflora, Hakea sp.

Other Comments

Population Data

Population size	451 plants along creek banks
Area Surveyed	10 hectares
Age structure	0.5 - 3 metres high
Reproductive stage	Flowering
Other Comments	European bee collecting nectar 2 ant species collecting nectar.


Vegetation
Cleared
Terry Road
King Road
creek
N

Sheet No. 1

Taxon Lambertia rariflora Population No. 5

Observer's Name D. Halford Date 9 / 2 / 1980

LOCALITY Specific Description

2.6 km east from Jacka Road along Bridge Road.
0.5 km east of Bridge Road.

(Grid reference F W 2045)

Latitude 33° 49' Longitude 115° 16' Resolution

Map Used Forestry Map. Busselton 80

Direction S.S.W. Air Distance 18.4 km To Nearest Named Place Busselton

Shire Name Augusta-Margaret R. Code 201

Land Status S.F. 32 (if Reserve - Code class)

HABITAT

Land form description Banks of ephemeral creek

Soil description Heavy reddish-brown. Clay (4 ft depth) over laterite (5YR 4/6)

Vegetation Structure (Muir 1977)

Forest of Marri (Eucalyptus calophyla), Jarrah (Eucalyptus marginata) Bullich (Eucalyptus megacarpa)

Dense thicket of Lambertia rariflora

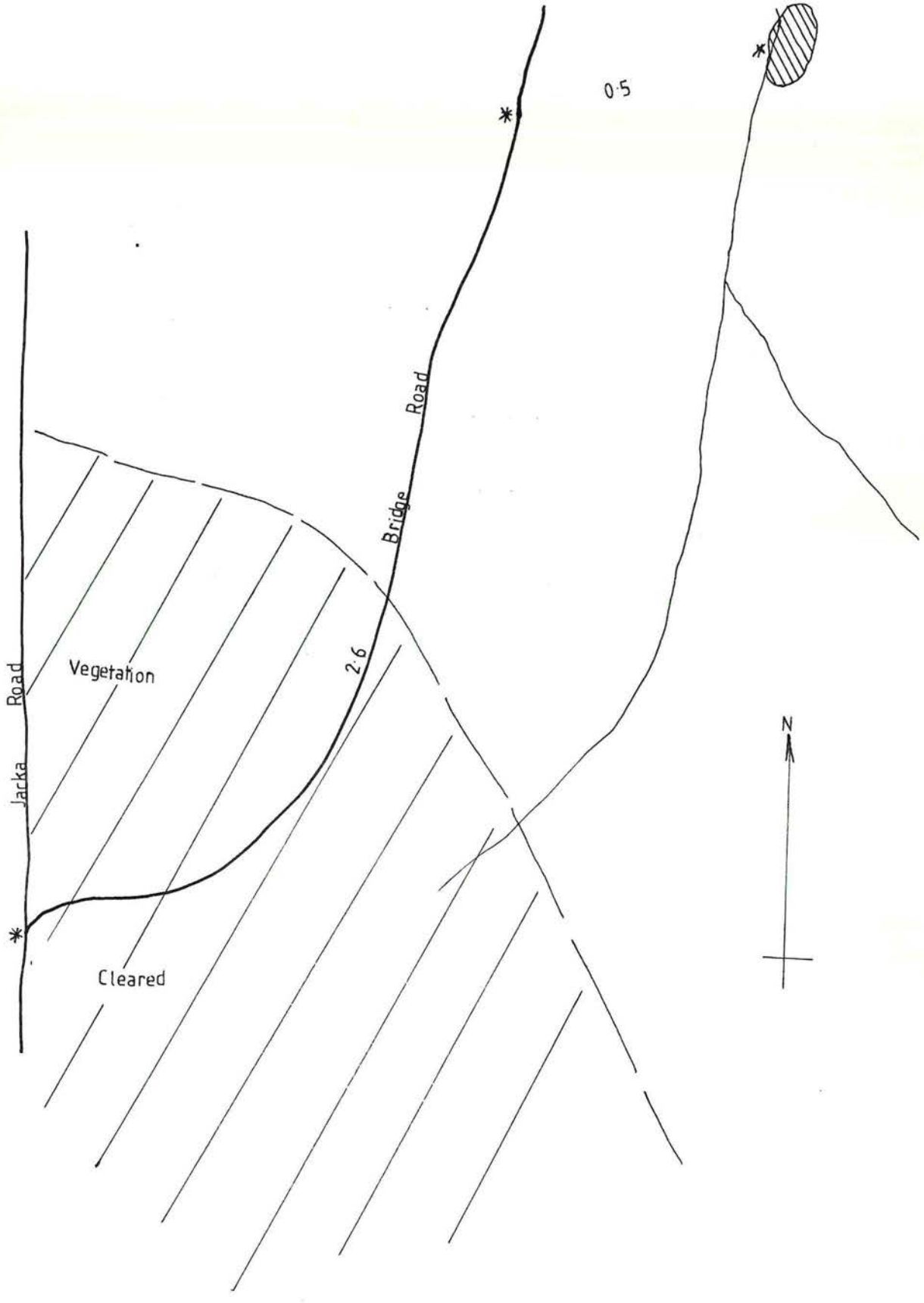
Dense tall sedge in creek.

Other Comments

Population Data

Population size	34 plants
Area Surveyed	8 hectares
Age structure	0.1 - 3.0 m high
Reproductive stage	Flowering

Other Comments


0·5
Bridge Road
2·6
Vegetation
Jacka Road
Cleared
N

Sheet No. 2

Taxon Lambertia rariflora Population No. 6

Observer's Name D. Halford Date 9 / 2 / 1980

LOCALITY Specific Description

0.4 km north from Shane Road along Smith Road.

(Grid reference F W 1812)

Latitude 33° 49' Longitude 115° 14' Resolution

Map Used Forestry Map Busselton 80

Direction S.W. Air Distance 20.4 km To Nearest Named Place Busselton

Shire Name Augusta-Margaret R. Code 201

Land Status S.F. 32 (if Reserve - Code class)

HABITAT

Land form description Banks of ephemeral creek

Soil description Heavy dull brown (7.5YR 5/4) clay

Vegetation Structure (Muir 1977)

Woodland of Jarrah (Eucalyptus marginata) Bullich (Eucalyptus megacarpa

Dense thicket of Agonis linearifolia, Hakea sp.

Low Heath D. of Boronia sp., Hypocalymma sp.

Other Comments

Population Data

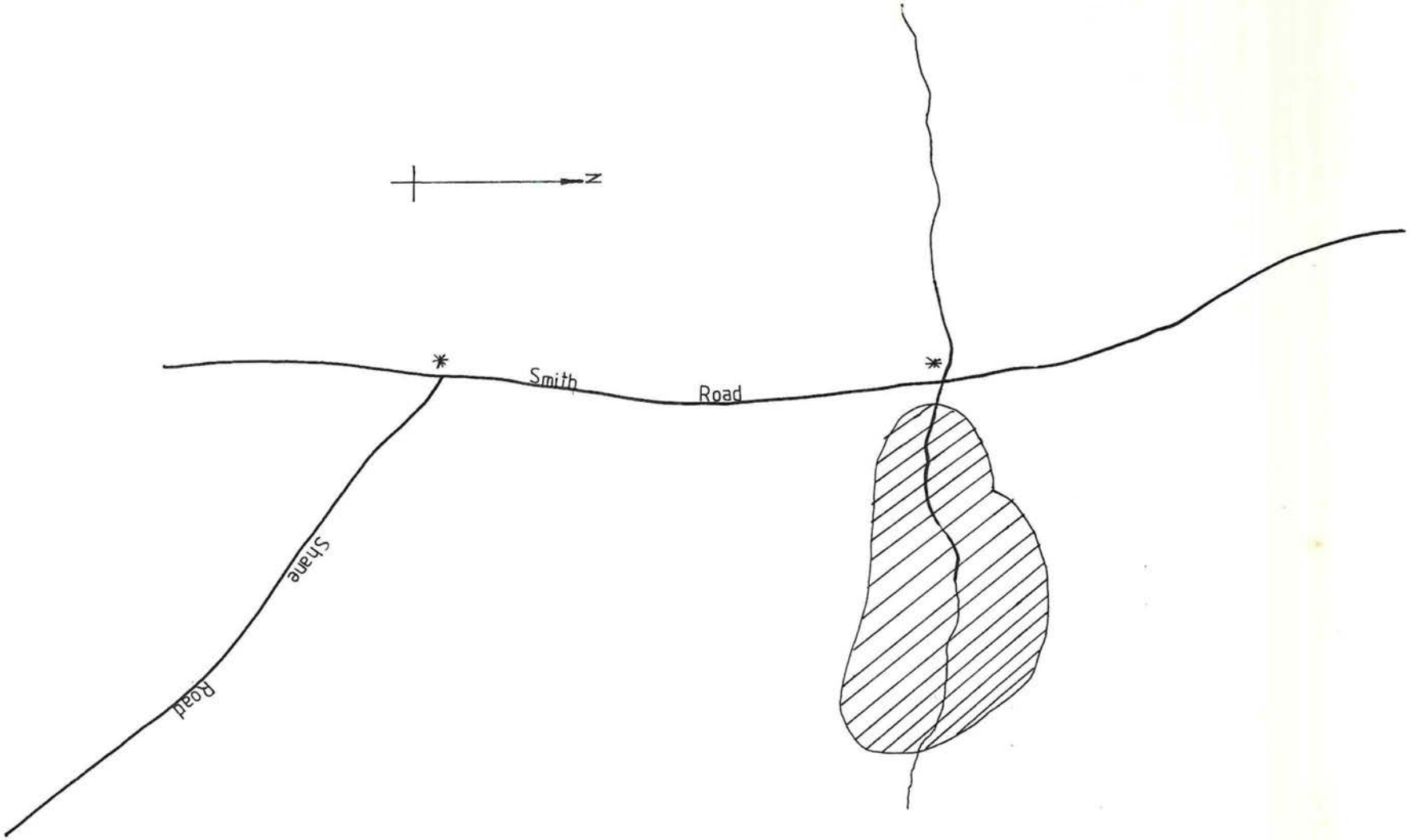
Population size 37 plants

Area Surveyed 5 hectares

Age structure 0.1 - 3.0 metres high

Reproductive stage Flowering

Other Comments


N
Smith
Road
Shane
Road

Sheet No. 3

Taxon Lambertia rariflora Population No. 7

Observer's Name D. Halford Date 9 / 2 / 1980

LOCALITY Specific Description

1.1 km south from Smith Road along Jacka Road.
0.9 km east of Jacka Road.
(Grid reference F W 1986)

Latitude 33° 49' Longitude 115° 16' Resolution

Map Used Forestry Map Busselton 80

Direction S.S.W. Air Distance 19.3 km To Nearest Named Place Busselton

Shire Name Augusta-Margaret R Code 201

Land Status S.F. 32 (if Reserve - Code class)

HABITAT

Land form description Banks of ephemeral creek

Soil description Heavy reddish-brown (5YR 4/8) clay (3 ft depth) over laterite

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Vegetation Structure (Muir 1977)

Forest of Jarrah (Eucalyptus marginata), Bullich (Eucalyptus megacarpa)

Heath A & B Agonis linearifolia, Lambertia rariflora

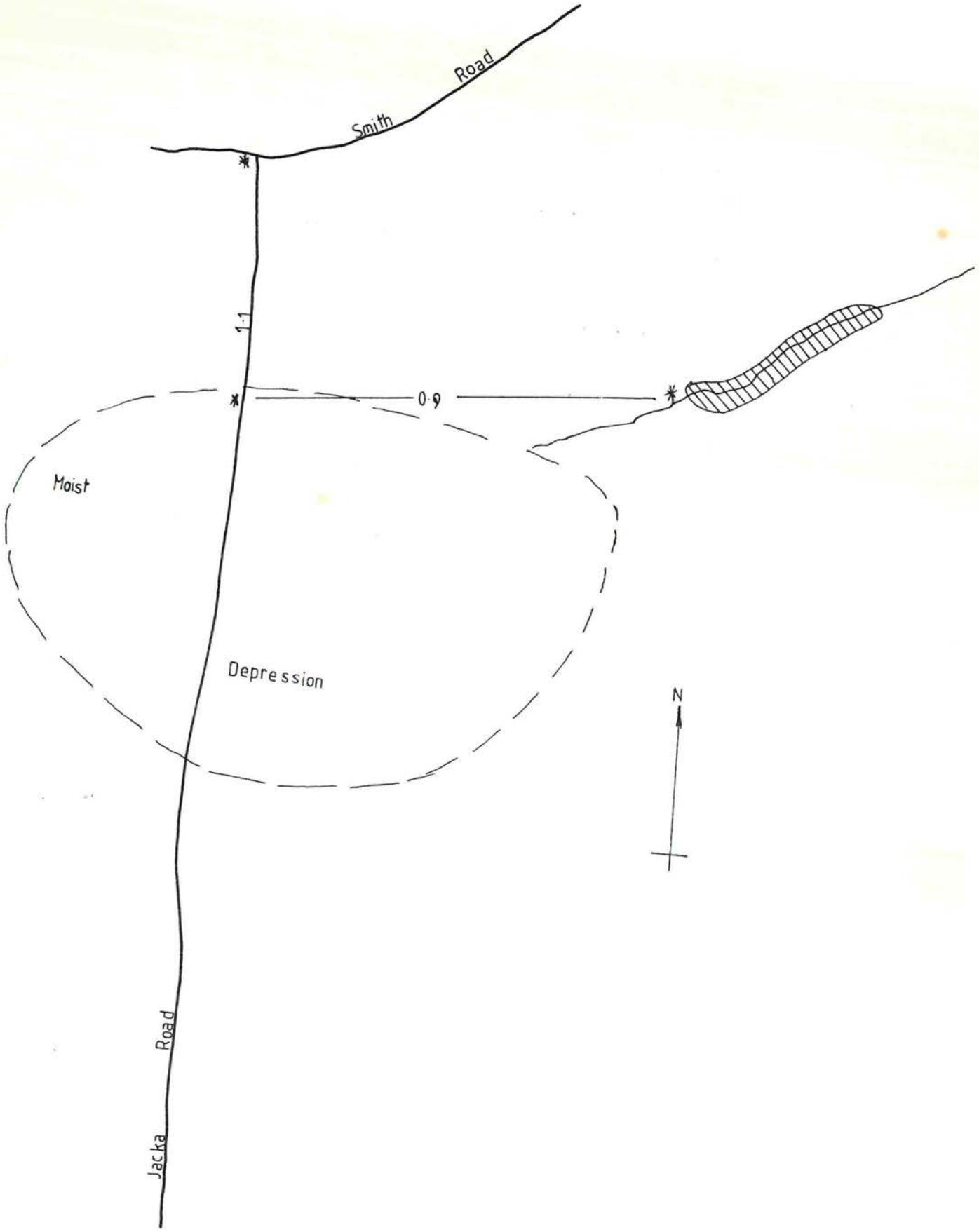
Low sedges in creek.

Other Comments

Population Data

Population size	21 plants
Area Surveyed	15 hectares
Age structure	0.2 - 2.0 metres high
Reproductive stage	Flowering

Other Comments


Smith Road
1·1
0·9
Moist
Depression
N
Jacka Road

Sheet No. 4

Taxon: Lambertia rariflora — Population No. 8

Observer's Name: D. Halford — Date: 10 / 3 / [illegible]

LOCALITY — Specific Description

0.4 km west from Molloy Road along Margaret Road.
(Grid reference F Z 2450)

Latitude 33° 52' — Longitude 115° 20' — Resolution [illegible]

Map Used: Forestry Map. Busselton 80

Direction: South — Air Distance: 24.2 km — To Nearest Town: Busselton

Shire Name: Augusta-Margaret R. — Code: 201

Land Status: S.F. 32 — (if Reserve - Code [illegible] Class)

HABITAT

Land form description: Low swampy flat ground

Soil description: Light gray (10 YR 7/1) clay

Vegetation Structure (Muir 1977)

Low Forest A of Blackbutt (Eucalyptus patens), Bullich (Eucalyptus megacarpa), Jarrah (Eucalyptus marginata)

Dense Heath B. of Agonis linearifolia, Agonis juniperina, Hypocalymma sp., Mesomelaena tetragona.

Other Comments

Population Data

Population size: 19 plants within 1 hectare

Area Surveyed: 4 hectares

Age structure: 0.5m - 2.0 m high

Reproductive stage: Flowering

Other Comments


Moist
Road
Margaret
Road
Depression
N
Molloy