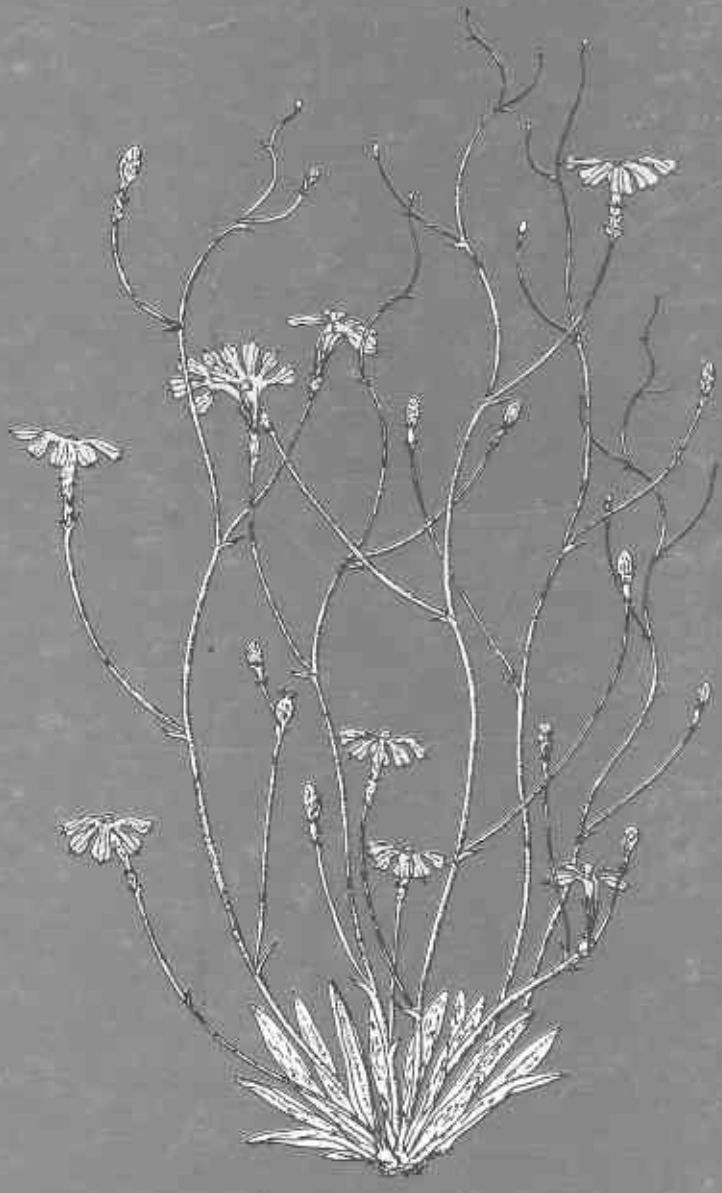
Declared Rare Flora and Other Plants in Need of Special Protection in the Merredin District

by Frans H. Mollemans, Paul H. Brown, David J. Coates



1993

Wildlife Management Program No 9

Department of Conservation and Land Management

WESTERN AUSTRALIAN WILDLIFE MANAGEMENT PROGRAM NO. 9

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Published jointly by the

Australian National Parks and Wildlife Service
GPO Box 636, Canberra, ACT 2601

Department of Conservation and Land Management
PO Box 104, Como, WA 6152

Department of Conservation and Land Management
Western Australian Wildlife Research Centre
PO Box 51, Wanneroo, W.A. 6065

This study (ANPWS ESP Project no. 21) was funded by the Endangered Species Program of the Australian National Parks and Wildlife Service.

Department of Conservation and Land Management
Western Australia 1993

ISSN 0816-9713

Cover illustration: *Scaevola tortuosa* Benth. *G.J. Howell* 115
by Susan Patrick

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Maps ..... CALM Mapping and R.E.S. Sokolowski
Production and distribution ..... CALM Public Affairs

FOREWORD

Western Australian Wildlife Management Programs are a series of publications produced by the Department of Conservation and Land Management (CALM). The programs are prepared in addition to Regional Management Plans to provide detailed information and guidance for the management and protection of certain exploited or threatened species (e.g. Kangaroos, Noisy Scrub-birds and the Rose Mallee).

This program provides a brief description of the appearance, distribution, habitat and conservation status of the Declared Rare Flora in CALM's Merredin District and makes recommendations for research and management action necessary to ensure their continued survival. By ranking the species in priority order for these requirements, Departmental staff and resources can be allocated to species most urgently in need of attention.

Priority species of rare flora that are under consideration for declaration are also dealt with, but to a lesser extent than the Declared Rare Flora. The information available should assist in the ongoing work of assessment of the conservation status of priority species.

ACKNOWLEDGEMENTS

Specialist advice was sought and promptly given by the following: J. Alford (*Tetratheca*), A. Brown (Orchidaceae), A.R. Chapman (*Acacia*), R.J. Chinock (*Eremophila*), B. Conn (Lamiaceae), R. Cowan (*Acacia*), A.S. George (*Dryandra*), T. Hawkeswood (*Calothamnus*), S.D. Hopper (*Eucalyptus*), R.J.F. Henderson (Euphorbiaceae), R. Makinson (*Grevillea*), N. Marchant (*Chamelaucium*), B.R. Maslin (*Acacia*), J. Wheeler (*Hibbertia*) and P.G. Wilson (Rutaceae). Bob Chinnock, Richard Cowan, Bruce Maslin and Paul Wilson all assisted on a number of occasions with specimen identifications, and W.A. Herbarium Curator, Jim Armstrong, also provided advice on the Rutaceae.

CALM staff who provided assistance were: L. Cade, C. Anderson, P. Heslewood, G. Keighery and R. Sokolowski (Woodvale), S. Cahill and J. Carter (Merredin), M. Graham (Katanning), R. Clifton (Pingelly), R. Thomas (Kalgoorlie), K. Atkins, M. O'Donoghue and J. Riley (Wildlife Branch, Como), Records staff Como, particularly C. Messenger. W.A. Herbarium staff assisted wherever possible including R. Cranfield, N. Lander, S. Patrick and P. Spencer. Beng Siew provided significant Librarian assistance.

Consultants S. Carstairs, A. Coates, A. Kelly and N. Hall are also thanked for their assistance and discussions.

Computing assistance in formatting the Management Program was provided by B. Kennington (Narrogin), while S. Cahill (Merredin), J. Eygenraam (Shenton Park) and J. Rayner, R. Hick and M. Mawkes (Woodvale) provided competent typing.

Others who provided assistance included: D. Backshall (Martinick and Associates), J. and M. Squire, B. and J. Maddocks, A. Sole, K. and E. Coate, M. Hancock and P. Hargraves.

Of particular assistance to this project was the W.A. Herbarium database under the supervision of A.R. Chapman. This system allows scrutiny of rare flora collections held in PERTH, and hard copy print-outs for field and other use. It is another factor that enabled this project to be completed on time.

Last, but not least, we thank Nellie Mollemans, whose cheerful assistance through some very difficult field trips, and in Perth was beyond expectation.

ABBREVIATIONS

CALM	Department of Conservation and Land Management
DRF	Declared Rare Flora
MRD	Main Roads Department
Nat. Pk	National Park
Nature Res.	Nature Reserve
Pastoral	Pastoral Lease
Private	Private Property
Road Res.	Road Reserve
Water Res.	Water Reserve
VCL	Vacant Crown Land

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PART ONE : INTRODUCTION

1. The Need For Management

Green (1985) listed 7125 described vascular species in the Western Australian flora, and by November 1988 this number had increased by about 600 (Green, Suppl. 7, 1988). It is estimated that at least 2000 taxa remain undiscovered or undescribed (Hopper *et al.* 1990). The total vascular flora for Western Australia is now considered to be at least 12 000 species, which is 48 per cent of Australia's estimated total of 25 000 (George 1981). A significant proportion of the Western Australian total is concentrated in the south-west of the State, where there are also a large number of endemics due to a long history of climatic and geological stability (Hopper 1979). According to Briggs and Leigh (1988) the State has 43 per cent of the Australian total of rare or threatened plant species with 82 per cent restricted to the south-west.

The State Conservation Strategy, Wildlife Conservation Act 1950, and Conservation and Land Management Act 1984 provide the guidelines and legislative basis for the conservation of the State's indigenous plant and animal species. Under the Wildlife Conservation Act, the Department of Conservation and Land Management (CALM) is responsible for the protection of flora and fauna on all lands and waters thoughout the State. Section 23F of the Act (Appendix I) gives the Minister responsible for the Act statutory responsibility for the protection of those classes of flora declared to be rare.

In 1991, 260 extant taxa were classified as Declared Rare Flora and a further 53 species were listed on the schedule as presumed extinct (Appendix 2). In addition to those with special protection, some 1200 taxa are listed on CALM's priority flora list. These taxa require further detailed survey to accurately assess their conservation status. Hopper *et al.* (1990) provide illustrations of the 1989 Declared Rare Flora, discuss the conservation of Western Australia's threatened species and review the relevant legislation, policy, research and management activities of CALM.

This Wildlife Management Program collates the available biological and management information on the Declared Rare Flora, and Priority One, Two and Three taxa of CALM's Merredin District excluding the Wongan-Ballidu shire. The latter was excluded because the Wongan Hills area contains many endemic flora including numerous rare and threatened flora which have been relatively well surveyed and will be the subject of a separate management program. The Merredin District covers an area extensively cleared for agricultural purposes and, with a few exceptions, is relatively poorly surveyed botanically, particularly for rare and threatened taxa. Figure I shows the location of the Merredin District in relation to the major CALM Management Regions of the State.

2. Objective of the Program

The objective of this program for the Merredin District is:

To ensure and enhance, by appropriate management, the continued survival in the wild of populations of Declared Rare Flora and other plants in need of special protection.

It aims to achieve this by:

* providing a useful reference for CALM staff and other land managers for the day to day management and protection of Declared Rare Flora populations and populations of other taxa which are poorly known and may be at risk;

* directing Departmental resources within the Region to those species most urgently in need of attention;

* assisting in the identification of Declared Rare species and other species potentially at risk, and their likely habitats;

* fostering an appreciation and increased awareness of the importance of protecting and conserving Declared Rare Flora and other species potentially at risk or in need of special protection.

3. Rare flora legislation and guidelines for gazettal

The Wildlife Conservation Act (1950-1985) protects all classes of indigenous flora throughout the State. Protected flora includes:

Spermatophyta - flowering plants, conifers and cycads
Pteridophyta - ferns and fern allies
Bryophyta - mosses and liverworts
Thallophyta - algae, fungi and lichens

Section 23F of the Act (Appendix I) provides special protection to those taxa (species, subspecies, varieties) considered by the Minister to be:

* in danger of extinction - the taxon is in serious risk of disappearing from the wild state within one or two decades if present land use and other causal factors continue to operate;

* rare - less than a few thousand adult plants of the taxon existing in the wild;

* in need of Special Protection - the taxon is not presently in danger of extinction but is at risk over a longer period through continued depletion, or occurs largely on sites likely to experience changes in land use which could threaten its survival in the wild;

or

* presumed Extinct - taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently.

This is achieved by declaring them to be 'rare' by notice published in the Government Gazette. CALM's Policy Statement No.9 (Appendix III) discusses the legislation relating to Declared Rare Flora and outlines the criteria for gazettal.

Under the provisions of Section 23F, the 'taking' of Declared Rare Flora is prohibited by any person on any category of land throughout the State without the written consent of the Minister. A breach of the Act is liable to a penalty of up to $10 000. The legislation refers only to wild growing populations and applies equally to Government officers and private citizens on Crown and private land.

To 'take' in relation to any flora includes 'to gather, pluck, cut, pull up, destroy, dig up, remove or injure the flora or to cause or permit the same to be done by any means'. This includes not only direct destruction or injury by human hand or machine but also such activities as allowing grazing by stock, introducing pathogens, altering water-tables so as to inundate or deprive the flora of adequate soil moisture, allowing air pollutants to harm foliage, and burning.

The schedule published in the Government Gazette is revised annually to accommodate additions and deletions to the Declared Rare Flora. To qualify for gazettal, plants must satisfy certain requirements as defined in Policy Statement No.9, namely:

* the taxon (species, subspecies, variety) must be well-defined, readily identifiable and represented by a voucher specimen in a State or National Herbarium. It need not be formally described under conventions in the International Code of Botanical Nomenclature, but such a description is preferred and should be undertaken as soon as possible after listing on the schedule;

* the taxon must have been thoroughly searched for in most likely habitats in the wild by competent botanists during the past five years;

* the searches have established that the plant in the wild is either rare, endangered or deemed to be threatened and in need of special protection.

Plants may be deleted from the Rare Flora schedule where:

* recent botanical survey has shown that the taxon is no longer rare, endangered or in need of special protection;

* the taxon is shown to be a hybrid;

* the taxon is no longer in danger of extinction because it has been adequately protected by reservation of land on which it occurs or because population numbers have increased beyond the danger point.

4. CALM's Priority Species List

CALM maintains a priority species list to determine priorities for survey of plants of uncertain conservation status. The list comprises some 1200+ taxa (at July 1991) that are poorly known and in need of high priority survey or are adequately surveyed but in need of monitoring. The poorly known taxa are possibly at risk but do not meet the survey requirements for gazettal as Declared Rare Flora (DRF), as outlined in Policy Statement No. 9 (Appendix III). Only those plants considered to be threatened on the basis of thorough survey or presumed extinct can be included on the DRF schedule.

The priority flora list is divided into the following categories according to the degree of threat.

Priority One - Poorly known Taxa

Taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.

Priority Two - Poorly Known Taxa

Taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.

Priority Three - Poorly Known Taxa

Taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora' but are in need of further survey.

Priority Four - Rare Taxa

Taxa which are considered to have been adequately surveyed and which, while being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5-10 years.

5. Responsibilities within the Department

* reviewing Departmental policy on Declared Rare Flora is the responsibility of the CALM Corporate Executive;

* identification of Declared Rare Flora is the initial responsibility of Herbarium staff, but should, with appropriate training, become a Regional responsibility also;

* locating Declared Rare Flora is the responsibility of Flora Conservation Research Program staff, the Wildlife Branch and Regional operations staff;

* determination of land status and preparation of material for notification to landowners is the responsibility of Wildlife Branch;

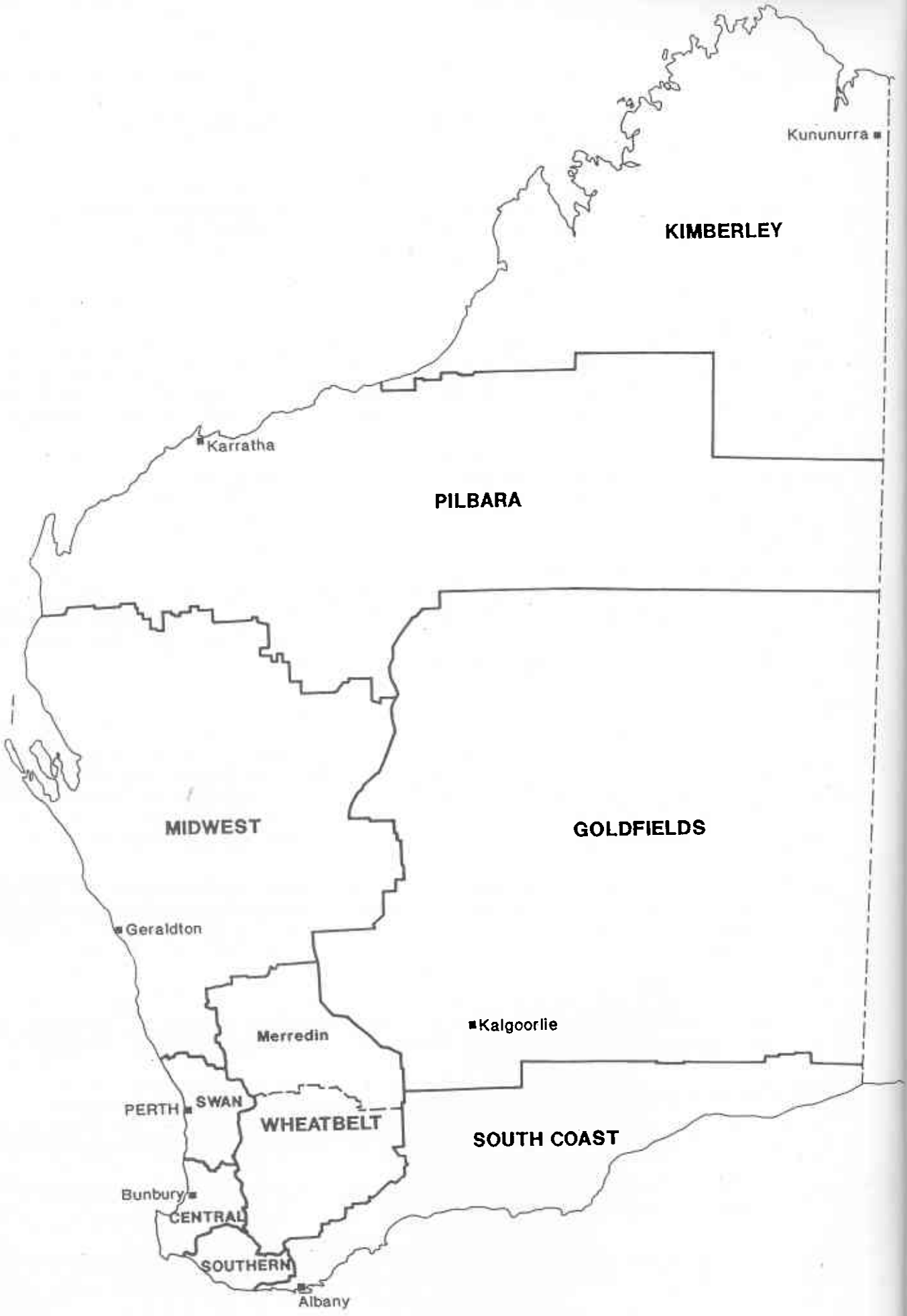


Figure 1. CALM Regions with the Merredin District.

- hand-delivered notification to landowners of Declared Rare Flora populations is the responsibility of Regional staff and Wildlife Branch;

- maintenance of Declared Rare Flora information and database, and dissemination of these data are the responsibility of Wildlife Branch;

- advice on management prescriptions is the responsibility of Flora Conservation Research Program staff, Regional Ecologists and the Senior Botanist, Wildlife Branch;

- management, protection and regular inspection of Declared Rare Flora populations is the responsibility of staff of the Merredin District;

- enforcement matters relating to the provisions of the Wildlife Conservaton Act are the responsibility of Wildlife Officers in the Wildlife Branch;

- implementation and revision of the management program is the responsibility of the Merredin District, Flora Conservation Research Program and Wildlife Branch.

6. The Merredin District

The Merredin District lies within the central wheatbelt of Western Australia and covers 16 shires in the northern half of CALM's Wheatbelt Region. Apart from the eastern boundary which forms a nearly straight line close to 120° longitude, the other boundaries are quite irregular. They are based on the shire boundaries of Yilgarn, Mt Marshall and Dalwallinu in the north; Dalwallinu, Wongan-Ballidu, Goomalling and Cunderdin in the west; and Cunderdin, Tammin, Kellerberrin, Merredin and Yilgarn in the south. Merredin District derives its name from Merredin, the major population centre, in the south of the District. The word Merredin comes from the aboriginal name Merritt for the local gum *Eucalyptus flocktoniae*, the wood of which was apparently quite suited to spear making, and with the suffix 'in' it literally means 'the place of Merritt' (Law 1961).

Merredin is one of three districts which make up CALM's Wheatbelt Region. The Merredin District contains over 230 separate nature reserves including 11 nature reserves with an area of greater than 2000 ha. The largest of these are Karroun Hill Nature Reserve (36936) 309 678 ha and Jilbadji Nature Reserve (24049) 208 866 ha, on the edge of the pastoral area in the north and east of the District respectively. The Merredin District has a total area of 76 672[2] km, with almost 40 per cent contained in the largely uncleared Yilgarn Shire in the east.

Excluding the shire of Wongan-Ballidu, the total area covered by this Wildlife Management Program is 73 322[2] km. However, in 1991 that part of the shire of Yilgarn that lies inland of the No.2 Vermin Proof Fence will be transferred to CALM's Goldfields Region. The area to go out of administrative control from the Merredin District is approximately 14 675[2] km (see Figure 2). As the transfer is not yet finalised, the area and rare flora species involved are included in this Wildlife Management Program although the boundary of the district shown on the distribution maps excludes this area.

The Merredin District measures 345 km in east-west dimensions and about 240 km on average in north-south dimensions. This large area covers four Botanical Districts within two natural, phytogeographic regions and a major interzone (see Beard 1980; Beard and Sprenger 1984; Prider 1990).

Climatic conditions therefore range from typical mediterranean hot, dry summers and cool, wet winters over the south-western part of the District, to arid with summer and winter rainfall in the north-east. Accordingly, rainfall in the District decreases from a high of around 650 mm in the south-west to a low of about 200 mm in the north-east (Beard 1980).

Botanical Districts

The major western part of the District containing virtually all of the agricultural lands falls within the Avon Botanical District (Beard 1980). Together with an area to the south-east of a line through Holleton and Skeleton Rocks, of the Roe Botanical District, these lands comprise a significant part of the central portion of the South-West Botanical Province. Alternatively, the Avon and Roe Botanical Districts are termed the Wheatbelt and Mallee (Natural) Regions, respectively, of the South-West Province (Beard and Sprenger 1984).

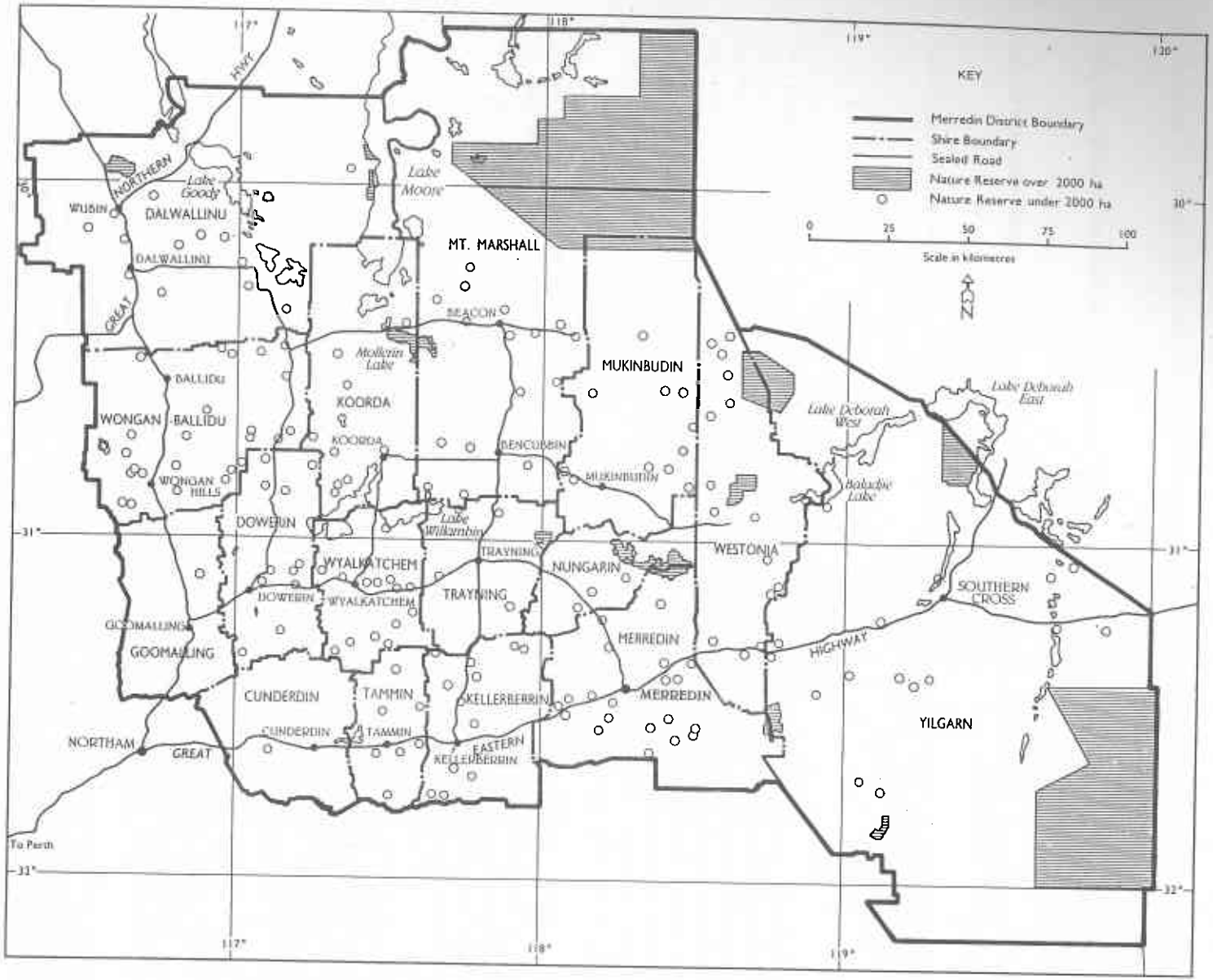


Figure 2. The Merredin District.

The South-West Botanical Province is separated by a north-west to south-east boundary line from the Eremaean (desert) Botanical Province and the South-Western Interzone to the north-east. This boundary runs from the eastern margin of Lake Moore in the north, and passes through Bonnie Rock and then to the west of Bullfinch, Southern Cross and Marvel Loch before reaching the eastern boundary of the Merredin District to the north of latitude 32°.

Only a small part of the Merredin District lies within the Austin Botanical District of the Eremaean Botanical Province, as recognised by Beard (1980), which is considered to be desert, albeit of a fringe nature. The Austin Botanical District or Murchison (Natural) Region as it is termed by Beard and Sprenger (1984), is that part of the Merredin District situated north of a line east-north-east from the mid-eastern margin of Lake Moore to just south of where the No. 2 Vermin Proof Fence meets the District's northern boundary.

All the remainder of the Merredin District comprises part of the Coolgardie Botanical District within the South-Western Interzone (see Beard 1980). Beard and Sprenger (1984) recognise no distinct natural region in this area, referring to it only as the South-Western Interzone.

Geology and Physiography

In a regional physiogeographic context, the Merredin District is somewhat unique. It lies within a very stable area referred to variously as the Yilgarn Block or Yilgarn Plateau, but also lies across a major drainage divide, between the inland, Western Plateau Division and the South West Coast Division (e.g. Wasson 1982). Consequently, drainage in the District varies from externally flowing watercourses in the west to land-locked, salt lake chain palaeorivers in the east. The Mortlock River is an example of an externally flowing watercourse, while the Lake Deborah salt lake chain is an example of a land-locked palaeoriver. Beard (1973) and van de Graaf *et al.* (1977) provide additional information on drainage and palaeodrainage patterns relevant to the Merredin District. These rivers and palaeorivers have played a part in developing the pattern of soils and therefore vegetation in the District, and their influences are reflected in the botanical district and natural region classifications discussed above.

Vegetation

Broadly, the vegetation patterns within the Merredin District are comprised of *Acacia* shrublands in the north, *Eucalyptus* shrublands (mallee) in the south and east (Williams 1982), and *Eucalyptus* forests and woodlands in the south and west. On a more local scale, the presence of granite rock outcrop, banded iron formation hills, and patterns of clay and loam soils interspersed with sand plains and dunes, and lateritic remnants, breaks up the broad vegetation types into a complex mosaic of integrated plant communities.

In the higher rainfall parts in the west, wandoo (*Eucalyptus wandoo*) woodlands dominate on loams, with York gum (*E. loxophleba*) and salmon gum (*E. salmonophloia*) on the same soils in areas of lesser rainfall. Gimlet (*E. salubris*) also tends to be quite prevalent in these areas, frequently being found in association with salmon gum. In the south-east sand mallee (*E. eremophila*) predominates in mallee communities, with Burracoppin mallee (*E. burracoppinensis*) more prevalent immediately to the south and east of Merredin while in the north an open mallee community predominates. Towards the eastern boundary of the Merredin District *Acacia* spp. are dominant. For soils of different character, scrub and heath occur on sandplain, while *Acacia* or *Allocasuarina* thickets predominate on lateritic soil remnants. *Allocasuarina* thickets are particularly prevalent, with the sheoaks *A. campestris* and *A. acutivalvis* frequently the dominants. *Allocasuarina huegeliana* is common on granite outcrops, with *Dryandra arborea* and *Acacia quadrimarginea* common on banded ironstone ranges like Bungalbin Hill in the north-east and dryandras and banksias associated with *Allocasuarina* on Mt Holland on similar substrate in the south-east.

Beard and Sprenger (1984) have calculated that 93 per cent of the Avon Botanical District has been cleared, while in the Roe Botanical District they have calculated a figure of 44 per cent. In the wheatbelt, vegetation remnants are restricted to nature reserves, shire reserves and other small remnants of Crown land, rocky hilltops, some road verges, and areas left uncleared on private land. It has also been calculated by Beard and Sprenger (1984), that 718 km^2 and 1.67 per cent of the Austin Botanical District and South-West Interzone, respectively, have been cleared. However, recent expansion in agricultural, pastoral and mining pursuits in these areas will have an increasing effect on the vegetation if not adequately managed.

7. Botanical History of the Merredin District

The foundation of the Swan River Colony occurred in 1829. In 1836 John Septimus Roe, Surveyor General, led an expedition to the present site of Merredin then north to Lake Brown and returned to the vicinity of New Norcia naming The Wongan Hills on the way. Plant specimens were collected during this and other expeditions by Roe.

James Drummond, who came to the Swan River Colony as honorary Government Naturalist to Captain Stirling, and subsequently took up farming at Toodyay, carried out botanical collecting expeditions in the early 1840s. Places he visited in the Merredin District, included the Bencubbin area, and he is also known to have collected from Mt Caroline (Hopper personal communication), his specimens being destined for sale to botanists such as J.D. Hooker in England (e.g. Drummond 1853).

From October 1890 to December 1891 the German botanists Ludwig Diels and Ernst Pritzel travelled widely through mining and agricultural areas, covering much of the country accessible at the time. Their collections included material from the Merredin District and were described by Diels and Pritzel (1904-5) in 'Fragmenta Phytographiae Australiae Occidentalis', an illustrated book and major authority on the Western Australian flora.

Charles Gardner in his position as government botanist and Curator of the State Herbarium travelled and collected widely throughout Western Australia over the period 1929-1961. He described many new species and prepared numerous papers and books on the vegetation of the State. He was accompanied on a number of his expeditions by amateur botanist William Blackall who developed the 'Blackall Key', an illustrated key for the recognition of Western Australia's flora. Considerable progress had been made with this work before his death in 1941. The project was completed after several years by the Head of the University Botany Department, Professor Brian Grieve.

In 1964, an overall mapping project for the State, the Vegetation Survey of Western Australia, was established. John Beard systematically described and mapped the vegetation at a scale of 1:1000 000 with maps also published at 1:250 000 over the more populated south-west of the State. He defined distinct regions on the basis of characteristic landscape and vegetation. On the basis of this work, Beard (1980) revised the botanical districts and boundaries of the South Western Botanical Province defined by previous authors.

More recently there have been detailed vegetation studies on reserves in the central wheatbelt (Muir 1979) and specialist studies on the evolutionary and population biology of *Eucalyptus caesia* (Hopper and Burgman 1983; Moran and Hopper 1983), *Eucalyptus crucis* (Sampson *et al.* 1988), *Isotoma petraea* (James *et al.* 1983) and the genus *Tetratheca* (Alford 1990). Botanists Ian Brooker, Andrew Brown, Bruce Maslin, Steve Hopper and Paul Wilson have also carried out recent taxonomic studies on a range of plant genera found within the District.

PART TWO: DECLARED RARE FLORA IN THE MERREDIN DISTRICT

Based on the 1991 list of Declared Rare Flora there are 33 extant species known from within the boundaries of the Merredin District excluding those endemic to the Wongan Hills or occurring only within the Shire of Wongan-Ballidu. In addition there are ten presumed extinct taxa of Declared Rare Flora recorded for the District. These are:

Calothamnus accedens
Eriostemon falcatus
Gonocarpus intricatus
Gyrostemon reticulatus
Leucopogon marginatus
Menkea draboides
Phlegmatospermum drummondii
Ptilotus fasciculatus
Stylidium merrallii
Thomasia gardneri

Of the 33 extant species, all but four are portrayed in some detail (including a photograph) by Hopper *et al.* (1990), while a further five species are now recognised under a different name. Those not dealt with by Hopper *et al.* (1990), are *Gastrolobium callistachys* and *Pityrodia scabra*, both gazetted in 1990, and *Sowerbaea multicaulis* and *Tetratheca 'paynteri'*, which were gazetted in 1991. The reader should note the use in the preceding sentence, of inverted commas to denote a manuscript name, a format which is used throughout this document. The five species of Declared Rare Flora dealt with by Hopper *et al.* (1990) which are now recognised by a different name are *Acacia lobulata* (formerly *Acacia* sp. (Chiddarcooping) *J. Brown* 59 and *A. Williams*), *Daviesia 'oxylobium'* (*Daviesia* sp. (central wheatbelt) *M.D. Crisp* 6612), *'Drakonorchis drakeoides'* (*Caladenia* sp. (Salt Lakes) *S.D. Hopper* 4162), *Eremophila caerulea* subsp. *'merrallii'*, (*Eremophila caerulea* subsp. eastern wheatbelt) *S.D. Hopper* 1799) and *Eucalyptus synandra* subsp. *'synandra'* (*Eucalyptus synandra* subsp. wheatbelt) *A.S. George* 16203).

A brief description of the taxonomic affinities, morphology, distribution and habitat, conservation status, known populations and response to disturbance (e.g. fire, mechanical disturbance, weed invasion and grazing) of each taxon of extant Declared Rare Flora is provided within this section. Recommendations for management and pertinent references are also provided.

Description of species are for the most part based on original taxonomic treatments or where these are lacking, by reference to herbarium specimens and specialist botanists. Distribution and habitat data are compiled from herbarium records and Departmental files as appropriate. Existing populations are tabulated, while unconfirmed records or old herbarium records are treated in lesser detail. In a number of cases, herbarium records relate to populations which no longer exist.

The conservation status of a species was based on intensive field surveys carried out over a six-month period, covering the main flowering season during 1990, and information recorded in Departmental files. A table is included in which broad population details, land status, number of plants and population conditions are provided. Precise locality data are contained within confidential Departmental records.

Response to disturbance is mentioned, and suggests two separate classes of rare flora, namely: those species favoured by disturbance and those to which disturbance is detrimental. The former are in the minority, and include Barbalin Boronia (*Boronia adamsiana*), Bell-flowered Eremophila (*Eremophila inflata*) and Many-stemmed Lily (*Sowerbaea multicaulis*). Such species seem to occupy a very narrow ecological niche and are rarely collected, although disturbance will result in a profusion of growth for a period, before the plants again disappear, sometimes for decades. Disturbance opportunists are discussed further in Part VI of this Management Program.

Twenty-one of the 33 Declared Rare Flora dealt with here are endemic to the Merredin District including two species, *Pityrodia scabra* and *Sowerbaea multicaulis*, which are known from only one (confirmed) population.

Populations of Declared Rare Flora in the District occur largely within the extensively cleared, agricultural lands (Figure 3). Nineteen populations fall within nature reserves. Some populations have also been mapped outside the Merredin District in the Yilgarn Shire (Figure 3) following the inclusion of this area in the initial field surveys.

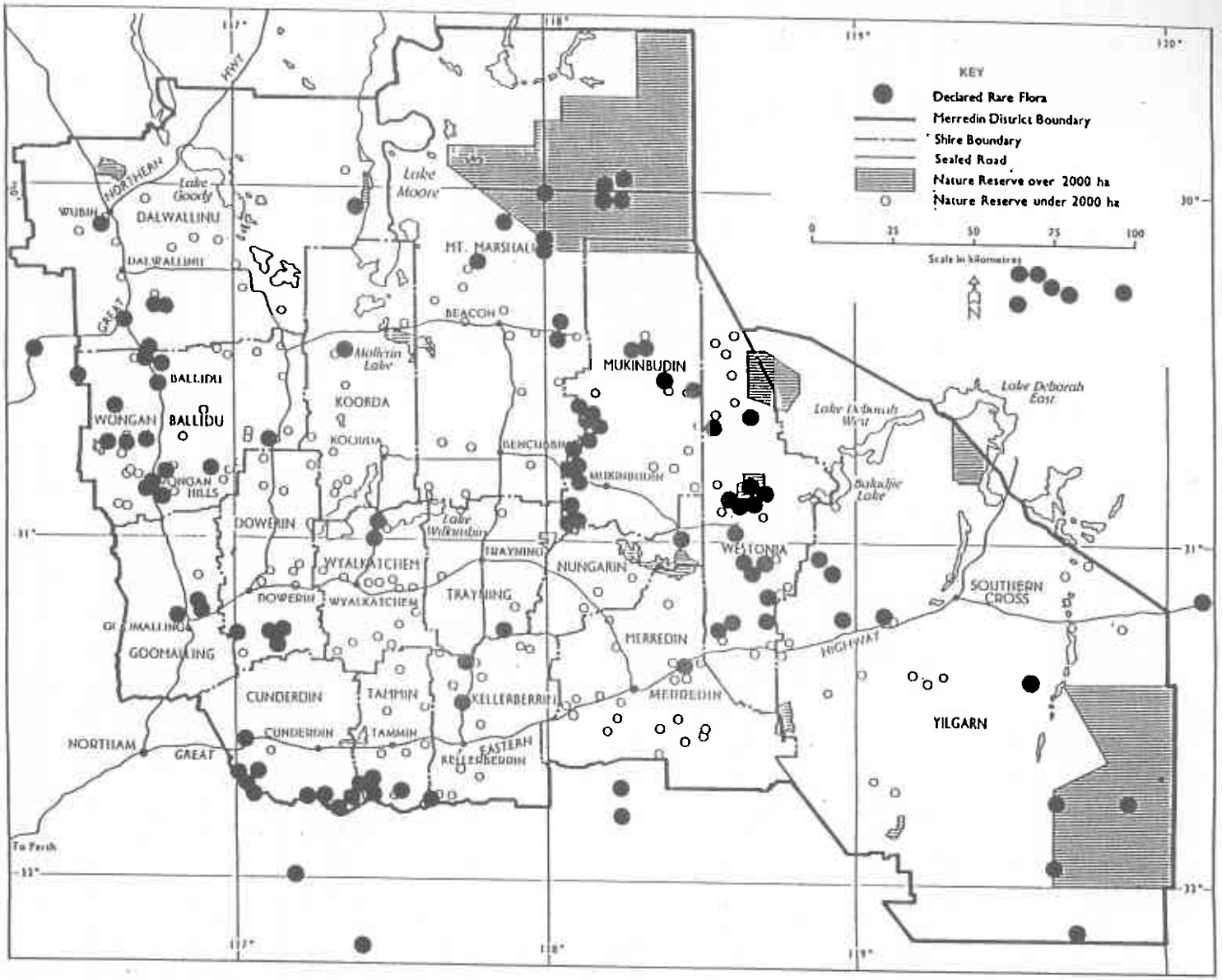


Figure 3. Distribution of Declared Rare Flora populations in the Merredin District.

ACACIA DENTICULOSA F. Muell. **Family: Mimosaceae**

Sandpaper Wattle

TAXONOMY

A distinct species with no major geographical variation. Easily identified.

DESCRIPTION

Erect, open shrub or small tree 2-4 m tall with smooth grey bark; branchlets dark reddish, round, rough and warty. Foliage dark green, sticky, stiff, rough, more or less round to oval phyllodes 5-7 cm x 20-50 mm with 3-5 prominent, curved, longitudinal, yellowish nerves and net-like veins. Flower-heads dense, curved yellow spikes 5-8 cm x 10-20 mm, on stout warty stalks 5-7 mm long, singly or in pairs in axils. Flowering period is August to November. Pods are light brown, wrinkled, linear, straight or slightly curved. Immature pods wine-red. Seeds black, shiny, oval, 3.5-4 x 2.5-3 mm. Seed December to January.

DISTRIBUTION AND HABITAT

A. denticulosa was originally known from fifteen collections at two localities (Wongan Hills and Mukinbudin) over a range of 150 km, it is now known from eight populations over a range of 180 km including two new populations located in 1989 in the Karroun Hill area. It is now extinct at the type locality at Mt Churchman north of Barbalin and the species has declined from over two hundred plants in 1984 to one hundred in 1988.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No.of Plants	Condition
1	Merredin	Mt Marshall	White Road	Water Res.	6	Good 21.10.85
2	Merredin	Mt Marshall	Karroun Hill	Nature Res.	300+	Healthy 4.3.88
3	Merredin	Mt Marshall	E of 2	Nature Res.	200+	6.9.89; Good 8.7.90
4	Merredin	Mt Marshall	E of 3	Nature Res.	68	6.9.89; Good 2 dead 8.7.90
5	Merredin	Mt Marshall	Wialki	Shire Res.	10	Very poor 12.4.84
6	Merredin	Mukinbudin	NW Mukinbudin	Road Res.	2	Good 5.7.90
7A	Merredin	Mukinbudin	Nth Barbalin	Private	40+	50% dead/dying 14.4.84
7B	Merredin	Mukinbudin	Nth Barbalin	Road Res.	?	" " "
7C	Merredin	Mukinbudin	Nth Barbalin	Private	200+	" " "
8	Merredin	Wongan-Ballidu	Mt Rupert Stn	Private	130+	Good 9.3.84

RESPONSE TO DISTURBANCE

Associated with granite outcrops and sheet granite (except Pop. No. 6) which in dry years are drought prone (1984, 1988). Response to fire, soil disturbance, weed invasion and grazing is not known.

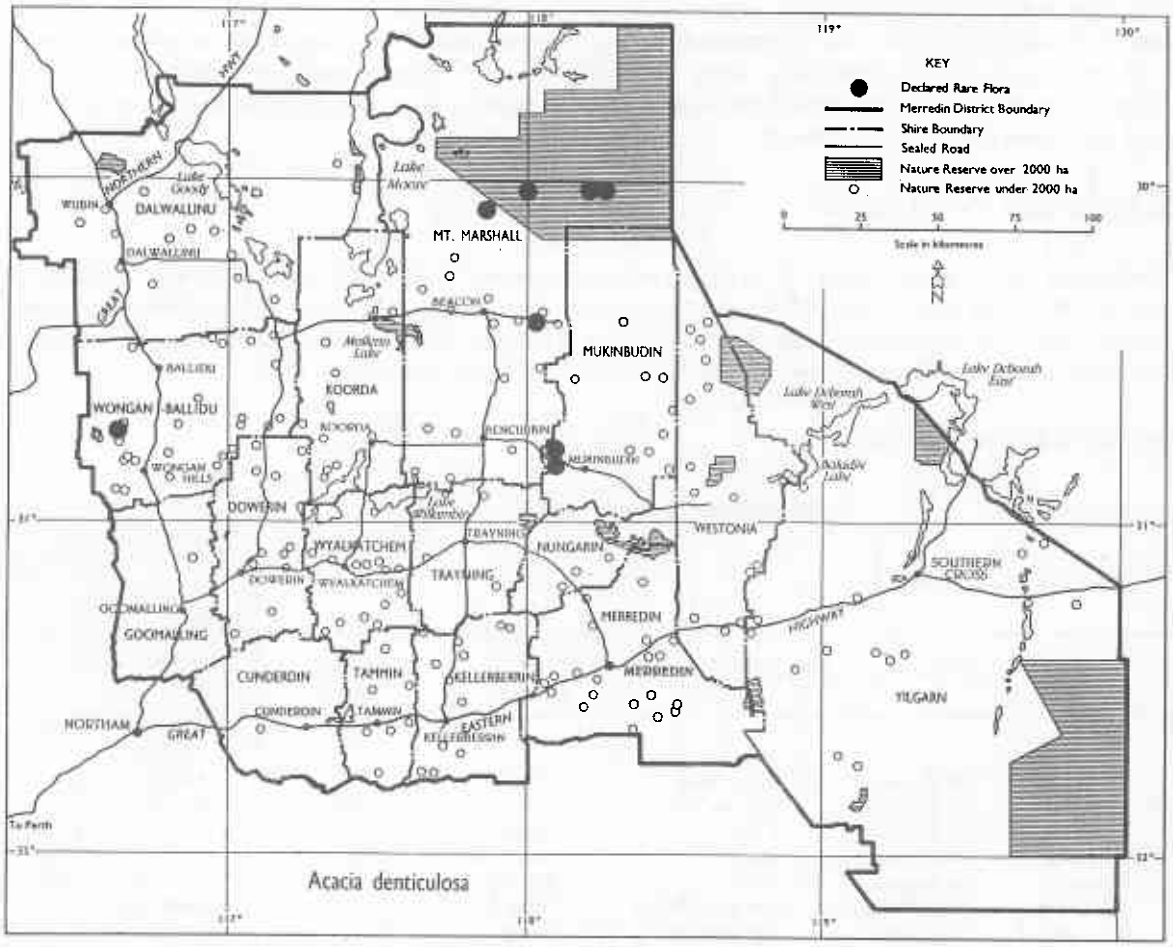
SUMMARY AND RECOMMENDATIONS

There are three large populations on Karroun Hill Nature Reserve in Mt Marshall Shire and two on private property at Wongan Hills and north Barbalin. Population declines, at north Barbalin and other locations need research to determine appropriate management options. Populations not visited in 1990 require re-survey. Fencing of populations on private property may be required.

Figure 5. Distribution of

REFERENCES

Millar (1982); Simmons (1988); Hopper *et al.* (1990).



ACACIA LOBULATA Cowan & Maslin **Family: Mimosaceae**

Chiddarcooping Wattle

TAXONOMY

A. lobulata is the only *Acacia* in Australia which has terete reticulate-nerved phyllodes. It is closely related to *A. verricula*, which has flat, reticulate-nerved phyllodes.

DESCRIPTION

Erect, open spindly shrubs 1-2 m tall. Bark smooth. Branchlets slightly angled, tuberculate, glabrous, resinous. Phyllodes terete with strongly, excentrically curved, acute tips, ascending, incurved, glabrous, dull, grey-green. Flower-heads globular, solitary, 3.5-4.5 mm diameter, 15-17-flowered. Flowers 5-merous. Seeds longitudinal, oblong, compressed, 4-5.5 mm long, 1.8-2.3 mm wide, dull dark brown. Flowers July, fruits in November.

DISTRIBUTION AND HABITAT

This species is known from two populations over a geographic range of 17 km on and adjacent to the Chiddarcooping Nature Reserve. It occurs on gritty clay loam in *Eucalyptus* woodland and mixed shrubland associated with breakaways.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No.of Plants	Condition
1	Merredin	Westonia	Chiddarcooping	Nature Res./Private	2000+	Good 8.11.90
2	Merredin	Westonia	North of 1	Private/VCL	300+	Undisturbed 13.10.88

RESPONSE TO DISTURBANCE

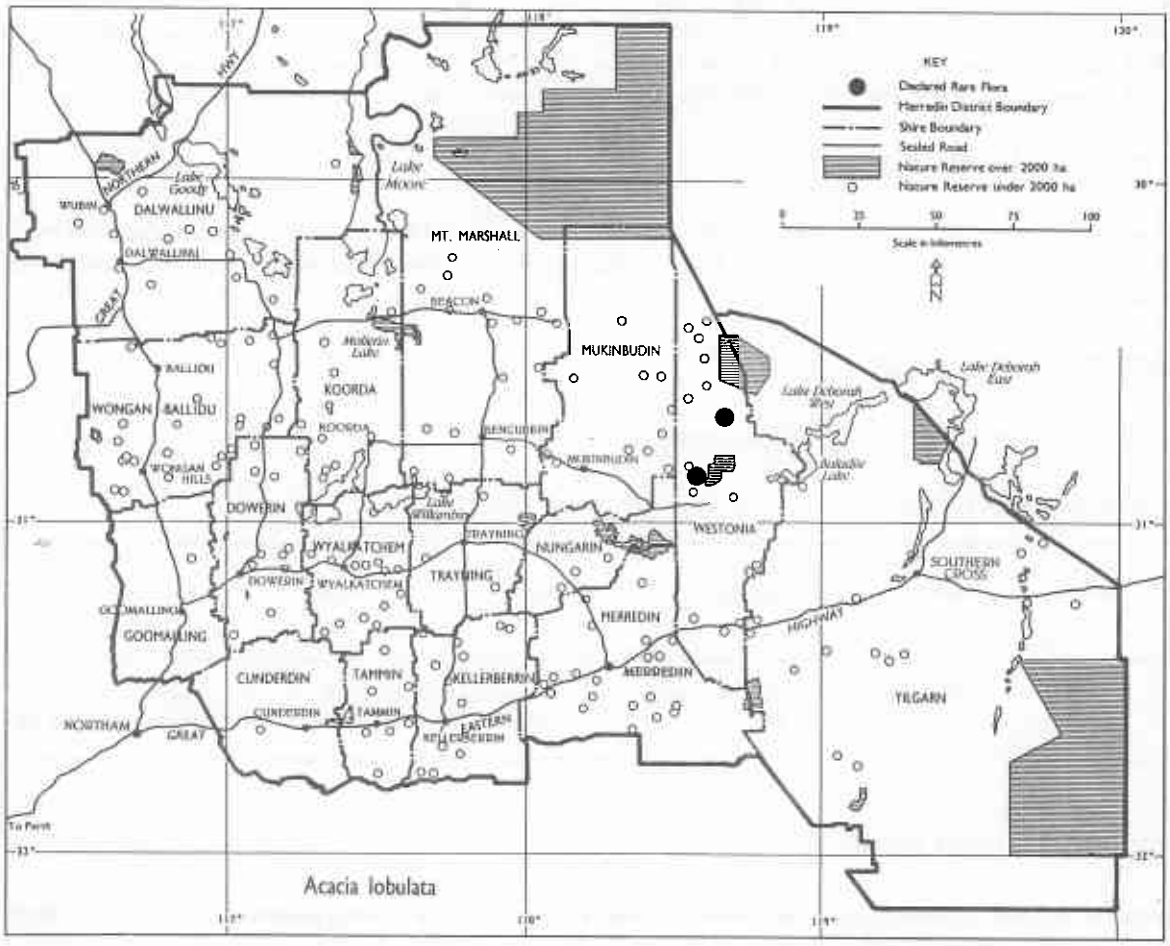
A. lobulata is found in association with breakaways which are a naturally eroding landform. Response to disturbance such as fire, weed invasion and grazing is unknown.

SUMMARY AND RECOMMENDATIONS

The Chiddarcooping population appears large and secure. It is proposed that the smaller northern population be incorporated into a new nature reserve which will include a large area of VCL and some adjoining private property. Negotiations for a land swap with the private property owner are in progress. Further surveys of breakaway areas would be desirable to locate new populations.

REFERENCES

Weston (1985); Cowan and Maslin (1990); Hopper *et al.* (1990).


KEY
Declared Rare Flora
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
Scale in kilometres
MT. MARSHALL
MUKINBUDIN
DALWALLINU
WUBIN
DALWALLINU
BEACON
KOORDA
WONGAN
BALLIDU
BALLIDU
KOORDA
WONGAN HILLS
DOWERIN
WYALKATCHEM
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
MERREDIN
MERREDIN
GOOMALLING
GOOMALLING
CUNDERDIN
TAMMIN
KELLERBERRIN
CUNDERDIN
TAMMIN
NORTHAM
YILGARN
SOUTHERN CROSS
HIGHWAY
Lake Moore
Lake Goodenough
Lake Deborah West
Lake Deborah East
Lake Wilkinson
Acacia lobulata

ACACIA MERRICKIAE Maiden & Blakely **Family: Mimosaceae**

Merrick's Wattle

TAXONOMY

This species shows affinity with *Acacia meissneri* Lehm., but differs in having rough branches, shorter and more elliptical phyllodes, larger flower-heads, more numerous and different shaped flowers and narrow pods.

DESCRIPTION

A glaucous shrub 2-3(4) m tall; branches very rough with enlarged, persistent bases of the shortly decurrent, common petioles. Phyllodes glaucous, ovate to obliquely elliptical, uninerved, shortly petiolate, 1-2 cm long, 5-10 cm broad. Pods glaucous, shortly stipitate, linear-oblong, compressed, more or less contracted between the seeds, 5-6 cm long. Seeds black, ovate. Flowers throughout the year.

DISTRIBUTION AND HABITAT

The two centres of occurrence are north of Kellerberrin and west of Mukinbudin over a geographic range of 85 km. *A. merrickiae* is generally found in wandoo (*Eucalyptus wandoo*) woodland on grey sandy soil.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1A	Merredin	Kellerberrin	Nth Kellerberrin	Road Res./Private	1000+	Good 10.10.89
1B	Merredin	Kellerberrin	Nth Kellerberrin	Road Res./Private	34	Good 10.10.89
1C	Merredin	Kellerberrin	Nth Kellerberrin	Road Res.	15	Good 10.10.89
1D	Merredin	Kellerberrin	Nth Kellerberrin	Road Res.	64	Good 10.10.89
1E	Merredin	Kellerberrin	Nth Kellerberrin	Road Res.	4	Good 10.10.89
1F	Merredin	Kellerberrin	Nth Kellerberrin	Road Res.	3	Good 6.10.89
1G	Merredin	Kellerberrin	Nth Kellerberrin	Road Res.	16	Good 6.10.89
1H	Merredin	Kellerberrin	Nth Kellerberrin	Road Res.	8	Good 28.9.89
1I	Merredin	Kellerberrin	Nth Kellerberrin	Road Res.	80	Good 3.10.89
1J	Merredin	Kellerberrin	Nth Kellerberrin	Road Res.	3	Good 6.10.89
1K	Merredin	Kellerberrin	Nth Kellerberrin	Road Res.	20	Good 6.10.89
1L	Merredin	Kellerberrin	Nth Kellerberrin	Road Res./Private	142	Good 6.10.89
1M	Merredin	Kellerberrin	Nth Kellerberrin	Nature Res./Road Res./Private	700+	Good 9.10.89
2A	Merredin	Mukinbudin	West Mukinbudin	Nature Res./Road Res./Private	300	Good 6.9.89
2B	Merredin	Mukinbudin	West Mukinbudin	Nature Res.	100	Good 6.9.89

RESPONSE TO DISTURBANCE

The type locality (Nalyering Well) where it was collected in May 1922 by C.A. Gardner is 2 km west of the closest extant population in the Kellerberrin area. Weed invasion is not likely to have any significant effect unless associated with major site disturbance. The size of the shrub suggests defoliation from grazing would be limited, except in young plants. Ring-barking of the slender stem by rabbits is a potential threat. Fire tolerance is unknown, but the woodland vegetation in which it occurs is of an open nature with little fuel build-up suggesting that fires are infrequent.

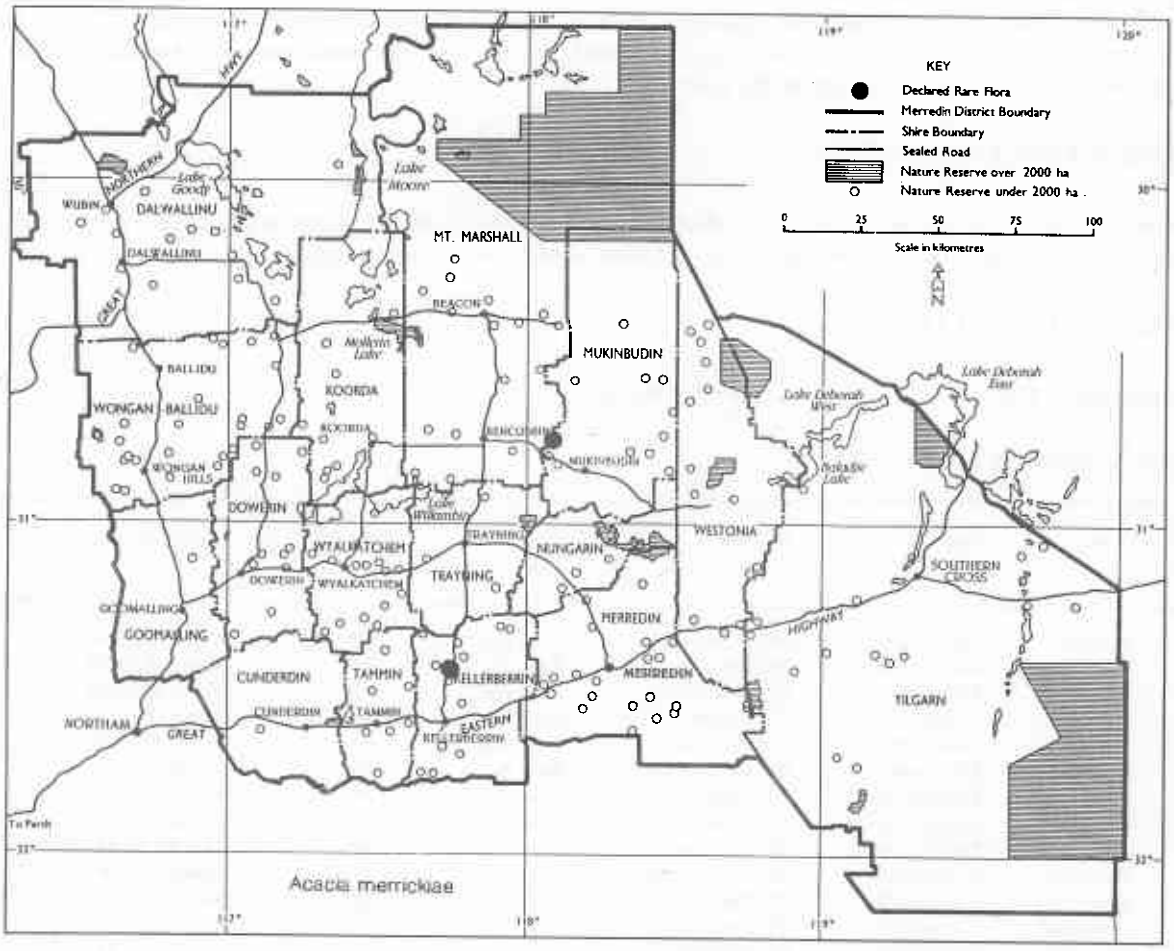
SUMMARY AND RECOMMENDATIONS

The two populations west of Mukinbudin are in a nature reserve, but in both cases at the boundary. The majority of populations north of Kellerberrin are on road reserves or on private property. Fencing of populations on private

property may be warranted. Local Shires will need to actively protect the roadside populations from disturbance during road maintenance. Possible acquisition of the private property associated with population 1A should be assessed.

REFERENCES

Maiden and Blakely (1928); Hopper *et al.* (1990).



ALLOCASUARINA FIBROSA (C.A.Gardner) L. Johnson **Family: Casuarinaceae**

Fibrous-coned Sheoak

TAXONOMY

A. fibrosa is related to both *A. microstachya* and *A. grevilleoides* in a group by whorls of 4-6 parts in fruits, and definite internodes on stems. The species is distinguished by the long fibrous hairs on its cones.

DESCRIPTION

Small, erect, densely branched shrub to 1.8 m high with the branchlets and branches erect and densely crowded. There are separate male and female plants. The branchlets are cylindrical or almost so, striated, with only 3-4 internodes, the basal one the shortest, the tip sharply pointed. Leaves are reduced to a whorl of 4 dry teeth united at the base to form a sheath at each node, the tips are irregularly divided. Flowers are unisexual. Female flowers are clustered in stalkless, ovoid-globular cones on the older wood and hidden among the dense branches; the cones are covered with long coarse hair-like fibres. The fruit is a globular woody cone containing numerous seeds, each seed bearing a broad wing wider than the seed and each enclosed between 2 woody valves. Flowers September to November.

DISTRIBUTION AND HABITAT

The two population centres are south of Tammin and west of Quairading covering a range of 35 km, in heath on white sand over laterite. Plants at the type locality, south-west of Tammin and a nearby population west-south-west of Tammin are now extinct. All other collections in the Tammin area appear to come from populations on a nature reserve. The two populations known from east of Quairading were discovered in 1989.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1A	Merredin	Tammin	South of Tammin	Nature Res.	98	Good, 5 dead 27.8.900
1B	Merredin	Tammin	South of Tammin	Nature Res.	182	Good 27.8.90
2A	Narrogin	Quairading	West of Quairading	Private	59	Good 1.8.90
2B	Narrogin	Quairading	Nth of 2A	Private	53	Good 1990

RESPONSE TO DISTURBANCE

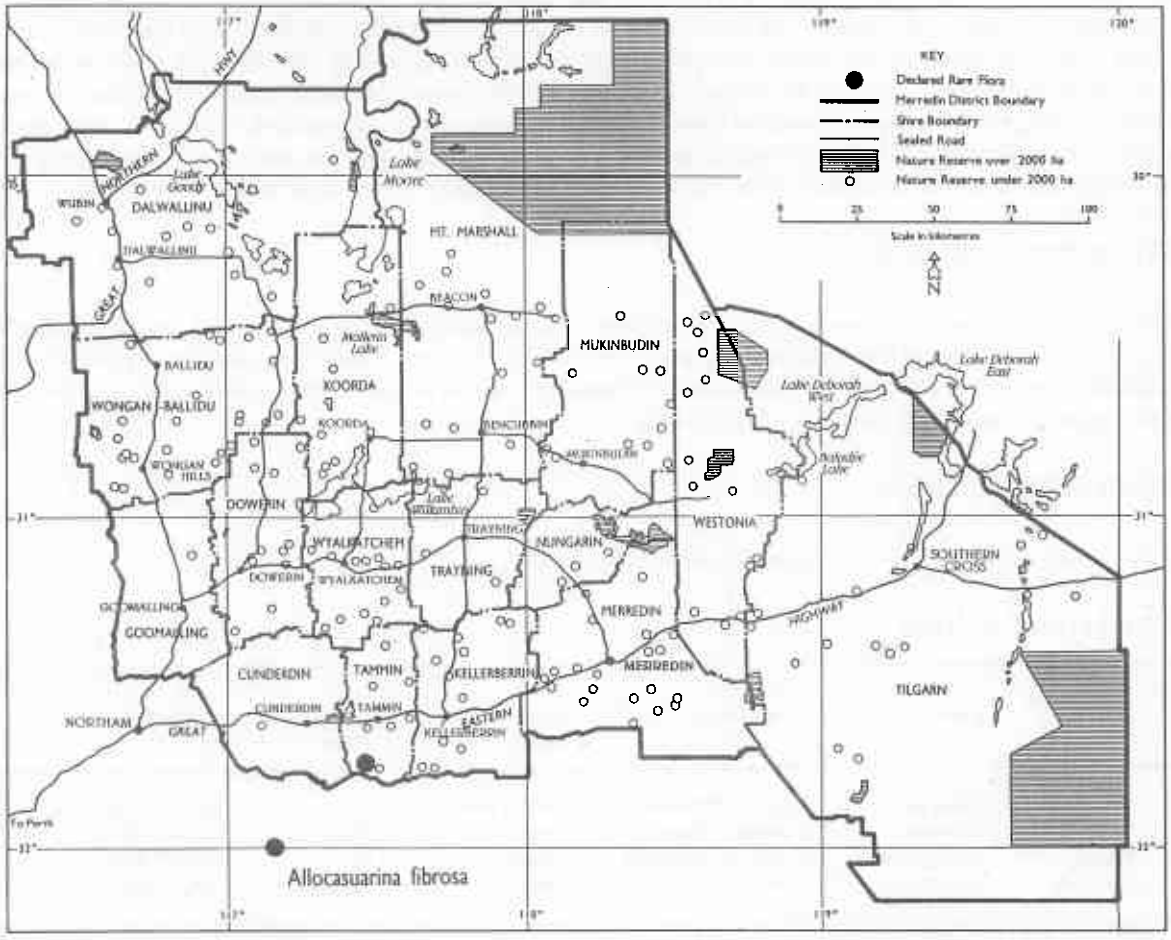
Following a fire, *A. fibrosa* regenerates from underground lignotubers and also releases seed. The last fire on the reserve south of Tammin was in 1966 and both sub-populations were burnt. Response to grazing, weed invasion and soil disturbance is unknown.

SUMMARY AND RECOMMENDATIONS

The Quairading plants are significantly taller than those in the Tammin area and there are indications that the populations near Tammin are in decline as the number in both populations has decreased from 550+ in 1982 to 290 in 1990. Fire effects on regeneration and adult plant survival needs investigation. Further surveys for this species within remnants of kwongan/heath associated with lateritic residuals and breakaways, particularly on private property, are required. Fencing populations on private property may be necessary.

REFERENCES

Gardner (1927); Lucas and Singe (1978); Leigh *et al.* (1984); Hopper *et al.* (1990).


KEY
Declared Rare Flora
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
Scale in kilometres
NORTHAM
GREAT
NORTHERN
HINT
WUBIN
DALWALLINU
MT. MARSHALL
MUKINBUDIN
KOORDA
WONGAN HILLS
BALLIDU
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
GOOMALLING
CUNDERDIN
TAMMIN
KELLERBERRIN
MERREDIN
SOUTHERN CROSS
TILGARN
EASTERN HIGHWAY
Allocasuarina fibrosa

BANKSIA SPHAEROCARPA R.Br. var. *DOLICHOSTYLA* A.S.George **Family: Proteaceae**

Ironcap Banksia

TAXONOMY

Similar to *B. sphaerocarpa* var. *caesia*, but has a much longer perianth and somewhat larger follicle. The style (pistil) is the longest of any *Banksia*.

DESCRIPTION

A shrub or small tree 2-4 m tall, with bluish-green, entire, linear leaves, and golden flowers. The inflorescences are erect and spherical, opening from the apex down. The styles are hooked just below the apex. The fruiting cone is spherical with up to 60 follicles, often crowded and at first with spreading hairs which may wear off on exposed surfaces. Flowers March to May.

DISTRIBUTION AND HABITAT

This species has a preference for iron-capped hills and rises on ironstone (lateritic) soil profiles. It is found in low woodlands to low shrublands with associates which include *Dryandra* and *Allocasuarina* species. It occurs in VCL east of the cleared wheatbelt north from Digger Rocks through Forrestania to Mt Holland in the Merredin District.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Yilgarn	Mt Holland	VCL/Water Res.	300	Barrow Pit Damage 30.8.90
2	Narrogin	Kondinin	N of Lake Cronin	VCL	50+	Good 5.4.89
3	Narrogin	Kondinin	S of 2	VCL	400+	Good 5.4.89
4	Narrogin	Kondinin	North Ironcap	VCL	100+	Good 4.4.89
5	Narrogin	Kondinin	Forrestania	VCL	50+	Est. 28.5.90
6	Narrogin	Kondinin	South Ironcap	VCL	1000+	Good 5.4.89; some damage by surveyors 1990
7	Narrogin	Kondinin	SE of South Ironcap	VCL	500+	Good 5.4.89

RESPONSE TO DISTURBANCE

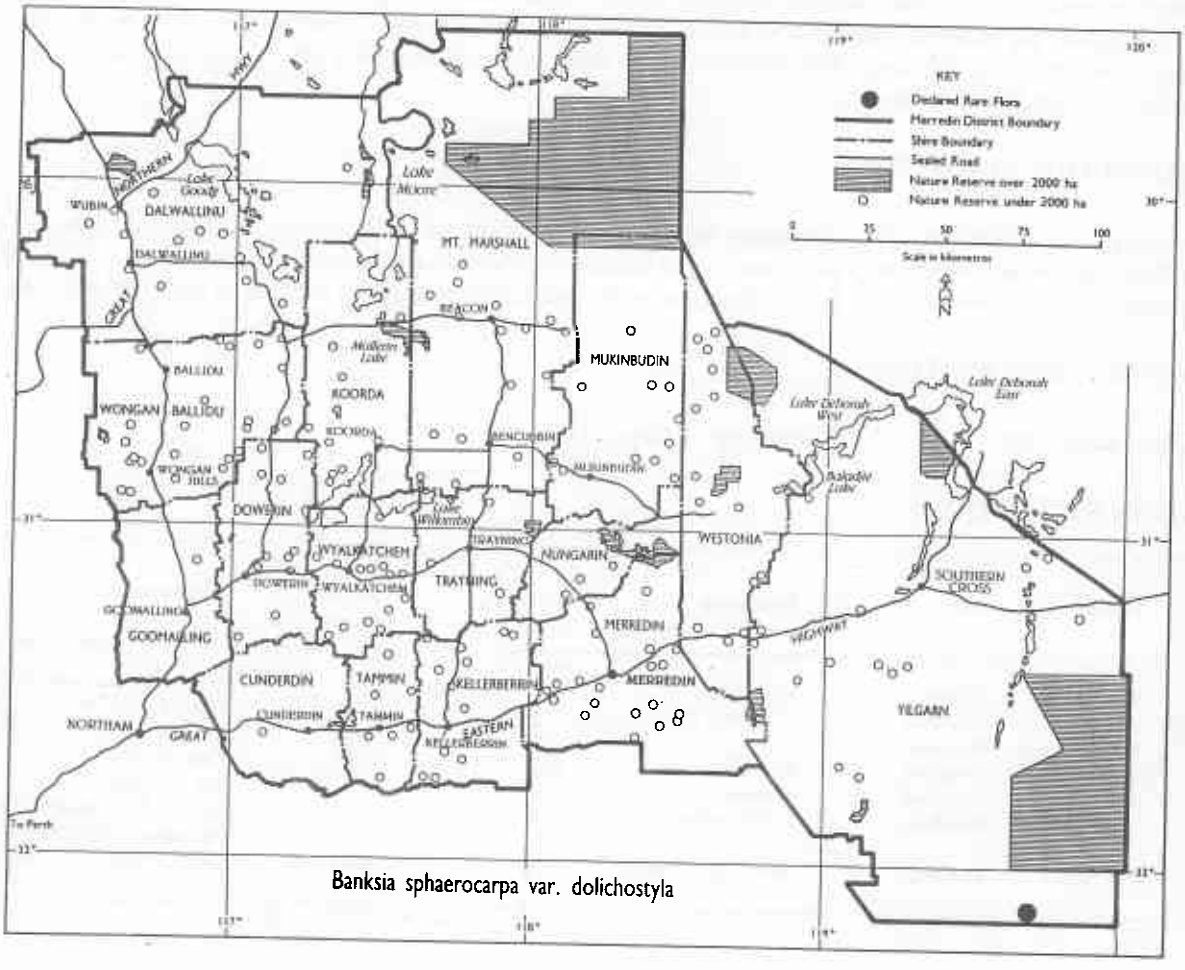
Direct destruction of plants through gravel mining, mineral exploration, and cutting of survey lines has resulted in damage to several populations. Weed invasion and fire are potential problems which may increase if mining activity in the area expands.

SUMMARY AND RECOMMENDATIONS

Reservation of at least some of the populations should be a matter of priority. Much of the area has been previously recommended for protection and under the State Government's new mining policy should become 'C' Class Nature Reserves in the future. Additional surveys should be carried out to locate more populations.

REFERENCES

George (1981b); Taylor and Hopper (1988); Hopper *et al.* (1990).



Banksia sphaerocarpa var. dolichostyla

BORONIA ADAMSIANA F. Muell. **Family: Rutaceae**

Barbalin Boronia

TAXONOMY

This species is closely related to *Boronia ternata*, but has longer sepals and densely tomentose (hairy) leaflets.

DESCRIPTION

Shrub 80-90 cm tall. Leaves crowded, sessile, trifoliolate, densely stellate-pilose; leaflets oblong-elliptic, 5-10 mm long. Flowers axillary, solitary, very shortly pedicellate. Flowers June to September.

DISTRIBUTION AND HABITAT

B. adamsiana occurs over a geographic range of 125 km, from south of Trayning to north-east of Beacon, in habitats of heath or shrub heath on sand. Six of the populations were documented as a result of surveys during 1990. The type collection was sent by Annie Adams of Mangowine, where no remnant vegetation now remains, so it is thought to be extinct. However, the Adams family at one time owned the present Barbalin Rock Reserve, so it is possible that the type collection came from this locality. It occurs with *Eucalyptus synandra* at population 7.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Mukinbudin	Barbalin North Road	Road Res.	2	Some dust effect 5.9.90
2	Merredin	Mukinbudin	Barbalin Rock	Water Res.	191	Good 5.9.90
3	Merredin	Mt Marshall	NW of Wialki	Private	28	Good 5.9.90
4	Merredin	Mukinbudin	W of Barbalin N Road	Private	35 seen, est. 1-300	Good 5.9.90
5	Merredin	Mukinbudin	E of Barbalin N Road	Private	74 seen, est. 2-300	Good 5.9.90
6	Merredin	Mukinbudin	Bonnie Rock	Road/Rail Res.	150	Healthy 14.9.90
7	Merredin	Mt Marshall	W of Clarke Road	Private	1098 seen, est. 1250+	Good 5.9.90
8	Merredin	Mt Marshall	Bimbijy Road	Road Res.	2	Healthy 18.9.90
9	Merredin	Trayning	Donerty Road	Road Res.	22	Good 20.8.90; 18.9.90

RESPONSE TO DISTURBANCE

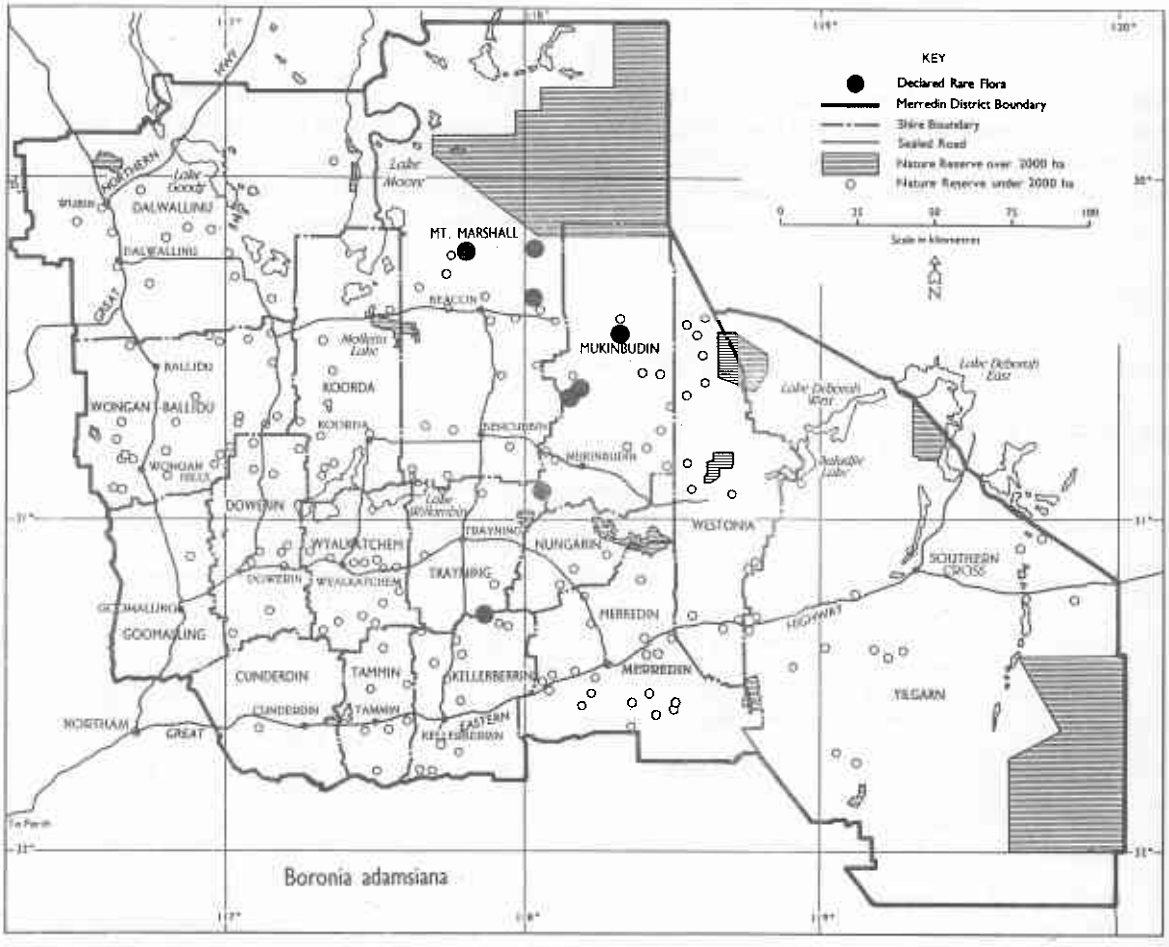
The four private property populations are in areas chained and partly cleared for agriculture, but subsequently left to regenerate. Weeds do not appear to be a problem in any of the populations.

SUMMARY AND RECOMMENDATIONS

The large population on private land west of Clarke Road has been fenced under the 1990/91 Remnant Vegetation Protection Scheme. The road verge populations of Bimbijy, Doherty and Bonnie Rock-Burakin Roads require markers to prevent possible damage during road maintenance operations. The location of four relatively large populations on private land in 1990, suggests the possibility of further occurrences on private land, a matter which should be investigated. Populations 1, 2 and 5 have plants which are senescing and appear to be in decline.

REFERENCES

von Mueller (1890); Blackall and Grieve (1974); Hopper *et al.* (1990).



CALADENIA CRISTATA R.S. Rogers **Family: Orchidaceae**

Crested Spider Orchid

TAXONOMY

This species resembles *C. plicata* but differs from it in the absence of clubbed sepals and fringed labellum margins. The calli are not arranged in definite rows as in *C. plicata*, but are crowded into a dense dark purple central band, which stands conspicuously erect on the lighter-coloured disc. The specific name refers to the crested appearance of this band of calli.

DESCRIPTION

A slender hairy plant about 30 cm high; leaf linear about 10 cm long. Flower solitary; segments of perianth yellowish-green, with a central reddish stripe. Labellum reddish-brown, spreading, mobile on short claw. Column almost equal in length to the labellum, much incurved and very widely winged in its upper half. Flowers September to October.

DISTRIBUTION AND HABITAT

C. cristata is found on low rises above saline flats in tall to medium shrubland dominated by *Melaleuca* and/or *Acacia* over low shrubs and ephemerals. Soils are white sand clays. The species occurs in the Pithara and Miling areas over a geographic range of 40 km and is found in association with *'Drakonorchis drakaeoides'* in population 3. Prior to its rediscovery in 1986 the species had not been collected for 63 years since its initial collection by E. Simpson near Pithara in 1923.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Dalwalinu	E of Pithara	Private	8	Stock disturbance 4.9.87
2	Merredin	Wongan-Ballidu	Damboring	Nature Res.	9	Rabbit grazing 9.9.88
3	Moora	Moora	Miling	Private	10	Grazing evidence & rubbish 4.9.87, 21.9.90
4	Merredin	Wongan-Ballidu	W of Ballidu	Private	300+	Undisturbed, 15.9.90
5	Moora	Coorow	SE Coorow	Nature Res.	*ca* 220	Undisturbed 28.9.91

RESPONSE TO DISTURBANCE

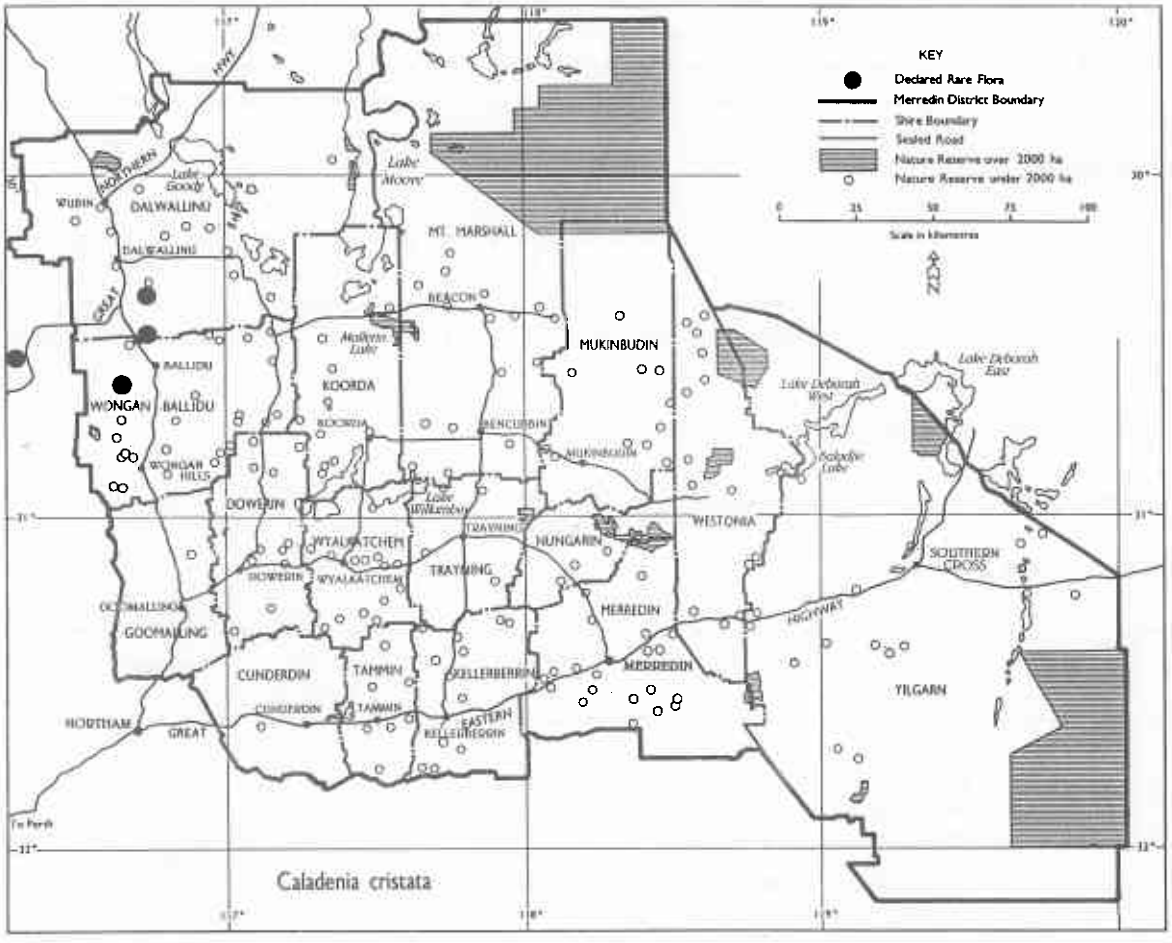
Factors such as soil disturbance, fire, grazing and weed invasion are all potential problems for this delicate species. Grazing is a potential threat for populations 1 and 3. Populations 3 and 4 were discovered by members of the W.A. Native Orchid Group in 1988 and 1990 respectively.

SUMMARY AND RECOMMENDATIONS

Reservation or at least fencing is required for populations on private land. Further survey to locate possible additional populations is also needed. Some success has been had in propagation of this species from seed. The impact of rising water-tables and salinity may require research. The impact of grazing on populations 1 and 3 needs to be investigated as a matter of priority and appropriate action taken.

REFERENCES

Rogers (1923); Hopper *et al.* (1990).



DAVIESIA EUPHORBIOIDES Benth. **Family: Papilionaceae**

Wongan Cactus

TAXONOMY

D. euphorbioides is a distinctive species that is easily recognised by its cactus-like habit.

DESCRIPTION

Leafless spreading shrub with a cactus-like appearance, to 45 cm high; branches erect, cylindrical, very thick (1 cm diameter), slightly tapering; leaves replaced by small prickly conical scales; flowers in clusters, from axils of scales, standards orange-yellow and keels deep red or purplish; fruit a triangular pod with sharp apex, tough, opens when ripe, 1-2 seeds per pod. Flowers September to October.

DISTRIBUTION AND HABITAT

This species is endemic to the Merredin District, from Wongan Hills east to Moonijin south of Dowerin covering a geographic range of 85 km. It has a preference for sandplain habitat and regenerates only after site disturbance. Populations 1-3 at Wongan Hills are associated with DRF *Hemigenia viscida*.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1A	Merredin	Wongan-Ballidu	Wongan Hills-Elphin	Road Res.	9	Good 10.1.89
1B	Merredin	Wongan-Ballidu	Wongan Hills-Elphin	Nature Res.	32	Vehicle damage 9.1.89
2	Merredin	Wongan-Ballidu	Wongan Hills-Elphin	Rail Res.	40	Several dead 9.1.89
3	Merredin	Wongan-Ballidu	Wongan Hills-Elphin	Rail Res.	45	Several dead 9.1.89
4	Merredin	Dowerin	North Moonijin	Rail Res.	1	Originally 2 plants, 25.9.89
5	Merredin	Goomalling	Berring Road	Road Res.	5	Originally 11 plants, 10.1.89
6	Merredin	Wongan-Ballidu	Manmanning Rd	Road Res.	1	Originally 4 plants, 4.10.89
7	Merredin	Dowerin	Hindmarsh	Road Res.	35	7 dead 5.10.89
8	Merredin	Goomalling	Berring	Road Res.	1	Originally 2 plants, 10.1.89
9	Merredin	Wongan-Ballidu	Wongan Hills North	Road Res.	1	Originally 2 plants, 9.1.89

RESPONSE TO DISTURBANCE

Daviesia euphorbioides is thought to reach maturity relatively quickly and live for only a few years. All known populations are in areas of soil disturbance caused by heavy machinery, six on graded road verges, two on railway reserves which have been cleared and allowed to regenerate and the last population is on a nature reserve in a site where gravel exploration and track construction have occurred. Many of the populations are senescent. Mature plants have many dead branches, there is an increasing number of dead plants, and little recruitment of new individuals.

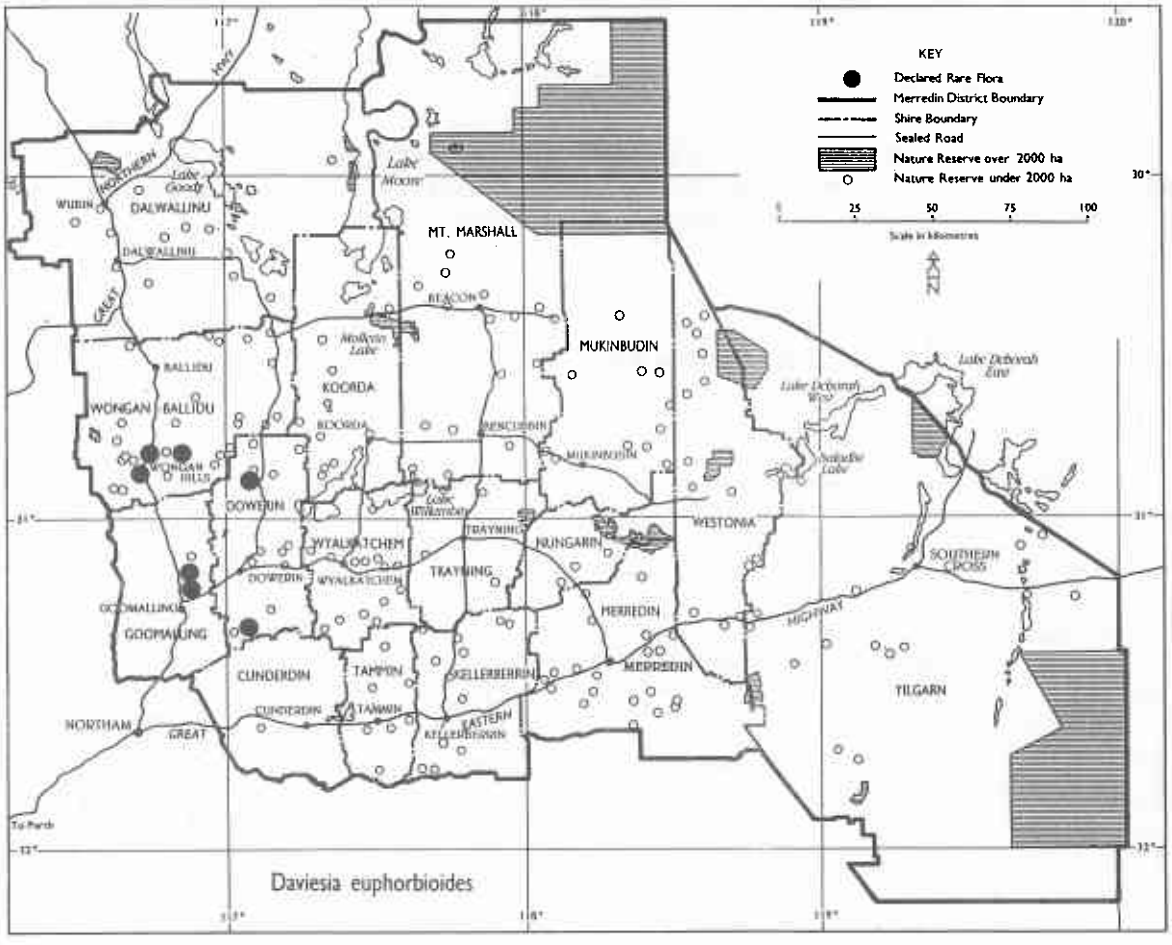
SUMMARY AND RECOMMENDATIONS

This endangered species has a restricted distribution on road and railway reserves with 170 individuals recorded from nine populations. It is a short-lived species that requires soil disturbance to regenerate. Regular monitoring of all populations is desirable. Detailed study of current population dynamics particularly concerning its recruitment response to disturbance is required.

The Water Reserve (16418), north of Wongan Hills townsite, requires intensive survey for new populations. Crisp (1983) found the species was 'easy to cultivate' from seed in the National Botanic Gardens, Canberra in 1979.

REFERENCES

Crisp (1983); Leigh *et al.* (1984); Hopper *et al.* (1990).



'DRAKONORCHIS DRAKEOIDES' S.D. Hopper ms
(previously known as *Caladenia* sp., Salt Lakes, *S.D. Hopper* 4162)

Family: Orchidaceae

Hinged Dragon Orchid

TAXONOMY

No details available, but the species will be included in the second edition of Hoffman and Brown's (1984) book on the *Orchids of South West Australia*, which is to be published this year.

DESCRIPTION

Inconspicuous, erect, tuberous herb 20 to 30 cm tall. Plants usually single-flowered, on a slender hairy stalk. Labellum hinged, insect-like (adapted for insect pollination by wasps); lamina to 10 mm long, connected to a loose very mobile hinge similar to that of the hammer orchids. Flowers August to October.

DISTRIBUTION AND HABITAT

This species, which may be found in association with *Caladenia cristata*, occurs on low rises above saline flats in tall to medium shrubland dominated by *Melaleuca* and/or *Acacia* over low shrubs and ephemerals. Soils are white sand clays. It occurs over a geographic range of 115 km in the Marchagee, Miling and Goomalling areas and is also recorded to the west of Lake Moore.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Moora	Coorow	Masons Rd	Private	10000	Good; to be fenced 3.8.88
2	Moora	Coorow	W of 1	Private	100	Good 3.8.88
3	Merredin	Wongan-Ballidu	Damboring	Nature Res.	3	Good 11.9.88
4	Merredin	Dalwallinu	West Pithura	Private	220	Good 10-11.9.88
5	Merredin	Wongan-Ballidu	Meadows Rd	Private	30	Good 10.9.88
6	Merredin	Wongan-Ballidu	Kondut	Private	30	Good 10.9.88
7	Moora	Moora	Miling	Private	5	Good 4.9.87
8	Merredin	Dalwallinu	W of Lake Moore	?	10	Good 11.9.88; not found 20.9.90
9	Merredin	Goomalling	NW Goomalling	Private ?	2	Good 25.9.84
10	Merredin	Wongan-Ballidu	W of Ballidu	Private	4	Good 15.9.90

RESPONSE TO DISTURBANCE

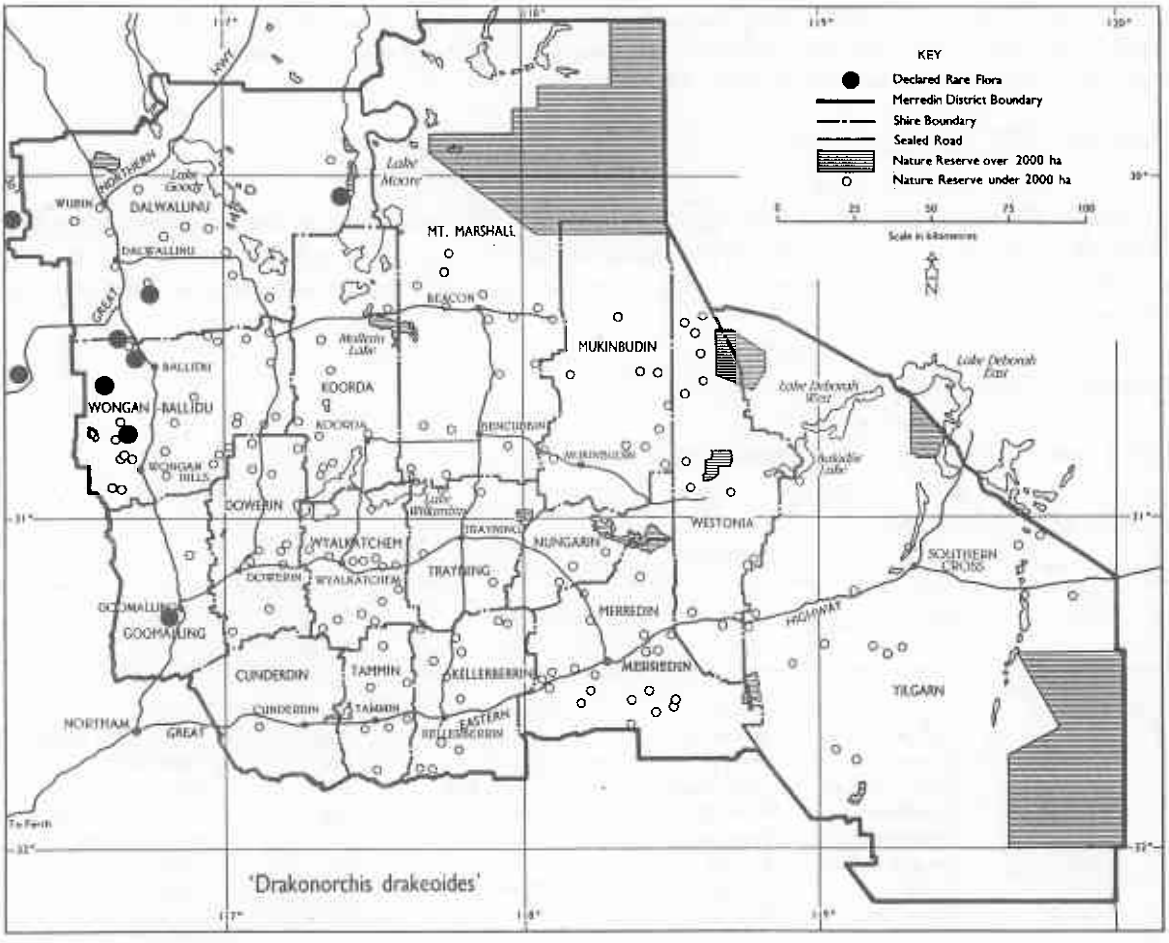
Soil disturbance, fire, grazing, weed invasion and canopy cover are all potential problems. All but three plants are on private land. Fencing of the largest population 1 will protect the plants from possible grazing and mechanical damage.

SUMMARY AND RECOMMENDATIONS

Re-survey of all known populations is a priority as they have not, with the exception of population 10, been inspected for at least three years. Annual re-surveys and searches for additional populations should provide a better understanding of the distribution of this species, both geographically and between years. The species is by no means secure with five populations numbering ten or less individuals.

REFERENCE

Hopper *et al.* (1990).



DAVIESIA 'OXYLOBIUM' M.D.Crisp ms **Family: Papilionaceae**

Central Wheatbelt Daviesia

TAXONOMY

This species is related to *D. daphnoides* with the floral parts almost identical. Its main distinguishing features are a sharp pointed fruit and the pungent phyllodes (leaves).

DESCRIPTION

Bushy shrub to 1 m tall. Phyllodes erect, narrowly clavate, with acicular tips, articulate, 20-70 x 1-1.75 mm, striate. Corolla standard transverse-broad to depressed-ovate, 4-4.5 x 5.5-6 mm, with 1 mm claw, rich yellow towards margins, deep pinkish red towards centre. Pod tapered to a long sharp beak. Seed plump, broad-ellipsoid. Flowers July to August.

DISTRIBUTION AND HABITAT

First collected in the Youndegin area (between Cunderdin and Quairading) in 1889 and remnant populations still occur in that area and to just north of Bruce Rock over a geographic range of 80 km. Habitat is heath or open scrub on sand-plain or heavier soils containing laterite gravel. Known populations are on disturbed road and rail verges. This species is found with DRF *Hakea aculeata* at population 3.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Narrogin	Bruce Rock	Bruce Rock	Rail/Road Res.	72	11 sub-popns, 10.4.86, 14.5.87
2	Narrogin	Quairading	North Quairading	Road Res.		8 sub-popns
3A	Narrogin	Quairading	Rabbit Proof Fence Rd	Road Res.	200+	Healthy 19.7.84; 1940
3B	Merredin	Cunderdin	Rabbit Proof Fence Rd	Road Res.		
4	Merredin	Cunderdin	Mills Rd	Road Res.	1	4 plants 28.10.85

RESPONSE TO DISTURBANCE

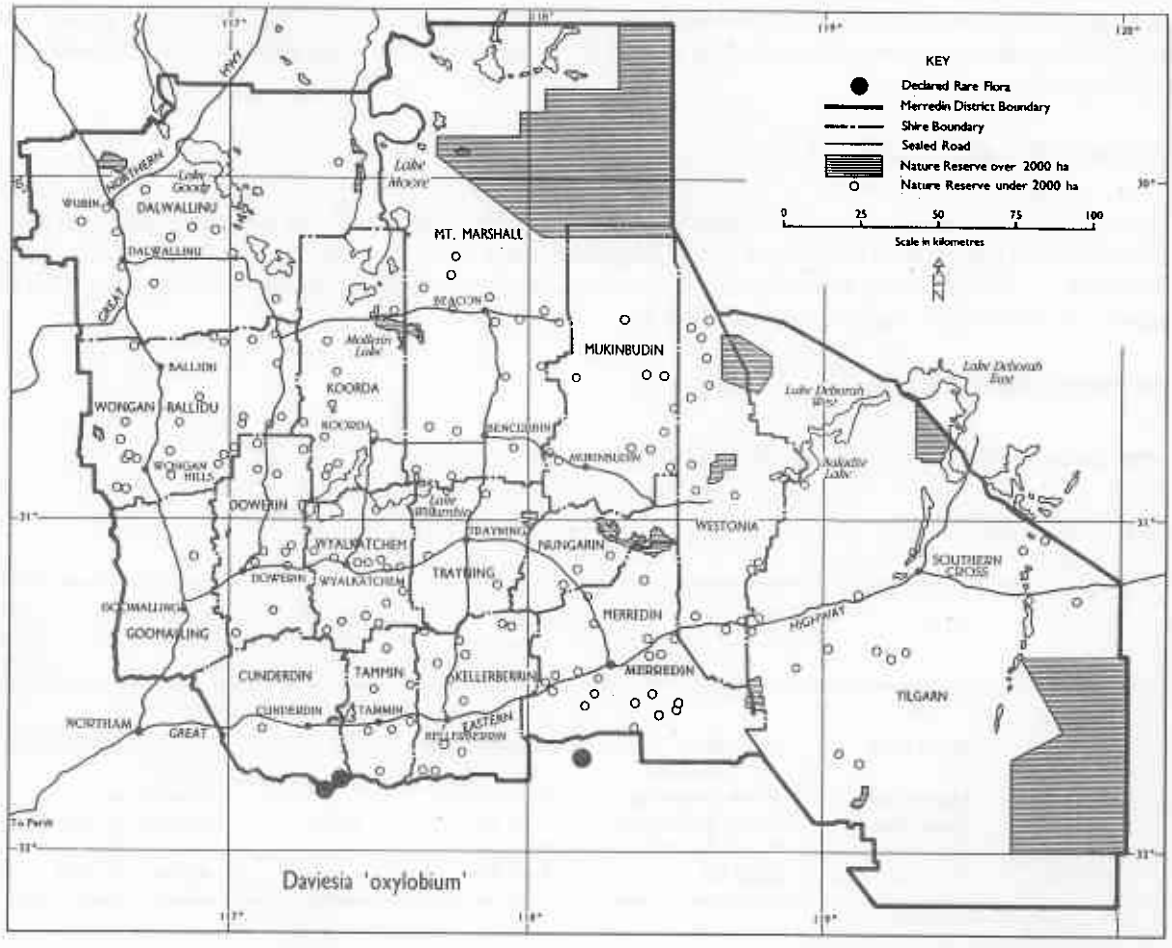
All populations occur on disturbed verges, in some cases with a dense cover of introduced grasses suppressing regeneration. Soil disturbance may be a requirement for continued survival of populations once numbers are low. Fire and grazing affects are unknown. Some plants have been lost due to herbicide use on power-poles and a water pipeline at population 3. The experimental use of the selective herbicide fusilade on some populations of this species has been carried out by Dr K. Atkins (CALM) for the control of competing grass weeds.

SUMMARY AND RECOMMENDATIONS

Re-survey of populations 1 and 2 within the Narrogin District should be a priority. Additional surveys for new populations are required, particularly in larger areas of existing vegetation, where conservation has the greatest chance of success. Apart from population 3A/3B which is relatively large, the remainder appear to have little prospect of long-term survival. Cultivation should also be a priority.

REFERENCES

Crisp (1983); Hopper *et al.* (1990).



EREMOPHILA CAERULEA (S.Moore) Diels subsp. ***'MERRALLII'*** **Family: Myoporaceae**
R. Chinnock ms (previously known as *Eremophila merrallii*)

Bruce Rock Eremophila

TAXONOMY

A higher rainfall subspecies of *Eremophila caerulea* with a sprawling prostrate habit.

DESCRIPTION

Shrub to 0.2 m tall and 0.5 m across. Leaves narrow-linear, subterete, thick, warted, 6-7 mm long. Calyx and ovary hairy. Corolla tubular, blue, purple or violet, dark blotched, 1 cm long. Hairs on the plant comprised of long, branched trichomes. Fruits ovoid 0.2 x 0.3 cm rarely containing a seed. Flowers August to January.

DISTRIBUTION AND HABITAT

The species was first collected near Bruce Rock in October 1927 by O.H. Sargent and again collected in the same area in 1980, in open shrub mallee on light colour stony clay loam soil. A single plant reported south-east of Southern Cross, has not been relocated after a number of searches. The marked difference in habitat between the two localities suggests that the determination may have been incorrect.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Narrogin	Bruce Rock	Wogarl	Road Res.	18	Included 2 seedlings 1.6.90
2	Merredin	Yilgarn	Cheritons	Nature Res.	1	Reported 1988; not relocated during at least 5 searches

RESPONSE TO DISTURBANCE

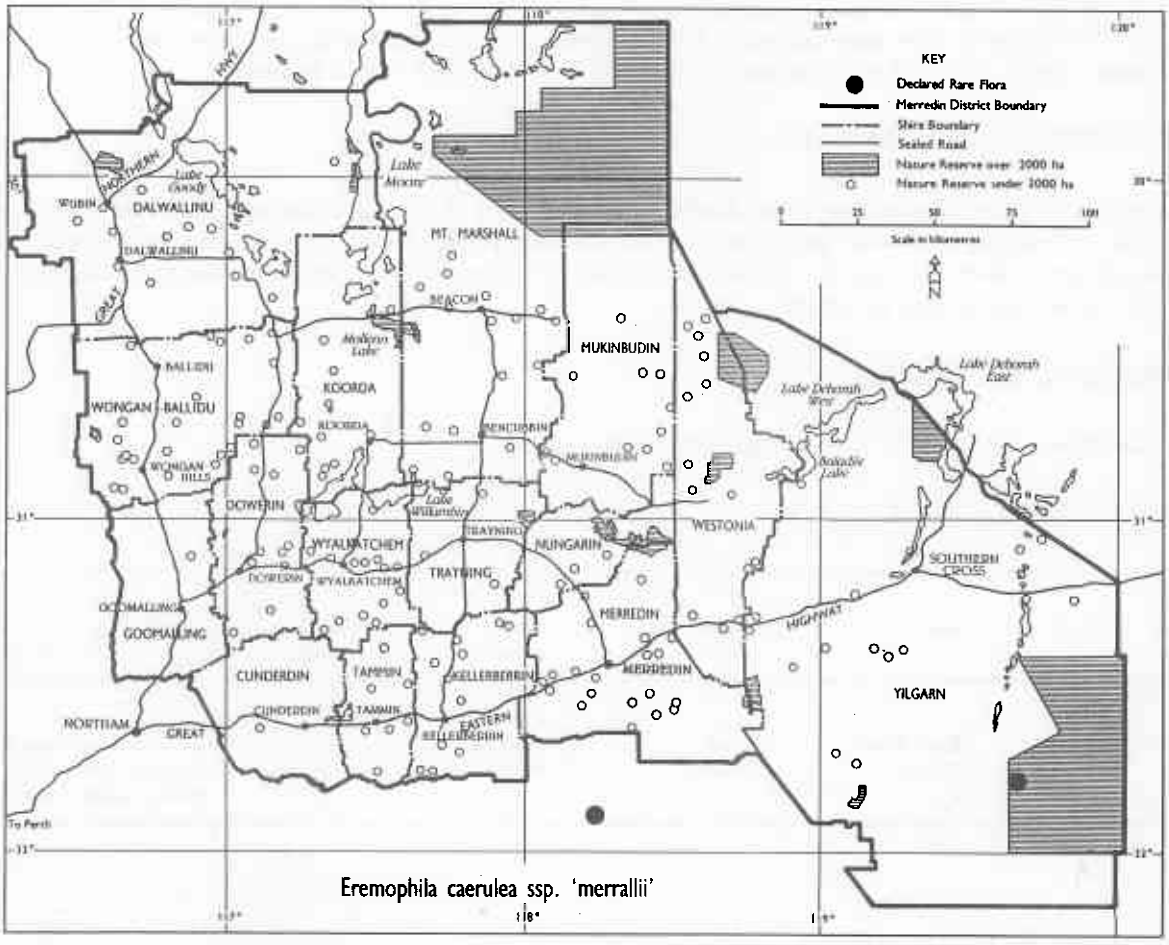
The species is known to sucker when roots are disturbed. Physical site disturbance remains a real threat, while fire and weed invasion are not problems at this time. The road reserve has been used as a stock route and grazing may be a threat.

SUMMARY AND RECOMMENDATIONS

The species is entomophilous with wasps, small bees and moths observed feeding on plants. It has been cultivated relatively easily from cuttings in the Adelaide Botanic Gardens. Additional surveys remain a priority as the number of plants known is small and situated on a narrow road verge and water pipeline. The possibility of permanently moving the above-ground pipeline away from the population should be investigated. The absence of seed in most fruits requires investigation.

REFERENCES

Blackall and Grieve (1981); Hopper *et al.*(1990).



Eremophila caerulea ssp. 'merrallii'

EREMOPHILA INFLATA C.A.Gardner **Family: Myoporaceae**

Swollen or Bell-flowered Eremophila

TAXONOMY

A distinctive species that is easily recognised by its pink-pale violet inflated, bulbous flower. The flower is somewhat different from those of other *Eremophila* species; *E. inflata* may eventually be recognised as distinct at the generic level.

DESCRIPTION

Spreading erect shrub to 2 m high, hairless except for the flowers, the branches sparingly resinous and warty. Leaves are linear-oblanceolate, up to 3 cm long and 3.5 mm wide, with a blunt and sometimes shortly-hooked tip, narrowed at the base, stalkless or shortly-stalked, only the central vein conspicuous. Flowers are pale violet, borne singly or sometimes in pairs on slender, curving peduncles arising in the leaf axils. Each flower is shortly tubular and more or less cup shaped but much inflated at the base. Fruit ovoid, 0.3 x 0.25 cm, beaked, hairy. Flowers May to December.

DISTRIBUTION AND HABITAT

E. inflata was recorded in the late 1800s from Lake Moore and Mt Holland where it is now thought to be extinct. *E. inflata* is now known from four populations all east of the cleared wheatbelt between Marvel Loch and Lake King over a geographic range of 175 km. It occurs on brown clay loam to red brown clay soils in *Eucalyptus* low woodland.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Yilgarn	Marvel Loch	Road Res./VCL	175	Good 1990; flowered twice in six months after rains
2	Narrogin	Kondinin	Lake Cronin	Road Res.	2	Good 28.6.88
3	Narrogin	Kondinin	Mid Ironcap	Road Res.	1	4 plants 15.12.88; many 1978
4	Katanning	Lake Grace	Lake King	Road Res.	13	55 plants 3.7.85

RESPONSE TO DISTURBANCE

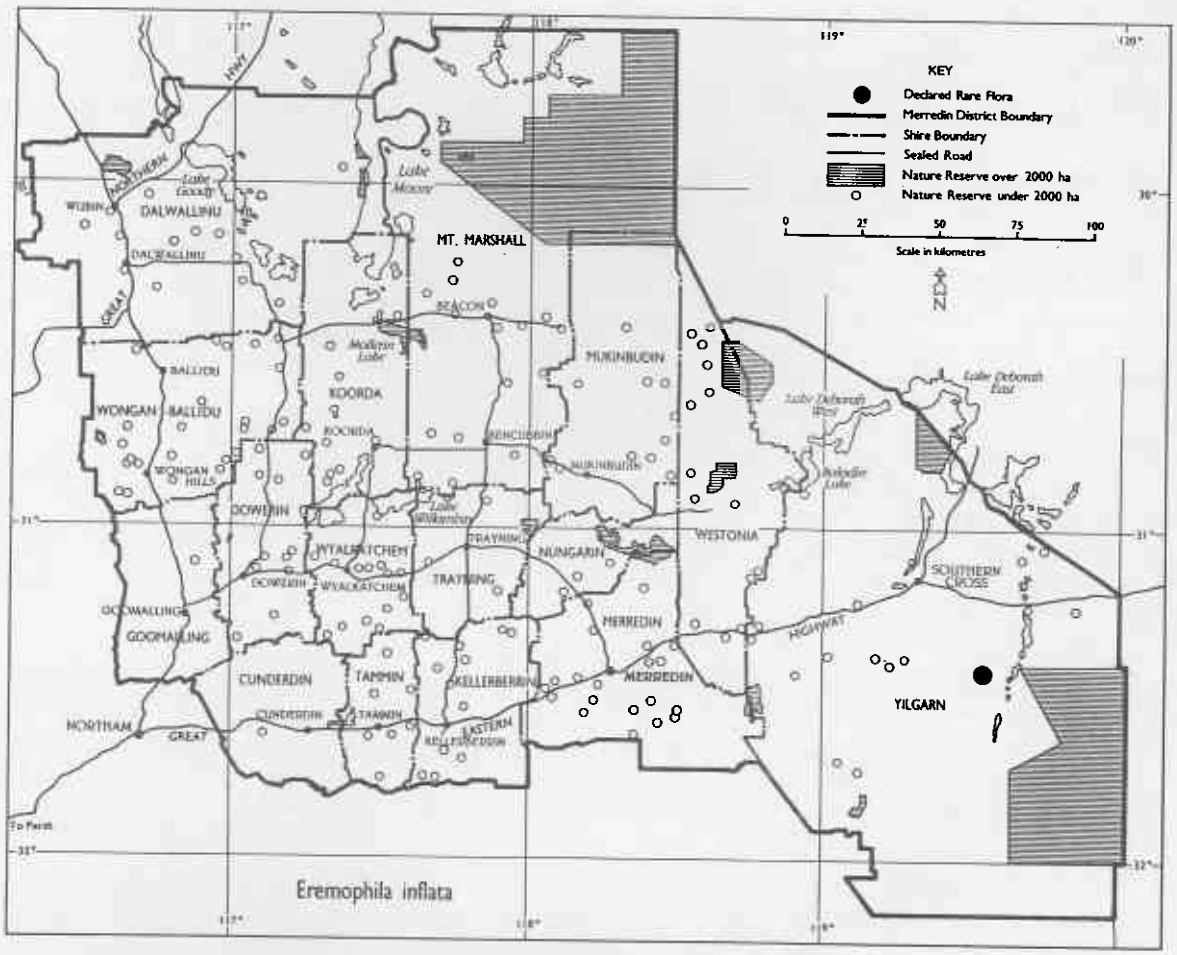
This species is favoured by physical disturbance, with known occurrences being on disturbed road verges and adjacent disturbed areas. Loss of plants at population 4 was due to destruction during roadworks. Species declines in other populations suggest that it is not a long-lived taxon; perhaps up to ten years. Drought appears to be implicated in plant loss from population 3. Effects of fire, weed invasion and grazing are unknown.

SUMMARY AND RECOMMENDATIONS

Surveys are required to locate plants in areas other than road verges. Research into long term seed viability and recruitment patterns into populations following disturbance are needed and regular monitoring of populations is recommended.

REFERENCES

Leigh *et al.* (1984); Hopper *et al.* (1990).


KEY
Declared Rare Flora
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
MT. MARSHALL
DALWALLINU
WONGAN HILLS
KOORDA
MUKINBUDIN
WESTONIA
MERREDIN
YILGARN
SOUTHERN CROSS
CUNDERDIN
TAMMIN
NORTHAM
GOOMALLING
DOWERIN
NUNGARIN
TRAYNING
Eremophila inflata

EREMOPHILA RESINOSA F. Muell. **Family: Myoporaceae**

Resinous Eremophila

TAXONOMY

The common name is derived from the resinous papillae or tubercles that are found on most parts of the upper stems including the petals.

DESCRIPTION

Spreading shrub to 60 cm - 1.2 m tall; young growth sticky; branches densely covered in white hairs, warty; leaves to 1 cm x 0.3 cm, alternate, cuneate-obovate, erect to spreading, greyish green, sparse to dense covering of short hairs, margins entire, apex pointed or blunt; flowers tubular, about 1.5 cm long, violet, exterior hairy, lobes pointed, constricted near base, solitary, axillary, nearly sessile, near ends of branchlets; stamens not exserted; calyx lobes narrow, pointed, hairy; fruit ovoid, about 0.6 cm long, hairy. Flowers September to January (with one record in April).

DISTRIBUTION AND HABITAT

Recorded from the Merredin District from around Cowcowing to Westonia, *E. resinosa* occurs in open mallee scrub on light brown sandy clay loam soils. The species is now known only in disturbed road verges and a partly disturbed rail reserve.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Westonia	Boodarockin Road	Road Res.	36	20 healthy 3.11.84, 25.1.89
2	Merredin	Wyalkatchem	Cowcowing	Rail Res.	2	Healthy 19.12.85
3	Merredin	Westonia	Warralackin Road	Road Res.	50	Weeds 8.3.89
4	Merredin	Mt Marshall	South Gabbin	Road Res.	?	

RESPONSE TO DISTURBANCE

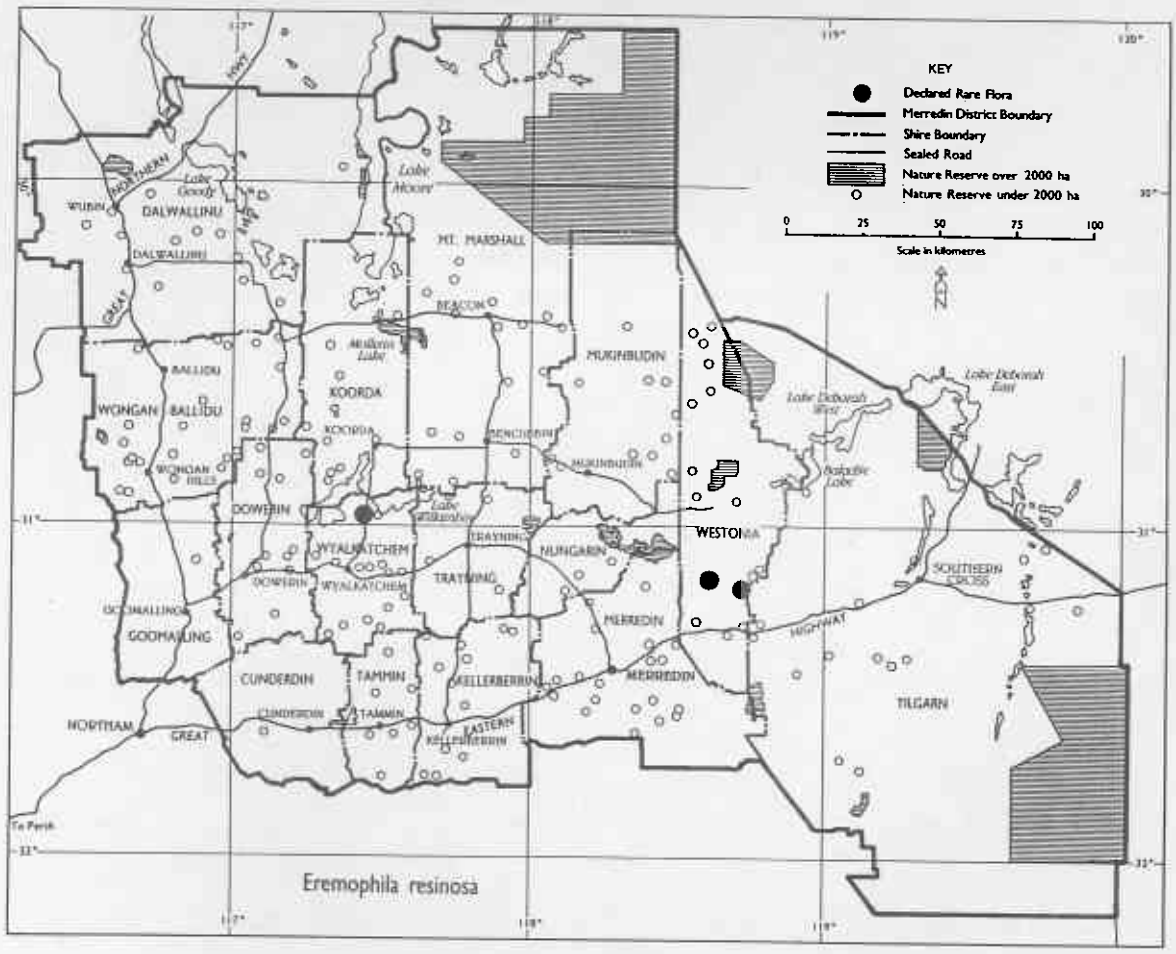
This species has regenerated after grading of road verges and appears to be favoured by disturbance. Weed invasion and grazing are continuing threats, with the former likely to influence seedling establishment. Fire effects are unknown.

SUMMARY AND RECOMMENDATIONS

All populations require regular monitoring and populations 2 and 4 should be re-surveyed. Survey of remnants on private property in the Westonia area is recommended to locate any populations outside road or railway reserves. Research into recruitment response following disturbance and the effects of weed invasion is required.

REFERENCE

Hopper *et al.* (1990).


KEY
Declared Rare Flora
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
Eremophila resinosa
DALWALLINU
WUBIN
MT. MARSHALL
BEACON
MUKINBUDIN
KOORDA
WONGAN HILLS
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
GOOMALLING
CUNDERDIN
TAMMIN
MERREDIN
NORTHAM
TILGARN
SOUTHERN CROSS
HIGHWAY
GREAT EASTERN

EREMOPHILA VIRENS C.A.Gardner **Family: Myoporaceae**

Campion Eremophila

TAXONOMY

Diagnostic features of this *Eremophila* are the large leaves and prominent tufts of yellow -white hair on sepals and buds. It has affinities with *E. gibbosa* and *E. serrulata*.

DESCRIPTION

Medium to tall shrub, 3-5 m high, 1.5-3.5 m across; young growth sticky; branches erect, sparse, slender, sticky; leaves to 8 cm x 3.5 cm, alternate, oblong-lanceolate to ovate-lanceolate, folded lengthwise, petiolate, glabrous, shiny, sticky, margins entire, apex pointed; flowers tubular, to 2 cm long, green exterior very hairy, lobes pointed, upper ones short, lower long and reflexed, 1-2 slender pedicels to 2 cm long, in upper axils, profuse; stamens exserted; calyx lobes to 1 cm long, margins hairy, shiny; fruit ovoid to globular drupe, 0.3-0.5 cm x *ca* 0.3 cm, glabrous. Flowers August to October, occasionally November.

DISTRIBUTION AND HABITAT

This species most commonly occurs on light brown sandy loam over granite in rocky situations in thicket or scrub with *Acacia* spp. and *Allocasuarina* spp. Within the Merredin District it occurs over a geographic range of 55 km in the Mukinbudin, Warralakin and Bonnie Rock areas, and there is an additional population (8) recorded from the Boorabbin area giving a total range of 210 km.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Mukinbudin	West Warralakin	Private	5	36 live & 100 dead 1981, 18.12.90
2	Merredin	Mukinbudin	Barbalin north	Road Res./Private	27	5.7.89
3	Merredin	Mukinbudin	SW of Mukinbudin	Road Res.	53	93 plants 11.4.87, 14.9.89
4	Merredin	Westonia	Chiddarcooping	Nature Res.	1	1985
5	Merredin	Mukinbudin	Barbalin south	Road Res.	50+	Healthy 17.7.87, not found 89/90
6	Merredin	Mukinbudin	Barbalin east	Road Res.	24	5.7.90
7	Merredin	Mukinbudin	Bonnie Rock	Rail Res.	92	14.9.90
8	Merredin	Westonia	North of Warralakin	Road Res./Private	11	7.5.91
9	Kalgoorlie	Coolgardie	Boorabbin	Water Res.	29	Water stressed 15.8.84

RESPONSE TO DISTURBANCE

Response to fire, weed invasion and grazing are unknown. This species is probably a disturbance opportunist although this requires clarification.

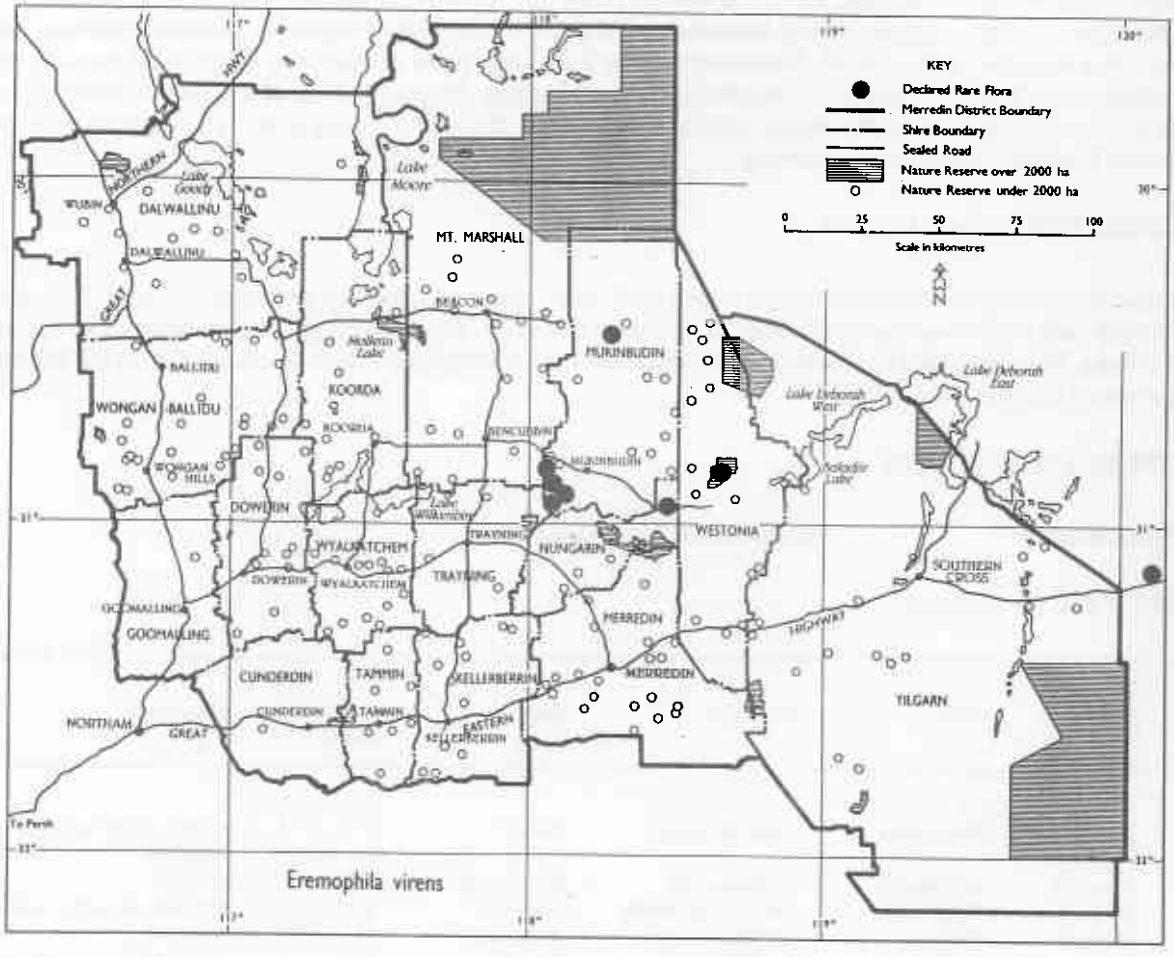
SUMMARY AND RECOMMENDATIONS

E. virens is a bird-pollinated species and produces numerous fruits but few seeds. Like many other *Eremophila* species it is probably a disturbance opportunist although this requires further research. Populations appear to be in decline in

areas where only minimal disturbance has taken place in the last five to ten years. Surveys particularly in the remnants on private property are needed to locate further populations outside rail and road reserves.

REFERENCES

Leigh *et al.* (1984); Hopper *et al.* (1990).



EREMOPHILA VISCIDA Endl. **Family: Myoporaceae**

Varnish Bush

TAXONOMY

This species is distinguished by its long linear-lanceolate leaves, prominent spotted flowers and large double blue-purple sepals. It has affinities with *E. neglecta* J.M. Black and can be confused with *Eremophila serrulata* in the field.

DESCRIPTION

A medium to tall shrub, 2-6 m high, 1.5-5 m across; branches glabrous, sticky, shiny brown; leaves 5-10 cm up to about 1 cm wide, alternate, lanceolate to elliptic, folded lengthwise, shiny, sticky, glabrous, margins entire, apex pointed; flowers tubular, about 2 cm long, white to pale yellow with purple spotted interior, exterior hairy, on slender pedicels, in upper axils; stamens exserted; calyx lobes to about 0.7 cm long, grey-blue or reddish, blunt, veined; fruit ovoid, 0.5-0.7 cm x *ca* 0.4 cm, compressed, hairy on the upper part. Flowers from August to October.

DISTRIBUTION AND HABITAT

Five extant populations located in the Merredin District are within 20 km of Chiddarcooping Nature Reserve with one population south-west of Mukinbudin giving a geographic range of 55 km. It was previously known from Latham, Koorda, Carnamah, Ballidu, Pindar and west-south-west of Merredin, a former range of 290 km. There is also a 1979 herbarium record from 125 km west of Norseman which indicates a potential geographic range of 600 km. It occurs in light brown sandy loam or red brown clay loam soils in open woodland and scrub vegetation, or associated with grass on disturbed road verges.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Westonia	Chiddarcooping	Nature Res.	5	1985; not relocated 7.11.90
2	Merredin	Westonia	Chutawalakin Hill	Private	1	Good 26.9.90
3	Merredin	Mukinbudin	Mukinbudin south	Road Res.	1	14.9.89
4	Merredin	Westonia	Warrachuppin south	Road Res.	2	5 healthy plants 3.11.84; 27.10.89
5	Merredin	Westonia	Chutawalakin Hill	Road Res.	2	Good 27.10.89
6	Merredin	Westonia	Warralakin north	Road Res./Private	30	Good but 2 dead 1.2.91

RESPONSE TO DISTURBANCE

Like most *Eremophila* spp. this is probably a disturbance opportunist although it still appears to be declining on some disturbed road verge sites (population 4). Fire response is not known. Grazing impacts are also not known, however, rabbits are a potential threat.

SUMMARY AND RECOMMENDATIONS

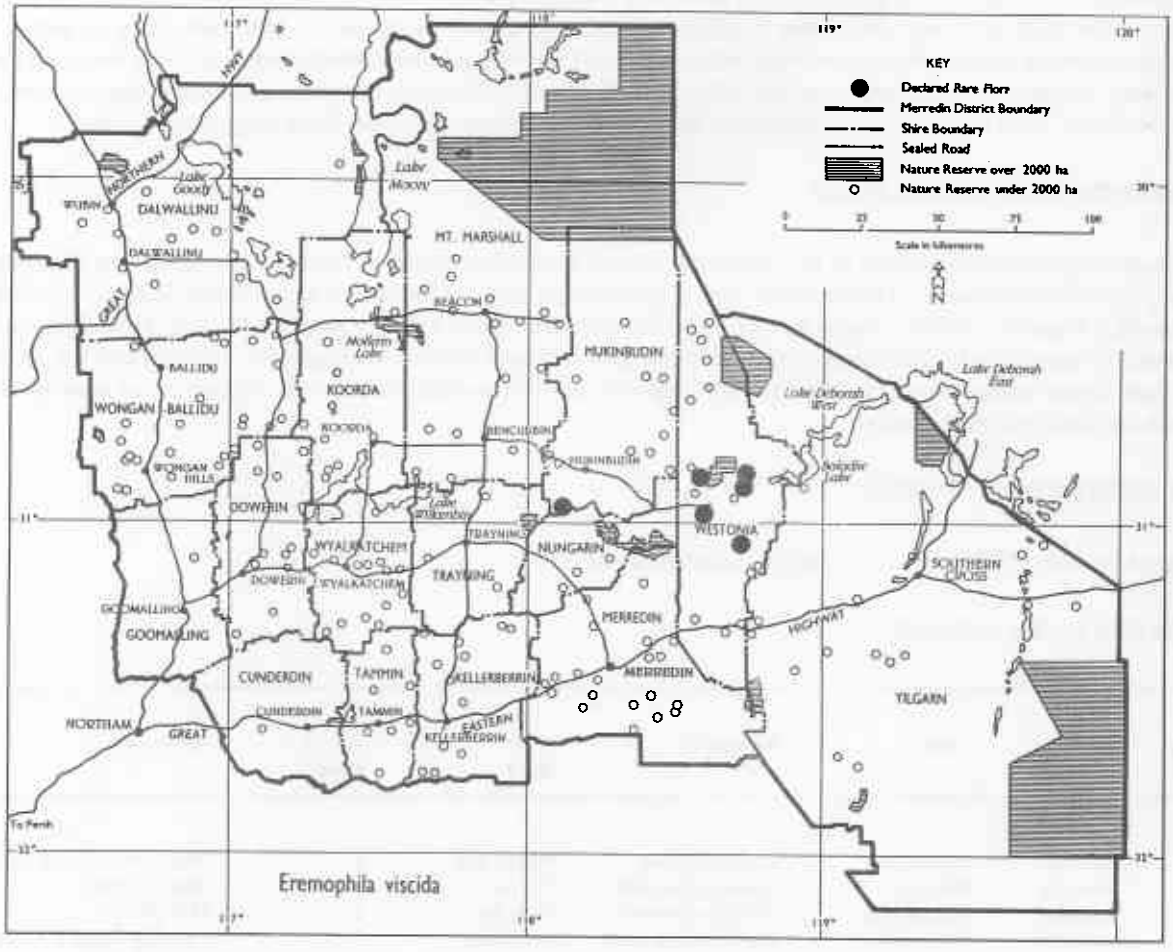
E. viscida is an extremely rare species with only 41 plants from six populations currently known. Only one population occurs on a nature reserve with the other five under direct threat from roadworks or grazing. Over the past ten years this distinctive tall shrub has been extensively searched for in the Chiddarcooping area. Nevertheless, there are still

substantial areas of uncleared land throughout its range which may contain additional, isolated populations. Surveys for the previously recorded population(s) in CALM's Greenough and Kalgoolie Regions are urgently required.

Research on recruitment response following disturbance and seed viability is urgently needed. Monitoring of all populations should be carried out on a regular basis.

REFERENCE

Hopper *et al.* (1990).



EUCALYPTUS BREVIPES Brooker **Family: Myrtaceae**

Mukinbudin Mallee

TAXONOMY

E. brevipes has affinities with *E. gracilis* but differs in having erect adult leaves and shorter peduncles. It was first described in 1986, and first collected in 1979.

DESCRIPTION

A mallee to 5 m tall. Bark rough, firm, grey-brown on stems. Smooth juvenile leaves shortly, obscurely petiolate, alternating, linear to narrow-lanceolate, to 8 x 1.5 cm, light green. Adult leaves petiolate, alternating, linear to narrow-lanceolate, held somewhat stiffly erect, to 10 x 0.8 cm, concolorous, slightly glossy, maturing very glossy, green. Inflorescences axillary, unbranched, 7-flowered; flowers white. Fruit shortly pedicellate, barrel-shaped to cupular, 0.5-0.7 x 0.5-0.5 cm; rim thin; disc descending, whitish; valves with longitudinal grooves but surface smooth. Flowers July to September.

DISTRIBUTION AND HABITAT

This species is known from a geographic range of 37 km from north of Mukinbudin to north-east of Chiddarcooping Rock. Soils range from pale red brown loams to white sand and quartzite outcrop, with vegetation of *Eucalyptus loxophleba* open shrub mallee over open low scrub with *Acacia acuminata*.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Mukinbudin	Cunderdin Hill	Nature Res.	204	Healthy 22.6.88
2	Merredin	Westonia	Echo Valley Road	Road Res.	18	Healthy 30.10.89
3	Merredin	Mukinbudin	Barbalin North	Private	1+	Healthy 5.9.90

RESPONSE TO DISTURBANCE

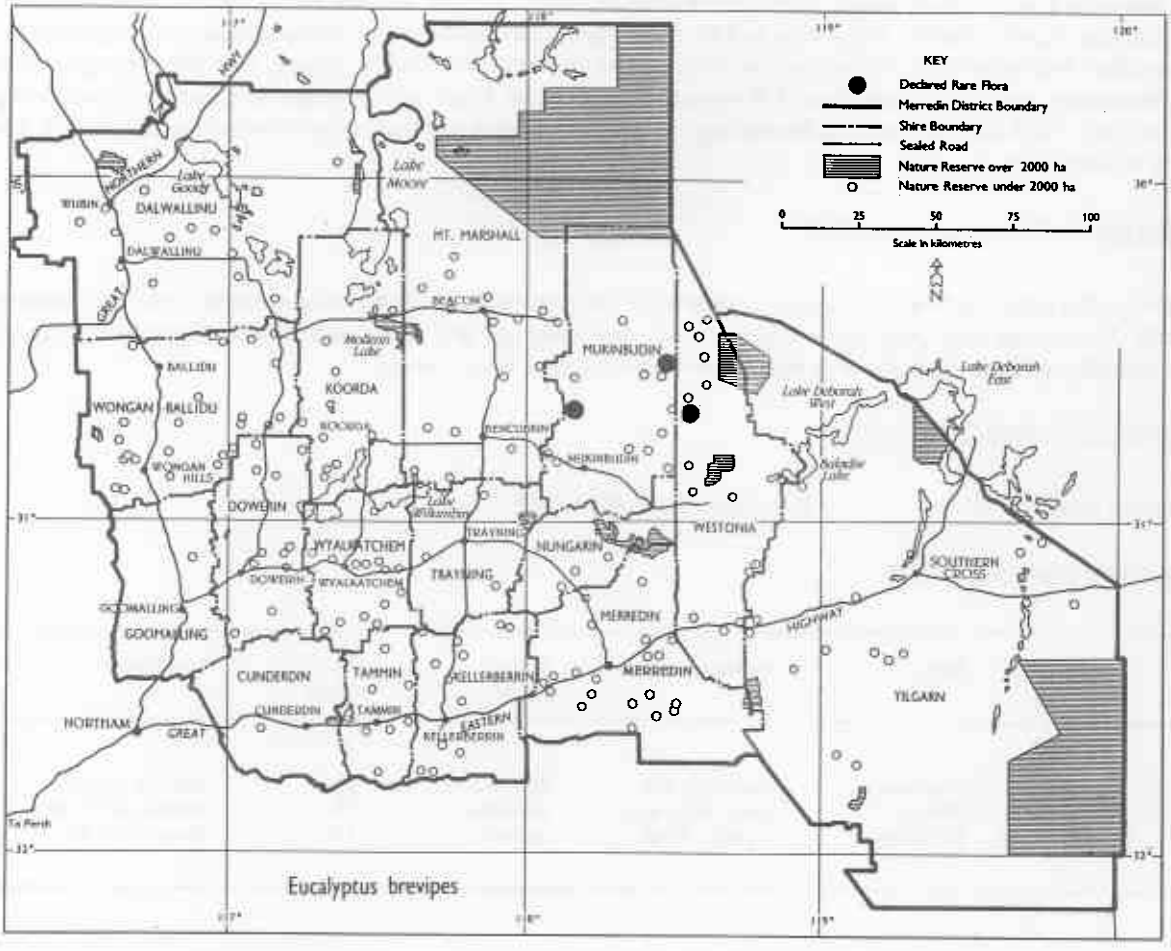
Probably re-sprouts from a lignotuber after fire although the time of year and severity of a fire will determine its impact. Weed invasion and grazing are likely to affect the level of recruitment into populations. Both populations 1 and 2 had some seedlings in June 1988.

SUMMARY AND RECOMMENDATIONS

District staff found *E. brevipes* difficult to distinguish from *E. kochii* subsp. *plenissima* during a survey of population 1 in 1990. Detailed re-survey of this large population is required. Additional surveys are needed to locate more populations, particularly on private property.

REFERENCES

Brooker (1986); Brooker and Kleinig (1990); Hopper *et al.* (1990).


KEY
Declared Rare Flora
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
Eucalyptus brevipes
DALWALLINU
MT. MARSHALL
MUKINBUDIN
KOORDA
WONGAN
BALLIDU
DOWERIN
WYALKATCHEM
TRAYNING
HUNGARIN
WESTONIA
GOOMALLING
CUNDERDIN
TAMMIN
KELLERBERRIN
MERREDIN
YILGARN
NORTHAM
SOUTHERN CROSS
Lake Deborah East
Lake Deborah West
Lake Moon
Lake Goody
Medcalf Lake
Lake Brown
Lake Bungulla
Bullaring Lake
Lake Williams
Lake Yealering
Lake Dulbelling
Lake Campion
Lake Minigin
Lake Wyalkatchem
Lake Minnivale
Lake Tammin
Lake Kellerberrin
Lake Muir
Lake Unicup
Lake Magenta
Lake Gnarlbine
Lake Cronin
Lake Ewlyamartup
Lake Dumbleyung
Lake Toolibin
Lake Bryde
Lake Pingrup
Lake Gilmore
Lake Varley
Lake Grace
Lake Hinds
Lake Ballard
Lake Lefroy
Lake Cowan
Lake Johnston
Lake Hannan
Lake Carlaminda
Lake Cronin
Lake Dumbleyung
Lake Toolibin
Lake Bryde
Lake Pingrup
Lake Gilmore
Lake Varley
Lake Grace
Lake Hinds
Lake Ballard
Lake Lefroy
Lake Cowan
Lake Johnston
Lake Hannan
Lake Carlaminda

EUCALYPTUS CRUCIS Maiden subsp. *CRUCIS* **Family: Myrtaceae**

Southern Cross Silver Mallee

TAXONOMY

This taxon is one of the eucalypts which possess red-brown crispate (Minni Ritchi) bark. However, the diagnostic feature of this subspecies is the more or less sessile-ovate to orbicular juvenile leaves. In *E. crucis* subsp. *crucis*, juvenile leaves are retained on the adult plant. In *E. crucis* subsp. *lanceolata*, these juvenile leaves are lost with the mature plant possessing lanceolate leaves.

DESCRIPTION

A sprawling mallee or small tree to 6 m (branches often resting on ground). Bark at base, rough, flaky, thick, dark grey, Minni Ritchi (red-brown, crisped) bark above. Branchlets, buds and fruit glaucous. Juvenile leaves sessile, opposite for an indefinite number of pairs, ovate to orbicular, apiculate, 2.5-4 x 1.7-5 cm. Stalkless, silvery grey ovate juvenile leaves retained on the mature plant, shortly petiolate. Inflorescence axillary, unbranched, 7-flowered; flowers white. Fruit pedicellate, hemispherical, 0.7-0.9 x 1.1-1.6 cm; rim thick; disc broad, level to slightly ascending; valves 4(5), exserted. Seed grey, compressed-ovoid, with shallow reticulum. Flowers December to March.

DISTRIBUTION AND HABITAT

E. crucis subsp. *crucis* grows in shallow, granite sand loam soil associated with *Allocasuarina*, *Acacia* and *Calothamnus* on granite rocks in the north-east wheatbelt. It is restricted to an area between Moorine Rock, Burracoppin and Warralakin over a geographic range of around 65 km. There is one early herbarium record (1929) from 80 km west of Ora Banda which suggests a previous range of over 200 km.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Merredin	Burracoppin	Private	12	8 in 1981; 1.3.88
2	Merredin	Yilgarn	Noongar North	Water Res.	3	Est. 10 in 1981; 2.3.88
3	Merredin	Yilgarn	Keokanie Rock	Private	27	5 in 1981; 2.3.88
4	Merredin	Westonia	Bacon Hill	Private	87	Est. 300 in 1981; 2.3.88
5	Merredin	Yilgarn	Moorine Rock	Water Res.	30	Est. 50 in 1981; 2.3.88
6	Merredin	Westonia	Sandford Rock	Nature Res.	76	<200 in 1981; 1.3.88
7	Merredin	Westonia	Warren Double Cunyan	Private	5	6 to 8 - 1981

RESPONSE TO DISTURBANCE

Sampson *et al.* (1988) suggest that increased recreation on granite outcrops and exploitation for ornamental use may be having a detrimental affect on some populations. Already at Sandford Rocks, a major local recreation site, much of the annual seed production is illegally harvested. Machinery damage associated with a water pipeline has occurred in population 6. The species is both drought and frost resistant. Effects of site disturbance, fire, weed invasion and grazing are unknown.

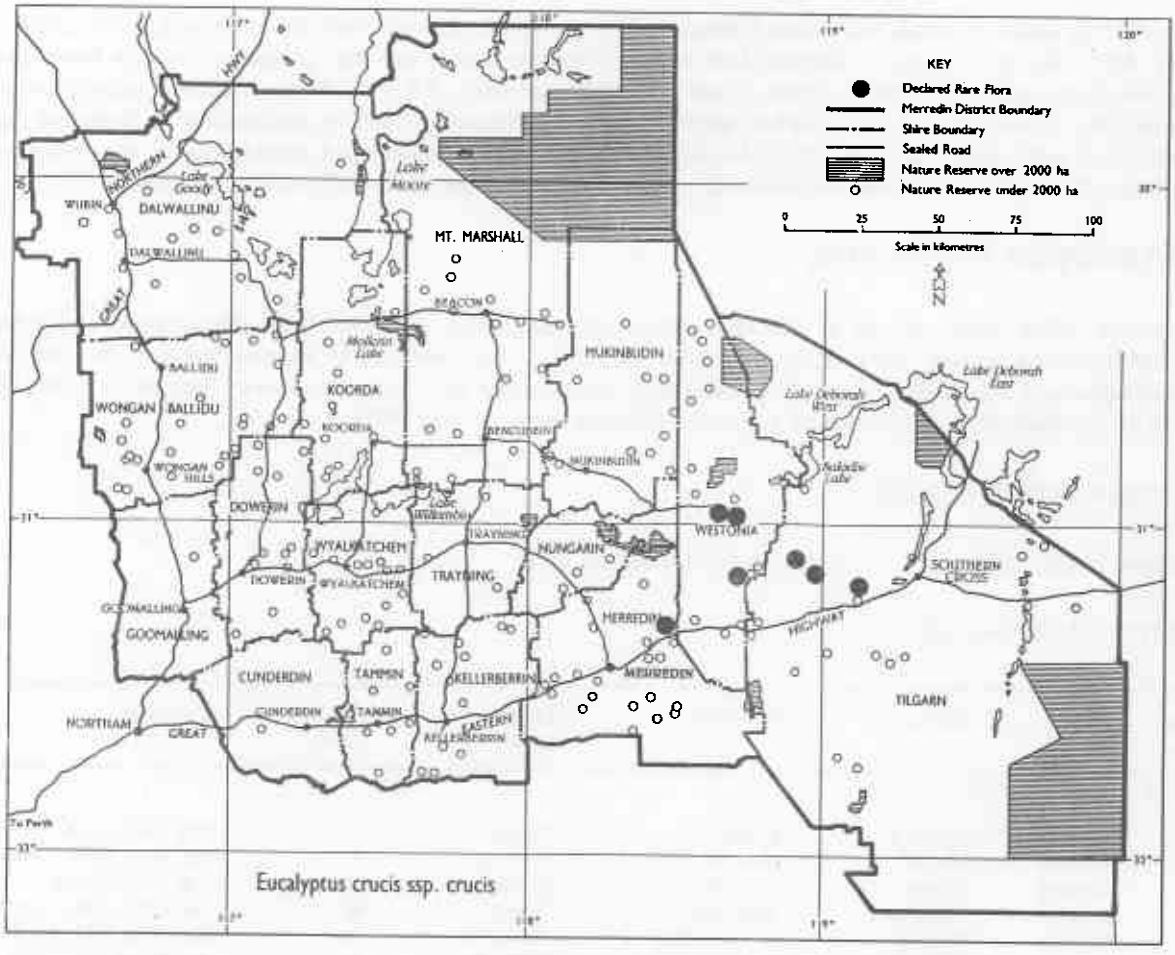
SUMMARY AND RECOMMENDATIONS

This species is known from seven populations totalling two hundred and fifty individuals and has been extensively surveyed and researched (Sampson *et al.* 1988). The impact of recreation on granite rocks in the vicinity of *E. crucis*

subsp. *crucis* populations needs to be assessed and appropriate management action taken. Known populations need to be mapped in detail and fencing may be required on private land. Further surveys for new populations are required and the Ora Banda record should be investigated.

REFERENCES

Sampson *et al.* 1988; Brooker and Kleinig (1990); Hopper *et al.* (1990).



EUCALYPTUS SYNANDRA M.D. Crisp **Family: Myrtaceae**

Jingymia Mallee

TAXONOMY

E. synandra has affinities with *E. beardiana* and *E. leptopoda* but differs from the former in the juvenile leaf colour and shape of fruits, and the latter in the length of both bud caps and capsule, and also in the degree of fusion of the stamens. Previously regarded as a subspecies, this taxon is in fact a species in the strict sense.

DESCRIPTION

An open sprawling mallee to 6 m with pendulous branches. Bark smooth, grey or red over powdery white. Juvenile leaves shortly petiolate, opposite for few pairs, then alternating, linear to lanceolate, to 9 x 1.5 cm, dull, grey-green. Adult leaves petiolate, alternating, linear to narrow-lanceolate, more or less erect, or pendulous, 7-20 x 0.3-1.6 cm, concolorous, dull, light green. Inflorescences axillary, unbranched, 7-flowered; pedicellate, yellow or red, 1.1 -1.6 x 0.5-0.8 cm, flowers creamy, maturing pink. Fruit pedicellate, hemispherical (excluding the disc), 0.3-0.5 x 0.8-1.4 cm; rim thick; disc broad, steeply ascending; valves 4 or 5, exserted. Seed brown, compressed-ovoid or D-shaped, with very shallow reticulum. Flowers December to March.

DISTRIBUTION AND HABITAT

This species grows in open mallee heath or in dense scrub on sand over laterite in the northern wheatbelt; a different species, previously considered a subspecies of this taxon, occurs in the Great Victorian Desert. Scattered populations occur from north of Morowa to north of Wialki over a geographic range of 300 km. There is an unconfirmed report from the east side of Lake Moore and an old herbarium record from Mt Gibson. Population 1 is associated with DRF *Boronia adamsiana*.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Mt Marshall	Emu Fence N of Wialki	Private Road/ Nature Res.	230	Good 17.9.90
2	Merredin	Koorda	Jingymia	Road Res./Private	30-50	Good 16.2.83
3	Merredin	Mt Marshall	Karroun Hill	Nature Res.	11	Good 6.9.89
4	Geraldton	Morawa	Sth Gutha	Road Res./Private	30	Healthy 20.6.88
5	Geraldton	Morawa	NE Gutha	Road/Water Res./ Private	213+	Healthy 10.6.88

RESPONSE TO DISTURBANCE

No plants have regenerated in Karroun Hill Nature Reserve north of population 1 after a fire burnt the area, suggesting the species may be fire sensitive. Soil disturbance, weed invasion and grazing are likely to affect recruitment.

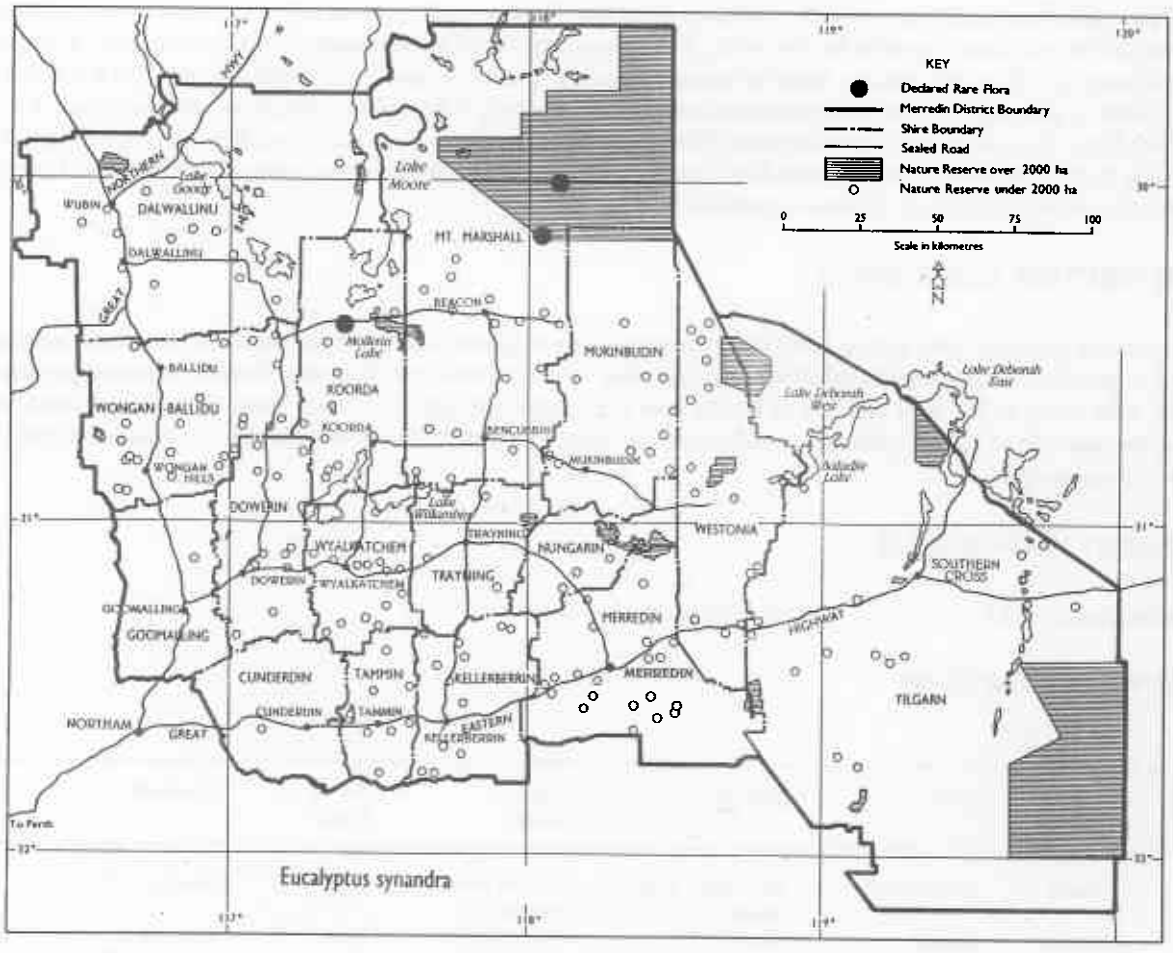
SUMMARY AND RECOMMENDATIONS

The north Wialki population has recently been fenced and protected under the 1990/91 Remnant Vegetation Protection Scheme. Fencing of other private property populations may be required. Further surveys are warranted and the Lake Moore record requires confirmation. Fire exclusion may be important. The species is in propagation at King's Park

and is likely to have value as an ornamental species. Populations should be monitored on a regular basis for illegal seed collection.

REFERENCES

Brooker and Kleinig (1990); Hopper *et al.* (1990).



GASTROLOBIUM CALLISTACHYS Meissner **Family: Papilionaceae**

Rock Poison

TAXONOMY

This highly toxic species is the only *Gastrolobium* which does not possess regular opposite or whorled leaves. The name 'callistachys' literally means beautiful spike, referring to its very attractive flowers.

DESCRIPTION

A shrub from 1-3 m tall with erect branches. The leaves are narrow, usually erect, 5 cm long, 1-3 mm broad, blunt or notched at the tip with a very small, fine point, tapering at the base into a short stalk. Stipules are small or absent or falling off very early. The flowers are yellow streaked with red, irregularly arranged in terminal, erect, rigid racemes 15 - 22 cm long. The leaves are alternate and separated by leafless areas rather than whorled, although sometimes they are grouped in loose clusters so as to appear whorled. Other species of *Gastrolobium* with similar long, narrow leaves either have strictly whorled leaves or shorter inflorescences. The pod is egg-shaped and bluntly pointed. Flowering period is September to November.

DISTRIBUTION AND HABITAT

G. callistachys occurs as small populations in granite sands usually at the base of granite rocks. Found in open woodland associated with *Eucalyptus wandoo*, *Allocasuarina* spp., *Melaleuca radula* over shrubland of mixed species including *Leptospermum*, *Beyeria* and *Grevillea* species (Sampson and Hopper 1990) it has a known range of 225 km from north-east of Watheroo to south of Kellerberrin. Sampson and Hopper (1990), record herbarium specimens from at least fifteen localities, although only three populations were relocated during their survey.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Kellerberrin	Mt Caroline	Nature Res.	10	Good, 3 sub-popns 4.10.90
2	Merredin	Wongan-Ballidu	ENE Kalguddering	Road Res.	Est. 20	28.11.89
3	Moora	Moora	NE of Watheroo	Private	10-20	14.8.89

RESPONSES TO DISTURBANCE

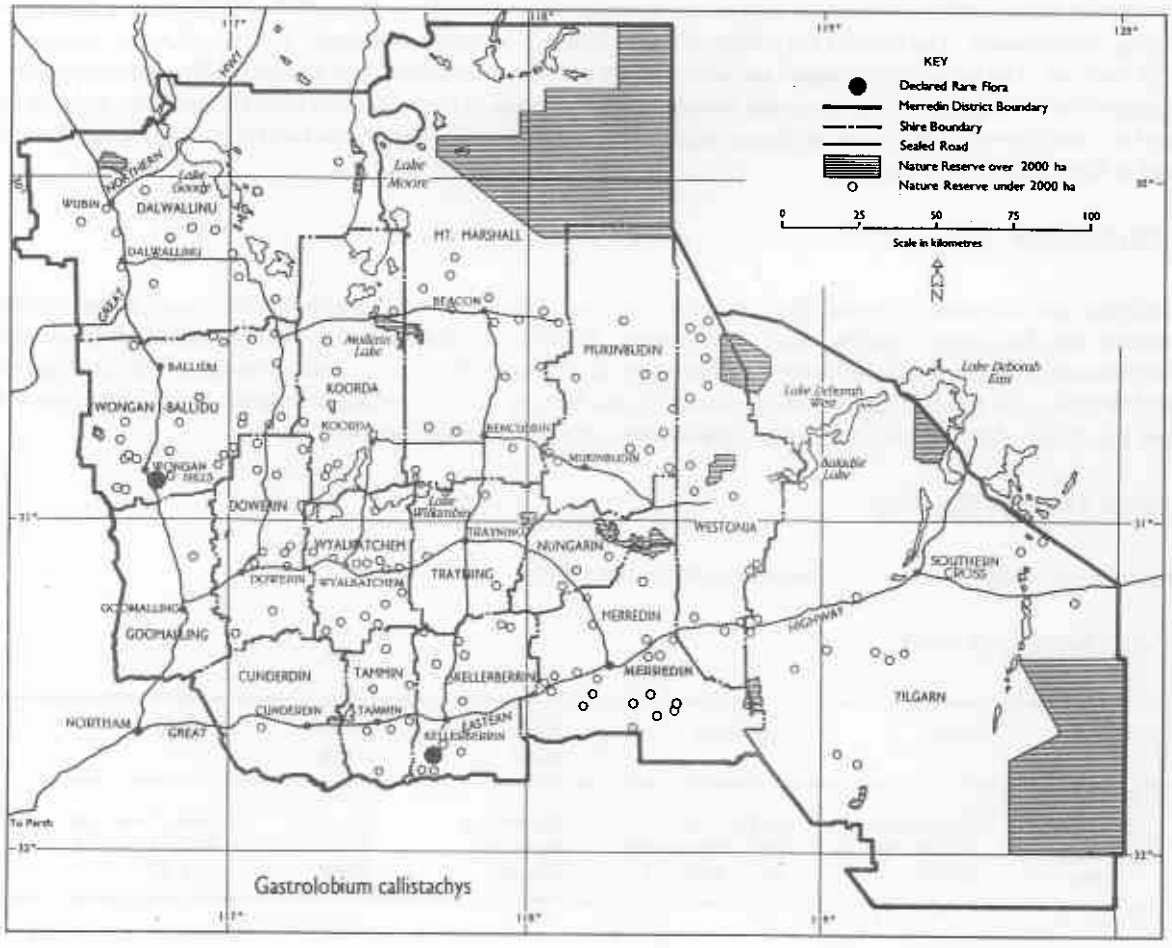
Responses to fire, soil disturbance, weed invasion, and canopy cover are not known (Sampson and Hopper 1990).

SUMMARY AND RECOMMENDATIONS

The species has been subject to physical removal and burning by landholders because of its toxicity to domestic stock. Many herbarium records are now thought to relate to populations which no longer exist. Sampson and Hopper (1990) recommend further surveys of suitable habitat; research into fire effects; installation of roadside markers at population 2; and possible acquisition of private property locations. A systematic survey of past known locations and potential new locations should occur. A more complete survey of population 3 is warranted to establish the exact number of plants, and fencing may be required. Propagation should be a priority so a secure number of plants can be established in cultivation in case circumstances change for the wild populations. Some seed collection has been carried out for this purpose and stored at King's Park and the CALM seed store.

REFERENCES

Gardner and Bennetts (1956); Sampson and Hopper (1990).



GREVILLEA DRYANDROIDES C.A.Gardner **Family: Proteaceae**

Phalanx Grevillea

TAXONOMY

A diagnostic feature of this species is the long, prostrate flower stalk. It has affinities with *G. thyrsoides*.

DESCRIPTION

A prostrate shrub to 20 cm high and 1 m diameter, with scattered erect stems bearing erect leaves. Leaves up to *ca* 12 cm long, deeply divided into numerous narrow segments, each up to 1.5 cm long. Leaf segments have fine short hairs and end in a short dark point. Leaf margins curled under towards the central prominent vein. Flowers very numerous, borne along the upper sides of prostrate stems. Each flower shortly stalked, red, hairy, *ca* 2 cm long including the long style. The style terminates in a striate cone. Fruit hairy, *ca* 1 cm long. Flowering period September-October, February-March.

DISTRIBUTION AND HABITAT

Grey sandy loam or yellow gravelly sand with shrubland of *Allocasuarina* and *Melaleuca* is the preferred habitat with the species also occurring in scrub heath. It occurs from Ballidu to Durokoppin and south to Lake Mears and Corrigin, a geographic range of 200 km.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Wongan-Ballidu	Cadoux Nth	Road Res./Rail Res.	200+	Many deaths 20.8.80; 21.2.90
2	Merredin	Wongan-Ballidu	Ballidu South	Road Res.	27	27 on 20.8.80 (17 dead)
3	Merredin	Wongan-Ballidu	Ballidu West	Road Res.	36	36 on 1.10.80 (33 dead)
4	Merredin	Wongan-Ballidu	Ballidu North	Road Res./Rail Res.	16	21.8.89
5	Merredin	Wongan-Ballidu	Ballidu South	Golf Course	2	4.11.85
6	Merredin	Dowerin	Hindmarsh	Nature Res.	40+	100+ 1.6.86 (40+ 13.3.84)
7	Merredin	Kellerberrin	Durokoppin	Nature Res.	40+	2 sub-popns 100 m apart 6.11.85
8	Narrogin	Quairading	Lake Mears	Road Res.	*ca* 100	Healthy with a few atypical plants 29.5.87
9	Narrogin	Corrigin	Corrigin	Shire Res.	100-150	Healthy, but 20% dead 12.8.88

RESPONSE TO DISTURBANCE

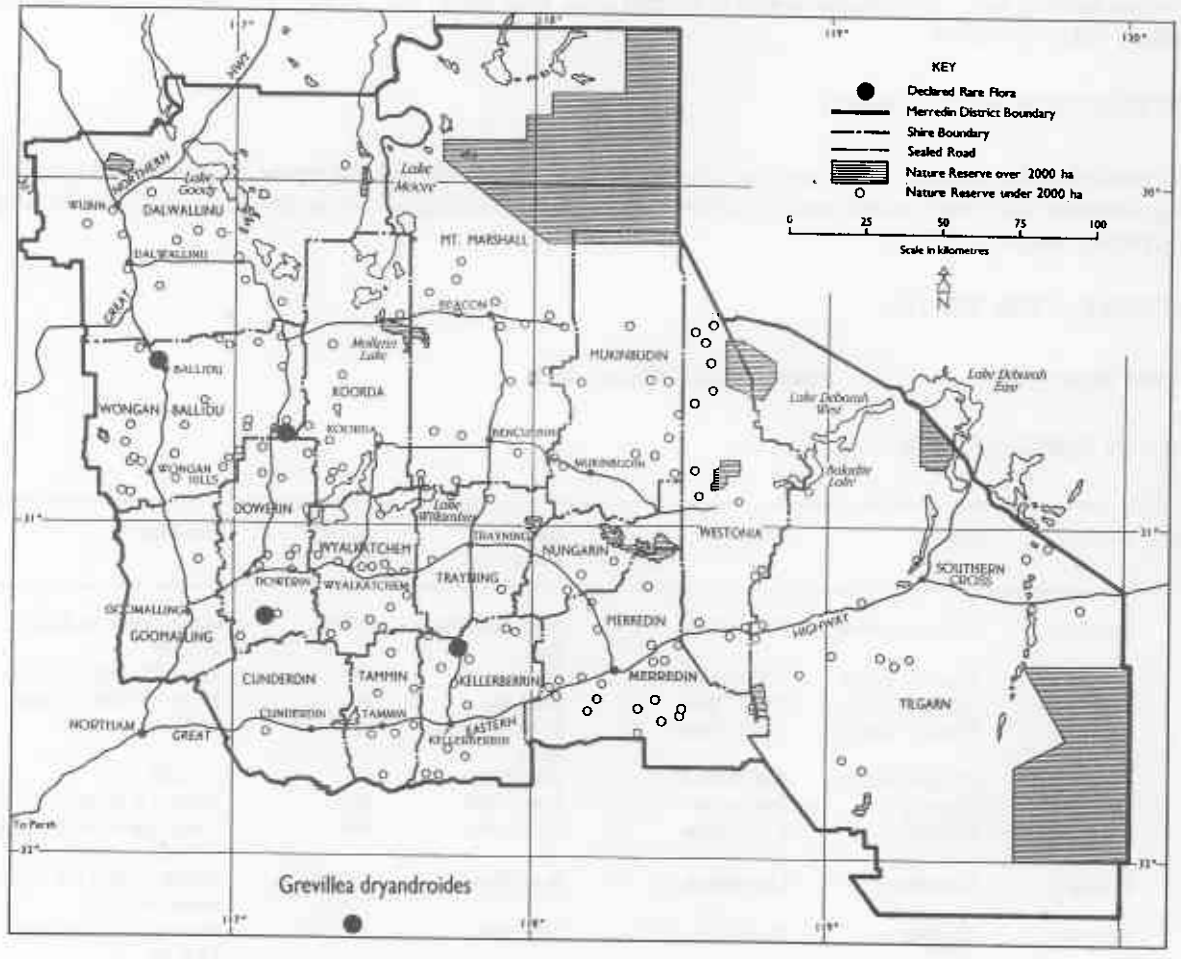
The species has a lignotuber up to 4 cm underground from which it can resprout following disturbance such as fire. Dr R. Hobbs (CSIRO) found that after a hot burn a population of *G. dryandroides* regenerated rapidly from existing root stocks, and approximately 95 per cent of individuals survived the fire. Vegetative growth and flowering performance increased following the fire. It appears on some sites to be a disturbance opportunist, with the largest populations occurring on rail and road verges. Weeds are reported to be a problem on one site. Grazing effects are unknown.

SUMMARY AND RECOMMENDATIONS

G. dryandroides is an attractive species, easy to propagate from cuttings and is hardy in cultivation. New populations have been found as recently as 1987 and surveys for additional populations should continue. Active management by site manipulation may be warranted for road verge populations.

REFERENCES

Leigh *et al.* (1984); Hopper *et al.* (1990).



GREVILLEA PROSTRATA C.A.Gardner & A.S.George **Family: Proteaceae**

Pallarup Grevillea

TAXONOMY

G. prostrata has affinities with *G. crithmifolia*, but differs in its completely prostrate habit, pinnate leaves, smaller bracts and perianth and smooth fruit. *G. eryngioides* is commonly associated with *G. prostrata* in remnant populations.

DESCRIPTION

A prostrate shrub. Stems hirsute, becoming glabrous, not much-branched. Leaves 2-4.5 cm long, petiolate, pectinate. Flowers in short, dense racemes on terminal and lateral branchlets. Style curved, glabrous. Young fruit ovoid, almost sessile, sparsely glandular. Flowers August to October.

DISTRIBUTION AND HABITAT

G. prostrata occurs in white or yellow sand in low shrubland, heath, open scrub mallee and low scrub. The major occurrence of the species is in the Newdegate and Pallarup areas in Katanning District, where some 650 plants are known from twenty populations. Pallarup is the type locality. The only occurrence in the Merredin District is in Jilbadji Nature Reserve 160 km outside its previous known range.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS (Merredin District only)

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Yilgarn	Jilbadji	Nature Res.	15	Healthy, but 1 dead 31.8.90

RESPONSE TO DISTURBANCE

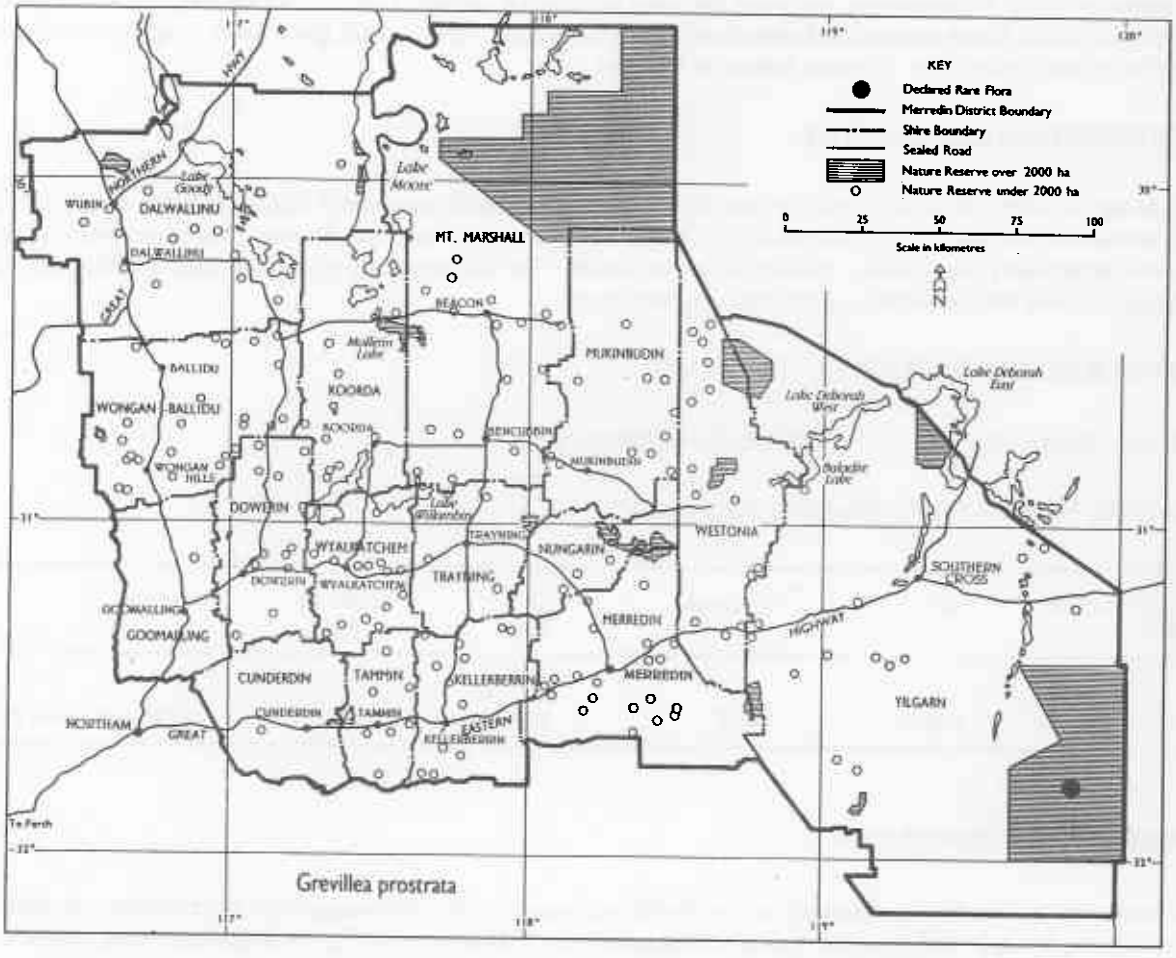
Some previously known populations have been lost through road works, and damage from wind erosion and water stress have also been implicated in the decline of other populations. This species is a typical disturbance opportunist usually occurring on road verges or fire breaks. Fire, weed invasion and grazing effects are unknown.

SUMMARY AND RECOMMENDATIONS

The recent discovery at Jilbadji has significantly increased its distribution and additional surveys in the area are required. With over twenty populations now known, and four of these in nature reserves, reassessment of its status is warranted.

REFERENCES

Gardner and George (1963); Hopper *et al.* (1990).


KEY
Declared Rare Flora
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
MT. MARSHALL
BEACON
MUKINBUDIN
KOORDA
BENCUBBIN
WONGAN HILLS
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
TRATHING
MERREDIN
GOOMALLING
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
NORTHAM
GREAT
SOUTHERN CROSS
YILGARN
HIGHWAY
To Perth
Grevillea prostrata

HAKEA ACULEATA A.S.George **Family: Proteaceae**

Column Hakea

TAXONOMY

H. aculeata has close affinities with *H. ruscifolia*, with the latter having shorter leaves and style, smaller fruit and a different flowering period.

DESCRIPTION

A shrub up to 3 m tall with a lignotuber and several upright stems. Branchlets numerous, spreading, mostly 1-5 cm long, making the branches look like dense columns. Leaves scattered but more crowded towards the ends of branchlets, up to 4 cm long and 0.8 cm wide, ending in a sharp brown point, shortly stalked or stalkless, initially hairy. Flowers yellow, strongly-scented, directly attached along a short stalk (*ca* 0.2 cm long) bearing 15-22 flowers. Ovary red, style red at tip, yellow below. Fruits pale brown. Flowering period is September to October.

DISTRIBUTION AND HABITAT

Collected from near Hines Hill in 1929, this species is now known over a geographic range of 80 km in the area south of Meckering, and Tammin to west of Quairading and north-east of Brookton. In several populations it occurs with *Eucalyptus macrocarpa* and *Dryandra* spp. in scrub and tall shrubland on pale sandy loam soil, otherwise it occurs on weed-choked road verges.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Tammin	Tammin Rd	Road Res.	2	3 in 1982; weeds 28.8.90
2	Merredin	Tammin	Rogers Rd	Road Res.	118	Est. 150 in 1982; rabbits 28.8.90
3	Merredin	Tammin	Rabbit Rd - a	Road Res.	2	2 in 1982; disturbed 28.8.90
4	Merredin	Tammin	Rabbit Rd - b	Road Res.	31	31 in 1982; 2 dead 28.8.90
5	Merredin	Quairading	Rabbit Rd - c	Road Res.	25	25 in 1982; 1 dead 28.8.90
6	Merredin	Cunderdin	Doodenanning Rd	Road Res.	7	7 in 1982; 4 dead 28.8.90 (herbicide)
7	Merredin	Cunderdin	Green Rd	Road Res.	1	5 in 1982; 2 dead 28.8.90 (destruction)
8	Merredin	Cunderdin	Coleman Rd E	Private	41	48 + 3 dead in 1982; 4.9.90
9	Merredin	Cunderdin	Coleman Rd E	Private	1	10 in 1982; 4 dead 28.8.90
10	Merredin	Cunderdin	Moore Rd	Private	24	27 + 3 dead in 1982
11	Merredin	Cunderdin	Nth Hardy Rd	Road Res.	2	10.8.82
12	Merredin	Cunderdin	Sth Hardy Rd	Road Res.	2	10.8.82
13	Narrogin	Quairading	Maynard Rd	Road Res.	0 Extinct	3 in 1982
14	Narrogin	Quairading	Goldfields Rd	Road Res.	0 Extinct	7 in 1982
15	Merredin	Cunderdin	Mills Rd	Road Res.	18	31 + 2 dead in 1982; 5 dead 4.9.90
16	Merredin	Cunderdin	Sth Mill Rd	Road Res.	6	8 in 1982; 2 dead 4.9.90
17	Merredin	Cunderdin	Mills Rd	Private	31	1 dead 12.12.89
18	Narrogin	Brookton	NE Brookton	Private	182	Good 17.9.87
19	Narrogin	Quairading	Mawson	Private	89	Good 1990

RESPONSE TO DISTURBANCE

Eleven populations were re-surveyed in 1990 with 158 plants of the 197 previously recorded by Millar (1982) being relocated. Millar (1982) conducted detailed surveys of the sixteen then known populations. The numbers recorded

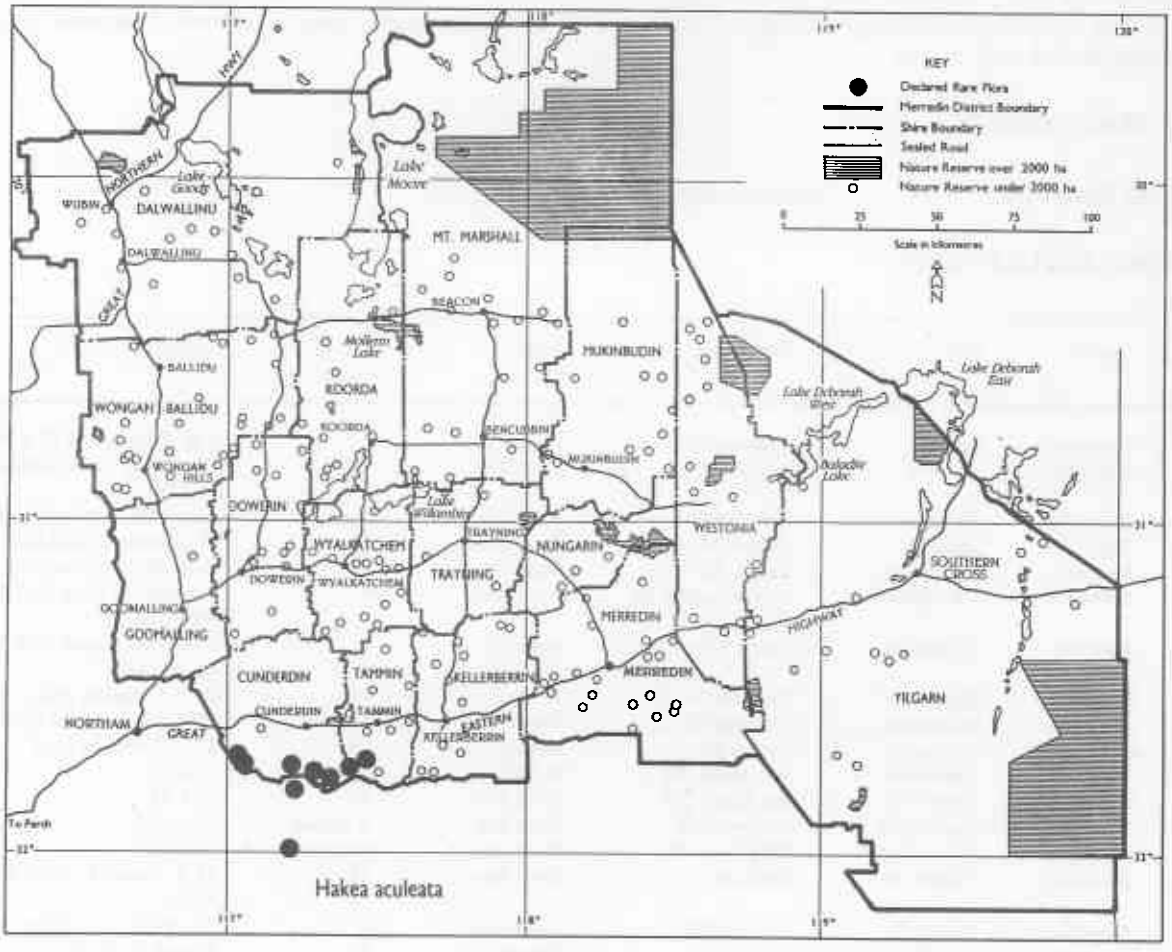
correspond to those used here. The species has a lignotuber so it is probably able to survive fire, but the common associations of abundant exotic weeds in most populations would seem to prevent recruitment. Indiscriminate herbicide use, direct physical disturbance and grazing have resulted in recent plant deaths.

SUMMARY AND RECOMMENDATIONS

Populations appear to have shown a gradual decline in numbers since 1982 with two now extinct. Senescence of older plants combined with no recruitment probably due to weed invasion would appear to be the major factor contributing to population decline. Three new larger populations have been located on private property since 1987. Re-survey of remaining populations and surveys for new populations is a priority. This species requires active management including chemical weed control and artificial propagation. Burning may be an option, but weed invasion would be a major post-fire problem. Cultivation of the species should be encouraged. George (1979) said that few seed were produced due to insect attack on follicles, which may account in part for the low recruitment rate.

REFERENCES

George (1979); Rye and Hopper (1981); Millar (1982); Leigh *et al.* (1984); Hopper *et al.* (1990).



HEMIGENIA VISCIDA S.Moore **Family: Lamiaceae**

Sticky Hemigenia

TAXONOMY

Hemigenia viscida is related to *H. pedunculata* with superficial similarities in leaf shape and habit, but is otherwise a distinctive species.

DESCRIPTION

H. viscida is an erect shrub up to 90 cm. Leaves tend to be bunched towards the apex of branches and stems, ovate to broad-ovate, nearly sessile. Stamen appendage bearded. Flowers solitary to 2 cm long, violet or purple. Flowering period November to January.

DISTRIBUTION AND HABITAT

The vegetation in which the species occurs is generally low heath on sand over laterite with a component of concretionary gravel in the soil. *H. viscida* occurs in the Wongan Hills area and 125 km south-east in and around the Charles Gardner Nature Reserve south of Tammin. Prior to its collection in the Charles Gardner Nature Reserve in December 1982 it had not been collected for 30 years. The type locality is Meenaar where it was collected by Stoward and described by Spencer Moore in 1920. The species is very hard to locate in the field as it flowers in summer and is often intertwined with branches of other shrubs. Found with DRF *Daviesia euphorbioides* in populations 2, 3 and 4, and with *Gastrolobium glaucum* at population 5.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Tammin	Charles Gardner	Nature Res.	64	4 sub-popns 27.8.90 OK
2	Merredin	Wongan-Ballidu	Wongan Hills-Elphin	Road Res.	9	10.1.89
3	Merredin	Wongan-Ballidu	Wongan Hills-Elphin	Nature Res.	11	10.1.89
4	Merredin	Wongan-Ballidu	Wongan Hills-Elphin	Rail Res.	26	10.1.89
5	Merredin	Wongan-Ballidu	N of Wongan Hills	Water Res.	5	12 in 1983; 25.10.89
6	Merredin	Tammin	Charles Gardner	Private	2	10.12.89

RESPONSE TO DISTURBANCE

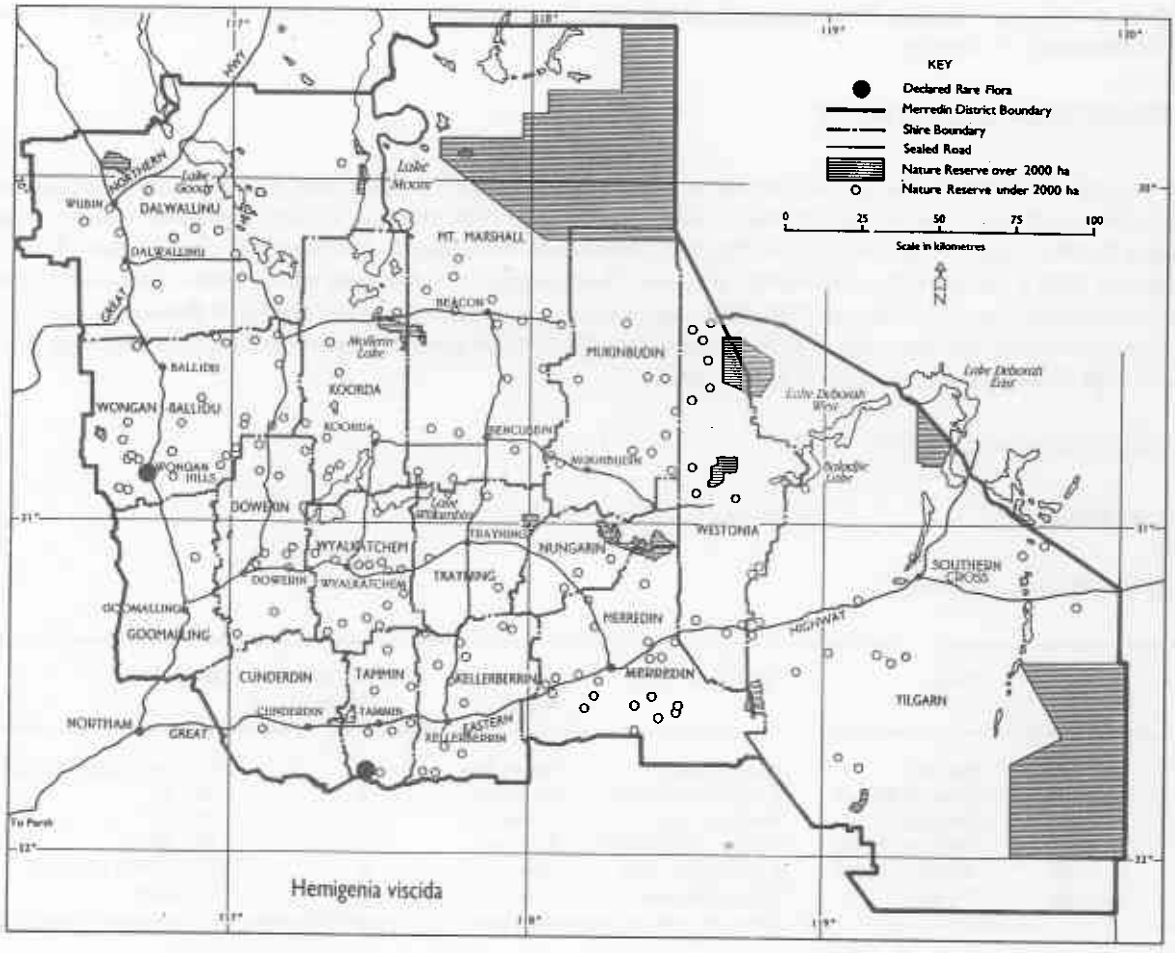
Responses to fire, weed invasion and grazing are not known. All Wongan Hills populations occur in areas cleared and left to regenerate. The decline in numbers in areas where there has been no fire for 25 years may indicate that fire is important for its long-term survival.

SUMMARY AND RECOMMENDATIONS

There has been a significant decline in numbers of plants recorded from populations 1 and 5 over the past eight years although the difficulty in locating the species in the thick heath vegetation may partly account for this. The preparation of detailed location plans for individual plants at Wongan Hills should assist subsequent surveys. Similar plans are required for the Charles Gardner Nature Reserve. Fire may be necessary to stimulate seed germination. Research into fire response and aspects of its reproductive biology are required.

REFERENCES

Moore (1920); Blackall and Grieve (1981); Coates (1990); Hopper *et al.* (1990).


KEY
Declared Rare Flora
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
Hemigenia viscida
DALWALLINU
MT. MARSHALL
BEACON
MUKINBUDIN
KOORDA
WONGAN HILLS
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
SOUTHERN CROSS
GOOMALLING
MERREDIN
CUNDERDIN
TAMMIN
KELLERBERRIN
TILGARN
NORTHAM
GREAT EASTERN HWY

MYRIOPHYLLUM PETRAEUM Orchard **Family: Haloragaceae**

Granite Myriophyllum

TAXONOMY

M. petraeum is a distinct species with no close relatives.

DESCRIPTION

Annual aquatic herb (5)15-30 cm tall; stems weak, 1-2 mm diameter, sparingly branched, mainly at the base. Leaves monomorphic, all alternate, linear to oblanceolate, 3-7 mm long, (0.4)0.8-0.9(2.5) mm wide (emergent leaves longer and broader than submerged ones), acute to obtuse, margins entire. Plants monoecious or dioecious. Inflorescence a simple spike with unisexual flowers borne singly in the axis of the upper leaves, male and female flowers on separate stems of same plant, or on different plants, or together on the same stem with male flowers above the female flowers. Female flowers 4-merous, sessile. Fruit sessile, yellow-brown to red-brown. Flowering begins in August and fruiting takes place from October to December.

DISTRIBUTION AND HABITAT

M. petraeum is restricted to ephemeral rock pools 10-30 cm deep on granite outcrops where it dries and collapses in summer and then re-establishes from seed with the next season's rainfall. It is endemic to southern W.A. from Southern Cross to east of Esperance, a geographical range of over 400 km. There are at least nine records from outside the Merredin District, which are not included here.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS (Merredin District only)

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Westonia	Bullaragin	Private	434	Disturbed 2.9.89
2	Merredin	Yilgarn	Nth Nulla Nulla	Private	315	Undisturbed 10.9.89
3	Merredin	Yilgarn	Split Rocks	VCL	80	Disturbed 17.10.90

RESPONSE TO DISTURBANCE

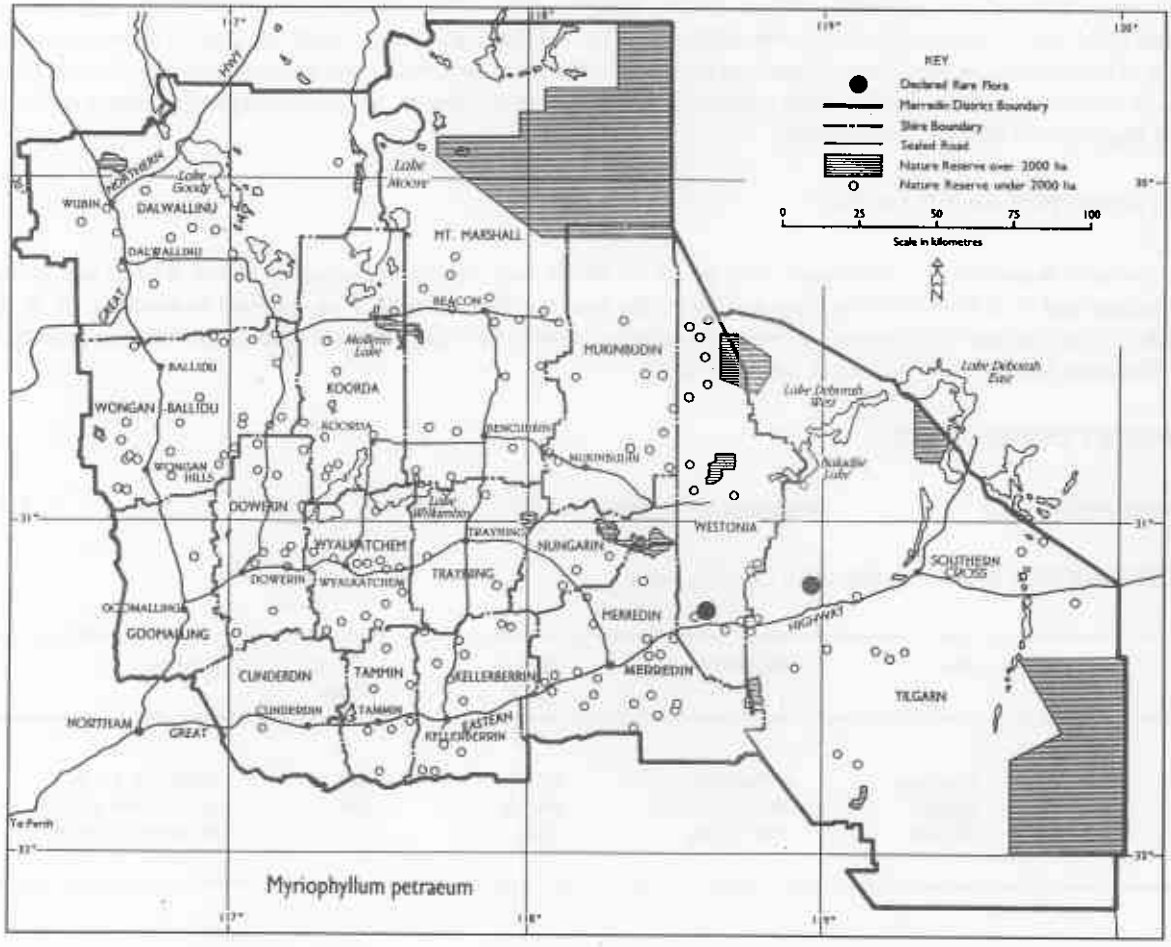
Response to grazing, site disturbance and aquatic weed invasion is unknown.

SUMMARY AND RECOMMENDATIONS

Populations may need to be protected from rabbits and goats, although this requires confirmation. Damage to its rock pool habitat by heavy machinery at the Split Rocks population needs to be investigated. Further survey to locate additional populations is required. Monitoring of known populations every 1-2 years will be necessary to document population dynamics during wet-dry cycles.

REFERENCES

Orchard (1985); Hopper *et al.* (1990).


KEY
Declared Rare Flora
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Lake Moore
MT. MARSHALL
BEACON
MUKINBUDIN
KOORDA
WONGAN - BALLIDU
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
TRATHING
MERREDIN
GOOMALLING
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
NORTHAM
GREAT
YILGARN
SOUTHERN CROSS
HIGHWAY
Lake Deborah East
Lake Deborah West
DALWALLINU
WUBIN
BALLIDU
WONGAN HILLS
To Perth
Myriophyllum petraeum

PITYRODIA SCABRA A.S.George **Family: Chloanthaceae**

TAXONOMY

P. scabra appears closest to *P. hemigenioides* (F.Muell.) Benth. However the coarse viscid indumentum gives it an entirely distinct appearance; further differences are the larger whorled leaves with somewhat bullate margins and the flowers in small cymes.

DESCRIPTION

Shrub to 1 m tall, with a viscid indumentum of branched hairs. Leaves in whorls of 3, 0.5-1.2 cm long, linear, obtuse, sessile; margins revolute, more or less crenulate so as to appear bullate, coarsely tomentose, becoming scabrous above. Flowers axillary, shortly cymose. Flowering period May to November.

DISTRIBUTION AND HABITAT

This species occurs only in the Cowcowing area where it was first collected in May 1958. It is found at a single site in disturbed vegetation on a road verge with a single plant (located in 1990) on adjacent private land.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS

Pop No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Wyalkatchem	Cowcowing	Road Res./Private	2	12 in 89; 1 new plant 8.12.90

RESPONSE TO DISTURBANCE

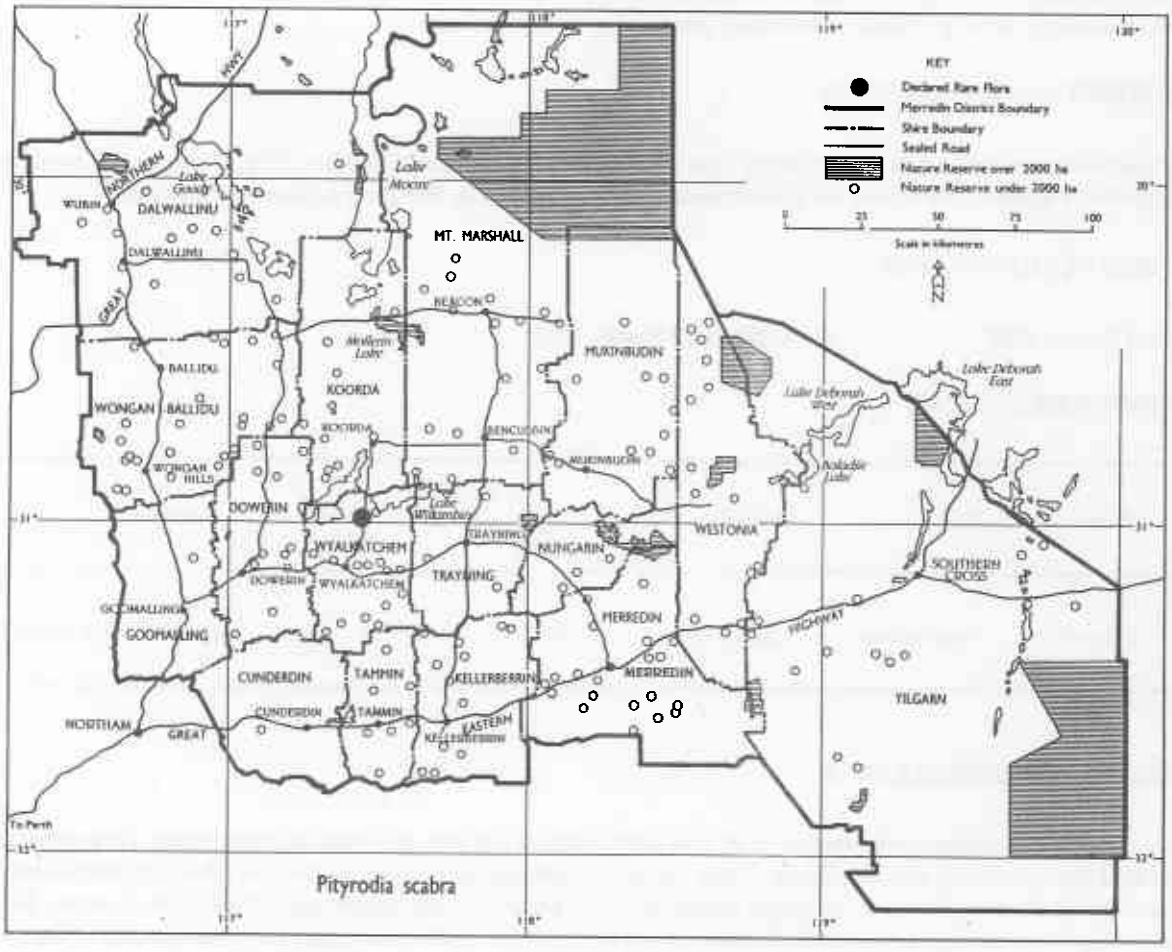
Many of the roadside plants regenerated on an area where topsoil was removed from the road verge. These plants have since died due to adverse site conditions. Other roadside plants appear to have established after disturbance but only one has survived in this habitat. The single private property plant has been fenced; movement of stock along the road reserve may cause damage to the roadside plant. Weed invasion is a problem and may have contributed to the decline of this species by preventing regeneration. Increasing salinity may also be a factor contributing to plant loss. Fire effects are unknown.

SUMMARY AND RECOMMENDATIONS

Cutting material and seed of *P. scabra* were collected from the five remaining plants during 1990. A few cuttings have been successfully propagated at Kings Park. The remaining plants will need to be closely monitored and protected. The establishment of a new population on a suitable site in this area needs careful consideration. Survey for new populations particularly on private property is imperative. Given the likely extinction of this population, propagation and germ plasm storage is of the highest priority for this species.

REFERENCES

George (1967); Muir (1979).


KEY
Declared Rare Flora
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
Scale in kilometres
MT. MARSHALL
DALWALLINU
WUBIN
WONGAN HILLS
WONGAN
BALLIDU
KOORDA
DOWERIN
WYALKATCHEM
TRAYNING
MUNGARIN
MUKINBUDIN
WESTONIA
MERREDIN
SOUTHERN CROSS
YILGARN
GOOMALLING
CUNDERDIN
TAMMIN
KELLERBERRIN
NORTHAM
GREAT EASTERN HIGHWAY
To Perth
Pityrodia scabra

PROSTANTHERA MAGNIFICA C.A.Gardner **Family: Lamiaceae**

Magnificent Prostanthera

TAXONOMY

The floral features of *P. magnifica* readily distinguish it from other species of *Prostanthera*, particularly the large purple calyx and its long tubular violet corolla. Climatic variation appears to result in variation in leaf size in this species.

DESCRIPTION

Slender to spreading erect shrub, 0.4-2.5 m high. Branches more or less terete, slightly flattened laterally and/or rigid, sparsely to moderately hairy, rarely glabrescent; hairs sometimes restricted to internodes between bases of leaves. Leaves green, very sparse, indumentum denser or restricted to petiole, midrib and margin; petiole 1-4 mm long; lamina elliptic to narrowly elliptic, sometimes narrowly ovate-obovate, 15-44 x 5-10 mm. Inflorescence a raceme 6-8-flowered. Calyx dark mauve to purple. Corolla 16-25 mm long, pale mauve (lilac), pale blue to pink, inner surface of tube and base of median lobe with dark purple spots. Fruiting calyx unchanged or slightly enlarged; seeds more or less cylindrical, *ca* 2.5 mm long, 1-1.5 mm wide. Flowering period is August to November.

DISTRIBUTION AND HABITAT

There were 23 recorded locations of *P. magnifica* in 1988 with a further three populations found in 1989, and one in 1990. Its range based on herbarium records is 500 km, and recent work suggests that this has not changed. *P. magnifica* occurs in small populations adjacent to granite outcrops and ironstone hills in red sand and sandy loam soils.

CONSERVATION STATUS

Current Status: DRF Recommended Status: P4

KNOWN POPULATIONS (Merredin District and Yilgarn Shire only)

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Mt Marshall	Mt Churchman	VCL	?	Herbarium specimen 16.10.66
2	Merredin	Mt Marshall	Karroun Hill	Nature Res.	25	Undisturbed 6.9.89
3	Kalgoolie	Yilgarn	Mt Jackson	VCL	20	Good 23.10.89
4	Kalgoolie	Yilgarn	Marda Tank Track	VCL	23	Undisturbed 20.10.90
5	Kalgoolie	Yilgarn	Mt Jackson East	VCL	26	Undisturbed 23.10.89
6	Merredin	Mukinbudin	Joverdine	Nature Res.	71	Good 14.9.90

RESPONSE TO DISTURBANCE

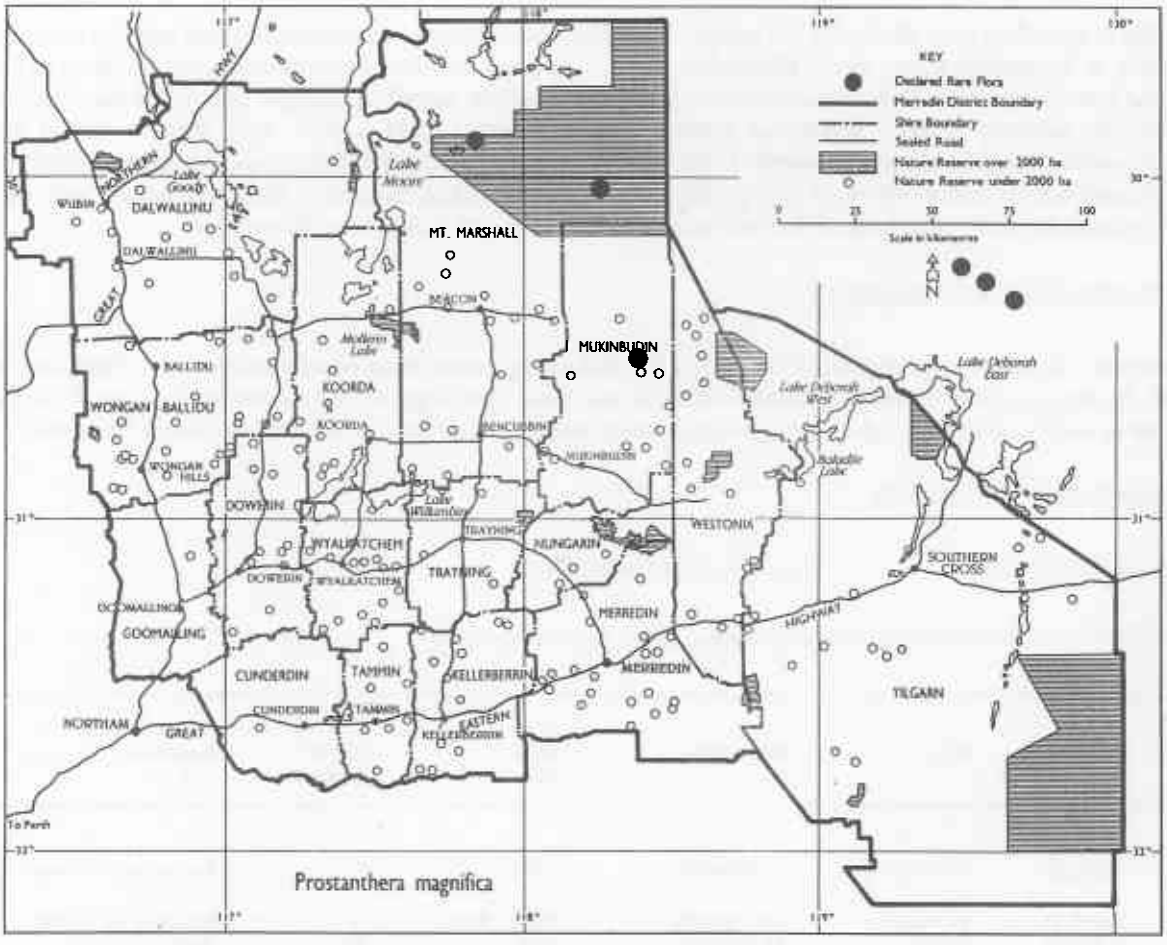
The species tends to occur in elevated situations away from general disturbance. Soil, fire and weed invasion affects are unknown. Some populations may have been affected where goats are prevalent e.g. Mt Churchman area or in town areas such as Mullewa where there are three recorded occurrences.

SUMMARY AND RECOMMENDATIONS

This species is relatively widely distributed and occurs in areas where there are still large tracts of undisturbed vegetation. It is recommended that its status as DRF be reviewed within the next two years with a view to placing it on Priority 4 list.

REFERENCES

Conn (1988); Hopper *et al.* (1990).



RHAGODIA ACICULARIS P.G.Wilson **Family: Chenopodiaceae**

TAXONOMY

This species is closely related to the more common species *Rhagodia ulicina*, which occurs widely in southern and south-eastern Australia. Some floral and seed characteristics of the two species differ, as well as the preferred habitat.

DESCRIPTION

Compact, intricately branched rounded shrub to 0.5 m high, scurfy due to a close covering of minute vesicular hairs which although collapsing, retain their circular shape with age, dioecious. Branchlets spinescent. Leaves alternate, small, somewhat fleshy, narrowly elliptic, 2-5 mm long. Flowers few, sessile, subtended by a minute bract. Male flowers broadly turbinate, *ca* 1 mm long. Female flowers spheroidal, *ca* 1.2 mm diameter. Terminal flower on female inflorescence sterile, densely filled with woolly hairs. Fruit baccate, depressed spherical, *ca* 3 mm diameter, pale red. Seed lenticular with rounded margin, 1.5 mm diameter, radially verruculose, black. Flowering period is October to May.

DISTRIBUTION AND HABITAT

R. acicularis is found in red soil on gravelly laterite slopes in *Eucalyptus* woodland. It occurs from Wongan Hills to south of Pithara and Wubin, over a geographical range of 80 km.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Wongan-Ballidu	Wongan Hills	Private	160+	Healthy 20.2.84
2	Merredin	Dalwallinu	Pithara	Road Res./ Water Res.	38	Undisturbed 25.5.88
3	Merredin	Dalwallinu	Wubin	?	1	Healthy 24.5.84
4	Moora	Moora	Ballidu West	Road Res.	?	21.2.90

RESPONSE TO DISTURBANCE

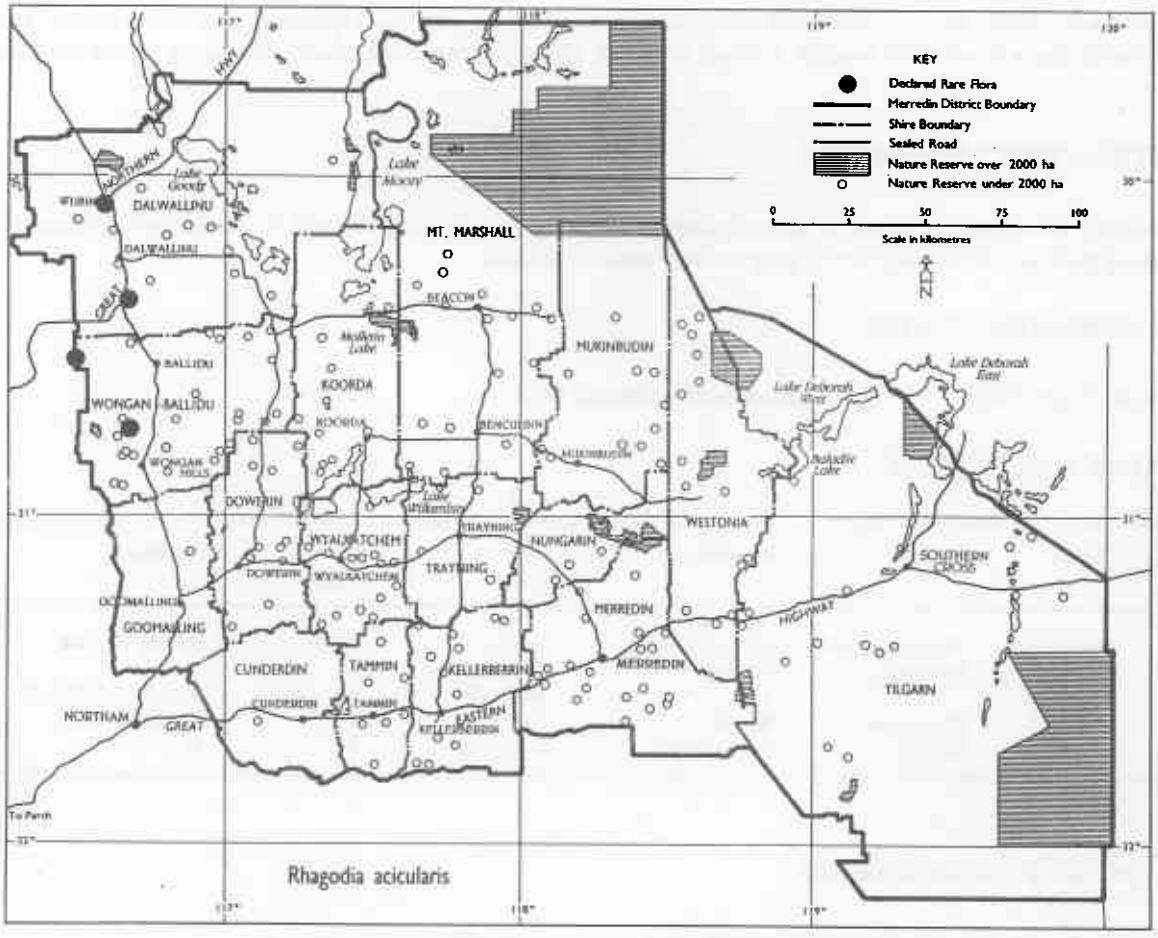
Soil disturbance, fire, weed invasion, grazing and canopy cover affects are unknown.

SUMMARY AND RECOMMENDATIONS

Further surveys are urgently required through the Wongan Hills and other areas and populations 1, 3 and 4 require re-survey. Low numbers suggest a limited habitat and/or poor regeneration. Research into its reproductive biology and recruitment patterns is needed. Fencing of the private property population may need to be considered.

REFERENCES

Wilson (1982); Hopper *et al.* (1990).


KEY
Declared Rare Flora
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
MT. MARSHALL
BEACON
MUKINBUDIN
KOORDA
BENCUBBIN
DOWERIN
WYALKATCHEM
TRAYNING
HUNTALIN
WESTONIA
MERREDIN
KELLERBERRIN
TAMMIN
CUNDERDIN
GOOMALLING
NORTHAM
YILGARN
Rhagodia acicularis

ROYCEA PYCNOPHYLLOIDES C.A.Gardner **Family: Chenopodiaceae**

Saltmat

TAXONOMY

This is a distinctive species with no close relatives.

DESCRIPTION

Much-branched mat-like subshrub with hairy, more or less parallel branchlets. Leaves are densely and spirally arranged and tightly overlapping, ovate-oblong or ovate, stalkless, about 2 mm long, more or less concave, bluish-grey in colour, the edges membranous and with very minute hairs. Flowers are green, small and inconspicuous, unisexual, borne either singly in the upper leaf axils or at the ends of the stems with the male and female flowers on separate plants. Fruit has not been seen. Flowering infrequent but mainly September and possibly through until February.

DISTRIBUTION AND HABITAT

The type locality is west of Cunderdin where it was collected in 1945 and 1973. In 1985 it was also discovered 240 km further south in the Pingrup area. *R. pycnophylloides* occurs in open sandy saline flats in dwarf scrub vegetation or in grey-brown claypan habitat as the dominant.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Cunderdin	Meckering East	Private	2	20 in 10.10.88; 8.10.90
2	Katanning	Kent	Pingrup	Nature Res.	2000+	Healthy 28.10.85

RESPONSE TO DISTURBANCE

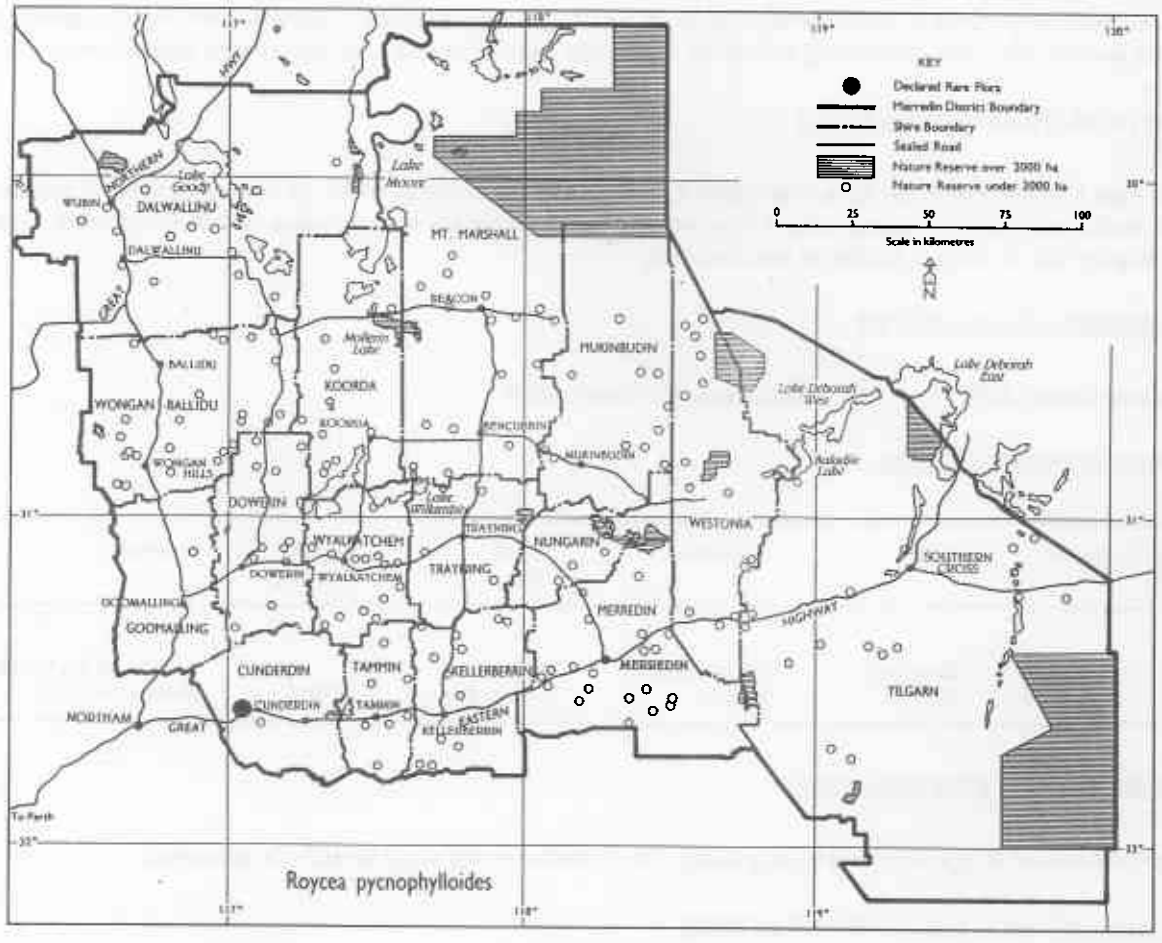
The response of *R. pycnophylloides* to grazing, site disturbance and weed invasion is unknown.

SUMMARY AND RECOMMENDATIONS

Ongoing monitoring of population 1 is required to determine the reasons for the apparent decline in numbers. More detailed surveys are required along the Mortlock River to locate additional populations. Fencing of the remaining plants at Meckering East is required.

REFERENCES

Gardner (1946); Leigh *et al.* (1984); Hopper *et al.* (1990).


KEY
Declared Rare Flora
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
HYDEN
DALWALLINU
MT. MARSHALL
BEACON
MUKINBUDIN
KOORDA
WONGAN HILLS
BALLIDU
DOWERIN
NUNGARIN
WESTONIA
MERREDIN
TRAYNING
GOOMALLING
CUNDERDIN
TAMMIN
KELLERBERRIN
NORTHAM
TOLGARN
SOUTHERN CROSS
Roycea pycnophylloides

SOWERBAEA MULTICAULIS E.Pritzel **Family: Anthericaceae**

TAXONOMY

This species has very attractive flowers and is easily distinguished from *S. laxiflora* the other member of the genus. Non-flowering *S. multicaulis* resembles immature non-flowering *Glischrocaryon aureum*.

DESCRIPTION

Small tufted plants, with unbranched flowering stems 10-20 cm in height, the many leaves arising from the base, 5-10 cm in length, with broadly membranous margins; particularly towards the base. The umbels are rounded and compact, 1-2 cm wide, with ovate to lanceolate outer bracts with a green keel. The inner bracts are divided into silky white hairs, as long as the pedicels, *ca* 5 mm, often shorter than the perianth, which is purple or violet (pinkish), divided into six free ovate segments 4-5 mm in length. The anthers are slightly longer than half the length of the perianth and the style is just longer than the anthers. Flowering period is November.

DISTRIBUTION AND HABITAT

S. multicaulis occurs in sand in heath or scrub heath vegetation. It was first collected in 1891 in the Lake Deborah area north of Southern Cross and was collected there again on the same day 100 years later. The other collections in 1931, 1964 and 1979 all came from over 200 km to the south in the Lake Hope-Ironcaps area.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Kalgoorlie	Yilgarn	Lake Deborah	Road Res.	1342	Excellent 14.11.90

RESPONSE TO DISTURBANCE

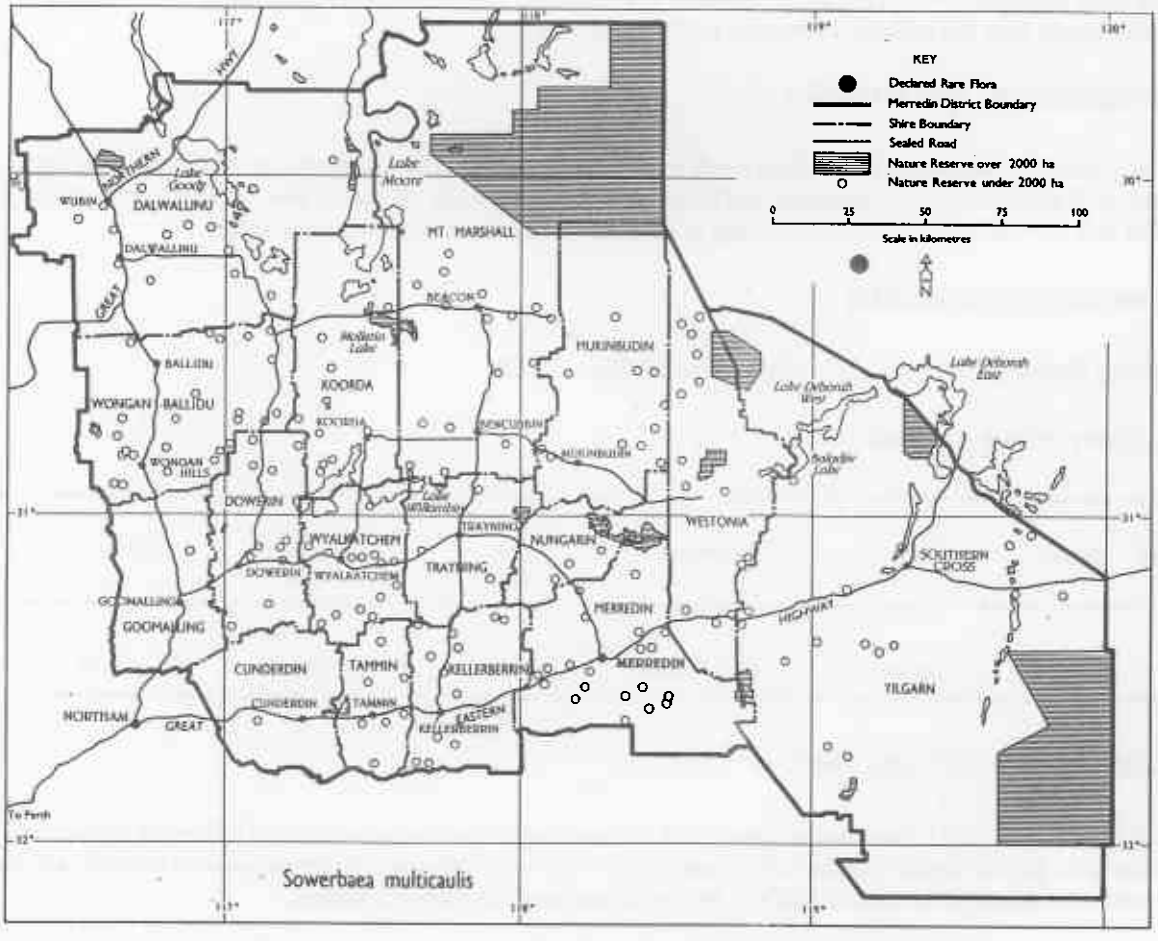
This species is clearly a disturbance opportunist becoming abundant for a short period following disturbance such as roadworks, before contracting again to a stage where it becomes undetectable. Its response to weed invasion and fire is unknown although fire is also likely to be one of the major disturbance factors.

SUMMARY AND RECOMMENDATIONS

Close monitoring of the known population is required to track population numbers following disturbance. Research is required on the population dynamics of this species. Road works will need to be closely monitored in the vicinity of this population.

REFERENCE

Patrick and Hopper (1982).


KEY
Declared Rare Flora
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
HWY
Lake Goody
Lake Moore
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
MUKINBUDIN
BALLIDU
KOORDA
WONGAN HILLS
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
SCHUTTERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
GREAT EASTERN
To Perth
Sowerbaea multicaulis

TETRATHECA APHYLLA F. Muell. **Family: Tremandraceae**

TAXONOMY

T. aphylla has affinities with *T. paynterae* but has only two ovules compared with four and has hairy peduncles.

DESCRIPTION

A dwarf shrub to 50-60 cm tall. Stems stout, terete, with slight vertical ridges, covered with dense minute tubercles produced into minute spreading or slightly retrorse hairs especially near the nodes, the stems 2-3 mm broad in the flowering region, the branches apparently few, alternate. Leaves alternate, soon deciduous. Flowers occurring singly in the axils of leaf-bases with bracts 1 mm long, lanceolate and with spreading hairs especially on the upper surface. Petals 5, dark pink, obovate to elliptical, *ca.* 1 cm long and *ca* half as wide with the greatest width apparently near the centre, deciduous. Fruit a capsule, tubular with constricted ends and a constriction down the centre to produce the seed chambers. Flowering period June to December.

DISTRIBUTION AND HABITAT

The species has a geographic range of about 10 km in the Helena and Aurora Ranges north of Koolyanobbing. It occurs in skeletal soil pockets among banded iron formation rock outcrop and debris in scrub vegetation.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Kalgoolie	Yilgarn	Helena/Aurora Ra.	VCL	$\leq$3000	Several sub-popns all satisfactory 28.6.90; 19.10.90.

RESPONSE TO DISTURBANCE

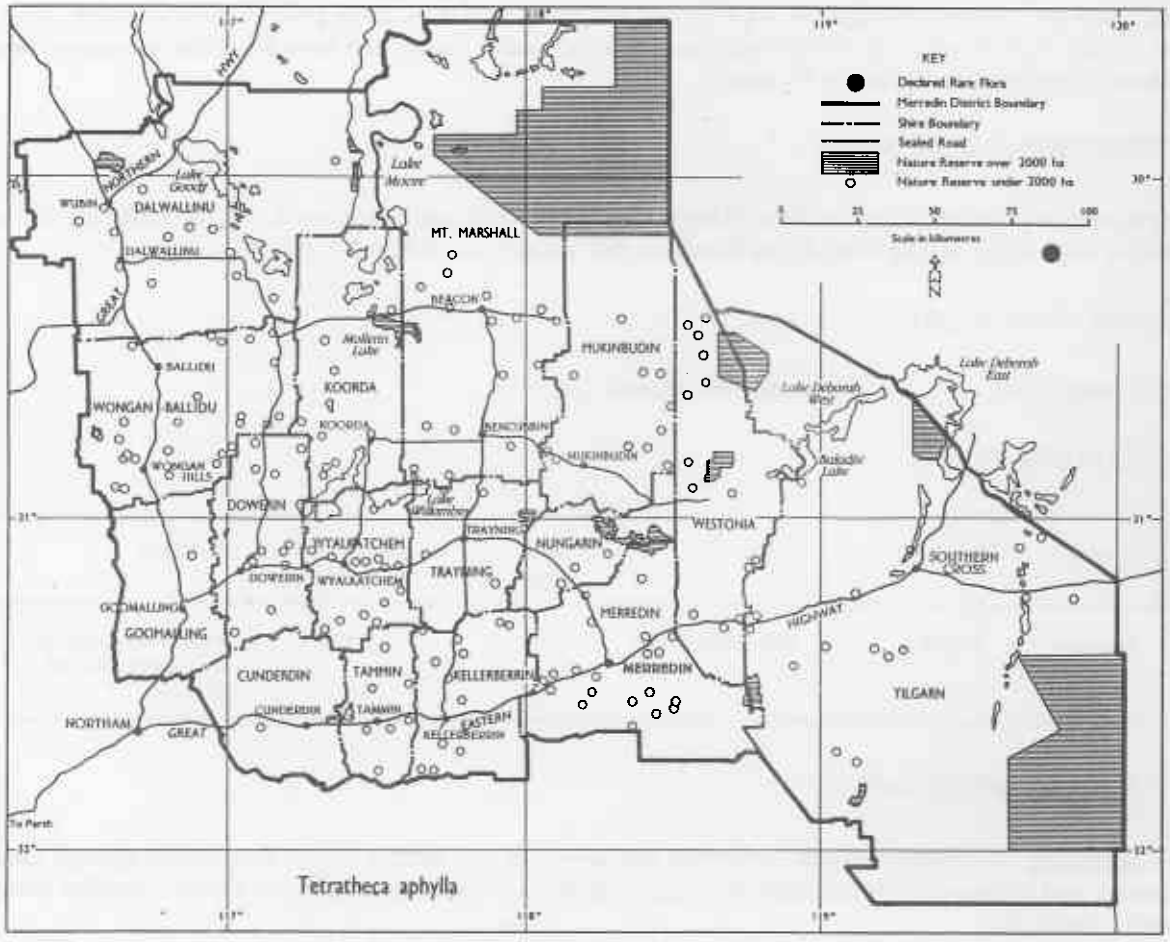
Fire and grazing are unlikely to be important for this species in this habitat. Direct disturbance through mineral exploration and mining remains the most likely potential threat, with competition from weeds a possible problem following disturbance.

SUMMARY AND RECOMMENDATIONS

Observations onsite suggest that mineral exploration has been limited in the range, but has concentrated in the lower country immediately to the north and north-west of the Bungalbin Hill (west) end of the range. If mining activity does not occur within the range then the species is not likely to be threatened. A conservation reserve in the area, which also accommodates associated rare species such as *Acacia 'adinophylla'* would ensure their protection in the long term.

REFERENCES

Thompson (1976); Hopper *et al.* (1990).


KEY
Declared Rare Flora
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
Scale in kilometres
MT. MARSHALL
DALWALLINU
BEACON
KOORDA
WONGAN
BALLIDU
DOWERIN
TRAYNING
NUNGARIN
WESTONIA
MERREDIN
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
SOUTHERN CROSS
GOOMALLING
NORTHAM
Tetratheca aphylla

TETRATHECA HARPERI F. Muell. **Family: Tremandraceae**

TAXONOMY

This species is distinguished with or without flowers by the dense covering of short spines (setae). Otherwise it has some affinity with *T. halmaturina*.

DESCRIPTION

A small shrub, 30 to perhaps 50 cm in height with rather stout stems. Leaves alternate, *ca* 2 mm long, broadly obovate to lanceolate, the surface with some hairs but with glabrous aspect, the margins dentate with short setae on the teeth, the mature branches leafless. Flowers occurring singly in the axils of leaf-bases. Petals 4 or 5, dark pink with darker streaks towards the base of each, 10-12 mm long and *ca* half as wide with the greatest width in the upper third, deciduous. Flowering period is July to November.

DISTRIBUTION AND HABITAT

The only known occurrence of this *Tetratheca* is the 'high jasper ranges' of Mt Jackson-Muddarning Hill area north of Southern Cross. Here it occupies crevices in precipitous areas of rock outcrop often being the only species present or sometimes occurring in association with *Isotoma petraea*. It is uniquely adapted to growing in rock crevices in very tiny pockets of soil in a habitat which is highly exposed and frequently windswept.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Kalgoolie	Yilgarn	Mt Jackson/ Muddarning	VCL	$\leq$1200	Est. 13.7.90, plants healthy

RESPONSE TO DISTURBANCE

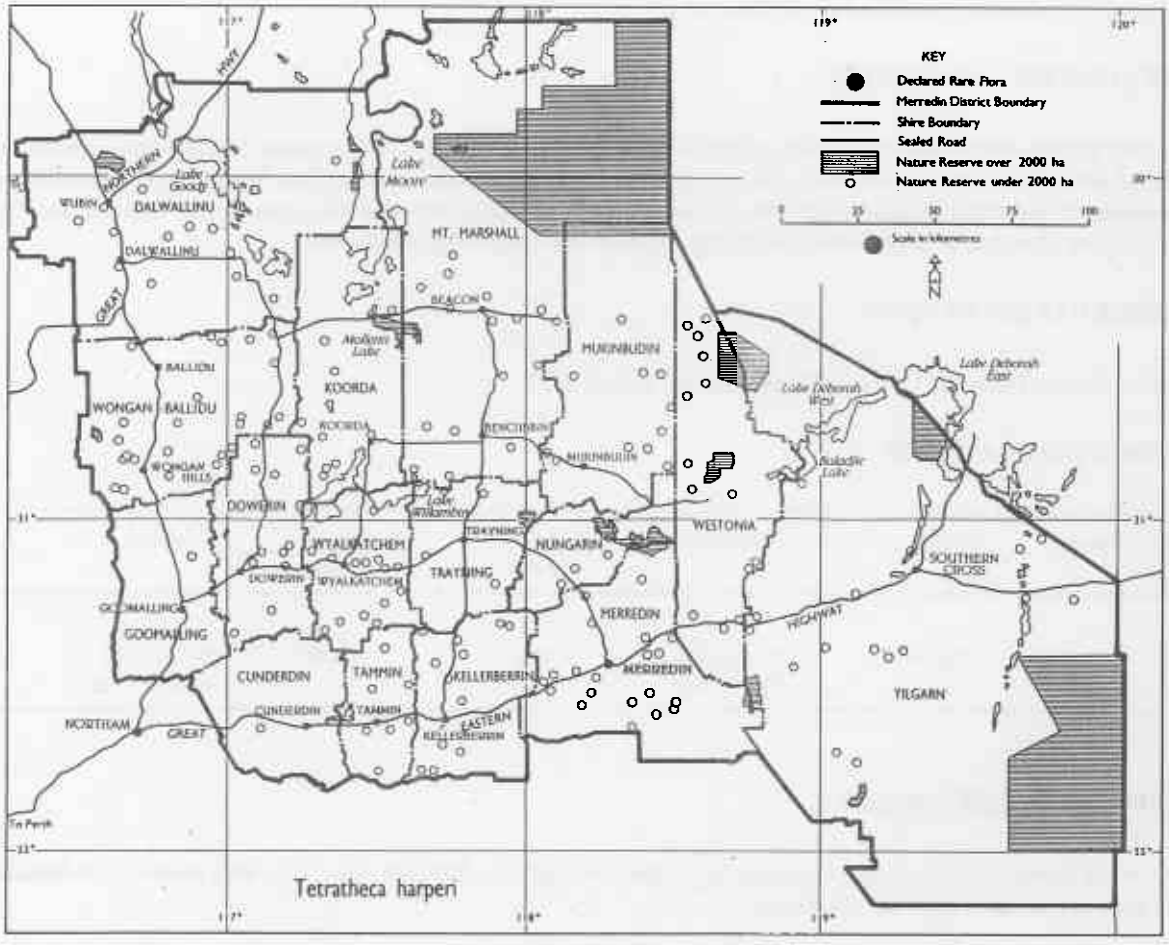
Fire, weed invasion, and grazing are unlikely to affect this species. Canopy cover may be a factor in its distribution as it always occurs in exposed situations.

SUMMARY AND RECOMMENDATIONS

Mineral exploration has occurred in the area but to date this has not affected the habitat of *T. harperi*. At present it appears to be secure in this area even though it has a geographic range of less than 5 km.

REFERENCES

Thompson (1976); Hopper *et al.* (1990).


KEY
Declared Rare Flora
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
Scale in kilometres
0
25
50
75
100
NORTH
MT. MARSHALL
BEACON
MUKINBUDIN
KOORDA
WONGAN
BALLIDU
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
MERREDIN
GOOMALLING
CUNDERDIN
TAMMIN
KELLERBERRIN
NORTHAM
YILGARN
SOUTHERN CROSS
HIGHWAY
GREAT
NORTHERN
Tetratheca harperi

TETRATHECA 'PAYNTERAE' J. Alford ms **Family: Tremandraceae**

TAXONOMY

This species has affinities with *T. aphylla*, but differs in having four ovules, glabrous peduncles, smaller floral parts, and in the shape of the fruit. *T. 'paynterae'* has an oblanceolate (capsule) with a mid-lie constriction, while *T. aphylla* has an oblong fruit. The two species also occupy different niches.

DESCRIPTION

The species is currently being described.

DISTRIBUTION AND HABITAT

T. 'paynterae' occurs entirely within the confines of an unnamed range north of Southern Cross, over a geographic range of perhaps 2 km. It has the same rock crevice habitat as *T. harperi*.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Kalgoorlie	Yilgarn	Unnamed range	VCL	$\leq$300	Good 23.6.90; 12.7.90

RESPONSE TO DISTURBANCE

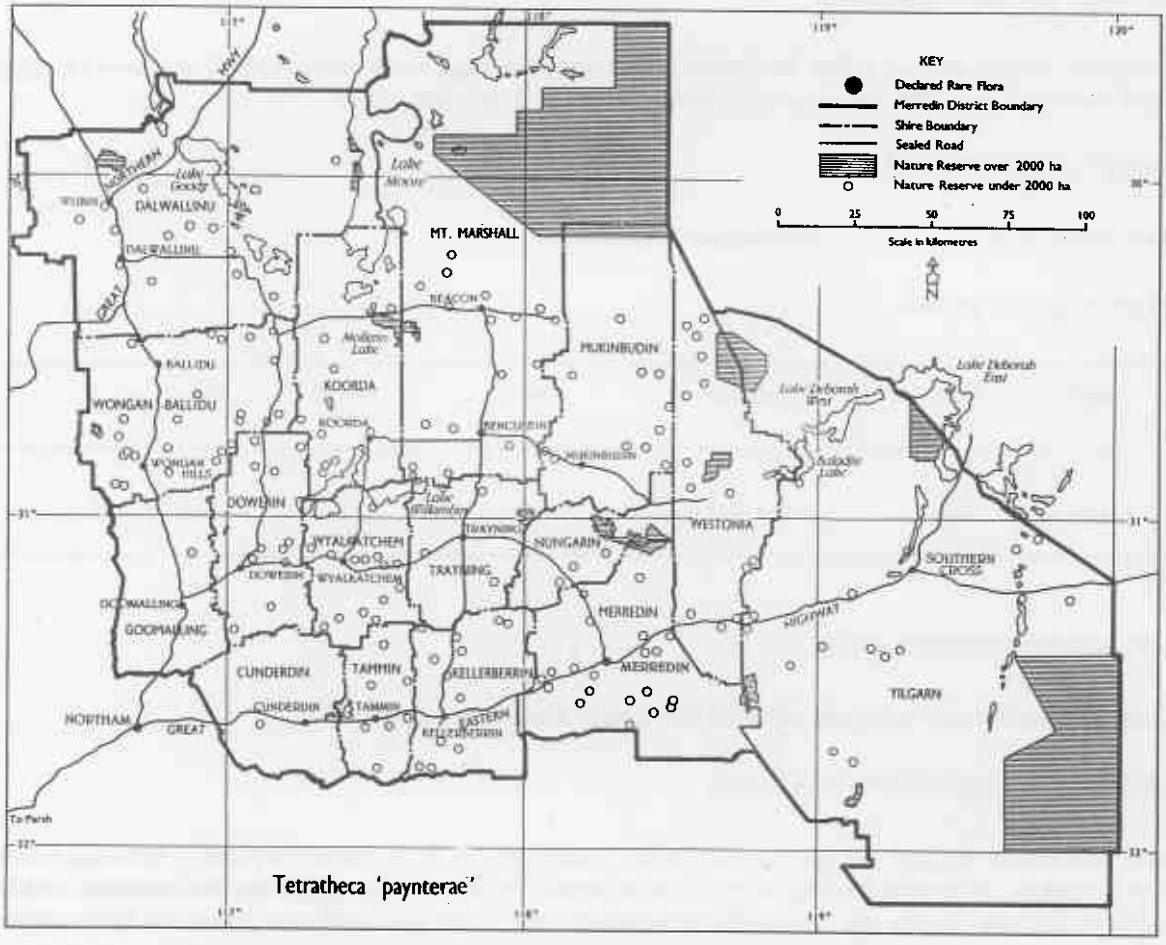
Response to disturbance is unknown although this species does prefer exposed sites.

SUMMARY AND RECOMMENDATIONS

Mineral exploration for iron ore has occurred in the vicinity of the *T. paynterae* population although mining is extremely unlikely. At present the species appears to be secure, however, recent upgrading and increased stocking of the adjacent Diemals Station may change the situation and that of an associated new species of *Ricinocarpos*. A conservation reserve to protect the range may therefore be warranted and fencing may need to be considered.

REFERENCE

J. Alford (1990).


KEY
Declared Rare Flora
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
MT. MARSHALL
DALWALLINU
BEACON
MUKINBUDIN
KOORDA
WONGAN-BALLIDU
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
MERREDIN
GOOMALLING
CUNDERDIN
TAMMIN
KELLERBERRIN
NORTHAM
WESTONIA
SOUTHERN CROSS
TILGARN
Tetratheca 'paynterae'

VERTICORDIA HUGHANII F. Muell. **Family: Myrtaceae**

TAXONOMY

V. hughanii is similar to *V. drummondii*, but has smaller flowers than the latter and lacks fringed margins to the petals.

DESCRIPTION

A small shrub to 50 cm tall. Leaves spreading oblong. Flowers axillary, congregated towards the apex of branches. Calyx-tube glabrous, with five herbaceous lobes divided into plumose segments. Petals orbicular, striate, minutely denticulate towards the apex, pale purple-red in colour. Flowering period is November to February.

DISTRIBUTION AND HABITAT

This species grows on grey sandy soil on the edge of salt-lakes between Dowerin and Goomalling, in low scrub.

CONSERVATION STATUS

Current Status: DRF Recommended Status: DRF

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Dowerin	Hindmarsh	Nature Res.	80	Healthy 13.7.84
2	Merredin	Dowerin	Nambling	Private	3000+	1300 in 10.2.87; 7.4.91

RESPONSE TO DISTURBANCE

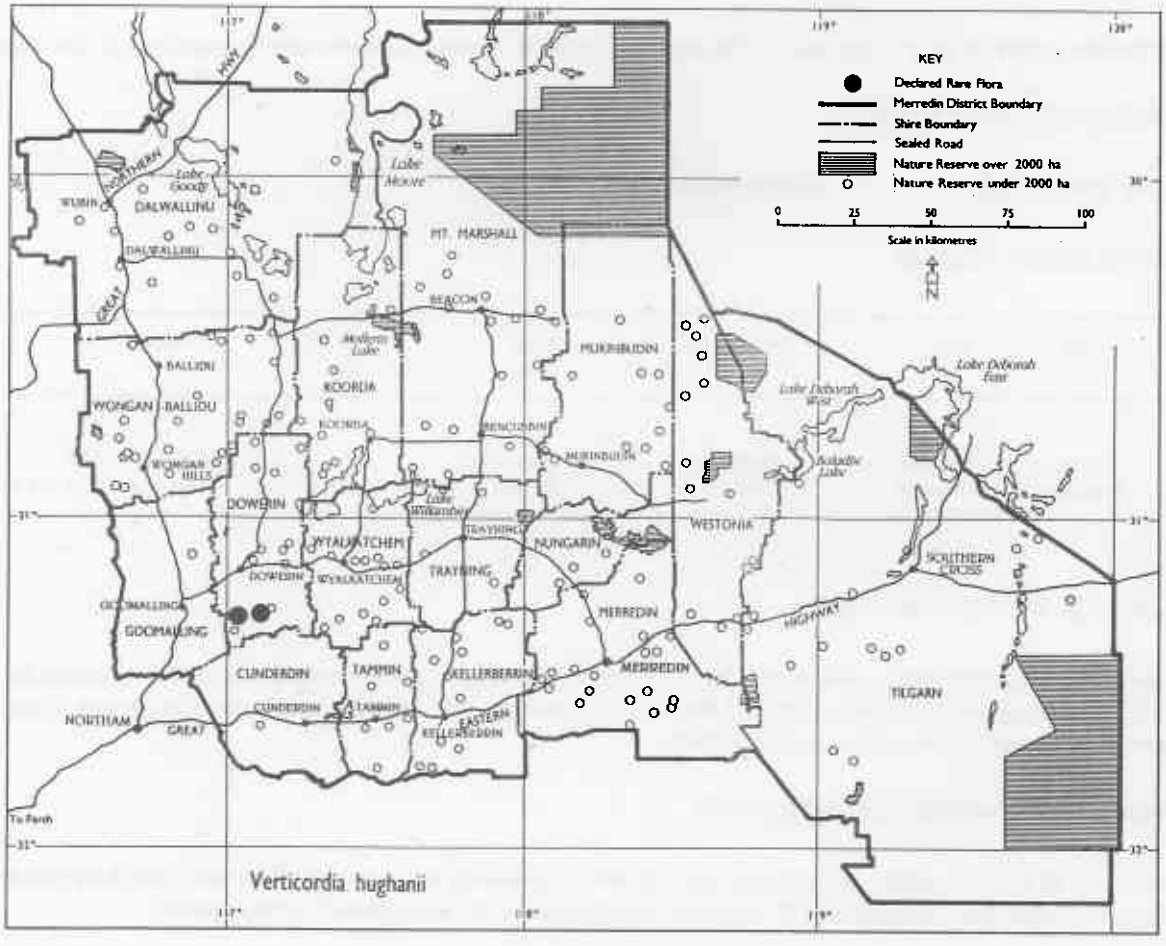
The private property population was fenced from stock in 1988 and since that time regeneration of this species has been prolific. The survey in April 1991 estimated 400 seedlings present, with a similar number of plant deaths. Fire, weed invasion and canopy cover effects are not known.

SUMMARY AND RECOMMENDATIONS

Monitoring of known populations and surveys for new populations are essential. Research into the reproductive biology and population dynamics of *V. hughanii* would assist in the management of this species.

REFERENCES

Blackall and Grieve (1980); Hopper *et al.* (1990).


KEY
Declared Rare Flora
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
Verticordia hughanii

PART THREE - PRIORITY ONE SPECIES IN THE MERREDIN DISTRICT

Based on the December 1990 priority taxa list 40 species of Priority One (P1) flora have been recorded within the boundaries of that part of the Merredin District covered by this Wildlife Management Program.

Individual species treatments that follow are generally brief and indicate the need for further surveys to accurately assess the conservation status of taxa in this group. The distribution of Priority One species in the district is shown in Figure 4.

The recommended conservation status is largely based on the surveys carried out as part of this study.

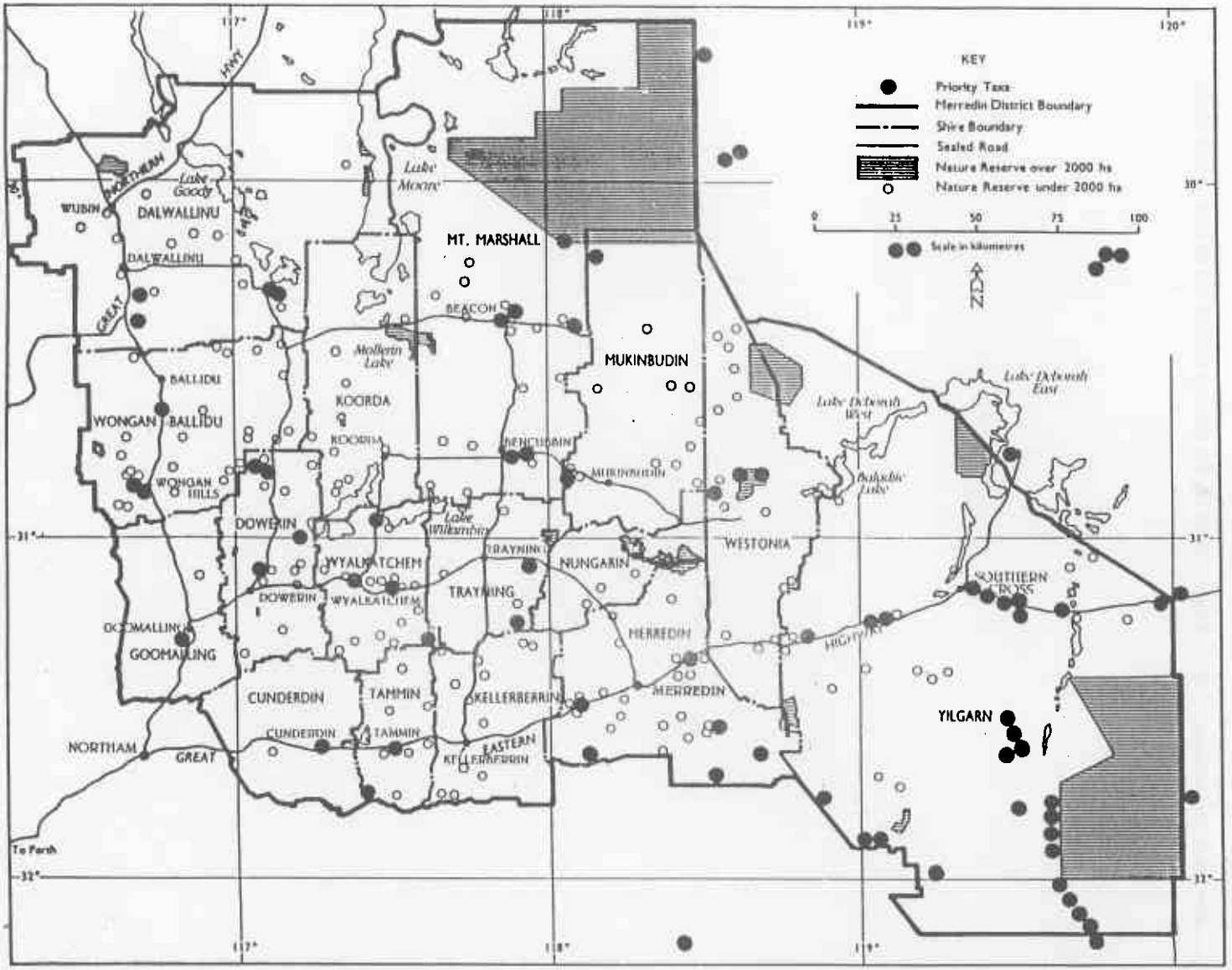


Figure 4. Distribution of Priority One Species populations in the Merredin District.

ACACIA 'ADINOPHYLLA' Maslin ms **Family: Mimosaceae**

TAXONOMY

Has affinities with *A. kochii* W.V.Fitzg.

DESCRIPTION

A. 'adinophylla' is a prostrate, dense, perennial woody shrub to 10-20 cm tall and 90-300 cm across. It has yellow globular flower-heads and small obovate phyllodes. Pods are recurved, to 20 mm long x 7 mm wide with constrictions about seeds. Flowering period is September to December.

DISTRIBUTION AND HABITAT

The species occurs on and around the Helena and Aurora Ranges north of Koolyanobbing, where it occurs in *Eucalyptus ebbanoensis* open mallee over shrubland vegetation in red clay and loam soil over jasper like rock. *A. 'adinophylla'* is of scattered occurrence with 54 plants counted along a transect 5.25 km long to the south of the range.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

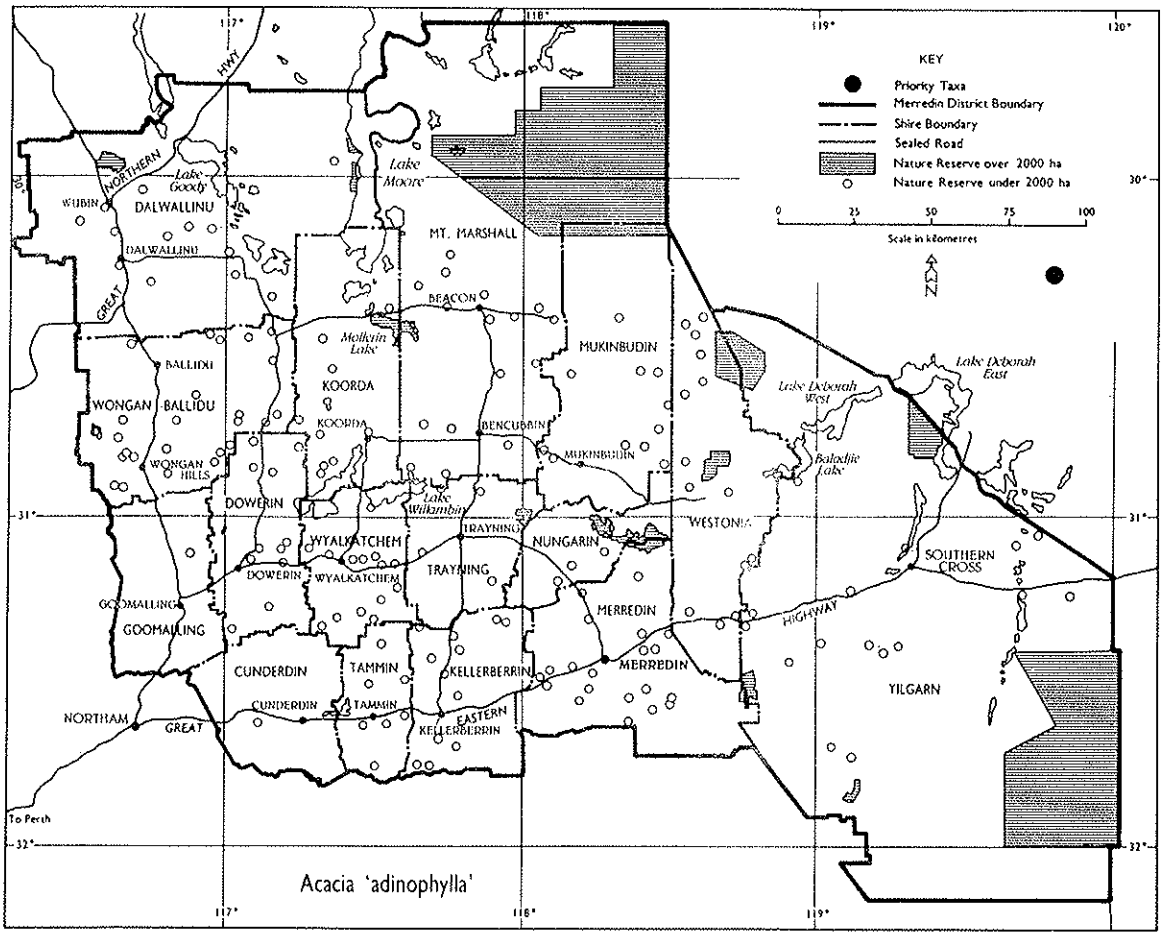
Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Kalgoorlie	Yilgarn	Helena & Aurora Ra.	VCL	Est. $\leq$300	Some disturbed 19.10.90

RESPONSE TO DISTURBANCE

Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

This species is being damaged by activities associated with mineral exploration in this area. Active management of the population is required with possible rerouting of the access road to Mt Dimer that runs along the southern part of the range. A conservation reserve in the area would protect this species and a number of associated rare species.


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Acacia 'adinophylla'
DALWALLINU
MT. MARSHALL
BEACON
MUKINBUDIN
KOORDA
BENCUBBIN
WONGAN
BALLIDU
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
MERREDIN
GOOMALLING
CUNDERDIN
TAMMIN
KELLERBERRIN
NORTHAM
SOUTHERN CROSS
YILGARN
HIGHWAY
Lake Moore
Lake Goody
Lake Deborah West
Lake Deborah East
Lake Williambin
To Perth

ACACIA CAESARIATA Cowan & Maslin **Family: Mimosaceae**

TAXONOMY

A. caesariata is allied to *A. torticarpa* and has some similarity in general appearance to both *A. multilineata* and *A. consobrina*.

DESCRIPTION

Dense, rounded-triangular or flat-crowned shrub 0.6-1.3 m tall, spreading 2-3 m diameter. Phyllodes narrowly oblong-oblanceolate, rounded-obtuse, mucronate, mucro short, straight or slightly curved, brown, hard, coarsely pungent; 20-45 mm long, 3-10 mm wide; 1-3 main nerves on each face. Flower-heads globular, dark lemon-yellow, 4 mm diameter. Pods oblong, 12-25 mm long, 2.5-3 mm wide. Flowering period is August to September, seed in January.

DISTRIBUTION AND HABITAT

A. caesariata is a geographically restricted and poorly collected species of the Bungulla-Kununoppin area. It occurs in mallee scrub and eucalypt woodland on hard gritty loam or clay.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

This species occurs in the Wyalkatchem, Kununoppin, Tammin, Korrelocking, South Kumminin and Yorkrakine areas. It is only known from herbarium records, four of which were collected in the 1970s and one from a road verge.

RESPONSE TO DISTURBANCE

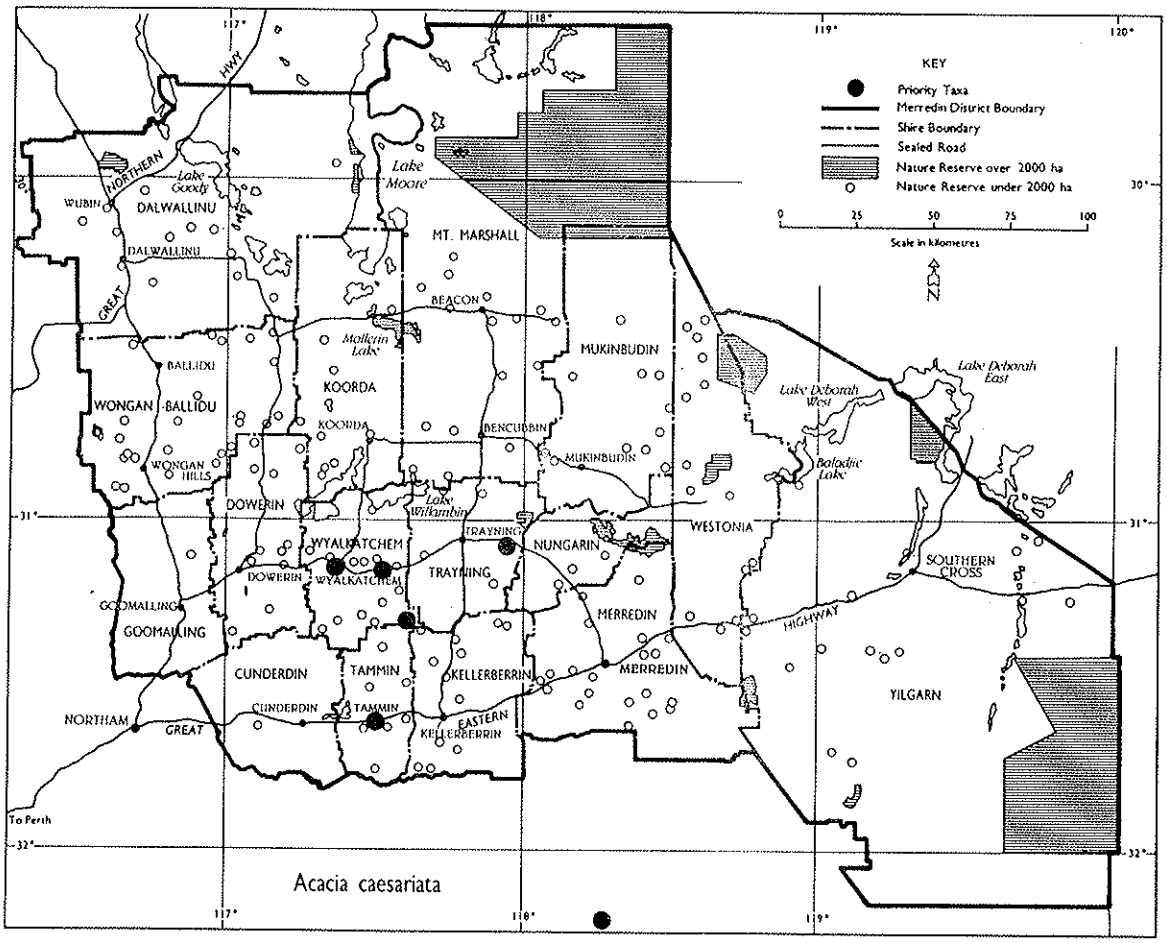
Response to fire, weed invasion, grazing, canopy cover and physical disturbance is unknown.

RECOMMENDATIONS

Insufficient information is available to make recommendations regarding this species. It requires survey as a matter of priority to determine its status in the wild. At present it is thought to have a geographic range of less than 200 km.

REFERENCE

Cowan and Maslin (1990b).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Acacia caesariata
MT. MARSHALL
BEACON
MUKINBUDIN
KOORDA
BENCUBBIN
WONGAN HILLS
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
MERREDIN
GOOMALLING
CUNDERDIN
TAMMIN
KELLERBERRIN
NORTHAM
YILGARN
SOUTHERN CROSS
HIGHWAY
GREAT
NORTHERN
To Perth

ACACIA COCHLOCARPA Meissner subsp. *'VELUTINOSA'* **Family: Mimosaceae**
A.R.Chapman & Maslin ms

TAXONOMY

This subspecies differs from *A. cochlocarpa* subsp. '*cochlocarpa*' in having hairy branchlets and phyllodes, persistent stipules, a broader midrib and marginal nerves and larger bracteoles.

DESCRIPTION

Shrub to 30 cm tall and to 1.2 m across. Phyllodes falcate to about 4 cm long and 4 mm wide, with 8 unequal nerves. Stems and nerves velutinous. Flowers globular, axillary. Pods not regularly coiled, impressed around seeds. Flowering period is June to August.

DISTRIBUTION AND HABITAT

There are five recent records from the Manmanning area, at least one on private property, and one 1840 record from the York district. *A. cochlocarpa* subsp. *'velutinosa'* occurs in heath on sandy soil, or in *Allocasuarina*, *Acacia* and mallee scrub on sandy laterite soil with quartz.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

Pop No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Dowerin	Manmanning	Private	?	Last record 1984

RESPONSE TO DISTURBANCE

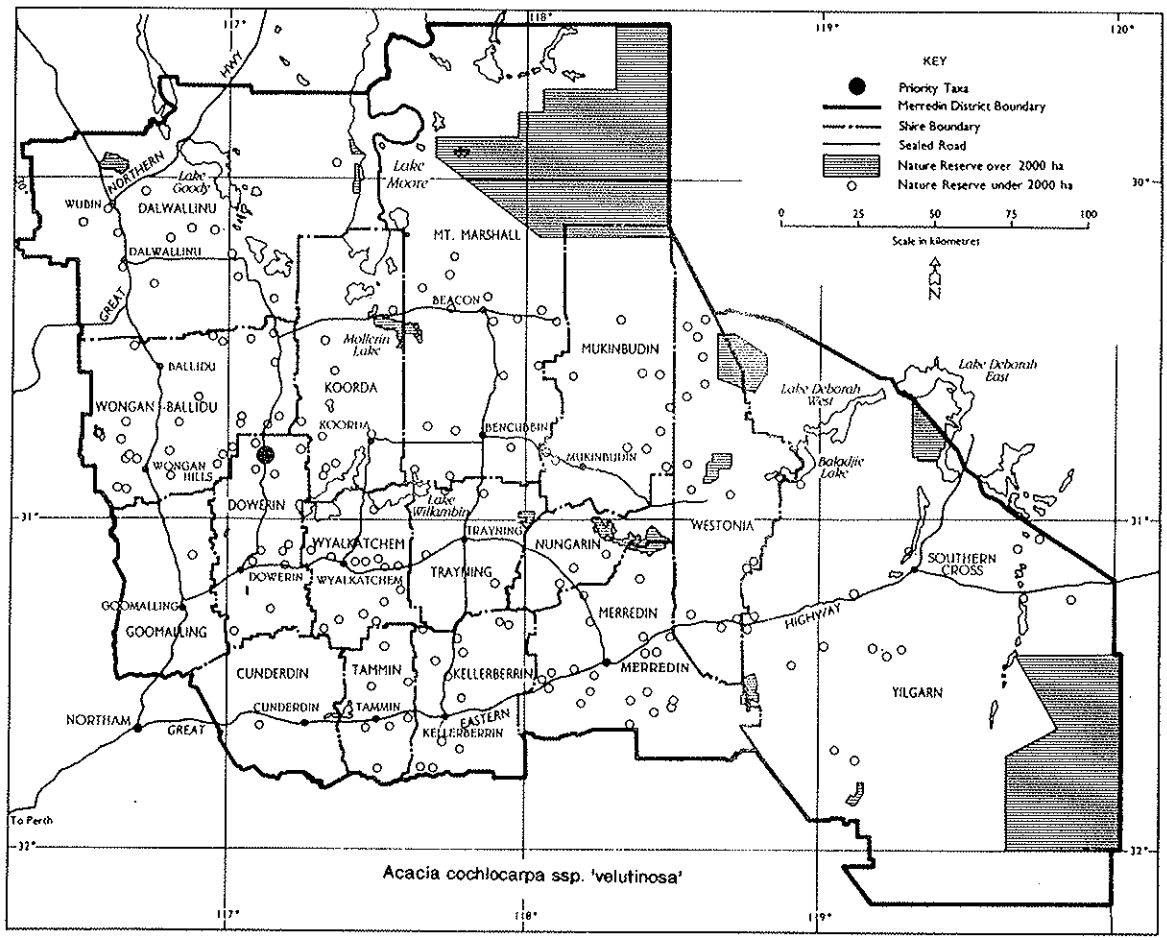
Responses to soil disturbance, fire, weed invasion, grazing and canopy cover unknown. The habitat description suggests a sprawling shrub in vegetation which would likely be of an open nature.

RECOMMENDATIONS

The species requires high priority further survey to accurately determine its conservation status.

REFERENCE

Chapman and Maslin (*ined.*).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
HWY
NORTHERN
Lake Goody
Lake Moore
WUBIN
DALWALLINU
DALWALLINU
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN-BALLIDU
KOORDA
BENCUBBIN
MUKINBUDIN
WONGAN HILLS
Lake Deborah West
Lake Deborah East
Baladjie Lake
DOWERIN
Lake Wilkinbin
TRAYNING
WESTONIA
WYALKATCHEM
NUNGARIN
SOUTHERN CROSS
DOWERIN
WYALKATCHEM
TRAYNING
GOOMALLING
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
MERREDIN
YILGARN
NORTHAM
CUNDERDIN
TAMMIN
GREAT
EASTERN
KELLERBERRIN
To Perth
Acacia cochlocarpa ssp. 'velutinosa'

ACACIA DESERTORUM Maiden & Blakely var. *NUDIPES* Cowan & Maslin ms **Family: Mimosaceae**

TAXONOMY

Differs from *A. desertorum* var. *desertorum* in having phyllodes with 16 narrow, unequal width nerves and solitary, generally glabrous peduncles. *A. desertorum* var. *desertorum* has paired, pubescent peduncles and eight-nerved phyllodes.

DESCRIPTION

Shrub to 2 m or tree to 4 m tall. Phyllodes terete, 16-nerved, rigid, straight, 5-15 mm wide, coarsely pungent. Flowers globular, yellow. Pods linear to 8.5 cm long and 1.5-2 mm wide, slightly curved. Flowering period September to October.

DISTRIBUTION AND HABITAT

The species is recorded from nine locations between Southern Cross and Boorabbin on or near the Great Eastern Highway, in sandplain covered by heath vegetation over a geographic range of 70 km.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

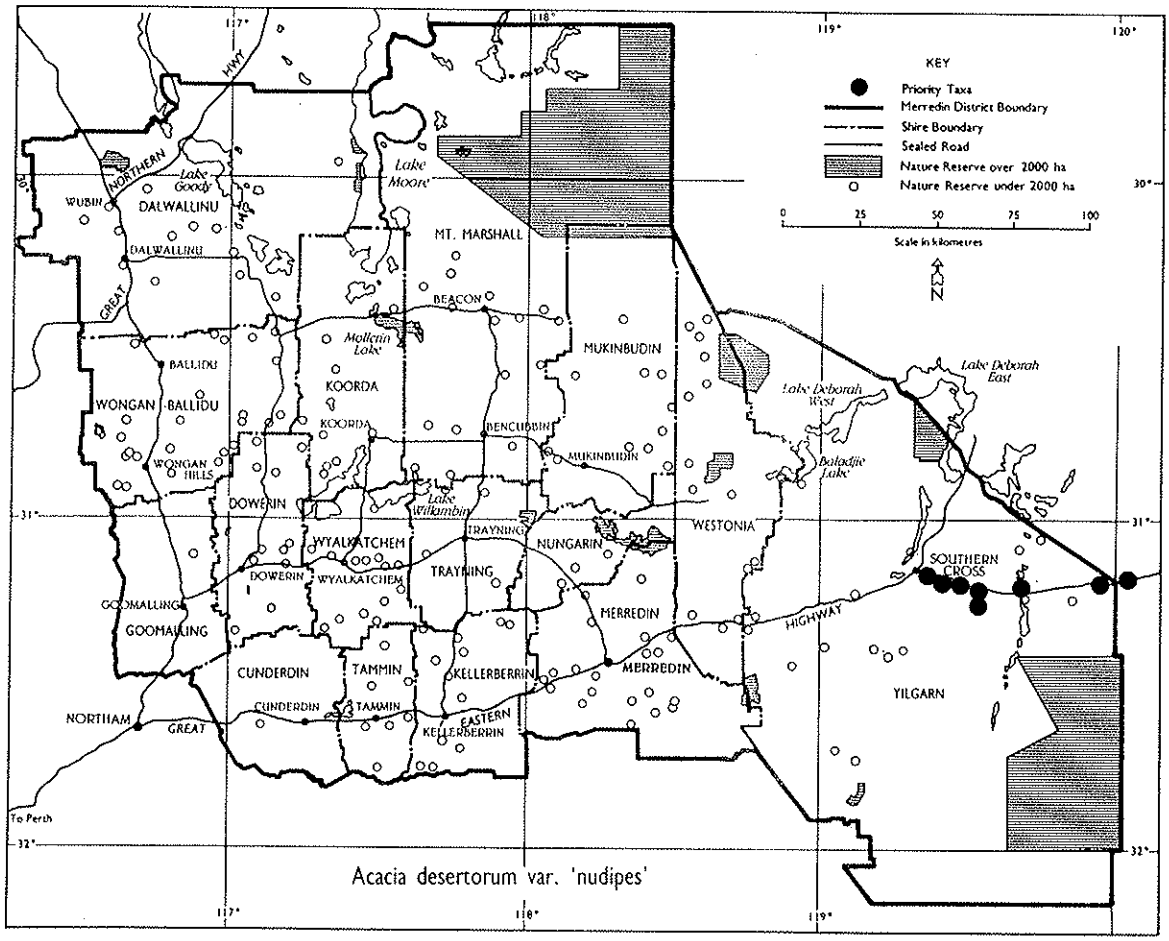
No population details are available other than for the Merredin District and Yilgarn Shire. The species has not been collected for ten years with past records from near Southern Cross, Ghooli and east of Yellowdine.

RESPONSE TO DISTURBANCE

Response to soil disturbance, weed invasion, grazing and canopy cover are unknown. Two of the herbarium records relate to regenerating sandplains that had been burnt.

RECOMMENDATIONS

The linear distribution along the Great Eastern Highway suggests opportunistic collection along that major transport route. Further surveys both north and south of the highway are urgently needed.



Acacia desertorum var. 'nudipes'

ACACIA INCEANA Domin subsp. '*CONFORMIS*' Cowan & Maslin ms **Family: Mimosaceae**

TAXONOMY

This subspecies differs from *A. inceana* subsp. *inceana* in the compressed phyllodes and shorter pods. *A. inceana* subsp. *inceana* has terete phyllodes and pods 80 to 85 mm long (it was referred to as *A. inceana* Maiden & Blakely in 1990, but that name is now known to be invalid).

DESCRIPTION

Shrub or small tree 2.5-4 m tall with 3-4 main stems. Phyllodes 4-7 cm long compressed, nerveless, pungent pointed with a hooked tip. Flowers globular, yellow on a 3-4 mm peduncle. Pods 40-70 x 3.5-4 mm, appressed around seeds. Flowering period August to September.

DISTRIBUTION AND HABITAT

A. inceana subsp. '*conformis*' occurs from Morowa to Kalannie and south-east to Hines Hill and Kulin with some thirteen recorded occurrences west of 120 degrees longitude. It occurs in open scrub vegetation in saline situations on substrates ranging from light brown soil to orange-brown loam associated with *Atriplex*.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

The most recent herbarium records were in 1984 from Kalannie, Hines Hill, Kondut (near Wongan Hills), Mukinbudin in the Merredin District and Lake O'Grady in Narrogin District. There is a 1916 record from Cowcowing. Land status, number of plants and condition of these populations is not known.

RESPONSE TO DISTURBANCE

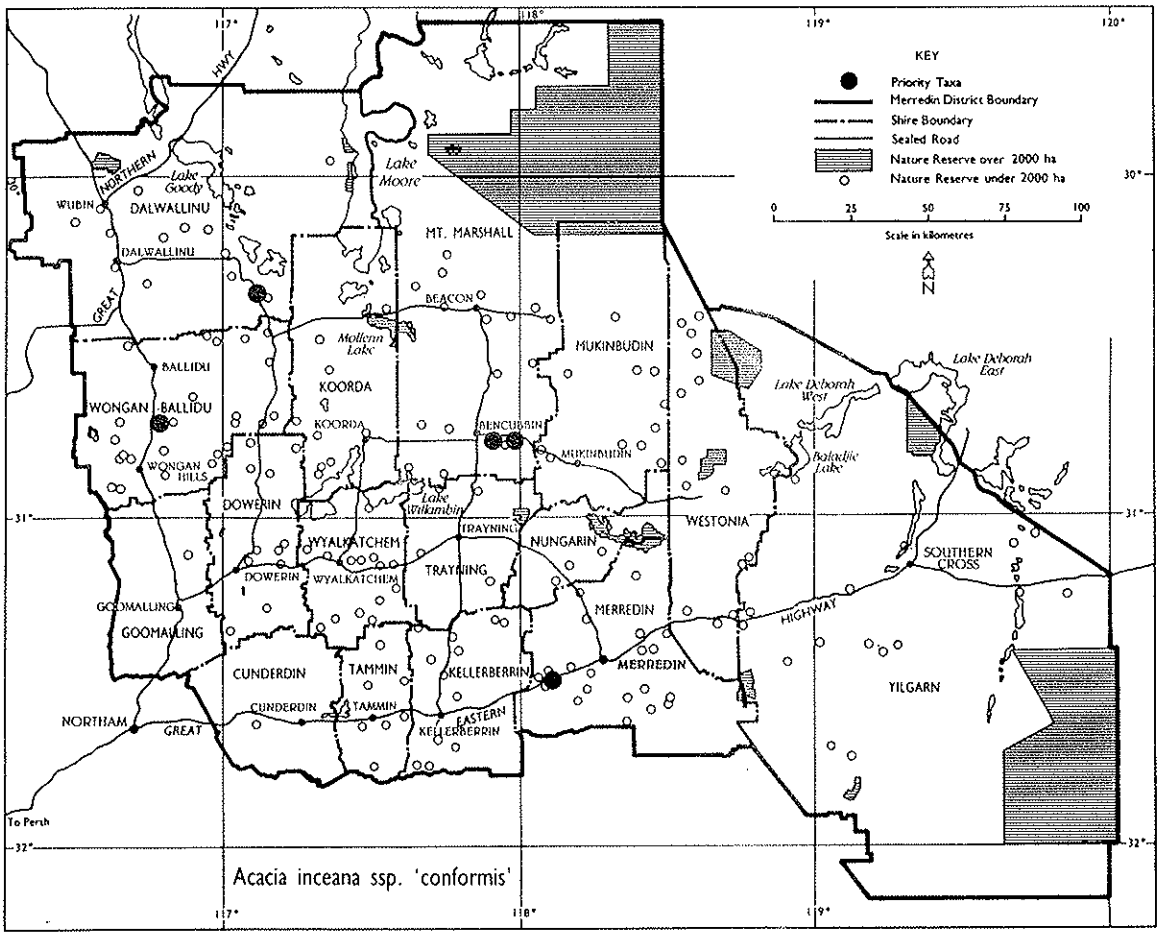
Response to disturbance of soil, fire, weed invasion, grazing and canopy cover is not known.

RECOMMENDATIONS

No other details are available other than herbarium records. This species urgently requires survey to determine its conservation status.

REFERENCE

R. Cowan, W.A. Herbarium (personal communication).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
Lake Goody
WUBIN
DALWALLINU
DAWS
Lake Moore
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN
WONGAN HILLS
BENCUBBIN
Lake Deborah West
Lake Deborah East
Baladjie Lake
DOWERIN
Lake Wilkinbin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
YILGARN
NORTHAM
To Perth
Acacia inceana ssp. 'conformis'

ACACIA SCIOPHANES Maslin **Family: Mimosaceae**

TAXONOMY

The species name *'sciophanes'* refers to the very diffuse open habit of this species. *A. sciophanes* has affinities with *A. anfractuosa.*

DESCRIPTION

Diffuse, openly branched, wispy shrub to 2.3 m tall, branches mostly pendulous, flexuose, terete, slightly resinous. Phyllodes coarsely filiform, 90-150 mm long, 1-2 mm wide, curved, spreading, very slightly resinous, prominently 4-ribbed; apex uncinate. Flower-heads bright yellow, globular, peduncles 5-6 mm long. Pods linear, to 100 mm long, 1-2 mm wide, terete, sometimes twisted, margins slightly contracted between seeds. Flowering period from late September to November.

DISTRIBUTION AND HABITAT

The species is known from only one locality between Mukinbudin and Bencubbin, where it occurs on yellow sandplain in scrub of *Acacia* spp. and *Allocasuarina acutivalvis.*

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Mukinbudin	Wundowlin	Road/Rail Res./ Nature Res.	10	Healthy 11/10/90

RESPONSE TO DISTURBANCE

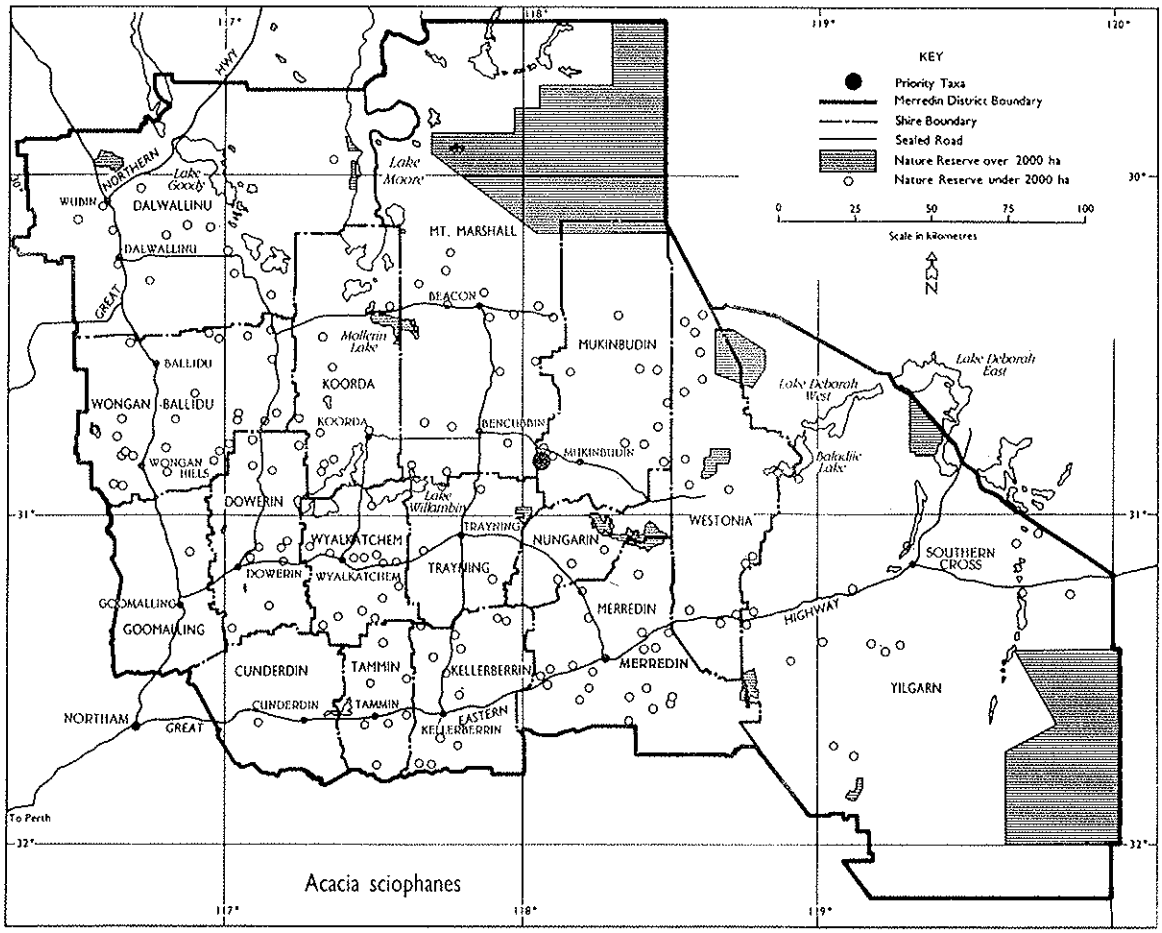
Responses to soil disturbance, fire, weed invasion, grazing and canopy cover are not known.

RECOMMENDATIONS

This species has never been recorded outside the known area of occurrence and is extremely rare. There are only ten known plants. No additional populations have been located during this survey. Further survey is a high priority. Research and management of the remnant population are required. Propagation should occur and wider cultivation needs to be encouraged.

REFERENCE

Maslin (1977).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Acacia sciophanes
NORTHERN HWY
Lake Goody
Lake Moore
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN
WONGAN HILLS
BENCUBBIN
Lake Deborah West
Lake Deborah East
Baladjie Lake
DOWERIN
Lake Wilkinbin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
YILGARN
NORTHAM
To Perth
117°
118°
119°
120°
30°
31°
32°

ACACIA SUBFLEXUOSA Maiden subsp. *CAPILLATA* Cowan & Maslin ms **Family: Mimosaceae**

TAXONOMY

Differs from *A. subflexuosa* subsp. *subflexuosa* in the more prominent stipules and the shorter, thicker, deeper green coloured pubescent phyllodes. Stipules are retained on older plants parts in *A. subflexuosa* subsp. *capillata*. It may be difficult to distinguish *A. subflexuosa* subsp. *subflexuosa* and *A. subflexuosa* subsp. *subcapillata* in the field.

DESCRIPTION

Shrub 25-30 cm tall. Phyllodes thickened terete, 3-4 cm long and 1-1.5 mm wide with *ca.* 8 nerves, pungent pointed. Flowers globular, yellow on 4-5 mm pubescent peduncles. Upper branches and phyllodes pubescent. Pods narrow coiled, *ca.* 4 cm long x 2 mm wide. Flowering period October to November.

DISTRIBUTION AND HABITAT

This subspecies occurs in grey sand with laterite south-south-east of Cunderdin in association with scrub heath vegetation.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

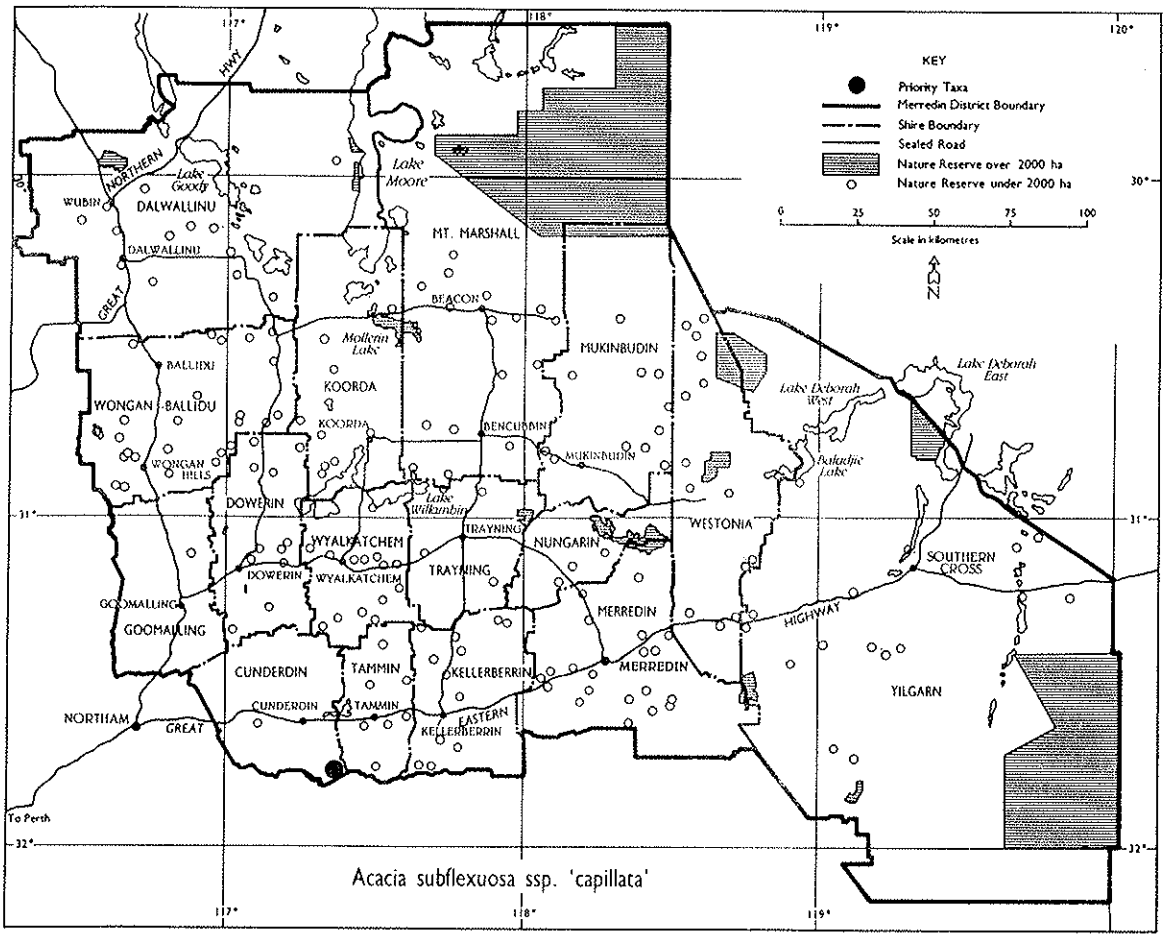
Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Cunderdin	Rabbit Rd	Road Res.	?	?; collected Nov., 1982

RESPONSE TO DISTURBANCE

Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

This species requires urgent survey. It may occur in association with *Hakea aculeata* and *Daviesia oxylobium*, at the only known recorded occurrence south-south-east of Cunderdin.



Acacia subflexuosa ssp. 'capillata'

CALOTHAMNUS sp. Diemals (*F.H. & M.P. Mollemans* 3078) **Family: Myrtaceae**

TAXONOMY

This is a distinct species with no other close relative in the genus.

DESCRIPTION

Shrub to 1 m tall. Leaves terete to 9-17 cm long with abundant upraised glands, brown, pungent pointed. Flowers scarlet with calyx tube covered in depressed glands. Fruit not seen. Flowering period July.

DISTRIBUTION AND HABITAT

The species occurs on yellow sand with a light brown soil (clay) crust in *Boronia ternata* mixed shrub heath to 1-1.2 m tall, in very isolated country to the west of Pigeon Rocks in the Diemals area north of Southern Cross.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

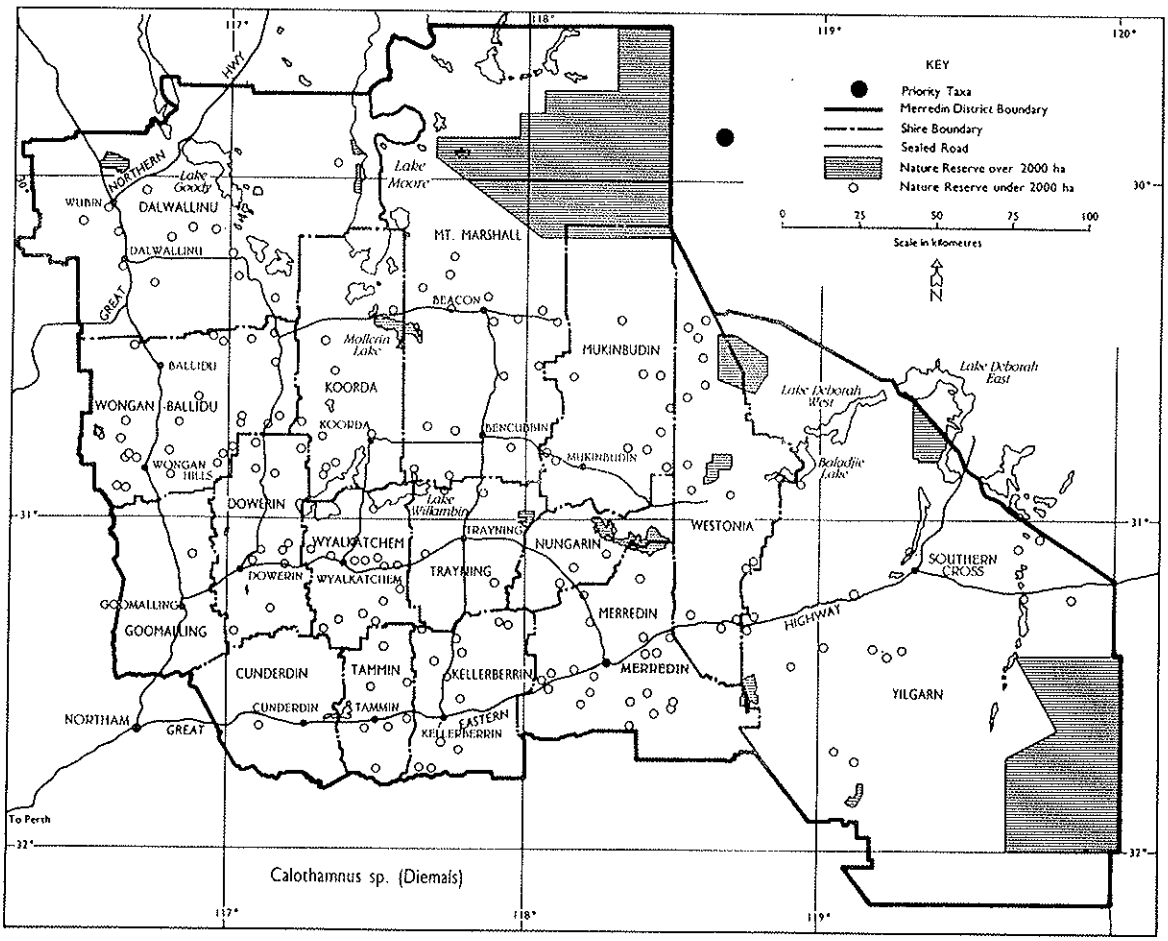
Pop. No.	District	Shire	Population	Land Status	No.of Plants	Condition
1	Kalgoorlie	Yilgarn	Diemals	? Pastoral/ VCL	2	Healthy 2.7.90

RESPONSE TO DISTURBANCE

This species was found in regenerating heath that had been burnt. Responses to soil disturbance, weed invasion, grazing and canopy cover are not known.

RECOMMENDATIONS

Discovered during 1990, this species is only known from two plants collected in very isolated country. The fruits had dehisced completely from the stem which is unusual for *Calothamnus*, and if this is a general character for the species it may account for its apparent rarity. Survey and further study warranted.


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
Lake Goody
WUBIN
DALWALLINU
Lake Moore
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
WONGAN
KOORDA
BENCUBBIN
WONGAN HILLS
Lake Deborah West
Lake Deborah East
Bolodjie Lake
DOWERIN
Lake Wilkinbin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
EASTERN
To Perth
Calothamnus sp. (Diemals)

CALYTRIX CRESWELLII (F. Muell.) B.D.Jackson **Family: Myrtaceae**

TAXONOMY

This is a distinctive taxon with large white flowers. It has similarities to both *C. desolata* and *C. brevifolia*.

DESCRIPTION

Shrub to 40-50 cm tall and across. Leaves ascending, ovate, 1-3 mm long, 0.6-1 mm wide. Flowers large, delicate. Petals white, narrowly elliptic to lanceolate, 8-11.5 mm long, 3.5-6 mm wide, the apex acute. Stamens *ca* 40-55. Flowering period November to December.

DISTRIBUTION AND HABITAT

This species occurs in *Banksia-Grevillea-Calytrix* species heath on yellow flat to undulating sandplain north-north-east of Koolyanobbing. It has a measured geographic range of 8.7 km and a period of 106 years has elapsed between the first and second collections.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Kalgoorlie	Yilgarn	Helena & Aurora Ra	VCL	4325	Est.; healthy 20.10.90

RESPONSE TO DISTURBANCE

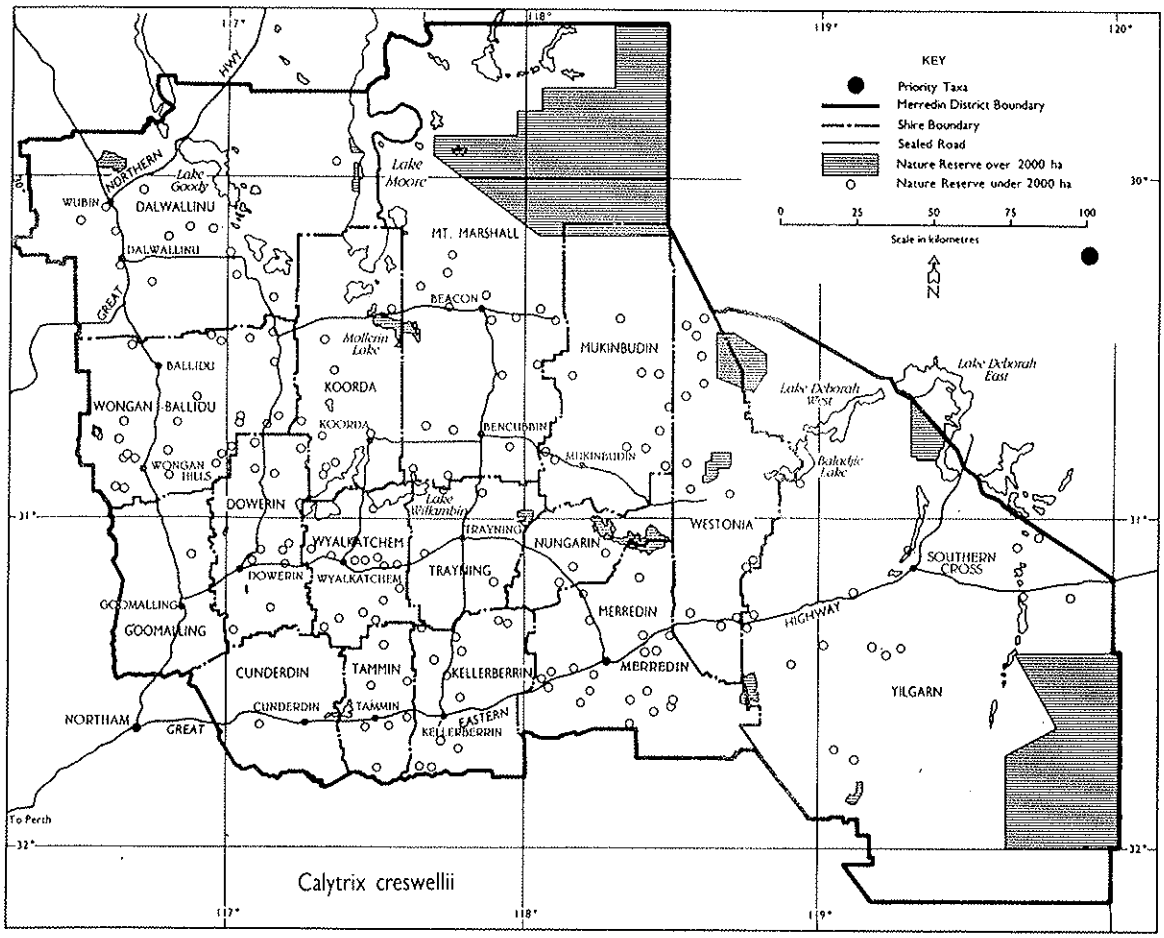
Responses to soil disturbance, weed invasion, grazing and canopy cover are not known.

RECOMMENDATIONS

C. creswellii is restricted to a single locality, where it is fairly common. This area is not subject to pastoral or agricultural influence, and is presently not actively explored for minerals although there is evidence of past activity. It is therefore not presently threatened, but active mineral exploration could result in plant loss. A conservation reserve encompassing the Helena and Aurora Range and associated sandplains would protect a significant number of rare species including *C. creswellii*.

REFERENCE

Craven (1987).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
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32°
HWY
NORTHERN
Lake Goorly
WUBIN
DALWALLINU
Lake Moore
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
BALLIDU
KOORDA
WONGAN HILLS
WONGAN BALLIDU
BENCUBBIN
MUKINBUDIN
Lake Deborah East
Lake Deborah West
Baladjie Lake
DOWERIN
Lake Wilkinbin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
YILGARN
NORTHAM
To Perth
Calytrix creswellii

CHAMELAUCIUM 'PAYNTERAE' N. Marchant & G.J. Keighery ms **Family: Myrtaceae**

TAXONOMY

A distinctive taxon with single flowers that resemble the individual flowers in a compound head of a *Darwinia*, such as *D. purpurea*.

DESCRIPTION

Small, domed, low, multi-stemmed shrub to 35 cm tall and across. Leaves club shaped, crowded on stems, to 2 mm long and 0.6 mm wide. Flowers to 5-6 mm long and 1.5 mm wide with a style to 1.2 mm long, white, ageing to red and green. Flowering period September to December.

DISTRIBUTION AND HABITAT

This species occurs in heath and low scrub vegetation over a geographic range of 8 km on undulating sandplain north-north-east of Koolyanobbing.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

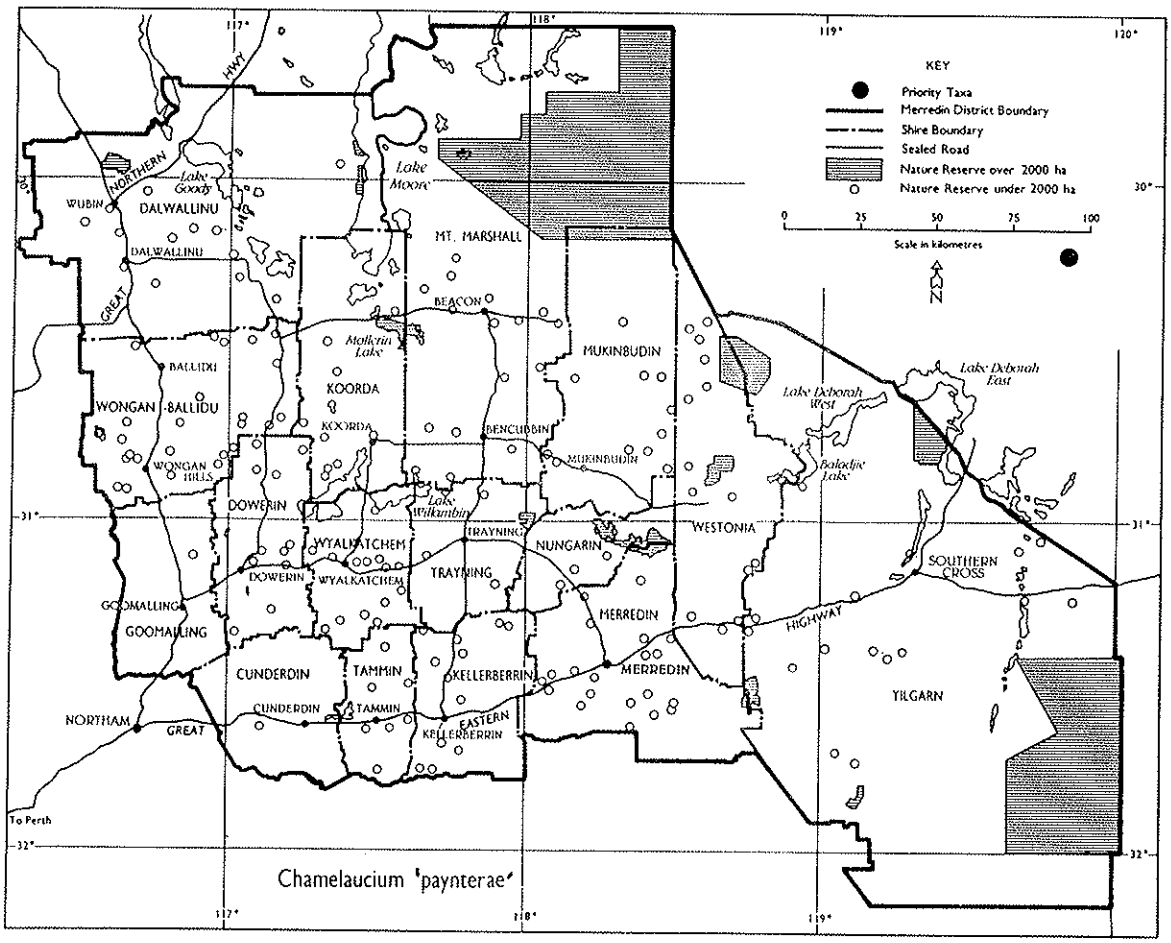
Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Kalgoorlie	Yilgarn	Helena & Aurora Ra	VCL	19	Healthy 1989/19.10.90

RESPONSE TO DISTURBANCE

Responses to soil disturbance, weed invasion and grazing are unknown. Canopy cover may be important as it was collected at the base of a larger shrub, in shade.

RECOMMENDATIONS

C. paynterae occurs in the same general area as *Calytrix creswellii*. This appears to be an extremely rare species and is urgently in need of further survey. Comments on land status are the same as for *C. creswellii*.


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
Lake Goody
WUBIN
DALWALLINU
Lake Moore
MT. MARSHALL
BEACON
GREAT
Malkerin Lake
MUKINBUDIN
BALLIDU
WONGAN
KOORDA
BENCUBBIN
Lake Deborah West
Lake Deborah East
Baladjie Lake
WONGAN HILLS
DOWERIN
Lake Wilkambin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
EASTERN
To Perth
Chamelaucium 'paynterae'

CYPHANTHERA ODGERSII (F. Muell.) L. Haegi subsp. *OCCIDENTALIS* Haegi **Family: Solanaceae**

TAXONOMY

This subspecies has much bigger leaves and is a larger shrub than *C. odgersii* subsp. *odgersii*. The name '*occidentalis*', refers to the occurrence of this subspecies in the west of the species range.

DESCRIPTION

Shrub to 2.5 m, greyish. Branches densely woolly-tomentose. Leaves broadly to narrowly ovate-elliptic, almost sessile, 25-35 mm long, 9-13 mm wide, woolly-tomentose. Flowers in dense clusters, often forming leafy spikes; pedicels 0.5-2 mm long. Calyx 4-7 mm long. Petals 5.5-8.5 mm long, white, with purple striations. Flowering period September to December.

DISTRIBUTION AND HABITAT

This subspecies is found on pale orange sand soil with a clay crust in scrub vegetation in the Cowcowing area. Searches in the Lake Moore area where it is known from a 1939 collection proved unsuccessful in 1990, so the Cowcowing occurrence appears to be the only population known.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1 (With highest priority for further survey and consideration for gazettal as DRF)

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Wyalkatchem	Cowcowing	Rail Res.	226	Some damaged 19.9.90

RESPONSE TO DISTURBANCE

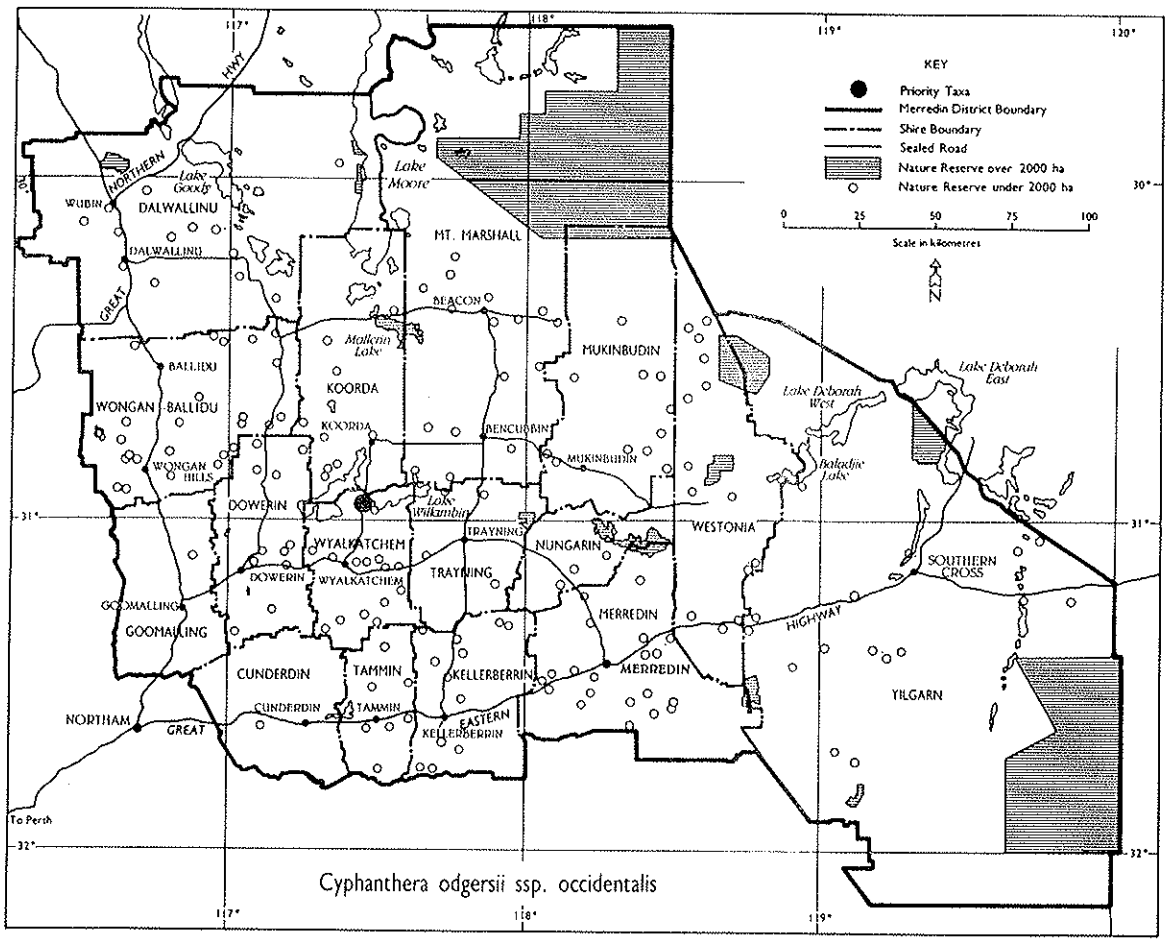
Fire, weed invasion, grazing and canopy cover effects are unknown.

RECOMMENDATIONS

This subspecies is rare, not conserved, and is threatened by accidental destruction at its only known population. Westrail needs to be notified regarding the apparent destruction of some plants by vehicles in the rail reserve.

REFERENCE

Purdie *et al.* (1982).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
Lake Goods
WUBIN
DALWALLINU
Lake Moore
MT. MARSHALL
BEACON
GREAT
Mallecin Lake
MUKINBUDIN
BALLIDU
WONGAN
KOORDA
BENCUBBIN
WONGAN HILLS
DOWERIN
Lake Williambin
TRAYNING
NUNGARIN
WESTONIA
Lake Deborah East
Lake Deborah West
Baladjie Lake
WYALKATCHEM
GOOMALLING
CUNDERDIN
TAMMIN
KELLERBERRIN
MERREDIN
SOUTHERN CROSS
HIGHWAY
YILGARN
NORTHAM
EASTERN
To Perth
Cyphanthera odgersii ssp. occidentalis

DAMPIERA SCAEVOLINA C.A.Gardner ex Rajput & Carolin **Family: Goodeniaceae**

TAXONOMY

This species resembles *D. diversifolia* but differs in its erect stems, linear-oblong leaves and appressed silvery hairs on the outer surface of the petals. The species name *'scaevolina'* refers to the similarity of its flowers to those of the genus *Scaevola*.

DESCRIPTION

A multi-stemmed perennial to 70 cm tall. Stems terete, ribbed with tomentose grooves. Leaves sessile, linear-oblong, 5-10 mm long, 1-1.5 mm wide, entire. Petals blue or white, linear-oblong, lobes to 5.5-7 mm long. Flowering period October to November.

DISTRIBUTION AND HABITAT

D. scaevolina has been recorded from Canna Siding (in the north west wheatbelt) to Beacon and Bencubbin in the Merredin District and Holt Rock east of Hyden in the Narrogin District. It is reported as occurring on sandy and gravelly soils.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Mt Marshall	Beacon	?	?	Last collected 16.10.60
2	Narrogin	Narembeen	Kumminin	?	?	Last collected 21.10.64

RESPONSE TO DISTURBANCE

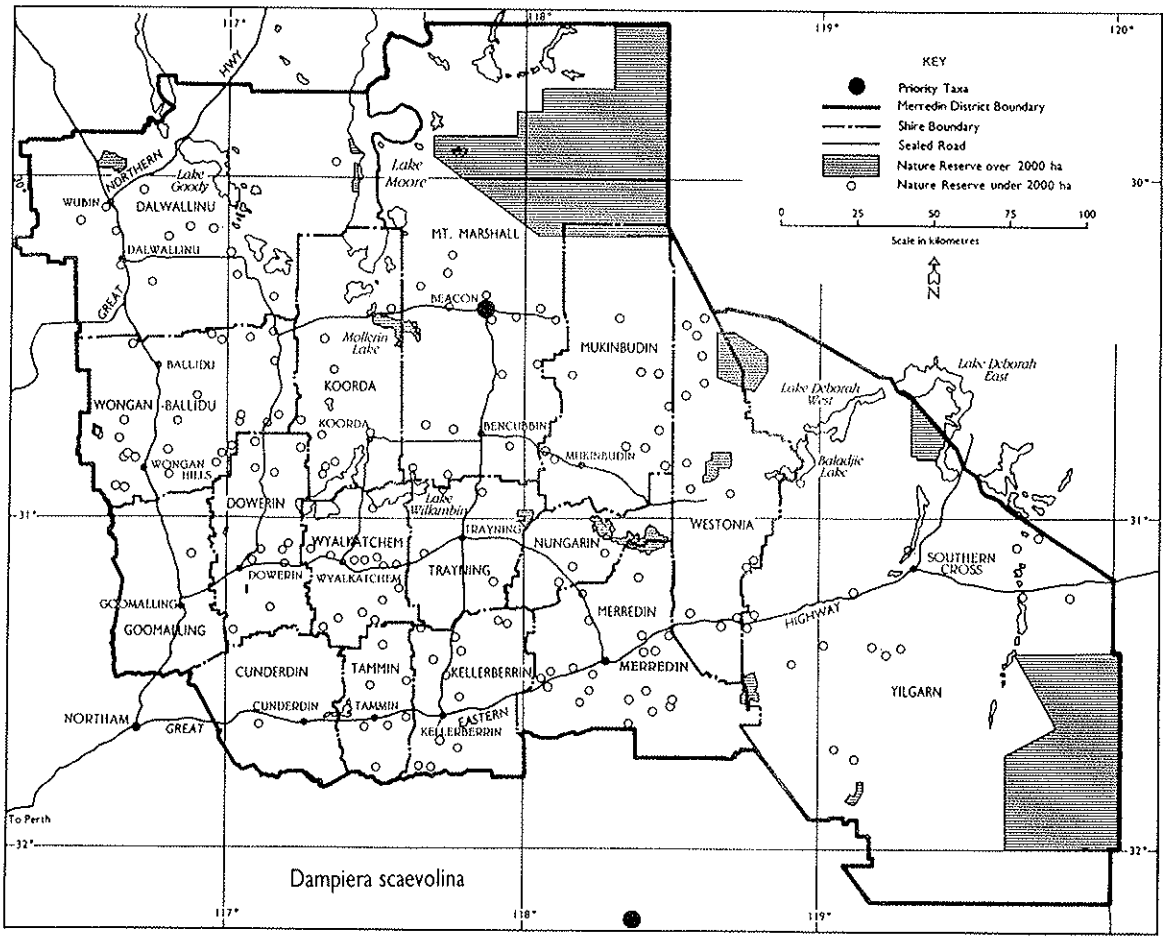
Responses to disturbances such as soil disturbance, fire, weed invasion, grazing and canopy cover are unknown.

RECOMMENDATIONS

No collections have been made of this species since 1964, with only two collections in the 1960s, four in the 1930s and one in 1915. Certainly the areas where it once occurred are now largely cleared for agriculture. Urgent survey of the herbarium localities should be carried out. Priority One status should be maintained for the time being.

REFERENCE

Rajput and Carolin (1988).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Dampiera scaevolina
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
Lake Goody
WUBIN
DALWALLINU
Lake Moore
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
Lake Deborah East
Lake Deborah West
Baladjie Lake
BALLIDU
WONGAN
KOORDA
BENCUBBIN
WONGAN HILLS
DOWERIN
Lake Wilkinbin
WESTONIA
TRAYNING
NUNGARIN
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
EASTERN
To Perth

X *'DRAKODENIA ORNATA'* **Family: Orchidaceae**

TAXONOMY

This taxon is a hybrid between *'Drakonorchis drakeoides'* and *Caladenia pendens*.

DESCRIPTION

Herb to about 25 cm tall, with a terete hairy scape. There is a mid-stem leaf and a shortened upper leaf just below the flower. However, the flower is 6 cm across including the upper and lower sepals. Sepals are green with red-brown midlines, and the labellum has an ornate toothed appendage. Flowering period is September.

DISTRIBUTION AND HABITAT

The species occurs in the Pithara area in tall shrubland of *Melaleuca* and *Acacia* over dense herbage on sandy clay soil. It was found on a rise between salt flats.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

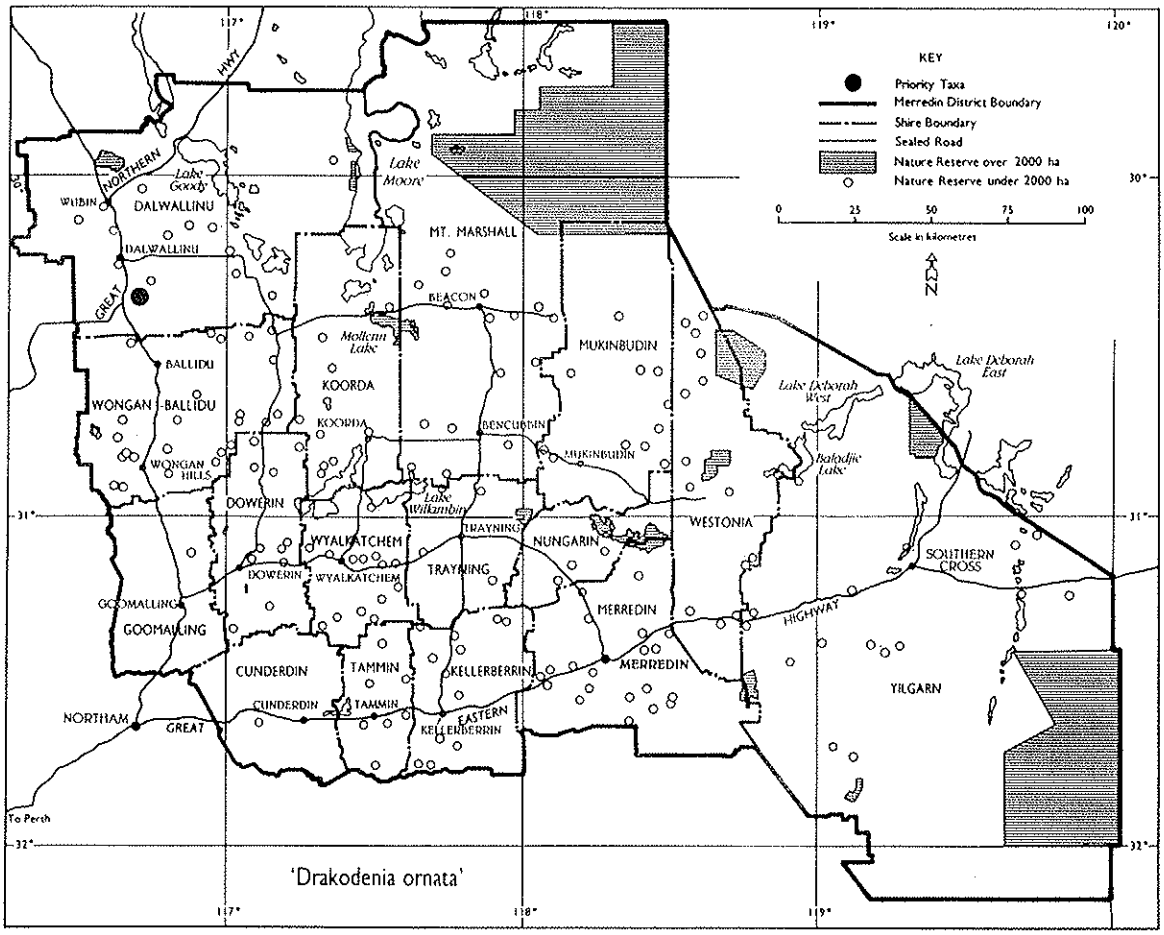
Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Dalwallinu	Pithara	Private	52	Healthy 9.9.88

RESPONSE TO DISTURBANCE

Responses to disturbances of soil, by fire, weed invasion, grazing and canopy cover are unknown.

RECOMMENDATIONS

This taxon is known only from one location where a relatively small number of individuals were recorded. Its hybrid status and mode of reproduction need to be clarified. It has not been recorded from the same area or elsewhere since September 1988.


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
'Drakodenia ornata'
DALWALLINU
WUBIN
MT. MARSHALL
BEACON
MUKINBUDIN
BALLIDU
WONGAN-BALLIDU
KOORDA
BENCUBBIN
WONGAN HILLS
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
GOOMALLING
CUNDERDIN
TAMMIN
KELLERBERRIN
MERREDIN
NORTHAM
YILGARN
SOUTHERN CROSS
HIGHWAY
EASTERN
GREAT
NORTHERN
Lake Goody
Lake Moore
Mollerin Lake
Lake Deborah West
Lake Deborah East
Baladjie Lake
Lake Wilkinbin
To Perth
117°
118°
119°
120°
30°
31°
32°

DRUMMONDITA 'WILSONII' F.H. Mollemans ms **Family: Rutaceae**

TAXONOMY

The leaf characteristics are similar to but significantly smaller than those of DRF *Drummondita ericoides*, while the floral characteristics are similar to but smaller than those of Priority 3 species *D. miniata*.

DESCRIPTION

Shrub to 1 m tall. Leaves glandular, crowded, linear, semi-terete, channelled above, 3-6 mm long and 0.7-1 mm wide, with a large terminal gland. Flowers tubular to 1.5 cm long, terminal, with 1-3 per stem and pink stamens. Calyx lobes are unequal. Flowering period June to September.

DISTRIBUTION AND HABITAT

Occurs in mallee to 4 m tall over heath to 1.2-1.5 m on quartzitic substrate with skeletal olive brown yellow sand soil. *Drummondita* 'wilsonii' occurs in the Parker Range area and has a geographic range of about 500 m.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

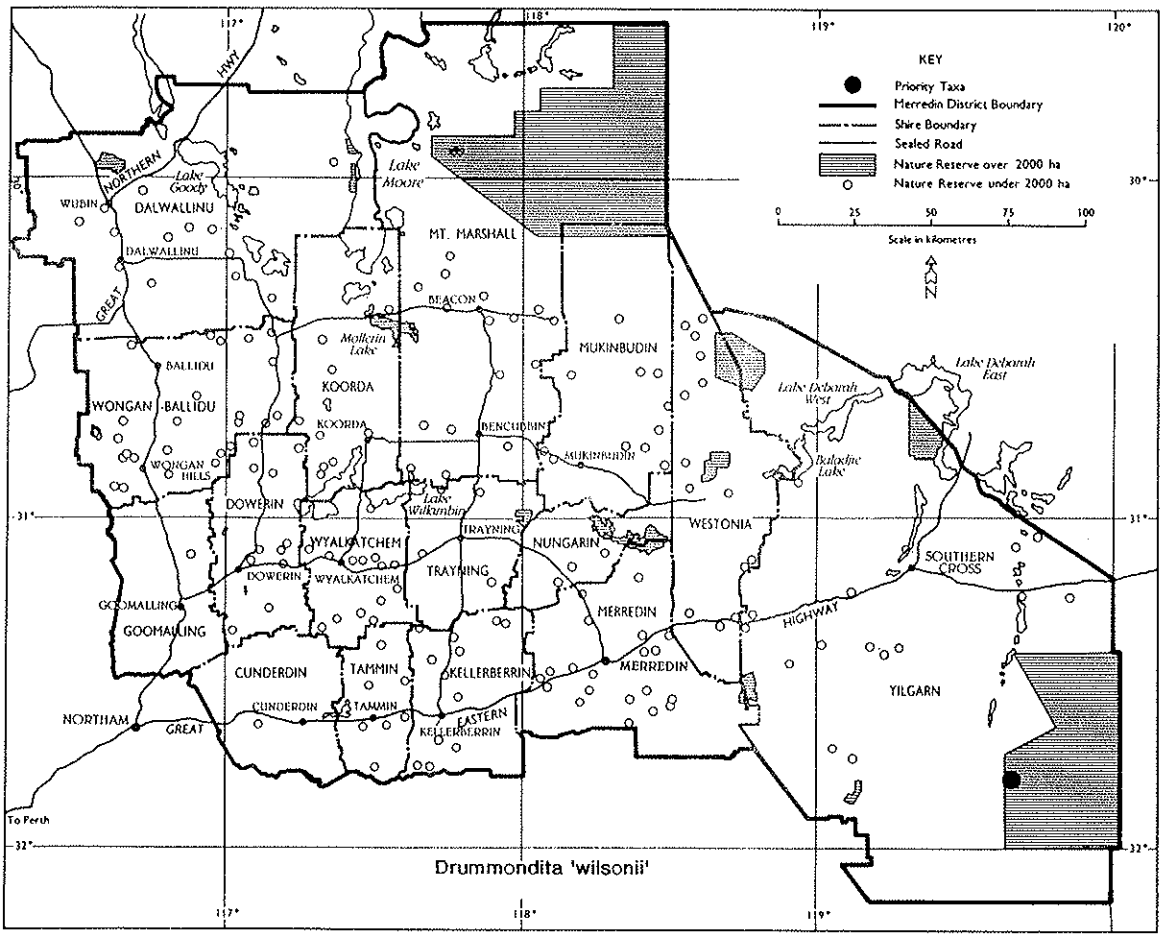
Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Yilgarn	Parker Ra.	VCL	c.2500	Est. 50 seen 14.7.90; some site disturbance

RESPONSE TO DISTURBANCE

Some plants have been affected by site disturbance associated with mineral exploration. Response to fire, weed invasion and grazing is unknown. Canopy cover may be important for this species as thirteen plants were found within dense taller vegetation.

RECOMMENDATIONS

This species is rare, has been affected by mineral exploration and may be damaged by any further mineral exploration activity or by mining, which may occur in the near future. It has a limited geographic range and further detailed surveys are a high priority. A conservation reserve may be necessary to protect it.


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
HWY
NORTHERN
Lake Goody
WUBIN
DALWALLINU
Lake Moore
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN-BALLIDU
BENCUBBIN
MUKINBUDIN
Lake Deborah West
Lake Deborah East
Baladine Lake
WONGAN HILLS
DOWERIN
Lake Wilkinbin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
EASTERN
To Perth
Drummondita 'wilsonii'

EREMOPHILA ADENOTRICHA (F. Muell. ex Benth.) F. Muell. **Family: Myoporaceae**

TAXONOMY

A distinctive somewhat weedy looking shrub, which Blackall and Grieve place in a separate group in the key to *Eremophila*.

DESCRIPTION

Shrub to 1.3 m tall, densely clothed with rust coloured glandular, viscid hairs. Leaves are flattened linear-obtuse to about 2.5 cm long and 2 mm wide, viscid. Flowers solitary, sessile, large with purple petals. Plants progressively flower from older to younger parts so carry all stages from mature fruit through to new buds. Flowering period is September to December.

DISTRIBUTION AND HABITAT

Only known from the Holleton area where it occurs in areas of disturbance on stony red soils in low woodland and scrub vegetation.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Yilgarn	Holleton	VCL	10 000	Est. 13.12.90; becoming senescent

RESPONSE TO DISTURBANCE

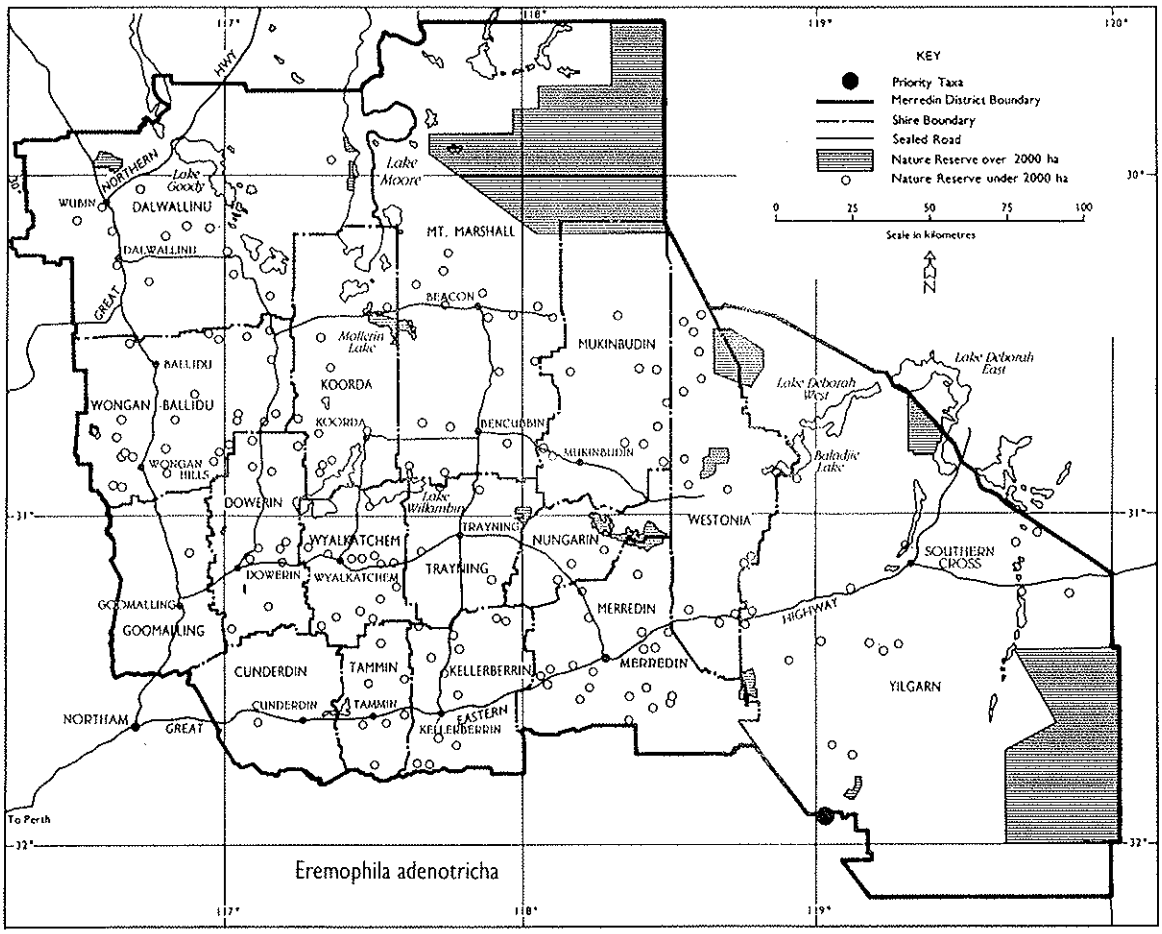
This species is favoured by disturbance after which it regenerates abundantly for a short period before contracting again to very low numbers. Without disturbances it becomes extremely rare and difficult to locate.

RECOMMENDATIONS

E. adenotricha was initially thought to be only poorly collected (1979), however was later presumed extinct (1988), and was subsequently relocated (1990). This species is similar to *Sowerbaea multicaulis* in being naturally rare and only appearing in abundance after disturbance. Monitoring of the known populations is warranted. Research will probably show that it is one of the species of *Eremophila* that produces abundant fruit, but few seed.

REFERENCES

Blackall and Grieve (1975); Marchant and Keighery (1979); Leigh and Briggs (1988).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
NORTHERN
Lake Goody
Lake Moore
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN
WONGAN HILLS
BENCUBBIN
Lake Deborah East
Lake Deborah West
Baladjie Lake
DOWERIN
Lake Wilkinson
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
YILGARN
NORTHAM
To Perth
Eremophila adenotricha

EREMOPHILA 'VERNICOSA' Chinnock ms **Family: Myoporaceae**

TAXONOMY

This species is known only from the type collection made by W.E. Blackall in September 1933.

DESCRIPTION

An erect shrub at least 40 cm tall. Leaves thickened, glossy, dark green, viscid, obovate, 6 mm long and 3 mm wide, with a few prominent veins and a short mucro. Flowers tubular, colour indeterminate (dried brown), to 1 cm long and 5 mm across. Style exserted, but stamens only slightly so. Flowering period September.

DISTRIBUTION AND HABITAT

The location on the herbarium specimen is 'near Kalannie'. Its habitat may be open in association with saline lakes possibly east of Kalannie and the glossy leaves suggest an adaptation to exposed harsh conditions.

CONSERVATION STATUS

Current Status: P1 Recommended Status: DRF (Presumed extinct)

KNOWN POPULATIONS

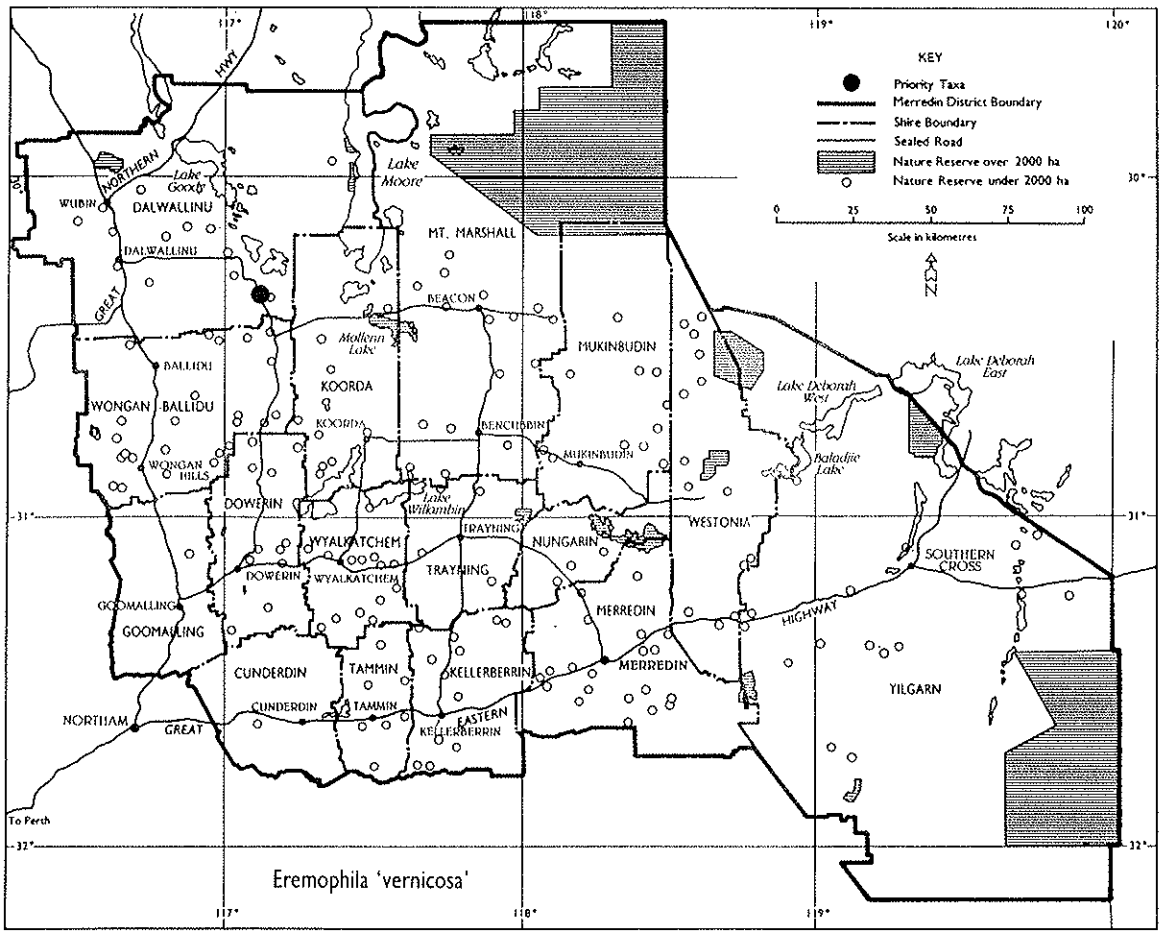
Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Dalwallinu	Kalannie	?	?	Known only from type collection in 1933

RESPONSE TO DISTURBANCE

Response to soil disturbance or other factors such as fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Only collected once in 58 years. This species is now presumed extinct.


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Eremophila 'vernicosa'
HWY
NORTHERN
Lake Goorly
WUBIN
DALWALLINU
MT. MARSHALL
Lake Moore
BEACON
GREAT
Mollenn Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN
BENCUBBIN
WONGAN HILLS
Lake Deborah West
Lake Deborah East
Baladjie Lake
DOWERIN
Lake Wilkamin
WESTONIA
WYALKATCHEM
TRAYNING
NUNGARIN
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
EASTERN
To Perth
117°
118°
119°
120°
30°
31°
32°

ERIOSTEMON 'CHIDDARCOOPINGENSIS' F.H. Mollemans ms Family: Rutaceae

TAXONOMY

This undescribed species has affinities with *E. falcatus* but the sepals are narrower and although the leaves and branches are glandular verrucose, *E. falcatus* has a different character of glands from those of *Eriostemon* 'chiddarcoopingensis'. The nature of branching is also different with *E. falcatus* showing more curvature in its branching, while the stature and habitat of the two species also differ. *E. falcatus* almost certainly comes from sandplain habitat.

DESCRIPTION

An erect shrub to 90 cm tall and up to 60 cm across. Leaves ascending, sometimes falcate, 6 mm long, glandular verrucose with glands strongly exserted. Flowers white, solitary. Flowering period September to October.

DISTRIBUTION AND HABITAT

This species occurs on granite sand loam soil in scrub or open shrubland vegetation to 2 m tall. It was collected from Chiddarcooping Nature Reserve.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

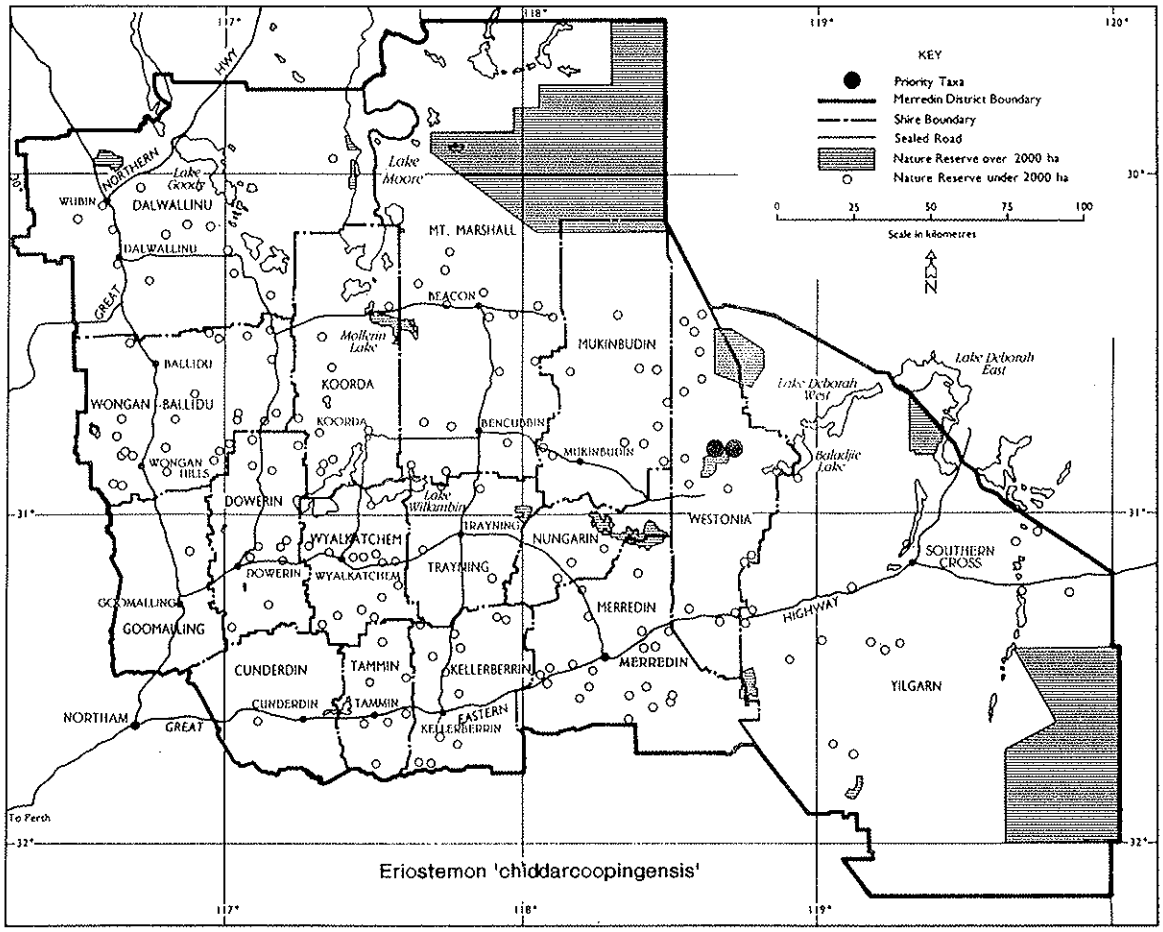
Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1a	Merredin	Westonia	Chiddarcooping E	Nature Res.	12	Healthy 7.11.90
1b	Merredin	Westonia	Chiddarcooping W	Nature Res.	6	Some site disturbance 8.11.90

RESPONSE TO DISTURBANCE

Canopy cover is not important as it occurs both as an understorey species and in the open. It is also present after limited site disturbance. Response to fire, weed invasion and grazing is unknown.

RECOMMENDATIONS

This species occurs in Chiddarcooping at the boundary of the reserve where it is under threat from firebreak maintenance. Further survey is required. Although it is within a conservation reserve, small population size indicates it warrants Priority One status and ongoing management.


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
Lake Goodg
Lake Moore
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
Lake Deborah East
Lake Deborah West
BALLIDU
KOORDA
WONGAN BALLIDU
BENCUBBIN
WONGAN HILLS
Baladjie Lake
DOWERIN
Lake Wilkinbin
TRAYNING
WESTONIA
WYALKATCHEM
NUNGARIN
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
EASTERN
To Perth
Eriostemon 'chiddarcoopingensis'

ERIOSTEMON TRAYNINGENSIS F.H.Mollemans ms **Family: Rutaceae**

TAXONOMY

This species has affinities with *Eriostemon falcatus*, but the leaves are longer i.e. 9 mm instead of 6 mm and the stems and branches are not distinctly glandular verrucose (warty).

DESCRIPTION

Erect shrub to 1 m tall. Leaves thickened, terete, glandular, ascending, to 9 mm long and 1-1.5 mm wide. Flowers white, 5-merous, solitary, terminal. Flowering period is August to October.

DISTRIBUTION AND HABITAT

Eriostemon trayningensis is known from a geographic range of 1.3 km to the south-east of Trayning where it occurs on deep yellow sand in scrub heath vegetation.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

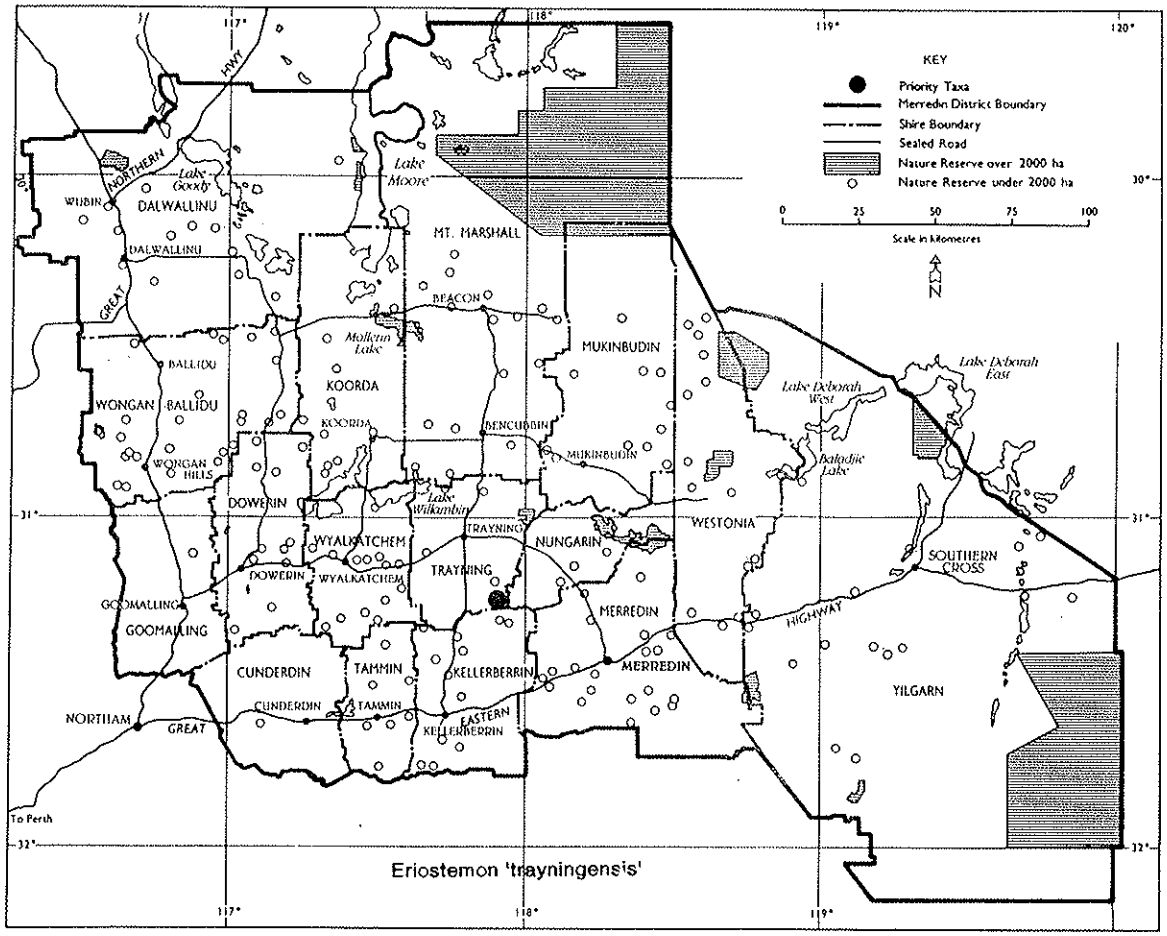
Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Trayning	Kodj Kodjin	Road Res.	65	Healthy 18.9.90

RESPONSE TO DISTURBANCE

Response to fire and soil disturbance is unknown. The species is found as an undershrub on a degraded road verge with some weed invasion evident and rabbits present. Locust damage did occur in late 1990 (J. Armstrong, W.A. Herbarium, personal communication) where locusts actually cut the flowers off many of the plants. This will reduce the seed output of this species but is probably only a temporary problem.

RECOMMENDATIONS

This species is rare and occurs in an area with little remnant vegetation. What does remain is mostly restricted to narrow road verges. Surveys along roads in the vicinity of the known population failed to locate additional plants. Further survey is essential. Research and management of the known population are required. Propagation is recommended.


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
Lake Goorly
WUBIN
DALWALLINU
Lake
Lake Moore
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN
WONGAN HILLS
BENCUBBIN
Lake Deborah West
Lake Deborah East
Baladjie Lake
DOWERIN
Lake Wilkinbin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
YILGARN
NORTHAM
To Perth
Eriostemon 'trayningensis'

GENUS NOV. (aff. *MELICHRUS*) *F.H. & M.P. Mollemans* 3069 **Family: Epacridaceae**

TAXONOMY

This new taxon has affinities with an eastern Australian (NSW, Qld) genus of Epacridaceae called *Melichrus*, the affinities being in the leaves, axillary flowers and internal floral characteristics. *Melichrus* is a (wet) mesic adapted genus with large leaves and flowers, while the new taxon has smaller leaves and flowers typical of an arid adapted group. There are two taxa in this new genus; the one dealt with here having hairless leaves. No details are currently available on the second apart from it having hairs on leaves and being collected along the Great Eastern Highway. Genus nov. (aff. *Melichrus*) is a very interesting taxon which may be a phytogeographic remnant (or relict) of a former pan-Australian group whose present distribution is the result of development of aridity in central Australia since the middle Tertiary.

DESCRIPTION

Shrub to 60-80 cm tall. Leaves crowded, alternate, tending to be appressed to the stem, flat on top, pungent-pointed, thick with a distended mid-zone below, 2-2.5 mm long and 1 mm wide. Flower pink-red, *Conostephium*-like, tapering towards the apex 4-6 mm long and 1.5 mm wide. Flowering period June to July.

DISTRIBUTION AND HABITAT

This taxon is known from three localities within the Yilgarn Shire where it occurs in heath and tall shrubland vegetation. There are two locations north-west and one east of Mt Jackson all on sandplain with or without laterite gravel.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Kalgoorlie	Yilgarn	Helena Aurora Ra	VCL	3	Healthy 20.10.90
2	Kalgoorlie	Yilgarn	Emu Fence	VCL	9	Healthy 10.7.90
3	Kalgoorlie	Yilgarn	Diemals	VCL	3	Healthy 11.7.90

RESPONSE TO DISTURBANCE

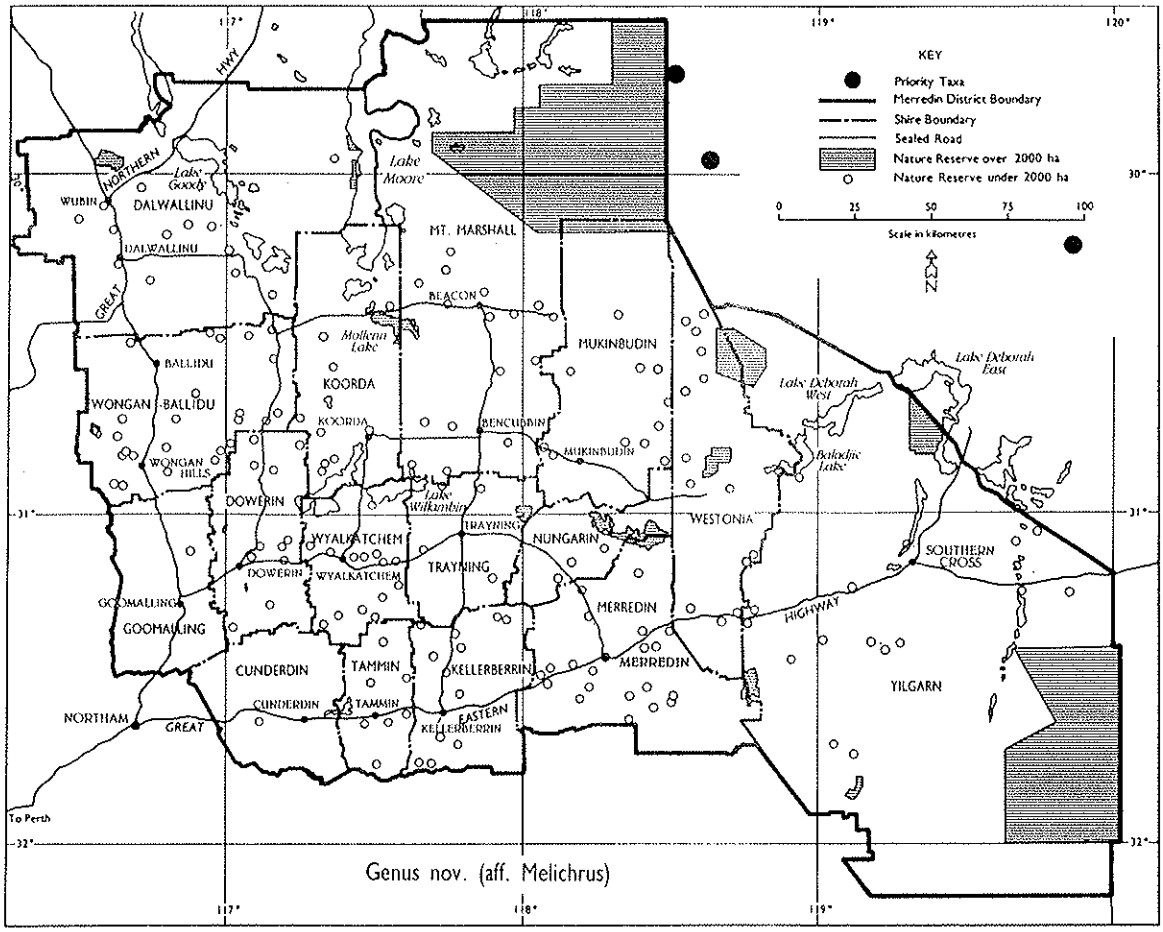
Response to site disturbance, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Appears to be known only from a small number of collections and individuals in isolated country and the collections having only been made in the last six years. It seems to be a rare taxon but further site surveys are required to accurately assess its conservation status. This is another taxon that would benefit from a conservation reserve over Bungalbin Hill-Helena and Aurora Range and the adjacent north-east sandplains.

REFERENCES

Beadle *et al.* (1982); J. Powell (National Herbarium of NSW, personal communication).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Lake Moore
Lake Goody
Mollerin Lake
Lake Deborah East
Lake Deborah West
Balodie Lake
Lake Wilkinbin
MT. MARSHALL
BEACON
MUKINBUDIN
BENCUBBIN
KOORDA
BALLIDU
WONGAN HILLS
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
SOUTHERN CROSS
MERREDIN
YILGARN
GOOMALLING
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
NORTHAM
GREAT
NORTHERN
HWY
To Perth
Genus nov. (aff. Melichrus)

GOODENIA PUSILLIFLORA F. Muell. **Family: Myoporaceae**

Small-flowered Goodenia

TAXONOMY

Has some similarity to *G. calygynoides* particularly in the nature of the leaves.

DESCRIPTION

Annual herb with several stems 1-20 cm long. Leaves basal, incised to deeply lobed 1-4 cm long, stalked, dull green in colour. Flowers yellow, 6-8 mm long, fused to a tube at the base, solitary. Fruit ovoid 5-8 mm, seeds ovate, 4-5 mm, winged. Flowering period August to October.

DISTRIBUTION AND HABITAT

Occurs in south-western New South Wales and other parts of eastern Australia where it is common, and in the drier parts of Western Australia between Merredin and Menzies and Ravensthorpe. It generally occurs on clay soils with a loamy character and has been recorded in Salmon Gum woodland, scrub and dwarf scrub vegetation in Western Australia. It may only appear in wetter years.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS (Merredin District Only)

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Merredin	Burracoppin West	?	?	Last collected 21.10.45

RESPONSE TO DISTURBANCE

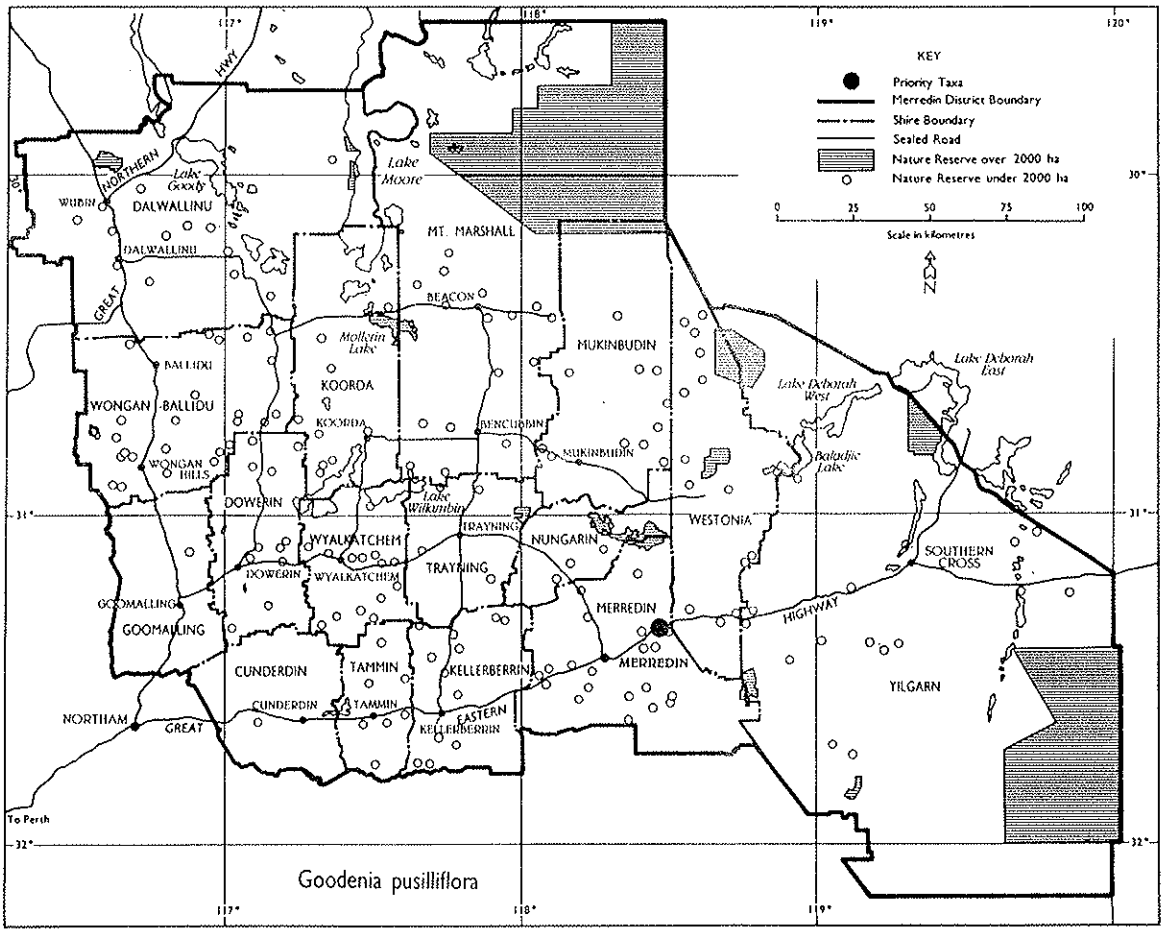
Response to disturbance such as fire, weed invasion, grazing, canopy cover and site disturbance is unknown. Its appearance in eastern Australia is associated with areas of water i.e. after heavy rainfall on any soil type.

RECOMMENDATIONS

This species appears to be rare in Western Australia, however, this may only be due to collection bias and not a true indication of its status. Ken Newbey made three widely spaced collections during August 1981 because he was in the field at the right time and collected annuals. It has not been collected in the Merredin district since 1945, but it is a very inconspicuous plant. More active collection of annuals is likely to indicate that it is not rare in Western Australia, but since there are only four verified collections for Western Australia it should remain a Priority One species for the time being.

REFERENCE

Cunningham *et al.* (1981).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Goodenia pusilliflora
117°
118°
119°
120°
30°
31°
32°
NORTHERN HWY
Lake Goodly
Lake Moore
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
GREAT
Mollotin Lake
MUKINBUDIN
Lake Deborah East
Lake Deborah West
Baladjie Lake
BALLIDU
KOORDA
WONGAN
WONGAN HILLS
BENCUBBIN
DOWERIN
Lake Wilkinbin
TRAYNING
WESTONIA
NUNGARIN
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
EASTERN
To Perth

GREVILLEA CHRISTINAE McGillivray **Family: Proteaceae**

TAXONOMY

This species has affinities with *G. costata.*

DESCRIPTION

Shrub to 50 cm tall. Leaves linear with closely revolute margins and a pungent tip, glabrous. Flowers small with creamish or reddish styles. Flowering period September.

DISTRIBUTION AND HABITAT

Within the Merredin District, this species is only known from the Mortlock River near Goomalling. The vegetation is scrubby in nature with the substrate a thin layer of sand over hard laterite.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1 (With highest priority for further survey and consideration for gazettal as DRF)

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Goomalling	Goomalling	Shire Res.	*ca* 500	Good 9/9/91
2	Moora	Moora		Road Res.	*ca* 100	22.8.91 Healthy
3	Moora	Watheroo		Road Res.	10	22.8.91 Healthy
4	Moora	Watheroo		Road Res.	11	22.8.91 Healthy

RESPONSE TO DISTURBANCE

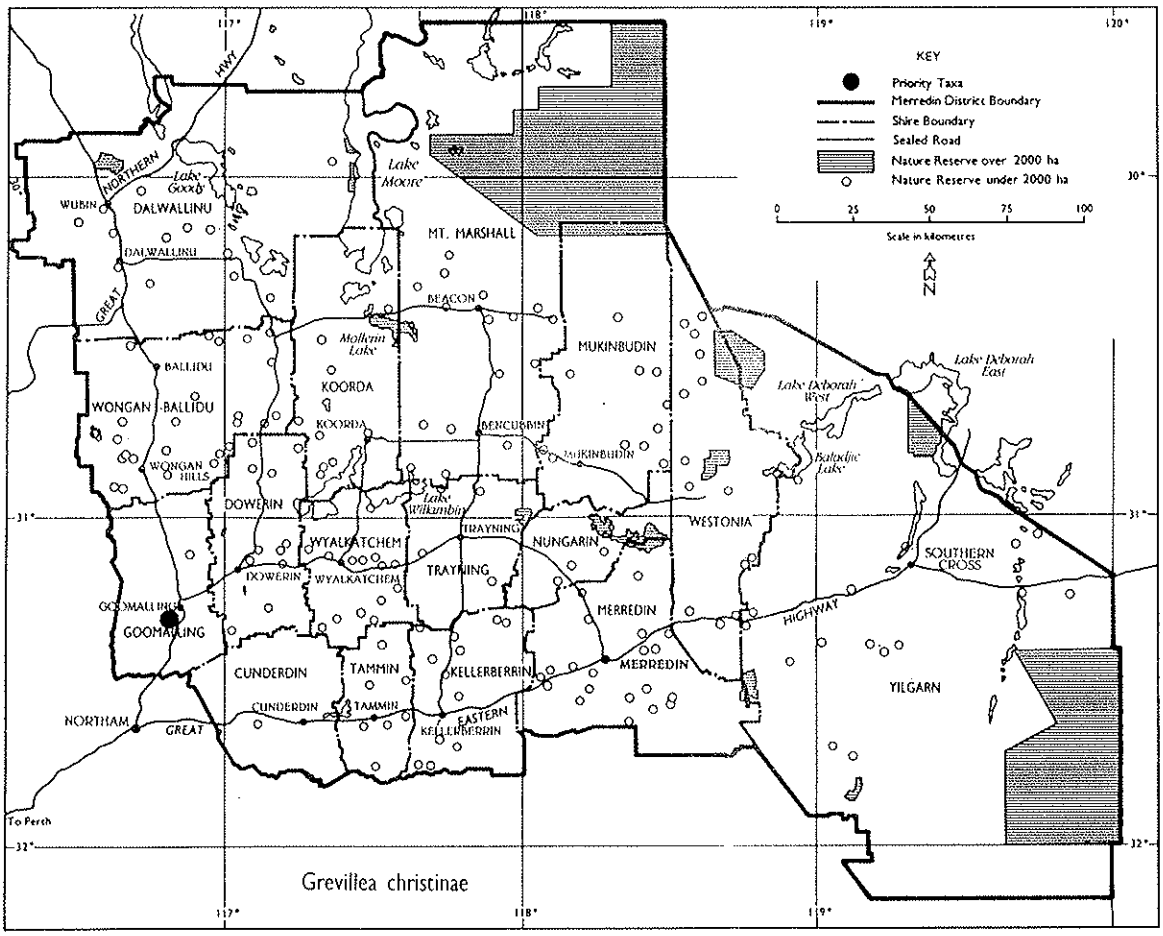
Responses to site disturbance, fire, weed invasion, grazing and canopy cover are not known.

RECOMMENDATIONS

Only a three-line description is available on this species. It occurs in an area used for borrow-pit purposes and dumping of rubbish, so is threatened by these activities. The available remnant vegetation, where it is known to occur, is only about 3 ha with significant disturbance apparent so it is endangered. Gazettal warranted along with high priority survey and management of the known locality. Acquisition of this area as a reserve may be necessary.

REFERENCE

McGillivray (1986).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Grevillea christinae
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
MUKINBUDIN
BALLIDU
WONGAN-BALLIDU
KOORDA
WONGAN HILLS
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
GOOMALLING
CUNDERDIN
TAMMIN
KELLERBERRIN
MERREDIN
SOUTHERN CROSS
YILGARN
NORTHAM
EASTERN HIGHWAY
GREAT NORTHERN HWY
To Perth

GREVILLEA LISSOPLEURA McGillivray **Family: Proteaceae**

TAXONOMY

G. lissopleura is closely related to *G. scabrida*, but differs from it in having smooth leaves and almost sessile flowers.

DESCRIPTION

Erect shrub to 1.2 m tall and 0.7 m across. Leaves simple, linear, slightly curved, 1- 3.5 cm long and 1-1.2 mm wide, margin revolute, with an obtuse mucro at the apex. Flower colour unknown. Flowering period August.

DISTRIBUTION AND HABITAT

This species is known from only one locality to the north of Mt Holland where it was collected in 1979. Its recorded habitat was open shrubland on well-drained stony soils.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Yilgarn	NNW of Mt Holland	VCL	? 3	A few scattered individuals 23.8.79

RESPONSE TO DISTURBANCE

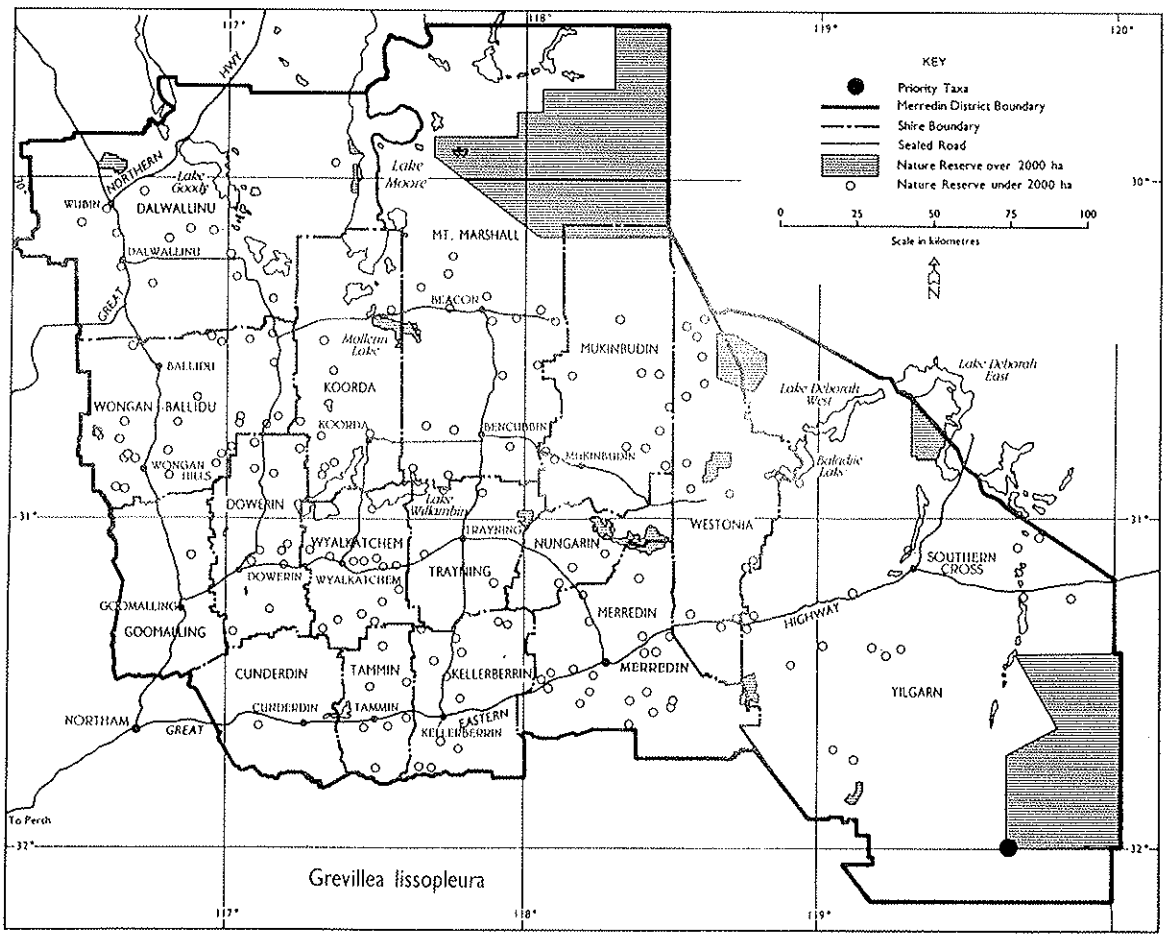
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

There have been at least six unsuccessful searches for this taxon, including three in 1990. Management and monitoring of the only known population is a priority.

REFERENCE

McGillivray (1986).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Grevillea lissopleura
DALWALLINU
MT. MARSHALL
MEACON
MUKINBUDIN
KOORDA
WONGAN HILLS
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
SOUTHERN CROSS
GOOMALLING
MERREDIN
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
HIGHWAY
To Perth

GREVILLEA PILOSA A.S. George subsp. *DISSECTA* McGillivray **Family: Proteaceae**

TAXONOMY

This subspecies differs from *G. pilosa* subsp. *pilosa* principally in the leaves, which are deeply divided (pinnate) with linear, rigid, pungent pointed lobes. These lobes resemble the main venation only of *G. pilosa* subsp. *pilosa* with the interstitial leaf tissue absent.

DESCRIPTION

Shrub to 1 m tall. Leaves deeply divided, pungent pointed, to 2 cm long. Flowers are densely villous (short-hairy) and are purple-red in colour. Flowering period is February.

DISTRIBUTION AND HABITAT

There are four recorded locations for this taxon all to the south-east of Marvel Loch. Its habitat is not recorded.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Yilgarn	Mt Holland Rd	VCL	?	1988 P. Olde
2	Merredin	Yilgarn	Mt Holland Rd	VCL	?	1988 P. Olde
3	Merredin	Yilgarn	Split Rock	VCL	?	11.10.70 W.H. Butler
4	Kalgoorlie	Coolgardie	Barker Lake	VCL	?	13.2.73 W.H. Butler

RESPONSE TO DISTURBANCE

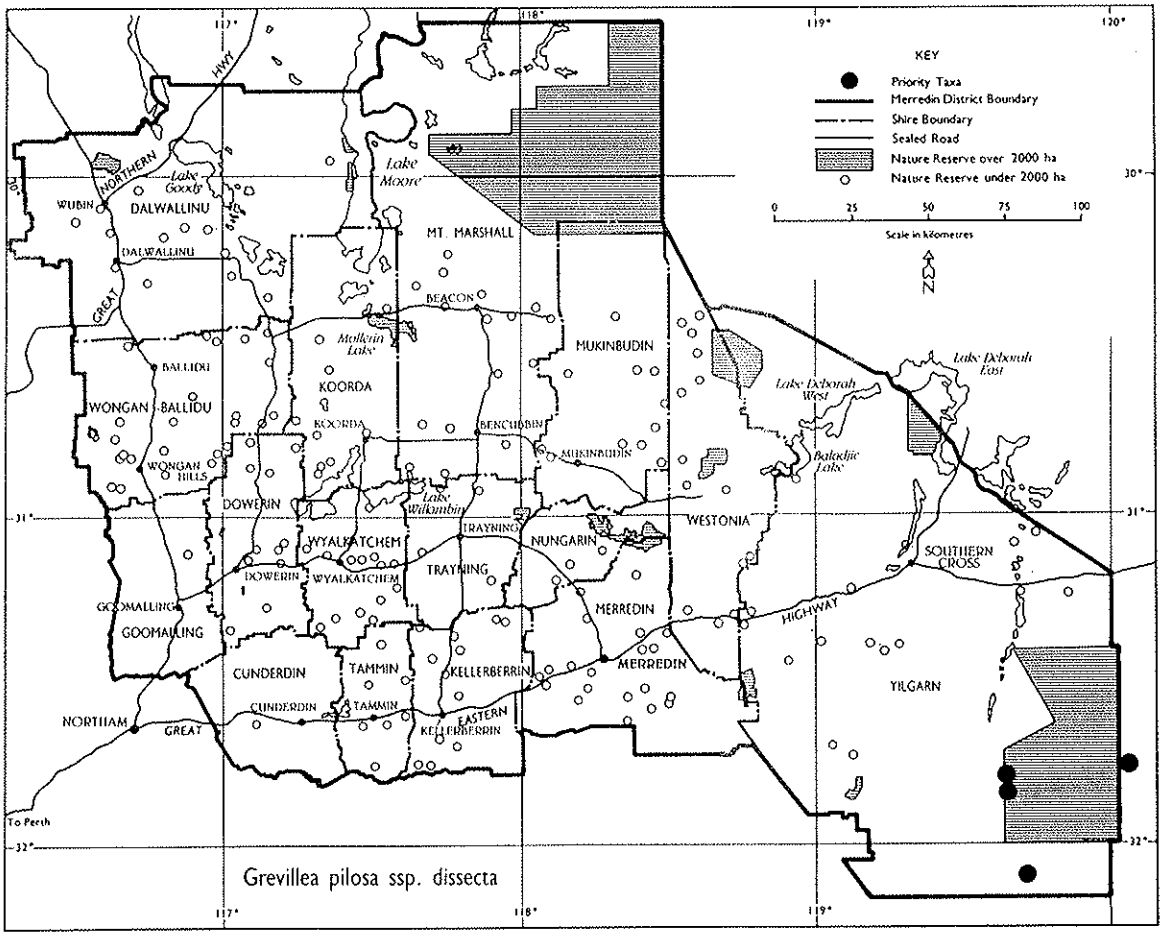
Responses to disturbances of soils, by fire, weed invasion, grazing and canopy cover unknown.

RECOMMENDATIONS

G. pilosa is probably more common than the collections indicate, but should remain as a Priority One species until further surveys have satisfactorily determined its status.

REFERENCE

McGillivray (1986).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
Lake Goods
Lake Moore
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN HILLS
BENCUBBIN
Lake Deborah West
Lake Deborah East
Baladjie Lake
DOWERIN
Lake Wilkomlin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
YILGARN
NORTHAM
To Perth
Grevillea pilosa ssp. dissecta

GREVILLEA ROSIERI McGillivray **Family: Proteaceae**

TAXONOMY

This species is related to *G. pityophylla* but it has shorter leaves, a few-flowered inflorescence and minute bracts.

DESCRIPTION

Bushy, erect shrub to about 1.2 m tall. Leaves erect, rigid, linear-terete, less than 7 cm long. Flowers red, arranged in few-flowered approximately sessile umbels on the old wood. Flowering period is July.

DISTRIBUTION AND HABITAT

G. rosieri is known only from one collection made in 1959 on the east side of Cowcowing Lakes. Its habitat is unknown.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Dowerin	Doodarding	?	?	B. Rosier July 1959

RESPONSE TO DISTURBANCE

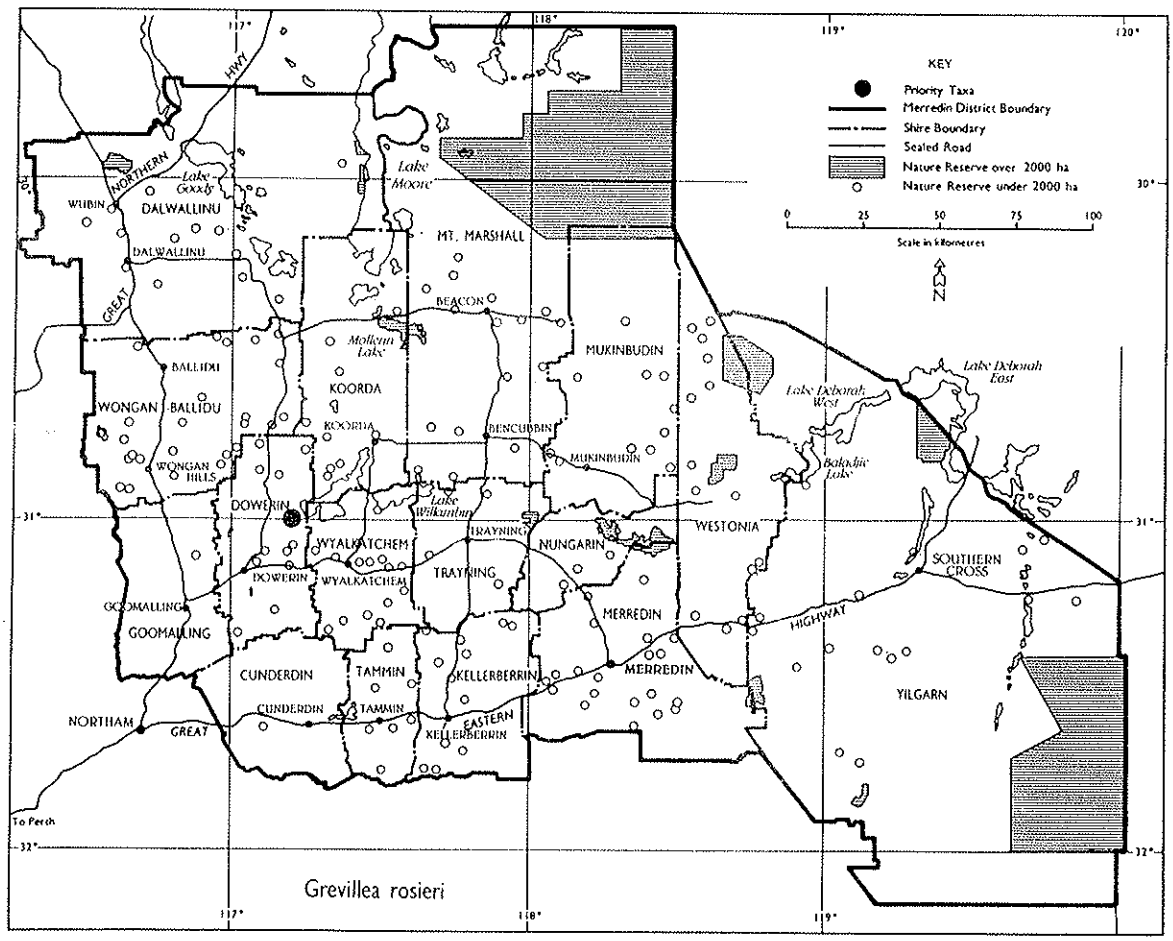
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Survey of the known locality is required as a matter of priority. This species has not been collected for 32 years in an area that is now largely cleared. Site survey may show it to be extinct.

REFERENCE

McGillivray (1986).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
Lake Goody
WUBIN
DALWALLINU
MT. MARSHALL
Lake Moore
BEACON
GREAT
Mollerin Lake
BALLIDU
WONGAN
KOORDA
MUKINBUDIN
Lake Deborah East
Lake Deborah West
BENCUBBIN
WONGAN HILLS
Bakodjie Lake
DOWERIN
Lake Brookman
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
YILGARN
NORTHAM
To Perth
Grevillea rosieri

GREVILLEA sp. Mt Holland (N. Marriott) **Family: Proteaceae**

TAXONOMY

Superficially similar to *Dryandra tridentata* in leaf characteristics.

DESCRIPTION

A shrub to 1 m high with stiff *Dryandra*-like foliage (similar to *D. tridentata*).

DISTRIBUTION AND HABITAT

There are two recorded occurrences, north and south of Mt Holland, respectively. Habitat details are as yet unavailable.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Yilgarn	Mt Holland Nth	VCL	?	? Collected May 1987
2	Narrogin	Kondinin	Mt Holland Sth	VCL	?	? Collected May 1987

RESPONSE TO DISTURBANCE

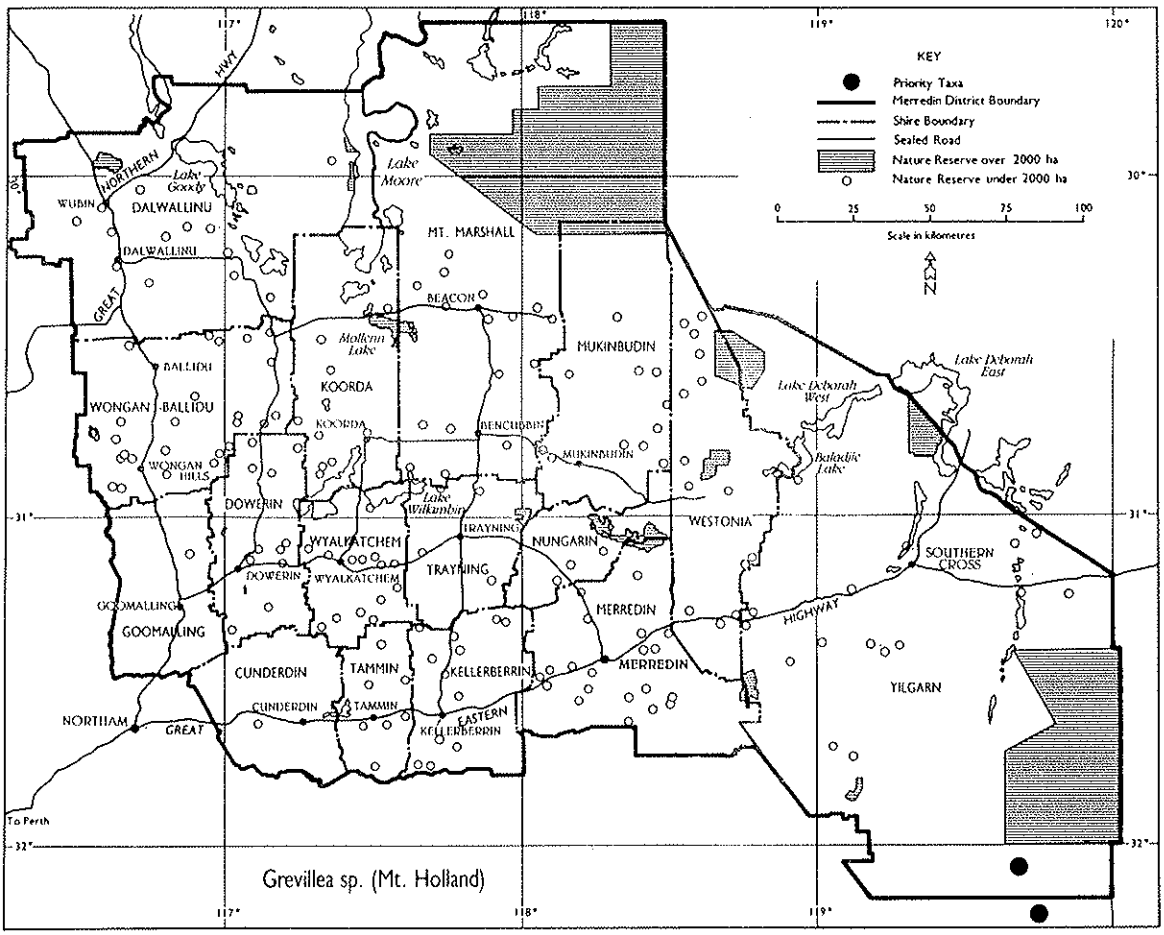
Responses to soil disturbance, fire, weed invasion, grazing and canopy cover unknown.

RECOMMENDATIONS

Further details on the locations of this taxon are required, along with a detailed description and habitat, and then a follow-up survey.

REFERENCES

Marriott (1988, 1989).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
119°
120°
30°
31°
32°
HUNT
NORTHERN
Lake Goxby
WUBIN
DALWALLINU
LANE
Lake Moore
MT. MARSHALL
BEACON
GREAT
Mollenn Lake
MUKINBUDIN
Lake Deborah East
Lake Deborah West
BALLIDU
WONGAN
KOORDA
BENCUBBIN
Baladjie Lake
WONGAN HILLS
DOWERIN
Lake Wilkinbin
TRAYNING
WESTONIA
WYALKATCHEM
NUNGARIN
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
EASTERN
To Perth
Grevillea sp. (Mt. Holland)

HALGANIA TOMENTOSA Helms ex Ewart & J. White **Family: Boraginaceae**

TAXONOMY

This taxon has affinities with *H. integerrima* from which it can be distinguished by the longer ovate to obovate leaves. Flowers in the two species are similar which may lead to confusion. The distributions do not appear to overlap.

DESCRIPTION

A somewhat woody herb 15-30 cm high. Stems wiry, densely short-hairy. Leaves thickened, 6-10 mm long, shortly petiolate, alternate, white-hairy. Flowers usually solitary, terminal. Petals 5, to 1 cm long, acute, free almost to the base. Calyx lobes brown, glandular-hairy. Flowering period October to November.

DISTRIBUTION AND HABITAT

This species occurs from Chiddarcooping to east of Merredin and Moorine Rock to Hatter Hill. It occurs in pale yellow-brown sand with or without laterite gravel in vegetation of *Eucalyptus* and *Allocasuarina* scrub.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Yilgarn	Moorine Rock	?	?	? Collected 1962 J.S. Beard
2	Esperance	Ravensthorpe	Hatters Hill	?	?	? Collected 1929 C.A. Gardner
3	Merredin	Yilgarn	Bodallin	MRD Road Res.	15	Healthy 15.10.90
4	Merredin	Yilgarn	Nulla Nulla	MRD Road Res.	20	Healthy 15.10.90
5	Merredin	Westonia	Chiddarcooping	Road Res./Nature Res.	15+ 15+	Healthy 8.11.9 Healthy 8.11.90

RESPONSE TO DISTURBANCE

H. tomentosa was collected from graded road verges in 1990 and is probably a disturbance opportunist. Response to fire, weed invasion, grazing and canopy cover is unknown.

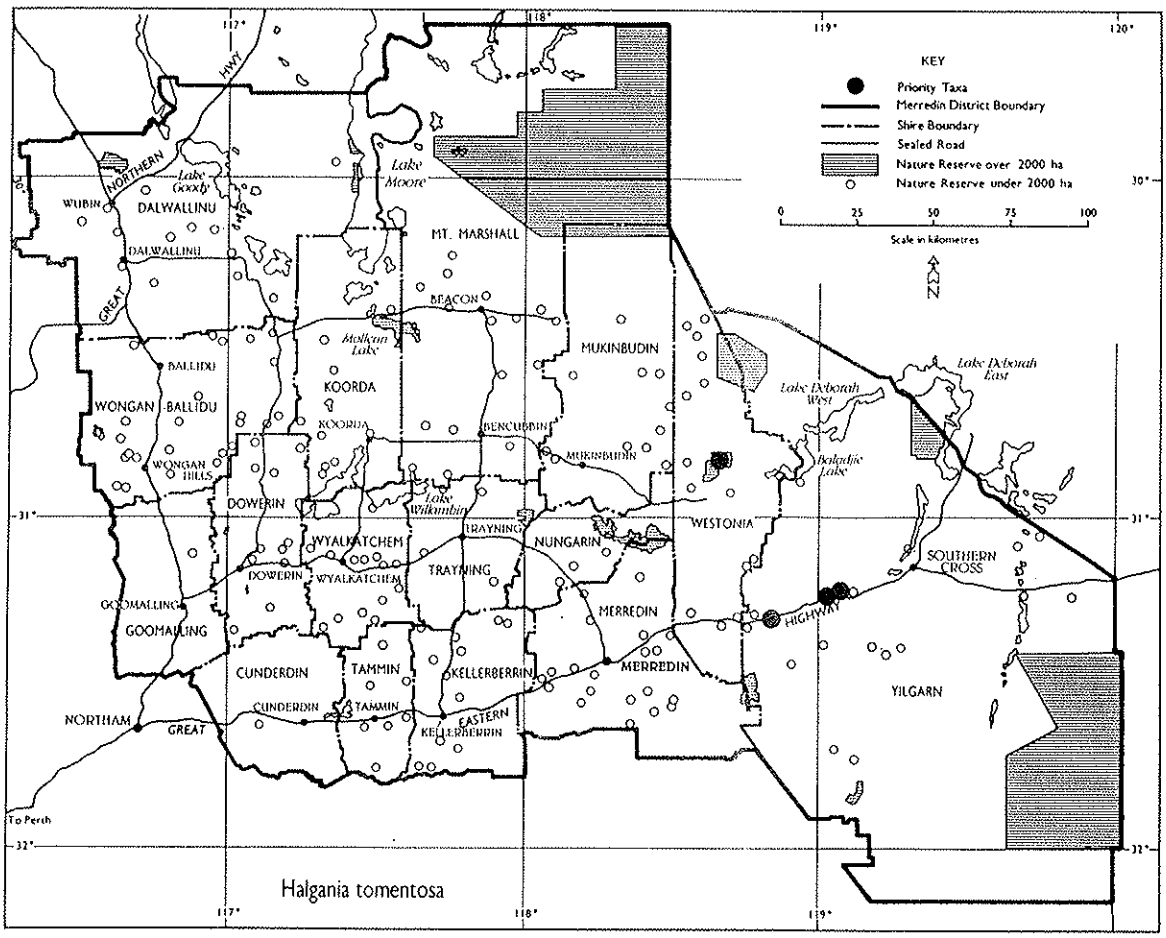
RECOMMENDATIONS

The species appears to be rare. Further survey is required in tracts of vegetation adjacent to recorded occurrences for additional plants. Gazettal is possibly warranted, but its taxonomic position relative to *H. integerrima* requires clarification.

REFERENCES

Ewart and White (1910); Blackall and Grieve (1981).

N.B. Since this summary was prepared, sorting of herbarium material by volunteers has revealed five additional collections from near Tammin Reserve (1967), east of Lake King (1964), north of Esperance (1966), east of Lake Cronin cross roads (1984) and Boorabbin National Park (1985).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Halgania tomentosa
DALWALLINU
WUBIN
MT. MARSHALL
BEACON
MUKINBUDIN
KOORDA
BENCUBBIN
MERREDIN
WONGAN HILLS
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
SOUTHERN CROSS
GOOMALLING
CUNDERDIN
TAMMIN
KELLERBERRIN
NORTHAM
YILGARN
Lake Moore
Lake Deborah East
Lake Deborah West
Baladjie Lake
Lake Wilkinbin
To Perth
HIGHWAY
GREAT
NORTHERN

HEMIGENIA OBOVATA F. Muell. **Family: Lamiaceae**

TAXONOMY

H. obovata has affinities with two other taxa, *H. glabrescens* which is priority 2 and *H. obtusa* which is DRF presumed extinct. It differs in the leaves, which are relatively short at 6-8 mm and in the flower which has a very long middle petal in the lower lobe.

DESCRIPTION

Shrub to 1 m, erect or spreading. Leaves obovate, flat, 6-8 mm long, glabrous. Flower white, upper lip shortly bidentate and middle lower lobe very long. Flowering period May and October.

DISTRIBUTION AND HABITAT

This taxon occurs on sandy or gravelly soil generally in heath vegetation from South Ironcap north to Cheritons and west to near Skeleton Rocks.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Narrogin	Kondinin	South Ironcap	VCL/Road Res.	2	One senescent 26.5.90
2	Merredin	Yilgarn	NW Mt Holland	VCL	2	Healthy 25.5.90
3	Merredin	Yilgarn	Mt Holland	VCL	30	Healthy 18.10.90
4	Merredin	Yilgarn	Cheritons	VCL	3	Healthy 14.7.90
5	Merredin	Yilgarn	Skeleton Rocks	VCL	1	Healthy 18.10.90

RESPONSE TO DISTURBANCE

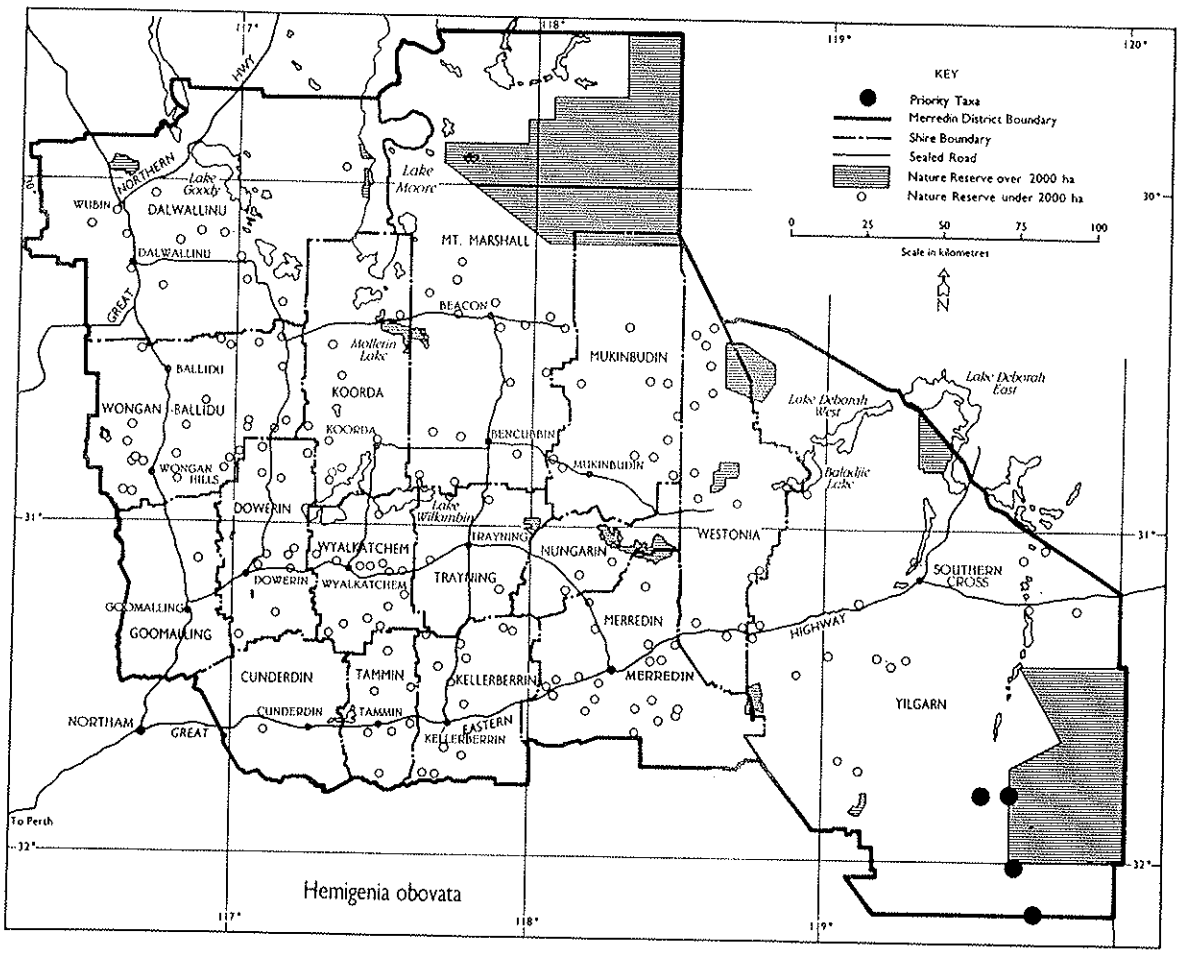
Population 1 includes one plant in an old borrow-pit, otherwise the species is scattered in undisturbed vegetation. Response to other soil disturbance, fire, weed invasion, grazing, and canopy cover is unknown.

RECOMMENDATIONS

This species appears to be rare, and restricted to scattered populations of low numbers in the south Yilgarn. Further survey is needed to clarify its conservation status.

REFERENCES

Blackall and Grieve (1981); B. Conn (National Herbarium of NSW, personal communication).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Hemigenia obovata
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
MUKINBUDIN
BALLIDU
WONGAN HILLS
KOORDA
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
POWERIN
GOOMALLING
MERREDIN
CUNDERDIN
TAMMIN
KELLERBERRIN
NORTHAM
SOUTHERN CROSS
YILGARN
HIGHWAY
GREAT
EASTERN
To Perth
Lake Moore
Lake Goorly
Mollerin Lake
Lake Wilkunbin
Lake Deborah West
Lake Deborah East
Baladjie Lake

LEPIDIUM MERRALLII F. Muell. **Family: Brassicaceae**

TAXONOMY

In the *Flora of Australia* treatment, *L. merrallii* is placed by Hewson (1982) near *L. virginicum* with similarities in basal leaves and silicula, and differences in sepal length indicated.

DESCRIPTION

Herb, annual or ephemeral, to 15 cm tall. Basal leaves toothed, while stem leaves are entire. Flowers racemose, parts minute. Silicula (fruit) ovate, 2.5 x 2 mm long and wide, open notched at apex.

DISTRIBUTION AND HABITAT

This species has been recorded in the 1890s from Parker Range, Palmer Range and near Coolgardie. The reported habitat is sand-dune rises adjacent to salt lakes. Three recent records are from north of Southern Cross.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Kalgoorlie	Yilgarn	Mt Jackson	VCL	?	Unknown
2	Kalgoorlie	Yilgarn	Unnamed Range	Pastoral	?	Unknown
3	Kalgoorlie	Yilgarn	Koolyanobbing	VCL	?	Unknown

RESPONSE TO DISTURBANCE

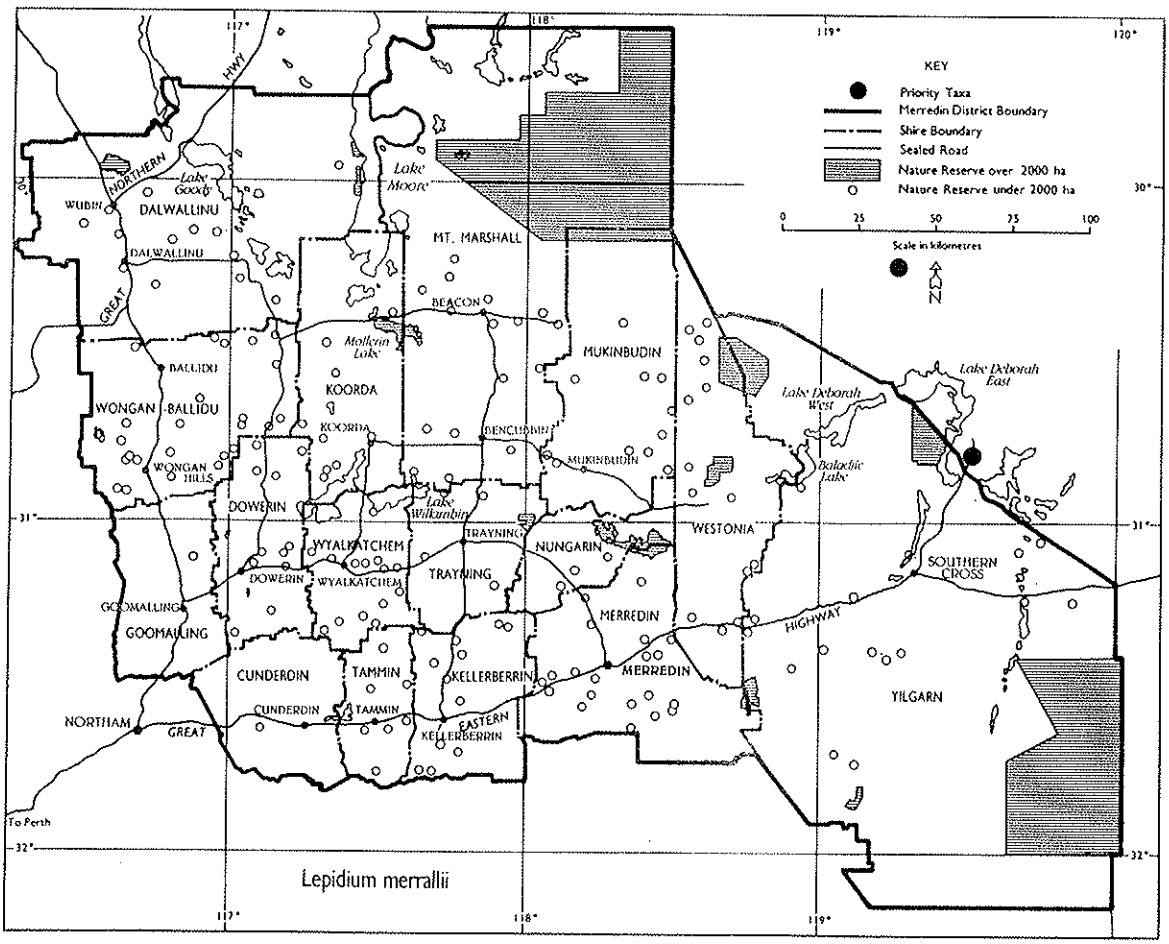
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

A species endemic to the Southern Cross-Coolgardie area. The Palmer Range area is now largely disturbed by repeated gold mining activities and the species was not found there in 1990 or around salt lakes in the Parker Range area, perhaps because conditions were relatively dry during the survey period. The areas north of Southern Cross from which it has been recorded need further survey. Priority One status should be maintained.

REFERENCE

Hewson (1982).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Lepidium merrallii
DALWALLINU
WUBIN
MT. MARSHALL
BEACON
MUKINBUDIN
KOORDA
WONGAN
BALLIDU
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
MERREDIN
GOOMALLING
CUNDERDIN
TAMMIN
KELLERBERRIN
NORTHAM
YILGARN
SOUTHERN CROSS
HIGHWAY
GREAT EASTERN
To Perth

LEPTOSPERMUM MACGILLIVRAYI J. Thomson **Family: Myrtaceae**

TAXONOMY

This species has affinities with *L. spinescens*, but can be readily distinguished by the sepals which are in an overlapping whorl.

DESCRIPTION

Open branched shrub to 1 m tall. Leaves obovate to 1 cm long. Outside of fruit silky villous, shedding seed in July.

DISTRIBUTION AND HABITAT

Occurs in the Die Hardy Range area and also near Mt Jackson. In the former area it was found on a decaying granite outcrop in 1976.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Kalgoorlie	Yilgarn	Die Hardy Range	Pastoral	?	? Collected 4.7.76 A.S. George
2	Kalgoorlie	Yilgarn	Mt Jackson	VCL	?	? Collected 4.7.76 D.J. & A.S.G. McGill

RESPONSE TO DISTURBANCE

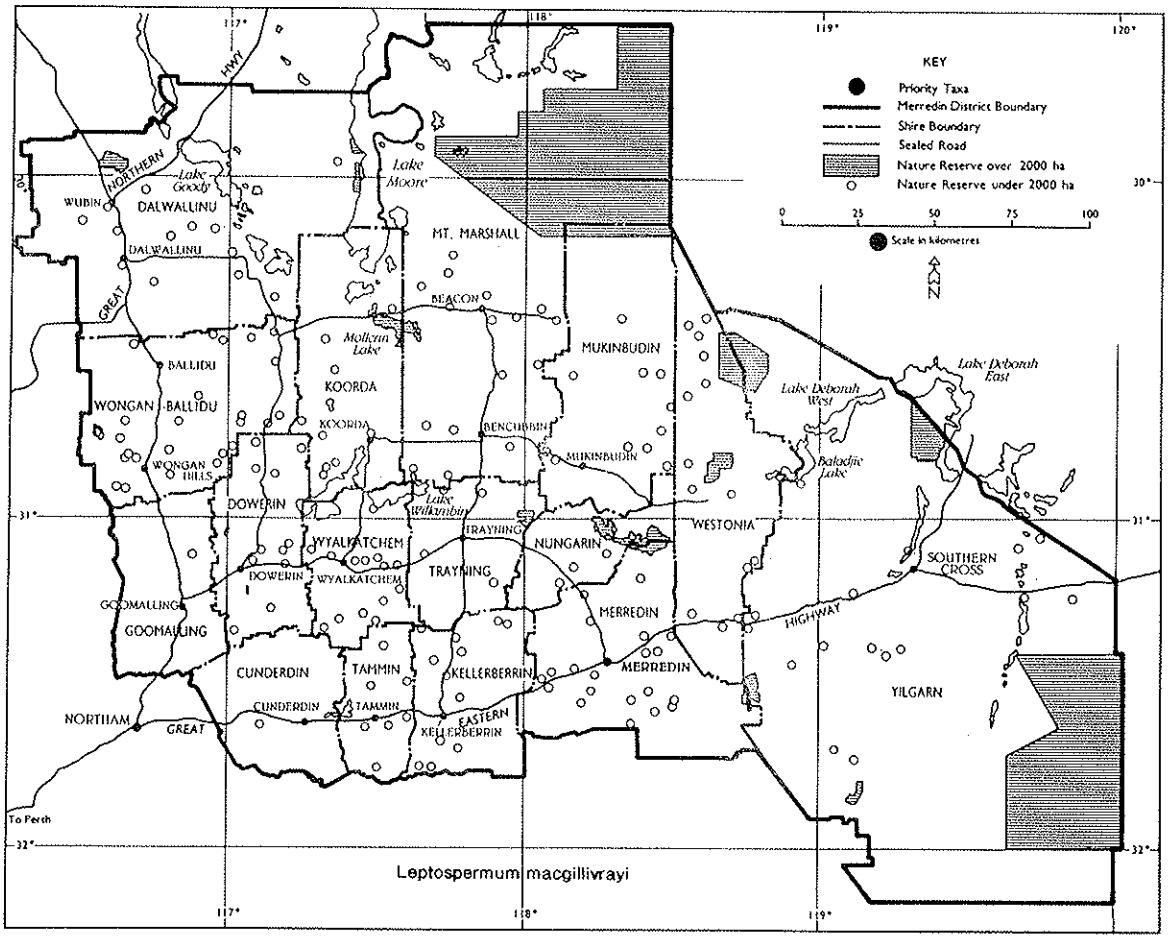
Response to soil disturbance, fire, grazing, weed invasion and canopy cover is unknown.

RECOMMENDATIONS

This species would seem to be rare with only two recorded localities. It may be threatened in the Die Hardy Range as Diemals Station fencing has recently been upgraded and stock numbers increased. Further survey is required as a matter of priority. Fencing and management of population 1 may be necessary.

REFERENCE

Thompson (1988).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
NORTHERN
Lake Goody
Lake Moore
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN - BALLIDU
WONGAN HILLS
BENCUBBIN
Lake Deborah West
Lake Deborah East
Baladjie Lake
DOWERIN
Lake Wilkinbin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
EASTERN
To Perth
Leptospermum macgillivrayi

LEUCOPOGON MARGINATUS W.V. Fitzg. **Family: Epacridaceae**

TAXONOMY

Allied to *L. obtectus* and *L. crassiflorus* but differing chiefly in the foliage, and the latter differs also in the inflorescence.

DESCRIPTION

Erect shrub 45-60 cm tall. Leaves ovate to ovate-lanceolate, margins crisped, concave, striate below, 4-6 mm long, pungent pointed. Flowers white with acute glabrous tips, 1-3-flowered peduncles in upper axils. Flowering period July to September.

DISTRIBUTION AND HABITAT

The type locality is the Arrino sandplains, but recent collections are mostly from Holleton to north of Mt Holland and south to Hatter Hill in sand or gravel associated with heath or scrub heath vegetation.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P3

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Yilgarn	Holleton - Ingram	Road Res.	Occasional	? Collected J.M. Powell 7.8.86
2	Merredin	Yilgarn	Cramphorne	Road Res.	40	Healthy 29.8.90
3	Merredin	Yilgarn	Hyden - Parker Ra	Road Res.	20-30	Healthy 14.7.90
4	Merredin	Yilgarn	Hyden Rd	Road Res.	50+	Healthy 14.7.90
5	Merredin	Yilgarn	Ingram - Mt Holland	Road Res.	Common	Healthy 31.8.90
6	Merredin	Yilgarn	Mt Holland	Road Res.	Common	Healthy 31.8.90
7	Esperance	Ravensthorp	Hatter Hill	Mining Lease	Fairly common	Healthy 6.9.90

RESPONSE TO DISTURBANCE

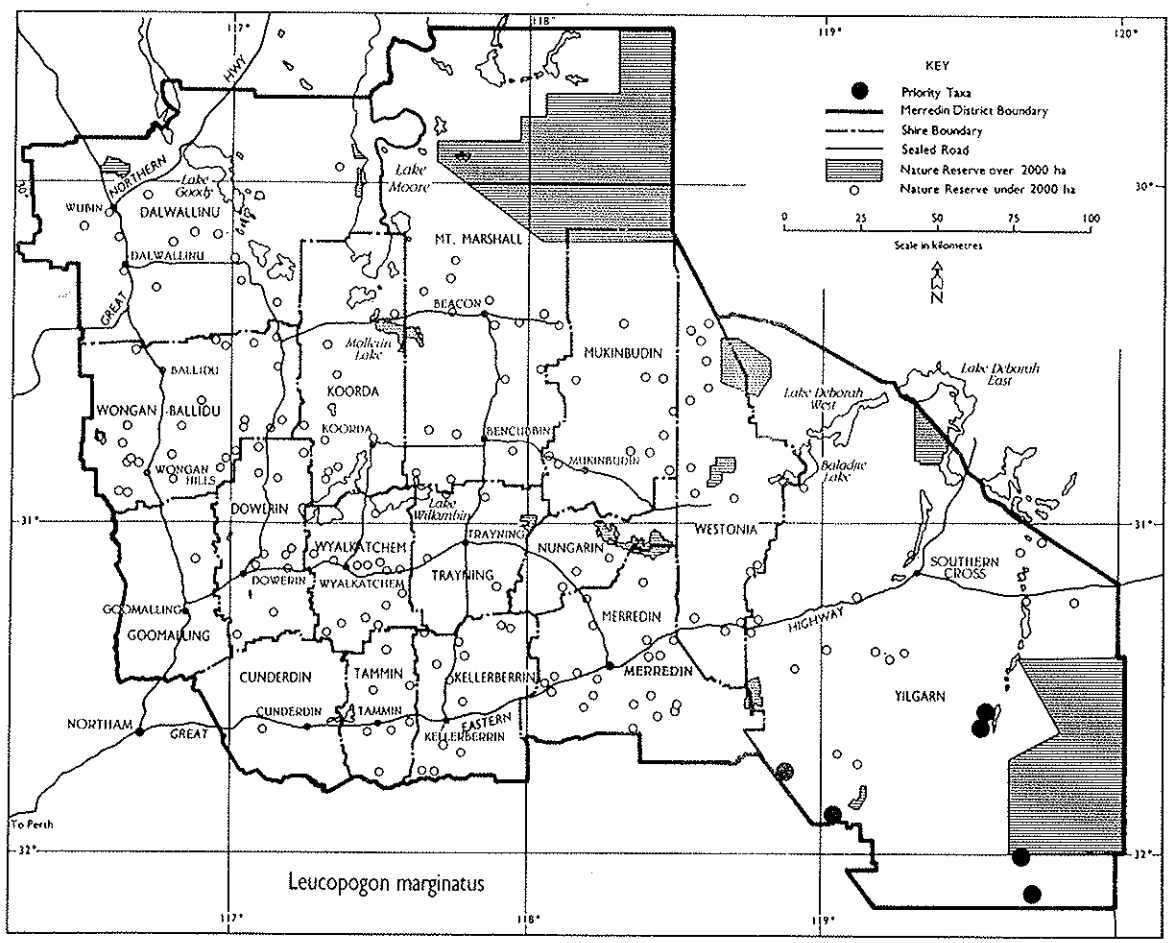
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

It is possible that this species is scattered in patches through the uncleared parts of the Yilgarn Shire in the Merredin District, however, further survey is required to confirm this. Its absence in the Arrino area and elsewhere in the wheatbelt further north is probably due to the extensive land clearing. Priority 3 status is recommended.

REFERENCES

Blackall and Grieve (1981); Fitzgerald (1904).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Leucopogon marginatus
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
MUKINBUDIN
KOORDA
BENCUBBIN
WONGAN HILLS
BALLIDU
WONGAN
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
GOOMALLING
CUNDERDIN
TAMMIN
KELLERBERRIN
MERREDIN
SOUTHERN CROSS
YILGARN
NORTHAM
To Perth
Lake Moore
Lake Goods
Lake Deborah West
Lake Deborah East
Baladie Lake
Lake Wilkinbin
Mollerin Lake
NORTHERN
GREAT
EASTERN
HIGHWAY

LEUCOPOGON TERETOSTYLUS J. Powell ms **Family: Epacridaceae**

TAXONOMY

This species has affinities with *L. tenuis*, but has different leaf and floral characters.

DESCRIPTION

Shrub 80-90 cm tall erect. Leaves thickened, narrow-lanceolate, apex obtuse, 1 cm long and 3 mm wide, underside finely striate. Flowers in long terminal spikes, petals white. Flowering period June to September.

DISTRIBUTION AND HABITAT

There are two widely separated occurrences of this taxon both on breakaway slopes on vertical shale and orange-brown clay sand with rock debris. Vegetation is generally open. In the Merredin district it occurs in the Parker Range.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Yilgarn	Parker Range	VCL	90+	Healthy 20.7.90; 31.8.90
2	Greenough	Greenough	Greenough Flats	?	?	? J. Powell pers. comm.

RESPONSE TO DISTURBANCE

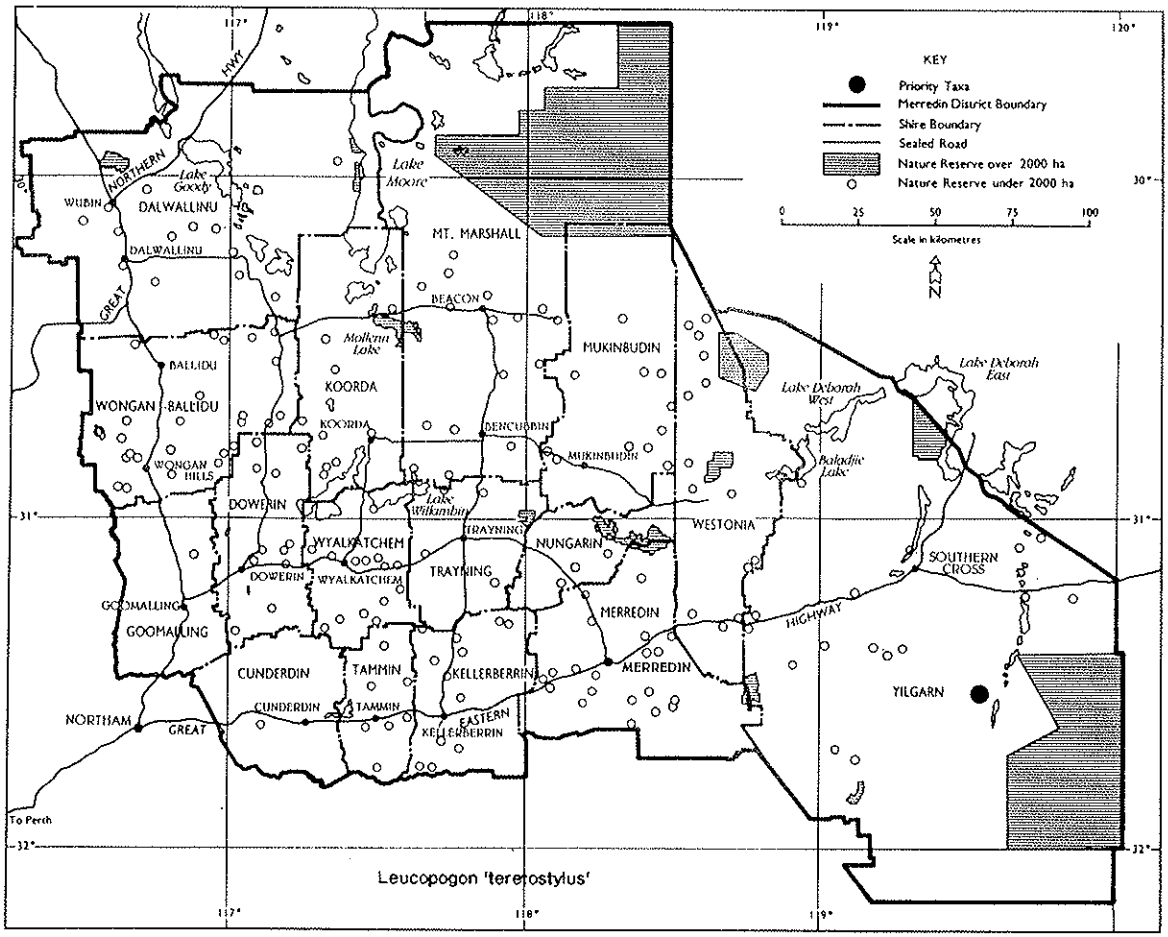
Response to fire, grazing, weed invasion and canopy cover is unknown.

RECOMMENDATIONS

This is a species which has an unusual disjunct distribution and further survey is needed. The Parker Range population is not threatened at this time although there has been some minimal disturbance through mineral exploration in the population's vicinity.

REFERENCE

J. Powell (National Herbarium of NSW, personal communication).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Leucopogon 'teretostylus'
DALWALLINU
WUBIN
MT. MARSHALL
BEACON
MUKINBUDIN
KOORDA
BENCUBBIN
WONGAN HILLS
BALLIDU
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
GOOMALLING
CUNDERDIN
TAMMIN
KELLERBERRIN
MERREDIN
SOUTHERN CROSS
YILGARN
NORTHAM
Lake Goody
Lake Moore
Lake Deborah East
Lake Deborah West
Baladjie Lake
Lake Wilkinbin
Mollerin Lake
NORTHERN
GREAT
EASTERN
HIGHWAY
To Perth

MYRIOPHYLLUM LAPIDICOLA Orchard ms **Family: Haloragaceae**

TAXONOMY

This taxon is closely allied to DRF *Myriophyllum petraeum*, but differs in fruit shape, size, number of stamens and leaf shape.

DESCRIPTION

Aquatic herbaceous annual or ephemeral with weak stems to 20 cm long. Leaves obovate <1 cm long. Flowering period is recorded (based on the date of collection) as September.

DISTRIBUTION AND HABITAT

Found only in one pool near the top of a granite rock west of Chiddarcooping Nature Reserve, in water 15-20 cm deep.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

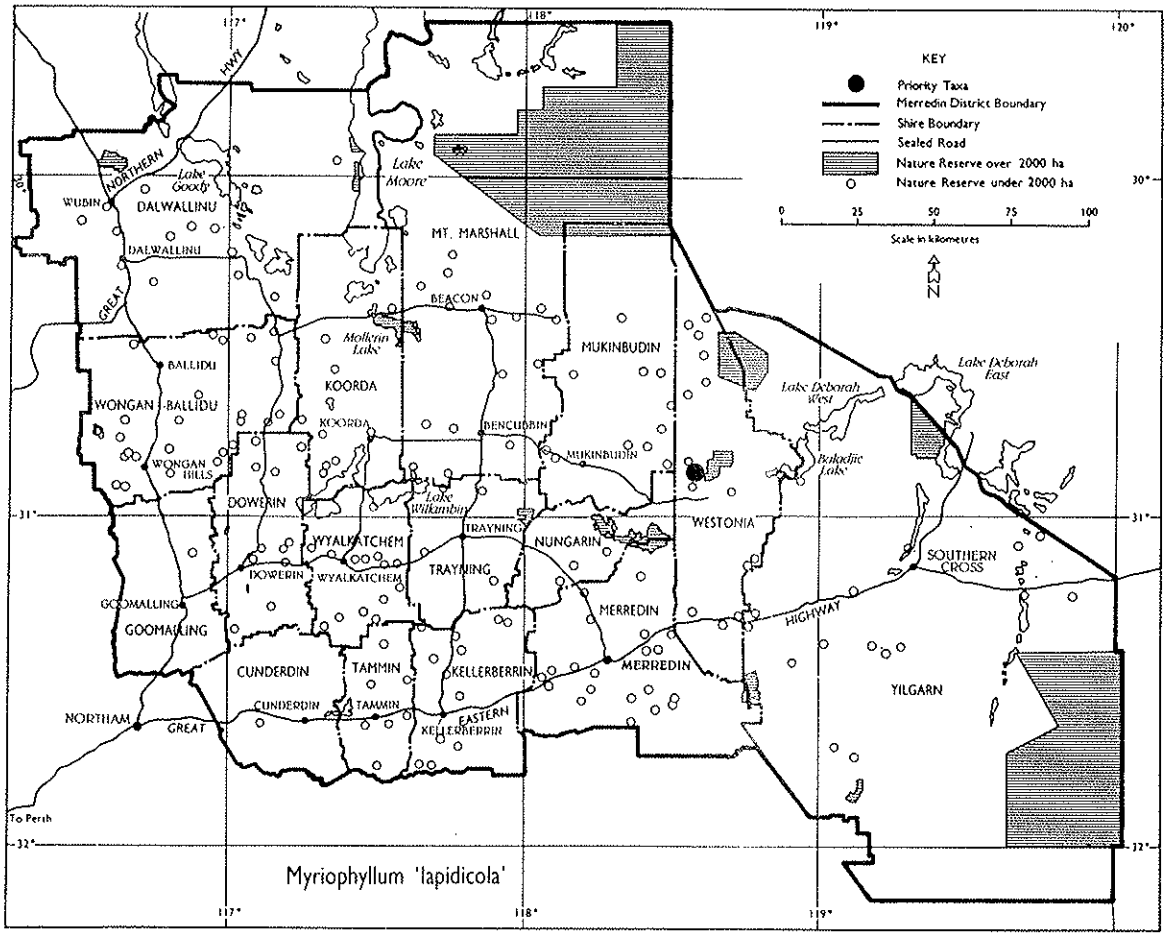
Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Westonia	Echo Valley Rd	Private	100	Undisturbed 11.9.89

RESPONSE TO DISTURBANCE

Response to disturbance is unknown.

RECOMMENDATIONS

A survey of the known population failed to relocate this species during 1990. Further survey of this location should be a matter of high priority. Fencing of the known occurrence needs to be urgently considered in order to prevent possible destruction by goats.


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Myriophyllum 'lapidicola'
MUKINBUDIN
MERREDIN
MT. MARSHALL
BEACON
KOORDA
BENCUBBIN
WESTONIA
NUNGARIN
TRAYNING
DOWERIN
WYALKATCHEM
GOOMALLING
CUNDERDIN
TAMMIN
KELLERBERRIN
NORTHAM
YILGARN
SOUTHERN CROSS
DALWALLINU
WUBIN
BALLIDU
WONGAN HILLS
Lake Moore
Lake Deborah East
Lake Deborah West
Baladjie Lake
Lake Wilkinbin
Mollerin Lake
Lake Goody
NORTHERN
GREAT
HIGHWAY
To Perth

PERSOONIA 'CHAPMANIANA' P.S. Weston ms **Family: Proteaceae**

TAXONOMY

This species has verrucose drupes, and 5-ribbed, subterete leaves which are both diagnostic characters. It is a distinctive taxon that does not closely resemble any other *Persoonia.*

DESCRIPTION

Erect, spreading shrub, branching from the base, 1-2 m high. Leaves alternate, often crowded, spreading to suberect, linear, acuminate, pungent, 2-8 cm long, 0.9-1.3 mm broad, rigid, subterete. Flowers regular, upright to pendulous. Tepals bright yellow, glabrous, acute, narrow-oblong to lanceolate. Flowering period September to November.

DISTRIBUTION AND HABITAT

This species is known in the Merredin District from a collection between Kalannie and Kulja, but lack of other details make it virtually impossible to relocate the population. It was not found during two days of searching in this area in 1990. It occurs outside the district further to the north-west in the vicinity of Eneabba, Carnamah and Coorow. It appears to have a preference for saline lakes associated with *Acacia* dominated heath. However, the Merredin district occurrence is recorded from York Gum woodland on yellow sandy loam over clay.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS (Merredin District only)

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Dalwallinu	Kalannie-Kulja	?	?	? collected 14.11.66

RESPONSE TO DISTURBANCE

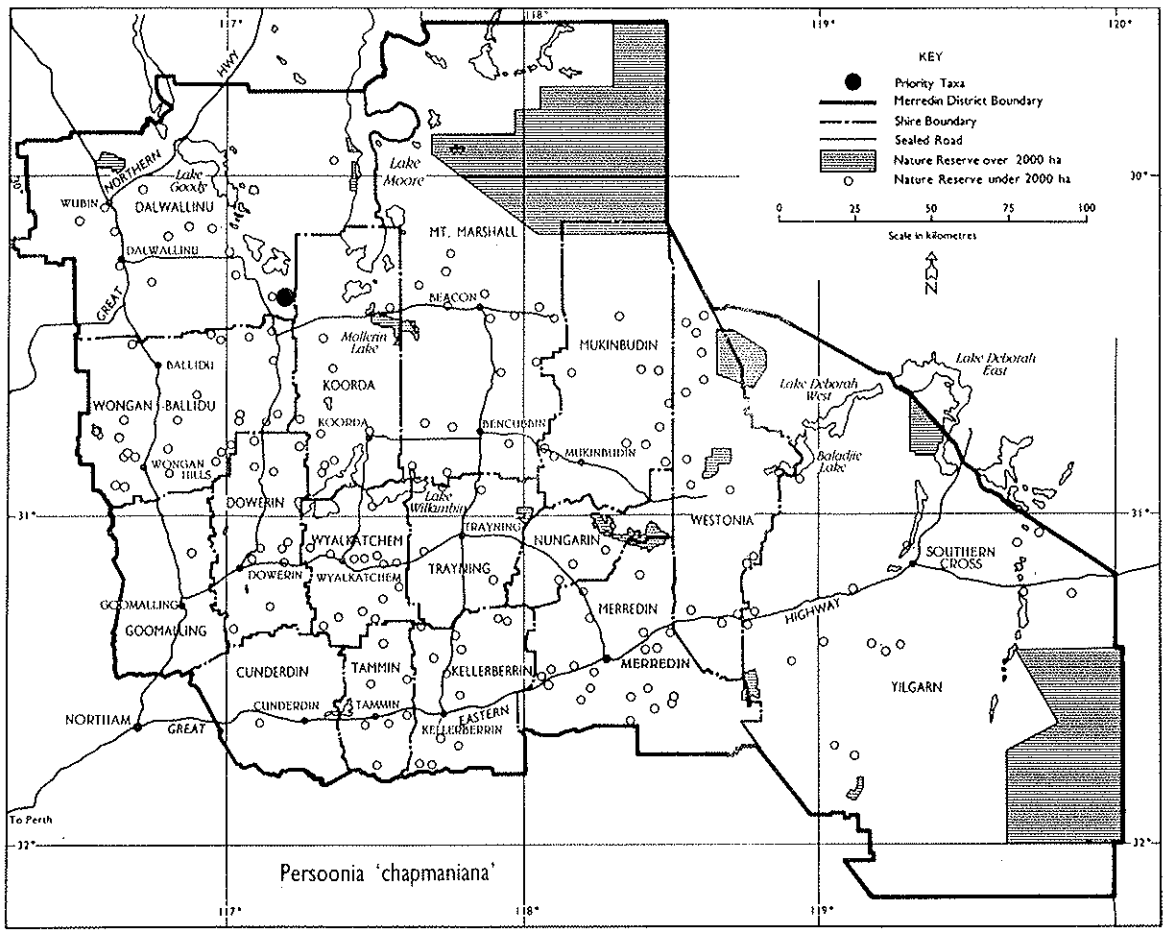
Response to soil disturbance, fire, grazing, weed invasion, and canopy cover is unknown.

RECOMMENDATIONS

Further survey should be a high priority.

REFERENCE

Dr P. Weston (National Herbarium of NSW, personal communication).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
Lake Goody
Lake Moore
WUBIN
DALWALLINU
MT. MARSHALL
MEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN
WONGAN HILLS
BENCUBBIN
Lake Deborah West
Lake Deborah East
Baladjie Lake
DOWERIN
Lake Willambie
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
EASTERN
To Perth
Persoonia 'chapmaniana'

PHEBALIUM BRACHYCALYX P.G. Wilson **Family: Rutaceae**

TAXONOMY

The species name *'brachycalyx'* refers to the short calyx possessed by this species. *P. brachycalyx* is closely allied to *P. microphyllum*.

DESCRIPTION

Shrub to 1 m tall. Leaves narrowly oblong-cuneate, 10-15 x 1.5 mm, apex round, margin bullate-crenulate, warty sites prominent on the lower mid-vein. Flowers 3-6, white in a terminal umbel. Flowering period August to September.

DISTRIBUTION AND HABITAT

This species occurs in sand or gravel soil in 1-2 m shrubland dominated by *Acacia*. There is an early record from just south of Southern Cross (1893), and more recent records from Wongan Hills, north of Wialki and the Tandagin-Muntadgin area.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Mt Marshall	Emu Fence Rd	Private	5+	Healthy 17.9.90
2.	Merredin	Wongan-Ballidu	Wongan Hills	?	?	? Collected 9.8.59 A.S. George
3	Merredin	Merredin	Muntadgin	?	?	? Collected 13.9.70 N. Marchant
4	Merredin	Merredin	Tandagin	?	?	? Collected n.d. P.G. Wilson
5.	Merredin	Wongan-Ballidu	NW Wongan Hills	?	?	? Collected 6.8.85 L. Nunn
6	Merredin	Wongan-Ballidu	Piawaning	?	?	? Collected 26.8.65 A.C. Beauglehole

RESPONSE TO DISTURBANCE

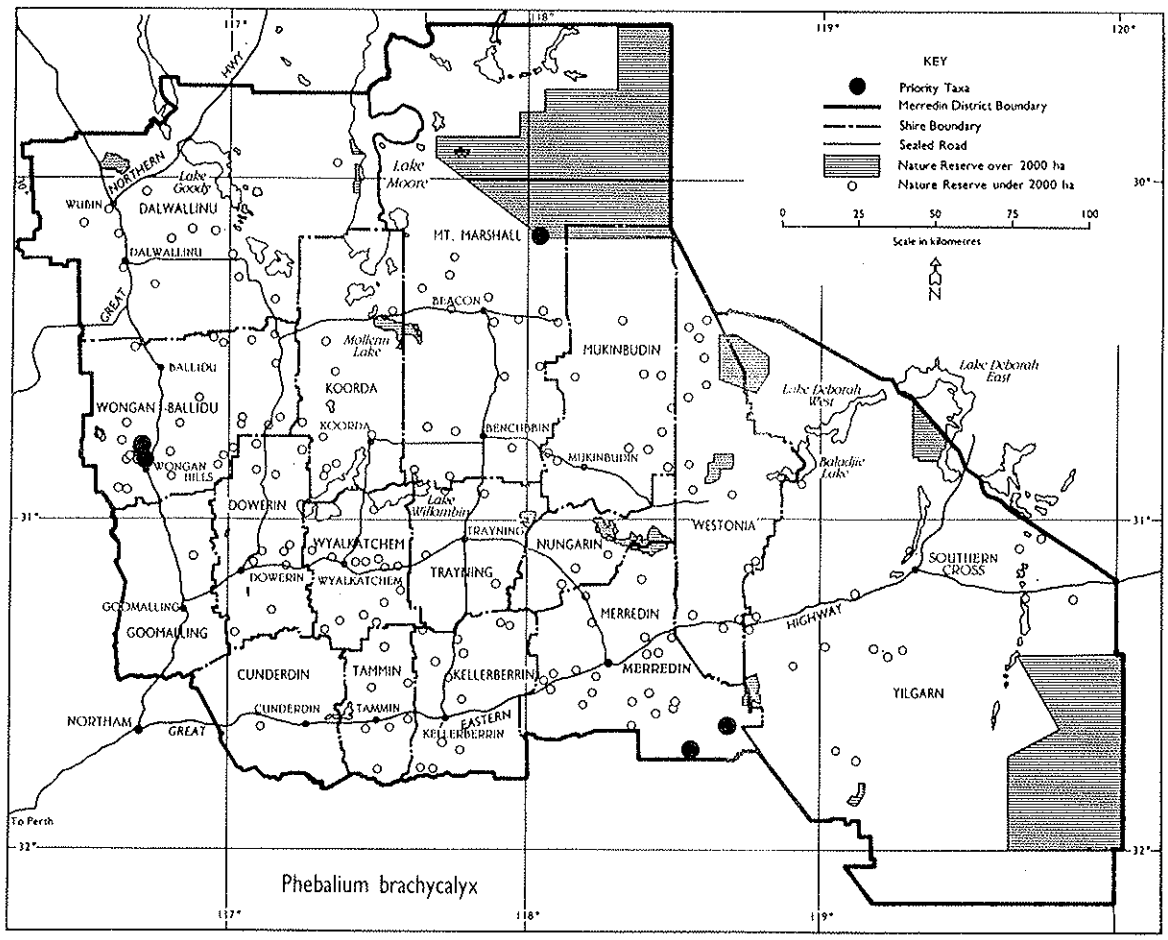
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

A concerted effort was made to collect *Phebalium* and *Eriostemon* species during 1990, for a forthcoming revision of the Rutaceae. Further survey is warranted as a matter of priority for all known populations of this species. It appears to be quite rare and management of the known population(s) may be required.

REFERENCE

Wilson (1970).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Phebalium brachycalyx
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
GREAT
Lake Goody
Lake Moore
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
Moliagul Lake
MUKINBUDIN
BALLIDU
WONGAN-BALLIDU
KOORDA
BENCUBBIN
WONGAN HILLS
Lake Deborah East
Lake Deborah West
Baladjie Lake
DOWERIN
Lake Willoughby
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
YILGARN
NORTHAM
To Perth

PHEBALIUM DRUMMONDII Benth. **Family: Rutaceae**

TAXONOMY

This species has close affinities with *P. filifolium* and *P. microphyllum*, each having similar floral characteristics and smooth stems, but different leaves. *P. drummondii* may hybridise with *P. filifolium* and *P. tuberculosum*.

DESCRIPTION

Shrub, with leaves to 3-5 x 1-2 mm, narrow to broad-elliptic or obovate, thickened, apex rounded, upper surface dull green, lower surface silvery lepidote. Flowers in 3-6-flowered umbels, petals yellow, 4 x 2.5 mm. Flowering period July to August.

DISTRIBUTION AND HABITAT

P. drummondii is known from Koorda to Mollerin, the Dowerin and Bonnie Rock-Wialki district (1961) and Manmanning. Habitat is laterite on sand over laterite carrying *Acacia, Allocasuarina, Hakea* and *Calothamnus*.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

(The B. Rosier collection and the 1961 collections by F. Spark are too general to list or map)

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Dowerin	Manmanning	?	?	? Collected 21.7.84 B.H. Smith
2	Merredin	Dowerin	Amery	Water Res.	?	? Collected 28.8.91 B.H. Smith

RESPONSE TO DISTURBANCE

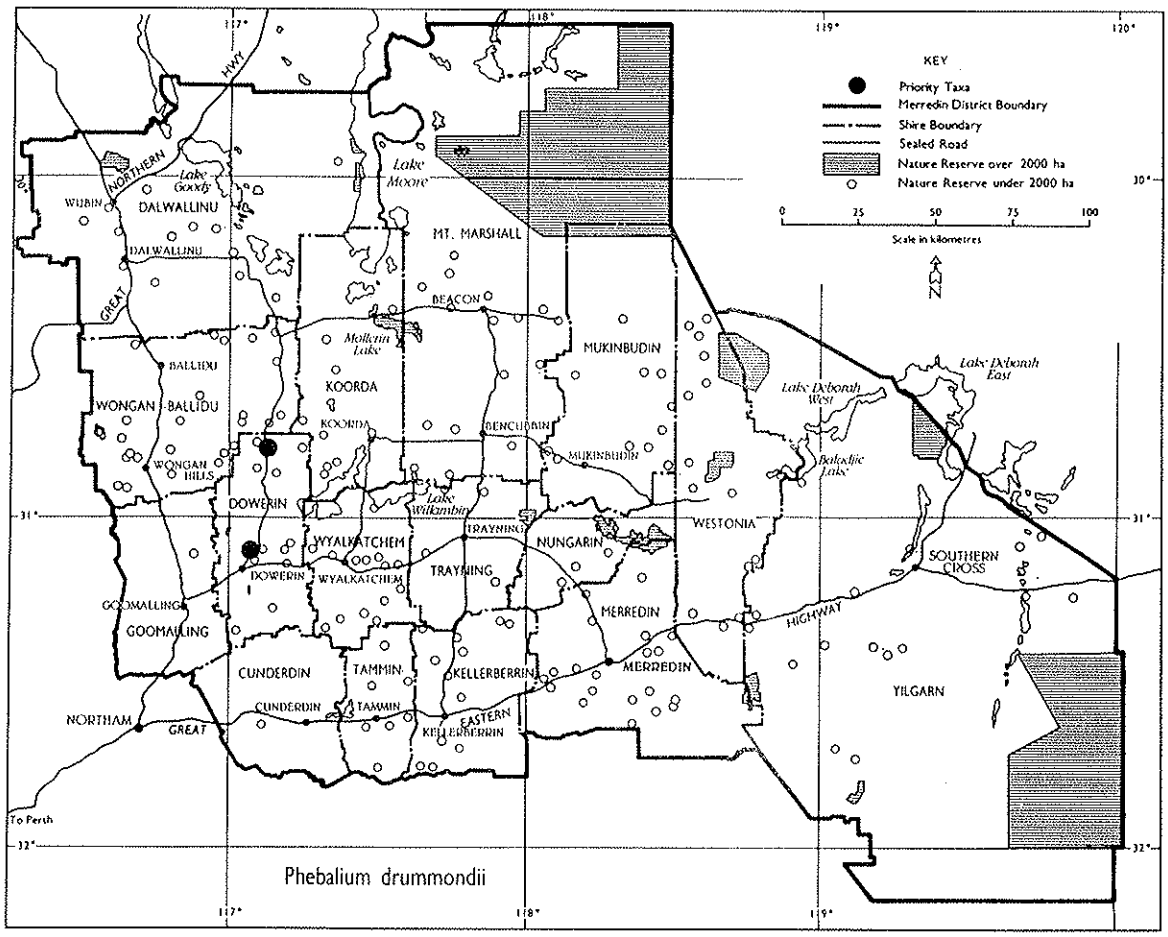
Responses to soil disturbance, fire, weed invasion, grazing and canopy cover are unknown.

RECOMMENDATIONS

The most recent collections by B.H. Smith from the Manmanning and Amery areas should be the focus of a detailed survey. Other locations are too general. Broad surveys in the indicated areas may locate remnant populations but these areas are now largely cleared.

REFERENCE

Wilson (1970).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Phebalium drummondii
NORTHERN
GREAT
EASTERN
HIGHWAY
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
MUKINBUDIN
BALLIDU
WONGAN
KOORDA
BENCUBBIN
WONGAN HILLS
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
GOOMALLING
MERREDIN
CUNDERDIN
TAMMIN
KELLERBERRIN
NORTHAM
SOUTHERN CROSS
YILGARN
To Perth
Lake Goody
Lake Moore
Lake Deborah East
Lake Deborah West
Baladjie Lake
Lake Wilkinbin
Mollerin Lake

RICINOCARPOS sp. Diemals (*F.H. & M.P. Mollemans* 3096) **Family: Euphorbiaceae**

TAXONOMY

This species is analogous in some respects to the presumed extinct taxon *Beyeria lepidopetala* of the same family.

DESCRIPTION

Shrub 1-1.8 m tall. Leaves oblong, 1.2-1.5 cm long and 2 mm wide, margins revolute, upper leaf surface green, lower white. Flowers with white petals. Leaves, pedicels and upper stems stellate hairy. Flowering period June to October.

DISTRIBUTION AND HABITAT

Known only from an unnamed range north of Southern Cross, where it occurs on skeletal banded iron formation soils of red clay loam with jasperlite gravel, pebbles and cobbles.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1 (With highest priority for further survey and consideration for gazettal as DRF)

KNOWN POPULATIONS

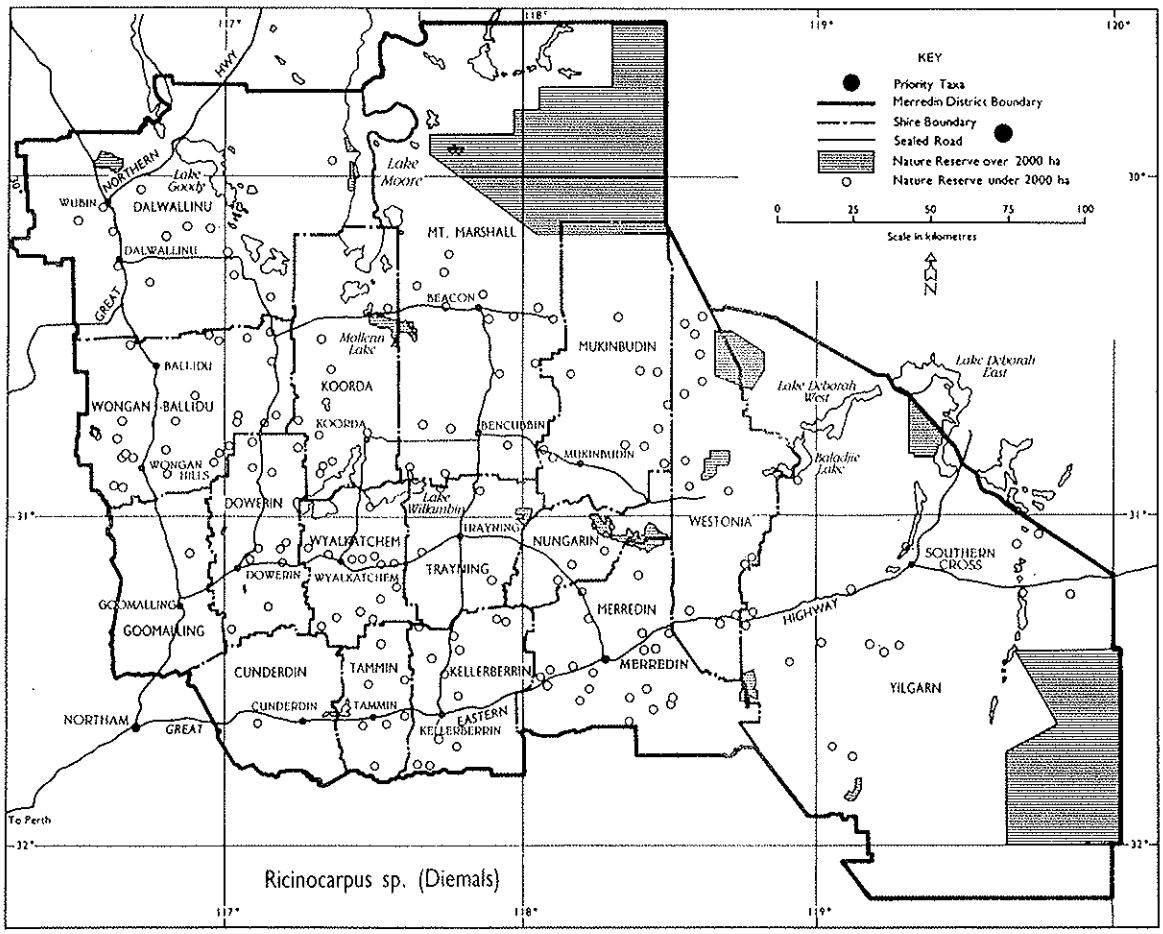
Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Kalgoorlie	Yilgarn	Unnamed Range	Pastoral	<800	Est.; healthy 11-12.7.90

RESPONSE TO DISTURBANCE

Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

A total of four days was spent in the area surveying this species and *Tetratheca paynterae*. The geology of the range is unique in being largely comprised of hematite. *Ricinocarpos* sp. is replaced on other adjacent banded iron formation hills, such as Mt Jackson, Muddarning Hill and Koolyanobbing Range by the more common species *Beyeria lechenaultii*. Upgrading of fences on Diemals Station and increased stock numbers may threaten plants nearer to the base of the range in the mid-slope region. Gazettal as DRF is warranted and reservation of the range area to protect both *Ricinocarpos* sp. and *Tetratheca paynterae* is desirable.


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
Lake Goorly
Lake Moore
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
GREAT
Mollenn Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN - BALLIDU
BENCUBBIN
WONGAN HILLS
Lake Deborah East
Lake Deborah West
Balodie Lake
DOWERIN
Lake Wilkamin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
EASTERN
To Perth
Ricinocarpus sp. (Diemals)

SCAEVOLA TORTUOSA Benth. **Family: Goodeniaceae**

TAXONOMY

This is a distinctive taxon with tortuous, rigid scapes by which it is easily recognised. It is quite small and is easy to confuse with *Logania tortuosa* but the latter species does not have basal leaves.

DESCRIPTION

Described as a perennial herb, but the known population occurred as an annual dying back in December. A herb to 20 cm tall, with basal oblanceolate leaves to 4 cm long. Flowers pale violet. Flowering period October.

DISTRIBUTION AND HABITAT

Known only from one population near Cunderdin where it occurs on a very low saline sand-dune fringe of the Mortlock River. Low grass, mat plants and dwarf scrub vegetation is present.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1 (With highest priority for further survey and consideration for gazettal as DRF)

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Cunderdin	Cunderdin	Road Res.	500	Est. Healthy 8.10.90, but devastated by locusts 8.12.90

RESPONSE TO DISTURBANCE

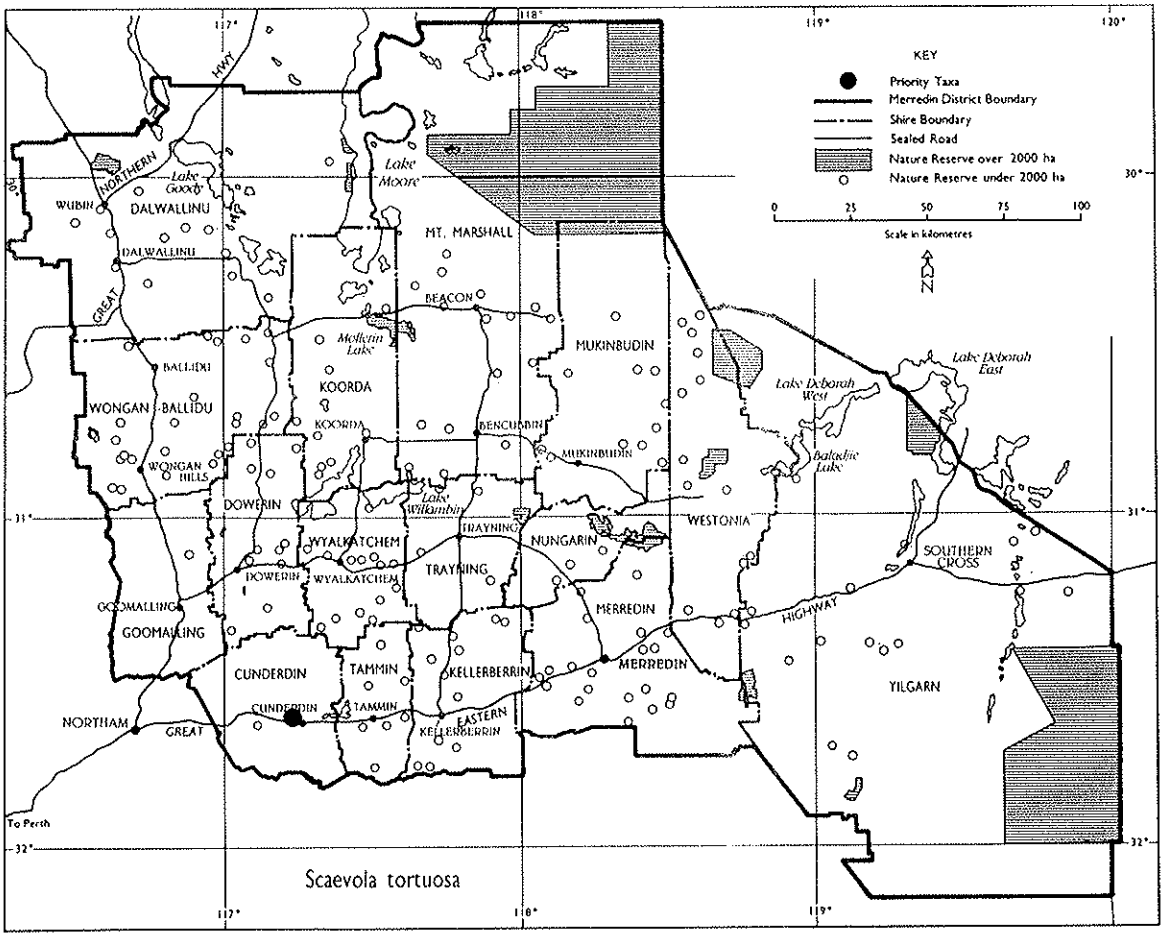
Response to fire, weed invasion, canopy cover is unknown. The disturbance of this species habitat had resulted in loss of some plants. Grazing by locusts destroyed much of the known population in late December 1990 although some plants still remain.

RECOMMENDATIONS

This species was located in 1990 where some 500 individuals occurred in an area of 5 x 7 m. Close monitoring of this site is required This species is extremely rare and any new population located should be protected and preserved as a matter of the highest priority. Further survey is urgently required. The appropriate habitat in the previous collection areas is now cleared and none of the original populations were located. Previous collections were at Kellerberrin (in November 1959), Wyola (1901), Cummering York East (1892) and SW Australia (1848 - J. Drummond). Gazettal as DRF is warranted.

REFERENCE

Blackall and Grieve (1982).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
HWY
NORTHERN
Lake Goorly
WUBIN
DALWALLINU
Lake Moore
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN
WONGAN HILLS
BENCUBBIN
Lake Deborah West
Lake Deborah East
Baladdie Lake
DOWERIN
Lake Willambin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
YILGARN
NORTHAM
To Perth
Scaevola tortuosa

VERTICORDIA GRACILIS A.S. George **Family: Myrtaceae**

TAXONOMY

Superficially similar to *V. pritzellii* and *V. stenopetala* but distinguished by a shortly exserted style, with a dense beard of forked hairs.

DESCRIPTION

A shrub to 30 cm tall with one to several basal stems. Leaves oblong, semi-terete, triquetrous, obtuse, 2-4 mm long. Flowers erect in level groups at apex of plant. Petals orbicular, 2 mm long, deep pink. Flowering period October to November.

DISTRIBUTION AND HABITAT

This species grows in yellow sand and gravelly sand in heath, between Bruce Rock and Hyden and east to the Mt Holland area.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Yilgarn	Mt Holland Nth	VCL	?	? Collected M. Smith 8.11.84
2	Merredin	Merredin	Koonadgin West	?	3	? Collected M. Smith 1983, 1984 and 1987
3	Narrogin	Kondinin	Nyonger	?	?	? Collected H. Demarz 26.11.87
4	Merredin	Merredin	Korbel	?	?	? Collected M. Smith 16.11.83
5	Narrogin	Kondinin	Hyden East	?	?	? Collected D. Bell 21.11.80

RESPONSE TO DISTURBANCE

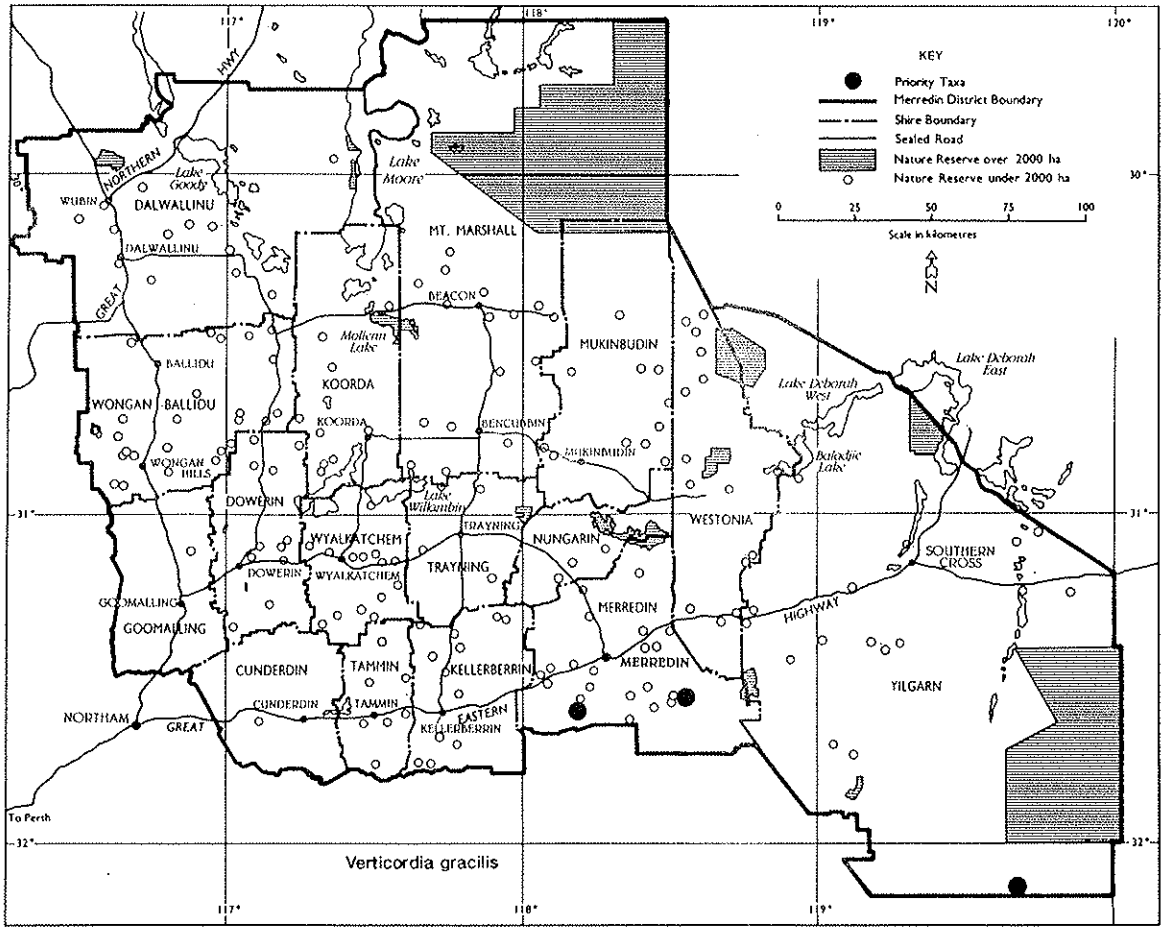
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Further survey is urgently needed.

REFERENCE

George (1991).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
Lake Goody
WUBIN
DALWALLINU
Lake Moore
MT. MARSHALL
DEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN
WONGAN HILLS
BENCUBBIN
Lake Deborah East
Lake Deborah West
Baladjie Lake
DOWERIN
Lake Wilkinbin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
EASTERN
To Perth
Verticordia gracilis

VERTICORDIA MULTIFLORA Turcz. subsp. *SOLOX* A.S. George **Family: Myrtaceae**

TAXONOMY

This taxon differs from *V. multiflora* subsp. *multiflora* in having longer sepals, petals and style.

DESCRIPTION

A shrub to 50 cm with one to several basal stems, openly and irregularly branched. Leaves oblong to elliptic, semi-terete to concave, obtuse, 2-4 mm long. Flowers erect to spreading in rounded groups. Petals 3.5-5 mm long, ovate to orbicular, bright yellow. Flowering period October to November.

DISTRIBUTION AND HABITAT

This subspecies occurs from south-east of Merredin to Marvel Loch on pale yellow sands, gravelly sand and sand over laterite, in tall open shrubland vegetation.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Yilgarn	Cockatoo Tank East	Road Res.	?	? Collected E. Berndt 22.10.84
2	Merredin	Yilgarn	King-Ingram Nth	Road Res.	?	? Collected D. Mills 2.1.88
3	Merredin	Yilgarn	Cockatoo Tank	Water Res.	?	? Collected M. Smith 24.11.81
4	Merredin	Yilgarn	Hyden Rd (5.5 m)	Road Res.	?	? Collected M. Smith 8.10.81

RESPONSE TO DISTURBANCE

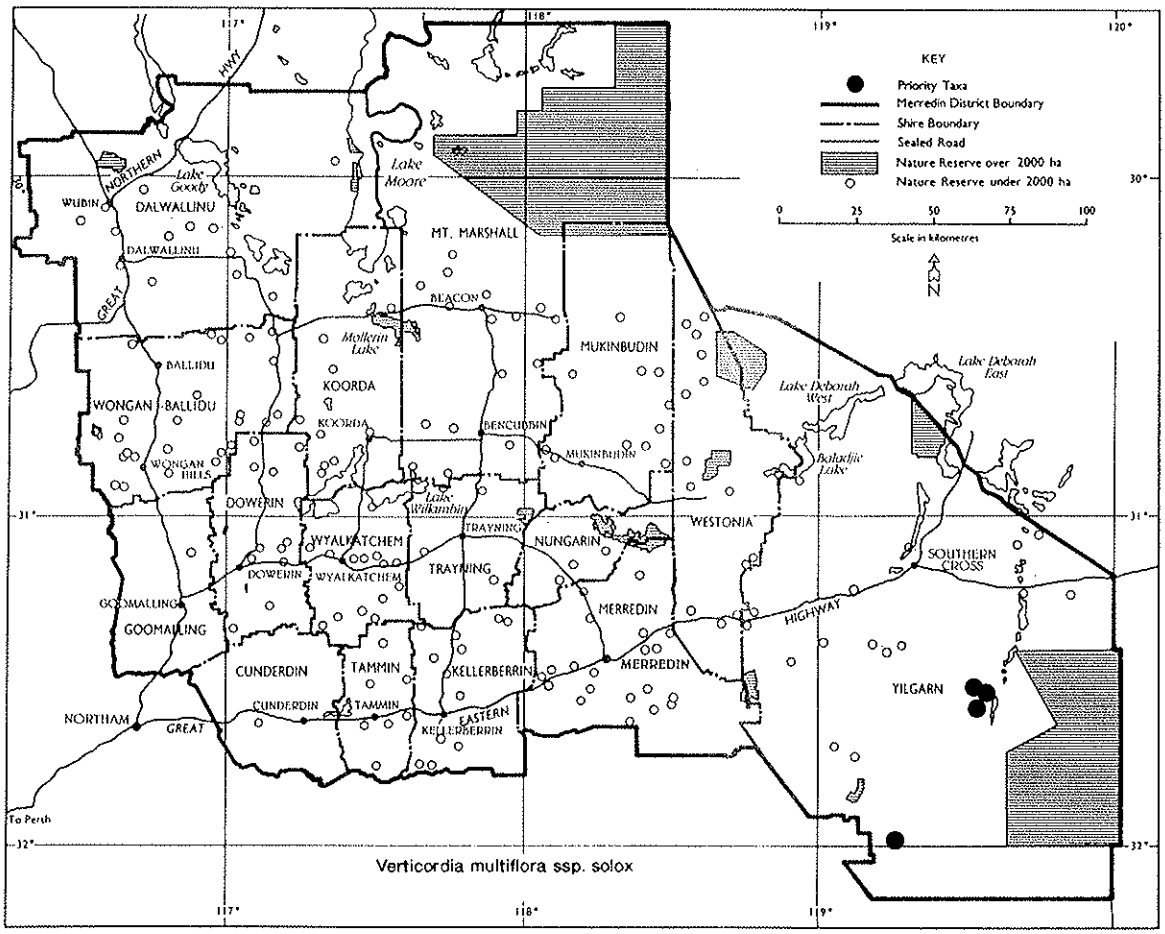
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Further survey urgently needed.

REFERENCE

George (1991).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
Lake Goorly
Lake Moore
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN-BALLIDU
BENCUBBIN
WONGAN HILLS
Lake Deborah East
Lake Deborah West
Baladjie Lake
DOWERIN
Lake Wilkinbin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
EASTERN
To Perth
Verticordia multiflora ssp. solox

VERTICORDIA ROEI Endl. subsp. *MEIOGONA* A.S. George **Family: Myrtaceae**

TAXONOMY

This taxon differs from *V. roei* subsp. *'roei'* by having shorter stamens, obtuse staminodes, and shorter style.

DESCRIPTION

Shrub to 80 cm with one basal stem that is corymbosely branched. Leaves linear to elliptic, deeply triquetrous, obtuse, 1.5-4 mm long. Flowers erect, at about the same level on the plants upper extremity. Petals 4-5 mm, elliptic, concave, creamy white. Flowering period September to October.

DISTRIBUTION AND HABITAT

Occurs north-west of Bonnie Rock and near Dalwallinu, on sandy loam with some gravel in low heath vegetation.

CONSERVATION STATUS

Current Status: P1 Recommended Status: P1

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Mt Marshall	Beacon Nth	?	?	? Collected M. Smith 11.10.84.
2	Merredin	Dalwallinu	SE Dalwallinu	? Nature Res.	?	? Collected A. Roach 3.10.81
3	Merredin	Mukinbudin	Adams Rd, Wialki	Road Res.	?	? Collected M. Smith 11.10.88
4	Merredin	Mt Marshall	Wialki	?	?	? Collected M. Smith 11.10.84

RESPONSE TO DISTURBANCE

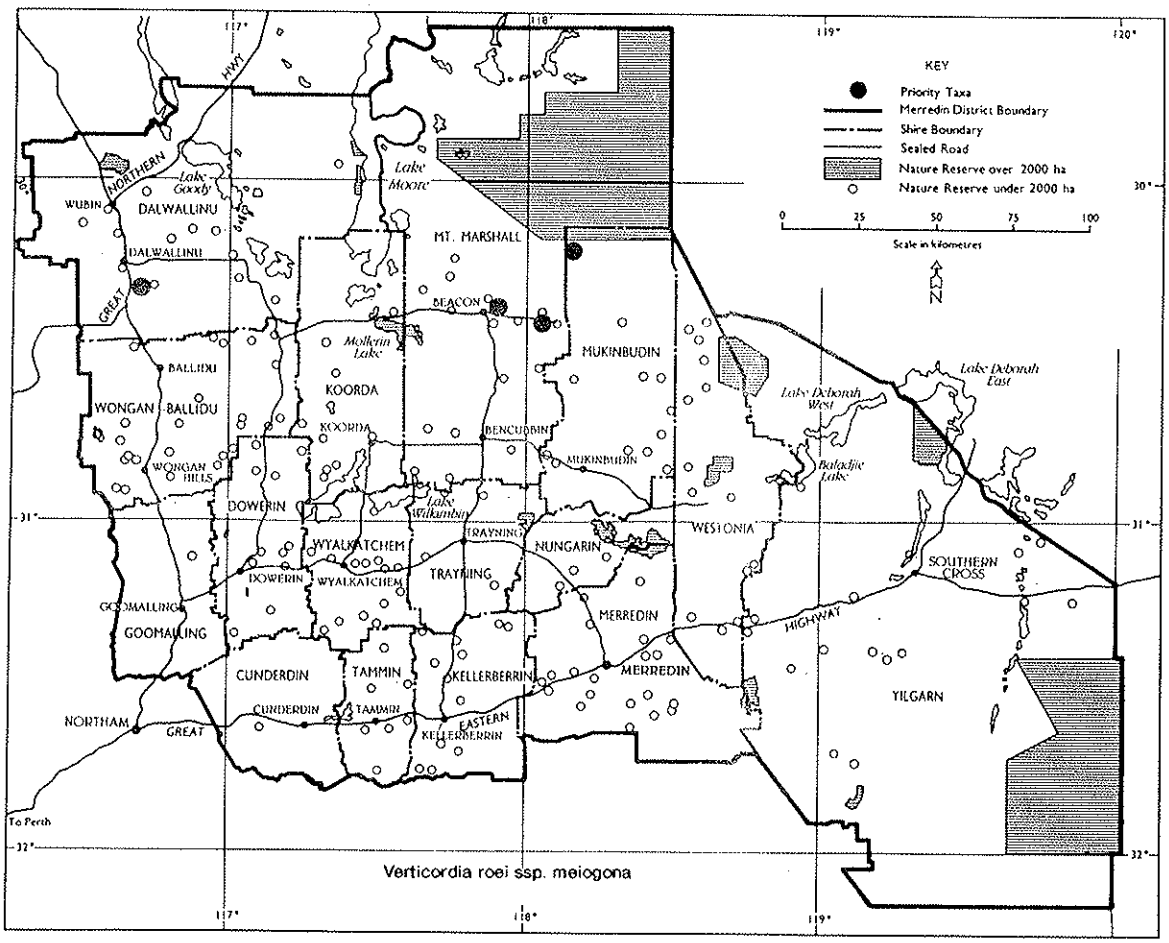
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Further survey is urgently needed.

REFERENCE

George (1991).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
NORTHERN
Lake Goorly
WUBIN
DALWALLINU
MT. MARSHALL
Lake Moore
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN
WONGAN HILLS
BENCUBBIN
Lake Deborah West
Lake Deborah East
Baladjie Lake
DOWERIN
Lake Wilkamin
WESTONIA
TRAYNING
NUNGARIN
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
YILGARN
NORTHAM
To Perth
Verticordia roei ssp. meiogona

PART FOUR - PRIORITY TWO SPECIES IN THE MERREDIN DISTRICT

Based on the December 1990 priority taxa list 36 species of Priority Two (P2) flora have been recorded within the boundaries of that part of the Merredin District covered by this Wildlife Management Program.

Individual species treatments that follow are generally brief and indicate the need for further surveys to accurately assess the conservation status of taxa in this group. The distribution of Priority Two species in the district is shown in Figure 5.

The recommended conservation status is largely based on the surveys carried out as part of this study.

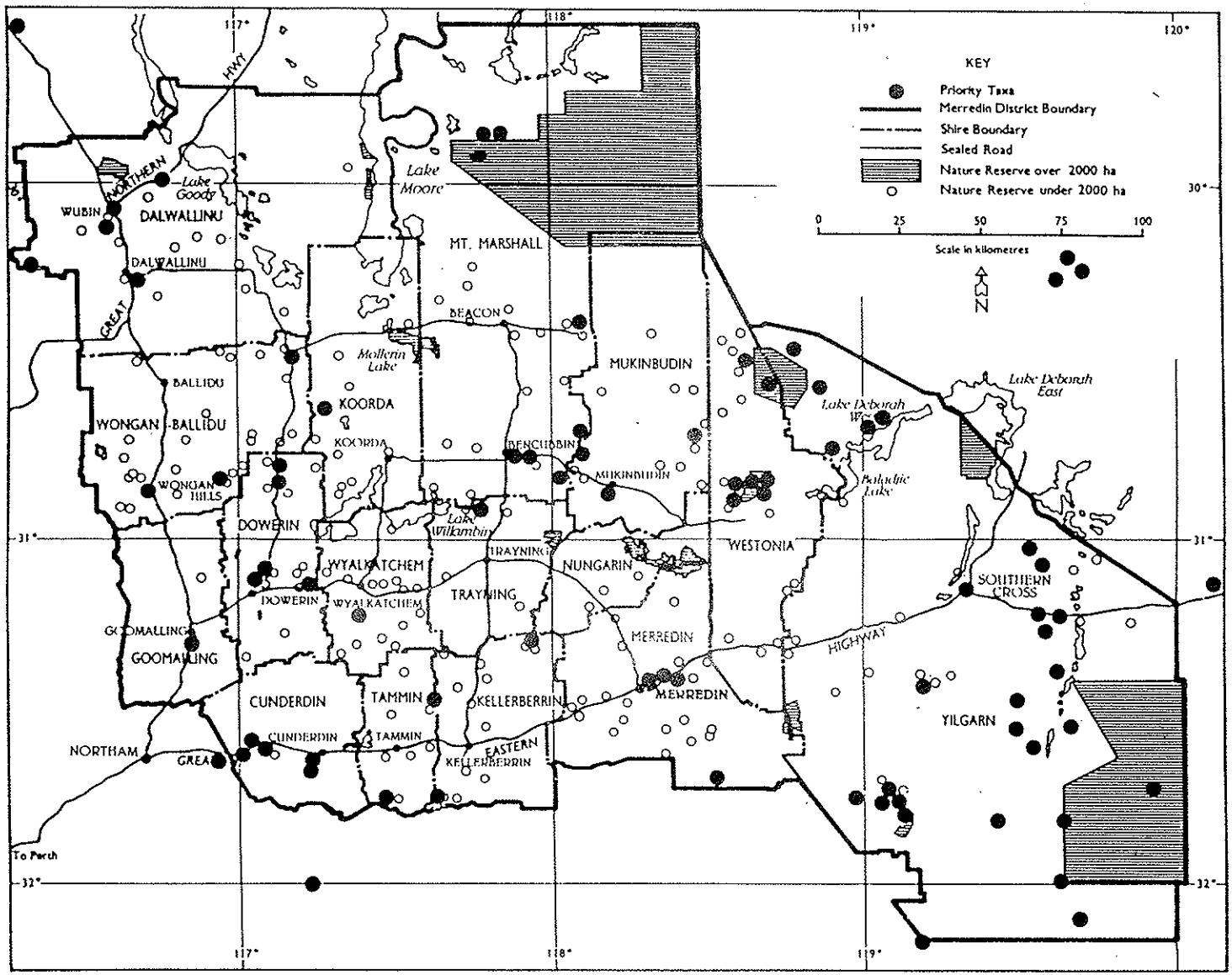


Figure 5. Distribution of Priority Two Species populations in the Merredin District.

ACACIA ASCENDENS B.R. Maslin **Family: Mimosaceae**

TAXONOMY

Acacia ascendens is most closely related to *A. abrupta* with similarities in phyllode and flora characteristics. The species name 'ascendens' refers to the ascending nature of the phyllodes.

DESCRIPTION

Moderately dense shrub 1.5-2 m tall, sometimes 3 m, single-stemmed or several branched at ground level. New shoots resinous, slightly viscid, pale green or light bronze. Branchlets terete, obscurely ribbed, glabrous, resinous and brown at extremities. Stipules semi-persistent, narrowly triangular, inconspicuous, *ca* 0.5 cm long, 0.1-0.2 mm wide, dark brown. Phyllodes terete, 2-4 cm long, *ca* 1 mm wide, ascending, glabrous, green, 4-nerved, resinous, apices often uncinate. Flowers at ends of branchlets, in axillary racemes. Flower-heads globular, 12 mm diameter, golden, resinous, densely 20-25-flowered. Flowers 5-merous. Petals 1.7 mm long, glabrous, very obscurely nerved. Pods narrowly oblong, 7 cm long, 5 mm wide, straight, flat, slightly undulate, resinous, glabrous. Flowering June to September.

DISTRIBUTION AND HABITAT

This taxon is only known from Chiddarcooping Nature Reserve where it occurs on scree slopes of granite breakaways and gullies in woodland or low scrub vegetation. It does not appear to be very common but at present it is not under any threat. Soils are comprised of white (kaolin) clay and smokey quartz derived from granite breakdown.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P2

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Westonia	Chiddarcooping	Nature Res.	+100	3 sub-popns healthy 7.11.90

RESPONSE TO DISTURBANCE

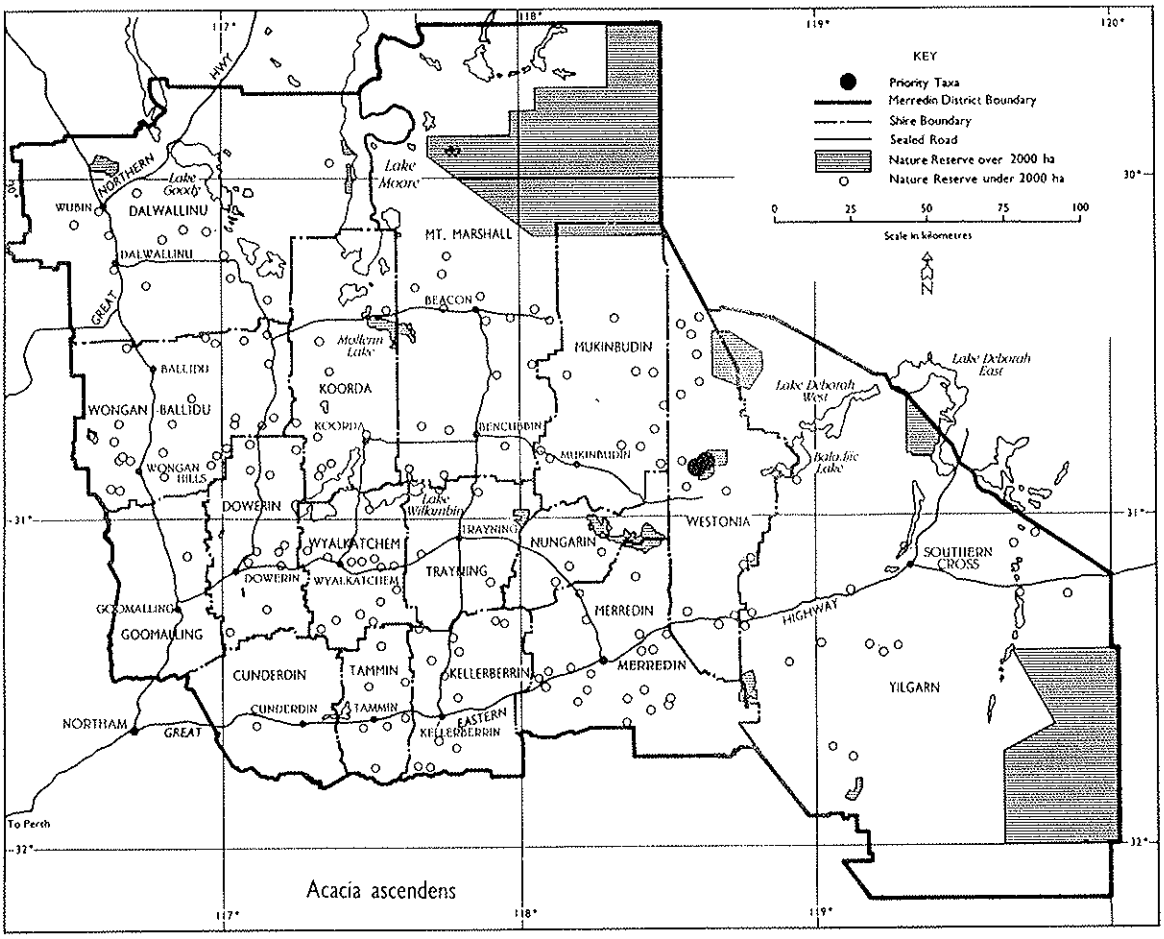
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is not known.

RECOMMENDATIONS

A. ascendens appears to be a rare species and urgently requires further survey.

REFERENCE

Maslin (1990).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
Lake Gooly
Lake Moore
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
Lake Deborah East
Lake Deborah West
BALLIDU
KOORDA
WONGAN
WONGAN HILLS
BENCUBBIN
Lake Wilkinbin
DOWERIN
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
YILGARN
NORTHAM
To Perth
Acacia ascendens

ACACIA 'ASEPALA' Maslin ms **Family: Mimosaceae**

TAXONOMY

This species is unusual because the flowers lack a calyx and are not subtended by a bracteole. *A. calcarata* has a similar phyllode, but differs in the stipules, peduncle length and the number of flowers per head. *A. calcarata* has a calyx and bracteoles.

DESCRIPTION

Shrub 0.5-1.5 m tall. Phyllodes thickly acicular, terete, 5-sided, 1-2.5 cm long, ca 1 mm wide, rigid, mostly straight, 5-nerved. Flowers 5-merous, heads globular, small, mid-golden. Pods unknown at this time. Flowering period September.

DISTRIBUTION AND HABITAT

A. 'asepala' is known only from near Marvel Loch and the Frank Hann National Park. Its habitat is loam and sandy loam soil in low *Eucalyptus* woodland. There is a further collection by A.J. Hart (Number 3 - 19.4.85), but no location details are given.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P2

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Yilgarn	Marvel Loch	?	?	? Collected K Newbey 23.8.79
2	Esperance	Ravensthorpe	Frank Hann	Nat. Pk	Common	? Collected B.R. Maslin 19.4.85

RESPONSE TO DISTURBANCE

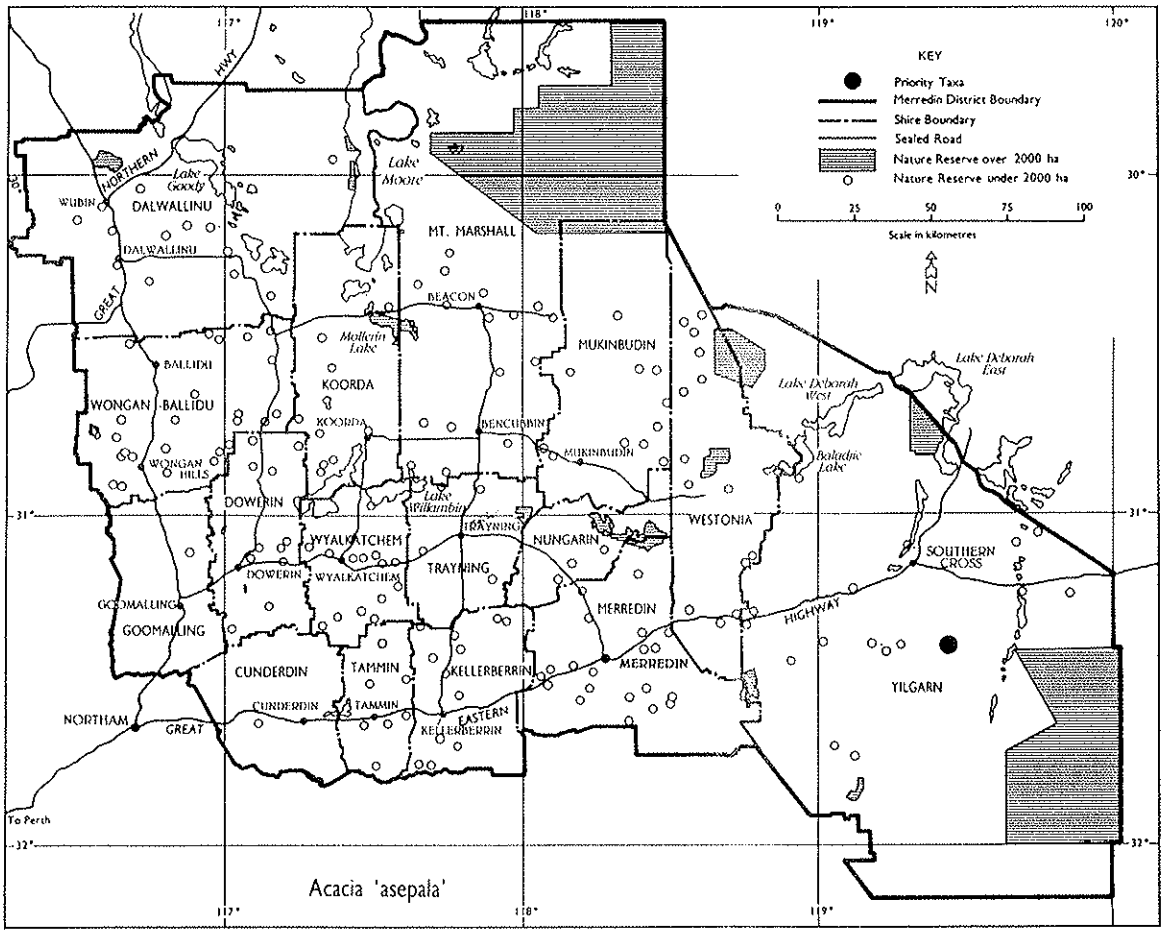
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Further survey is necessary. Population 1 was searched for but has not been relocated. This species is common and apparently secure in Frank Hann National Park, but has not been surveyed for six years.

REFERENCE

B.R. Maslin (personal communication).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Acacia 'asepala'
HUNT
NORTHERN
Lake Goody
WUBIN
DALWALLINU
Lake Moore
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN
WONGAN HILLS
BENCUBBIN
Lake Deborah West
Lake Deborah East
Baladie Lake
DOWERIN
Lake Pilkumbin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
EASTERN
To Perth
117°
118°
119°
120°
30°
31°
32°

ACACIA CAMPYLOPHYLLA Benth. **Family: Mimosaceae**

TAXONOMY

This species is allied to *Acacia colletioides*, but differs in the nature of the stipules and the pod. Phyllodes are recurved in *A. campylophylla* and are straight in *A. colletioides*.

DESCRIPTION

A rigid, bushy shrub to 30-35 cm tall. Phyllodes numerous, linear-terete, rigid but recurved, tapering into pungent points, 2-2.5 cm long, striate with several nerves. Stipules small, setaceous, almost spinescent. Flowers numerous, golden yellow, globular with narrow smooth petals. Pod linear, narrow, flat with nerve-like margins, and not contracted between the seeds. Flowering June to September.

DISTRIBUTION AND HABITAT

This taxon occurs in scrub vegetation on yellow sand with laterite gravel near Tammin, Dowerin, Amery, Quairading, Wyalkatchem and York. Three earlier occurrences based on records twenty or more years old near Cunderdin and Tammin are thought to no longer exist. *A. campylophylla* occurs near York in open *Eucalyptus wandoo* woodland. Three populations are on nature reserves.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P3

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Tammin	Tammin	Nat Res.	141	2 healthy sub-popns 27.8.90
2	Merredin	Dowerin	Dowerin North	Road Res.	1	? Collected R. Cumming 20.7.82
3	Merredin	Dowerin	Amery	Rail Res.	Moderately common	? Collected B.H. Smith 22.7.85
4	Narrogin	Brookton	Austin Rd	Road Res.	?	? Collected L.J. Sylvester 25.10.89
5	Mundaring	York	Mokine	Nature Res.	Uncommon	? Collected Keighery/Alford 1.8.85
6	Merredin	Wyalkatchem	Dingo Well	Nature Res.	?	? Collected P. Roberts 6.7.83
7	Mundaring	Toodyay	Bulligam Rd	Private	?	? File record 17.8.87

RESPONSE TO DISTURBANCE

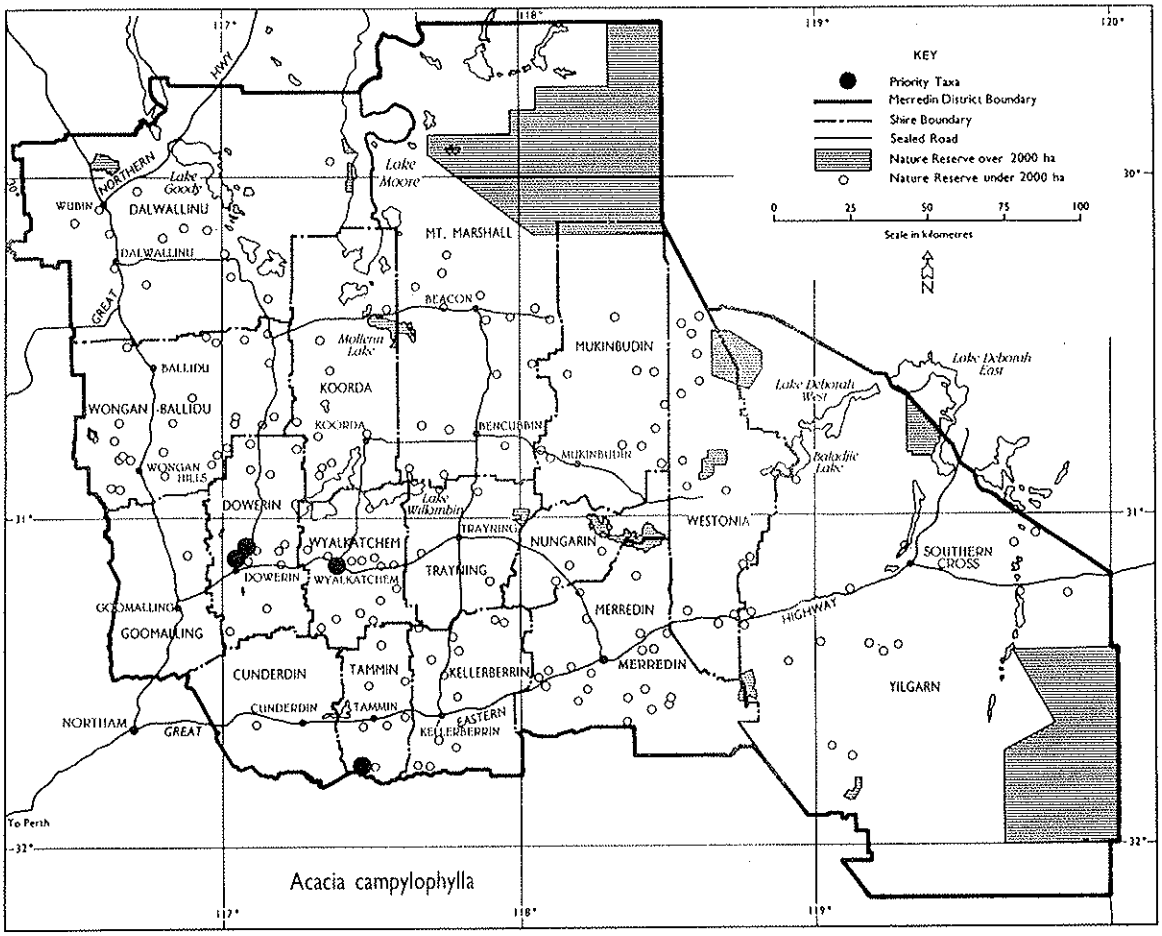
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Only one population was surveyed in 1990, the remaining populations urgently require surveys to assess their current conservation status.

REFERENCES

Blackall and Grieve (1974): Whibley (1980); Coates (1990).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Acacia campylophylla
DALWALLINU
WUBIN
MT. MARSHALL
BEACON
MUKINBUDIN
KOORDA
BENCUBBIN
WONGAN-BALLIDU
BALLIDU
WONGAN HILLS
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
GOOMALLING
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN KELLERBERRIN
MERREDIN
SOUTHERN CROSS
YILGARN
NORTHAM
To Perth
Lake Moore
Lake Goods
Lake Dobonah West
Lake Dobonah East
Lake Baladjie
Lake Wilkinbin
Mollerin Lake
NORTHERN
GREAT
HIGHWAY

ACACIA 'CASTANOSTEGIA' Maslin ms **Family: Mimosaceae**

TAXONOMY

This taxon is close to *A. pachypoda*, but differs principally in having yellow-ribbed branchlets and quadrangular phyllodes with a nerve at the apex of each angle.

DESCRIPTION

Shrub 0.7-1 m tall and 1-2 m in diameter. Phyllodes rigid, quadrangular, 2-3 cm long, pungent. Flowers 5-merous, heads cream, globular, 3-5 mm diameter. Pods linear, 4-5 cm long and 2-3 mm wide, not contracted between seeds. Flowering period July to October.

DISTRIBUTION AND HABITAT

There are nine recorded occurrences, of which three are in the Merredin District. The two most recent records are near North Ironcap (20.10.87) and south-east of Norseman (1.4.89). This species occurs mainly between Mt Holland and Hatter Hill and east to Lake Seabrook (near Koolyanobbing) and near Norseman. It is found in sand, loam and laterite soils, in *Eucalyptus* woodland open scrub or heath vegetation.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P3

KNOWN POPULATIONS (Merredin District Only)

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Yilgarn	Lake Seabrook	? VCL	?	? Collected K. Newbey 10.9.79
2	Merredin	Yilgarn	Mt Holland N	VCL	Common	? Collected K. Newbey 23.8.79
3	Merredin	Yilgarn	Mt Holland NNW	VCL	?	? Collected A.S. George 30.7.69

RESPONSE TO DISTURBANCE

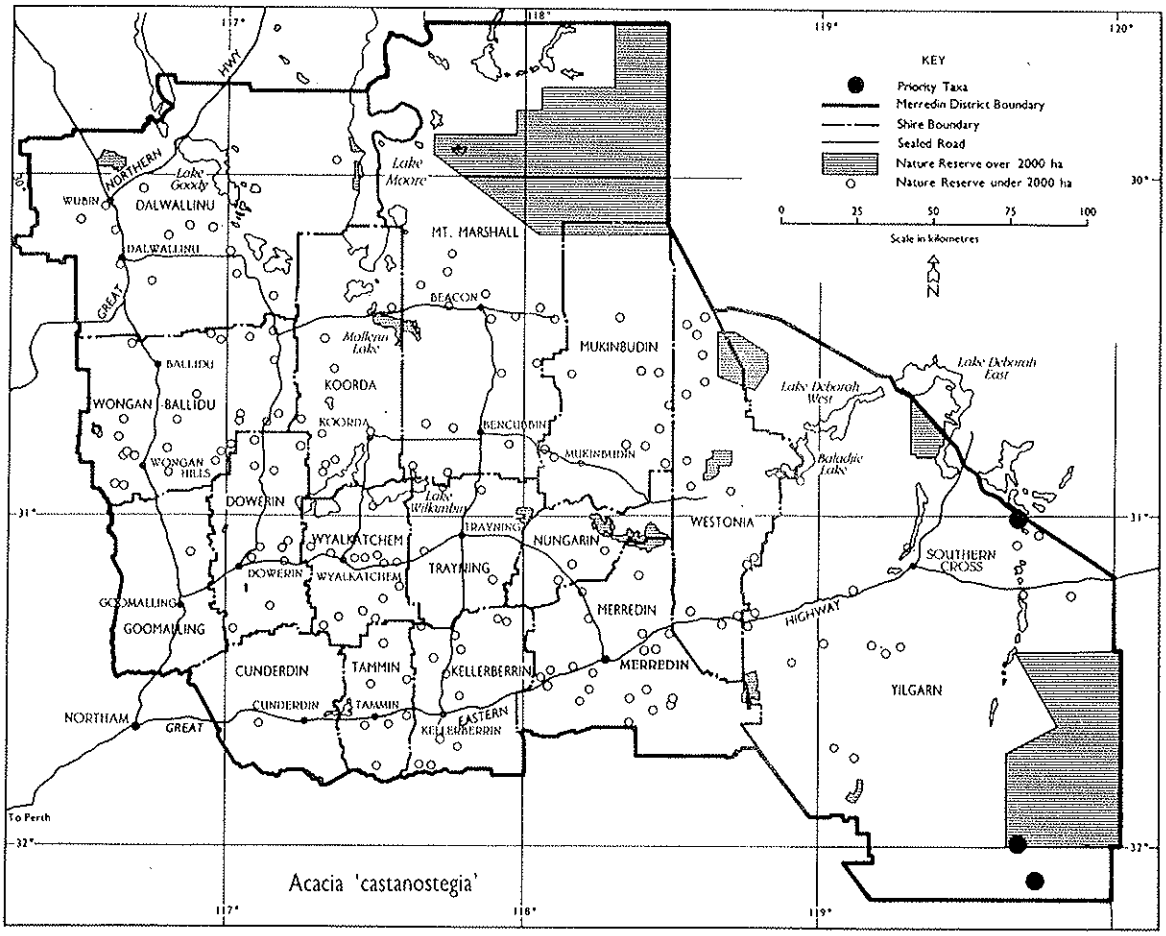
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Road works along the Southern Cross-Forrestonia Road may have affected populations 2 and 3. Priority survey is warranted as this taxon appears to be quite rare.

REFERENCES

Maslin (1974); B.R. Maslin (personal communication).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Acacia 'castanostegia'
HWY
NORTHERN
Lake Goorly
WUBIN
DALWALLINU
Lake Moore
MT. MARSHALL
BEACON
GREAT
Malkuna Lake
MUKINBUDIN
BALLIDU
WONGAN
KOORDA
BENCUBBIN
WONGAN HILLS
Lake Deborah West
Lake Deborah East
Baladjie Lake
DOWERIN
Lake Wilkinson
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
EASTERN
To Perth
117°
118°
119°
120°
30°
31°
32°

ACACIA COWANIANA Maslin **Family: Mimosaceae**

TAXONOMY

A. cowaniana has affinities with *A. wilhelmiana* an eastern Australian species, which has smaller stature, shorter phyllodes, and shorter, narrower pods.

DESCRIPTION

Shrub or small tree to 5 m tall, occasionally to 8 m. Phyllodes narrowly linear, narrowed at base, 3-5 cm long, 1-2.5 mm wide, flat, inclined, resinous, obscurely nerved, apex hooked. Flowers 2-headed, heads globular, cream to very pale lemon yellow, 10 mm diameter, 20-flowered, resinous. 5-merous. Pods linear, to 8 cm long, 4.5-6 mm wide, straight to slightly curved, slightly undulate, rounded on opposite sides over alternate seeds, slightly resinous. Flowering period April to July.

DISTRIBUTION AND HABITAT

This species has a restricted habitat on granites. There are twelve records from four locations, of which two are thought to still exist. Populations 2 and 3 are known from records greater than 20 years old and these areas need surveying to determine whether the species is still present. At Mt Caroline it occurs on granite in skeletal soil (sand loam) pockets.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P2

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Kellerberrin	Mt Caroline	Nature Res.	232	Undisturbed 4.10.90
2	Merredin	Kellerberrin	Mooranoppin	Nature Res.	?	? Collected B.R. Maslin 16.7.70
3	Merredin	Kellerberrin	Kellerberrin	Private	?	? Collected C.A. Gardner 2.7.36
4	Narrogin	Kulin	Jilakin	Nature Res.	?	? Collected K.J. Atkins 2.5.86

RESPONSE TO DISTURBANCE

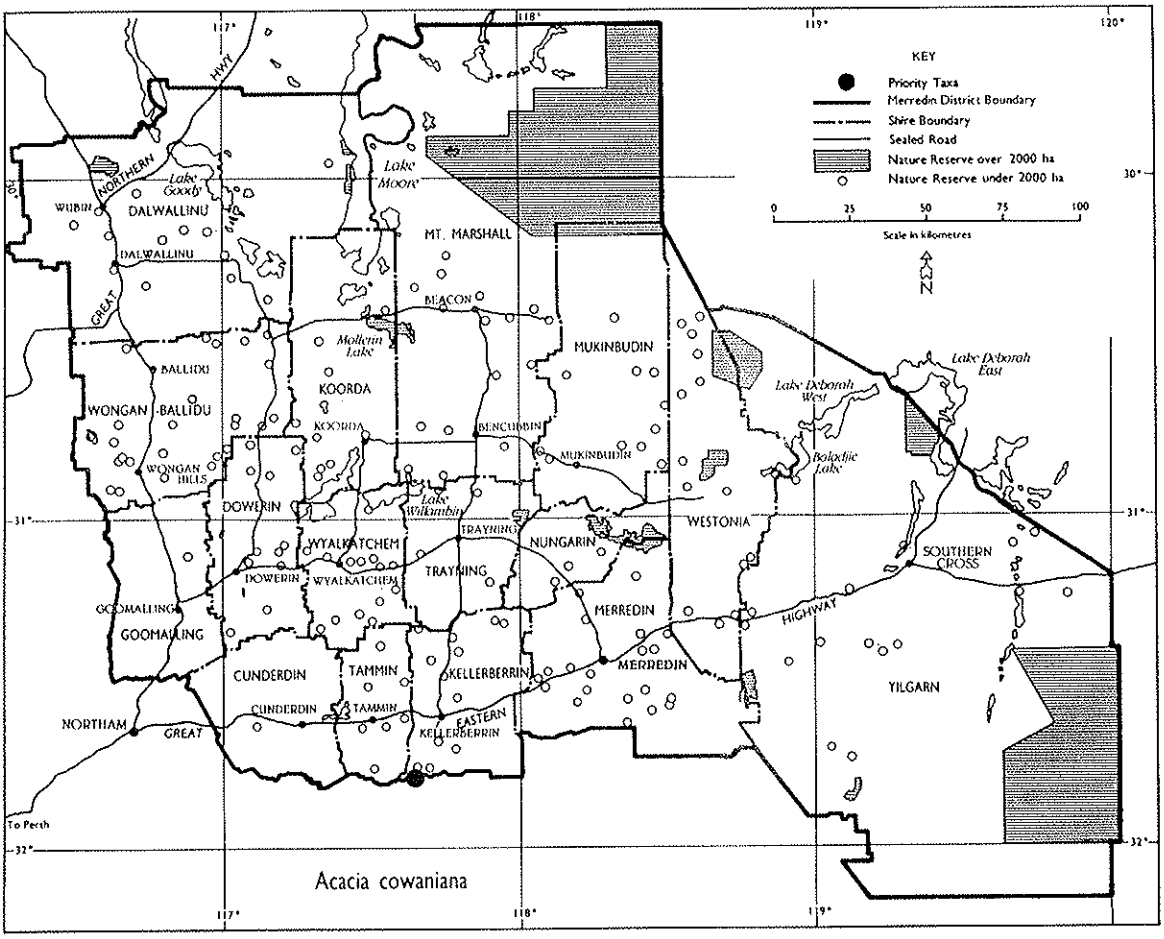
Response to soil disturbance, fire, weed invasion, canopy cover and grazing is unknown.

RECOMMENDATIONS

Populations 2 and 4 are in urgent need of survey. Priority One status may be warranted.

REFERENCES

Whibley (1980); Maslin (1990).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Acacia cowaniana
DALWALLINU
WUBIN
MT. MARSHALL
MEACON
MUKINBUDIN
KOORDA
BENCUBBIN
BALLIDU
WONGAN HILLS
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
GOOMALLING
MERREDIN
CUNDERDIN
TAMMIN
KELLERBERRIN
NORTHAM
YILGARN
SOUTHERN CROSS
HIGHWAY
GREAT
NORTHERN
To Perth

ACACIA SCLEROPHYLLA Lindl. var. *'PILOSA'* Cowan & Maslin ms **Family: Mimosaceae**

TAXONOMY

This taxon differs from other *A. sclerophylla* varieties in its pilose branchlets and main phyllode nerves and in its long, linear, persistent stipules.

DESCRIPTION

Shrub to 80 cm tall and across, sometimes prostrate in habit. Phyllodes linear-oblanceolate, 2-4 mm wide, curved. Primary nerves pilose, glabrescent. Flowers 5-merous, heads globular, 5-6 mm diameter, light-golden. Pods linear, 3-6 cm long, 2-3 mm wide, coiled when old. Flowering period August to October.

DISTRIBUTION AND HABITAT

A. sclerophylla var. *pilosa* is known from only a few localities between Kununoppin and Dumbleyung. Its habitat is sandy loam or clay soils in mallee vegetation sometimes at salt lake margins.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P2

KNOWN POPULATIONS (Merredin District only)

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Kellerberrin	Nth Bungulla	Nature Res.	?	? Collected B.G. Muir 30.8.77
2	Merredin	Kellerberrin	Ryans	Private	?	? Collected L. Atkins 12.10.87

RESPONSES TO DISTURBANCE

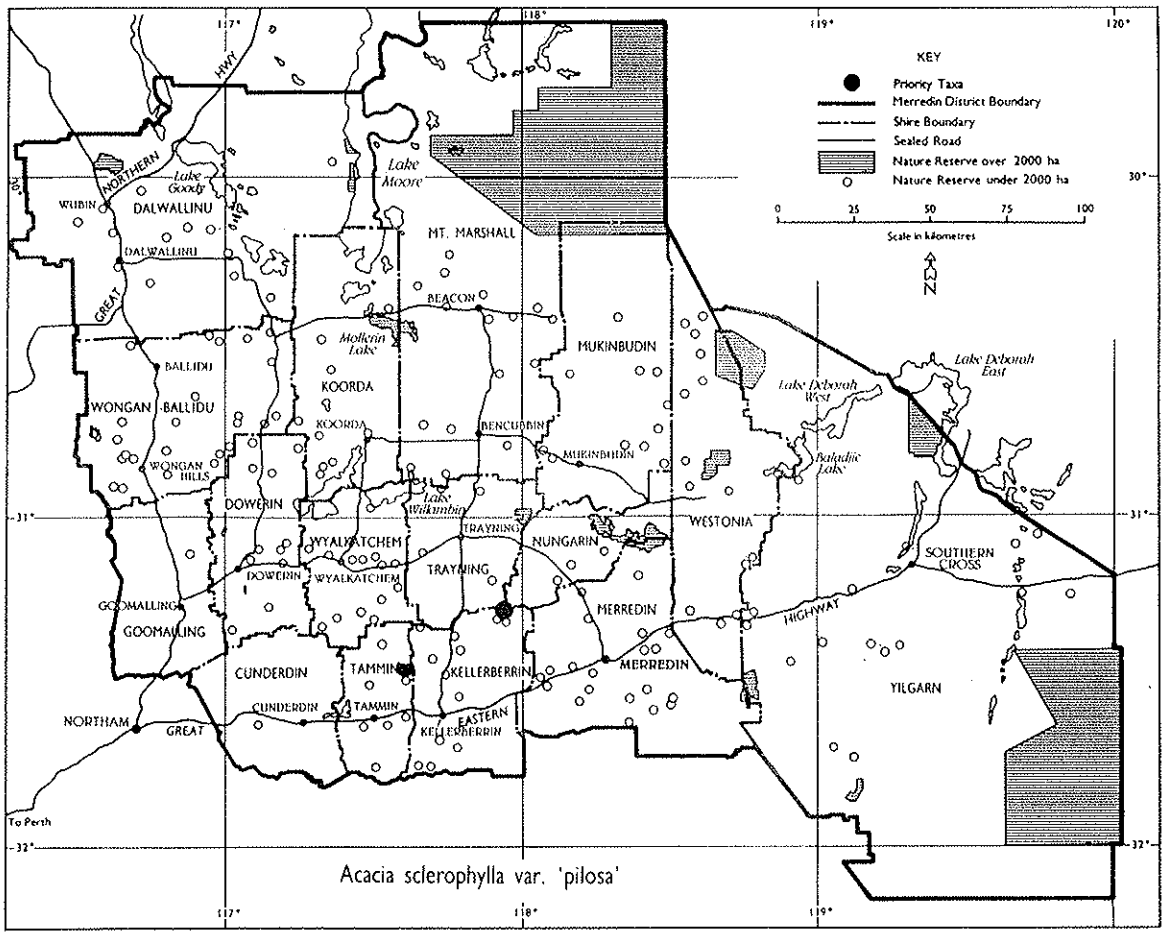
Responses to soil disturbance, fire, weed invasion, grazing and canopy cover are unknown.

RECOMMENDATIONS

Surveys of the known localities are urgently required. Protection of population 2 needs careful consideration.

REFERENCE

R. Cowan (personal communication).



Acacia sclerophylla var. 'pilosa'

ACROTRICHE PATULA R.Br. **Family: Epacridaceae**

TAXONOMY

This is a distinctive, easily recognised taxon. The leaf characteristics of this species at Hatter Hill are about halfway between the Eucla area collections and those of the Mt Lofty Ranges. Those on Kangaroo Island, S.A. have leaves similar to those occurring near Eucla.

DESCRIPTION

Rigid, divaricately branched shrub forming dense clumps up to 0.6 m diameter, and 0.4-0.6 m high; young stems lightly pubescent. Leaves ovate-lanceolate, rigid, concave above, 6-12 mm long, 2.3-5 mm broad, with attenuate mucronate pungent tips; margins slightly serrated towards the apex; upper surface glabrous, shiny; lower surface discoloured. Inflorescence: flowers pale green, in axillary spikes or clusters with 6-9 flowers. Fruit green, glabrous, depressed-globular, 2-3 mm diameter. Flowering period September.

DISTRIBUTION AND HABITAT

Indications from collections and field notes on recorded occurrences in W.A. suggest that this taxon is reasonably secure in the Western Australian part of its range. It is found on the red-brown (stony) earth, or stony loam breakaway slopes in mallee, scrub or open scrub vegetation from south of Marvel Loch to east of Skeleton Rocks and near Lake Cronin and Hatter Hill. It also occurs near Eucla, on Eyre Peninsula, in the Mt Lofty Ranges and on Kangaroo Island in South Australia.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P2

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Yilgarn	Parker Ra. Tank	VCL ? Nature Res.	626	Healthy 31.8.90
2	Merredin	Yilgarn	Parker Ra. South	Nature Res.	20	Healthy 18.10.90
3	Merredin	Yilgarn	Cockatoo Tank	? Water Res.	1	Healthy 19.10.90
4	Esperance	Ravensthorpe	Hatter Hill	VCL/Mining Lease	50	Some disturbed 6.9.90
5	Narrogin	Kondinin	Near Lake Cronin	VCL	?	? Collected K. Newbey 3.10.79

RESPONSE TO DISTURBANCE

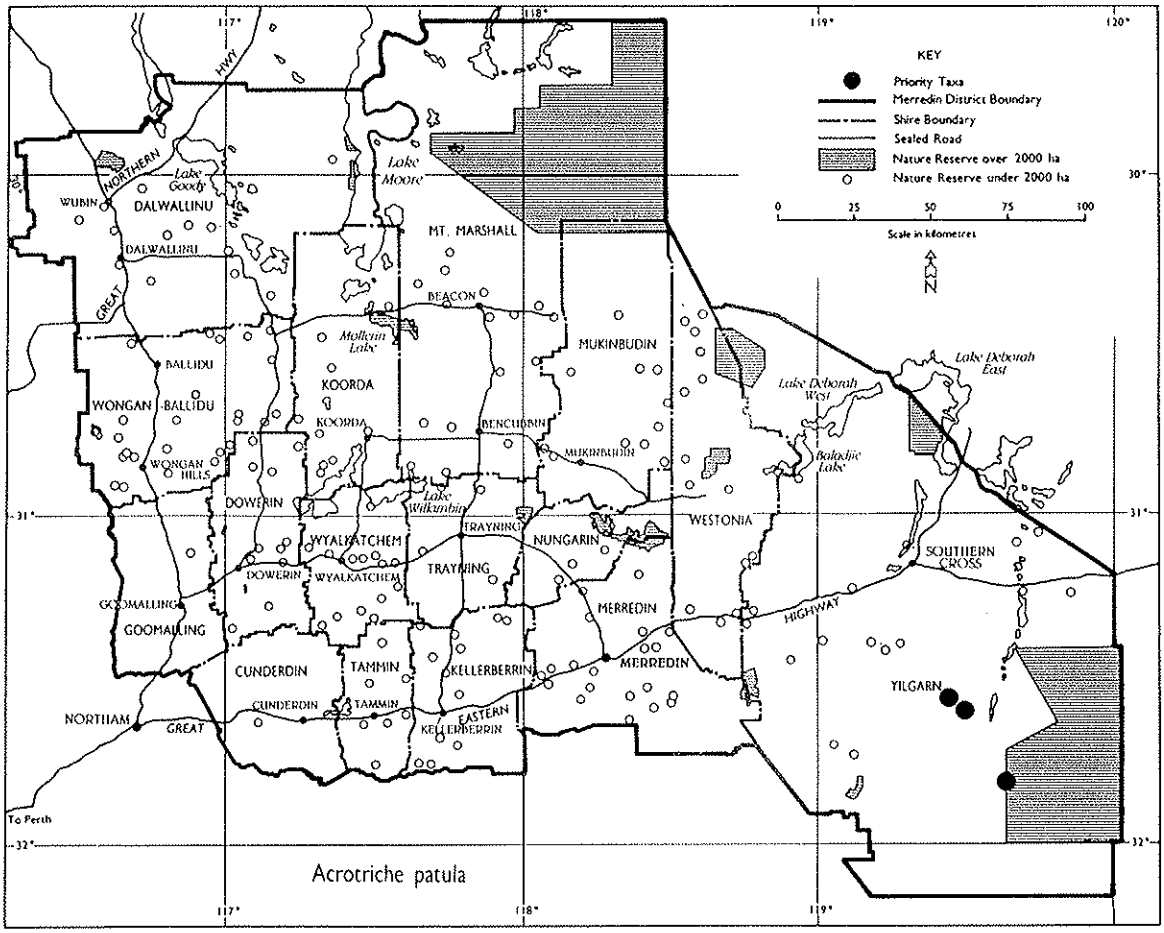
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Monitoring of populations near mining leases, particularly in the Hatter Hill area, is required. Further surveys are required in the eastern part of the species range to accurately assess its conservation status.

REFERENCE

Blackall and Grieve (1981).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
Lake Goody
WUBIN
DALWALLINU
DALWALLINU
GREAT
Lake Moore
MT. MARSHALL
BEACON
Mollerin Lake
MUKINBUDIN
BALLIDU
WONGAN
BALLIDU
KOORDA
KOORDA
BENCUBBIN
MUKINBUDIN
WONGAN HILLS
Lake Deborah West
Lake Deborah East
Baladjie Lake
DOWERIN
Lake Wilkinbin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
DOWERIN
WYALKATCHEM
TRAYNING
SOUTHERN CROSS
GOOMALLING
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
MERREDIN
YILGARN
NORTHAM
GREAT
CUNDERDIN
TAMMIN
EASTERN
KELLERBERRIN
To Perth
Acrotriche patula

ANDERSONIA CARINATA L. Watson **Family: Epacridaceae**

TAXONOMY

A. carinata has affinities with *A. parviflora*, but *A. carinata* is distinguished by its keeled bracteoles and internally pubescent petals.

DESCRIPTION

Shrub 20-30 cm tall, low and spreading. Leaves are appressed at the base, 2-5 mm long, 1.5-2 mm wide at the base, tapering towards the tip, ovate. Flowers 6-12 in terminal bundles, pink, ciliate at the margins of the sepals and pubescent below the middle on the inner part of petals. Flowering period October to November.

DISTRIBUTION AND HABITAT

The general area for recent collections is nearer to the south coast, whereas the three 1893 collections by Cronin (see Watson 1962) are all much further inland. The only Merredin District record is from between Bunkin and Southern Cross, 1893, Cronin *s.n.* There is a 1982 record from the Stirling Ranges in sand clay over sandstone with mallee heath vegetation. Other records come from south of 33° latitude, apart from a doubtful Cronin record from Coolgardie.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P2

KNOWN POPULATIONS (Merredin District)

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Yilgarn	? Southern Cross	?	?	? Collected Cronin 1893

RESPONSE TO DISTURBANCE

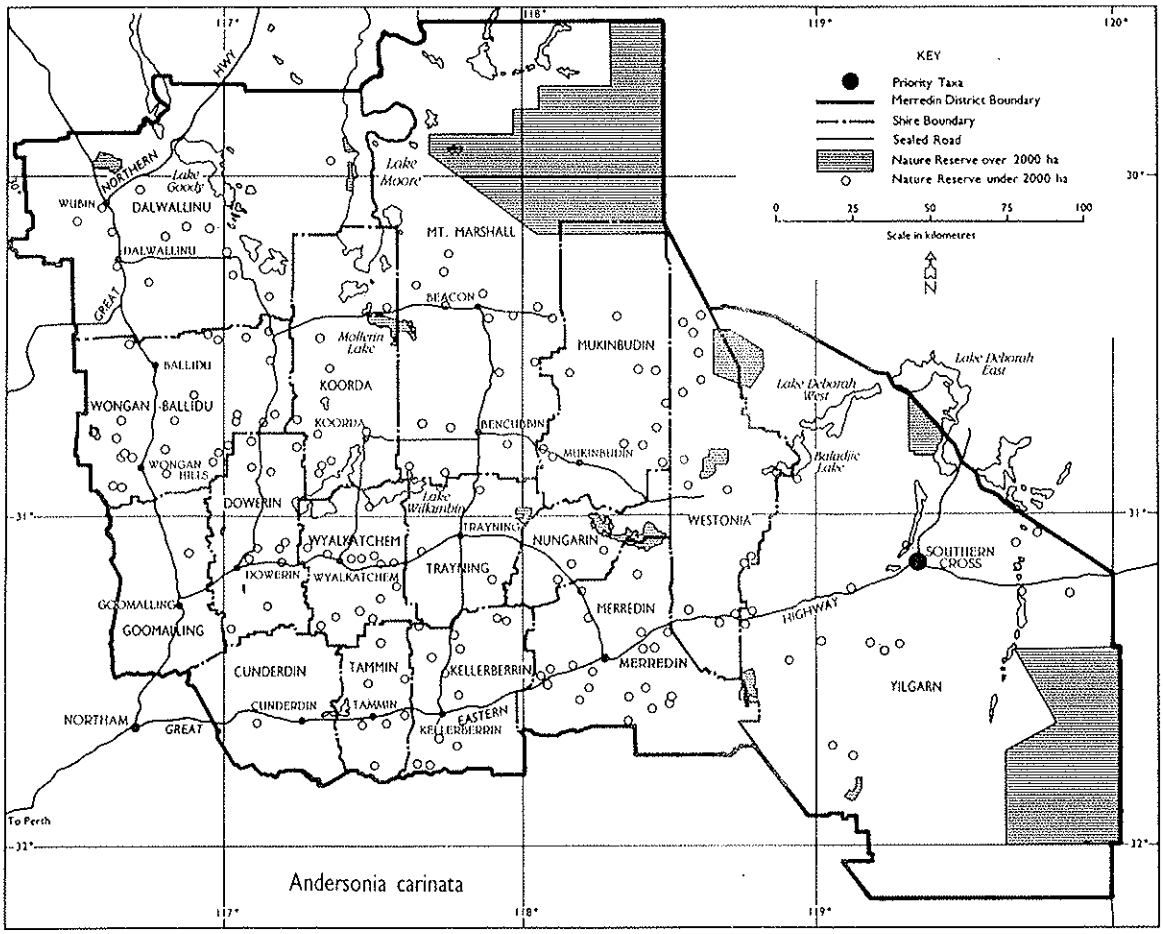
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Andersonia carinata appears to have a higher rainfall requirement than found in the Merredin District which suggests that the Southern Cross record is not correct. This requires further investigation.

REFERENCES

Watson (1962); Blackall and Grieve (1981).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
Lake Goods
Lake Moore
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
WONGAN
KOORDA
BENCUBBIN
WONGAN HILLS
Lake Deborah East
Lake Deborah West
Baladjie Lake
DOWERIN
Lake Wilkinbin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
EASTERN
To Perth
Andersonia carinata

ANIGOZANTHOS BICOLOR Endl. subsp. *EXTANS* Hopper **Family: Haemodoraceae**

Two-coloured Kangaroo Paw

TAXONOMY

Differs from other subspecies of *A. bicolor* in the longer, narrower perianth. *A. bicolor* is easily recognised by its two-coloured, red and green perianth.

DESCRIPTION

Perennial herb with several scapes, 10-25 cm tall. Leaves 5-15 cm long. Flowers parallel-sided or slightly constricted, 4-10 mm wide at narrowest point above middle, 55-75 mm long. Flowering period September to October.

DISTRIBUTION AND HABITAT

Most known populations of this taxon are in the Meenaar and Pingelly areas. Apart from a survey of the Meckering population in early October 1990 which failed to locate any plants, other populations have not been surveyed for seven or more years. The only record from the Merredin District is on brown clay loam in *Eucalyptus loxophleba* low woodland over *Acacia acuminata* In the Meenaar and Pingelly areas, where it is most abundant the habitat is similar with *Eucalyptus wandoo* replacing *E. loxophleba*. *Allocasuarina huegeliana* is also prominent.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P1

KNOWN POPULATIONS (Merredin District only)

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Cunderdin	Meckering	?	?	Not present 9.10.90

RESPONSE TO DISTURBANCE

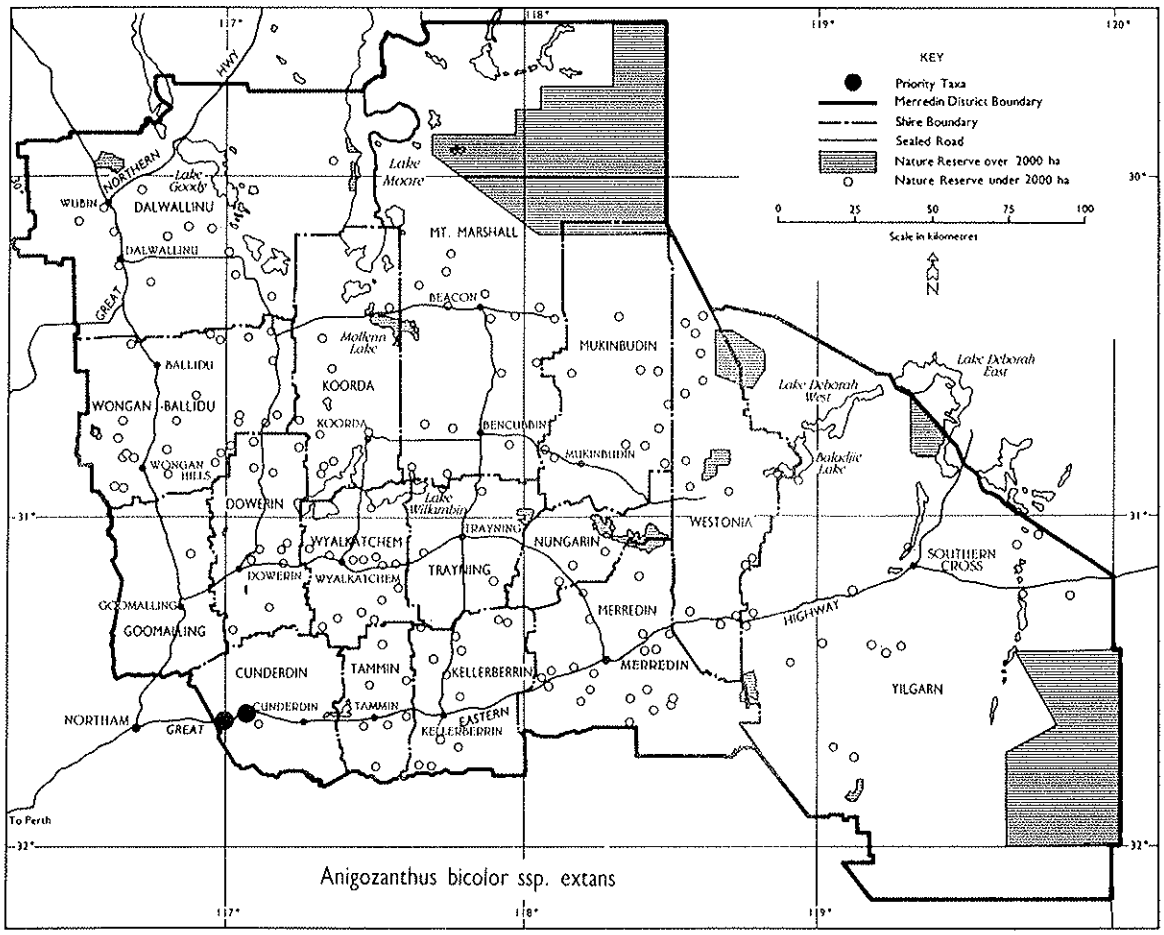
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Survey of the known populations is urgently needed. Priority One status is recommended.

REFERENCE

Hopper (1987).



Anigozanthus bicolor ssp. extans

BLENNOSPORA PHLEGMATOCARPA (Diels) P.S. Short **Family: Asteraceae**

TAXONOMY

B. phlegmatocarpa has clear affinities with *B. drummondii*, but it has purple-red to black florets in otherwise yellow flower-heads, two florets (generally) in each partial head and a shorter overall stature.

DESCRIPTION

Annual herb 5-10 cm tall, white woolly. Leaves 6-8 mm long and 0.75 mm wide. Flower-heads yellow, three florets in each partial head, pappus, florets and floret bracts with numerous fine hairs. Flowering period September to November.

DISTRIBUTION AND HABITAT

This species is found in *Halosarcia* spp. low shrubland or scrub heath on sub-saline flats adjacent to and at higher levels than salt lakes/rivers. Its distribution is from Cowcowing south to Lake Biddy.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P2

KNOWN POPULATIONS (Merredin District only)

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Wyalkatchem	Cowcowing Lakes	?	?	? Collected M. Koch Sept. 1904
2	Merredin	Cunderdin	Mortlock River	Private	Common	? Collected L. Haegi 3.10.76

RESPONSE TO DISTURBANCE

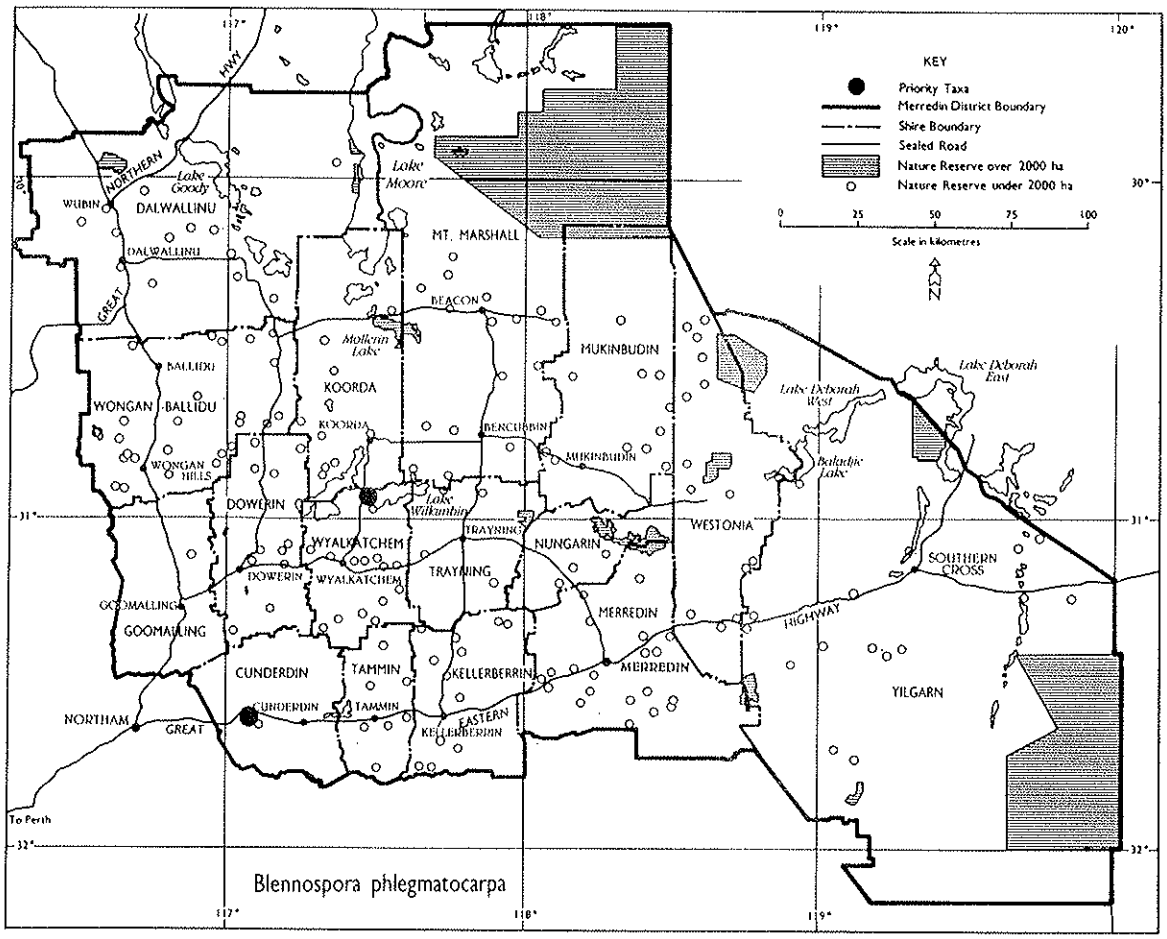
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Surveys of the appropriate habitat are urgently required to accurately assess the conservation status of this species. It may be more common than current information suggests.

REFERENCE

Blackall and Grieve (1982).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Blennospora phlegmatocarpa
MT. MARSHALL
MUKINBUDIN
KOORDA
WONGAN
BALLIDU
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
MERREDIN
KELLERBERRIN
TAMMIN
CUNDERDIN
GOOMALLING
NORTHAM
YILGARN
SOUTHERN CROSS
BENCUBBIN
BEACON
DALWALLINU
WUBIN
To Perth

CALYTRIX PARVIVALLIS Craven **Family: Myrtaceae**

TAXONOMY

C. parvivallis has close affinities with *C. nematoclada*, but differs in having stipules, a more pubescent calyx, petals with acute apices, and in possessing sterile stamens.

DESCRIPTION

Shrub to 50 cm tall. Leaves decussate, appressed, narrowly elliptic, 2-3 mm long, 0.5-0.8 mm wide, straight. Calyx segments connate at the base (up to 0.25 mm), pubescent for at least three-quarters of the length. Petals glabrous, purple, elliptic to ovate, 5-6.5 mm long, 2.75-3.25 mm wide, the apex acute. Flowering period October.

DISTRIBUTION AND HABITAT

This taxon is rare. It is known only from one location occupying about 3 ha. in a nature reserve but not far from a frequently used road intersection. The species was first collected at this locality in October 1963; it is the type locality and was surveyed during 1990. Surveys elsewhere in the Merredin District failed to locate any additional populations. It occurs in *Allocasuarina, Daviesia* and *Melaleuca* heath on pale sandy clay soil.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P1 (With highest priority for further survey and consideration for gazettal as DRF)

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Dowerin	Namelcatchem	Nature Res.	291	Est. 500; Healthy 6.10.90

RESPONSE TO DISTURBANCE

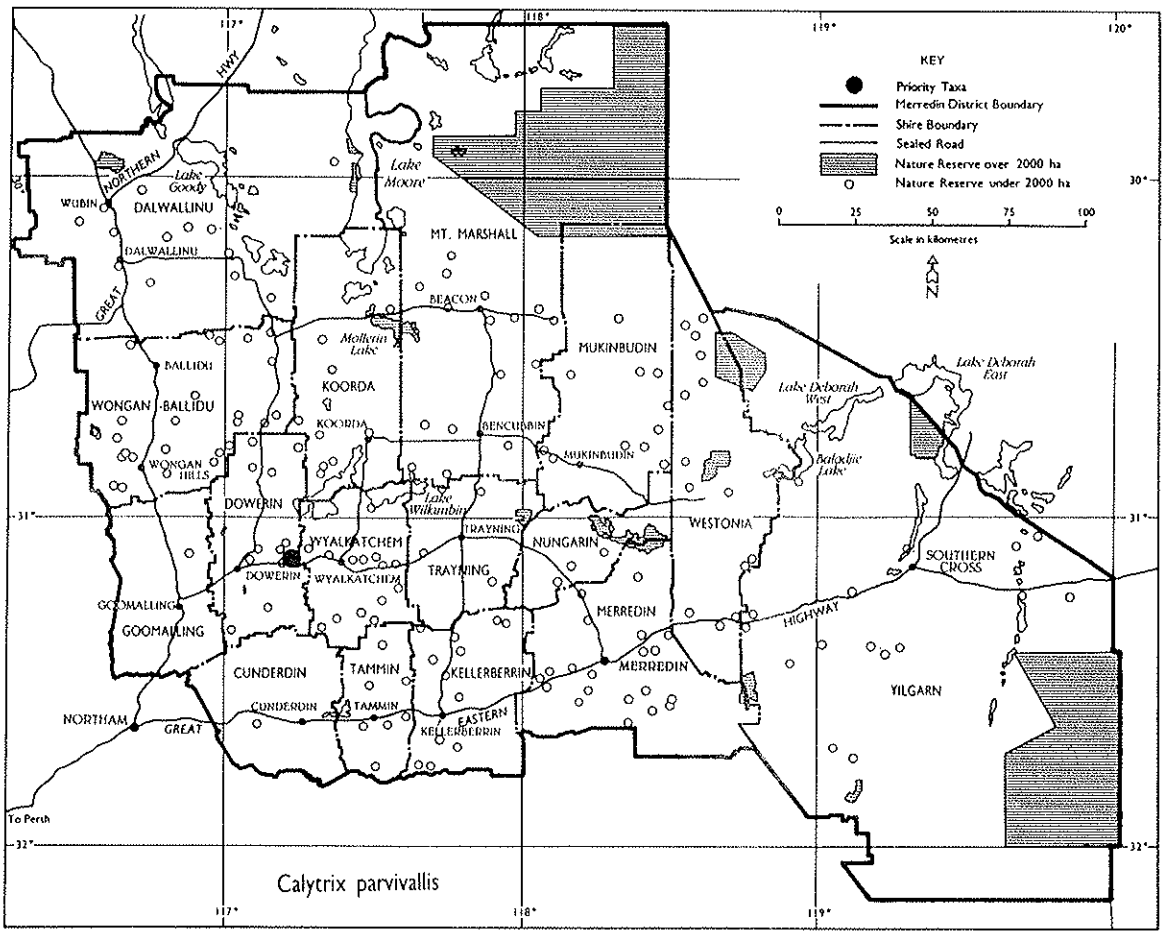
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

This species is in urgent need of further survey although detailed surveys were carried out in 1990. Germ plasm collection and propagation is desirable. Gazettal as DRF is recommended.

REFERENCE

Craven (1987).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
HWY
NORTHERN
Lake Goody
Lake Moore
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN-BALLIDU
BENCUBBIN
WONGAN HILLS
Lake Deborah East
Lake Deborah West
Baladjie Lake
DOWERIN
Lake Wilkinbin
TRAYNING
WESTONIA
WYALKATCHEM
NUNGARIN
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
YILGARN
NORTHAM
To Perth
Calytrix parvivallis

CONOSTYLIS ALBESCENS Hopper **Family: Haemodoraceae**

TAXONOMY

C. albescens has affinities with *C. bealiana*, but has hairy leaves and the yellow-cream flowers are curved.

DESCRIPTION

Perennial herb to 17 cm tall. Leaves 12-17 cm, 0.8-1.5 mm wide, grey-green to white, suffused with purple on lobes, which are 4-7 mm long. Flowering period August to September.

DISTRIBUTION AND HABITAT

C. albescens is found in heath and tall shrubland or scrub on yellow sand with laterite gravel and pebbles over a geographic range of just 6.5 km north-east of Merredin. Overall numbers may be less than 500 individuals.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P1 (With highest priority for further survey and consideration for gazettal as DRF)

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Merredin	Burragattin	Nature Res.	262	Healthy 2.10.90
2	Merredin	Merredin	Booraan North	Road Res.	24	On disturbed verge 2.10.90
3	Merredin	Merredin	Booraan NE	Rail Res.	?	? Collected 24.8.89

RESPONSE TO DISTURBANCE

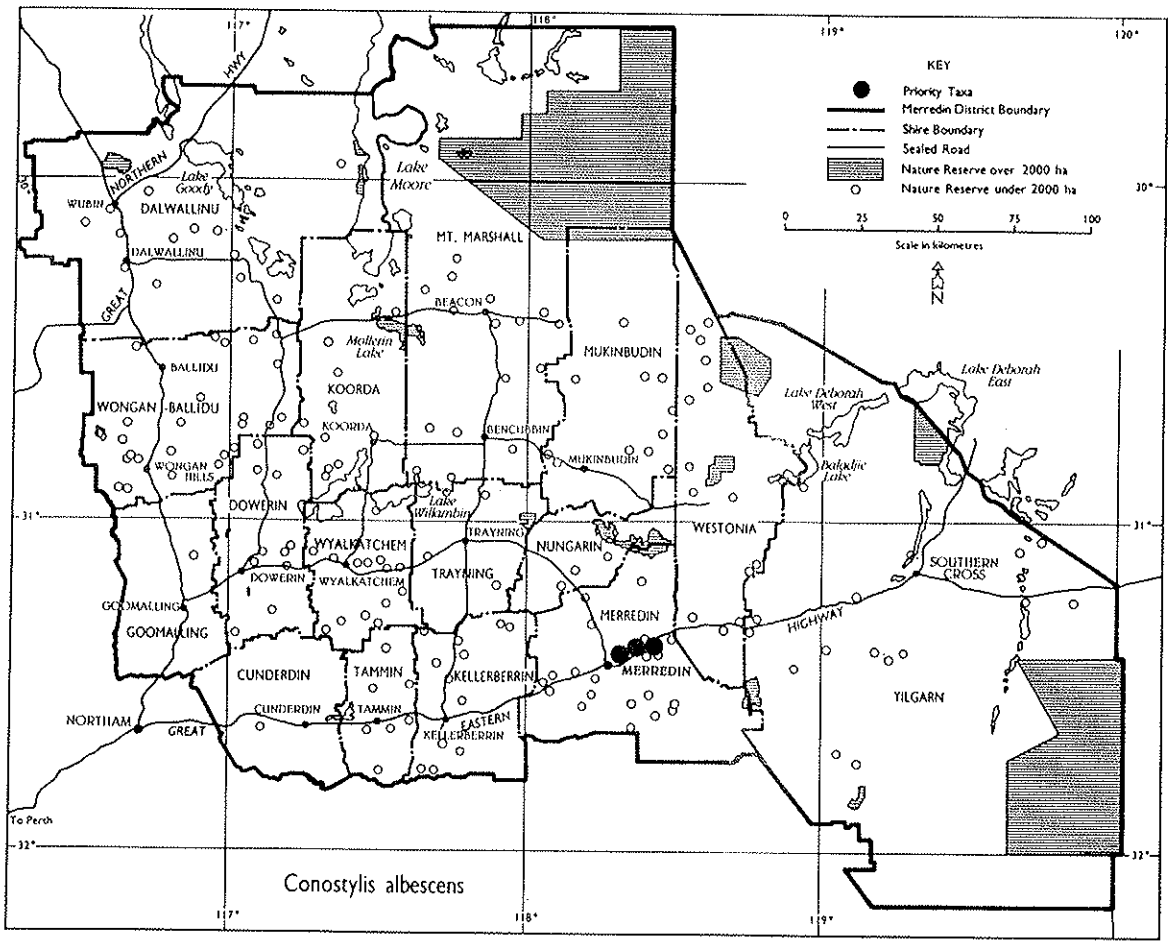
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown. It occurs as an undershrub so canopy cover may be important.

RECOMMENDATIONS

Gazettal as DRF is warranted with population 3 urgently in need of survey. Management of known populations needs to be considered as a matter of priority.

REFERENCE

Hopper (1987).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Conostylis albescens
DALWALLINU
MT. MARSHALL
BEACON
MUKINBUDIN
KOORDA
WONGAN - BALLIDU
BENCUBBIN
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
GOOMALLING
MERREDIN
CUNDERDIN
TAMMIN
KELLERBERRIN
NORTHAM
YILGARN
SOUTHERN CROSS
Lake Moore
Lake Goorly
Lake Deborah West
Lake Deborah East
Lake Wilkinbin
Baladjie Lake
HIGHWAY
GREAT EASTERN
To Perth

DAVIESIA DIELSII E. Pritzel **Family: Papilionaceae**

Bitter-pea

TAXONOMY

Quite distinct in having spinous branchlet apices and being quite glabrous overall.

DESCRIPTION

Divaricate shrub to 1 m tall. Leaves cuneate-triangular, pungent, ca 1 cm long. Flowers less than 1 cm across, axillary, orange and brown 'egg and bacon' type. Flowering period July to August.

DISTRIBUTION AND HABITAT

Known from six locations with only two collections at PERTH. Habitat is *Allocasuarina campestris* tall heath or *Eucalyptus rhodantha* scrub on laterite gravel with orange loam. Distribution is from Badgingarra north to Three Springs and east to beyond Watheroo.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P1

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Dalwallinu	Carot Well	Road Res.	43	? File record B. Haberley no date
2	Moora	Vic. Plains	Gillingara	Nature Res.	10	Good
3	Moora	Vic. Plains	Mogamber	Road/Rail Res.	4	Good

RESPONSE TO DISTURBANCE

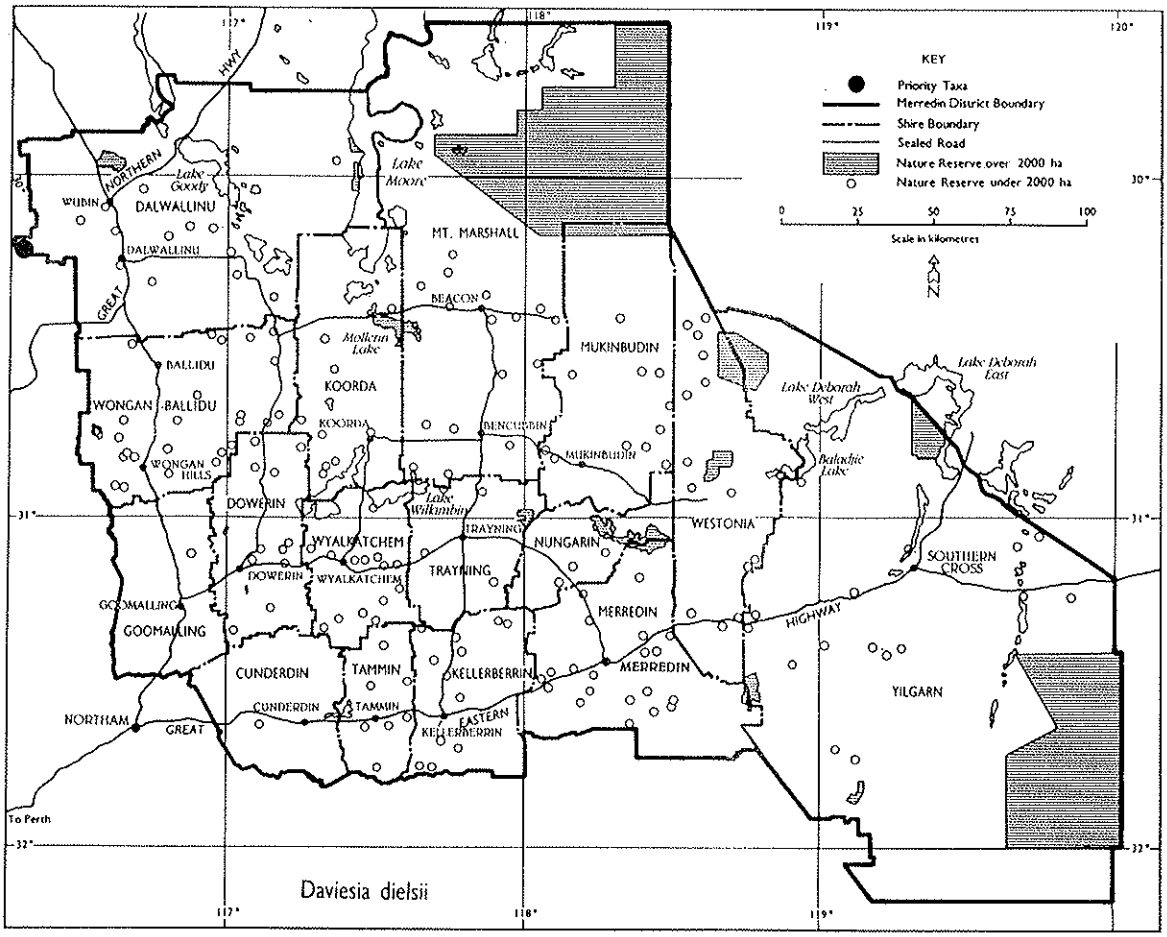
Response to soil disturbance, fire, weed invasion and canopy cover is unknown.

RECOMMENDATIONS

Appears to be quite rare, and priority survey of known occurrences should be carried out. Management of known occurrences, including fencing of private property, may be necessary. Priority One status is recommended as overall numbers seem quite low.

REFERENCE

Blackall and Grieve (1974).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
HWY
NORTHERN
Lake Goorly
WUBIN
DALWALLINU
Lake Moore
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN
WONGAN HILLS
BENCUBBIN
Lake Deborah West
Lake Deborah East
Baladjie Lake
DOWERIN
Lake Wilkinbin
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
YILGARN
NORTHAM
To Perth
Daviesia dielsii

EREMOPHILA 'COMPLANATA' R.J. Chinnock ms **Family: Myoporaceae**

TAXONOMY

This species has affinities with *E. phillipsii* with similarities in the densely glandular-hairy sepals and in the alternate linear leaves. The two taxa differ in the hairiness of leaves, *E. 'complanata'* having densely glandular-papillose leaves, while those of *E. phillipsii* are glabrous.

DESCRIPTION

Erect shrub to 2 m tall. Leaves, alternate, linear to linear-elliptic, 2.0-3.5 cm long and 1.6-3.4 mm wide, densely glandular-papillose, resinous, shiny. Flowers 3-6 per leaf axil, densely glandular-pubescent, petals 15-18 mm, purple above and pale pink to white below. Flowering period September.

DISTRIBUTION AND HABITAT

E. 'complanata' is known from the Chiddarcooping area and Willgoyne Hill, where it grows amongst granite boulders in skeletal sandy soils. Shrubland with *Dodonaea* and *Solanum* is the recorded vegetation.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P2

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Mukinbudin	Wilgoyne	?	?	?
2	Merredin	Westonia	Chiddarcooping	Nature Res.	1	Hopper pers. comm.
3	Merredin	Westonia	Chiddarcooping (west)	Private	Large	? File note A. Weston 4.9.86

RESPONSE TO DISTURBANCE

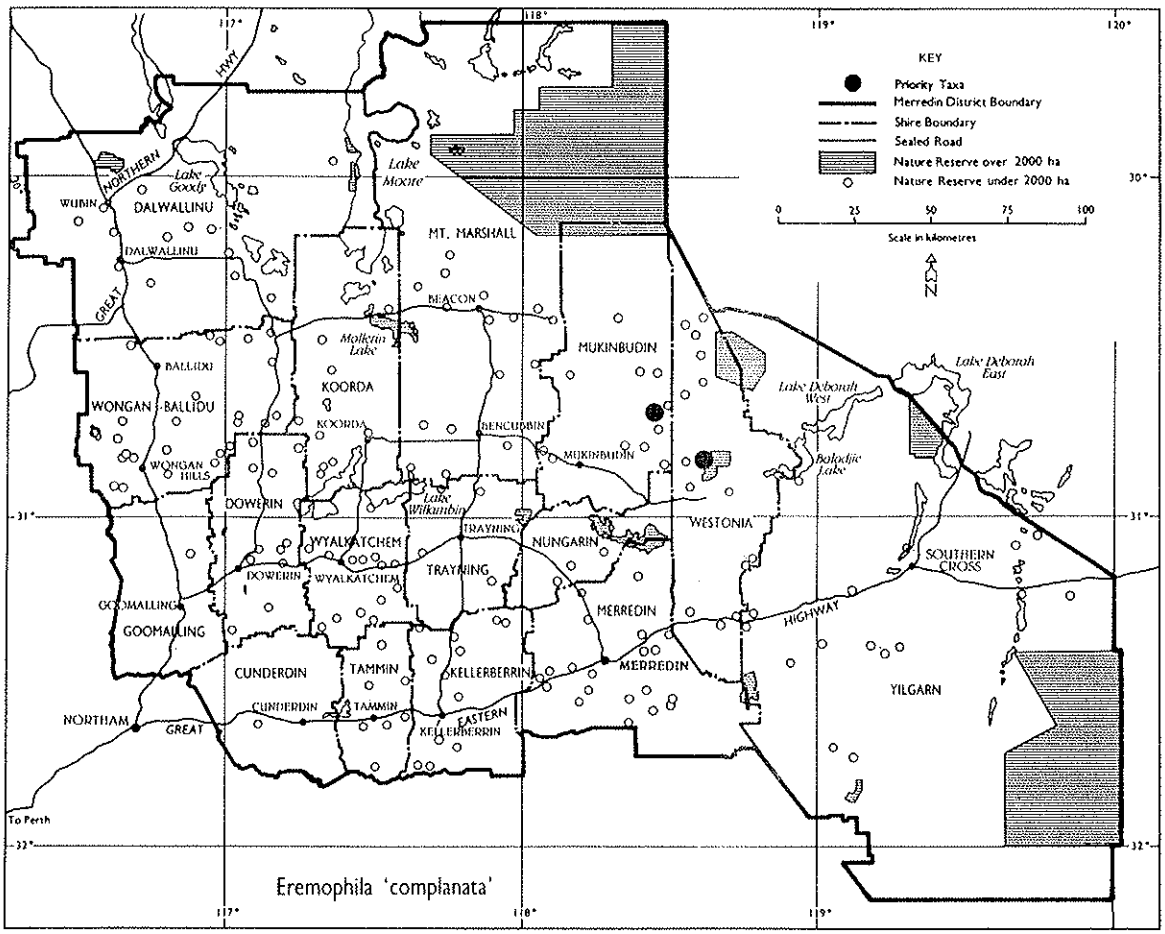
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

A rare taxon, which urgently requires further survey.

REFERENCE

R.J. Chinnock (Adelaide Herbarium, personal communication).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
NORTHERN HWY
Lake Goodja
Lake Moore
WUBIN
DALWALLINU
MT. MARSHALL
MEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN
BENCUBBIN
WONGAN HILLS
Lake Deborah East
Lake Deborah West
Bolodjie Lake
DOWERIN
Lake Wilkambin
TRAYNING
WESTONIA
WYALKATCHEM
NUNGARIN
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
EASTERN
To Perth
Eremophila 'complanata'

EREMOPHILA 'PINNATIFIDA' R.J. Chinnock ms **Family: Myoporaceae**

TAXONOMY

E. 'pinnatifida' is close to *E. ternifolia* but differs in its pinnate leaves and prominently pubescent leaves and branches.

DESCRIPTION

Erect, rounded shrub 0.6-1 m tall. Leaves in whorls of 3, erect, imbricate, ovate to oblong, deeply pinnately lobed 5.0-9.5 x 2.5-4.5 mm, densely glandular-pubescent, viscid. Flowers 1 per axil, sessile, petals 18-25 mm long, pale purple, externally pubescent. Flowering period September.

DISTRIBUTION AND HABITAT

E. 'pinnatifida' was first discovered in 1990, with a small number of individuals present at the type location. It is known only from the Dalwallinu area on brown clay loam with a vegetation cover of *Eucalyptus* woodland over sparse shrubland of *Eremophila, Santalum* and *Acacia* with chenopods and grasses.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P2

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Dalwallinu	Dalwallinu	Nature Res.	35	Est. R.J. Chinnock 12.9.90 OK

RESPONSE TO DISTURBANCE

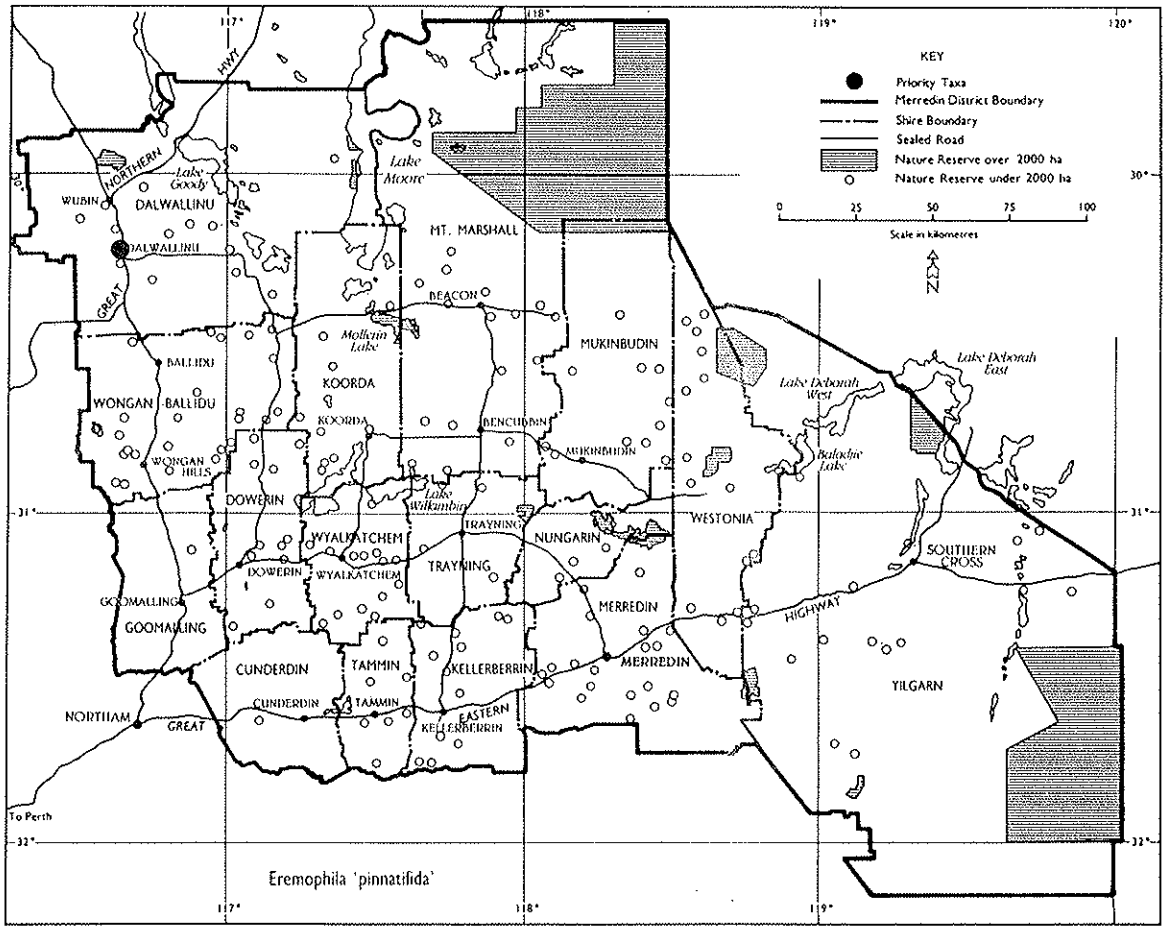
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

This species is in urgent need of further survey to assess its conservation status.

REFERENCE

R.J. Chinnock (Adelaide Herbarium, personal communication).


KEY
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Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
119°
120°
30°
31°
32°
HUNT
NORTHERN
Lake Goody
Lake Moore
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
WONGAN
KOORDA
BENCUBBIN
WONGAN HILLS
Lake Deborah West
Lake Deborah East
Baladee Lake
DOWERIN
Lake Wilkamin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
CUNDERDIN
TAMMIN
KELLERBERRIN
MERREDIN
HIGHWAY
YILGARN
EASTERN
NORTHAM
To Perth
Eremophila 'pinnatifida'

EUCALYPTUS ORBIFOLIA subsp. Dromedaries (*S.D. Hopper* 1852) **Family: Myrtaceae**

TAXONOMY

This taxon differs from typical *Eucalyptus orbifolia* principally in the longer, acute-apexed operculum.

DESCRIPTION

Mallee to 4 m tall, with Minni Ritchi bark. Adult leaves petiolate, alternating, obovate, emarginate, 2-5.5 x 1.2-3.7 cm, concolorous, dull, grey-green to glaucous. Flowers axillary, unbranched. Buds pedicellate, double-conic, glaucous, 1.0-1.2 x 0.6-0.8 cm, operculum acutely conical and slightly beaked. Valves 4, strongly exserted in fruit. Flowering period March and July.

DISTRIBUTION AND HABITAT

Two possible occurrences have been indicated for Johnson Rocks and Old Rainy Rocks on the Menzies Road north of Mt Manning Range Nature Reserve which is north of the Yilgarn Shire boundary, but these need confirmation. It is possible that these will be typical *E. orbifolia*. Populations 1 and 2 may be the same location as the gazetteer records the same latitude/longitude for each. If that is the case there may be as many as six collections from the same population of only a few individuals taken over the last 24 years. No other occurrences were noted in 1990. The population is near a frequently used camping area and occurs in granite sand loam soil carrying open mallee vegetation.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P2

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Mt Marshall	Dromedaries	? VCL/Nature Res.	3	Healthy 10.7.90
2	Merredin	Mt Marshall	Gillian Rock	? VCL/Nature Res.	?	? Collected M. Brooker 16.3.84

RESPONSE TO DISTURBANCE

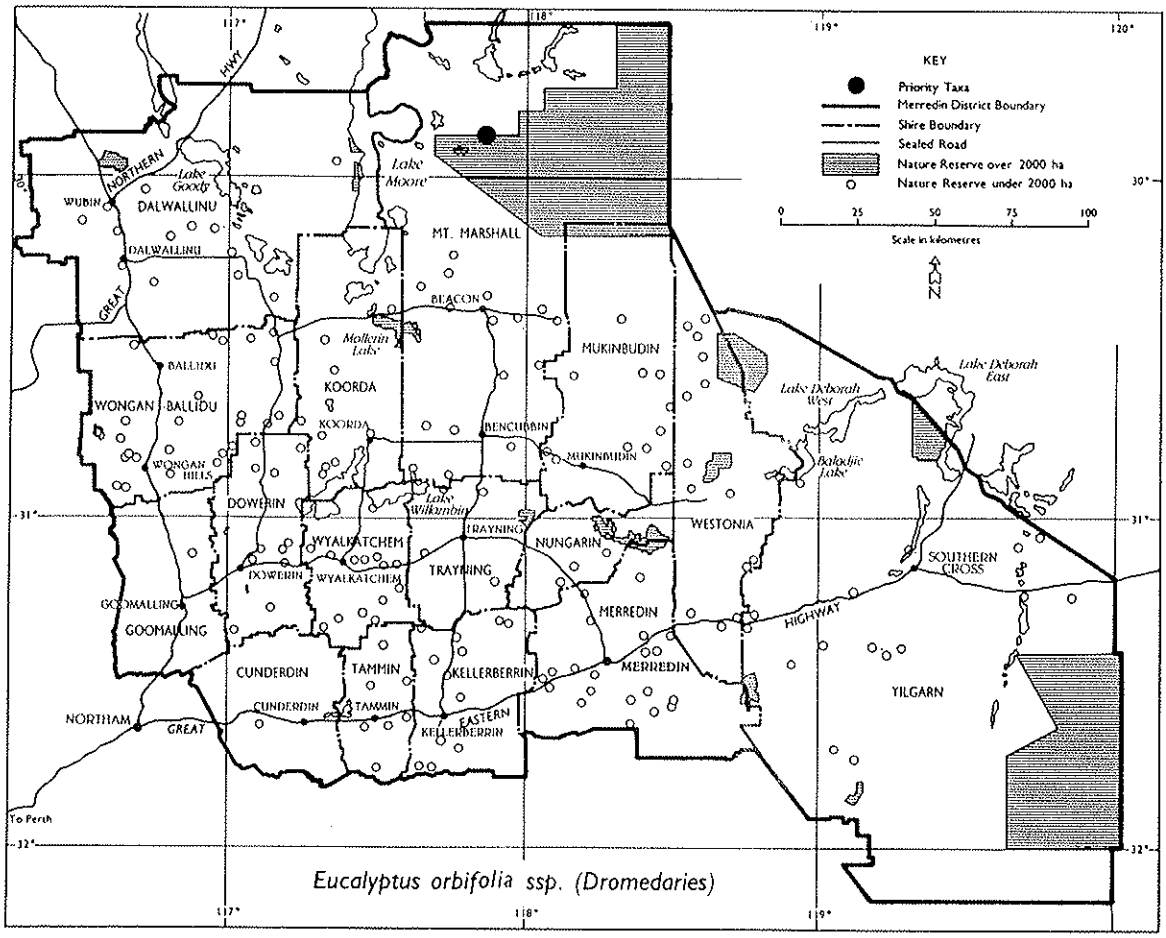
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Fencing of the known plants is desirable, along with appropriate management of the location.

REFERENCE

Brooker and Kleinig (1990).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
HWY
NORTHERN
Lake Goody
WUBIN
DALWALLINU
Lake Moore
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
WONGAN
KOORDA
BENCUBBIN
Lake Deborah East
Lake Deborah West
Baladjie Lake
WONGAN HILLS
DOWERIN
Lake Wilkamin
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
YILGARN
NORTHAM
To Perth
Eucalyptus orbifolia ssp. (Dromedaries)

FITZWILLIA AXILLIFLORA (W.V. Fitzg. ex Ewart & J. White) P.S. Short **Family: Asteraceae**

TAXONOMY

This taxon forms a monotypic group separate from *Angianthus* within which it was previously placed.

DESCRIPTION

Annual herb, 3-13 cm, erect. Leaves lanceolate, 4-7 mm long and 0.7-1.3 mm wide, concave, semi-succulent, mucronate, glabrous. Flower-heads compound, obovoid, 4.5-7 mm long, 2.5-8 mm diameter, white. Flowering period September to October.

DISTRIBUTION AND HABITAT

F. axilliflora is confined to salt lake margins where it grows among samphire in sand or clay loam soil. It apparently occupies the same habitat as *Blennospora phlegmatocarpa* at Cowcowing, where it is thought that surveys in the appropriate season will be successful in relocating it. Other records are Newdegate (1931), Lake Bryde (1978), Cairlocup Nature Reserve (1983), and 5 km south of Moora (1986).

CONSERVATION STATUS

Current Status: P2 Recommended Status: P2

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Wyalkatchem	Cowcowing	?	?	? Collected M. Koch Sept. 1904

RESPONSE TO DISTURBANCE

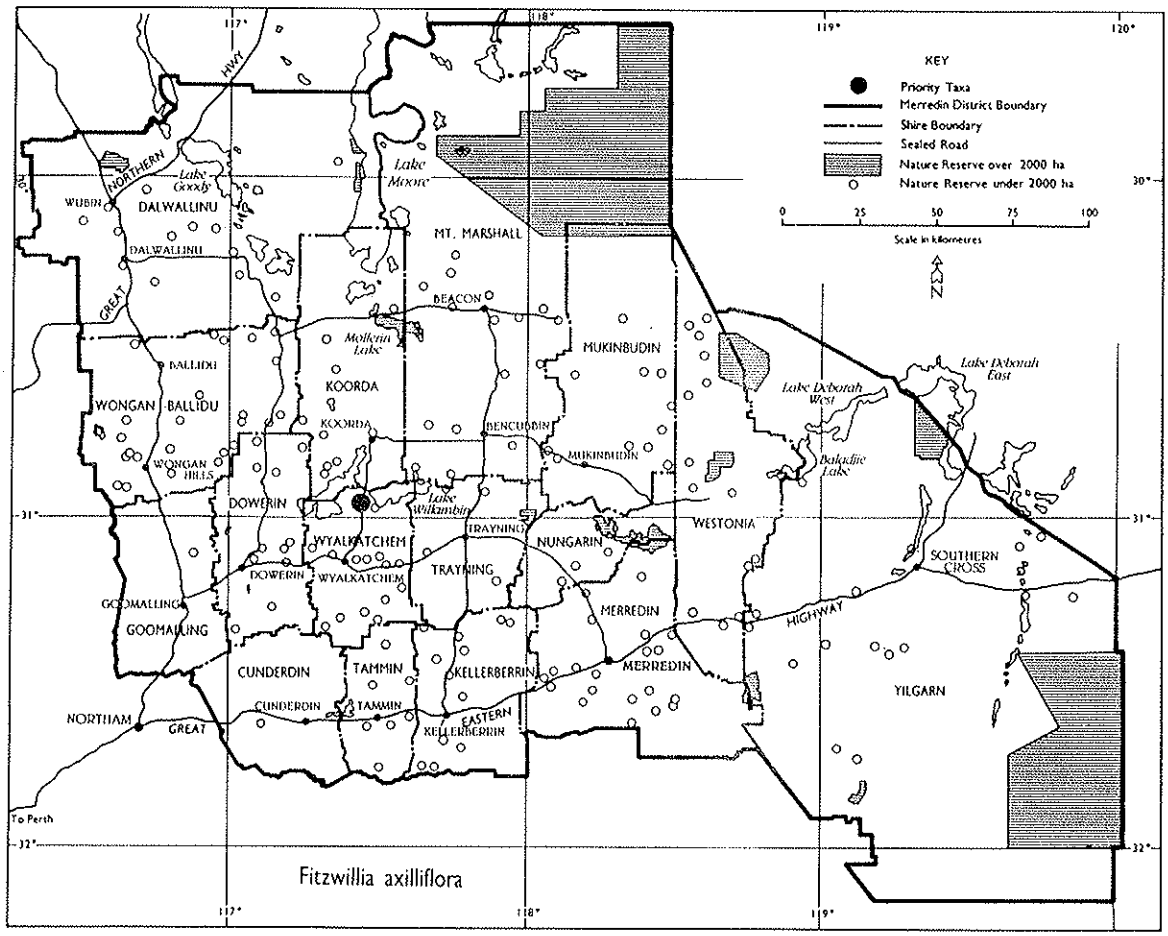
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Further surveys are urgently needed. This species appears to be extremely rare, however the margins of salt lakes are generally poorly collected and further survey may indicate it is more common.

REFERENCE

Short (1989).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
119°
120°
30°
31°
32°
NORTHERN
HWY
Lake Goorly
WUBIN
DALWALLINU
Lake Moore
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN
WONGAN HILLS
BENCUBBIN
Lake Deborah West
Lake Deborah East
Baladjie Lake
DOWERIN
Lake Wilkinbin
WESTONIA
WYALKATCHEM
TRAYNING
NUNGARIN
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN KELLERBERRIN
YILGARN
NORTHAM
To Perth
Fitzwillia axilliflora

FRANKENIA BRACTEATA Turcz. **Family: Frankeniaceae**

Broad Bract Frankenia

TAXONOMY

Has some affinity with *F. pauciflora* in the nature of the petals and stamens.

DESCRIPTION

Spreading small shrub with stems to 15 cm long; stems red, shining, with short scattered hairs, later glabrous. Leaves linear, petiolate, curved, glabrous above or with short hairs near apex, shining, lower surface pubescent; margins recurved to cover midrib; petiole flattened. Flowers in dense heads, bracts and bracteoles petiolate, lanceolate to ovate, acute, 4-8.5 cm long, imbricate, appressed to calyx, margins partially recurved; midrib with longer hairs. Calyx 6-6.5 mm long, 1.5-2 mm diameter; 5-ribbed. Petals 5, 9-12 mm long. Flowering period October.

DISTRIBUTION AND HABITAT

This species is known only from a few records with the last collection in 1962. The Merredin record is probably based on a collection by Diels and Pritzel in October 1901 at Waeel. It occurs between Mullewa and Cunderdin and near Esperance. Its habitat in the Merredin District is probably saline margins of the Mortlock River flats near Cunderdin.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P1

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Cunderdin	Waeel	?	?	?

RESPONSE TO DISTURBANCE

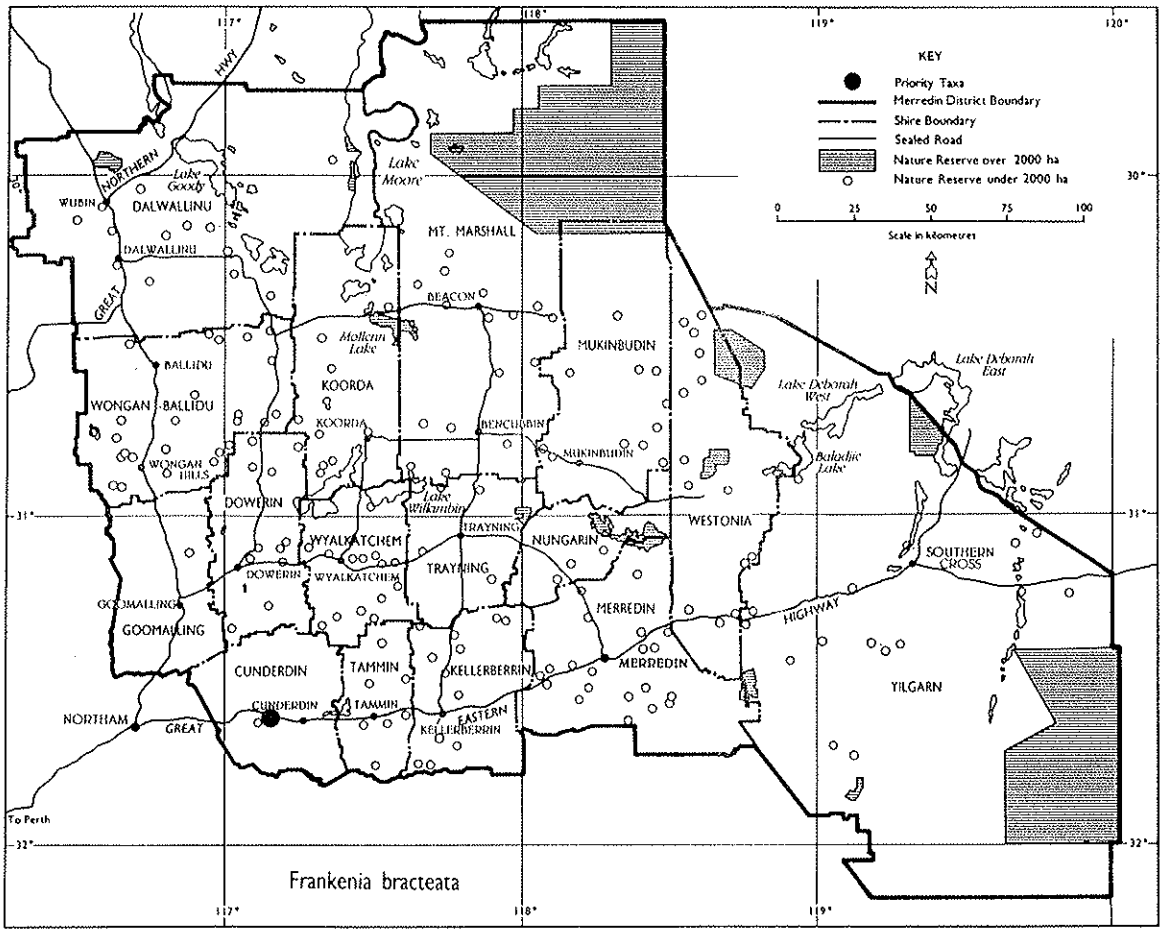
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

This species is in urgent need of further survey and Priority One status is recommended.

REFERENCE

Barnsley (1982).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Frankenia bracteata
HWY
NORTHERN
Lake Goody
Lake Moore
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN
WONGAN HILLS
BENCUBBIN
Lake Dobonah West
Lake Dobonah East
Baladjie Lake
DOWERIN
Lake Wilkamin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
YILGARN
NORTHAM
To Perth
117°
118°
119°
120°
30°
31°
32°

FRANKENIA GLOMERATA Turcz. **Family: Frankeniaceae**

TAXONOMY

Closely related to *F. setosa*, but leaves are longer, and floral parts glabrous or only slightly pilose.

DESCRIPTION

Much-branched small shrub; stems slender with fine spreading or upturned hairs. Leaves petiolate, clustered, 4-11.5 mm long, usually less than 1 mm wide and curved, margins recurved covering midrib. Flowers in dense heads; bracts and bracteoles similar to leaves but with longer petioles; petioles wide, flat, strongly ciliate near apex. Calyx 5-7.5 mm long, *ca* 1 mm diam.; four- or five-ribbed, glabrous or sparsely pilose outside. Petals four or five, narrow, 7.5-12.5 mm long, pink. Flowering period March and November.

DISTRIBUTION AND HABITAT

F. glomerata occurs from the Murchison to Cunderdin. In the Merredin District, there are records from Waeel near Cunderdin and the Mortlock River in the same area that are over 30 years old. Its habitat is probably saline margins of lakes and salt rivers.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P1

KNOWN POPULATIONS (Merredin District Only)

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Cunderdin	Waeel	?	?	? Collected T. Aplin April 1960
2	Merredin	Cunderdin	Mortlock River	?	?	? Collected C. Gardner 642

RESPONSE TO DISTURBANCE

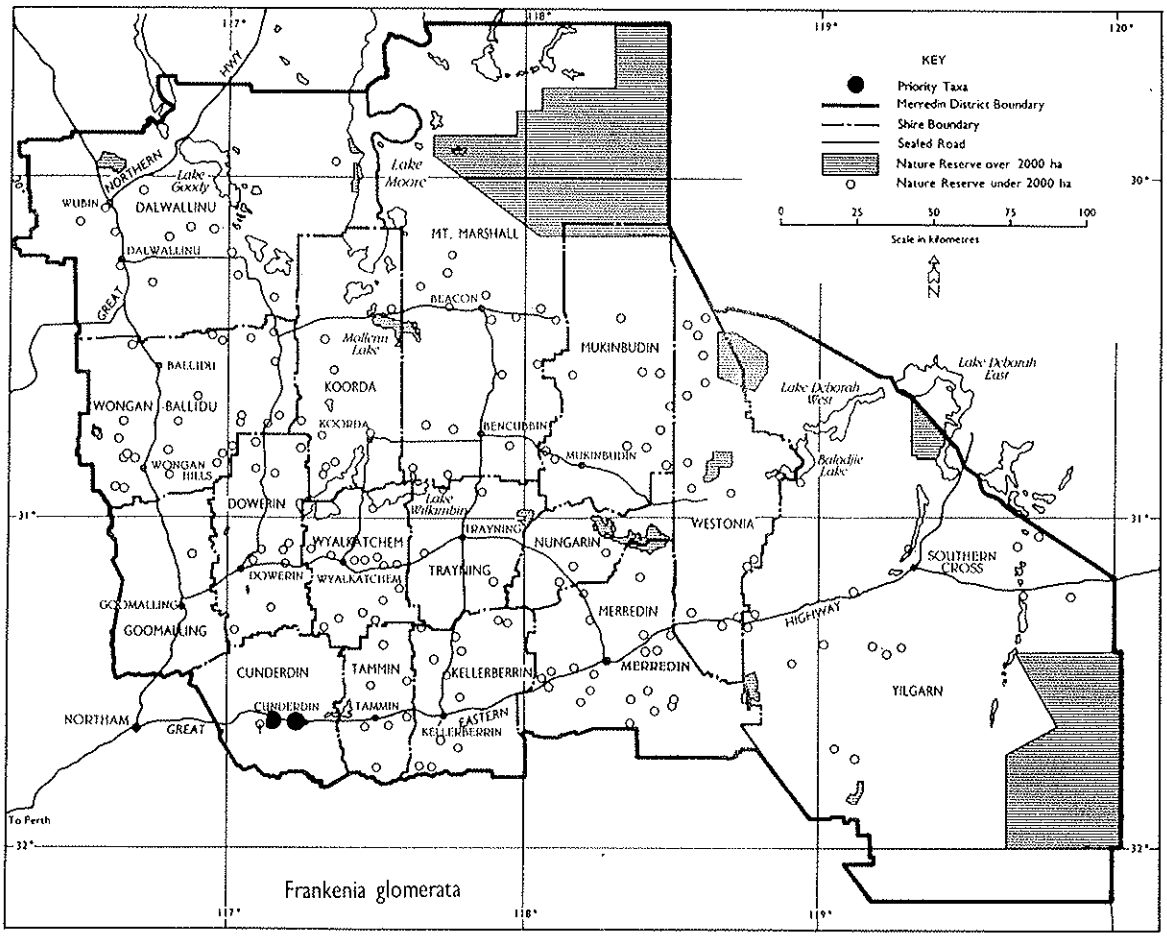
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Similar comments to *Frankenia bracteata* are applicable here. High priority survey is required and Priority One status is indicated.

REFERENCE

Barnsley (1982).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
Lake Gooly
WUBIN
DALWALLINU
Lake Moore
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN
WONGAN HILLS
BENCUBBIN
Lake Deborah West
Lake Deborah East
Baladjie Lake
DOWERIN
Lake Wilkamin
WESTONIA
WYALKATCHEM
TRAYNING
NUNGARIN
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
YILGARN
NORTHAM
To Perth
Frankenia glomerata

GREVILLEA NANA C. Gardner subsp. ***ABBREVIATA*** McGillivray **Family: Proteaceae**

TAXONOMY

This taxon differs from the typical form of *Grevillea nana* in the leaves, which are smaller in size and have shorter lobes.

DESCRIPTION

Shrub, decumbent in habit, to 40 cm tall with reasonably large branching inflorescences running along the ground. It is usually found around granite outcrops. It has almost terete, divided, pungent leaves. Flowers crimson, gold-tipped. Flowering period October.

DISTRIBUTION AND HABITAT

Two known records of this taxon suggest it is quite rare. It is found around granite outcrops near Wubin, and in sand heath in the Shire of Mukinbudin and is also recorded from Dowerin although details of this last record are not available.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P1

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Dalwallinu	Wubin	Road Res.	?	? Collected Lullfitz 8.10.63
2	Merredin	Mukinbudin	?	Private	?	? Collected A. Sale Sept 1986

RESPONSE TO DISTURBANCE

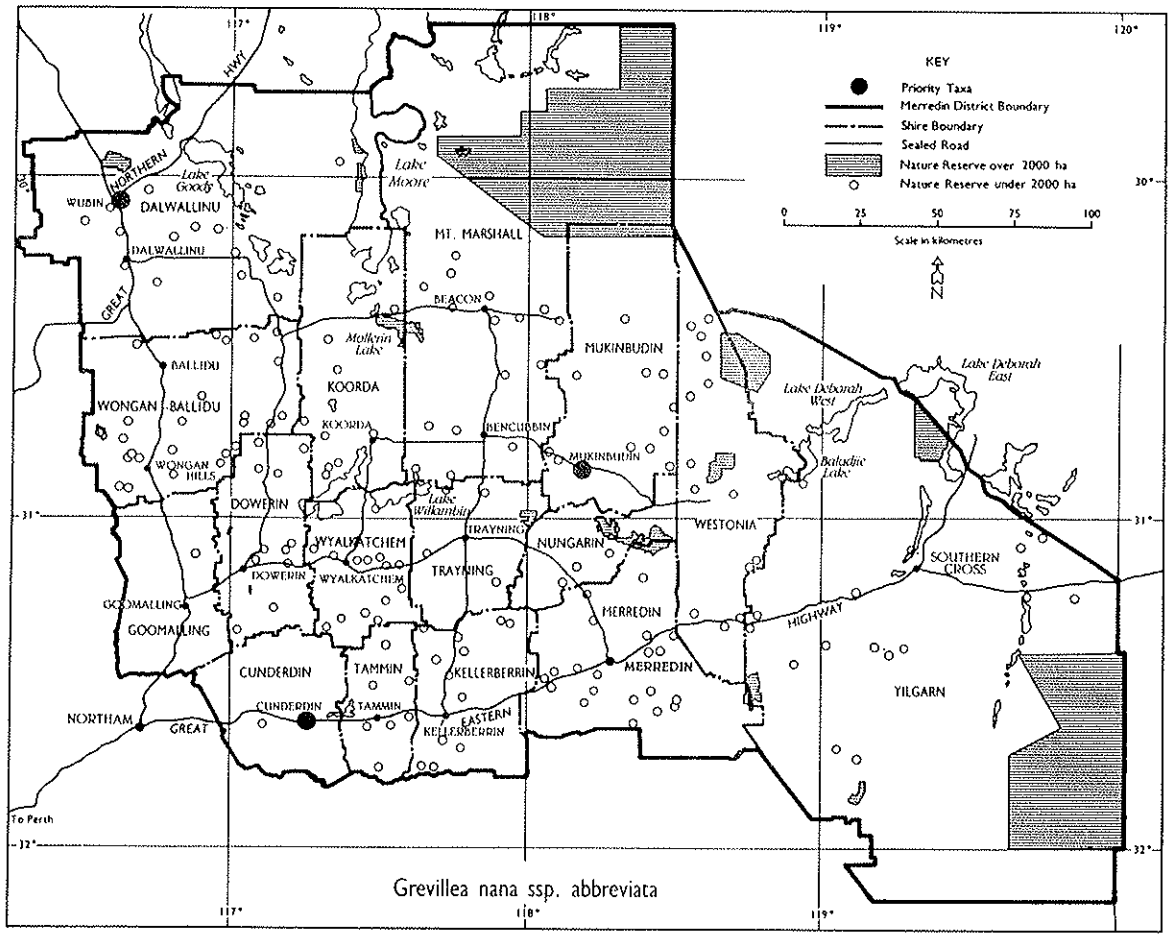
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Further surveys of the known locations are urgently required. Priority One status is recommended.

REFERENCE

Blackall and Grieve (1988).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
119°
120°
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31°
32°
HWY
NORTHERN
Lake Goody
Lake Moore
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN
WONGAN HILLS
BENCUBBIN
Lake Deborah West
Lake Deborah East
Baladdie Lake
Lake Wilkamble
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
YILGARN
NORTHAM
To Perth
Grevillea nana ssp. abbreviata

GREVILLEA ROYCEI McGillivray **Family: Proteaceae**

TAXONOMY

G. roycei has affinities with *G. spineoissima*, but the branches are glabrous, grey-green in colour and the spiny foliage is smaller.

DESCRIPTION

Shrub to about 1 m tall. Leaves rigid, three times divided, with pungent lobes, branches glabrous. Flowers small, racemose, white. Flowering period August.

DISTRIBUTION AND HABITAT

There is a record from the Goomalling area based on a 1962 collection by R.D. Royce although habitat details are not available. There are also vague records from Cunderdin and Dowerin, but again no details are available.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P1

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Goomalling	Goomalling	?	?	? Collected R.D. Royce 18.8.62

RESPONSE TO DISTURBANCE

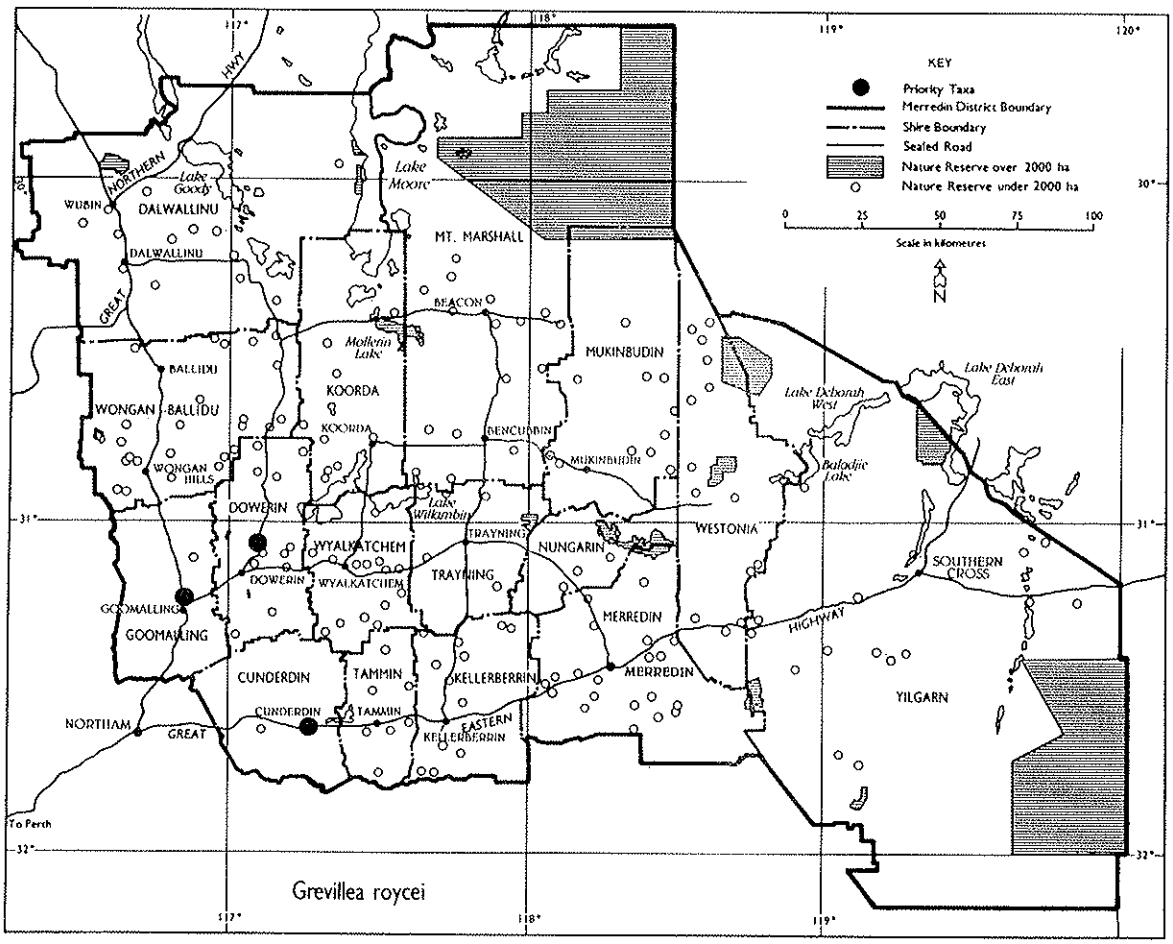
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Further survey is urgently required. Priority One status is recommended.

REFERENCE

McGillivray (1986).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
HWY
NORTHERN
Lake Goody
Lake Moore
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN-BALLIDU
BENCUBBIN
WONGAN HILLS
Lake Deborah East
Lake Deborah West
Balodine Lake
DOWERIN
Lake Wilkambin
TRAYNING
WESTONIA
NUNGARIN
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
EASTERN
To Perth
Grevillea roycei

GREVILLEA SPINOSISSIMA McGillivray **Family: Proteaceae**

TAXONOMY

G. spinosissima is related to *G. roycei* but differs in having hairy branchlets and longer foliage.

DESCRIPTION

Shrub to 1.3 m tall with hairy branchlets. Leaves rigid and three times divided with very pungent lobes. Flowers are white with broad conical style-ends. Flowering period June.

DISTRIBUTION AND HABITAT

The habitat of *G. spinosissima* is recorded as shallow sandy loam and laterite gravelly loam in the Manmanning area. It is also recorded from Wongan Hills and Mawson.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P1

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Dowerin	Manmanning	Private	Frequent	? Collected McGillivray 17.6.76

RESPONSE TO DISTURBANCE

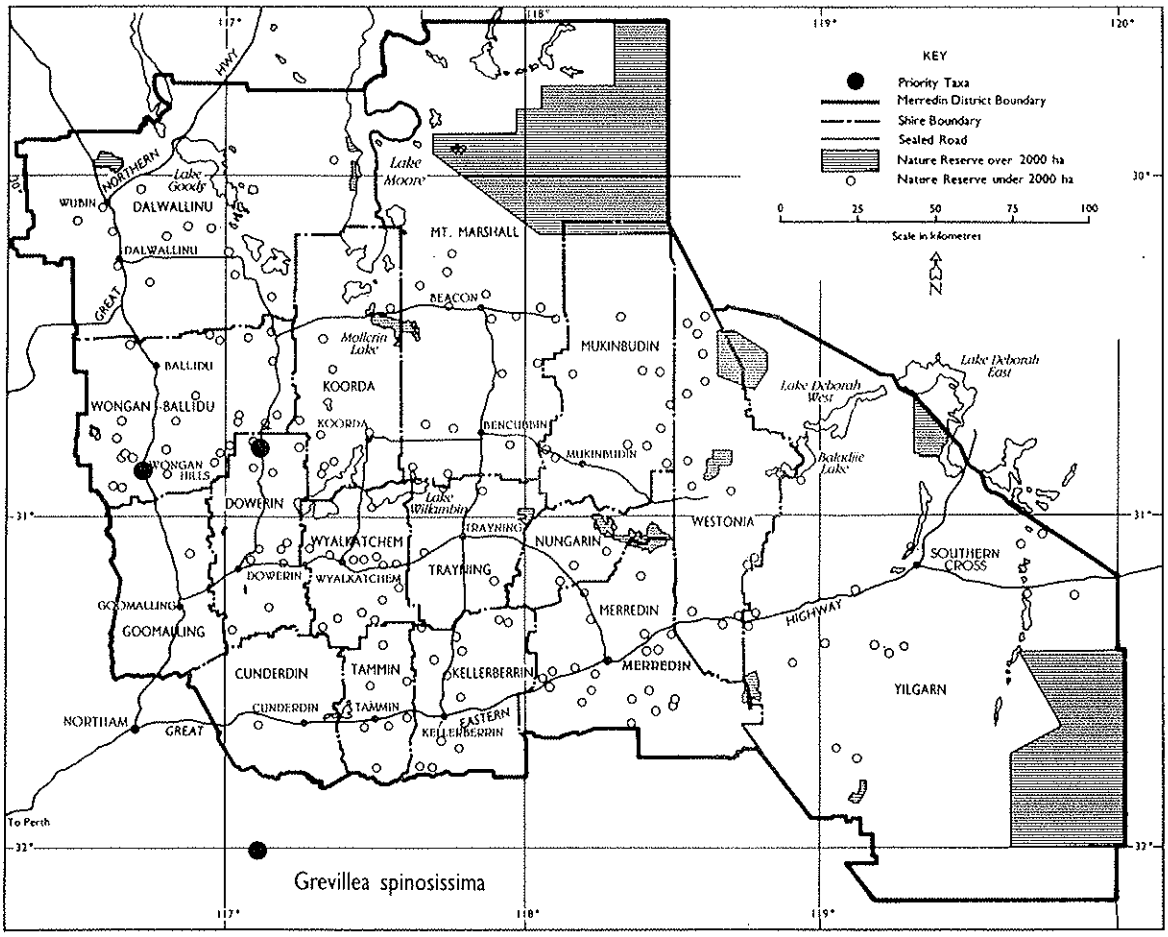
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Further survey is urgently required. Priority One status is recommended.

REFERENCE

McGillivray (1986).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Grevillea spinosissima
DALWALLINU
WUBIN
MT. MARSHALL
BEACON
MUKINBUDIN
BALLIDU
KOORDA
WONGAN HILLS
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
GOOMALLING
CUNDERDIN
TAMMIN
KELLERBERRIN
MERREDIN
YILGARN
SOUTHERN CROSS
NORTHAM
To Perth
Lake Moore
Lake Deborah East
Lake Deborah West
Baladjie Lake
Lake Wilkinbin
Mollerin Lake
HIGHWAY
GREAT EASTERN

GREVILLEA TETRAPLEURA McGillivray **Family: Proteaceae**

TAXONOMY

G. tetrapleura has affinities with *G. extorris*, but differs in having terete, four-ribbed leaves, and differs in habit.

DESCRIPTION

Shrub to 90 cm tall and 1 m across, flat-topped, spreading. Leaves, terete, four-ribbed to 3 cm long and 1.5 mm wide, pungent. Flowers few, red, on older wood. Style persistent in fruit. Flowering period July. Fruiting in October.

DISTRIBUTION AND HABITAT

Some 2000 individuals of *G. tetrapleura* are known from twelve populations in a largely uncleared area with three populations on nature reserves. It occurs from south of Yellowdine to north of Mt Jackson and near Walyahmoning on flat granite sand loam terrain in dwarf scrub with *Verticordia* and *Borya* or in shrubland.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P5

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Yilgarn	Duladgin	Nature Res.	2-300	Minor vehicle disturbance 15.10.90
2	Merredin	Yilgarn	Yellowdine	Water Res.	700	Minor vehicle disturbance 17.10.90
3	Merredin	Yilgarn	Yellowdine East	VCL	14	Undisturbed 17.10.90
4	Merredin	Yilgarn	Condarnin	Nature Res.	500+	Cut by road 17.10.90
5	Merredin	Westonia	Walyahmoning	Nature Res.	*ca* 80	Cut by old track 21.10.90
6	Merredin	Yilgarn	Kurrajong	VCL	100+	Cut by old track 21.10.90
7	Merredin	Yilgarn	Yellowdine Sth	VCL	100+	Cut by road 17.10.90
8	Kalgoorlie	Yilgarn	Mt Jackson Nth	? VCL/Pastoral	Frequent	? Collected McGillivray 4.7.76
9	Merredin	Yilgarn	Lake Deborah	? Private	206	Some dead 4.9.89
10	Merredin	Yilgarn	Ennuin	Pastoral	48	Cut by tracks 5.9.89
11	Merredin	Yilgarn	Trough Well	Water Res.	1	Nearly dead 5.9.89
12	Merredin	Yilgarn	Barcooting	? VCL	Occasional	? Collected R. Cranfield 3.9.89

RESPONSE TO DISTURBANCE

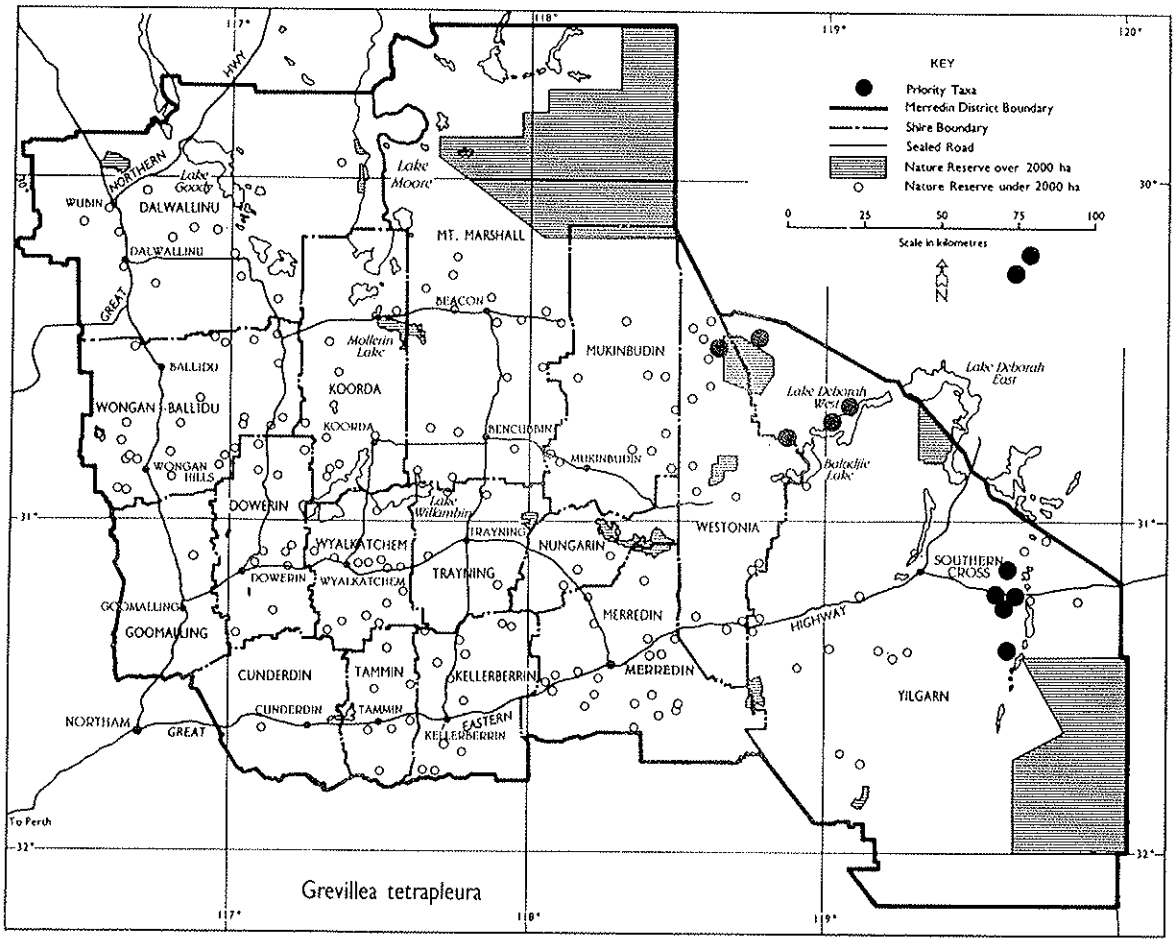
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Population 8 may be threatened by increased stocking of Diemals Station. Currently this taxon does not appear to be threatened, but opening up of new agricultural lands and increased pastoral activity may change this status. Priority Five status is warranted.

REFERENCE

McGillivray (1986).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
NORTHERN
Lake Goody
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WUBIN
DALWALLINU
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN
WONGAN HILLS
BENCUBBIN
Lake Deborah West
Lake Deborah East
Baladjie Lake
DOWERIN
Lake Wilgamba
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
YILGARN
NORTHAM
To Perth
Grevillea tetrapleura

HAKEA 'RIGIDA' C.A. Gardner ms **Family: Proteaceae**

TAXONOMY

This taxon has affinities with *H. falcata* with similar old leaves and flowers, but different fruits. The species is probably in the *H. sulcata* group although the 5-sided leaves make it distinct from *H. sulcata* which has 5-angled leaves.

DESCRIPTION

Perennial, woody shrub 2.1-2.7 x 2-3 m. Leaves 5-sided (pentagonal) in transverse section early, but older leaves becoming flattened, concave below and 3-ribbed above, rigid, curved ascending, brown, nearly pungent pointed. Flowers to 8 mm in many-flowered groups in leaf axils. Flowering period is September.

DISTRIBUTION AND HABITAT

H. 'rigida' is recorded from the Lake Brown/Campion area to north-north-west of Bullfinch. It occurs in *Eucalyptus leptopoda* open mallee on deep, undulating yellow sandplains at the latter locality. The populations in the Lake Brown/ Campion area have not been relocated for 60 years. Being in sand mallee habitat, in an area now largely cleared, it is quite likely that they no longer exist. Currently one population of 4-6 plants is known. A recent collection in the Lake Campion area (*A. Coates* 2236) is similar to *H. 'rigida'*, but has narrower, shorter leaves, and a larger fruit with more exserted rough tubercles, but the fruit beak is the same. The habitat is different from that at the Bullfinch locality. It is quite probable that this collection and *H. 'rigida'* are the same taxon, but this requires confirmation.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P2

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Yilgarn	NNW of Bullfinch	Pastoral	4-6	Not disturbed 24.9.86

RESPONSE TO DISTURBANCE

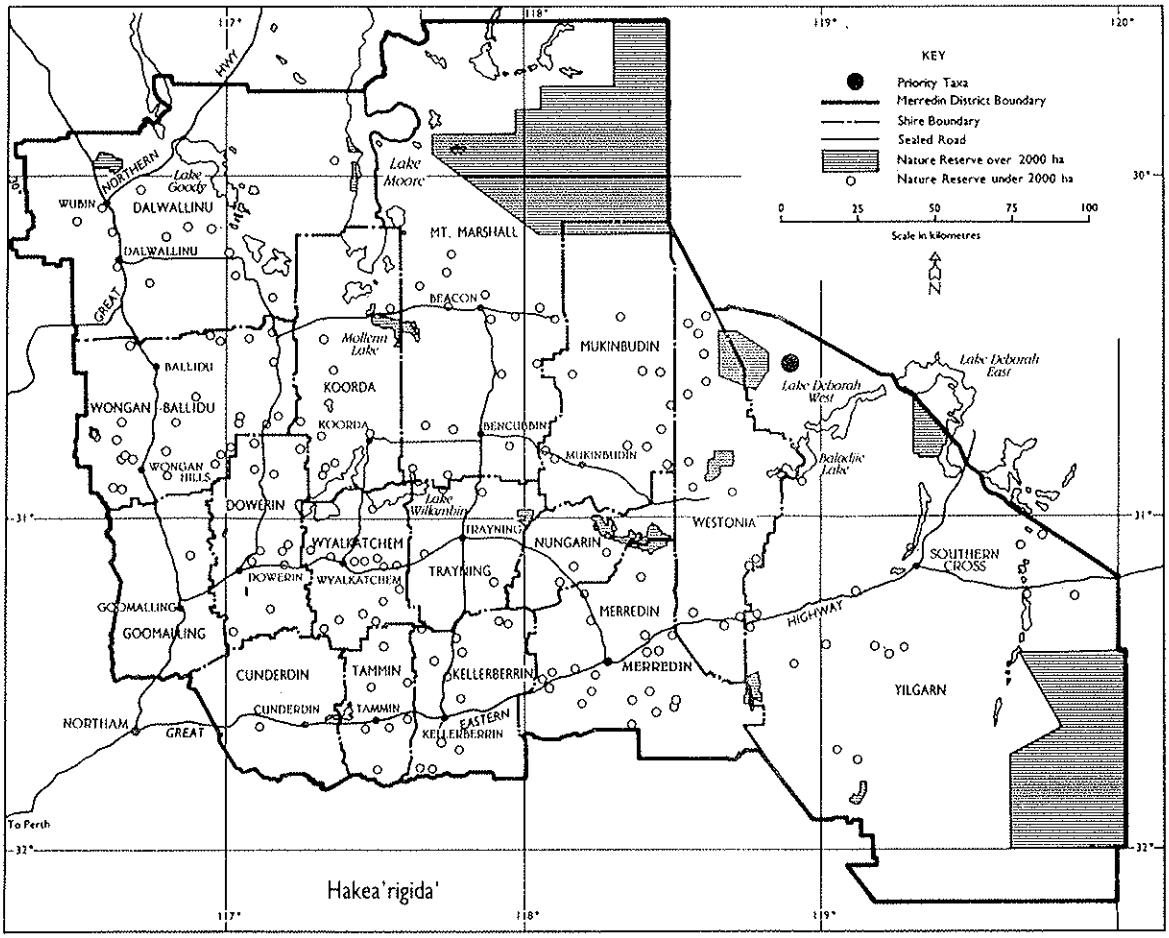
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

The only known population needs to be surveyed in detail and the possible impact of grazing assessed. Taxonomic status of the Lake Campion collection needs to be confirmed. Further surveys are urgently required. Priority One status is recommended.

REFERENCE

Field notes - K.R. Newbey (1982).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Shire Boundary
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Nature Reserve under 2000 ha
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NORTHERN
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WUBIN
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KOORDA
KOORDA
BENCUBBIN
MUKINBUDIN
WONGAN HILLS
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Lake Wilkamin
TRAYNING
NUNGARIN
WESTONIA
SOUTHERN CROSS
DOWERIN
WYALKATCHEM
WYALKATCHEM
TRAYNING
GOOMALLING
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
MERREDIN
YILGARN
CUNDERDIN
TAMMIN
NORTHAM
GREAT
EASTERN
KELLERBERRIN
To Perth
Hakea 'rigida'
117°
118°
119°
120°
30°
31°
32°

HEMIGENIA BRACHYPHYLLA F. Muell. **Family: Lamiaceae**

TAXONOMY

This taxon has affinities with *H. teretiuscula*, but the leaves are shorter in *H. brachyphylla* and the calyx-lobes are not as acute. *H. teretiuscula* has glabrous calyx-lobes, while those of *H. brachyphylla* are ciliate.

DESCRIPTION

Shrub 20-50 cm tall. Leaves 6-10 mm long, terete, grooved, grouped at nodes. Flowers pale violet, axillary, to 1 cm long, stalks very short. Flowering period October.

DISTRIBUTION AND HABITAT

Within the Merredin District this species has been collected by Young from Ularring in 1875, and by Gardner from Mt Churchman in 1961. There are two recent collections outside the Merredin District from south-west of Norseman and north-west of the Fitzgerald River National Park. Both collections were in sand heath.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P1

KNOWN POPULATIONS (Merredin District only)

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Mt Marshall	Mt Churchman	VCL	?	? Collected C. Gardner 10.10.61

RESPONSE TO DISTURBANCE

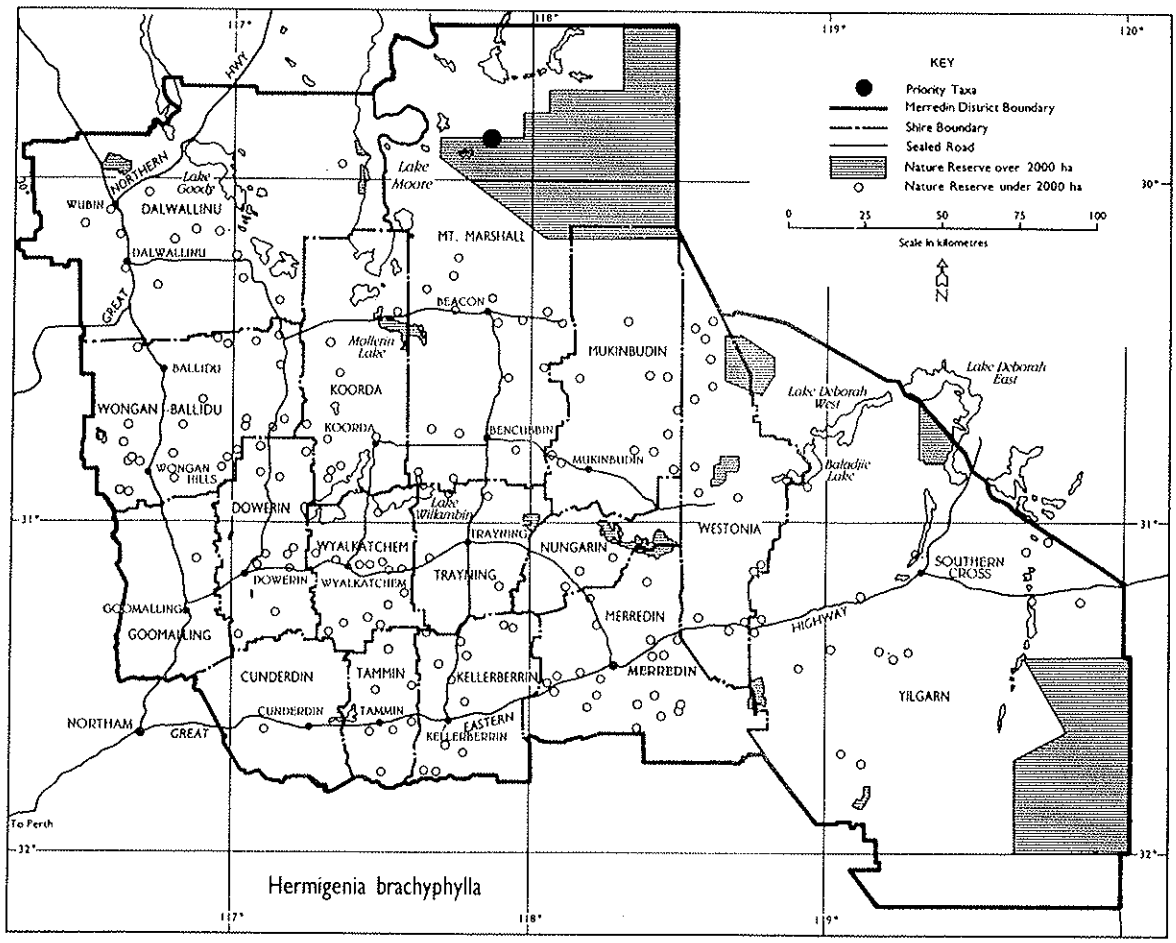
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

This species requires urgent survey. Priority One status is recommended.

REFERENCE

Blackall and Grieve (1981).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Hermigenia brachyphylla
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
GREAT
Lake Goods
Lake Moore
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
Mollerin Lake
MUKINBUDIN
BALLIDU
WONGAN
KOORDA
BENCUBBIN
WONGAN HILLS
Lake Deborah West
Lake Deborah East
Baladjie Lake
DOWERIN
Lake Wilkinbin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
YILGARN
NORTHAM
To Perth

HIBBERTIA sp. Chiddarcooping (*Cranfield* 7820) **Family: Dilleniaceae**

Bush Buttercup

TAXONOMY

This is a distinctive taxon, easily recognised by its erect habit and prickly pungent leaves and sepals, and when in flower by its large, showy flower.

DESCRIPTION (based on collection *F.H. & M.P. Mollemans* 3784)

Erect shrub to 1 m tall. Leaves lanceolate, 2-2.5 cm long, 1.5 mm wide, concave-convex in transverse section (concave above) pungent pointed. Flowers yellow, large, with petals to 1.5 cm long, sepals brown, *ca* 1.2 cm long and 0.6 cm wide, pungent. Flowering period September.

DISTRIBUTION AND HABITAT

This *Hibbertia* is known from several granite outcrops north of Westonia, where it occurs in granite sand pockets with *Thryptomene* and *Borya*. At Chiddarcooping it is only seen occasionally in patches of two or three. In 1985 the Chiddarcooping population was estimated at thirty, but available habitat suggests a larger number is likely.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P2

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Westonia	Chiddarcooping	Nature Res.	100+	Est. Healthy 7.11.90
2	Merredin	Westonia	Chutawalakin Hill	Private	53	Healthy 3.9.89
3	Merredin	Westonia	English Rd	Private	86	Healthy 11.9.89

RESPONSE TO DISTURBANCE

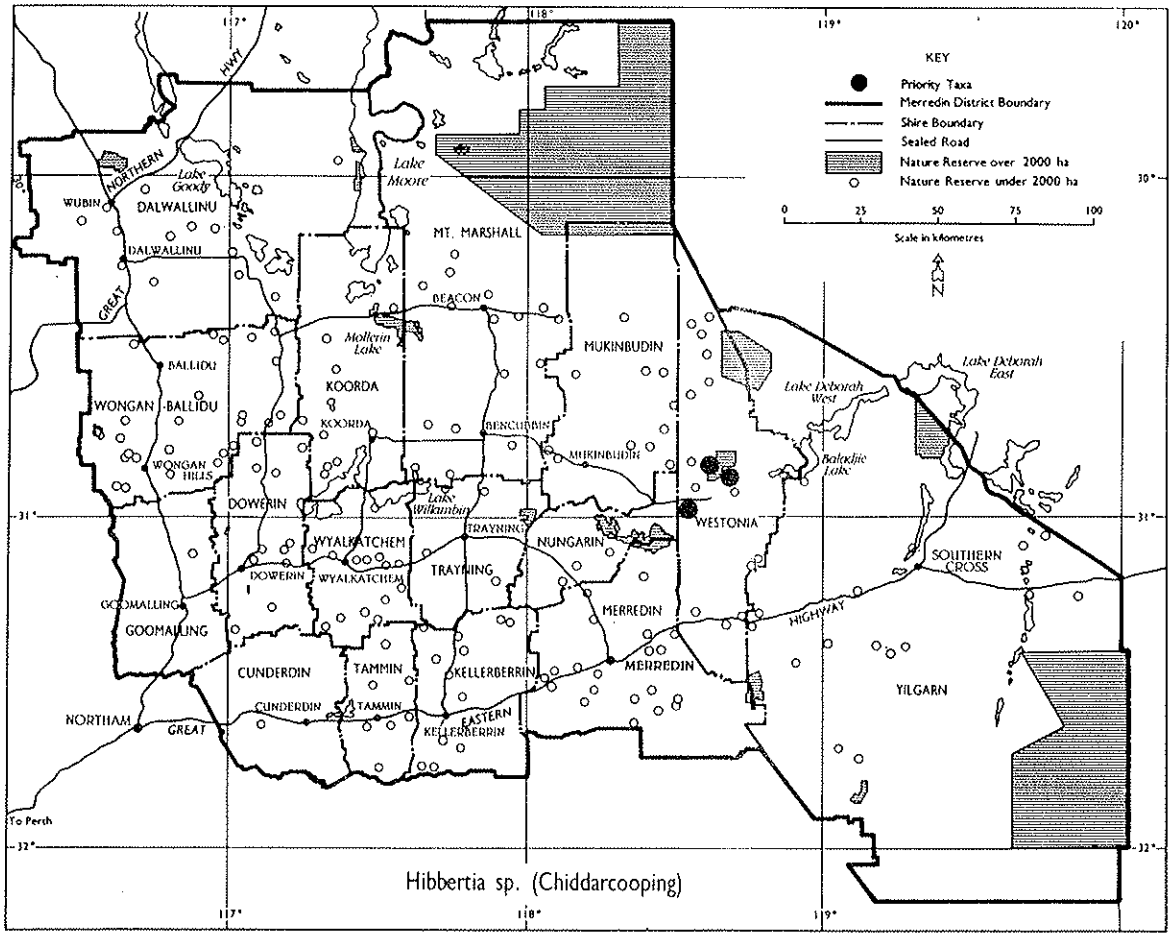
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown. Some plants may have been affected by the last fire at Chiddarcooping.

RECOMMENDATIONS

Detailed surveys of the known populations are required to assess this species conservation status and develop management options. Further surveys in the general area are required. This taxon is not currently under threat at Chiddarcooping. Further surveys in the general area are required.

REFERENCE

Weston (1985).



Hibbertia sp. (Chiddarcooping)

LEPIDIUM GENISTOIDES H.J. Hewson

Family: Brassicaceae

TAXONOMY

Superficially this species is similar to *L. leptopetalum* and *L. platypetalum.*

DESCRIPTION

Perennial shrub to 50 cm tall, dense, intricately branched. Leaves narrow, needle-like, 20 mm long and 1 mm wide. Petals acute, 5-6 mm long, white. Silicula obovate, 5-7 x 4-5 mm, wing curved over, style persistent. Flowering period October to December.

DISTRIBUTION AND HABITAT

L. genistoides occurs from Cowcowing east to Boorabbin and south to beyond Marvel Loch. It is found in *Dodonaea* and *Acacia* shrubland at upper salt lake margins and there is a single record of small numbers near a granite rock. Near Marvel Loch it was in *Eucalyptus* forest on red loam, and near Mukinbudin in *Eucalyptus* woodland on alkaline soil. The 1904 Cowcowing record of M. Koch may be from the same location as the *Fitzwillia axilliflora* and *Blennospora phlegmatocarpa* Cowcowing Lakes collections.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P2

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Wyalkatchem	Cowcowing	?	?	? Collected M. Koch Aug. 1904
2	Merredin	Yilgarn	Mt Day Rd	VCL	Plentiful	? Collected B.H. Smith 3.11.87
3	Merredin	Mt Marshall	Bencubbin	?	?	? Collected C. Gardner 24.11.53
4	Merredin	Mukinbudin	Mukinbudin	?	?	? Collected C. Gardner. 28.9.31
5	Merredin	Mt Marshall	Bencubbin East	?	?	? Collected C. Gardner 14.12.45
6	Merredin	Westonia	Walyahmoning	Nature Res.	Small	? Collected K. Newbey
7	Kalgoorlie	Coolgardie	Boorabbin	VCL	?	? File record

RESPONSE TO DISTURBANCE

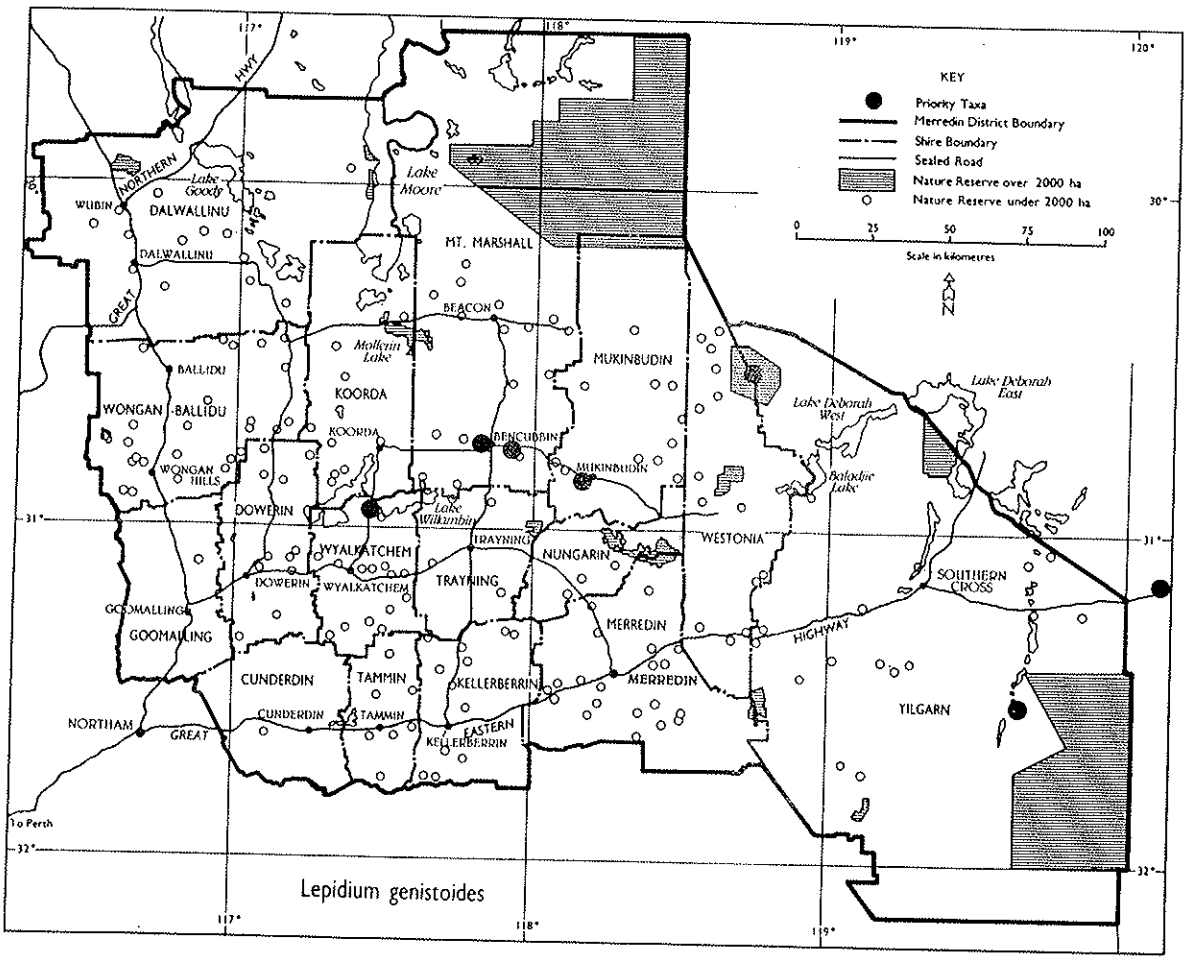
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Further survey is needed. This species may still be present at some of the recorded locations except in the Mukinbudin/ Cowcowing area where land clearing has been extensive.

REFERENCE

Hewson (1982).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
Lake Goods
WUBIN
DALWALLINU
DALWALLINU
GREAT
Lake Moore
MT. MARSHALL
BEACON
Mollerin Lake
BALLIDU
WONGAN - BALLIDU
KOORDA
KOORDA
WONGAN HILLS
DOWERIN
Lake Wilkinbin
DENCUBBIN
MUKINBUDIN
MUKINBUDIN
Lake Deborah West
Lake Deborah East
Balodine Lake
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
DOWERIN
WYALKATCHEM
TRAYNING
SOUTHERN CROSS
GOOMALLING
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
MERREDIN
CUNDERDIN
TAMMIN
EASTERN KELLERBERRIN
YILGARN
NORTHAM
GREAT
To Perth
Lepidium genistoides

LOGANIA sp. Ironcap (*G.J. Keighery* 901) **Family: Loganiaceae**

TAXONOMY

This taxon is quite distinct with simple, slender stems.

DESCRIPTION

Erect, slender, wiry-stemmed perennial herb ,34-40 cm tall. Leaves reduced to small scale-like appendages at the nodes. Flowers crowded at the nodes. Petals white with brown striations, tubular, fused for two-thirds of length. Flowering period September to October and March.

DISTRIBUTION AND HABITAT

This species is recorded from the Mt Day Road and Vermin Fence north and west of Mt Holland, respectively, and near Hatter Hill. Its habitat is sand, pale yellow sandy loam and laterite soil, in heath and mallee scrub vegetation.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P2

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Yilgarn	Rabbit Fence	VCL	?	? Collected C. Gardner 9.29
2	Esperance	Ravensthorpe	Hatter Hill	VCL	v. common	? Collected G. Keighery 2.10.76
3	Merredin	Yilgarn	Mt Day Rd	Nature Res.	?	? Collected A.S. George 14.3.78

RESPONSE TO DISTURBANCE

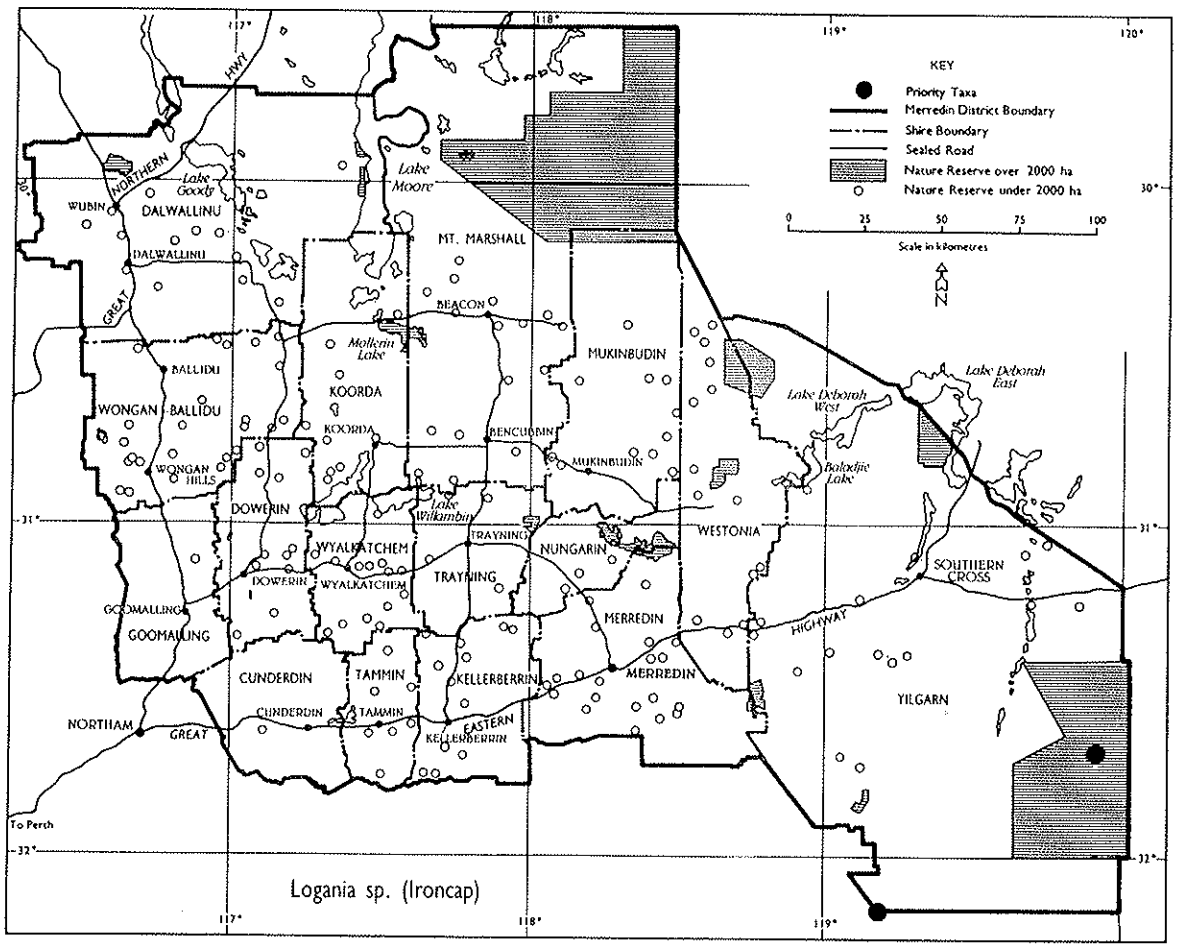
Response to fire, weed invasion, grazing and canopy cover is unknown. This species, like *Sowerbaea multicaulis*, may be a disturbance opportunist but this requires confirmation. It seems likely it will persist in undisturbed areas in very low numbers.

RECOMMENDATIONS

Detailed surveys of known locations together with more broad scale surveys are needed.

REFERENCE

Blackall and Grieve (1981).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Logania sp. (Ironcap)
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
MUKINBUDIN
BALLIDU
WONGAN
KOORDA
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
GOOMALLING
CUNDERDIN
TAMMIN
KELLERBERRIN
MERREDIN
NORTHAM
YILGARN
SOUTHERN CROSS
Lake Moore
Lake Deborah West
Lake Deborah East
Baladjie Lake
Lake Wilkamby
Mollerin Lake
To Perth

PETROPHILE INCURVATA W. Fitzg. **Family: Proteaceae**

TAXONOMY

P. incurvata has clear affinities with *P. conifera* and a superficial similarity to *P. shuttleworthiana* from which it can be readily distinguished by its smooth flat leaves.

DESCRIPTION

A much-branched shrub 1-2 m tall. Leaves glabrous, incurved, rigid and flattened, with 2-3 pungent-pointed segments, 7-12 cm long. Flowers in yellow-white oblong cylindrical terminal heads. Flowering period September to November.

DISTRIBUTION AND HABITAT

Based on herbarium records *P. incurvata* is found from Paynes Find to Caron and Wubin, south to Wongan Hills and east to Mukinbudin. Its habitat is pale yellow sand with laterite gravel in shrubland vegetation.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P3

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Mukinbudin	Wundowlin	Nature Res.	25	Cut by road, healthy 9.11.90
2	Merredin	Wongan-Ballidu	Burakin	Road Res.	1	Healthy 21.9.90
3	Merredin	Mt Marshall	Wialki	?	?	? Collected G.M. Storr 4.10.58
4	Geraldton	Perenjori	Caron	?	?	? Collected F.W. Went 9.9.62
5	Merredin	Koorda	Kirwan East	Private	Mod. frequent	? Collected B.H. Smith 9.10.83
6	Merredin	Dalwallinu	Vermin Fence	Road Res.	Mod. frequent	? Collected B.H. Smith 4.10.84
7	Merredin	Mukinbudin	Barbalin Nth	Private	?	? Collected M. Squire 1.9.85
8	Merredin	Wongan-Ballidu	Res. 22363	Public Utility Res.	?	? Collected K. Atkins 25.5.89
9	Merredin	Dalwalinu	Wubin	Road Res.	Occasional	? Collected N. Hoyle 20 9.85
10	Merredin	Dowerin	Booralamming	Road Res.	?	? File Record

RESPONSE TO DISTURBANCE

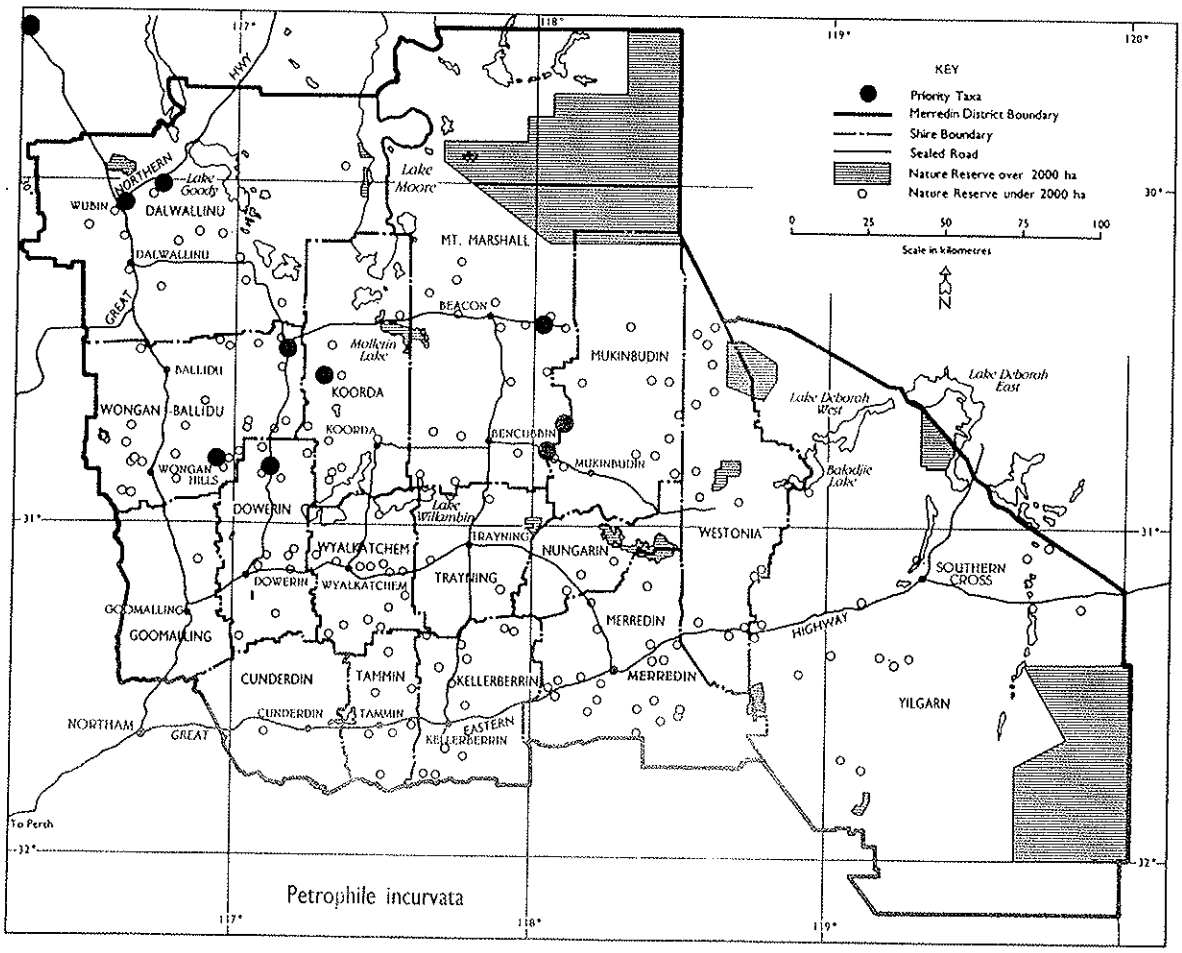
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Further survey is required in the vicinity of populations 1 and 2 as additional plants are likely to be present. The other recorded localities also need surveying to accurately assess the conservation status of this species. Priority 3 status is recommended.

REFERENCES

Sainsbury (1987); Blackall and Grieve (1988).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Petrophile incurvata
DALWALLINU
WUBIN
MT. MARSHALL
BEACON
MUKINBUDIN
KOORDA
BENCUBBIN
WONGAN HILLS
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
GOOMALLING
MERREDIN
SOUTHERN CROSS
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
To Perth
Lake Moore
Lake Goodg
Lake Deborah West
Lake Deborah East
Bokodjie Lake
Lake Williambin
HIGHWAY
GREAT
NORTHERN

PIMELEA GRANITICOLA B.L. Rye **Family: Thymelaeaceae**

TAXONOMY

P. graniticola has affinities with *P. imbricata*, but its leaves are narrower and the involucre bracts are more numerous.

DESCRIPTION

Shrub 0.2-1 m high, erect, spreading, single-stemmed at ground level. Leaves alternate, pale green to bluish green, linear, 4-17 x 0.5-1 mm, flat or adaxially concave, acute or obtuse. Involucre bracts numerous, usually *ca* 40, becoming reflexed in fruit, similar in colour to leaves, narrowly triangular to linear, 6-8 x 1-2 mm, glabrous or sparsely hairy outside, densely hairy inside. Inflorescence erect, compact. Pedicels 0.2-0.5 mm long, longest hairs *ca* 1 mm long. Flowers cream or white, very densely hairy. Sepals elliptic or narrowly elliptic, 2-5 mm long, with hairs on outside to 1-2 mm long, glabrous inside. Flowering period September to December.

DISTRIBUTION AND HABITAT

There are six recorded populations of *P. graniticola* one of which is in the Merredin District. The habitat of this taxon is sand loam pockets on granite in vegetation of dwarf scrub, with a distribution ranging from Chiddarcooping in the north to near Jerramungup, Lake King and Norseman in the south and east.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P2

KNOWN POPULATIONS (Merredin District Only)

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Westonia	Chiddarcooping	Nature Res.	20-30	Healthy 7.11.90

RESPONSE TO DISTURBANCE

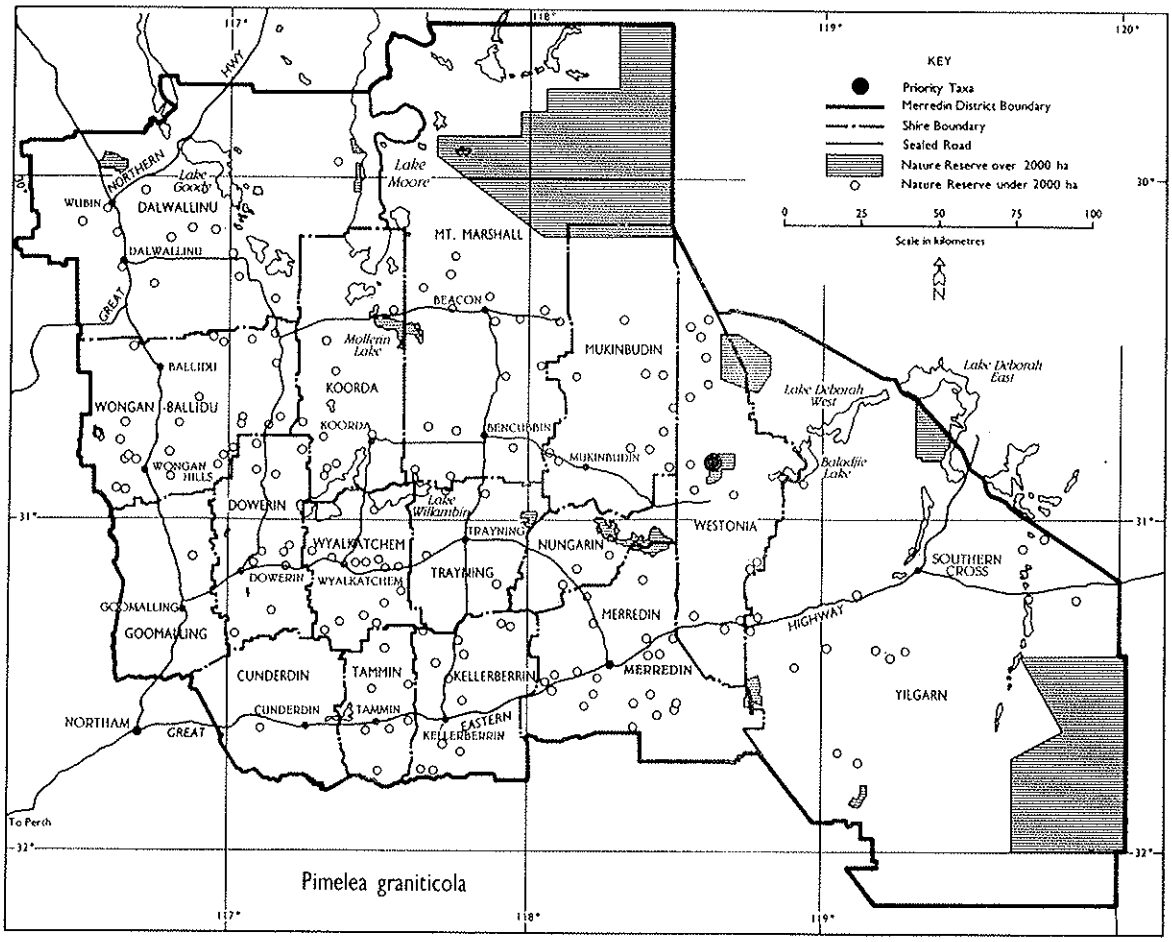
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Further survey is urgently needed.

REFERENCE

Rye (1990).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Pimelea graniticola
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
Lake Gooty
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN
WONGAN HILLS
BENCUBBIN
Lake Deborah West
Lake Deborah East
Bolokijin Lake
DOWERIN
Lake Willambin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
YILGARN
NORTHAM
To Perth

REGELIA CYMBIFOLIA (Diels) C.A. Gardner **Family: Myrtaceae**

TAXONOMY

This species is close to *R. inops* with very similar leaves, except that they are appressed in the latter and spreading in *R. cymbifolia*. *R. cymbifolia* has pubescent calyx lobes while those in *R. inops* are glabrous.

DESCRIPTION

Shrub to 2.5 m tall, erect and much-branched. Leaves opposite with alternate pairs at right-angles to each other, 3-5 mm long, boat-shaped, with stiff marginal hairs. Flowers deep pink to purple, in very short, dense spikes. Flowering period is August to November.

DISTRIBUTION AND HABITAT

The recorded distribution is in the Tambellup area between Broomehill and Albany, which is the type locality, with a 1974 record from north of Trayning in the Merredin District. Open wandoo (*Eucalyptus wandoo*) woodland, with a tall shrubland understorey on grey sandy loam is the recorded habitat. The Trayning record is definitely *Regelia cymbifolia*, although there has been some doubt in the past due to the large distance from the type locality at Tambellup (345 km) with no populations elsewhere in Merredin District or in Narrogin District. The specimen is smaller in average dimensions than the Tambellup collections, but otherwise leaf and floral characteristics are identical. The size difference is attributed to the drier nature of the Trayning area.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P2

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Trayning	Trayning Nth	?	?	? Collected P.S. Valentine 18.8.74

RESPONSE TO DISTURBANCE

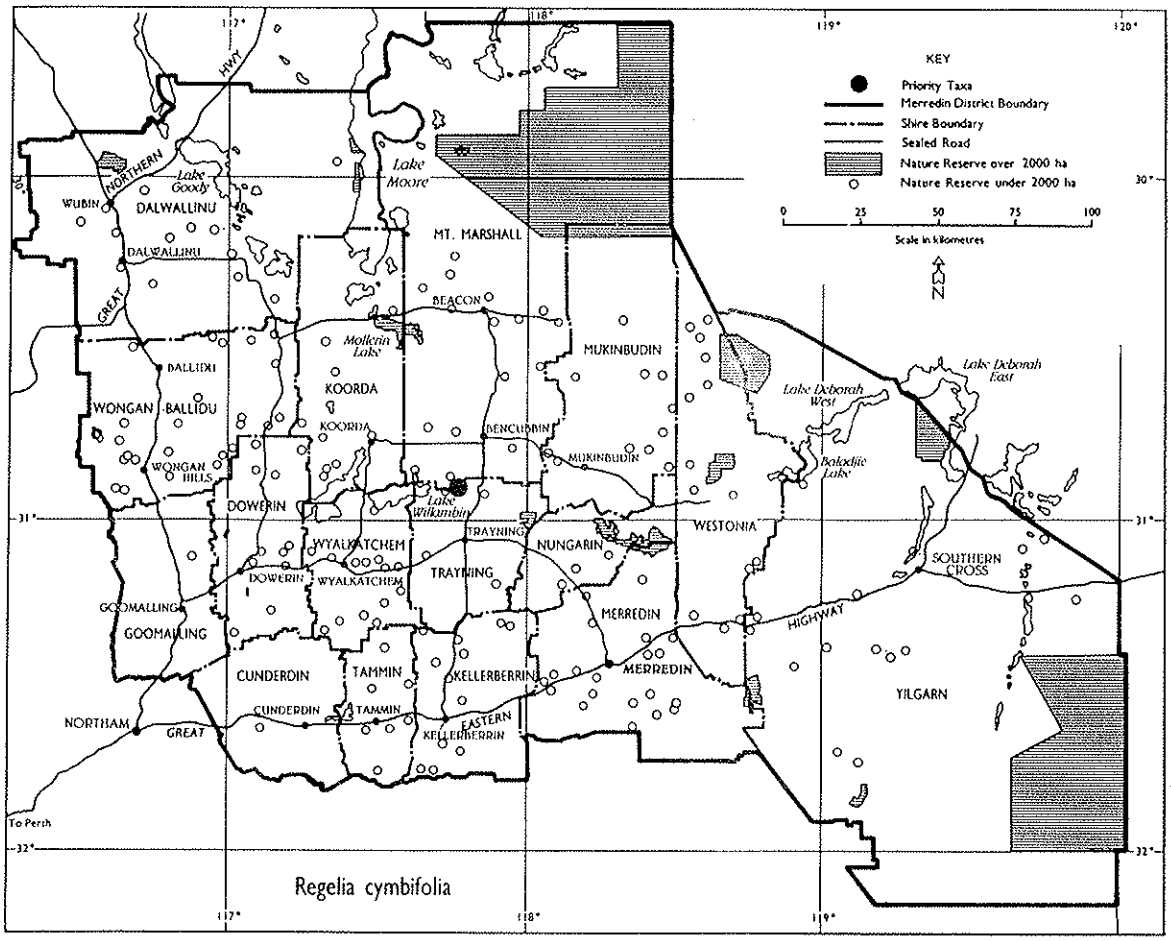
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown. Grazing is a recorded threat in the southern range of this taxon.

RECOMMENDATIONS

Further survey required.

REFERENCE

Blackall and Grieve (1980).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Regelia cymbifolia
Lake Goody
Lake Moore
Mollerin Lake
Lake Wilkinbin
Lake Deborah West
Lake Deborah East
Bolodjie Lake
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
MUKINBUDIN
KOORDA
BENCUBBIN
BALLIDU
WONGAN HILLS
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
GOOMALLING
MERREDIN
SOUTHERN CROSS
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
YILGARN
NORTHAM
GREAT
NORTHERN
To Perth

STYLIDIUM CHOREANTHUM Erickson & Willis **Family: Stylidiaceae**

Dancing Triggerplant

TAXONOMY

This triggerplant has a similar habit to *S. repens* and has spurred leaf bases. The flowers of *S. choreanthum* are quite distinct.

DESCRIPTION

A small, weeping matted plant with stems to 1-13 cm. Leaves smooth, grey-green, 2-3 mm long, lanceolate with a fine point. Flowers single or up to 8 blooms on short pedicels. Petals white or pale pink with flushes of red, very unequal. Flowering period September to October.

DISTRIBUTION AND HABITAT

This species is known from north of Koolyanobbing to near Southern Cross and east to Kambalda, where it occurs in sandy soil in open heath and shrubland vegetation.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P2

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Kalgoorlie	Yilgarn	Helena & Aurora Ra.	VCL	*ca* 990	Est. Healthy 20.10.90
2	Merredin	Yilgarn	Gondarnin	Nature Res.	11	Healthy 16.10.90

RESPONSE TO DISTURBANCE

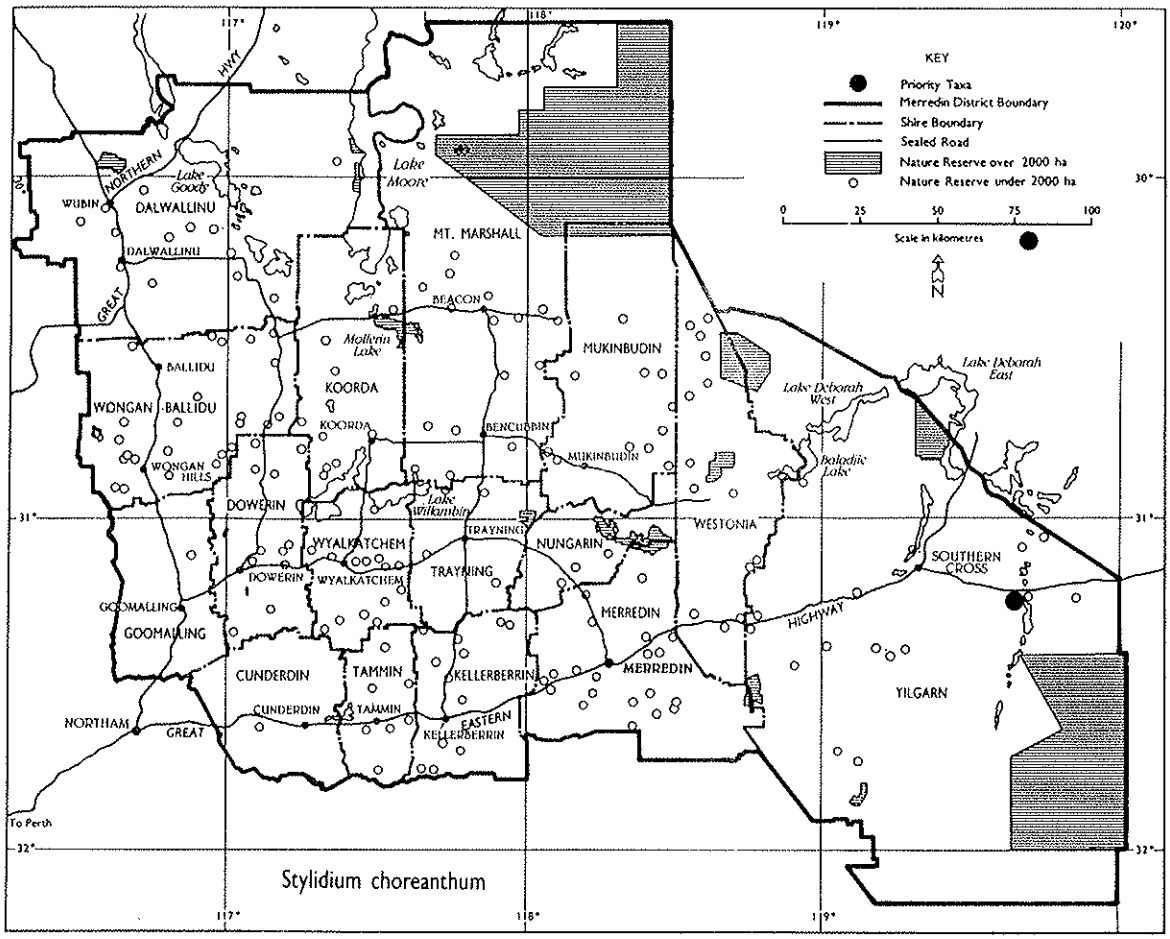
Population 1 is along a track and is therefore subject to periodic damage by vehicles. Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown. The species appears to prefer open situations and is likely to be a disturbance opportunist.

RECOMMENDATIONS

There are herbarium or book records from Kambalda, the Southern Cross-Bullfinch Road, Ghooli and between Boorabbin and No. 7 Pumping Station but no details are available. Further survey is required.

REFERENCE

Erickson (1981).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Stylidium choreanthum
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
MUKINBUDIN
BALLIDU
WONGAN
KOORDA
BENCUBBIN
WONGAN HILLS
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
SOUTHERN CROSS
GOOMALLING
MERREDIN
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
EASTERN
HIGHWAY
GREAT
NORTHERN
To Perth
Lake Goody
Lake Moore
Mollerin Lake
Lake Deborah West
Lake Deborah East
Baladjie Lake
Lake Wilkinbin

TETRATHECA DELTOIDEA J. Thompson **Family: Tremandraceae**

TAXONOMY

A distinctive species with no close relatives.

DESCRIPTION

Dwarf shrub 60-80 cm tall, growing generally within other thick vegetation for support or protection. Stems terete, leaves to 13 mm long, deltoid to ovate in shape. Flowers single, axillary. Petals five, dark pink, to 1 cm long and 7 mm wide. Flowering period August to September.

DISTRIBUTION AND HABITAT

This species is only known from the one location at Mt Caroline Nature Reserve where it occurs under *Eucalyptus caesia* in scrub vegetation in small pockets of rich, grey loamy humus in swales of massive granite.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P1 (With highest priority for further survey and consideration for gazettal as DRF)

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Kellerberrin	Mt Caroline	Nature Res.	150	Est. Healthy 3.10.90

RESPONSE TO DISTURBANCE

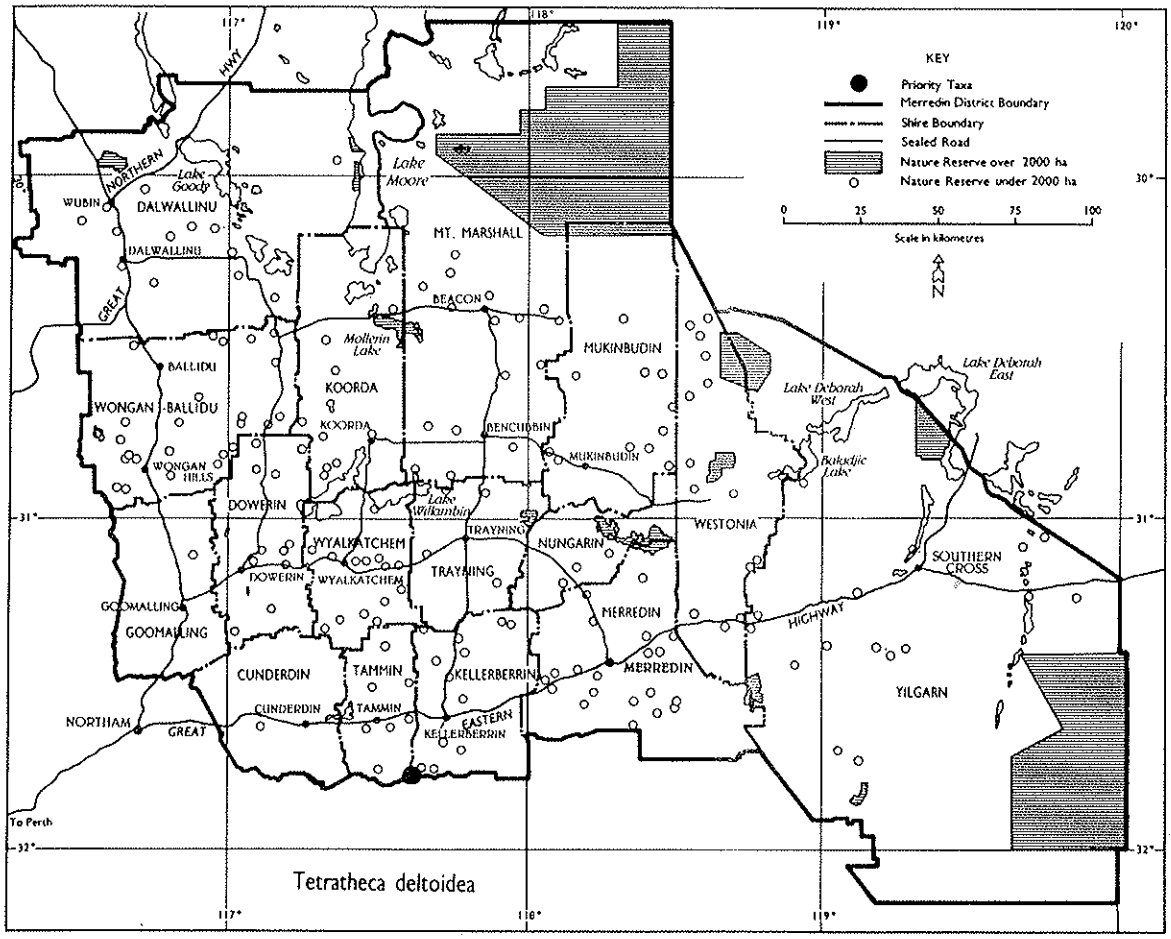
Response to soil disturbance, fire, and canopy cover is unknown. Exotic grasses and rabbits may affect the establishment of seedlings.

RECOMMENDATIONS

This species has been extensively surveyed and no further populations have been located. Gazettal as DRF is recommended. Weed and rabbit control may be necessary at the Mt Caroline site. Collection of germ plasm may need to be considered.

REFERENCE

Thompson (1976).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
Lake Goody
Lake Moore
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN HILLS
BENCUBBIN
Lake Deborah East
Lake Deborah West
Bakadjie Lake
DOWERIN
Lake Wilkamin
WESTONIA
WYALKATCHEM
TRAYNING
NUNGARIN
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
EASTERN
To Perth
Tetratheca deltoidea

THYSANOTUS CYMOSUS N.H. Brittan **Family: Anthericaceae**

TAXONOMY

This taxon is distinctive, with its cymose inflorescence and the non-twisted anthers.

DESCRIPTION

Perennial herb with fibrous roots. Leaves two to three, terete, glabrous, 20-30 cm long. Scape simple to 25 cm, topped by a 4-6-flowered umbel, each flower on a 10 mm pedicel. Perianth linear to 1 cm long (outer) and elliptic to 9 mm with a 4 mm fringe (inner). Flowering period September to October.

DISTRIBUTION AND HABITAT

The last collections of this species were made in 1973 near Hyden. It appears to be extremely rare, and was not relocated near Muntadgin in 1990. A survey in the recorded locality found only a disturbed verge with grass and a few shrubs. Its habitat appears to be sand plain remnants with mallee *Eucalyptus* in sandy loam soil often near granite. The species has been recorded from Muntadgin to Kulin.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P1

KNOWN POPULATIONS (Merredin District Only)

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Merredin	Muntadgin	? Road Res.	?	? Collected E.T. Bailey Sept 1947

RESPONSE TO DISTURBANCE

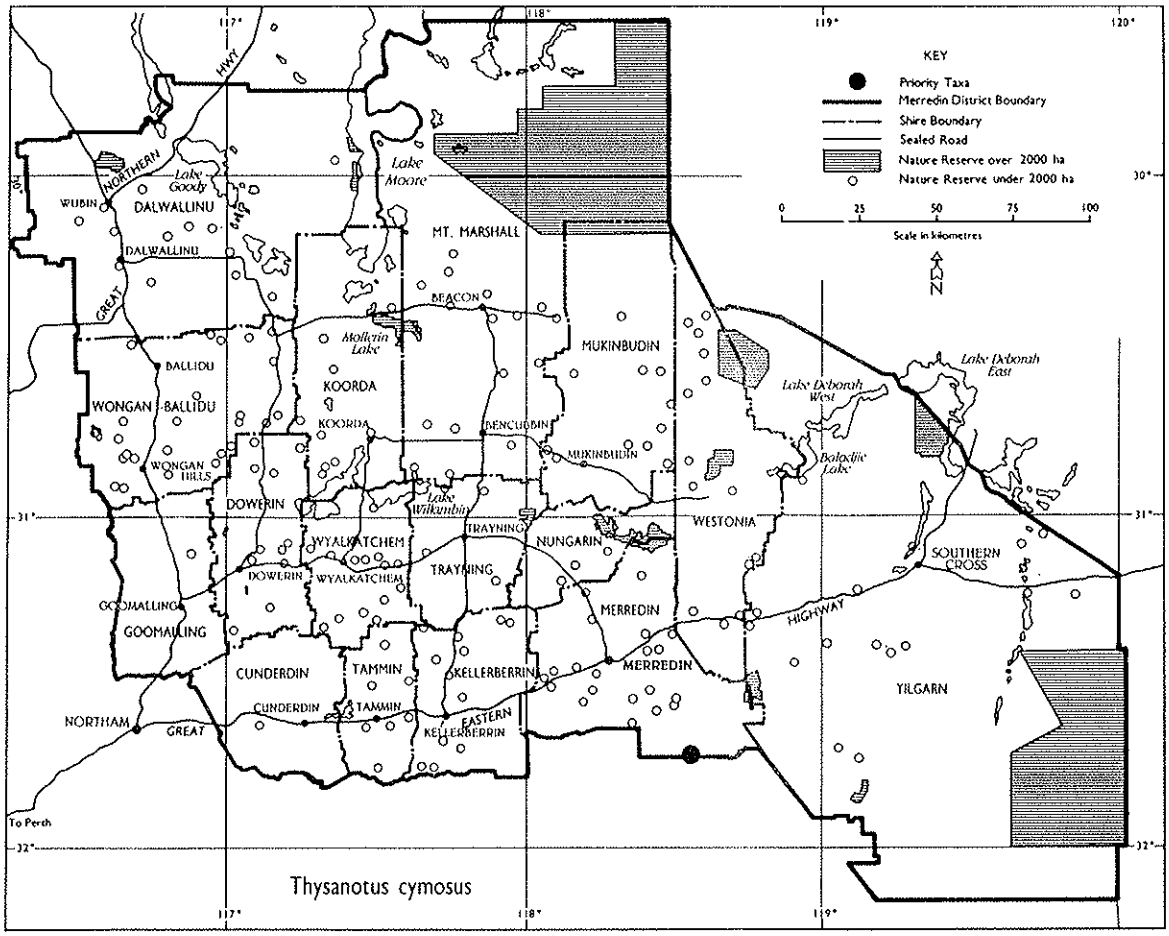
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Detailed survey is urgently required. Priority One status is recommended.

REFERENCE

Brittan (1987).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Thysanotus cymosus
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
Lake Goody
WUBIN
DALWALLINU
Lake Moore
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
BALLIDU
WONGAN - BALLIDU
KOORDA
MUKINBUDIN
Lake Deborah East
Lake Deborah West
Baloolie Lake
WONGAN HILLS
DOWERIN
Lake Wilkinbin
TRAYNING
NUNGARIN
WESTONIA
SOUTHERN CROSS
WYALKATCHEM
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
YILGARN
NORTHAM
To Perth

VERTICORDIA DASYSTYLIS A.S. George subsp. *DASYSTYLIS* **Family: Myrtaceae**

TAXONOMY

V. dasystylis subsp. *dasystylis* differs from two other subspecies in the length of the staminodes, pedicels and petals. It is intermediate in morphology between the other two taxa.

DESCRIPTION

Shrub to 40 cm, with many basal stems. Leaves oblong-elliptic, concave, obtuse, 2-3.5 mm long. Flowers erect, grouped at apex; staminodes 1.2-2 mm long, pedicels 1.5-4 mm long, petals 2-2.5 mm long, lemon yellow. Flowering period September to early November.

DISTRIBUTION AND HABITAT

This species is known from four populations over a geographic range of less than 20 km. It is very attractive when flowering and may be subject to pressure from flower pickers. Other granites in the survey area do not have the open-space to accommodate this taxon and no other populations were noted during a thorough search. This taxon occurs in the Yellowdine area east of Southern Cross where it grows on sandy flats adjacent to granite rocks.

CONSERVATION STATUS

Current Status: P2 Recommended Status: P5

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Yilgarn	Duladgin	Nature Res.	1800	Minor vehicle damage 15.10.90
2	Merredin	Yilgarn	Yellowdine	Water Res.	344	Minor vehicle damage 17.10.90
3	Merredin	Yilgarn	Condarnin	Nature Res.	250	Cut by road 17.10.90
4	Merredin	Yilgarn	Yellowdine East	VCL	228	Undisturbed 17.10.90

RESPONSE TO DISTURBANCE

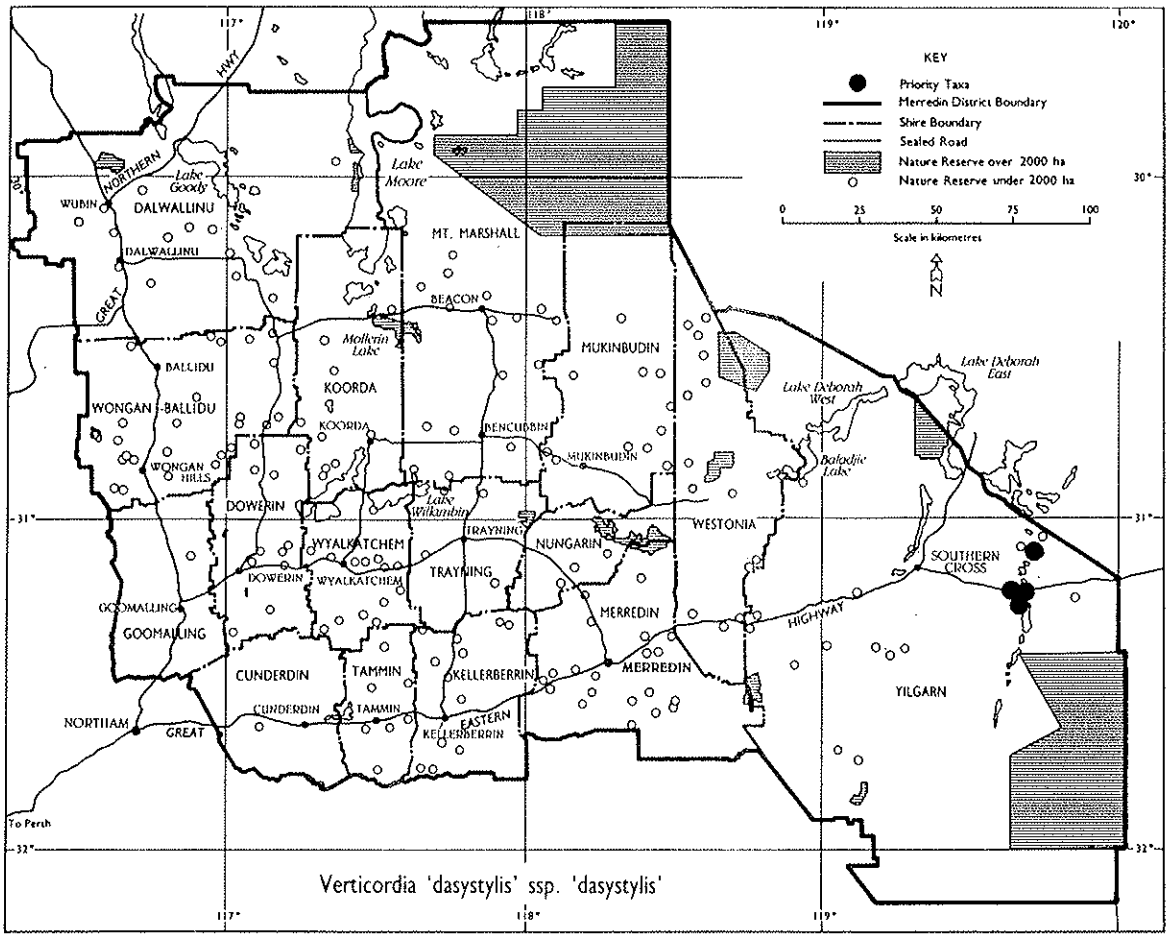
The only disturbance noted in these populations was some damage by vehicles. Response to fire, canopy cover, weed invasion and grazing is unknown.

RECOMMENDATIONS

The available data indicate that this taxon requires monitoring and is not currently threatened. Populations are of a reasonable size, although there are only four known. Priority 5 status is warranted.

REFERENCE

George (1991).



Verticordia 'dasystylis' ssp. 'dasystylis'

VERTICORDIA PULCHELLA A.S. George ms **Family: Myrtaceae**

TAXONOMY

V. pulchella is easily recognised by the hairy red flowers and the long 13-15 mm styles.

DESCRIPTION

Shrub to 40 cm with one to several basal stems and many spreading branches. Leaves linear, semi-terete, 2-7 mm, verrucose. Flowers spreading to pendulous, in rounded groups. Petals 3-4 mm long, orbicular-ovate, concave, red. Flowering period is October to December.

DISTRIBUTION AND HABITAT

This species occupies the same habitat as *Verticordia dasystylis* subsp. *dasystylis* but in a different geographic area. Known populations are mostly on road verges except for two in nature reserves. It occurs in the Mt Hampton area and east to Skeleton Rocks. The habitat is sandy loam over granite in low open heath and tall shrubland. It sometimes occurs as an undershrub associated with *Allocasuarina campestris, Acacia, Leptospermum, Calytrix* and *Borya.*

CONSERVATION STATUS

Current Status: P2 Recommended Status: P2

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Yilgarn	Sandalwood	Nature Res.	74+	Some rubbish (old) 17.8.90
2	Merredin	Yilgarn	Nargalyerin	Nature Res.	450+	Undisturbed 17.9.88
3	Merredin	Yilgarn	Mt Hampton NW	Private	3-400	Grazed partly 29.10.87
4	Merredin	Yilgarn	Moorine Sth	Private/Road Res.	60+	Some disturbance 29.10.87
5	Merredin	Yilgarn	Sandalwood	Road Res.	2-300	Undisturbed 29.10.87
6	Merredin	Yilgarn	Skeleton Rocks	VCL	288	Healthy 18.10.90
7	Merredin	Yilgarn	Mt Hampton School	Road Res.	5	Undisturbed 29.10.87
8	Merredin	Yilgarn	Bodallin Sth	Road Res.	?	? File Record

RESPONSE TO DISTURBANCE

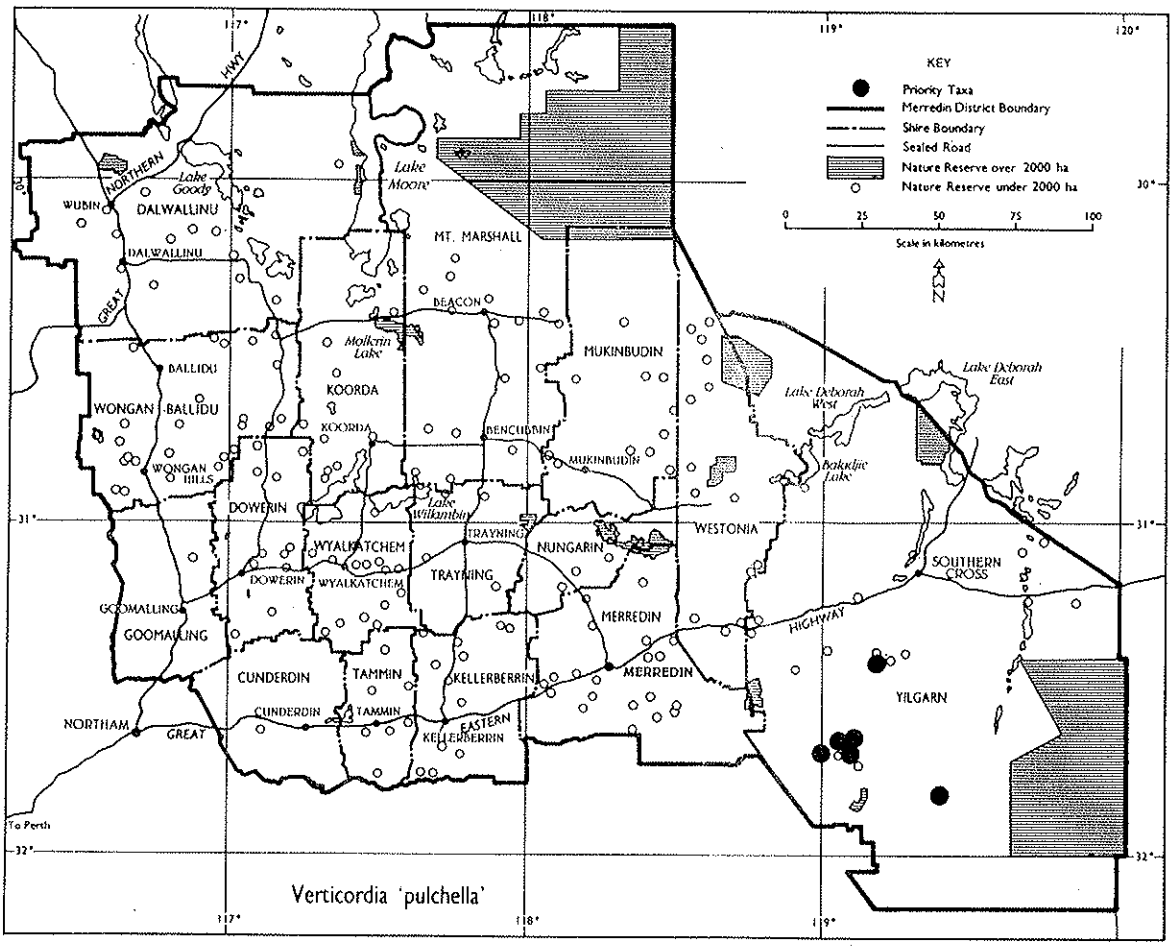
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Further surveys are required. A nature reserve on Skeleton Rocks is recommended.

REFERENCE

George (1991).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
HWY
NORTHERN
Lake Goody
WUBIN
DALWALLINU
DALWALLINU
GREAT
Lake Moore
MT. MARSHALL
BEACON
Moilkrin Lake
MUKINBUDIN
BALLIDU
WONGAN-BALLIDU
KOORDA
KOORDA
BENCUBBIN
MUKINBUDIN
WONGAN HILLS
DOWERIN
Lake Wilkamkin
TRAYNING
WESTONIA
WYALKATCHEM
NUNGARIN
DOWERIN
WYALKATCHEM
TRAYNING
GOOMALLING
GOOMALLING
MERREDIN
CUNDERDIN
TAMMIN
KELLERBERRIN
MERREDIN
CUNDERDIN
TAMMIN
EASTERN
KELLERBERRIN
NORTHAM
GREAT
To Perth
Lake Deborah West
Lake Deborah East
Bakajin Lake
SOUTHERN CROSS
HIGHWAY
YILGARN
117°
118°
119°
120°
30°
31°
32°
Verticordia 'pulchella'

PART FIVE - PRIORITY THREE SPECIES IN THE MERREDIN DISTRICT

Based on the December 1990 priority taxa list 23 species of Priority Three (P3) flora have been recorded to 1991 within the boundaries of that part of the Merredin District which is covered by this Wildlife Management Program.

The individual species treatments that follow are generally brief and indicate the conservation status of taxa in this group. The distribution of Priority Three species in the District is shown in Figure 6.

The recommended conservation status is largely based on the surveys carried out as part of this study.

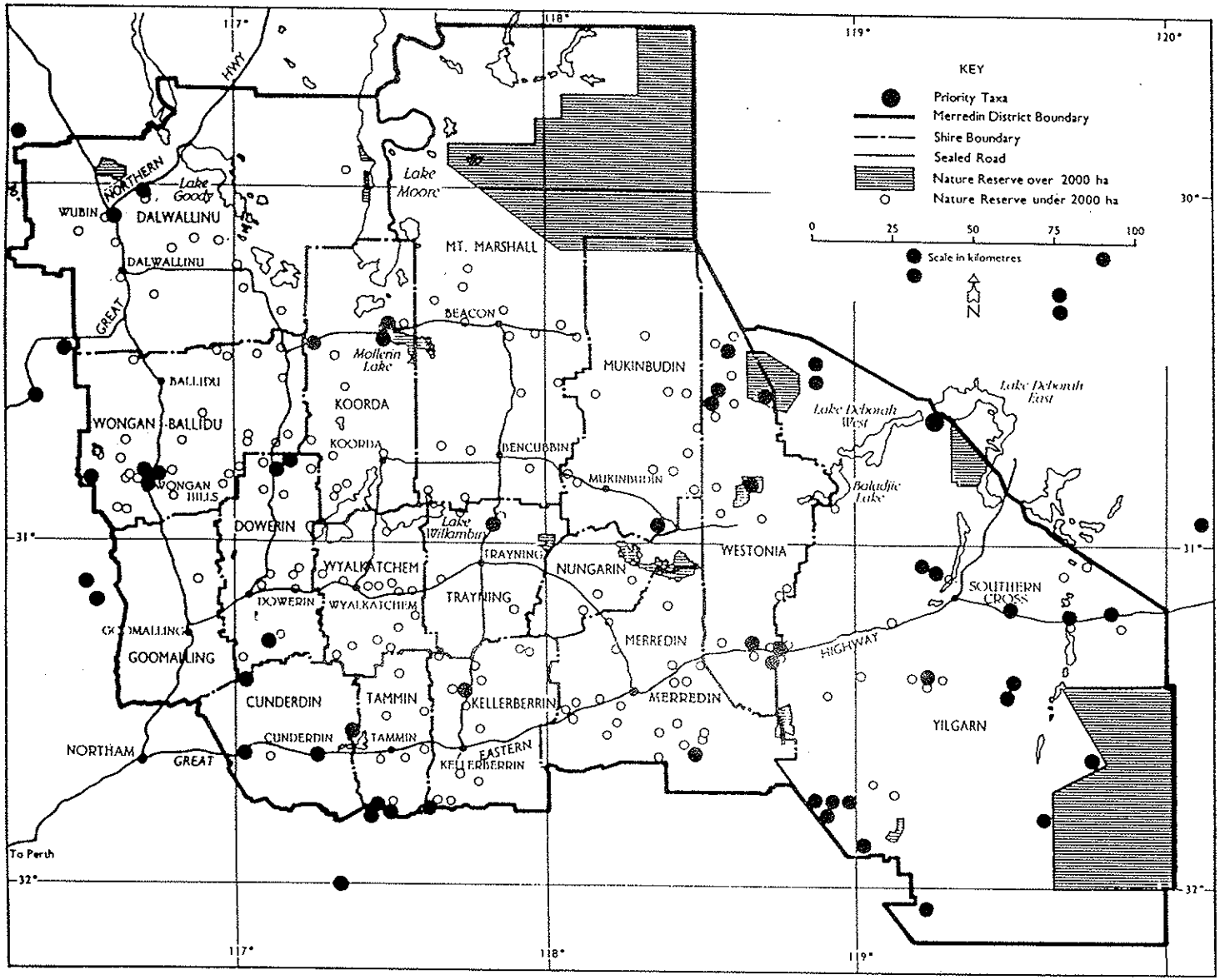


Figure 6. Distribution of Priority Three Species populations in the Merredin District.

ACACIA 'CYLINDRICA' Cowan & Maslin ms **Family: Mimosaceae**

TAXONOMY

A. 'cylindrica' is most closely related to *A. desertorum* which has 8-nerved phyllodes, longer flower stalks and oval to subglobular heads. There is also a superficial resemblance to *A. sibina* which has indistinct nervature.

DESCRIPTION

Shrub to 3 m tall and 2.5 m across. Phyllodes terete or quadrangular-terete, straight-tipped, 8-13 cm long and 1-1.2 mm diameter, 16-nerved, straight, ascending. Flowers 5-merous, heads cylindrical, dark golden, 10-11 mm long, 5 mm diameter. Pods linear, compressed, 6.5 cm long, 2-2.5 mm wide. Flowering period September to October.

DISTRIBUTION AND HABITAT

This species has a scattered distribution from near Kalannie east to Southern Cross and to north of Koolyanobbing. Its habitat is yellow sand or gravelly sand, sometimes on hillsides in tall open shrubland and open shrubland vegetation.

CONSERVATION STATUS

Current Status: P3 Recommended Status: P1

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Yilgarn	Southern Cross.	Road Res.	?	? Collected J. Taylor 3.10.79
2	Merredin	Yilgarn	Mt Correll	VCL	?	? Collected K. Newbey 4.9.82
3	Merredin	Yilgarn	Hunt Ra. Track	VCL	Frequent	? Collected K. Newbey 8.9.84
4	Merredin	Koorda	Kulja	Road Res.	?	? Collected B.H. Smith 17.12.71
5	Merredin	Yilgarn	Southern Cross	Road Res.	?	? Collected R. Cumming 6.9.82

RESPONSE TO DISTURBANCE

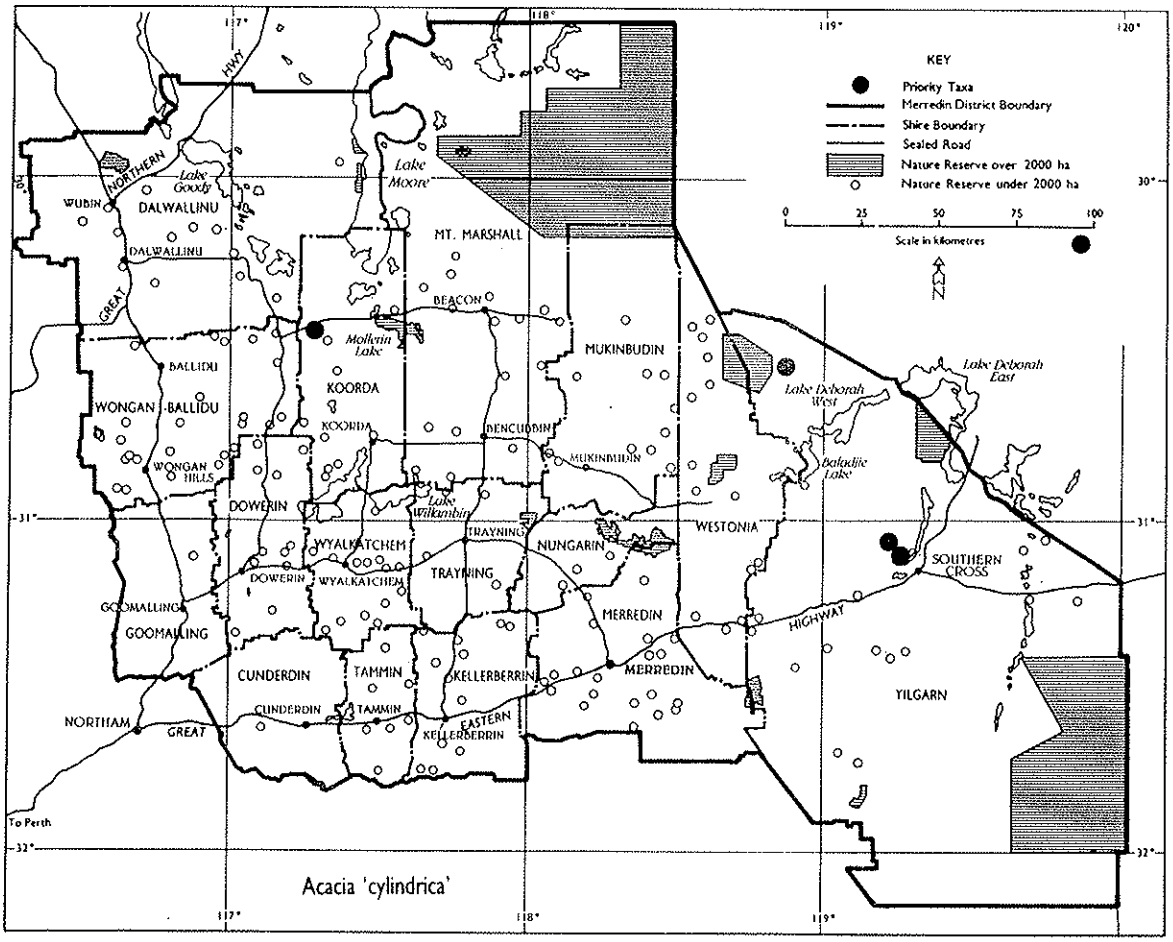
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Surveys are needed to determine numbers in known populations. This species was last collected in 1984, with the other records up to twenty years old. Priority One status is recommended.

REFERENCE

R. Cowan (personal communication).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
HWY
NORTHERN
Lake Goody
WUBIN
DALWALLINU
Lake Moore
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN
WONGAN HILLS
DENCUDDIN
Lake Deborah West
Lake Deborah East
Balodjie Lake
DOWERIN
Lake Wilkamin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
YILGARN
NORTHAM
To Perth
Acacia 'cylindrica'

ACACIA FILIFOLIA Benth. **Family: Mimosaceae**

TAXONOMY

A. filifolia is close to *A. viscifolia*, but differs in having sessile flower heads and a glabrous calyx.

DESCRIPTION

Shrub 1-2 m tall, sometimes 4 m. Phyllodes terete or slightly flattened, curved, 3-10 cm long, 0.5-1.5 mm wide, finely-nerved, with a long, fine, brittle point. Flowers globular to 8-10 mm in diameter, bright yellow. This species is occasionally cultivated. Flowering period April to September.

DISTRIBUTION AND HABITAT

There are 27 records from the Wongan Hills area, the most recent in 1986 and as this area is not the subject of this document they are all treated as one population. There are only three records outside the Merredin District out of a total of 40 and these are greater than 10 years old. Of the six records between Merredin and Southern Cross the most recent was from a 1981 collection by Cumming, which is listed here as population 2. This species occurs from Geraldton to south of Perth and east to Southern Cross. Its habitat is sand or sandy gravel in *Eucalyptus* or *Allocasuarina* woodland.

CONSERVATION STATUS

Current Status: P3 Recommended Status: P3

KNOWN POPULATIONS (Merredin District Only)

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Wongan-Ballidu	Wongan Hills	?	?	? Collected J.M. Powell 9.8.86
2	Merredin	Yilgarn	Yerbillon	Road Res.	?	? Collected R. Cumming 6.9.81

RESPONSE TO DISTURBANCE

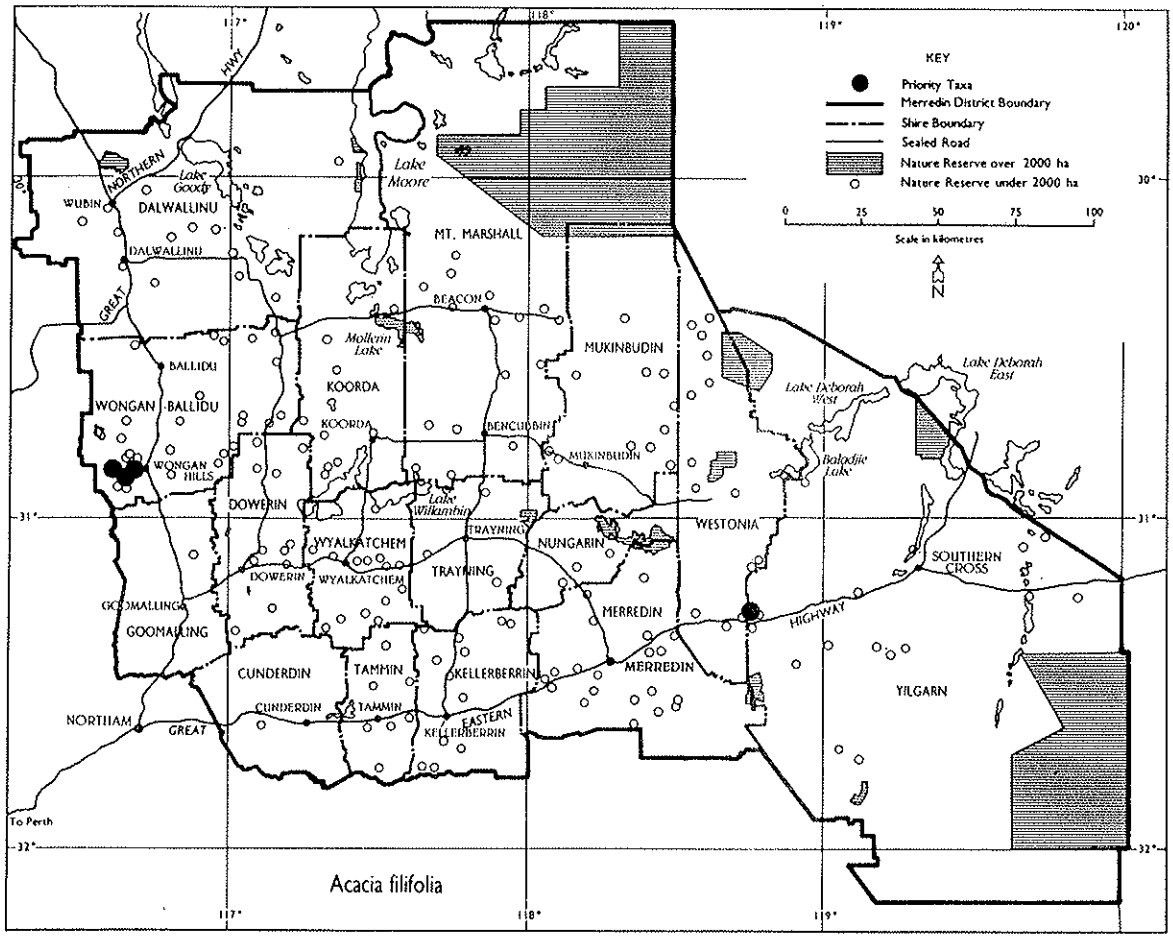
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Further survey is needed particularly in the Wongan Hills area.

REFERENCES

Blackall and Grieve (1974); Simmons (1988).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
HWY
NORTHERN
Lake Goode
Lake Moore
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
BALLIDU
KOORDA
MUKINBUDIN
Lake Deborah East
Lake Deborah West
WONGAN
WONGAN HILLS
DENCUDDIN
Baladjie Lake
DOWERIN
Lake Wilkambin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
EASTERN
To Perth
Acacia filifolia

ACACIA PHAEOCALYX Maslin **Family: Mimosaceae**

TAXONOMY

A. phaeocalyx is a distinctive taxon, readily recognised by its spiny stipules, obdeltate leaves, large golden flowers and terete, striate pods.

DESCRIPTION

Shrub 0.3-0.6 m tall, branches terete, finely ribbed, glabrous. Phyllodes very asymmetrically broadly obdeltate, acuminate, 8-15 mm long, 6-11 mm wide (at broadest point), rigid, slightly undulate, glabrous, margins yellowish, pungent. Flowers simple, 1 per node on 5-10 mm long stalks. Heads golden yellow, globular, with 7-8 rather loosely arranged flowers, 4-merous. Pods terete, to 50-60 mm long, 4 mm wide, curved, tapered at both ends, not contracted between seeds, hard and brittle, glabrous, red-brown, longitudinally striate. Flowering period April to June.

DISTRIBUTION AND HABITAT

This species has a sporadic distribution from Wongan Hills to Kellerberrin and Tammin on sand over laterite in tall shrubland. The most recent collection in the Wongan Hills area was in 1982 and there are eight others, some over 20 years old; these are all treated as a single collection.

CONSERVATION STATUS

Current Status: P3 Recommended Status: P3

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Wongan-Ballidu	Wongan Hills	?	?	? Collected P. Roberts 1.12.82
2	Merredin	Tammin	C.A. Gardner	Nature Res.	?	? Collected M. Crisp 27.1.79
3	Merredin	Kellerberrin	Durokoppin	Nature Res.	Common	? K. Atkin's file record
4	Narrogin	Quairading	Jacobs Well	Road Res.	?	? Collected J. Taylor 25.9.83

RESPONSE TO DISTURBANCE

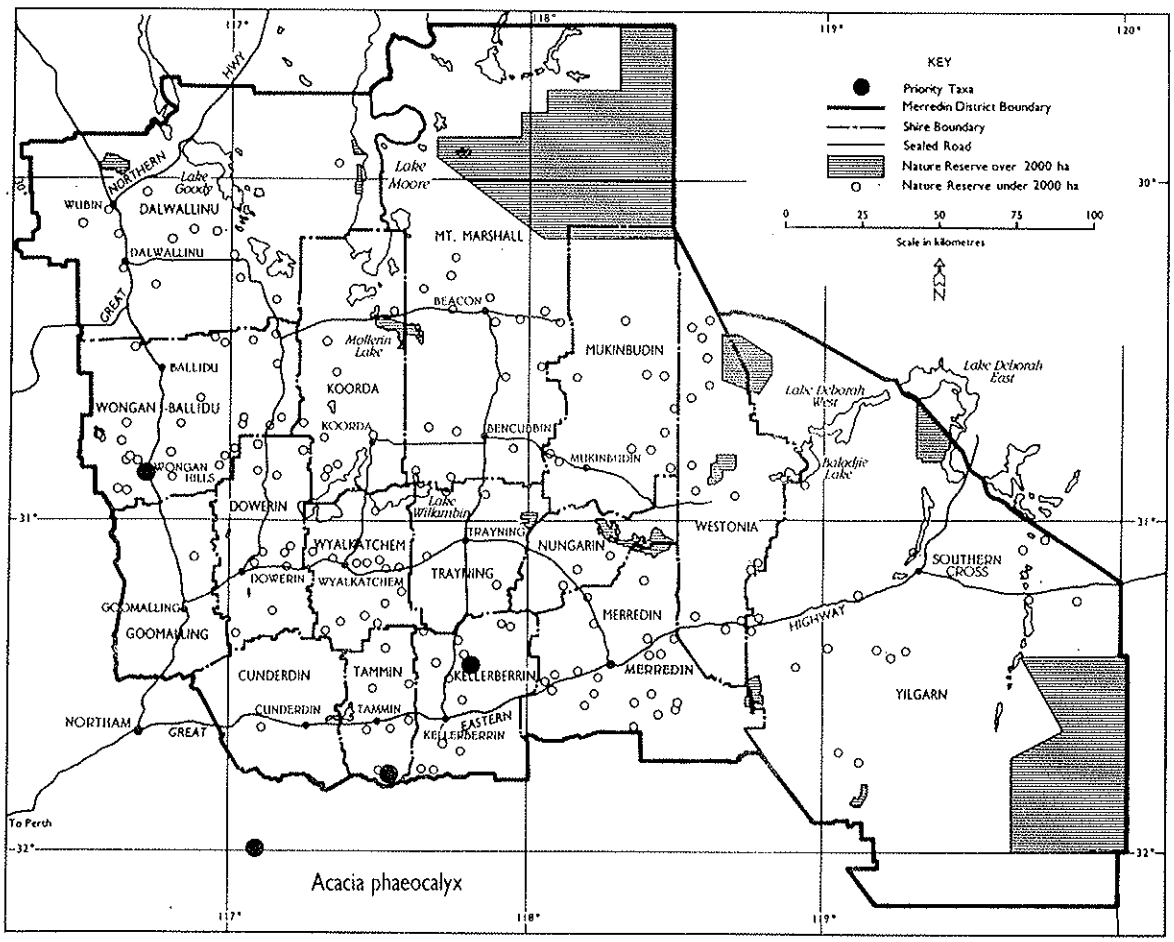
Reported to be reasonably common on Durokoppin Nature Reserve in burnt and unburnt areas, so this species appears to be fire tolerant. Response to soil disturbance, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Some eight herbarium records are fifteen to twenty years or more old so further surveys are required to determine if this species still exists at the recorded locations. Further field surveys are warranted.

REFERENCES

Simmons (1981); K. Atkins (CALM, personal communication).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Acacia phaeocalyx
HWY
NORTHERN
Lake Goody
Lake Moore
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
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TAMMIN
KELLERBERRIN
MERREDIN
NORTHAM
EASTERN
Lake Deborah East
Lake Deborah West
Baloojie Lake
SOUTHERN CROSS
HIGHWAY
YILGARN
To Perth

CALOTHAMNUS BREVIFOLIUS T.J. Hawkeswood **Family: Myrtaceae**

TAXONOMY

The name 'brevifolius' refers to the short leaves which are a characteristic feature of this taxon.

DESCRIPTION

Small, erect, spreading, much-branched glabrous shrub to 50 cm high. Leaves sessile, short, linear, terete, somewhat scabrous, 8-12 mm long, 0.5-0.8 mm wide, shortly mucronate but not pungent. Flowers 1-5, in short, dense clusters encircling stems amongst leaves, or scattered in groups. Petals narrow-oblong, 5-6 mm long, mostly acute, glabrous. Fruit sessile, depressed-globular to almost cylindrical, 4-5 mm long, pubescent. Flower period January to February.

DISTRIBUTION AND HABITAT

Remnant vegetation containing this species includes scrub heath and heath vegetation on pale sand. There is a collection by P. Roberts which appears to be from population 4 dated 1985, and two old collections from near Corrigin and Cunderdin where the species may no longer exist. This taxon is quite rare, but appears to be secure at Charles Gardner Reserve and Marchagee Reserve. There is a file record from private property 13 km east of Goomalling, but no collection, and the identification was not confirmed. The species occurs from south of Tammin to north-east of Cunderdin and near Wongan Hills and Coorow.

CONSERVATION STATUS

Current Status: P3 Recommended Status: P3

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Dowering	Hindmarsh	?	Plentiful	? Collected B.H. Smith 2.1.85
2	Merredin	Tammin	Gardner	Nature Res.	8	Healthy 27.8.90
3	Merredin	Cund./Tamm.	Wyola Nth	Road Res.	2	On disturbed verge 5.10.90
4	Merredin	Wongan-Ballidu	W Piawaning	Road Res.	2	? File Note 26.11.80
5	Moora	Coorow	Marchagee	Nature Res.	?	? Collected B.G. Muir 1.6.77

RESPONSE TO DISTURBANCE

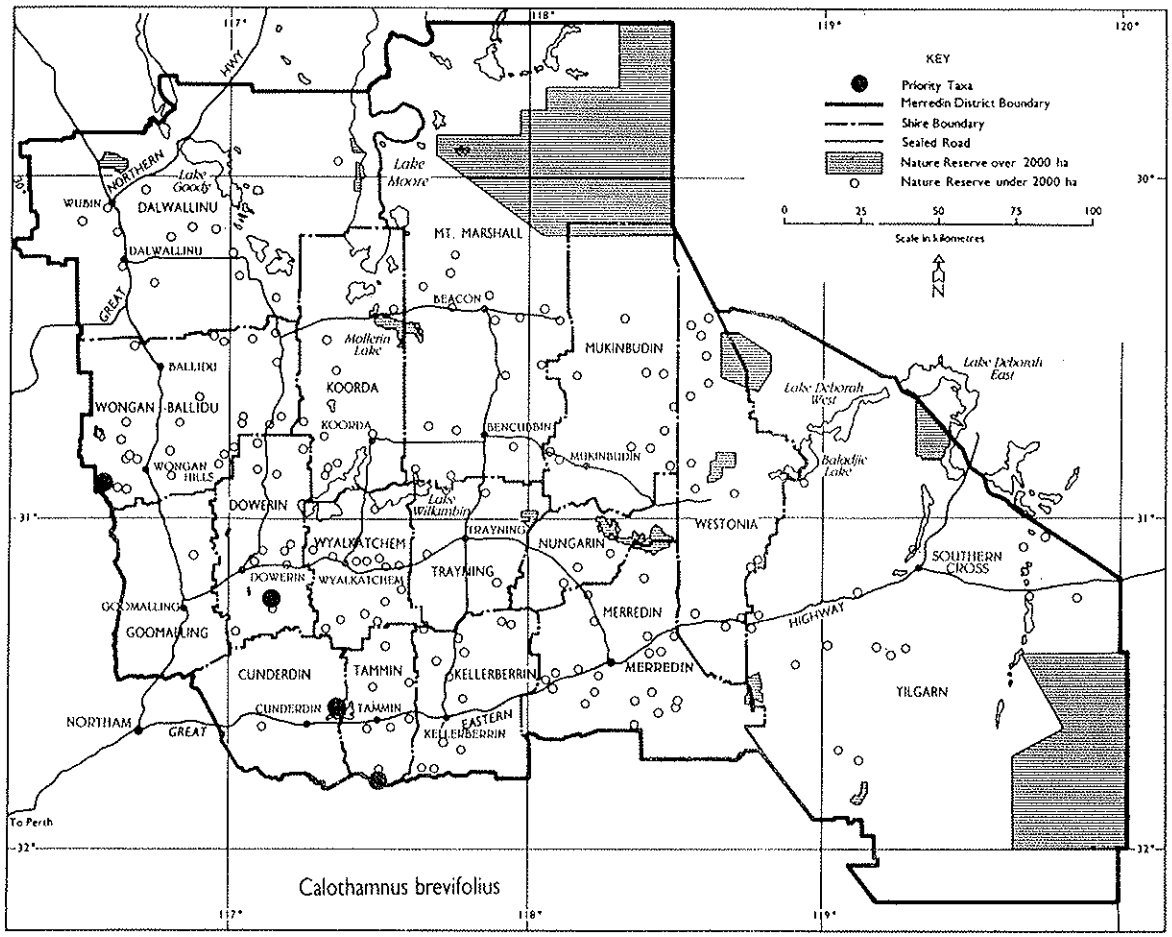
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Further survey is needed.

REFERENCES

Hawkeswood (1984); Coates (1990).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Calothamnus brevifolius
HWY
NORTHERN
Lake Goody
Lake Moore
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
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Lake Deborah West
Lake Deborah East
Baladjie Lake
DOWERIN
Lake Wilkinbin
TRAYNING
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WYALKATCHEM
NUNGARIN
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
EASTERN
To Perth
117°
118°
119°
120°
30°
31°
32°

CALYTRIX PLUMULOSA (F. Muell.) B.D. Jackson **Family: Myrtaceae**

TAXONOMY

This species can be readily distinguished from all others in the genus with pubescent calyces, by the orbicular to suborbicular transverse sections of its leaves.

DESCRIPTION

Shrub to 40 cm tall; branchlets pubescent. Leaves closely to widely spaced, spreading, linear to linear-obovate, 3-11 mm long, 0.4-1 mm wide. Flowers scattered on plant. Petals usually glabrous, rose to violet, yellow at the base, lanceolate to elliptic, 7.5-10 mm long, 3-5 mm wide, the apex obtuse to acute. Flowering period October and November.

DISTRIBUTION AND HABITAT

C. plumulosa occurs in scrub and thicket vegetation on yellow sand with or without laterite gravel. Based on herbarium records to the west of Chiddarcooping it is known from the area between Bunjil and Bencubbin. One known population was not relocated in Chiddarcooping during 1990, nor was the 1933 collection by Blackall near Bencubbin. Wubin, Mt Churchman, Mollerin and between Mollerin and Koorda are other herbarium localities, with additional populations listed in Craven (1987). Only the Chiddarcooping locality and the Bencubbin area were checked in 1990 and details of the Chiddarcooping population are listed below.

CONSERVATION STATUS

Current Status: P3 Recommended Status: P3

KNOWN POPULATIONS (Merredin District Only)

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Westonia	Chiddarcooping	Nature Res.	558	Healthy 8.11.90; 8 sub-popns
2	Merredin	Koorda	Mollerin	Road Res.	?	? Collected L. Craven 18.10.81

RESPONSE TO DISTURBANCE

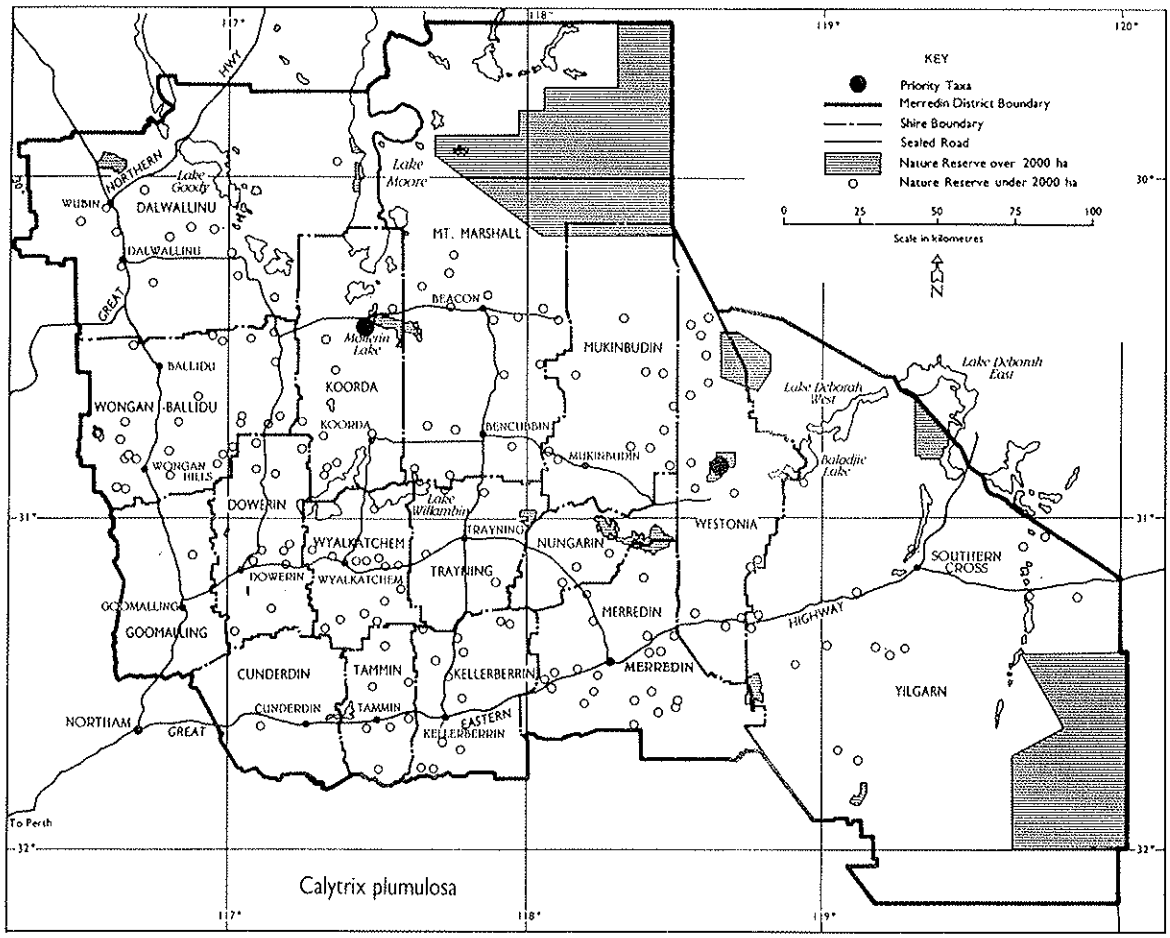
Populations in Chiddarcooping have been cut by firebreaks, but still survive in adjacent vegetation. Response to fire, weed invasion, grazing and canopy cover is unknown. The species mostly occurs as an undershrub, so canopy cover may be important.

RECOMMENDATIONS

Firebreak or road maintenance work may result in destruction of plants at Chiddarcooping, so the relevant populations should be marked. The species was not observed in the Mt Churchman area or along the Koorda-Mollerin Road during surveys. Further survey is required.

REFERENCES

Weston (1985); Craven (1987).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
HWY
NORTHERN
Lake Goody
WUBIN
DALWALLINU
Lake Moore
MT. MARSHALL
BEACON
GREAT
Moorine Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN-BALLIDU
BENCUBBIN
WONGAN HILLS
Lake Deborah West
Lake Deborah East
Baladjie Lake
DOWERIN
Lake Wilkinbubbin
WESTONIA
TRAYNING
NUNGARIN
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
EASTERN
To Perth
Calytrix plumulosa

DIURIS PICTA J. Drummond **Family: Orchidaceae**

TAXONOMY

This is a late flowering *Diuris* similar to *D. laxiflora* and was until recently considered synonymous with that species. In 1989 it was re-erected as a distinct taxon after a 1988 collection south-south-east of Moorine Rock.

DESCRIPTION

D. picta is an annual herb to 35 cm tall, on a single scape which is divided near the apex to support at least two flowers. Flowers are yellow with purple markings on each of the floral parts. Flowering period is October.

DISTRIBUTION AND HABITAT

D. picta occurs on herbaceous mats near watercourses and around moist edges of densely vegetated thickets on granites from Mt Caroline near Kellerberrin to east of Yellowdine. There are five known populations.

CONSERVATION STATUS

Current Status: P3 Recommended Status: P2

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Yilgarn	Karalee	VCL	44	Healthy 16.10.90
2	Merredin	Yilgarn	Yellowdine	Water Res.	100+	Early flower 10.10.90
3	Merredin	Yilgarn	Frog Rock	Nature Res.	?	? Ref. Clements (1989)
4	Merredin	Westonia	Chiddarcooping	Nature Res.	50	? Weston (1985)
5	Merredin	Kellerberrin	Mt Caroline	Nature Res.	200+	? File record

RESPONSE TO DISTURBANCE

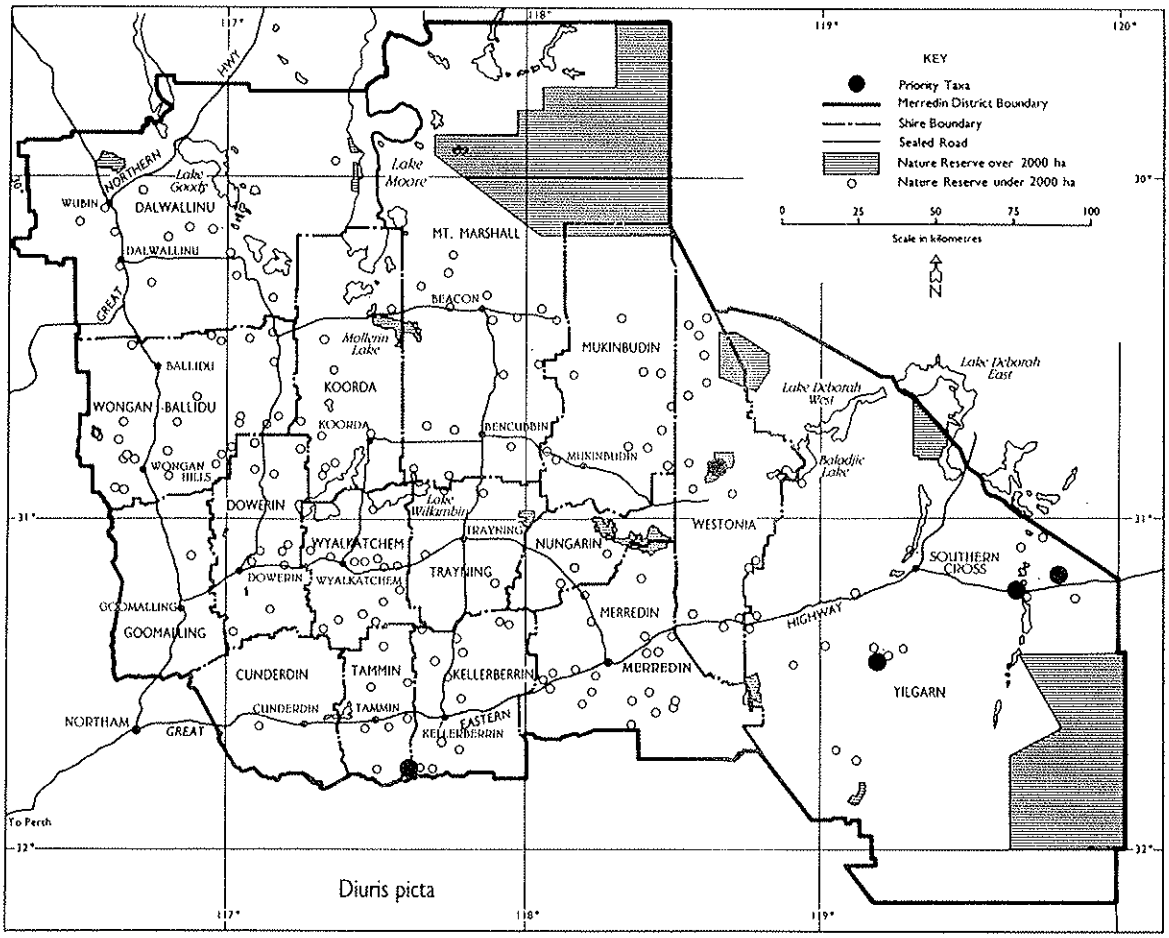
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Overall numbers of this species are not high, but it is found on three nature reserves.

REFERENCES

Hoffman and Brown (1984); Clements (1989); A.P. Brown (CALM, personal communication 1990).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
Lake Goorly
WUBIN
DALWALLINU
DALWALLINU
GREAT
Lake Moore
MT. MARSHALL
BEACON
Mollyum Lake
MUKINBUDIN
BALLIDU
WONGAN
BALLIDU
KOORDA
KOORDA
BENCUBBIN
MUKINBUDIN
WONGAN HILLS
Lake Deborah West
Lake Deborah East
Baladjie Lake
DOWERIN
Lake Wilkinbin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
DOWERIN
WYALKATCHEM
TRAYNING
SOUTHERN CROSS
GOOMALLING
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
MERREDIN
YILGARN
CUNDERDIN
TAMMIN
EASTERN KELLERBERRIN
NORTHAM
GREAT
To Perth
Diuris picta

DRYANDRA HORRIDA Meissner **Family: Proteaceae**

TAXONOMY

D. horrida is close to *D. erythrocephala*, but flower-heads are narrower and axillary, the limb of perianth tube is silky-hairy and bracts are glabrous.

DESCRIPTION

An open shrub to about 1.3 m high and 1 m wide with thick, hoary, tomentose branches. Leaves narrow, rigid, 7-10 cm long, pinnatifid with long, distant, pungent-pointed lobes to 1 cm long. The central part of each leaf blade, from which the lobes extend, is very narrow (3 mm) with the midrib particularly prominent on the undersurface. The yellow flower-heads are axillary, about 3 cm wide. Bracts, both the inner and outer, are beset with long, soft hairs. Flowering period October to December.

DISTRIBUTION AND HABITAT

Although there are populations recorded from the Meckering and Corrigin areas, they have never been relocated and are now considered extinct. Now only known from south of Dowerin to south of Tammin, where it occurs on sand or gravel soil in scrub vegetation.

CONSERVATION STATUS

Current Status: P3 Recommended Status: P2

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Dowerin	Culbarting	? Private	?	? Collected B.H. Smith 12.3.83
2	Merredin	Tammin	C.A. Gardner	Nature Res.	?	? Ref. Coates (1990)
3	Merredin	Tammin	Rogers Rd	Road Res	2	Healthy 27/8/90

RESPONSE TO DISTURBANCE

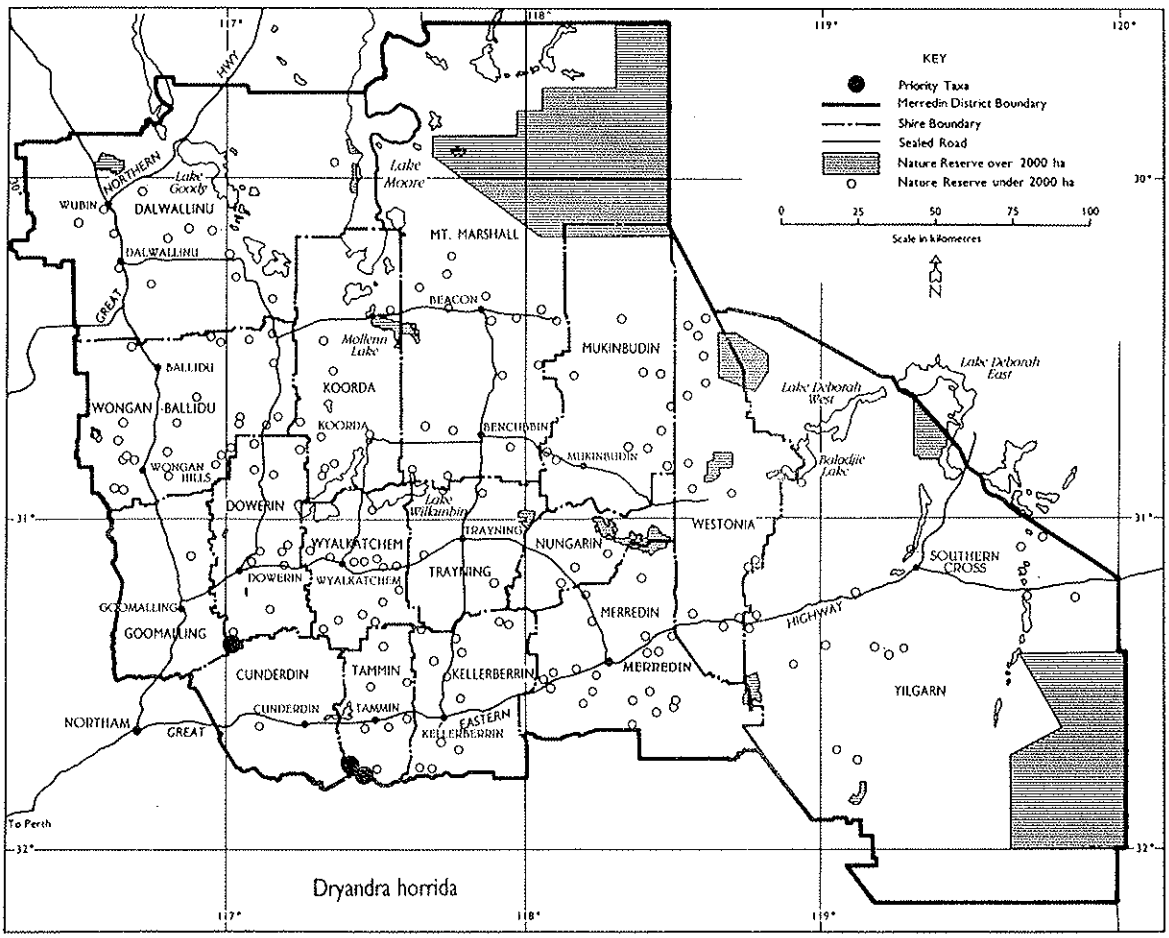
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Recorded numbers of this species are very low. Urgent further survey is needed.

REFERENCES

Sainsbury (1985); Blackall and Grieve (1988).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Dryandra horrida
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
Lake Goorly
WUBIN
DALWALLINU
Lake Moore
MT. MARSHALL
BEACON
GREAT
Mollenn Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN
WONGAN HILLS
BENCUBBIN
Lake Deborah West
Lake Deborah East
Balodile Lake
DOWERIN
Lake Willambin
TRAYNING
WESTONIA
WYALKATCHEM
NUNGARIN
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
EASTERN
To Perth

DRYANDRA SHANKLANDIORUM R.P. Randall **Family: Proteaceae**

TAXONOMY

This taxon is quite close to *D. pteridifolia*, but differs in style, perianth and bract length, follicle width and in the hairiness of leaf lobes. In the latter character, *D. shanklandiorum* is glabrous and its floral parts tend to be shorter than those of *D. pteridifolia*.

DESCRIPTION

Low, much-branched, compact shrub, to 1.5 m tall. Stems with dense, ferruginous indumentum. Leaves crowded towards stem apices, glabrous, variable in size, 6-46 cm long, 1.5-14 cm wide. The disjunct distribution is interesting with the northern plants quite tall and robust, while those in the south tend to be of lower stature. Flowering period June to August.

DISTRIBUTION AND HABITAT

The Tandegin location of Kuchel was visited during 1990, but *D. shanklandiorum* was not found. Habitat is sand, over gravel on sand soil with scrub or heath vegetation, with a distribution from Cadoux to east of Skeleton Rocks.

CONSERVATION STATUS

Current Status: P3 Recommended Status: P3

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Dowerin	McKay	Road Res.	? 1000	Randall 1988
2	Merredin	Wongan-Ballidu	Johnson	Road Res.	215	Some disturbance 11.10.90
3	Merredin	Yilgarn	Moorine South	Road Res.	140+	Minor disturbance 17.8.90
4	Merredin	Merredin	Branit	Road Res.	61	Under threat 29.8.90
5	Merredin	Yilgarn	West Cramphorne	Road Res.	30	Undisturbed 29.8.90
6	Merredin	Yilgarn	Meranda Nth	Road Res.	1	At road edge 29.8.90
7	Merredin	Yilgarn	East Cramphorne	Road Res.	7	Minor disturbance 30.8.90
8	Merredin	Yilgarn	Mt Hampton Sth	Road Res.	27	Minor disturbance (3 dead) 30.8.90
9	Merredin	Yilgarn	Parker Range Sth	VCL	445	Cut by track 31.8.90

RESPONSE TO DISTURBANCE

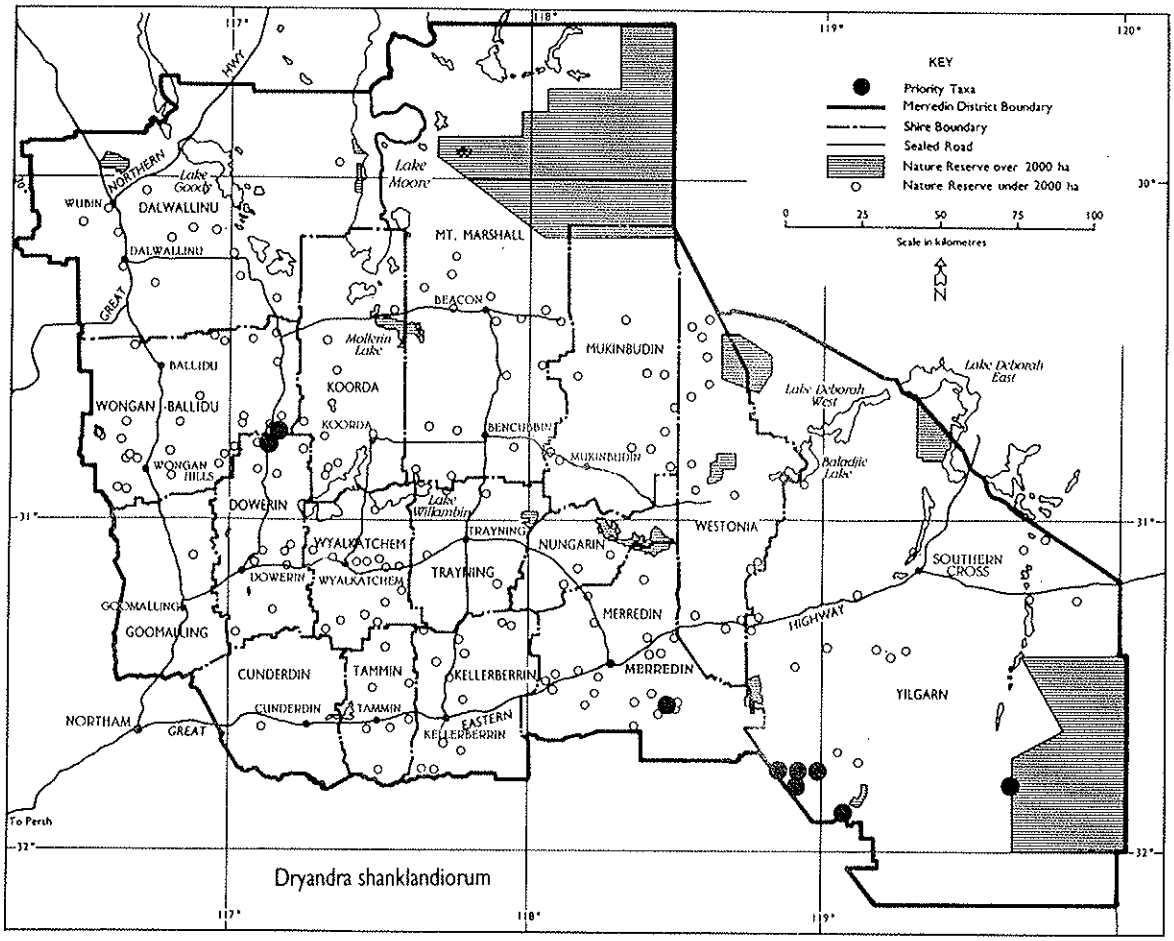
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

There are several populations, but three are small and none are reserved, although population 3 is on the boundary of the proposed Holleton Nature Reserve. Surveys in 1990 were very thorough so few if any additional populations are expected to be located.

REFERENCE

Randall (1988).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
HWY
NORTHERN
Lake Goorly
Lake Moore
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
BALLIDU
KOORDA
WONGAN-BALLIDU
MUKINBUDIN
Lake Deborah East
Lake Deborah West
Baladjie Lake
WONGAN HILLS
DOWERIN
Lake Wilkambin
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
EASTERN
To Perth
Dryandra shanklandiorum

DRYANDRA SPECIOSA Meissner **Family: Proteaceae**

TAXONOMY

There are two distinct forms of this easily recognised species. To the north-west in the Eneabba-Marchagee area it flowers later, has more yellow flowers, narrower bracts and reticulate pubescent leaves. In the Tammin area it flowers earlier, has orange-red flowers, marginally broader bracts and has non-reticulate, glabrous leaves.

DESCRIPTION

Shrub to about 1.5 m in height. Leaves are very narrow, linear, entire with closely revolute margins up to 13 cm long. Flowers are pendulous with yellowish to red flower-heads 4-8 cm long. Floral bracts are linear, numerous, over 5 cm long with hairy margins. Flowering period is June to September (Tammin area) and October to January (Eneabba-Marchargee area).

DISTRIBUTION AND HABITAT

There are 19 herbarium collections from the Tammin area of which only six locations are still known to exist. In the Eneabba-Marchargee area there are 11 records probably from eight locations of which four are still thought to exist. *D. speciosa* is found in sand, sandy clay and/or gravel soil with heath vegetation in the Tammin area, and heath or mallee heath vegetation in the Eneabba-Marchargee area.

CONSERVATION STATUS

Current Status: P3 Recommended Status: P2

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Tammin	Gardner	Nature Res.	50+	Healthy 1.8.90
2	Merredin	Tammin	Roger Rd	Road Res.	5	Healthy 27.8.90

RESPONSE TO DISTURBANCE

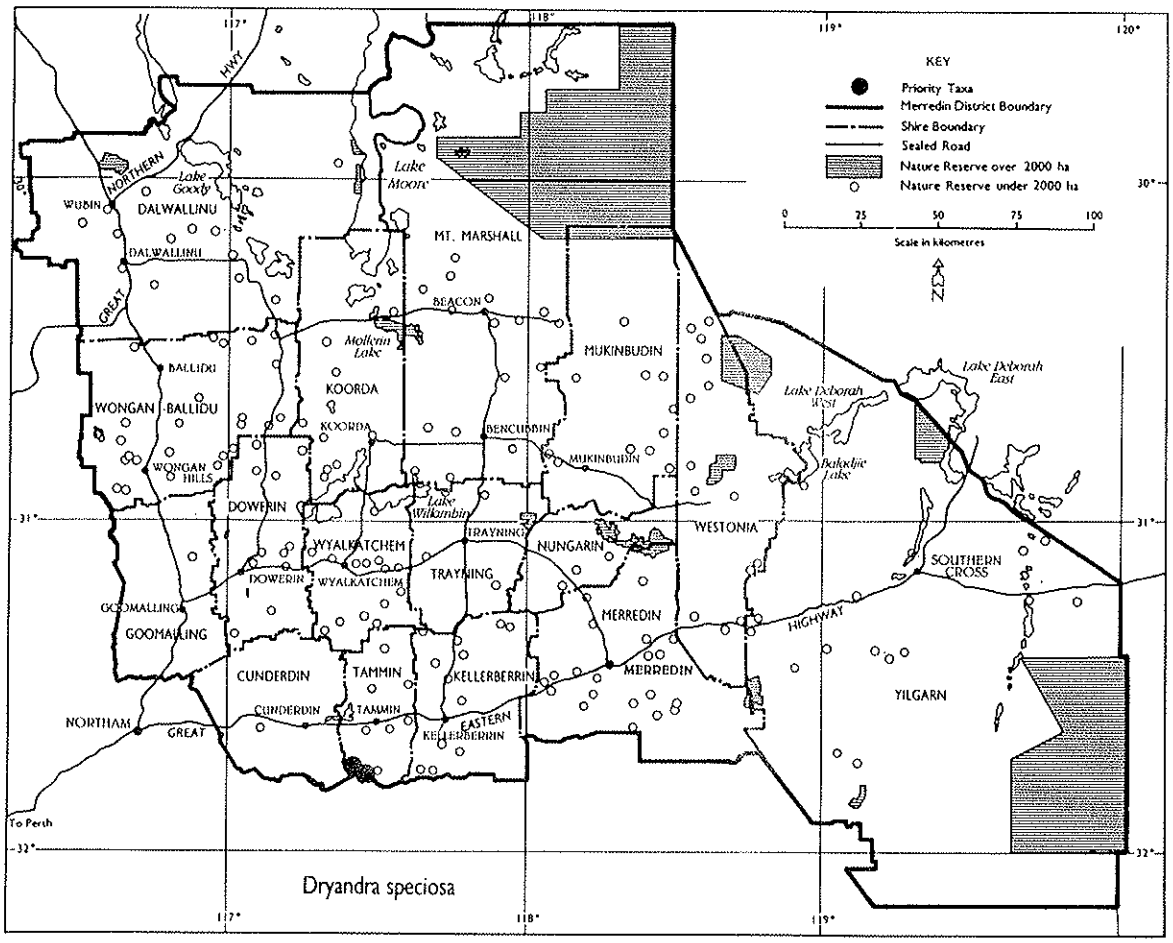
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Further survey is warranted. Priority Two status is recommended.

REFERENCES

Griffin (1985); Sainsbury (1985).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
Lake Goorly
WUBIN
DALWALLINU
DALWALLINU
GREAT
Lake Moore
MT. MARSHALL
BEACON
Mollerin Lake
MUKINBUDIN
BALLIDU
WONGAN-BALLIDU
KOORDA
KOORDA
BENCUBBIN
MUKINBUDIN
WONGAN HILLS
DOWERIN
Lake Wilkamble
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
DOWERIN
WYALKATCHEM
TRAYNING
GOOMALLING
GOOMALLING
MERREDIN
CUNDERDIN
TAMMIN
KELLERBERRIN
MERREDIN
CUNDERDIN
TAMMIN
EASTERN
KELLERBERRIN
NORTHAM
GREAT
To Perth
Lake Deborah West
Lake Deborah East
Bakadjie Lake
SOUTHERN CROSS
HIGHWAY
YILGARN
Dryandra speciosa

GREVILLEA ASPARAGOIDES Meissner **Family: Proteaceae**

TAXONOMY

G. asparagoides is related to *G. treueriana*, but has a longer pedicel and brown floral bracts.

DESCRIPTION

A divaricately branched or prostrate intricate shrub to 1.5 m tall. Leaves once, twice or three times divided into rigid divaricate pungent-pointed segments, very narrow-linear, double grooved underneath. 2.5-5 cm diameter. Flowering period August to September.

DISTRIBUTION AND HABITAT

G. asparagoides is found in sand or gravelly sand with shrubland vegetation, and has a distribution from Wubin to the Wongan Hills area.

CONSERVATION STATUS

Current Status: P3 Recommended Status: P1

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Moora	Moora	Bindi, Bindi	Road Res.	?	? Collected M. Warnock 22.8.90
2	Merredin	Wongan-Ballidu	Lake Hinds	Road Res.	?	? Collected P. Roberts 28.7.83
3	Merredin	Dalwallinu	Wubin-Paynes Find	Road Res.	?	? Collected McGillivray 16.6.76
4	Merredin	Dalwallinu	Wubin	?	Common	? Collected Maslin 7861 28.8.76

RESPONSE TO DISTURBANCE

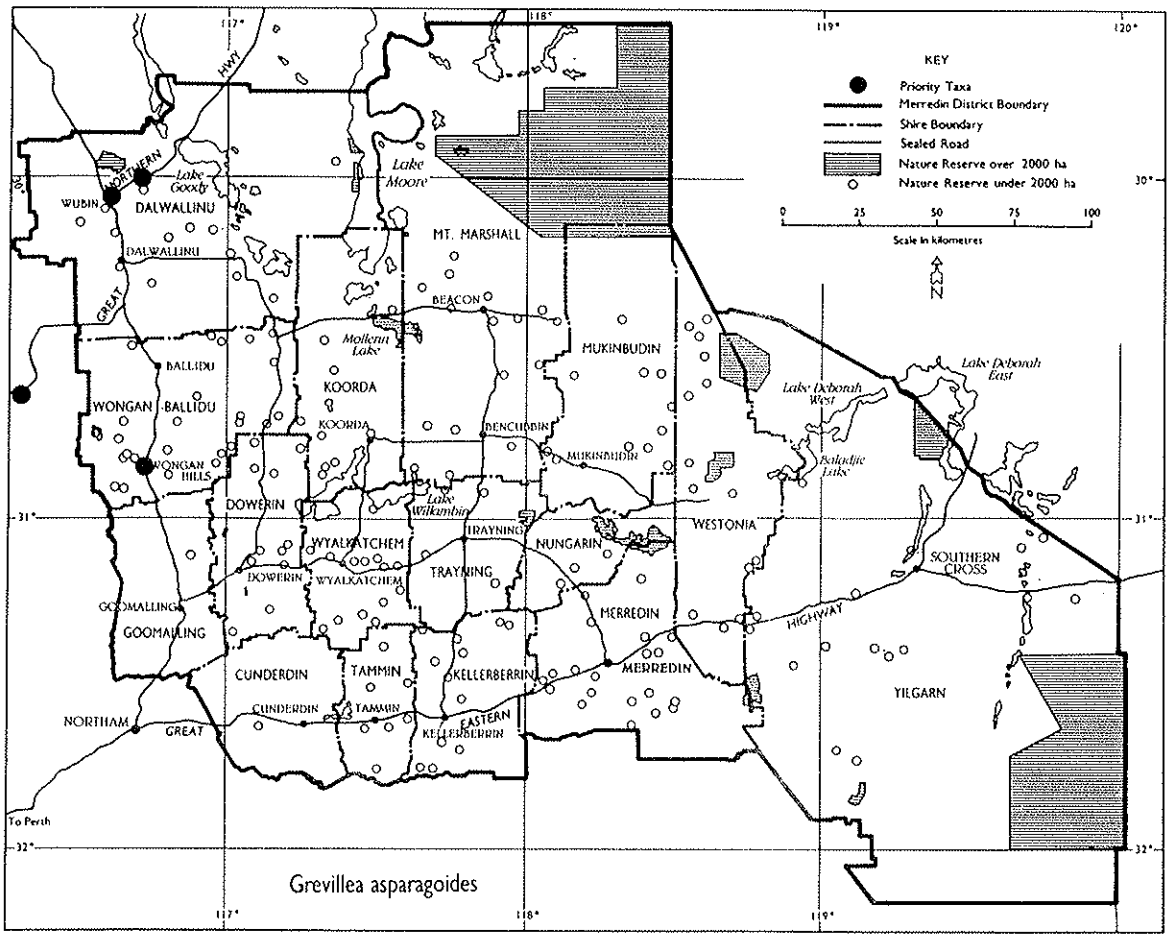
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Survey of the known locations is urgently required. Priority One status is recommended.

REFERENCE

Blackall and Grieve (1988).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
Lake Goody
WUBIN
DALWALLINU
Lake Moore
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN HILLS
DENCUBBIN
Lake Deborah West
Lake Deborah East
Bodallin Lake
DOWERIN
Lake Wilkinbin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
EASTERN
To Perth
Grevillea asparagoides

GREVILLEA ERECTILOBA F. Muell. **Family: Proteaceae**

TAXONOMY

This species is related to *G. involucrata*, but leaf segments are longer, and the colour is red not orange.

DESCRIPTION

Shrub to 2.2 m with finely hairy branchlets. Leaves simple, pinnatisect, erect, filiform, to 7 cm long, segments two-grooved below. Flowers glabrous outside, silky-hairy inside, large, red. Flowering period September.

DISTRIBUTION AND HABITAT

This species is recorded from three locations previously in the Merredin District and from three others. In two cases it is indicated to be common or abundant. *G. erectiiloba* occurs north of Mt Jackson near Bungalbin Hill and towards Bullfinch from Mt Jackson. It is found in sand or gravelly red loam with a tall shrubland vegetation cover.

CONSERVATION STATUS

Current Status: P3 Recommended Status: P3

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Kalgoorlie	Yilgarn	SW Mt Jackson	VCL	Abundant	? Collected McGillivray 4.7.76
2	Kalgoorlie	Yilgarn	Bungalbin	VCL	?	File record
3	Kalgoorlie	Yilgarn	Mt Jackson	VCL	?	File record

RESPONSE TO DISTURBANCE

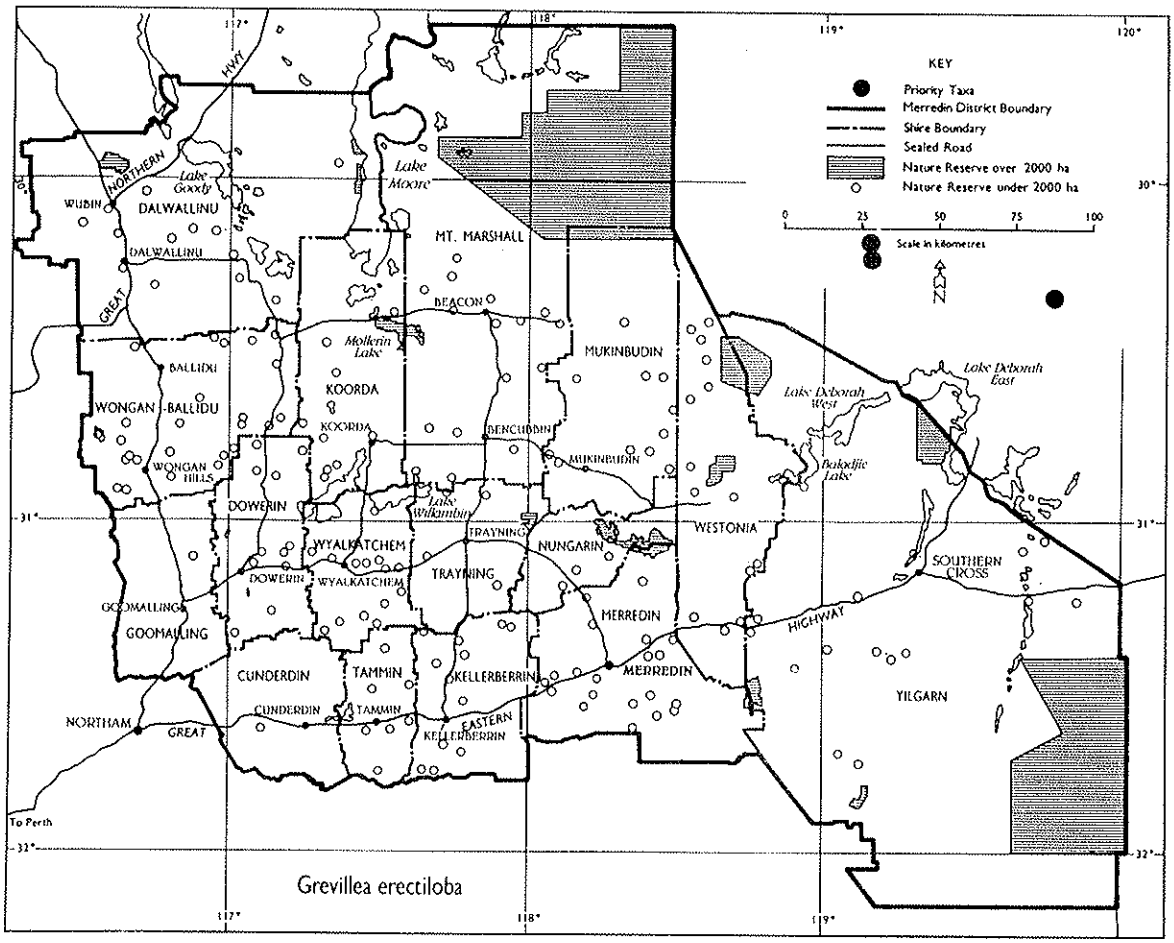
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Further survey required.

REFERENCE

Blackall and Grieve (1988).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
Lake Gooly
Lake Moore
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN HILLS
BENCUBBIN
Lake Deborah West
Lake Deborah East
Bokoljie Lake
DOWERIN
Lake Wilkamin
TRAYNING
WESTONIA
WYALKATCHEM
NUNGARIN
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
EASTERN
To Perth
Grevillea erectiloba

GREVILLEA ERIOBOTRYA F. Muell. **Family: Proteaceae**

TAXONOMY

A distinctive taxon easily recognised by its ascending linear leaves and white woolly flowers.

DESCRIPTION

Erect shrub to 4 m tall and across, branchlets pubescent. Leaves stiff, linear, 5-18 cm long, striate above, revolute below. Flowers white in cylindrical densely-woolly racemes, 6-12 x 2-3 cm. Flowering period September to October.

DISTRIBUTION AND HABITAT

Four populations can be traced to precise localities. Population 1 was largely depleted by land clearance in 1980 and left only as a road verge remnant. This species occurs scattered in shrubland vegetation on deep yellow sand, from Koorda to Mukinbudin and north to Beacon and Lake Moore. There are older records from north of Boorabbin and the Mt Churchman area.

CONSERVATION STATUS

Current Status: P3 Recommended Status: P2

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Mukinbudin	Lake Brown	Road Res.	?	? Collected J.D. Briggs 26.9.80
2	Merredin	Yilgarn	Yerbillon	?	?	? Collected R. Cranfield 25.10.83
3	Merredin	Trayning	Waddouring	?	?	? Collected McGillivray 17.6.76
4	Merredin	Koorda	Mollerin	Nature Res.	?	? Collected B. Muir 3.12.78

RESPONSE TO DISTURBANCE

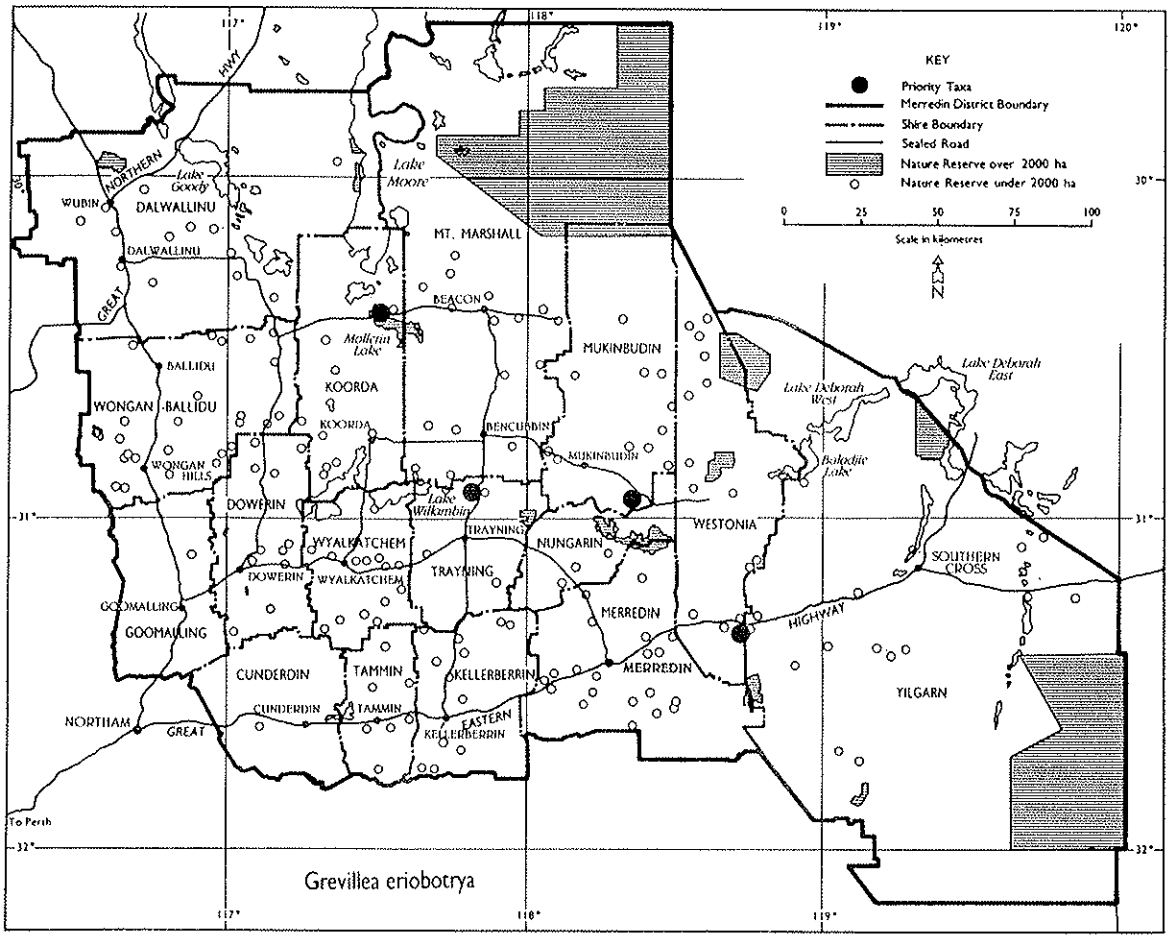
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

This species appears to be quite rare and urgently requires survey. Priority One status recommended.

REFERENCE

Leigh *et al.* (1984).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
GRID
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
Lake Goorly
Lake Moore
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
WONGAN
KOORDA
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Bodallin Lake
DOWERIN
Lake Wilkinbin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
EASTERN
To Perth
Grevillea eriobotrya

GREVILLEA GEORGEANA McGillivray **Family: Proteaceae**

TAXONOMY

G. georgeana is related to *G. wilsonii*, but the inflorescence is subcylindrical, the styles are shorter and less hairy and the fruit is smaller.

DESCRIPTION

An erect or widely spreading shrub up to 2.5 m tall by 4 m wide. Leaves grey-green, divided several times into linear lobes, length up to 70 cm, intricately entwined, margins revolute. The bright red-pink flowers erect, terminal, cylindrical racemes up to 10 cm long, on long, smooth stalks to 11 mm long. The perianth, smooth on the outside and hairy within, is about 17 mm long. The mostly smooth style is about 20 mm long. Flowering period August to October and January.

DISTRIBUTION AND HABITAT

This species is found in open scrub or tall shrubland vegetation on red loam, brown lateritic sandy clay or stoney brown clay loam. It is known from five populations from Mt Correll north to the Die Hardy Ranges.

CONSERVATION STATUS

Current Status: P3 Recommended Status: P1

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Conditiion
1	Merredin	Yilgarn	Mt Correll	Pastoral	12	Undisturbed 5.9.89
2	Kalgoorlie	Yilgarn	Mt Geraldine	Private	200+	Undisturbed 6.9.89
3	Kalgoorlie	Yilgarn	Die Hardy Ra	?	Common	? Collected McGillivray 4.7.76
4	Kalgoorlie	Yilgarn	Bungalbin	VCL	Common	? Collected DJP 554 2.1.89
5	Kalgoorlie	Coolgardie	Coorara Soak	VCL	Common	? Collected R. Cranfield 15.9.88

RESPONSE TO DISTURBANCE

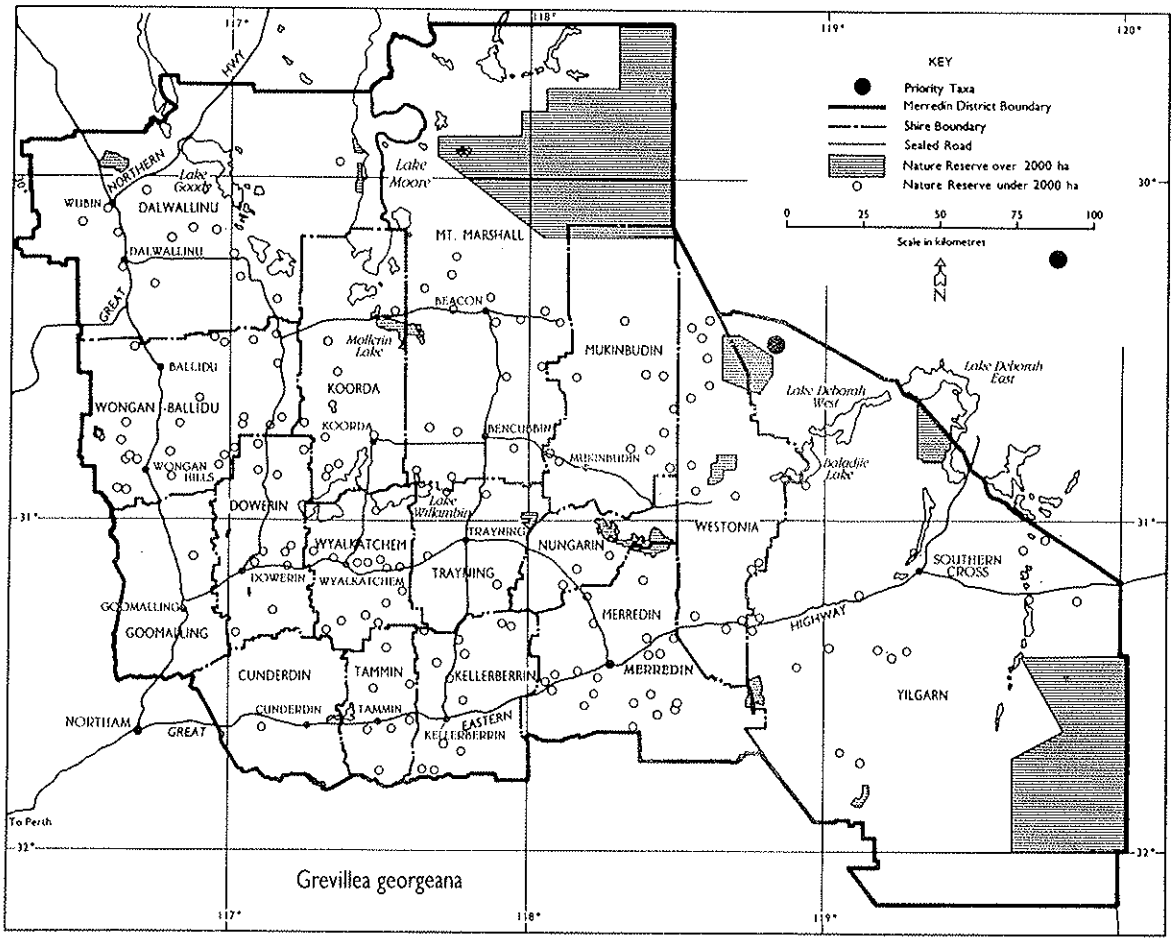
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

This species requires urgent further survey. Priority One status is warranted given that there are no populations on conservation reserves.

REFERENCES

McGillivray (1986); Wrigley and Fagg (1989).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Grevillea georgeana
MT. MARSHALL
MUKINBUDIN
BEACON
KOORDA
BENCUBBIN
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
MERREDIN
SOUTHERN CROSS
YILGARN
HIGHWAY
DALWALLINU
WUBIN
WONGAN-BALLIDU
WONGAN HILLS
GOOMALLING
CUNDERDIN
TAMMIN
KELLERBERRIN
NORTHAM
EASTERN
GREAT
NORTHERN
Lake Goody
Lake Moore
Mollerin Lake
Lake Deborah West
Lake Deborah East
Bodallin Lake
Lake Wilkinson
To Perth

LEUCOPOGON AMPLECTENS Ostenf. **Family: Epacridaceae**

TAXONOMY

L. amplectens has affinities with *L. cucullatus* and *L. sprengelioides*. It differs from both in the much broader leaves, and from the former in its smaller flowers. *L. amplectens* has no petiole and wraps around the branch although some plants may possess a petiolar rudiment.

DESCRIPTION

Erect shrub 30-60 cm tall with glabrous branches. Leaves suborbiculate and subacute, 4-6 mm long, without a petiole, wrapping around and attaching to stem by the leaf base. Flowers white, petals 1.5 mm long, bearded, style short. Flowering period June to September and April.

DISTRIBUTION AND HABITAT

There is only one recent collection from north of Kellerberrin in 1976, with a 1960 collection by Gardner from the same location (*C.A. Gardner* 12316). The type was collected at Tammin in 1914, and there is a 1922 collection from the same area. The only other collections are from Bungulla (*Gardner,* April 1943) and Kellerberrin (September 1897). *L. amplectens* is found in sand heath from Tammin to north of Kellerberrin.

CONSERVATION STATUS

Current Status: P3 Recommended Status: P2

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Kellerberrin	Durokoppin	Nature Res.	<100	?

RESPONSE TO DISTURBANCE

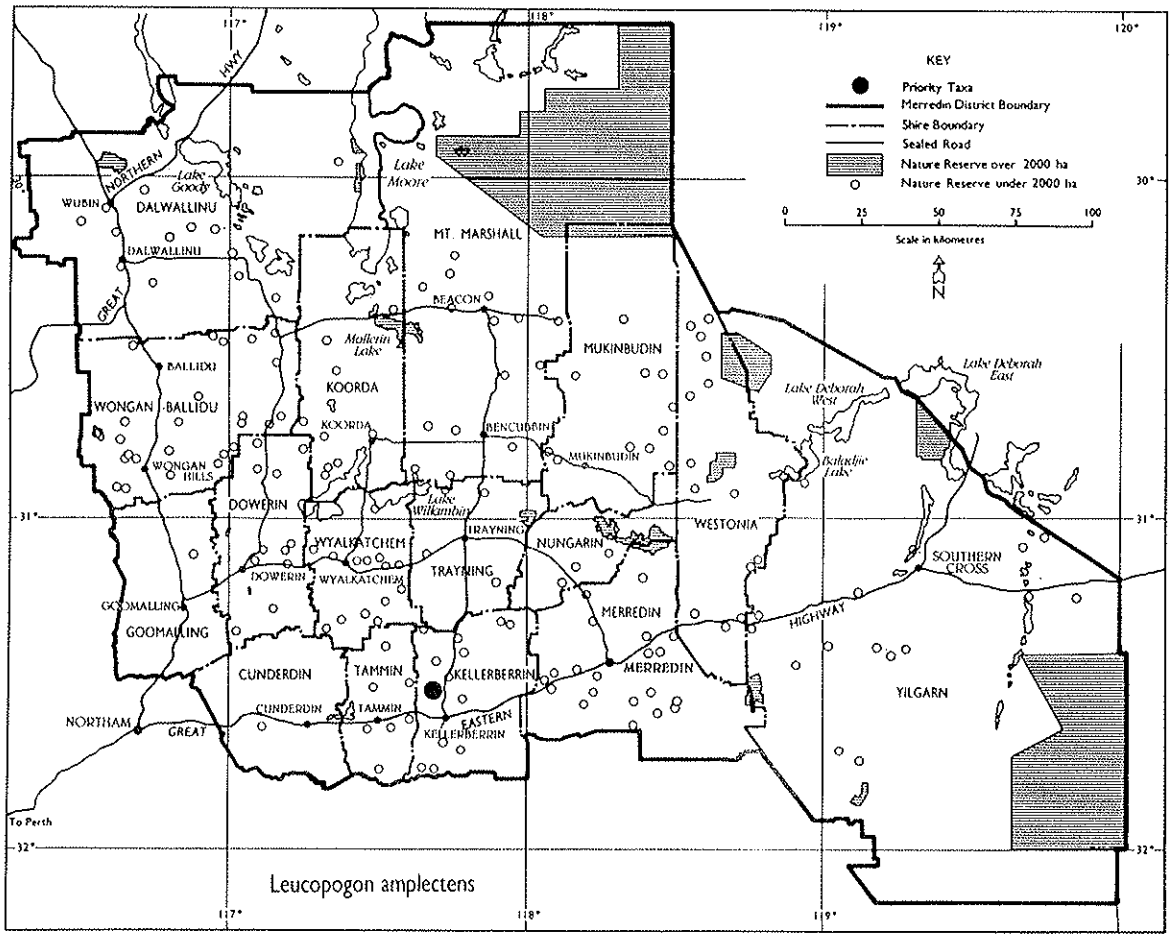
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

This taxon appears to be extremely rare and urgently requires further survey. Priority Two status is recommended and gazettal as Declared Rare Flora needs to be considered.

REFERENCES

Blackall and Grieve (1981); Atkins CSIRO (personal communication).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
Lake Goody
Lake Moore
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN-BALLIDU
BENCUBBIN
WONGAN HILLS
Lake Deborah East
Lake Deborah West
Bullaclie Lake
DOWERIN
Lake Wilkinbar
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
EASTERN
To Perth
Leucopogon amplectens

MELALEUCA SCLEROPHYLLA Diels. **Family: Myrtaceae**

TAXONOMY

This species is related to *M. nesophila*, but differs in having a white ciliate calyx-tube and lobes, thick, tuberculate leaves and the buds which are enclosed in large, deciduous bracts.

DESCRIPTION

Sometimes almost prostrate shrub 25 cm to 1 m tall, and 1 m across. Leaves alternate, tuberculate, oblanceolate, thick, leathery, 0.8 to 3 cm long, 0.2-0.5 cm wide, with 1 centred nerve. Flowers purple, terminal, anthers yellow. Flowering period June to September.

DISTRIBUTION AND HABITAT

This species is known from Wongan Hills north to Marchagee and east to Manmanning. Its habitat is recorded as sandy gravel or coarse sand with low closed heath patches among lichen covered granite.

CONSERVATION STATUS

Current Status: P3 Recommended Status: P1

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Moora	Moora	Miling-Pithara	?	?	? Collected R. Hnatiuk 24.7.80
2	Merredin	Dowerin	Manmanning	Private	?	? Collected B. & M. Smith

RESPONSE TO DISTURBANCE

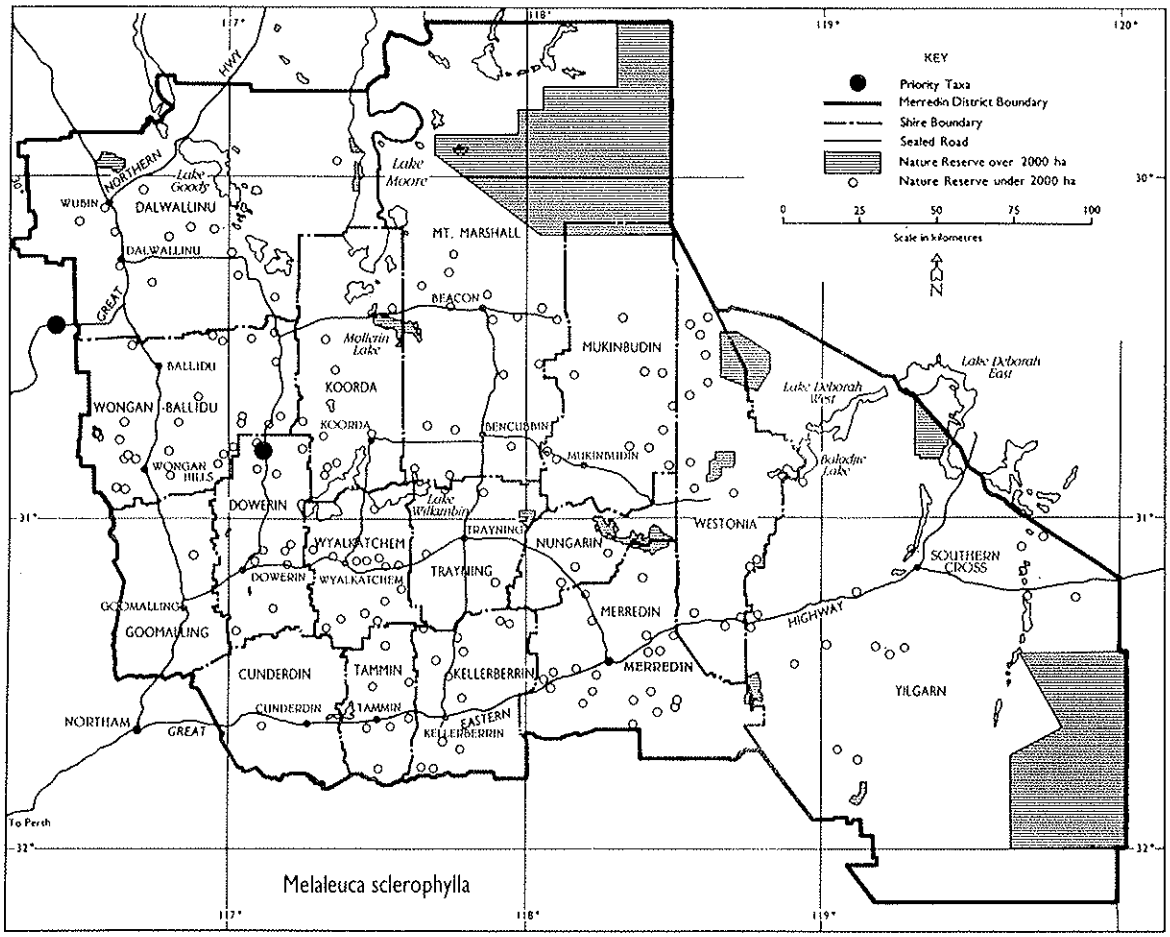
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

M. sclerophylla appears to be quite rare and high priority survey is warranted. Priority One status is recommended.

REFERENCES

Blackall and Grieve (1980); Holliday (1989).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
HWY
NORTHERN
Lake Goody
WUBIN
DALWALLINU
Lake Moore
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN-BALLIDU
BENCUBBIN
MUKINBUDIN
Lake Deborah West
Lake Deborah East
Bodallin Lake
WONGAN HILLS
DOWERIN
Lake Wilkamin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
YILGARN
NORTHAM
EASTERN
To Perth
Melaleuca sclerophylla

POMADERRIS INTANGENDA F. Muell. **Family: Rhamnaceae**

TAXONOMY

This taxon is quite distinct from any other *Pomaderris* species with its divaricate, spinescent branchlets and tubular flowers, which make it superficially similar to some species of *Cryptandra*.

DESCRIPTION

A spreading shrub to 90 cm high with spiny branches and extremely hairy branchlets. Leaves are alternate, small 1-2.5 cm long, obovate or oblong to wedge-shaped, the margins lobed or toothed near tip, hairless, pale-green beneath. Flowers are small, white, borne singly in the leaf axils on short peduncles. Individual flowers have 5 petals and broadly triangular calyx lobes 2 mm long which are soon shed. Fruit is large 3-(rarely 2-)chambered capsule to about 8 mm long. Flowering June to August, fruit recorded in October.

DISTRIBUTION AND HABITAT

P. intangenda has been recorded from small pockets of humus-rich soil on slopes of granite outcrops north of Westonia and Boorabbin and north-north-east of Esperance. Vegetation is tall shrubland or scrub.

CONSERVATION STATUS

Current Status: P3 Recommended Status: P3

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Westonia	Geeraning	Nature Res.	2	2 dead, 11.9.89
2	Merredin	Westonia	Walyahmoning	Nature Res.	2	Undisturbed 11.9.89
3	Merredin	Westonia	Yanneymooning	Nature Res.	12	One half dead, 11.9.89
4	Merredin	Westonia	Yanneymooning Nth	Private	4	Undisturbed 12.9.89
5	Kalgoorlie	Coolgardie	Mt Walter	VCL	2	Unknown, K.R. Newbey 8955
6	Esperance	Esperance	Mt Ridley	? VCL	? 2	? 1981 Collection K.R. Newbey
7	Kalgoorlie	Menzies	Donkey Rocks	VCL	Abundant	? CollecteD H. Pringle 8.6.89
8	Kalgoorlie	Menzies	Ularring	Pastoral	Frequent	? Collected R. Cranfield 16.6.88
9	Narrogin	Kondinin	Bates Cave	?	?	? Collected C. Searle 9.7.87

RESPONSE TO DISTURBANCE

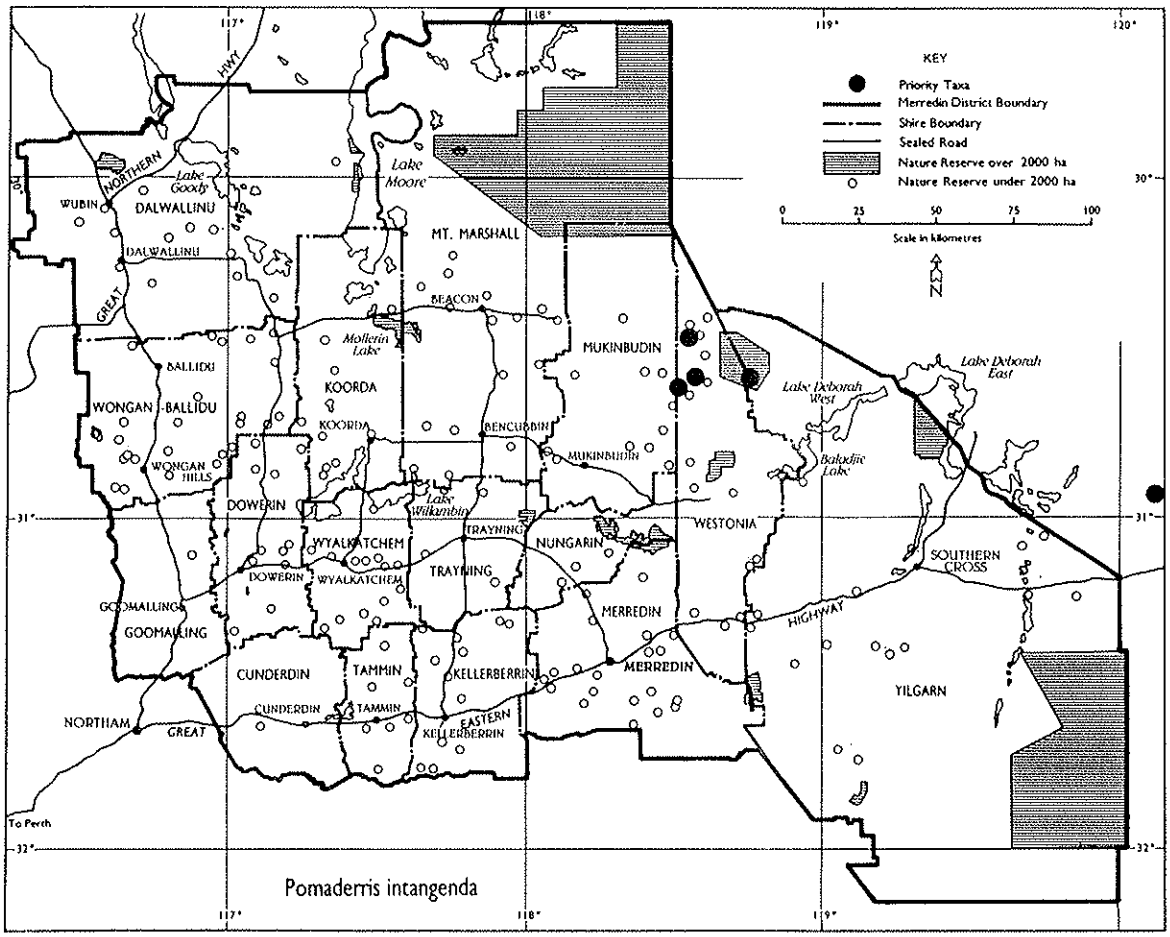
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

This species appears to be widespread but in low numbers. No further populations were located in the 1990 survey and although occurring on nature reserves most populations have very low numbers. It urgently requires further survey.

REFERENCE

Leigh *et al.* (1984).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
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HWY
NORTHERN
Lake Goorly
WUBIN
DALWALLINU
MT. MARSHALL
Lake Moore
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
WONGAN
KOORDA
BENCUBBIN
WONGAN HILLS
Lake Deborah West
Lake Deborah East
Baladjie Lake
DOWERIN
Lake Wilkinbin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
YILGARN
NORTHAM
To Perth
Pomaderris intangenda

PROSTANTHERA NANOPHYLLA B. Conn **Family: Lamiaceae**

TAXONOMY

The small leaves of this taxon, often clustered on short axes, readily distinguish it from other Western Australian species of *Prostanthera*.

DESCRIPTION

Shrub to 1 m tall. Leaves arranged along long axes or clustered, ovate, elliptic or narrow-oblong, 1.3-4.6 x 0.7-1.4 mm, apex obtuse. Flowers mauve, blue to white, tube 7.4-10.1 mm long, 4-5 mm across mouth, lobed; calyx tube to 2.3 mm; flowers in groups of 6-10. Flowering period October to November.

DISTRIBUTION AND HABITAT

The two most recent collections of this species are given below. *P. nanophylla* is found on sand or yellow sand over laterite in scrub or heath vegetation. It occurs from Cadoux to east of Southern Cross and to south-east of Marvel Loch.

CONSERVATION STATUS

Current Status: P3 Recommended Status: P1

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Koorda	Rabbit	Road Res.	?	? Collected B. Conn 18.9.85
2	Merredin	Yilgarn	Mt Day	Road Res./VCL	?	? Collected B. Smith 6.11.84

RESPONSE TO DISTURBANCE

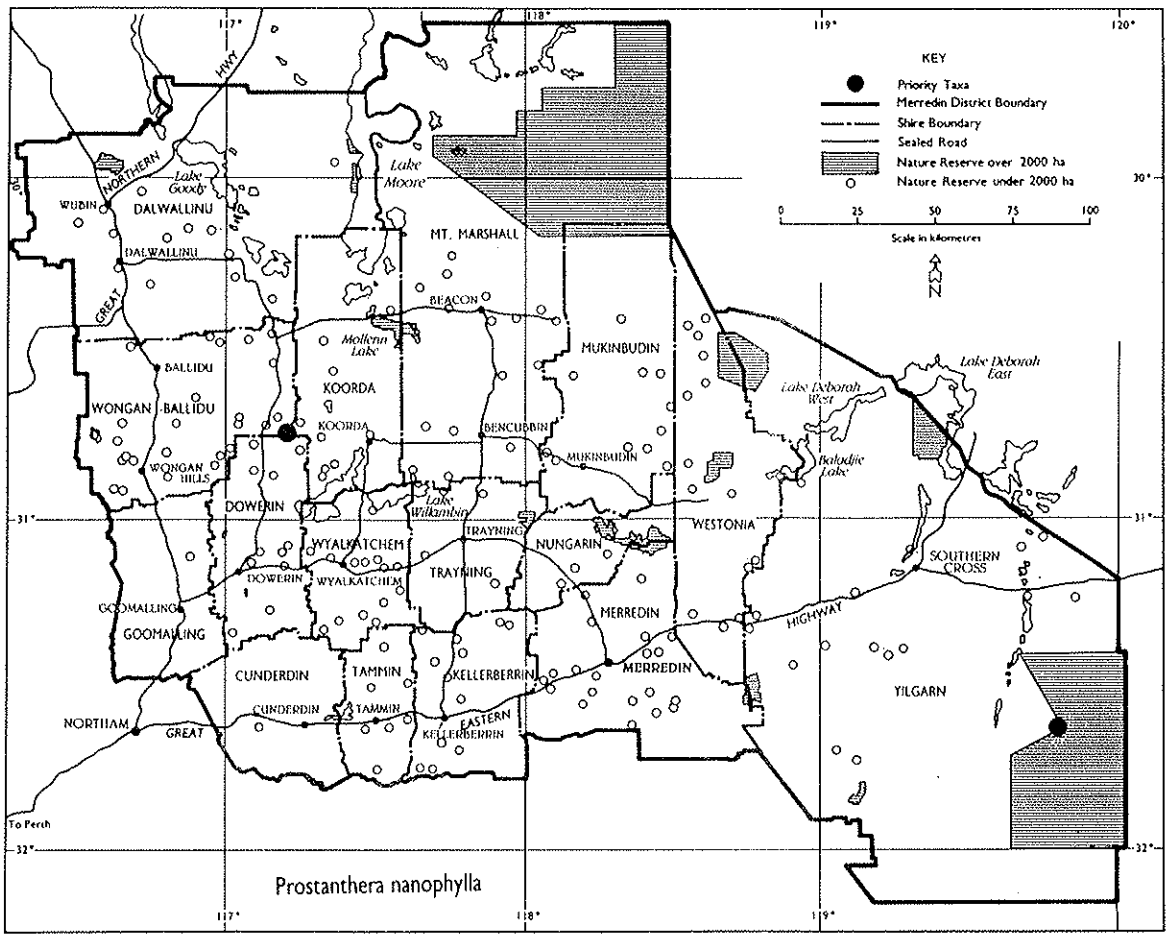
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

This is urgently in need of further survey and Priority One status is recommended.

REFERENCE

Conn (1988).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Priority Taxa
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Shire Boundary
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Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
Lake Goodenough
Lake Moore
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN
WONGAN HILLS
BENCUBBIN
Lake Deborah East
Lake Deborah West
Balodjie Lake
DOWERIN
Lake Wilkinson
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
YILGARN
NORTHAM
To Perth
Prostanthera nanophylla

RINZIA CRASSIFOLIA Turcz. **Family: Myrtaceae**

TAXONOMY

Related to *Rinzia fumana*, *R. crassifolia* has shorter and thicker, ovate to oblong leaves. It is quite variable in habit from prostrate to erect.

DESCRIPTION

Prostrate or spreading shrub to 20 cm tall and 40 cm across. Leaves linear to narrow-oblong, obtuse, 2-9.5 x 0.5-1.5 mm. Flowers 1-6, axillary. Petals white or pink, 7.5-11.0 mm diameter.

DISTRIBUTION AND HABITAT

R. crassifolia occurs in heath, thicket and woodland on sand or clay over laterite or chert. It is recorded from Watheroo to near Perth and east of Meckering. The two most recent records are from near York and Kalamunda. The Merredin District occurrence may relate to an 1890 collection from Youndegin by A. Eaton.

CONSERVATION STATUS

Current Status: P3 Recommended Status: P1

KNOWN POPULATIONS (Merredin District only)

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Cunderdin	Meckering	?	?	?

RESPONSE TO DISTURBANCE

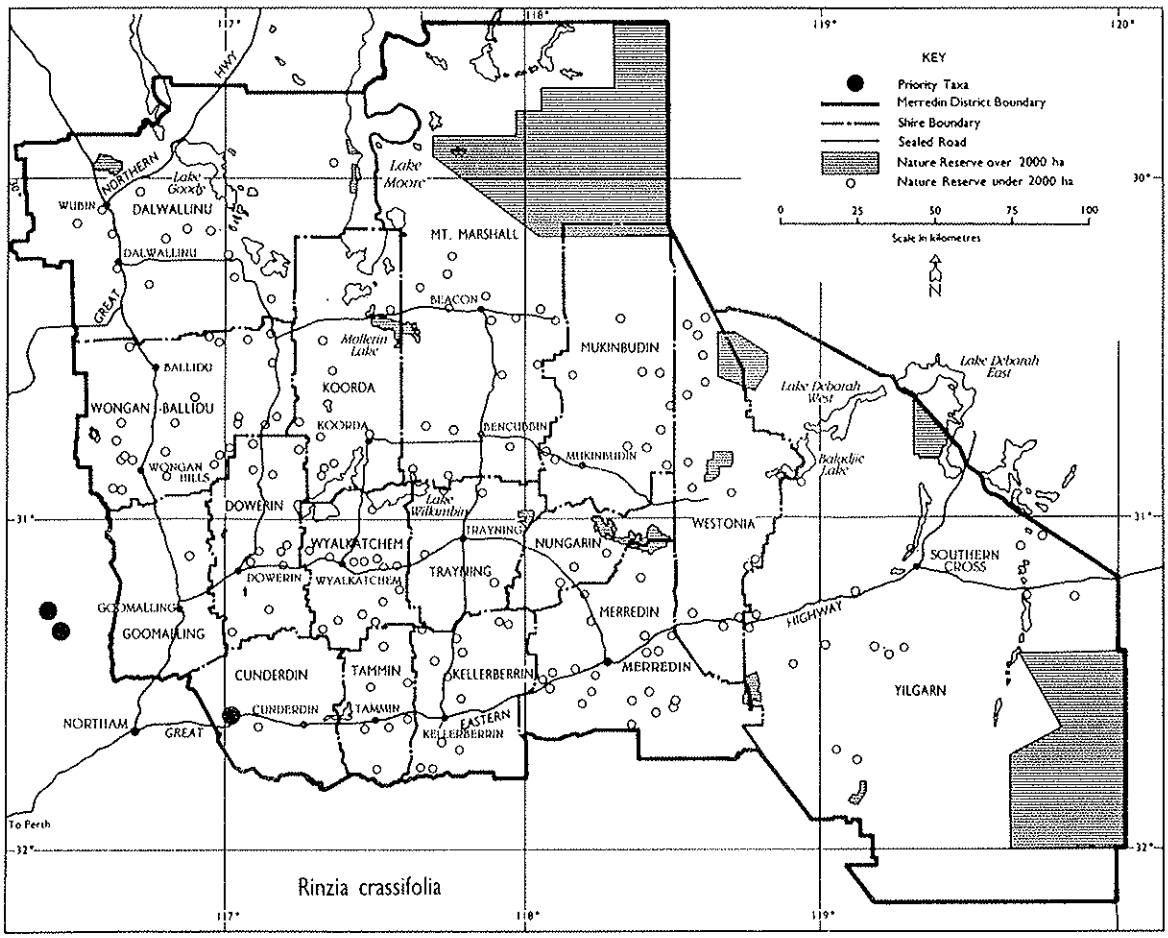
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

This species appears to be rare and urgently requires further survey. Priority One status is recommended.

REFERENCE

Trudgen (1986).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
HWY
NORTHERN
Lake Goods
DALWALLINU
WUBIN
DALWALLINU
GREAT
Lake Moore
MT. MARSHALL
BEACON
Mallerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN-BALLIDU
KOORDA
BENCUBBIN
MUKINBUDIN
WONGAN HILLS
DOWERIN
Lake Wilkunbin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
DOWERIN
WYALKATCHEM
TRAYNING
GOOMALLING
GOOMALLING
MERREDIN
CUNDERDIN
TAMMIN
KELLERBERRIN
MERREDIN
CUNDERDIN
TAMMIN
EASTERN
KELLERBERRIN
NORTHAM
GREAT
To Perth
Lake Deborah East
Lake Deborah West
Baladjie Lake
SOUTHERN CROSS
HIGHWAY
YILGARN
Rinzia crassifolia

SCHOLTZIA EATONIANA (Ewart & J. White) C. Gardner **Family: Myrtaceae**

TAXONOMY

S. eatoniana is related to *S. teretifolia* but differs in the leaves, and the transparent glabrous calyx lobes.

DESCRIPTION

Small, much-branched, prostrate shrub 10-15 cm tall. Leaves glandular, cylindrical, sessile, obtuse, decussate, 2 mm long. Flowers solitary, with 2 bracteoles. Petals 5, free, orbicular, shortly stalked, white, *ca* 2 mm long. Flowering period November.

DISTRIBUTION AND HABITAT

S. eatoniana is known from a 1920 record in the Merredin District at Cunderdin. Its habitat is not given but is probably sand with heath vegetation. There is one other record from Badjalling in the Narrogin District.

CONSERVATION STATUS

Current Status: P3 Recommended Status: P1

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Cunderdin	Cunderdin	?	?	? Collected 1920.
2	Narrogin	Quairading	Badjalling	Road Res.	?	? Collected J. Seabrook 11.12.79

RESPONSE TO DISTURBANCE

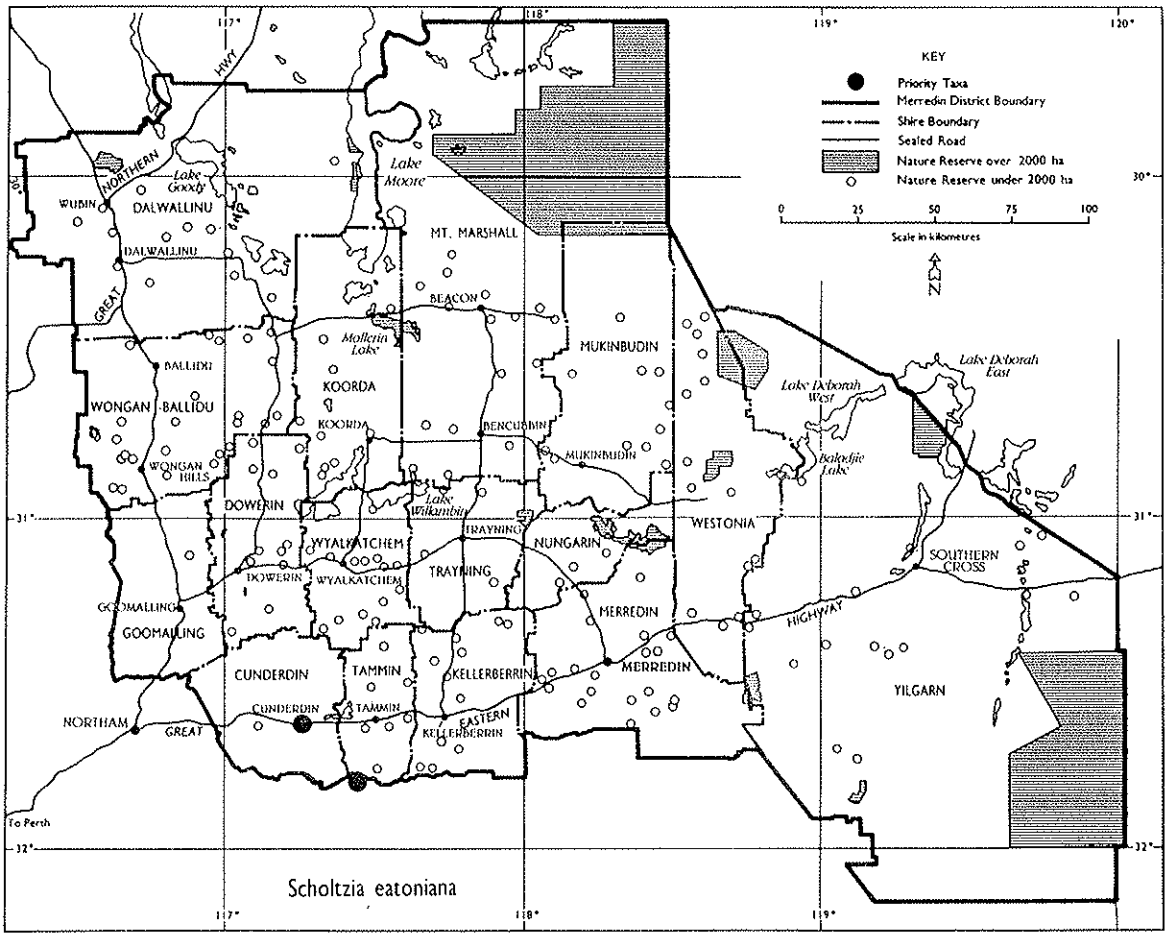
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

This species urgently requires survey and Priority One status is recommended.

REFERENCE

Blackall and Grieve (1980).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
117°
118°
119°
120°
30°
31°
32°
HWY
NORTHERN
Lake Goorly
WUBIN
DALWALLINU
Lake Moore
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN
WONGAN HILLS
BENCUBBIN
Lake Deborah West
Lake Deborah East
Baladjie Lake
DOWERIN
Lake Wilkambin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
YILGARN
NORTHAM
To Perth
Scholtzia eatoniana

TRIGLOCHIN STOWARDII N.E. Brown **Family: Juncaginaceae**

Stoward's Arrowgrass

TAXONOMY

T. stowardii has affinities with *T. calcitrapa*, but its fruits are pedicellate, smaller and more linear.

DESCRIPTION

Annual herb 10-14 cm tall, glabrous. Leaves terete-filiform, 3-5 cm long and 0.5 mm wide, peduncle to 12 cm. Flowers 6-segmented, ovate-lanceolate, acute, concave. Flowering period September.

DISTRIBUTION AND HABITAT

This species is known from north of Moora to Mollerin and south to Highbury. It is found on sand, clay or salt that is associated with a quartz hill or wet and weedy situations.

CONSERVATION STATUS

Current Status: P3 Recommended Status: P2

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Moora	Moora	Moora	Road Res.	?	? Collected E Scrymgeour 29.9.66
2	Merredin	Koora	Mollerin	? Nature Res.	?	? Collected P. Wilson 2.9.67
3	Narrogin	Highbury	Arthur River	Flats ? Nature Res.	?	? Collected A. George 29.9.71

RESPONSE TO DISTURBANCE

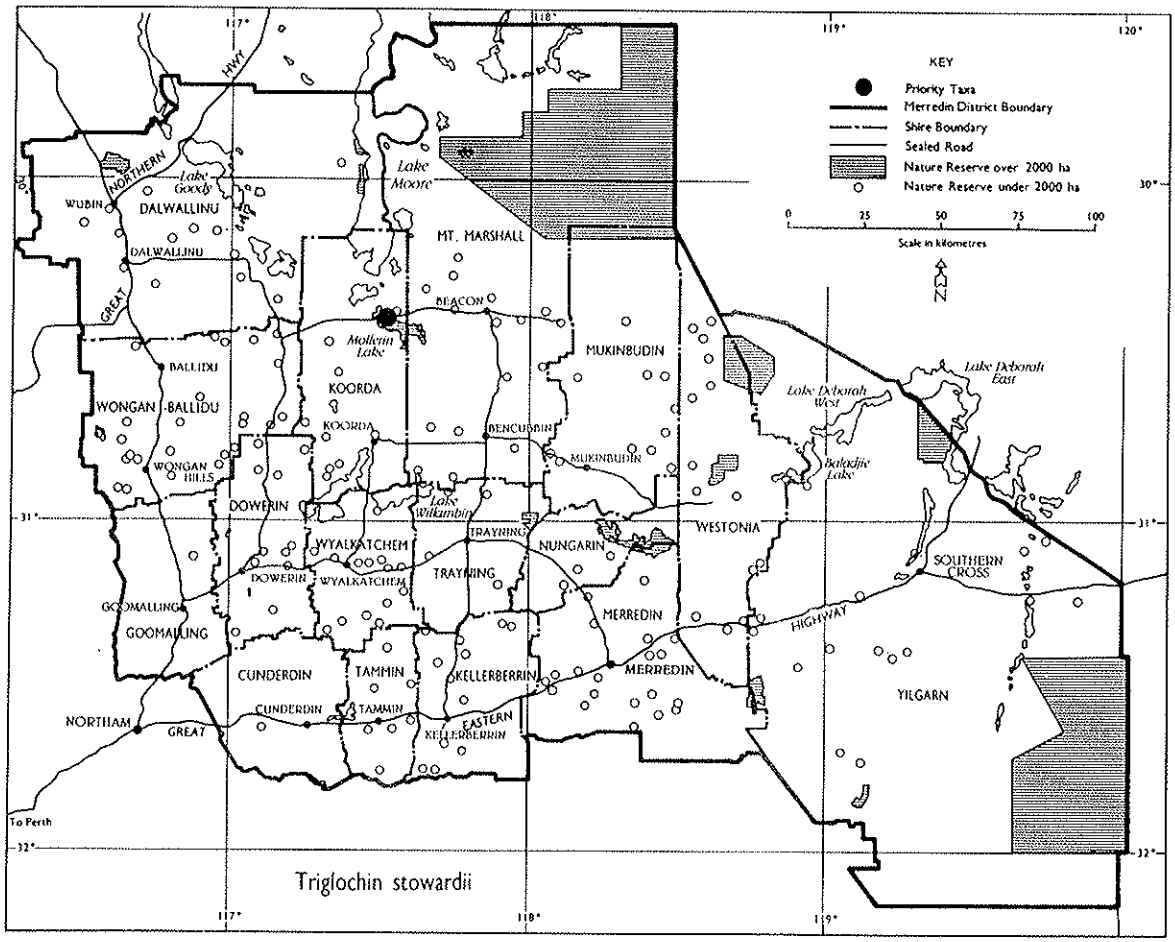
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

This species urgently requires survey and Priority Two status is recommended.

REFERENCES

Brown (1914); Blackwall and Grieve (1974).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
NORTHERN
HWY
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DALWALLINU
MT. MARSHALL
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN
WONGAN HILLS
BENCUBBIN
Lake Deborah West
Lake Deborah East
Baladjie Lake
DOWERIN
Lake Wilkamin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
YILGARN
NORTHAM
To Perth
Triglochin stowardii

VERTICORDIA HALOPHILA A.S. George **Family: Myrtaceae**

TAXONOMY

The saline lake margin habitat of this species is apparently unique to *Verticordia,* hence the species name *halophila* (salt-loving).

DESCRIPTION

Shrub to 50 cm tall and across, much-branched. Leaves decussate, crowded towards ends of branches, semiterete, 1.5-2 mm long, apex acute. Flowers mauve-pink in colour. *V. halophila* flowers late in the year and occurs in a relatively extreme environment. Flowering period October to November.

DISTRIBUTION AND HABITAT

This taxon occurs on sandy clay saline lake margins in the Coorow-Latham area, and in the Lake Deborah system north of Southern Cross. In the Lake Deborah system it seems to occur frequently on the east margins of lakes, which may be the lee shore to which gypsum is blown during dry windy phases of saline lake development. It is also thought to occur in at least two other areas in addition to those indicated below. Dwarf scrub vegetation predominates.

CONSERVATION STATUS

Current Status: P3 Recommended Status: Deletion

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Moora	Perenjori	Coorow-Latham	? Private	?	? Collected 10.10.87; 5/7.11.85
2	Kalgoorlie	Yilgarn	Lake Deborah System	VCL	10 000+	Est. Healthy 15.11.90

RESPONSE TO DISTURBANCE

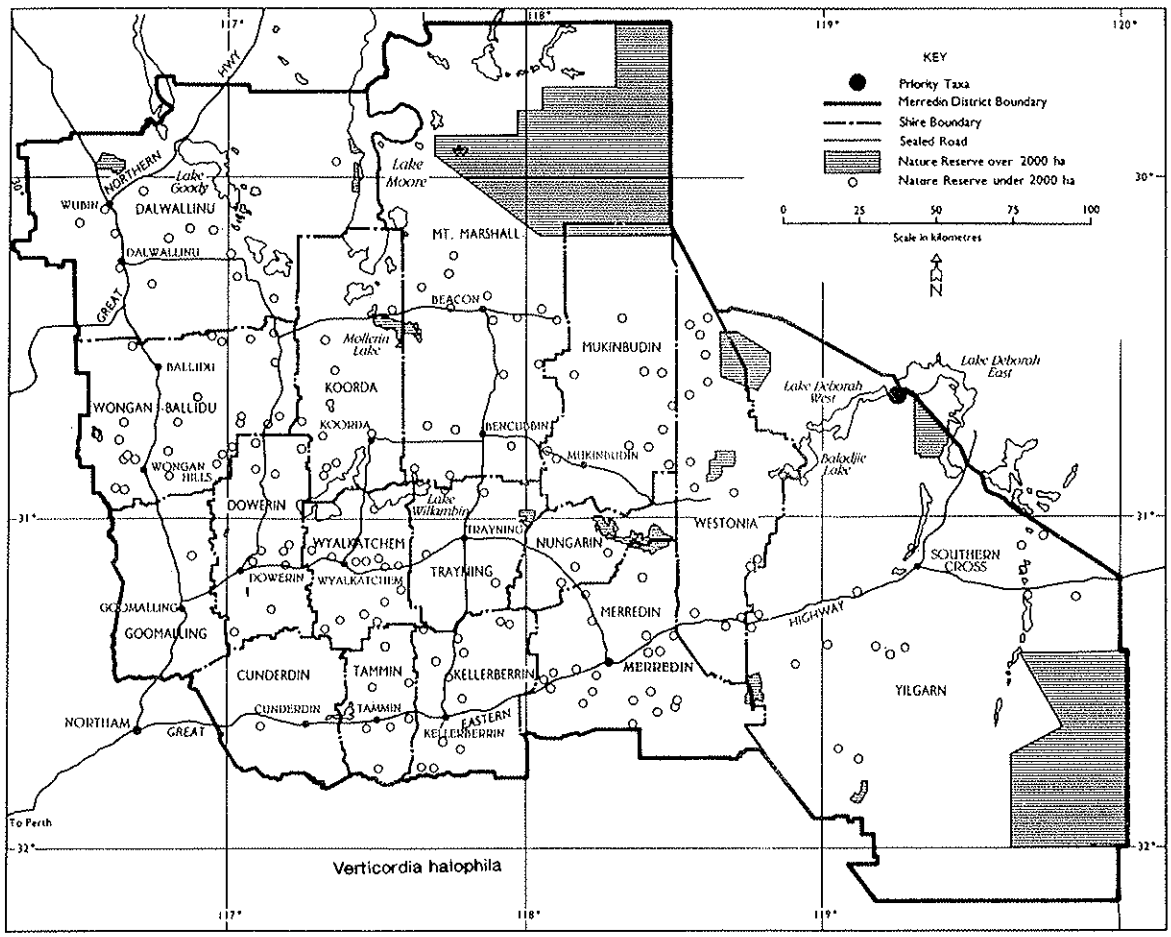
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Indications are that the species is quite widespread, so it may occur in other systems of lakes, such as the Barker Lake area and the Lake Hope-Johnson system. Further survey to confirm this wider distribution is, however, a low priority. *V. halophila* appears to be poorly collected rather than rare and its deletion from the priority list is recommended.

REFERENCE

George (1991).


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Verticordia halophila
117°
118°
119°
120°
30°
31°
32°
PERTH
NORTHERN
Lake Goody
WUBIN
DALWALLINU
MT. MARSHALL
Lake Moore
BEACON
GREAT
Mollerin Lake
MUKINBUDIN
BALLIDU
KOORDA
WONGAN
WONGAN HILLS
BENCUBBIN
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Lake Deborah West
Baladjie Lake
DOWERIN
Lake Wilkamin
TRAYNING
NUNGARIN
WESTONIA
WYALKATCHEM
SOUTHERN CROSS
GOOMALLING
MERREDIN
HIGHWAY
CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
YILGARN
NORTHAM
To Perth

VERTICORDIA MITODES A.S. George **Family: Myrtaceae**

TAXONOMY

Some plants of this species exhibit leaf variation in size and arrangement on the stem.

DESCRIPTION

Shrub to 50 cm with one to several stems, much-branched. Leaves broadly elliptic-ovate, thick, flat to concave, shortly ciliate, 1-2 mm long. Flowers spreading in spike-like groups. Petals 4-5 mm long, pink. Flowering period November to December.

DISTRIBUTION AND HABITAT

There are six records of this species, three with vague location details. It occurs in the area between Nungarin, Bungalbin Hill, Parker Range and Narembeen on yellow sand in shrubland vegetation.

CONSERVATION STATUS

Current Status: P3 Recommended Status: P3

KNOWN POPULATIONS

Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Westonia	Chiddarcooping	Nature Res.	?	? Collected J. Seabrook 6.11.84
2	Kalgoorlie	Yilgarn	Cockatoo Tank	Water Res.	?	? Collected M. Smith 24.11.81
3	Merredin	Yilgarn	Ghooli	Road Res.	?	? Collected K. Newbey 22.10.85

RESPONSE TO DISTURBANCE

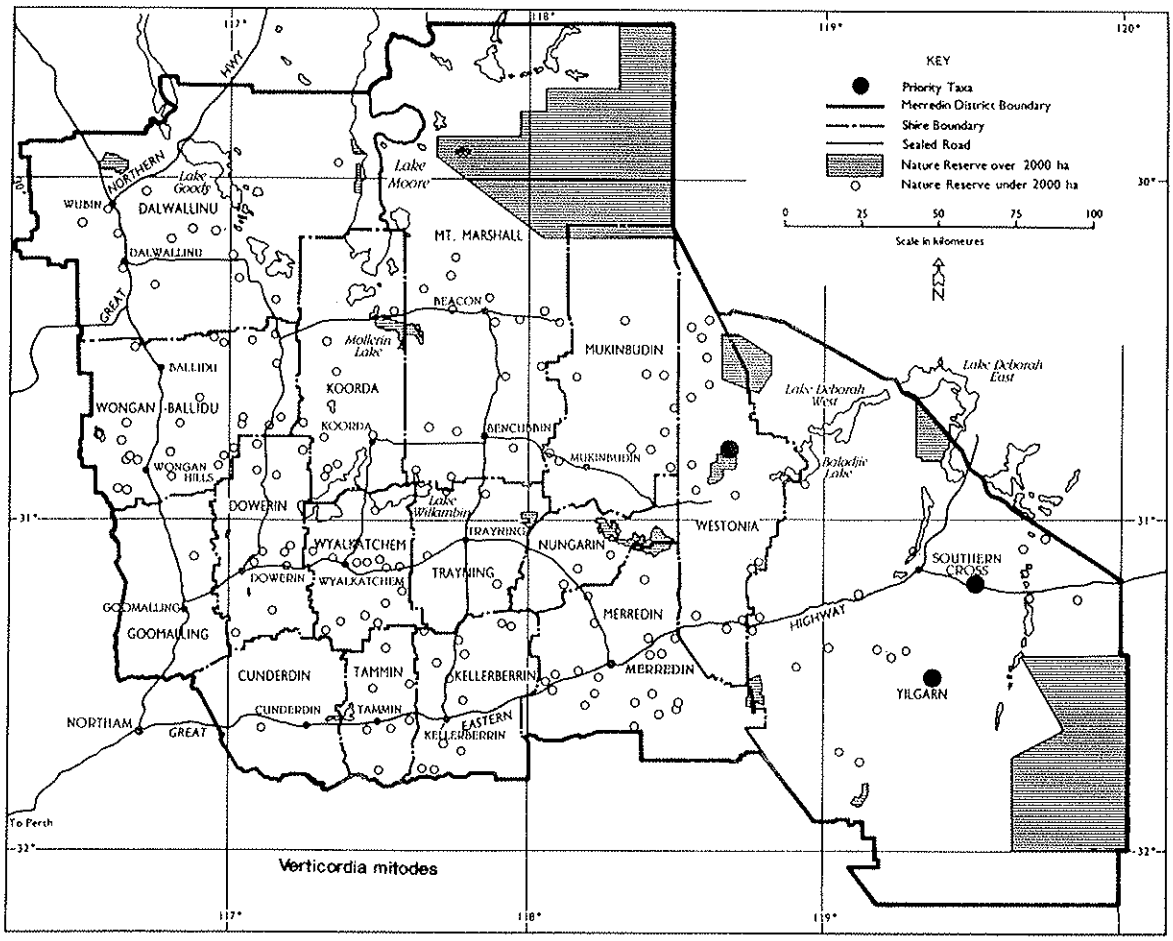
Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

This species requires further survey.

REFERENCE

George (1991).


KEY
Priority Taxa
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Shire Boundary
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Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Verticordia mitodes
WUBIN
DALWALLINU
MT. MARSHALL
BEACON
MUKINBUDIN
KOORDA
BENCUBBIN
WONGAN HILLS
DOWERIN
WYALKATCHEM
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CUNDERDIN
TAMMIN
KELLERBERRIN
EASTERN
NORTHAM
YILGARN
WONGAN-BALLIDU
BALLIDU
Lake Moore
Lake Goods
Lake Deborah East
Lake Deborah West
Bolodjie Lake
Lake Wilkamber
Mollerin Lake
NORTHERN
GREAT
HIGHWAY
To Perth

VERTICORDIA STENOPETALA Diels. **Family: Myrtaceae**

TAXONOMY

Has similarities to *V. helichrysantha*, but differs in the shorter style and the flower colour.

DESCRIPTION

Shrub to 50 cm, with one basal much-branched, spreading stem. Leaves linear-clavate, obtuse, semiterete, 3-5 mm long. Flowers erect to spreading in rounded or corymb-like groups. Petals 3-3.5 mm long, ovate, deep pink. Flowering October to December.

DISTRIBUTION AND HABITAT

V. stenopetala occurs between Southern Cross, Queen Victoria Rock and Mt Holland. It grows on sandy loam, in tall open shrubland.

CONSERVATION STATUS

Current Status: P3 Recommended Status: P3

KNOWN POPULATIONS

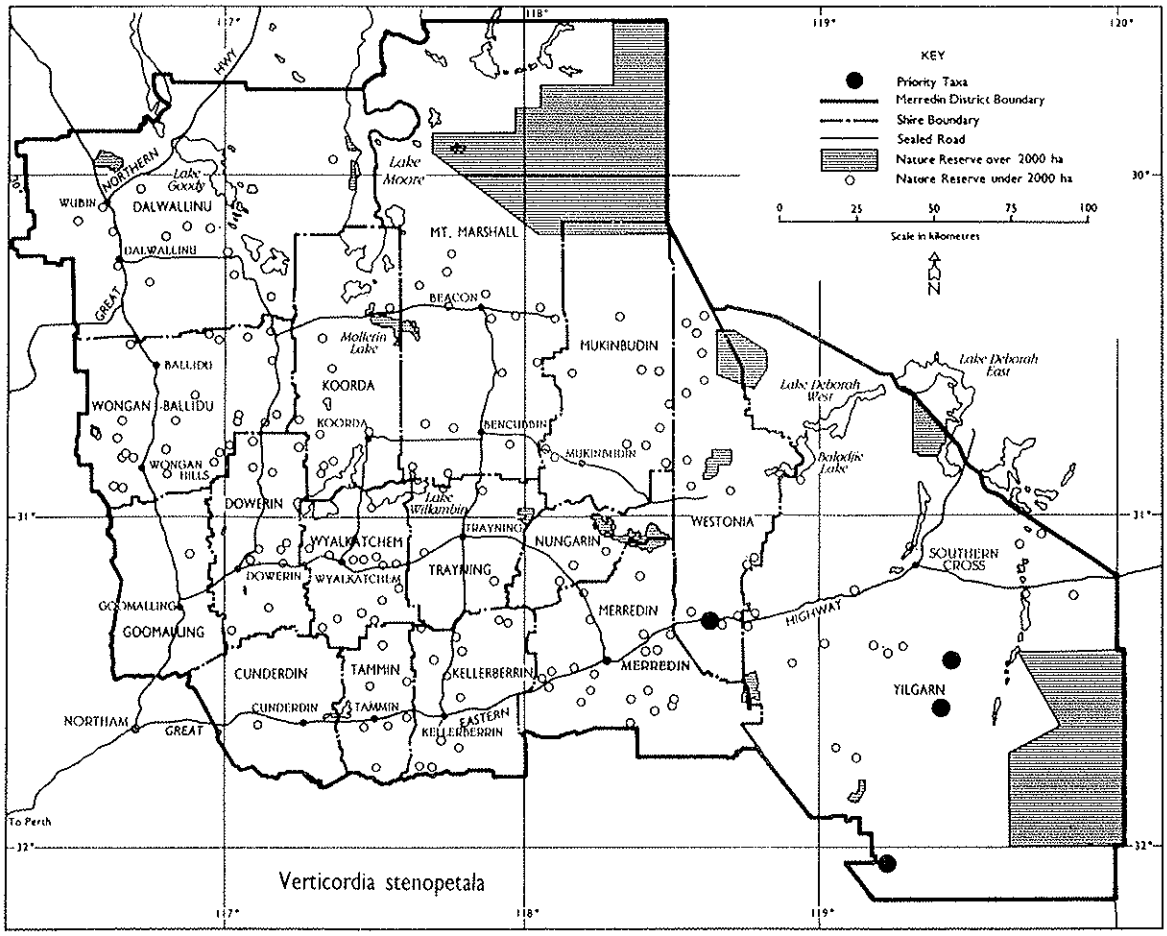
Pop. No.	District	Shire	Population	Land Status	No. of Plants	Condition
1	Merredin	Yilgarn	Hyden Rd	Road Res.	?	? Collected B. Smith 14.11.86
2	Merredin	Westonia	Carrabin	Road Res.	?	? Collected R. Royce 30.10.72
3	Kalgoorlie	Coolgardie	Queen Victoria Rock	VCL	?	? Collected K. Newbey 1.11.79
4	Merredin	Yilgarn	Marvel Loch	VCL	?	? Collected D. Bell 13.1.82
5	Merredin	Yilgarn	Hyden Rd	VCL	?	? Collected M. Smith 3.11.81

RESPONSE TO DISTURBANCE

Response to soil disturbance, fire, weed invasion, grazing and canopy cover is unknown.

RECOMMENDATIONS

Further survey needed.


KEY
Priority Taxa
Merredin District Boundary
Shire Boundary
Sealed Road
Nature Reserve over 2000 ha
Nature Reserve under 2000 ha
0 25 50 75 100
Scale in kilometres
N
Verticordia stenopetala
DALWALLINU
WUBIN
MT. MARSHALL
BEACON
MUKINBUDIN
KOORDA
BENCUBBIN
WONGAN HILLS
BALLIDU
DOWERIN
WYALKATCHEM
TRAYNING
NUNGARIN
WESTONIA
GOOMALLING
CUNDERDIN
TAMMIN
KELLERBERRIN
MERREDIN
SOUTHERN CROSS
YILGARN
NORTHAM
To Perth
Lake Moore
Lake Goody
Lake Deborah East
Lake Deborah West
Baladjie Lake
Lake Wilkinbin
Mollerin Lake
HIGHWAY
GREAT
NORTHERN
EASTERN

PART SIX: THE PLAN FOR MANAGEMENT

1. Determining Priorities

This Chapter assesses the conservation status of each species of DRF (threatened flora) within the Merredin District and makes recommendations for protection, research and management. On the basis of these recommendations, each species was ranked on a scale of 1 to 3 under 19 categories (Table 1) recognised as potential threats or management requirements. Species with a low degree of threat or urgency for management and research action were given a score of 1. Those with a high degree of threat were allocated a score of 3. Species neither threatened nor in need of action were marked with a dash. The scores were summed for each of the 33 species and for each threat/requirement category. Table 1 summarizes the perceived threats, and management and research requirements for each species of DRF in the Merredin District.

Table 2 lists the 33 species of DRF in priority order according to the urgency of their requirement for management action. Species with a high ranking score are most threatened and/or most in need of action. It is intended that all requirements for each species, as outlined in the previous species treatments, will be implemented. Work will be conducted, programmed or deferred according to priority, available funds and existing resources and workloads. Attention is directed to Table 2 to determine with which species action should commence. This will enable resources and staff within the Merredin District to be allocated where they are most urgently required.

Species most in need of attention for a particular management or research requirement can be determined from Table 1 and ranking the categories illustrates which are the most critical threats/management requirements in the District.

2. Management and Research Actions

2.1 Mapping and re-survey of known populations

For most populations early records and location plans have been very poor, with many only known from herbarium specimens or vague locations (e.g. north of Cunderdin). Although Rare Flora Report Forms and detailed site plans are available for many populations there are a number which still require this base-line survey information.

After initial detailed assessment each population in the District should be re-surveyed at least once every five years to observe fluctuations in population numbers and to monitor changes. The following species are in need of mapping and re-survey of known populations:

Caladenia cristata
Daviesia 'oxylobium'
Drakonorchis 'drakeoides'
Eucalyptus crucis subsp. *crucis*
Hakea aculeata

2.2 Location of other populations

Further survey in suitable habitat in the wild is a requirement for all of the DRF in the Merredin District. Most species, apart from *Tetratheca aphylla*, *T. harperi* and *T. 'paynterae'*, and to a lesser extent *Acacia merrickiae, Boronia adamsiana* and *Prostanthera magnifica,* are in need of urgent attention, either because of the small number or size of known populations, or their poor representation in conservation reserves. Species that are most urgently in need of intensive field surveys are:

Daviesia euphorbioides
Eremophila caerulea subsp. *'merrallii'*
Eremophila viscida
Gastrolobium callistachys
Hakea aculeata
Myriophyllum petraeum
Pityrodia scabra
Roycea pycnophylloides

Table 1. MERREDIN DISTRICT DECLARED RARE FLORA SCORED (1-3) ACCORDING TO THE DEGREE OF THREAT OR URGENCY FOR MANAGEMENT AND RESEARCH ACTION

	Mapping & re-survey of known populations	Location of other populations	Liaison with landowners	Research	Fire management	Small population size/ vulnerability	Species favoured by disturbance	Monitoring quadrats	Land acquisition	Linear marking	Transport corridors/ public utilities	Fencing/grazing control	Mining	Recreation usage	Drought	Seed collection and storage	Propagation	Re-establishment	Weed control	TOTAL
Acacia denticulosa	2	3	1	2	2	1	-	1	-	1	-	2	1	-	3	1	1	-	-	21
Acacia lobulata	2	3	2	-	2	-	-	1	3	-	2	2	-	1	1	3	2	-	-	24
Acacia merrickiae	1	2	1	-	2	1	1	2	3	2	3	2	-	1	-	3	3	-	1	26
Allocasuarina fibrosa	1	3	2	1	-	2	-	2	3	-	2	3	-	1	-	3	3	-	-	26
Banksia sphaerocarpa var. *dolichostyla*	2	3	-	-	1	1	-	1	3	3	3	-	3	1	1	3	3	-	-	28
Boronia adamsiana	1	2	1	2	1	1	3	2	-	3	3	1	-	-	-	3	3	-	-	26
Caladenia cristata	3	3	2	2	1	3	-	3	2	-	1	3	-	1	2	3	3	-	2	34
Daviesia euphorbioides	1	3	-	3	1	3	3	3	-	3	3	-	-	2	1	3	3	3	3	38
Daviesia 'oxylobium'	3	3	-	3	1	3	3	3	-	3	3	-	-	1	-	3	3	3	3	38
'Drakonorchis' 'drakaeoides'	3	3	3	3	1	1	-	3	1	-	2	3	-	1	1	3	3	-	2	33
Eremophila caerulea subsp. *'merrallii'*	2	3	1	3	2	3	1	3	-	2	3	1	2	1	-	3	3	3	2	38
Eremophila inflata	1	2	2	3	1	3	3	3	-	3	3	-	3	1	2	3	2	-	1	36
Eremophila resinosa	2	3	-	3	1	3	1	3	2	2	3	-	1	1	1	3	2	3	3	37
Eremophila virens	1	2	-	3	1	3	1	3	1	2	3	1	-	1	3	3	2	1	1	32
Eremophila viscida	1	3	1	3	1	3	2	3	1	2	3	3	-	1	3	3	3	3	2	41
Eucalyptus brevipes	2	3	1	2	1	2	-	1	-	1	1	1	-	1	1	3	3	1	-	24
Eucalyptus crucis subsp. *crucis*	3	2	2	1	1	3	-	1	2	-	1	2	-	3	1	3	1	-	-	26
Eucalyptus synandra	1	3	1	2	2	2	-	2	-	2	2	1	-	1	1	3	3	-	-	26
Gastrolobium callistachys	2	3	1	2	1	3	-	3	2	3	3	2	-	1	-	3	3	2	-	34
Grevillea dryandroides	2	3	-	2	-	2	3	3	-	1	3	1	-	2	-	3	2	-	1	28
Grevillea prostrata	1	3	-	-	1	1	3	3	-	-	1	-	3	-	-	3	3	-	-	22
Hakea aculeata	3	3	2	3	1	3	1	3	3	3	3	3	-	2	1	3	3	3	3	46
Hemigenia viscida	2	3	1	2	1	3	1	2	1	2	2	-	-	2	-	3	3	1	-	29
Myriophyllum petraeum	2	3	3	2	-	2	-	3	2	-	1	3	2	3	2	3	3	1	1	36
Pityrodia scabra	-	3	3	3	3	3	1	3	-	-	3	3	-	3	3	3	3	3	3	43
Prostanthera magnifica	1	2	-	3	3	1	-	2	-	1	2	1	1	3	2	3	2	-	-	27
Rhagodia acicularis	2	3	2	2	1	2	-	2	2	1	1	1	-	1	-	3	3	1	-	27

Table 1 *(continued)*

	Mapping & re-survey of known populations	Location of other populations	Liaison with landowners	Research	Fire management	Small population size/ vulnerability	Species favoured by disturbance	Monitoring quadrats	Land acquisition	Linear marking	Transport corridors/ public utilities	Fencing/grazing control	Mining	Recreation usage	Drought	Seed collection and storage	Propagation	Re-establishment	Weed control	TOTAL
Roycea pycnophylloides	1	3	2	3	-	3	-	3	-	-	-	3	-	-	1	3	3	3	-	28
Sowerbaea multicaulis	2	3	-	3	1	1	3	3	-	3	3	-	-	2	-	3	3	2	2	34
Tetratheca aphylla	2	-	-	2	-	2	-	1	3	-	1	1	3	2	1	3	3	-	1	25
Tetratheca harperi	1	-	-	2	-	2	-	1	3	-	-	1	3	2	1	3	3	-	-	22
Tetratheca 'paynterae'	1	-	3	2	-	3	-	1	3	-	-	1	3	2	1	3	3	-	-	26
Verticordia hughanii	2	3	1	2	1	1	1	2	1	-	1	3	-	1	-	3	3	-	1	26
TOTAL	56	84	38	69	35	70	31	75	39	43	65	48	25	45	33	97	89	33	32	

1 = species with a low degree of threat or urgency for management and research action.
3 = species with a high degree of threat
- = species neither threatened nor in need of action

2.3 Liaison with landowners

Close association and cooperation with private landowners is essential to ensure the continued survival of the majority of the Declared Rare species in the District. Survival of some species currently relies entirely on the goodwill of private landowners. Departmental staff are required to provide advice and assistance regarding conservation and management to landholders with DRF populations on land under their control. Landowners are requested to arrange their operations so that the area of DRF will not be destroyed or damaged in any way. Priority species for staff liaison with landowners are:

'Drakonorchis' 'drakeoides'
Myriophyllum petraeum
Pityrodia scabra

2.4 Research

Few of the DRF in the District have been the subject of detailed studies. Research into their taxonomy, genetic systems, population biology and ecology is needed to determine the best means of protecting and managing populations. Response to different fire regimes, drought tolerance, and the impact of bees on native pollinators require attention. Priority areas for research are identified below:

2.4.1 Taxonomy and formal descriptions

Significant numbers of threatened taxa have yet to be formally described and are currently referred to by their 'manuscript' names. In addition, Kelly *et al.* (1990) consider there are at least 2000 species which have yet to be discovered or formally described in Western Australia. Many of these species will come from the extensively cleared wheatbelt and adjoining arid woodlands, a large area of which occurs within the Merredin District. DRF species yet to be formally described are:

Daviesia 'oxylobium'
'Drakonorchis' 'drakeoides'
Eremophila caerulea subsp. *'merrallii'*
Eucalyptus synandra subsp. *'synandra'*
Tetratheca 'paynterae'

2.4.2 Fire research

Very little research has been conducted on the fire sensitivity and post-fire regeneration strategies of rare or threatened flora in the District. Two monitoring projects have been conducted - (i) by CSIRO on a population of *Grevillea dryandroides* burnt during a hot experimental burn, and (ii) by Dr S. Hopper on *Eucalyptus caesia* after two wild fires. All DRF, particularly those known from only one or a few localities, require exclusion or protection from fire until adequate research has been undertaken (see 2.5). Specifically tailored fire regimes need to be developed by both research and regional staff for sensitive species. Taxa which are high priority for fire research are:

Eucalyptus synandra subsp. *'synandra'*
Pityrodia scabra
Prostanthera magnifica

2.4.3 Short-lived, disturbance species

Some species are favoured by disturbance, either because they cannot compete with associated species in undisturbed vegetation or disturbance is essential for recruitment. Species in this category, which present special management difficulties, are:

Boronia adamsiana
Daviesia euphorbioides
Daviesia 'oxylobium'
Eremophila inflata
Pityrodia scabra
Sowerbaea multicaulis

2.4.4 Population decline

Surveys to date have identified a significant decline in plant numbers for one or more populations of several DRF. Research on the following species is needed to address those factors which are causing population decline:

Pityrodia scabra
Daviesia euphorbioides
Hakea aculeata
Roycea pycnophylloides

2.5 Fire management

All populations of rare flora should be excluded from prescribed burns on CALM and other lands, until appropriate research has been carried out (see 2.4.2). No fuel reduction burning currently occurs in the Merredin District. Parts of two nature reserves have been burnt under hot conditions in conjunction with CSIRO's wildlife research program at Kellerberrin. Such habitat burns are not used operationally. Species will also need to be protected, where possible, from wild fires. The construction and maintenance of fire breaks should take into account the location of rare flora. District information systems should provide population details once a fire is detected. Appropriate fire suppression can then be implemented, unless such fires correspond to the fire regime recommended for that species. Note: during the suppression of wild fires, the protection of human life and property takes precedence over the protection of threatened flora. Species requiring special protection from fire are:

Pityrodia scabra
Prostanthera magnifica

2.6 Small population size/vulnerability

A number of species of DRF have very small population sizes making them particularly vulnerable to localised disturbance. Species at risk in some or all of their known populations are:

Daviesia euphorbioides
'Drakonorchis' 'drakeoides'
Eremophila caerulea subsp. *'merrallii'*
Eremophila resinosa
Eremophila viscida
Eucalyptus crucis subsp. *crucis*
Gastrolobium callistachys
Hakea aculeata
Hemigenia viscida
Myriophyllum petraeum
Pityrodia scabra
Roycea pycnophylloides
Tetratheca 'paynterae'

2.7 Monitoring quadrats

Through the detailed mapping of individual plants in small populations, and permanent sample plots for smaller species and larger populations (as part of 2.1), subsequent surveys can provide information on population dynamics, plant longevity and regeneration. The following groups of species have highest priority for the establishment of permanent monitoring plots and for more intense monitoring at regular intervals:

* Species which require specialised annual/biannual monitoring to assesss population dynamics:

Caladenia cristata
'Drakonorchis' 'drakeoides'
Myriophyllum petraeum

Table 2. MERREDIN DISTRICT DECLARED RARE FLORA RANKED IN PRIORITY ORDER FOR PROTECTION AND MANAGEMENT ACTION

1 *Hakea aculeata**
2 *Pityrodia scabra*
3 *Eremophila viscida*
4 *Daviesia 'oxylobium'*
5 *Daviesia euphorbioides*
6 *Eremophila caerulea* subsp. *'merrallii'*
7 *Eremophila resinosa*
8 *Eremophila inflata*
9 *Myriophyllum petraeum*
10 *Gastrolobium callistachys*
11 *Sowerbaea multicaulis*
12 *Caladenia cristata*
13 *'Drakonorchis' 'drakeoides'*
14 *Eremophila virens*
15 *Hemigenia viscida*
16 *Banksia sphaerocarpa* var. *dolichostyla*
17 *Grevillea dryandroides*
18 *Roycea pycnophylloides*
19 *Prostanthera magnifica*
20 *Rhagodia acicularis*
21 *Acacia merrickiae*
22 *Allocasuarina fibrosa*
23 *Boronia adamsiana*
24 *Eucalyptus crucis* subsp. *crucis*
25 *Eucalyptus synandra*
26 *Tetratheca 'paynterae'*
27 *Verticordia hughanii*
28 *Tetratheca aphylla*
29 *Acacia lobulata*
30 *Eucalyptus brevipes*
31 *Grevillea prostrata*
32 *Tetratheca harperi*
33 *Acacia denticulosa*

* This ranking is based on Merredin District populations only.

* Short-lived, disturbance species which are not generally found in the wild without some disturbance event, and require special monitoring to determine their longevity:

Daviesia euphorbioides
Eremophila inflata
Pityrodia scabra
Sowerbaea multicaulis

* Species with small population numbers which require at least annual monitoring as any damage or loss of plants may result in local extinction:

Caladenia cristata
Eremophila viscida
Eremophila caerulea subsp. *'merrallii'*
Gastrolobium callistachys
Pityrodia scabra

2.8 Land acquisition

Acquisition of land by the Department, by donation, exchange or purchase, is required for those species not well represented on conservation reserves. DRF occurring on land reserved for nature conservation are generally considered to be less threatened than those on land designated for other purposes. It should be noted, however, that their presence on a reserve contributes to, but does not guarantee, population survival. Reserves, like other areas, are subject to disturbances such as weed invasion, fire, altered drainage and water tables, grazing, disease and where approved, mining activities:

Acacia lobulata
Banksia sphaerocarpa var. *dolichostyla*
Tetratheca aphylla
Tetratheca harperi
Tetratheca 'paynterae'

The above species are on Crown land, while other species that may warrant protection in this way, are not on land suitable or available for acquisition, e.g.

Allocasuarina fibrosa
Daviesia euphorbioides
Hakea aculeata

2.9 Linear marking

Populations in need of linear marking are located along linear reserves (road and rail reserves) and associated with linear, above and below ground utilities such as powerlines, water pipelines and Telecom lines. In all such situations plants are vulnerable to damage or destruction by maintenance and construction operations. The Main Roads Department has developed a permanent, but discrete field marking system for demarcation of environmentally significant areas on road reserves. CALM has adopted this system to mark DRF and priority flora populations occurring along linear routes both on CALM land and on other areas. Local shires have also been encouraged to adopt such a system. However, there can be problems with roadside markers, as many people now recognise them and smaller plants can be trampled by 'tourists' and removed by unscrupulous plant collectors. Populations on CALM and other lands most urgently in need of linear marking are:

Banksia sphaerocarpa var. *dolichostyla*
Boronia adamsiana
Daviesia 'oxylobium'
Daviesia euphorbioides
Eremophila inflata
Gastrolobium callistachys
Hakea aculeata
Sowerbaea multicaulis

2.10 Transport corridors/public utilities

Over 80 populations or >45 per cent of populations of DRF in the Merredin District occur on, or partly-on road, and to a lesser extent rail reserves. Most road/rail reserves are only one or two chains (20 or 40 m) wide, which includes the road itself and one or more public utilities. These narrow reserves are affected, both directly and indirectly, by the use and nature of adjoining lands (predominantly agriculture). Threats include weed invasion, periodic grazing (road reserves are often used as stock routes), drift of chemical sprays and fertilisers, fenceline maintenance and periodic burning. Being access routes the vegetation on road reserves can also be affected by rubbish dumping, uncontrolled vehicle access, wildflower picking and camping. The location of populations of rare flora in more secure, larger patches of remnant vegetation should always be a high priority.

The majority of road reserves are vested in Local Authorities or the Main Roads Department, and rail reserves in Westrail. DRF can be accidentally damaged during road works such as maintenance operations (grading, weed control), drainage works, minor and major road/rail upgrading, metal dumps and gravel/sand extraction. These authorities all use contract personnel and equipment as well as permanent staff for these operations. Management and field personnel within Shires and the two Government Departments need to know where the populations of DRF and priority flora occur to avoid accidental destruction of plants. This is carried out currently by notification letters from CALM and the use of linear markers in the field (see 2.9). The development of Shire registers and wall-plans (see 4.4) will further assist in informing managers.

Above- and below-ground utilities such as powerlines, water pipelines and Telecom lines generally follow road and rail reserves. As many threatened or priority flora populations occur on these narrow linear reserves, any maintenance, upgrading or management of these utilities close to known populations can damage plants. This will generally be in the form of mechanical damage to plants by machinery and equipment. However, some agencies control weeds around poles or along pipelines with residual chemicals, which can kill or damage native plants. Such chemicals should not be used adjacent to DRF populations. Taxa which are most at risk are:

Acacia merrickiae
Daviesia euphorbioides
Daviesia 'oxylobium'
Eremophila caerulea subsp. 'merrallii'
Eremophila resinosa
Eremophila virens
Eremophila viscida
Hakea aculeata
Pityrodia scabra
Sowerbaea multicaulis

2.11 Fencing/grazing control

DRF populations on private property in the District are generally on farmland where they require protection from grazing by domestic stock. In many situations landholders themselves have excluded stock, and in others CALM has provided fencing materials as part of formal agreements. Rabbits are a widespread and often overlooked problem, particularly on sandy soils (which carry species-rich heath or kwongan vegetation) and granite outcrop areas. Both of these habitats contain many DRF species. Other feral animals (e.g. goats) are rare but have been detected on the edge of the cleared wheatbelt. Fencing may be required for populations of:

Caladenia cristata
'Drakonorchis' 'drakeoides'
Eremophila viscida
Hakea aculeata
Roycea pycnophylloides

2.12 Mining

The mining industry is centred in the Yilgarn Shire and in isolated pockets of greenstone at Westonia in the eastern part of the District. A highly prospective greenstone belt goes from north of Bullfinch through Southern Cross, Marvel Loch, Mt Holland (Yilgarn Shire), the three Ironcap hills to Hatter Hill (Kondinin Shire). Numerous DRF and priority taxa occur in this area and are generally poorly surveyed. Mining activities which may affect DRF include exploration

(clearing of survey lines, drilling and costean operations), actual mine site establishment, provision of services (road making, power) and increased recreation activity by mine workers. Close liaison between companies, CALM, the Mines Department and the EPA is essential. Species most at risk are:

Banksia sphaerocarpa var. *dolichostyla*
Eremophila inflata
Tetratheca aphylla
Tetratheca harperi
Tetratheca 'paynterae'

Two other forms of mining in the District are gravel/sand mining by Local Authorities and other Government Departments and salt lake dune mining for gypsum by small operators.

2.13 Recreation usage

Tourism is not a major industry in the District, however, significant local recreation occurs, principally associated with day-use/camping on granite outcrops and skiing on salt lakes. These specialised habitats contain a range of unique flora which includes many rare species. Significant damage can occur from uncontrolled vehicle access through the open vegetation. Recreation should be controlled or excluded from sensitive sites depending upon the degree of threat. The following species are in need of protection from recreational damage:

Eucalyptus crucis subsp. *crucis*
Myriophyllum petraeum
Pityrodia scabra
Prostanthera magnifica

2.14 Drought

Some species suffer as a result of particularly dry years or localised drought conditions. The management options here are somewhat limited, but this is nonetheless an important management consideration. Species which appear to be at risk due to drought are:

Acacia denticulosa
Eremophila virens
Pityrodia scabra

2.15 Seed collection and storage

Collection and long-term storage of germ plasm (seed or tissues) from wild populations of DRF provides a source of propagation material for future re-establishment. Priority for collection of this material will depend upon the degree of threat to the species.

2.16 Cultivation and propagation

Although conservation of the DRF in the wild is the highest priority, all species should ideally be established in cultivation. This would eliminate any need for harvesting of wild populations and ensure safety against extinction, particularly for those species known in the wild from only a few individuals. Some species of *Eremophila* and *Daviesia* have been established in at least one botanic garden, but wider cultivation is desirable.

2.17 Re-establishment in suitable habitats in the wild

Species which are likely to require re-establishment into the wild under approved management programs are:

Daviesia euphorbioides
Daviesia 'oxylobium'
Eremophila resinosa
Eremophila viscida
Gastrolobium callystachys

Hakea aculeata
Pityrodia scabra
Roycea pycnophylloides

2.18 Weed control

Competition from introduced grasses and broadleaf weeds significantly reduces regeneration of most native plant species. However, weed control methods for use near threatened flora populations still requires research. Assessment of selective herbicides and removal by hand should be investigated. A pilot study by Dr K. Atkins using Fusilade (a selective grass herbicide) to control grasses in a population of *Hakea aculeata* and *Daviesia 'oxylobium'* showed some promise. The use of non-selective herbicides near populations of DRF or priority flora should be avoided. The following species require weed control or eradication at some or all of their populations:

Daviesia euphorbioides
Daviesia 'oxylobium'
Eremophila resinosa
Hakea aculeata
Pityrodia scabra

2.19 *Phytophthora* spp. (dieback) disease

To date no *Phytophthora* species have been recovered from the Merredin District and no special management for the disease, within the District, has been carried out in relation to DRF. Detailed surveys for *Phytophthora* species in the Merredin District by experienced staff (familiar with dieback on the west and south coasts) should be carried out over the next 12 months and periodically thereafter. Initial surveys should include the Wongan Hills, Charles Gardner Nature Reserve and road reserves in the western (higher rainfall) part of the District. In the absence of *Phytophthora* species, DRF species have not been ranked (Table 1) or identified as being threatened by these or other fungal diseases.

3. Priority Taxa in the Merredin District

Poorly known taxa considered to be at risk and in need of urgent further survey are treated in Parts III, IV and V, and their recommended status is tabulated (Table 3).

4. Assistance from Volunteers and Information Systems

4.1 Rare Flora Volunteers

In recent years CALM has used volunteers to assist with a number of flora surveys including the Banksia Atlas, the Rare Eucalypt Survey and the Rare Poison Plant Survey. In 1990 CALM initiated a Rare Flora Volunteer Program. Currently there are five rare flora volunteers in the Merredin District. Future expansion of the program in the District will depend on the availability of District staff to service the volunteers. In addition, where appropriate, volunteers will be used in specific rare flora surveys.

A significant number of new populations of DRF and priority taxa have been located by amateur botanists, either individuals or members of groups such as the Orchid Society, Naturalists Club and the W.A. Wildflower Society. Such groups and individuals should be given every encouragement to continue their good work.

4.2 District recording systems

Confidential registers, with precise locality details of known populations, are maintained in the Merredin District office and in the central record system at CALM's head office in Como. The register is updated regularly as required. Within the District system a Wheatbelt Regional code number has been designated for each DRF taxon and this number is used for both filing and mapping systems throughout the Region. However, over the next five years population numbers will be updated to reflect State-wide codings. Information on populations on CALM land will also be retained on individual nature reserve files.

4.3 Herbarium specimens

The Western Australian Herbarium has requested voucher specimens from all populations of DRF and priority species. Unfortunately, many populations of these taxa in the District do not currently have vouchers. Specimens of DRF can only be collected with written approval from the Minister. The District will, over the next 5 years, collect a voucher specimen and colour slide photographs of each of its DRF taxa.

4.4 Shire register and wall-plan for rare flora

Many of the populations of threatened flora in the District occur on road reserves, which are highly vulnerable to weed invasion, mechanical disturbance and periodic grazing. Closer liaison and information transfer with local authorities and the Main Roads Department will be required to protect these populations in the future. Upgraded plans and a detailed information folder will be developed for each of the 16 Shires in the Merredin District. A map of each Shire, based on the MRD's 100 000 scale 'State of Construction' plans, will show general locations of threatened flora populations on roadsides within the Shire. Three copies of each plan will be maintained; one at the Shire office, one at the MRD Regional office at Northam and the 'master copy' at CALM's Merredin District office. All copies will be checked annually by CALM staff.

5. Conservation and Management of Special Areas

The Wongan Hills and adjoining sand plains are of national importance due to their endemic flora. Current records show 14 species of DRF and 23 species of priority taxa. A separate plan to cover threatened flora in the Wongan-Ballidu Shire will be prepared over the next two years.

Charles Gardner Nature Reserve south of Tammin has an extremely diverse heath and kwongan flora with 443 species recorded on the reserve (Coates 1990), including two species of DRF (*Allocasuarina fibrosa, Hemigenia viscida*) and 13 priority taxa. Tammin is one of the most extensively cleared Shires in the State with less than 7 per cent of native vegetation still remaining (Coates 1987). This reserve requires special management to protect its diverse flora from threats such as uncontrolled access, fire and the introduction of disease due to *Phytophthora* species.

Helena/Aurora Range north of Southern Cross is within the area recently transferred to the Kalgoorlie District. The Range contains one species of DRF (*Tetratheca aphylla*) and a number of priority taxa. A proposal to include the Ranges in a reserve is part of the Goldfields Regional Plan which is currently being prepared.

6. Implementation and Term of the Management Program

A recovery team will be appointed which will oversee and report annually to the Corporate Executive on the implementation of this Management Program.

This program will run for a period of 10 years, unless subsequent research or changes to the schedule of Declared Rare Flora cause it to be superseded earlier. During this period, the Department of CALM may institute any changes to the provisions outlined in this program as are found, through further research, to be necessary for conservation of the Declared Rare Flora in the District.

Table 3. Priority One, Two and Three species lists with recommended status indicated.

Species	Recommended Status
Priority One Species	
Acacia 'adinophylla'	P1
Acacia caesariata	P1
Acacia cochlocarpa subsp. *'velutinosa'*	P1
Acacia desertorum var. *'nudipes'*	P1
Acacia inceaena subsp. *'conformis'*	P1
Acacia sciophanes	P1
Acacia subflexuosa subsp. *'capillata'*	P1
Calothamnus sp. (Diemals)	P1
Calytrix creswellii	P1
Chamelaucium 'paynterae'	P1
Cyphanthera odgersii subsp. *occidentalis*	P1*
Dampiera scaevolina	P1
'Drakodenia ornata' x	P1
Drummondita 'wilsonii'	P1
Eremophila adenotricha	P1
Eremophila 'vernicosa'	P4
Eriostemon 'trayningensis'	P1
Eriostemon 'chiddarcoopingensis'	P1
Genus nov. [aff. *Melichrus*] Epacridaceae	P1
Goodenia 'pusilliflora'	P1
Grevillea christinae	P1*
Grevillea lissopleura	P1
Grevillea pilosa subsp. *dissecta*	P1
Grevillea rosieri	P1
Grevillea sp. (Mt Holland)	P1
Halgania tomentosa	P1
Hemigenia obovata	P1
Lepidium merrallii	P1
Leptospermum macgillivrayi	P1
Leucopogon marginatus	P3
Leucopogon 'teretostylus'	P1
Myriophyllum 'lapidicola'	P1
Persoonia 'chapmaniana'	P1
Phebalium brachycalyx	P1
Phebalium drummondii	P1
Ricinocarpos sp. (Diemals)	P1*
Scaevola tortuosa	P1*
Verticordia gracilis	P1
Verticordia multiflora subsp. *solox*	P1
Verticordia roei subsp. *meiogona*	P1

Priority Two Species

Acacia accendens	P1
Acacia 'asepala'	P2
Acacia campylophylla	P3
Acacia 'castonostegia'	P3
Acacia cowaniana	P2
Acacia sclerophylla var. *'pilosa'*	P2
Acrotriche patula	P2
Andersonia carinata	P2
Anigozanthus bicolor subsp. *extans*	P1
Blennospora phlegmatocarpa	P2
Calytrix parvivallis	P1*
Conostylis albescens	P1*
Daviesia dielsii	P1
Eremophila 'complanata'	P2
Eremophila 'pinnatifida'	P2
Eucalyptus orbifolia subsp. (Dromedaries)	P2
Fitzwillia axilliflora	P2
Frankenia bracteata	P1
Frankenia glomerata	P1
Grevillea nana subsp. *abbreviata*	P1
Grevillea roycei	P1
Grevillea spinosissima	P1
Grevillea tetrapleura	P5
Hakea 'rigida'	P2
Hemigenia brachyphylla	P1
Hibbertia sp. (Chiddarcooping)	P2
Lepidium genistoides	P2
Logania sp. (Ironcap)	P2
Petrophile incurvata	P3
Pimelea graniticola	P2
Regelia cymbiflora	P2
Stylidium choreanthum	P2
Tetratheca deltoidea	P1*
Thysanotus cymosus	P1
Verticordia dasystylis subsp. *dasystylis*	P5
Verticordia pulchella	P2

Priority Three Species

Acacia 'cylindrica'	P1
Acacia filifolia	P3
Acacia phaeocalyx	P3
Calothamnus brevifolius	P3
Calytrix plumulosa	P3
Diuris picta	P3
Dryandra horrida	P2
Dryandra shanklandiorum	P3
Dryandra speciosa	P2
Grevillea asparagoides	P1

Grevillea erectiloba	P3
Grevillea eriobotrya	P2
Grevillea georgeana	P3
Leucopogon amplectens	P2
Melaleuca sclerophylla	P1
Pomaderris intangenda	P3
Prostanthera nanophylla	P1
Rinzia crassifolia	P1
Scholtzia eatoniana	P1
Triglochin stowardii	P1
Verticordia 'halophila'	P5
Verticordia 'mitodes'	P3
Verticordia stenopetala	P3

* These taxa have the highest priority for further survey and consideration for gazettal as DRF

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GLOSSARY

acicular needle-shaped and stiff

acuminate tapering gradually to a protracted point

acute terminating in a distinct but not protracted point, the converging edges separated by an angle less than 90 degrees

alternate of leaves or other lateral organs, borne singly at different heights on the axis; of floral parts, on a different radius, e.g. describing the position of stamens with respect to petals

annual a plant whose life span ends within one year after germination

apiculate terminating in a short, sharp, flexible point

appendage a structure arising from the surface or extending beyond the tip of another structure

appressed pressed closely against but not united with

ascending growing erect after an oblique or semi-horizontal beginning

attenuate tapering gradually

awn a bristle-like appendage, e.g. on the tip or back of the lemma of a grass floret

axil the angle between a leaf or bract and the axis bearing it. adj. **axillary**

axis a stem, (commonly used for the main stem of a whole plant or of an inflorescence)

beak a prominent terminal projection, especially of a carpel or fruit

bract a leaf-like structure, different in form from the foliage leaves and without an axillary bud, associated with an inflorescence or flower

bracteole a small bract-like structure borne singly or in pairs on the pedicel or calyx of a flower

calyx the sepals of one flower collectively

calyx-tube a tube formed by fusion or cohesion of sepals. cf. **hypanthium**

campanulate bell-shaped

capitulum a racemose inflorescense with sessile flowers compacted on a flattened and expanded, or rounded apex of a peduncle

capsule a dry fruit formed from two or more united carpels and dehiscing at maturity to release the seeds

caudate having a narrow tail-like appendage

cilia in unicellular plants, gametes, spores etc., minute hair-like protoplasmic protrusions whose movement confers motility on the cell; in higher plants, hairs more or less confined to the margins of an organ. sing. **cilium**; adj. **ciliate**

clavate club-shaped

claw a narrow, stalk-like basal portion of a petal, sepal or bract

compressed flattened in one plane, either dorsally (bringing the front and back closer together) or laterally (bringing the sides closer together)

cone (loosely) in *Casuarina*, a woody multiple fruit incorporating the bracts and bracteoles associated with the flowers

connate fused to another organ (or other organs) of the same kind

convolute of the arrangement of corolla lobes in a bud, a form of imbricate aestivation in which each segment has one edge overlapping the adjacent segment, like a furled umbrella

cordate of a leaf blade, broad and notched at the base; heart-shaped

corolla the petals of a flower collectively

corymb a racemose inflorescence in which the pedicels of the lower flowers are longer than those of the flowers above, bringing all flowers to about the same level

cotyledon the primary leaf (or one of two or more primary leaves) of an embryo

crenate with small, rounded teeth; scalloped

crenulate minutely scalloped

crown the part of a tree or shrub above the level of the lowest branch

cuneate wedge-shaped

cuspidate tapering into a sharp, rigid point

cyclic of floral organs, several borne at the same level on the axis; whorled. cf. **spiral**

cyme an inflorescence in which each flower, in turn, is formed at the tip of a growing axis and further flowers are formed on branches arising below it

deciduous falling seasonally, e.g. of the leaves or bark of some trees

decumbent spreading horizontally but then growing upwards

decurrent extending downwards beyond the point of insertion, e.g. of a lamina extending downwards to form a flange along the petiole

decussate in pairs, with successive pairs borne at right angles to each other

dehiscent breaking open at maturity to release the contents

dentate toothed

denticulate finely toothed

dicotyledon a flowering plant whose embryo has two (rarely more) cotyledons (seed leaves) cf. **monocotyledon**

digitate branching from the axis or stalk like the fingers of a hand

dioecious having the male and female reproductive structures on separate plants. cf. **monoecious**

disc a plate or rim of tissue, derived from the receptacle of a flower, occurring between whorls of floral parts

distal remote from the point of origin or attachment. cf. **proximal**

divaricate widely spreading

dorsiventral having structurally different upper and lower surfaces

drupe a succulent fruit formed from one carpel, having the seed(s) enclosed in an inner stony layer of the fruit wall. adj. **drupaceous** (which is often used to mean drupe-like but not strictly a drupe)

edaphic pertaining to the soil

elliptic oval in outline, widest at the centre

enation an epidermal outgrowth

endemic having a natural distribution confined to a particular geographical region

entire having a smooth margin, not dissected or toothed

entomophilous pollinated by insects

ephemeral short-lived

eremean pertaining to regions of low, irregular rainfall

evergreen bearing green leaves throughout the year

exserted protruding, e.g. of stamens with respect to a corolla tube

falcate sickle-shaped

family a group of one to many genera believed to be related phylogenetically, usually clearly separable from other such groups

filament the stalk of a stamen; a thread one or more cells thick; in blue-green Algae, a trichome enclosed in a mucilaginous sheath

filiform thread-like

floral belonging to or associated with a flower

floret a grass flower, together with the lemma and palea that enclose it (often applied to flowers in Cyperaceae and Asteraceae)

follicle a dry, dehiscent fruit formed from one carpel and dehiscing along the line of fusion of its edges

forb a non-woody plant other than a grass, sedge, rush, etc., cf. **herb**

free not fused or united (with other organs)

fruit the seed-bearing structure in angiosperms formed from the ovary after flowering

genus a group of species believed to be related phylogenetically and usually clearly separable from other such groups, or a single species without close relatives. pl. **genera**

geophyte a plant whose perennating buds are buried in the soil

glabrescent becoming glabrous

glabrous without hairs

gland a structure, without or on the surface of a plant, with a secretory function

glandular bearing glands; functioning as a gland

glaucous blue-green in colour, with a whitish bloom (as in the juvenile leaves of many eucalypts)

habit the growth form of a plant, comprising its size, shape, texture and orientation

habitat the environment in which a plant lives

halophyte a plant adapted to living in highly saline habitats; a plant that accumulates high concentrations of salt in its tissues

herb any vascular plant that never produces a woody stem. cf. **forb**

herbaceous not woody; soft in texture

hyaline translucent, almost like clear glass

hybrid an offspring of genetically different parents (in a Flora, usually applied where the parents are of different species)

imbricate of perianth parts, having the edges overlapping in the bud

incised cut deeply, sharply and often irregularly (an intermediate condition between toothed and lobed)

incurved bent or curved inwards or upwards; of leaf margins, curved towards the adaxial surface

induplicate folded inwards so that the outer faces of the margins are in contact

inflexed bent sharply upwards or forwards

inflorescence the group or arrangement in which flowers are borne on a plant

internode the portion of a stem between the level of insertion of two successive leaves or leaf pairs (or branches of an inflorescence)

juvenile of leaves, formed on a young plant and different in form from the adult leaves

keel a ridge like the keel of a boat; in particular, a boat-shaped structure formed by fusion of the two anterior petals of a flower in Fabaceae

keeled of leaves or bracts, folded and ridged along the midrib

labellum a lip; in Orchidaceae, the distinctive median petal that serves as an alighting platform for pollinating insects

lamina the blade of a leaf

lanceolate of a leaf, about four times as long as it is broad, broadest in the lower half and tapering towards the tip

leaflet one of the ultimate segments of a compound leaf

legume a fruit characteristic of the families Mimosaceae, Caesalpiniaceae and Papilionaceae formed from one carpel and either dehiscent along both sides, or indehiscent

lepidote covered with small, membranous scales

lignotuber a woody swelling below or just above the ground, containing adventitious buds from which new shoots develop if the top of the plant is cut or burnt (common in the shrubby eucalypts and in many other fire-tolerant Australian shrubs)

limb the upper free, spreading portion of a corolla or perianth that is connate at the base

linear very narrow in relation to the length, and with the sides parallel

mallee a growth habit in which several woody stems arise separately from a lignotuber (usually applied to shrubby eucalypts); a plant having the above growth habit

marginal occurring at or very close to the margin

midrib the central, and usually the most prominent, vein of a leaf or leaf-like organ

monocotyledon a flowering plant whose embryo has only one cotyledon (seed lead). cf. **dicotyledon**

monoecious having the male and female reproductive structures in separate flowers but on the same plant. cf **dioecious**

morphology the form and structure of an organism or part of an organism; the study of form and structure

mucro a sharp, abrupt terminal point. adj. **mucronate**

nerve a vein

node the level (transverse plane) of a stem at which one or more leaves arise

obconical cone-shaped but attached at the narrower end

obcordate of a leaf blade, broad and notched at the tip; heart-shaped but attached at the pointed end

oblanceolate similar in shape to **lanceolate** but attached at the narrower end

oblique of a leaf or leaflet, larger on one side of the midrib than on the other, i.e. asymmetrical.

oblong having the length greater than the width but not many times greater, and the sides parallel

obovate similar in shape to **ovate** but attached at the narrower end

obtuse blunt or rounded at the apex, the converging edges separated by an angle greater than 90 degrees

operculum a lid or cover becoming detached at maturity by abscission; in *Eucalyptus* (for example), a cap covering the bud and formed by fusion or cohesion of perianth parts

opposite of leaves, borne at the same level but on opposite sides of the stem; of floral parts, on the same radius (as). cf. **alternate**

orbicular circular or nearly so

ovate shaped like a section through the long axis of an egg, and attached by the wider end

panicle a compound raceme; an indeterminate inflorescence in which the flowers are borne on branches of the main axis or on further branches of these

paniculate indeterminate and much-branched

papilla a small, elongated protuberance on the surface of an organ, usually an extension of one epidermal cell. adj. **papillose**

pappus a tuft (or ring) of hairs or scales borne above the ovary and outside the corolla in Asteraceae and possibly representing the calyx; a tuft of hairs on a fruit

-partite divided, almost to the base, into segments (commonly applied to a style)

pedicel the stalk of a flower. adj. **pedicellate**

peduncle the stalk of an inflorescence; in ferns, the stalk of a sporocarp. adj. **pedunculate**

penicillate pencil-shaped; tufted like an artist's brush

perennial a plant whose life-span extends over more than two growing seasons

perianth the calyx and corolla of a flower, especially where the two are similar

petal a member of the inner whorl of non-fertile parts surrounding the fertile organs of a flower, usually soft and coloured conspicuously

petiole the stalk portion of a leaf

phyllode a leaf whose blade is much reduced or absent, and whose petiole and rachis have assumed the functions of the whole leaf. cf. **cladode**

pilose hairy, the hairs soft and clearly separated but not sparse

pinnate divided into pinnae; once-compound. cf. **bipinnate**

pinnatifid cut deeply into lobes that are spaced out along the axis (of the leaf). cf. **palmatifid**

pinnatisect dissected down to the midrib but having the segments confluent with it

plumose like a feather; with fine hairs branching from a central axis

pod a leguminous fruit

pollination the transfer of pollen from the male organ, where it is formed, to the receptive region of a female organ, e.g. from anther to stigma

procumbent trailing or spreading along the ground but not rooting at the nodes

propagule a structure with the capacity to give rise to a new plant, e.g. a seed, a spore, part of the vegetative body capable of independent growth if detached from the parent

prostrate lying flat on the ground

puberulous covered with minute, soft, erect hairs

pubescent covered with short, soft, erect hairs

pulvinus a swelling at the base of the stalk of a leaf or leaflet, often glandular or responsive to touch

punctate marked with dots

pungent ending in a stiff, sharp point; having an acrid taste or smell

raceme an indeterminate inflorescence in which a main axis produces a series of flowers on lateral stalks, the oldest at the base and the youngest at the top. adj. **racemose**

rachis the axis of an inflorescence or a pinnate leaf; pl. **rachises. secondary rachis:** the axis of a pinna in a bipinnate leaf

receptacle the axis of a flower (= **torus**); in ferns, an axis on which sporangia arise

recurved curved or curled downwards or backwards

reflexed bent sharply downwards or backwards

reticulate forming a network

retrorse directed backwards or downwards. cf. **antrorse**

revolute rolled downwards or backwards

scabrid (= scabrous) rough to the touch

scale a reduced or rudimentary leaf

scape the stem-like, flowering stalk of a plant with radical leaves

scarious dry and membranous

sclerophyllous with leaves stiffened by sclerenchyma

sepal a member of the (usually green) outer whorl of non-fertile parts surrounding the fertile organs of a flower

seriate in rows or whorls

serrate toothed, with asymmetrical teeth pointing forward

sessile without a stalk (when applied to a stigma, indicates that the style is absent, the stigma being 'sessile' on the ovary)

seta a bristle or stiff hair

shrub a woody plant less than 5 m high, either without a distinct main axis, or with branches persisting on the main axis almost to its base

siliceous containing silica

silicula a short siliqua, not more than twice as long as its width

simple undivided; of a leaf, not divided into leaflets; of a hair or an inflorescence, not branched

sinuate with deep, wave-like depressions along the margin. cf. **undulate**

solitary of flowers, borne singly, not grouped in an inflorescence

spathulate (= spatulate) spoon-shaped; broad at the tip and narrowed towards the base

species a taxon comprising individuals, or populations of individuals, capable of interbreeding to produce fertile offspring; the largest group of individuals between which there are no distinguishable, consistent differences in form or reproductive mechanisms

spike an unbranched, indeterminate inflorescence in which the flowers are without stalks. adj. **spicate**

spikelet a unit of the inflorescence in grasses, sedges and some other monocotyledons, consisting of one to many flowers and associated glumes

spine a stiff, sharp-pointed structure, formed by modification of a plant organ, e.g. a lateral branch or a stipule

spinescent ending in a spine; modified to form a spine

spinose bearing spines

spiral of leaves or floral organs, borne at different levels on the axis, in an ascending spiral. cf. **cyclic**

standard the posterior petal in the flower in Papilionaceae

stellate star-shaped; consisting of star-shaped cells

stem the main axis or a branch of the main axial system of a plant, developed from the plumule of the embryo and typically bearing leaves

stipule one of a pair of appendages at the bases of leaves in many dicotyledons

stolon a prostrate or trailing stem that produces roots at the nodes

striate striped with parallel longitudinal lines or ridges

subulate narrow and tapering gradually to a fine point

sulcate grooved; furrowed

taxon a group or category, at any level, in a system for classifying plants or animals

terete cylindrical or nearly so; circular in cross-section

terminal at the apex or distal end

ternate in groups of three; of leaves, arranged in whorls of three; of a single leaf, having the leaflets arranged in groups of three

terrestrial of or on the ground; of the habitat of a plant, on land as opposed to in water, or on the ground as opposed to on another plant

throat of a corolla tube, the top, where the tube joins the lobes

tomentum a covering of dense, matted, woolly hairs. adj. **tomentose**

torus see **receptacle**

trifoliate having three leaves

truncate with an abruptly transverse end, as if cut off

tuber a storage organ formed by swelling of an underground stem or the distal end of a root

tubercle a small wart-like outgrowth

tuberculate covered with tubercles

tuberous swollen; of roots, tuber-like

umbel a racemose inflorescence in which all the individual flower stalks arise in a cluster at the top of the peduncle and are of about equal length

undulate wavy, i.e. not flat. cf. **sinuate**

unisexual bearing only male or only female reproductive organs

united fused together

urceolate urn-shaped

vein a strand of vascular tissue

venation the arrangement of veins in a leaf

verrucose warty

verticillate arranged in one or more whorls

vesicle a bladder-like sac or cavity filled with gas or liquid

vestigial reduced from the ancestral condition and no longer functional. cf. **rudimentary**

villous shaggy with long, weak hairs

viscid of a surface, sticky; coated with a thick, syrupy secretion

whorl a ring of leaves, bracts or floral parts borne at the same level on an axis

wing a membranous expansion of a fruit or seed, which aids dispersal; a thin flange of tissue extended beyond the normal outline of a stem or petiole; a lateral petal of a flower in Papilionaceae

xerophyte a drought-tolerant plant

(2) A person who makes or obtains a record pursuant to paragraph (b) of subsection (1) of this section shall retain the record for not less than twelve months and produce it on demand to a wildlife officer.

Rare or endangered species of flora.
Added by No. 86 of 1976, s. 17 (As amended by No. 28 of 1979, s. 7.).

23F. (1) In this section "rare flora" means flora for the time being declared to be rare flora for the purposes of this section.

(2) Where the Minister is of opinion that any class or description of protected flora is likely to become extinct or is rare or otherwise in need of special protection, he may, by notice published in the *Government Gazette* declare that class or description of flora to be rare flora for the purposes of this section throughout the State.

(3) The Minister may vary or revoke a notice published under subsection (2) of this section by subsequent notice or notices published in the *Government Gazette*.

(4) A person shall not, whether or not he is—

(a) the holder of a license issued under this Act to take protected flora;

(b) the owner or occupier of private land on which rare flora exists; or

(c) authorised by the owner or occupier of land on which rare flora exists,

take any rare flora unless—

(d) where he is not the holder of a license issued under this Act, he first obtains the consent thereto in writing of the Minister;

(e) where he is the holder of a license issued under this Act, he first obtains the further consent thereto in writing of the Minister.

(5) [*This subsection was in section 23F. as added by No. 86 of 1976, however it was repealed by No. 28 of 1979 at the time section 23F. came into operation.*]

(6) A person who takes any rare flora contrary to the provisions of this section is liable on conviction to a penalty not exceeding one thousand dollars. *

(7) Where an owner or occupier of private land who has been refused consent to take rare flora on that land satisfies the Minister that he will suffer loss of use or enjoyment of the land by reason of that refusal, the Minister shall inform the Treasurer in writing accordingly and the owner or occupier shall be paid compensation for that loss at such rate or rates per annum as—

(a) is agreed between the owner or occupier and the Treasurer; or

(b) in default of agreement, is determined by a valuer appointed by agreement between the Treasurer and the owner or occupier, or in default of agreement on such an appointment, by a valuer appointed by the Minister,

for such period, not exceeding five years, as the loss continues.

(8) Where compensation has been paid under subsection (7) of this section for a period of five years in respect of any particular land, the Minister shall not refuse an application by the owner or occupier of that land to take rare flora on that part of the land for the loss of use or enjoyment of which compensation has been so paid.

(9) Notwithstanding that compensation has been paid under subsection (7) of this section, whether for a period of five years or for a lesser period, for the loss of use or enjoyment of any land, that land may at any time be taken by the Governor under and subject to the Public Works Act, 1902 for any of the purposes of this Act.

* *Amended to ten thousand dollars on the 28 October 1985 Amendment Act No 58.*

APPENDIX II

[Extract from Government Gazette (No. 70) of 17 May 1991]

WILDLIFE CONSERVATION ACT 1950
WILDLIFE CONSERVATION (RARE FLORA) NOTICE 1991

Made by the Minister under section 23F (2).

Citation

1. This notice may be cited as the *Wildlife Conservation (Rare Flora) Notice 1991.*

Interpretation

2. In this notice—

"extant" means still existing in its original state;

"protected flora" means the classes of flora declared to be protected flora in the notice made by the Minister under section 6 (6) of the Act and published in the *Gazette* on 9 October 1987 at p. 3855;

"rare flora" has the meaning given at section 23F (1) of the Act;

"taxa" includes protected flora that is described by a genus name and any other name or description.

Rare Flora

3. Subject to clause 4 all taxa of protected flora described in items 1 and 2 of the Schedule growing in an original state are declared to be rare flora throughout the whole of the State.

Certain protected flora excluded

4. Clause 3 shall not apply to the taxa of protected flora described in the Schedule when that protected flora is growing in a domesticated or cultivated state.

Revocation

5. The notice made by the Minister under section 23F (2) of the *Wildlife Conservation Act 1950* and published in the *Gazette* on 1 June 1990 at pp. 2486-89 is revoked.

Schedule

(Clause 3)

Protected Flora Declared as Rare Flora

Item 1. Taxa Known to be Extant.

Item 2. Taxa Presumed to be Extinct.

BOB PEARCE, Minister for the Environment.

ITEM 1—TAXA KNOWN TO BE EXTANT

Acacia anomala
Acacia aphylla
Acacia argutifolia
Acacia denticulosa
Acacia depressa
Acacia forrestiana
Acacia 'lanuginophylla' m.s.
Acacia lobulata
Acacia merrickiae
Acacia pharangites
Acacia 'pygmaea' m.s.
Acacia semicircinalis
Acacia simulans
Acacia vassalii
Acacia sp. (Dandaragan) S. van Leeuwen 269
Adenanthos cunninghamii
Adenanthos dobagii
Adenanthos ellipticus
Adenanthos eyrei
Adenanthos ileticos
Adenanthos pungens subsp. effusa
Adenanthos pungens subsp. pungens
Adenanthos velutinus
Allocasuarina fibrosa
Allocasuarina tortiramula
Andersonia sp. (Two Peoples Bay) G. Keighery 8229
Anigozanthos bicolor subsp. *minor*
Anigozanthos humilis subsp. *chrysanthus*
Anigozanthos viridis subsp. *terraspectans*
Anthocercis gracilis
Apium prostratum subsp. *'phillipii'* m.s.
Aponogeton hexatepalus
Asplenium obtusatum
Asterolasia drummondii
Asterolasia grandiflora
Asterolasia nivea
Baeckea arbuscula
Banksia brownii
Banksia cuneata
Banksia goodii

Banksia oligantha
Banksia sphaerocarpa var. *dolichostyla*
Banksia tricuspis
Banksia verticillata
Bentleya spinescens
Billardiera mollis
Boronia adamsiana
Boronia revoluta
Caladenia bryceana subsp. *bryceana*
Caladenia bryceana subsp. *'uncinata'* m.s.
Caladenia 'caesarea' subsp. *'maritima'* m.s.
Caladenia 'christineae' m.s.
Caladenia cristata
Caladenia dorrienii
Caladenia 'elegans' m.s.
Caladenia 'excelsa' m.s.
Caladenia 'exstans' m.s.
Caladenia 'harringtoniae' m.s.
Caladenia 'hoffmanii' m.s.
Caladenia huegelii
Caladenia integra
Caladenia 'viridescens' m.s.
Caladenia 'voigtii' m.s.
Caladenia wanosa
Calectasia sp. (central wheatbelt) K. Dixon 861
Calytrix breviseta subsp. *breviseta*
Chamelaucium 'erythrochlora' m.s.
Chamelaucium 'griffinii' m.s.
Chamelaucium 'roycei' m.s.
Conospermum toddii
Conostylis drummondii
Conostylis lepidospermoides
Conostylis micrantha
Conostylis misera
Conostylis rogeri
Conostylis seorsiflora subsp. *trichophylla*
Conostylis setigera subsp. *dasys*
Conostylis wonganensis
Coopernookia georgei
Corybas 'limpidus' m.s.
Darwinia acerosa
Darwinia apiculata
Darwinia carnea
Darwinia collina
Darwinia 'ferricola' m.s.
Darwinia macrostegia
Darwinia masonii
Darwinia meeboldii
Darwinia oxylepis
Darwinia squarrosa
Darwinia wittwerorum
Darwinia sp. (Stirling Range) G.J. Keighery 5732
Daviesia 'bursarioides' m.s.
Daviesia euphorbioides
Daviesia 'megacalyx' m.s.
Daviesia 'microcarpa' m.s.
Daviesia 'oxylobium' m.s.
Daviesia 'pseudaphylla' m.s.
Daviesia purpurascens
Daviesia 'speciosa' m.s.
Daviesia spiralis
Diuris drummondii
Diuris purdiei
Diuris sp. (Kwinana) A.P. Brown 10.9.84
Diuris sp. (Northampton) A.P. Brown 203
Drakaea 'confluens' subsp. *'confluens'* m.s.
Drakaea 'confluens' subsp. *'isolata'* m.s.
Drakaea 'concolor' m.s.
Drakaea elastica
Drakaea 'micrantha' m.s.
'Drakonorchis barbarella' m.s.
'Drakonorchis drakeoides' m.s.
Drosera fimbriata
Drummondita ericoides
Drummondita hassellii var. *longifolia*
Dryandra mimica
Dryandra serratuloides
Dryandra sp. (Kamballup) M. Pieroni 20.9.88
Dryandra sp. (Stirling Range) F. Lullfitz 3379
Epiblema grandiflorum var. *'caeruleum'* m.s.
Eremophila caerulea subsp. *'merrallii'* m.s.
Eremophila denticulata subsp. *denticulata*
Eremophila denticulata subsp. *'trisulcata'* m.s.
Eremophila inflata
Eremophila microtheca
Eremophila nivea
Eremophila racemosa
Eremophila resinosa
Eremophila 'subteretifolia' m.s.
Eremophila ternifolia
Eremophila 'veneta' m.s.
Eremophila verticillata
Eremophila virens
Eremophila viscida
Eriostemon wonganensis
Eucalyptus 'absita' m.s.
Eucalyptus 'argutifolia' m.s.
Eucalyptus 'articulata' m.s.
Eucalyptus 'balanites' m.s.
Eucalyptus beardiana
Eucalyptus bennettiae
Eucalyptus brevipes
Eucalyptus burdettiana
Eucalyptus ceracea
Eucalyptus cerasiformis
Eucalyptus coronata
Eucalyptus 'crispata' m.s.
Eucalyptus crucis subsp. *crucis*
Eucalyptus crucis subsp. *'praecipua'* m.s.
Eucalyptus 'cuprea' m.s.
Eucalyptus 'dolorosa' m.s.
Eucalyptus erectifolia
Eucalyptus goniantha subsp. *goniantha*
Eucalyptus 'graniticola' m.s.
Eucalyptus 'impensa' m.s.
Eucalyptus insularis
Eucalyptus johnsoniana
Eucalyptus lateritica
Eucalyptus 'leprophloia' m.s.
Eucalyptus merrickiae
Eucalyptus mooreana
Eucalyptus 'olivacea' m.s.
Eucalyptus rhodantha var. *petiolaris*
Eucalyptus rhodantha var. *rhodantha*
Eucalyptus steedmanii
Eucalyptus suberea
Eucalyptus synandra s.s.
Eucalyptus sp. (Cape Naturaliste) K.H. Rechinger 58888
Eucalyptus sp. (Midlands Highway) M.I.H. Brooker 8734
Eucalyptus sp. (Moresby Range) S.D. Hopper 2759
Eucalyptus sp. (Norseman) S.D. Hopper 2736
Gastrolobium appressum
Gastrolobium callistachys
Gastrolobium glaucum
Gastrolobium graniticum
Gastrolobium hamulosum
Gastrolobium tomentosum
Grevillea calliantha
Grevillea cirsiifolia
Grevillea dryandroides
Grevillea inconspicua
Grevillea infundibularis
Grevillea involucrata
Grevillea prostrata
Grevillea saccata
Grevillea scapigera
Hakea aculeata
Hakea megalosperma
Halosarcia bulbosa
Hemiandra gardneri

Hemiandra rutilans
Hemigenia viscida
Hensmania chapmanii
Hibbertia sp. (Porongurups) R.D. Hoogland 12186
Hydrocotyle lemnoides
Isopogon uncinatus
Kennedia beckxiana
Kennedia glabrata
Kennedia macrophylla
Lambertia echinata subsp. *echinata*
Lambertia fairallii
Lambertia orbifolia
Laxmannia jamesii
Lechenaultia chlorantha
Lechenaultia laricina
Lechenaultia pulvinaris
Lechenaultia superba
Lepidium catapycnon
Leucopogon obtectus
Melaleuca sciotostyla
Microcorys eremophiloides
Microtis globula
Myoporum cordifolium
Myoporum turbinatum
Myriophyllum petraeum
Pandanus spiralis var. *flammeus*
Pimelea rara
Pittosporum moluccanum
Pityrodia augustensis
Pityrodia scabra
Pleurophascum occidentale
Prostanthera carrickiana
Prostanthera magnifica
Pterostylis sp. (Northampton) S. D. Hopper 3349
Ptychosema pusillum
Pultenaea pauciflora
Restio abortivus
Rhagodia acicularis
Rhizanthella gardneri
Ricinocarpos trichophorus
Roycea pycnophylloides
Sowerbaea multicaulis
Spirogardnera rubescens
Stawellia dimorphantha
Stylidium coroniforme
Stylidium galioides
Stylidium plantagineum
Stylidium scabridum
Tetratheca aphylla
Tetratheca harperi
Tetratheca 'paynteri' m.s.
Thelymitra benthamiana
Thelymitra psammophila
Thelymitra stellata
Thomasia montana
Thomasia sp. (York) A.S. George 8075
Thryptomene wittweri
Tribonanthes purpurea
Verreauxia verreauxii
Verticordia fimbrilepis
Verticordia harveyi
Verticordia helichrysantha
Verticordia hughanii
Verticordia staminosa
Verticordia sp. (Fitzgerald) C.A. Gardner 9148
Villarsia calthifolia
Wurmbea drummondii
Wurmbea tubulosa
Wurmbea sp. (Cape Naturaliste) S.D. Hopper 5871
Xyris sp. (Stirling Range) G.J. Keighery 7951

ITEM 2—TAXA PRESUMED TO BE EXTINCT

Acacia prismifolia
Acacia volubilis
Beyeria lepidopetala
Calothamnus accedens
Centrolepis caespitosa
Coleanthera virgata
Cryptandra nudiflora
Cryptandra tubulosa
Deyeuxia drummondii
Dicrastylis morrisonii
Eriostemon falcatus
Eucalyptus rameliana
Frankenia conferta
Frankenia decurrens
Frankenia parvula
Glyceria drummondii
Gonocarpus intricatus
Grevillea batrachioides
Gyrostemon reticulatus
Haloragis platycarpa
Hemigenia exilis
Hemigenia obtusa
Hydatella leptogyne
Hypocalymma longifolium
Lasiopetalum rotundifolium
Lepidium drummondii
Leptomeria dielsiana
Leptomeria laxa
Leucopogon cryptanthus
Leucopogon marginatus
Menkea draboides
Meziella trifida
Nemcia lehmannii
Opercularia acolytantha
Phlegmatospermum drummondii
Platysace dissecta
Plectrachne bromoides
Pseudanthus nematophorus
Ptilotus fasciculatus
Ptilotus pyramidatus
Scaevola attenuata
Scaevola macrophylla
Schoenus natans
Spyridium kalganense
Spyridium microcephalum
Stylidium merrallii
Stylidium neglectum
Taraxacum cygnorum
Tetraria australiensis
Tetratheca elliptica
Tetratheca fasciculata
Thomasia gardneri
Verticordia plumosa var. (Serpentine) L. Preiss 174

APPENDIX III

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

POLICY STATEMENT NO. 9

CONSERVATION OF THREATENED FLORA IN THE WILD

MAY 1991

1. OPERATIONAL OBJECTIVE

To conserve threatened flora in the wild in Western Australia and to comply with Section 23F of the Wildlife Conservation Act.

2. DEFINITIONS

The term 'threatened flora' is used to mean any plant taxon which is threatened with extinction and declared under section 23F of the Wildlife Conservation Act as "rare flora" (i.e. "is likely to become extinct or is rare or otherwise in need of special protection").

"Interim Wildlife Management Guidelines" means guidelines approved by the Director of Nature Conservation for the management and protection of threatened or harvested taxa where no full Wildlife Management Program has been prepared.

"Wildlife Management Program" means a publication produced by CALM providing detailed information and guidance for the management and protection of threatened or harvested species or groups of those species. Programs for threatened taxa are sometimes referred to as "Species Recovery Plans".

3. BACKGROUND

The Department of Conservation and Land Management has statutory responsibilities for endangered flora conservation. This is a major concern because:

i) Western Australia has a flora that is exceptionally rich in localised and rare endemic plant species. Moreover, areas where rare species are concentrated coincide predominantly with the wheatbelt and other areas where there has been extensive clearing or modification of the native flora.

ii) Section 23F of the Wildlife Conservation Act prohibits the taking (injury or destruction) of declared threatened (rare) flora by any person on any land throughout the State without the consent in writing of the Minister. A breach of this provision may lead to a fine of up to $10 000. The flora provisions of the Act are binding on the Crown.

Officers of the Department need to know how to identify declared threatened flora, to know where it occurs, and to know how best to manage it. Moreover, the Act prescribes that endangered flora be protected on all categories of land throughout the state. Hence, the legislation requires officers of the Department to advise and otherwise deal with a broad spectrum of landowners and users. Threatened flora conservation is thus an issue of high public profile, and one where the Department's activities are subject to intense public scrutiny.

The Schedule of Declared Rare Flora

The Schedule of Declared Rare (Threatened) Flora is reviewed annually.

Plants (not including hybrids) which are protected flora declared under the Wildlife Conservation Act may be recommended for gazettal as declared rare (threatened) flora if they satisfy the following criteria:

i) the taxon (species, subspecies, variety) is well-defined, readily identifiable and represented by a voucher specimen in a State or National Herbarium. It need not necessarily be formally described under conventions of the International Code of Botanical Nomenclature, but such a description is preferred and should be undertaken as soon as possible after listing on the schedule;

ii) have been searched for thoroughly in the wild by competent botanists during the past five years in most likely habitats, according to guidelines approved by the Executive Director (see Appendix);

iii) searches have established that the plant in the wild is either:

a) rare;

or

b) in danger of extinction;

or

c) deemed to be threatened and in need of special protection;

or

d) presumed extinct (i.e. the taxon has not been collected from the wild, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently).

(Plants which occur on land reserved for nature conservation may be considered less in need of special protection that those on land designated for other purposes.)

The status of a threatened plant in cultivation has no bearing on this matter. The legislation refers only to the status of plants in the wild.

Plants may be deleted from the schedule of declared rare (threatened) flora where:

i) recent botanical survey as defined in (ii) above has shown that the taxon is not rare, in danger of extinction or otherwise in need of special protection;

ii) the taxon is shown to be a hybrid;

or

iii) the taxon is no longer threatened because it has been adequately protected by reservation of land where it occurs, or because its population numbers have increased beyond the danger point.

"Taking" Endangered Flora

In the Wildlife Conservation Act (subsection 6 (1)) the following definition is given:

> "to take" in relation to any flora includes to gather, pluck, cut, pull up, destroy, dig up, remove or injure the flora or to cause to permit the same to be done by any means;"

Thus, taking declared threatened flora would include not only direct injury or destruction by human hand or machine but such activities as allowing stock to graze on the flora, introducing pathogens that attack it, altering water-tables such that the flora is deprived of adequate soil moisture or is inundated, allowing air pollutants to harm foliage etc.

In the case of threatened plants which need fire for regeneration, burning at an appropriate time may not adversely affect the survival of the population. However, burning would injure existing plants and constitutes "taking" under the Act. Therefore, Ministerial approval is required prior to conducting a burn which involves any species of endangered flora.

4. POLICY

The Department will:

3.1 Identify, locate and seek to conserve threatened flora.

3.2 Undertake research into the taxonomy, population biology, ecology, protection and propagation of threatened flora.

3.3 Implement management practices to conserve threatened flora and its habitat.

3.4 Publicise the need for conservation of threatened flora, and encourage involvement in conservation from all sectors of the community.

3.5 Liaise with other land management and research agencies and private landowners to enhance the study and conservation of threatened flora.

3.6 Develop and manage a geographic database for threatened flora at its headquarters and at regional and district officers.

5. STRATEGIES

To accomplish the Departmental objective and policies, staff will:

5.1 Establish a consultative committee with the Western Australian Herbarium, Kings Park Board, tertiary institutions and other relevant organisations to ensure that research and management of declared threatened flora are co-ordinated.

5.2 Develop Wildlife Management Programs and Interim Wildlife Management Guidelines, for threatened plant taxa, and appoint fixed term "recovery teams" for their implementation.

5.3 Undertake training in Departmental obligations to conserve and manage threatened flora.

5.4 Nominate Threatened Flora Officers (additional to District Wildlife Officers) in each region and district who shall be responsible for identifying, locating, mapping, training staff, overseeing management programs and providing liaison and advice on threatened flora.

5.5 Establish and maintain field herbaria, photographic collections, map records and other aids concerning threatened flora at each Ranger station and district and regional office.

5.6 Arrange an inspection to establish whether declared threatened flora are present before undertaking any activity on CALM land that involves permanent destruction (i.e. clearing for road-making, building, mining or other purposes) of native flora.

5.7 Ensure that no known declared threatened flora is destroyed, damaged, or otherwise injured by Departmental staff or their contractors without first obtaining a ministerial permit so to do.

5.8 Ensure that any burning program (for fire protection purposes) will not cause irreparable damage to species of threatened flora known to be susceptible to fire.

5.9 Observe other operational guidelines for protection of endangered flora on CALM lands as detailed in Administrative Instruction No. 24 "Protection of Endangered (Threatened) Flora in Departmental Operations".

5.10 Monitor known populations of threatened flora.

5.11 Maintain a geographic and biological database on threatened flora.

5.12 Develop management programs for species of threatened flora.

5.13 Collect seed and propagate threatened flora in Departmental nurseries. Replant propagated material in the wild under approved management programmes or approved Interim Wildlife Management Guidelines.

5.14 Undertake research on the distribution, taxonomy, genetic systems, population biology, ecology, protection and propagation of threatened flora.

5.15 Assist private property owners and other land management agencies in the protection and conservation of threatened flora.

5.16 Acquire land through donation, exchange or purchase to protect threatened flora where land and/or funds are available.

5.17 Maintain a system for listing and delisting flora on the declared threatened schedule.

5.18 Publicise information on threatened flora (without disclosing precise locations) and encourage community involvement in the conservation of threatened flora.

5.19 Maintain, through the Wildlife Branch, central records of all correspondence, discoveries of threatened flora populations, basic information on susceptibility to fire or dependence on fire for regeneration, applications for ministerial permits and other matters to do with declared threatened flora.

5.20 Refer enforcement matters regarding the taking of declared threatened flora to the appropriate District Wildlife Officer.

APPENDIX

GUIDELINES FOR SURVEYS OF PLANTS PROPOSED FOR ADDITION OR DELETION TO THE SCHEDULE OF DECLARED THREATENED FLORA

These guidelines were developed in conjunction with new criteria for additions and deletions to the Schedule of declared flora.

Criterion (ii) for additions states:

> The taxon "have been searched for thoroughly in the wild by competent botanists during the past five years in most likely habitats, according to guidelines approved by the Executive Director."

The intensity of survey necessary to understand the conservation status of a plant varies according to a number of factors. Important considerations are:

1. Geographic range

   A taxon extending over 10 km of terrain will take less time to survey than one that occurs over 100 km.

2. Area of available habitat

   Taxa confined to specific localised habitats (e.g. granite outcrops) will require less time to survey than those more catholic in habitat preference.

3. Plant size

   Large conspicuous perennial plants (e.g. eucalypts) can be identified and counted more quickly than small inconspicuous annuals.

4. Seasonality and identification

   Some plants are identifiable and conspicuous on vegetative features at any time of year. Others only stand out during flowering or fruiting, which may be confined to just a few weeks in the year, and may also be dependent on good seasonal conditions.

5. Disturbance opportunism

   Some plants only germinate and/or flower following disturbance events such as bushfire or earthworks, and hence can only be surveyed after such events.

Based on these considerations, and the accumulated survey experience of many botanists and other CALM officers who have searched for hundreds of Western Australian plants over the past decade, the following matrix provides guidelines as to the duration of search necessary for plants to be considered for addition or deletion to the schedule of declared threatened flora.

Extremes of plant taxa in terms of ease and seasonality of identification are given.

Geographical Range	Area of available habitat	Recommended period of full time field survey: *Taxon easily identifiable any time	Recommended period of full time field survey: # Taxon identifiable with difficulty over short flowering period in certain years
< 50 km	small	0.5-1 month	1-2 months over several years
	large	1-2 months	3-6 months over a decade
> 50 km	small	3-6 months	6-12 months over a decade
	large	6-12 months	not possible

*e.g. large perennial plants identifiable any time on vegetative characteristics - *Eucalyptus crucis, Banksia tricuspis.*

e.g. short-lived small annuals with inconspicuous flowers - *Hydrocotyle* spp., annual sedges etc.

Having completed surveys according to the above guidelines, the next phase in considering listing on the schedule is described under Criterion for additions (iii).

"Such recent botanical survey has shown that the taxon in the wild is either rare, or in danger of extinction or in need of special protection".

These three categories of endangered flora are defined below.

Rare

Less than a few thousand plants of the taxon exist in the wild.

In danger of extinction

The taxon is in serious risk of disappearing from the wild state within one or two decades if present land use and other causal factors continue to operate.

In need of special protection

The taxon is not presently in danger of extinction but is at risk over a longer period through continued depletion, or largely occurs on sites likely to experience changes in land use which would threaten its survival in the wild.

Presumed extinct

The taxon has not been collected in the wild, or otherwise verified, over the past 50 years (from the date of listing) despite thorough searching, or of which all of the known wild populations have been destroyed more recently, and is presumed to be extinct.