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Declared Rare and Poorly Known Flora in the Albany District

by

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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-bird and the Rose Mallee).

This program provides a brief description of the appearance, distribution, habitat and conservation status of flora declared as rare under the Western Australian Wildlife Conservation Act (Threatened Flora) and poorly known flora (Priority Flora) in CALM's Albany District and makes recommendations for research and management action necessary to ensure their continued survival. By ranking the Declared Rare Flora in priority order for these requirements, Departmental staff and resources can be allocated to taxa most urgently in need of attention.

Priority 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 taxa.

ACKNOWLEDGEMENTS

We are indebted to many people for their support, assistance and encouragement in the background research, field work and preparation of this document.

CALM Albany district staff, Malcolm Grant, Nathan McQuoid, Lawrie Anderson, Allan Rose and Lindsay Brown were invaluable in the field. Maurice McDonald and Anne Cochrane from WA Herbarium Threatened Flora Seed Centre also coordinated their activities to assist us.

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Margaret Pieroni made Dryandra Study Group data available.

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Consultants Alex George and Malcolm Trudgen provided identification and taxonomic information on the groups they are revising. Gillian Craig provided the results of some of her research at Kew.

Kings Park researchers Kingsley Dixon, Kathy Meney and Ingrid Sieler identified sedges and Eleanor Bennett provided new descriptions of species of *Conospermum*.

ABBREVIATIONS

Alb	Albany Shire
Aug	Augusta-Margaret River Shire
Cb	Cranbrook Shire
Dnmk	Denmark Shire
Esp	Esperance Shire & District
FRNP	Fitzgerald River National Park
Gno	Gnowangerup Shire
Jer	Jerramungup Shire
Manj	Manjimup Shire
MRD	Main Roads Department
NP	National Park
NR	Nature Reserve
pers. comm.	personal communication
Pl	Plantaginet Shire
Rav	Ravensthorpe Shire
SF	State Forest
SRNP	Stirling Range National Park
Ta	Tambellup Shire
TFSC	Threatened Flora Seed Centre
Tmbr	CALM Timber Reserve
Town	Albany Town Council Reserve
UVR	Unvested Reserve
VCL	Vacant Crown Land
verge	Road verge vesting undetermined
WAWA	WA Water Authority
WH	as stated on WAHerb

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PART ONE : INTRODUCTION

1. The Need For Management

Western Australia has a unique flora world renowned for its diversity and high level of endemism. WACENSUS, the database of plant names for the State, lists 10809 taxa (August, 1994) with the total likely to exceed 13000 once botanists have completed surveying, searching and describing the flora. A significant proportion of the Western Australian total is concentrated in the south-west of the State, where there is 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 percent of the Australian total of threatened, rare or poorly known plant species with 82 percent restricted to the south-west. Nearly 2000 taxa are currently recognised as threatened, rare or poorly known (Atkins, pers. comm.).

Although some plants are rare because of their requirement for a specific restricted habitat, the majority have become rare because of the activities of European man. Extensive land clearing and modification of the environment has resulted in the extinction of some species and threatens the survival of many others. Continued land clearing, disease particularly due to *Phytophthora* species, exotic weeds and pests, road works, domestic grazing and salinity continue to threaten the flora.

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 throughout the State. Section 23F of the Act (Appendix I) gives the Minister responsible for the Act statutory responsibility for the protection of those plant taxa declared to be rare (threatened taxa).

In 1993, 271 extant taxa were classified as Declared Rare Flora and a further 43 species were listed on the schedule as presumed extinct (Appendix II). In addition to those with special protection, 1408 taxa were listed on CALM's priority flora list as at October 1992. 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 Albany District, **as of October 28 1992**. The Albany District covers some 22,000 km^2 of which much has been cleared for agriculture. Although a significant proportion of land occurs in conservation reserves and National Parks, the flora in many of these uncleared areas is under severe threat from dieback disease caused by *Phytophthora* species; soil borne fungal pathogens. Figure 1 shows the location of the Albany District in relation to the major CALM Management Regions of the State.

2. Objective of the Program

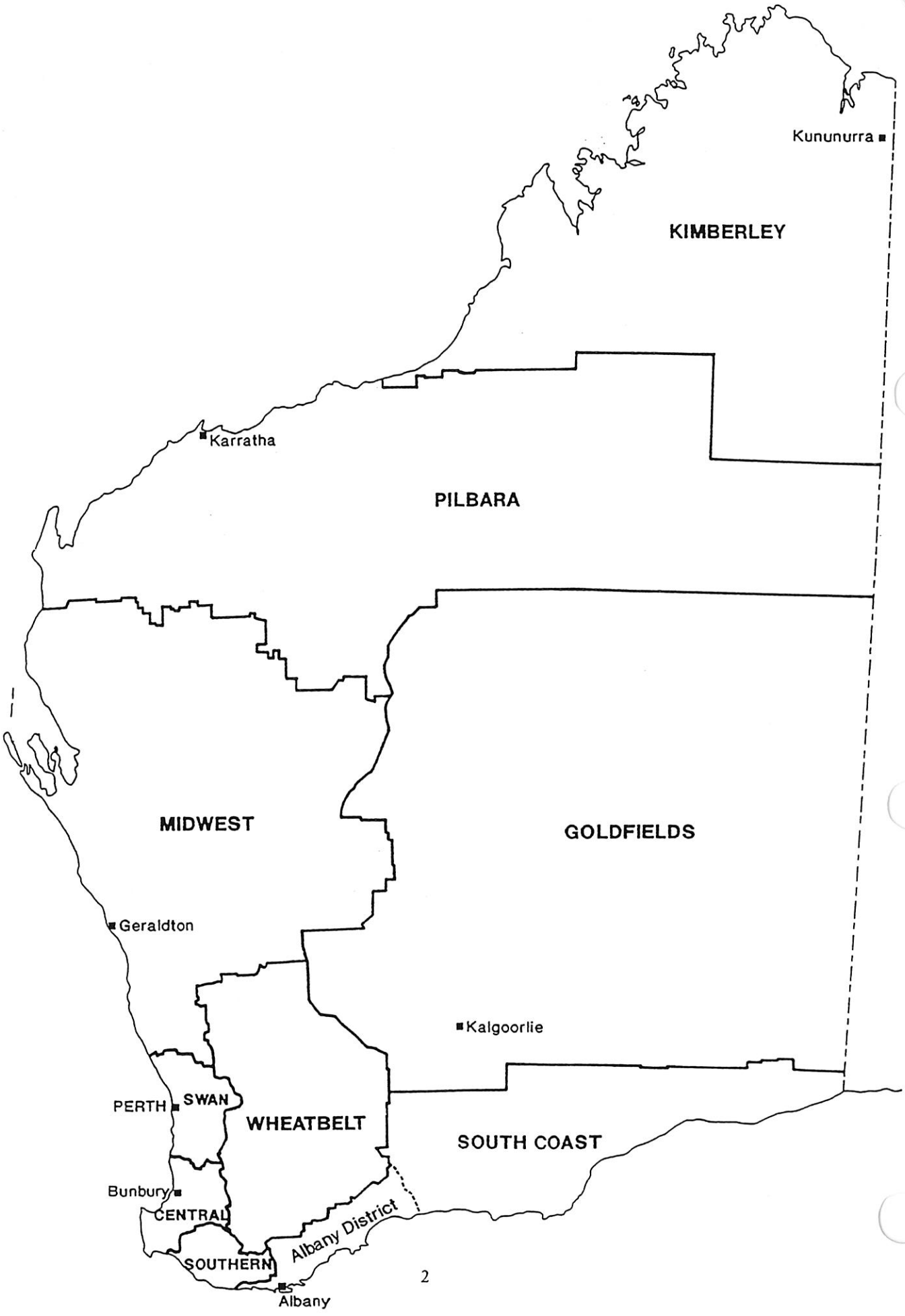
The objective of this program for the Albany District is:

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;

Figure 1. Location of the Albany District in relation to other CALM Management Regions of the State



* 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 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, hybrids) 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;

* Deemed to be threatened and 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.

In addition hybrids or suspected hybrids which satisfy the above criteria also must be:

* a distinct entity, that is, the progeny are consistent with the agreed taxonomic limits for that taxon group;

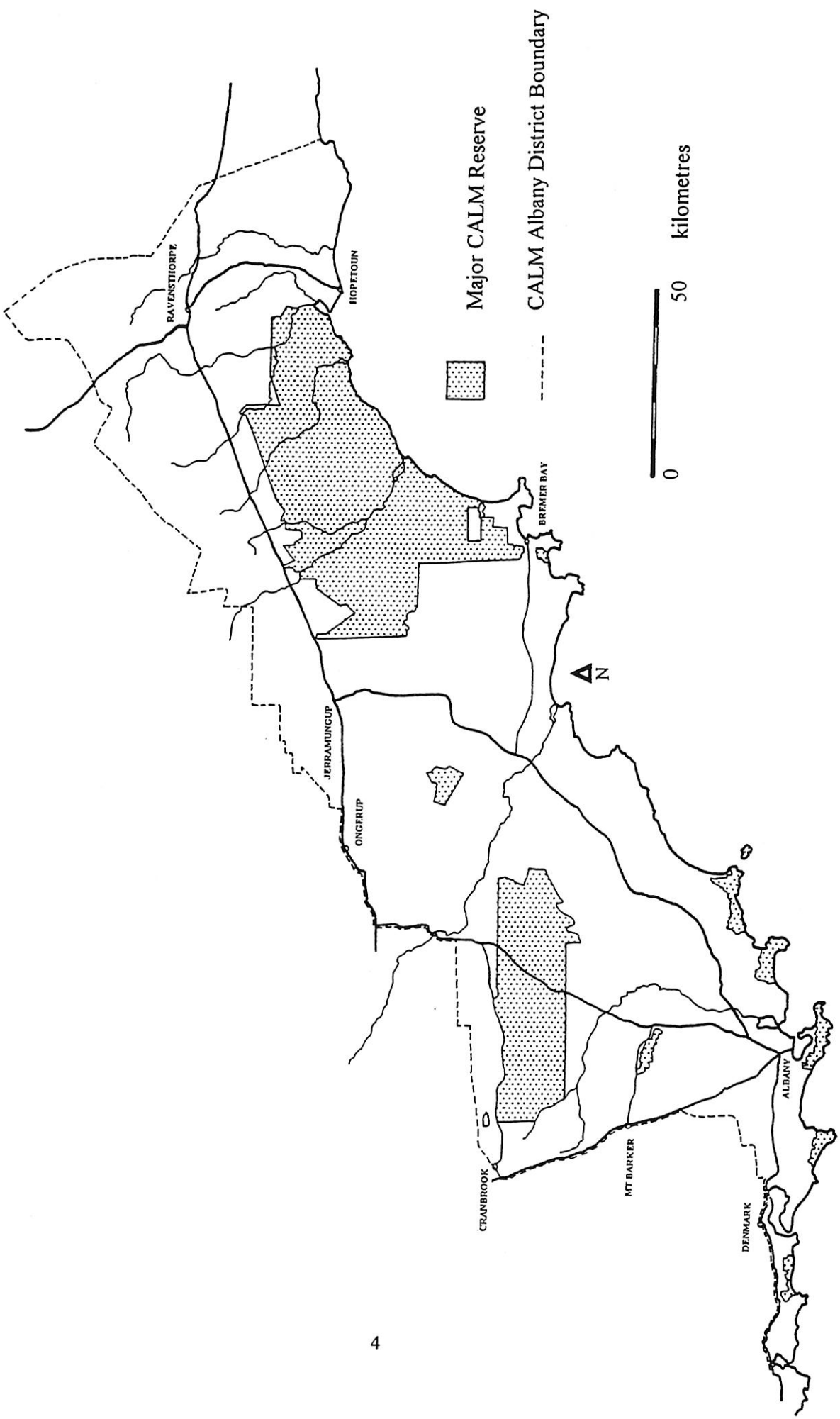
* capable of being self perpetuating, that is, not reliant on the parental taxa for replacement; and

* the product of a natural event, that is, both parents are naturally occurring and cross fertilisation was by natural means.

Protection under section 23F 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', by any person, 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.

Figure 2. The Albany District covered by this program



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 (Appendix III), 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 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 Flora List

CALM maintains a priority flora list to determine priorities for survey of plants of uncertain conservation status. The list comprised 1408 (at October 1992) 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. 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 perceived 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, 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 the Species Conservation Section (Bioconservation Group, Science and Information Division) 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;

* 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 Species Conservation Section (Bioconservation Group, Science and Information Division) 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 Albany District;

* Enforcement matters relating to the provisions of the Wildlife Conservation Act are the responsibility of Wildlife Officers in the South Coast Region;

* Implementation and revision of the management program is the responsibility of the Albany District and Wildlife Branch.

6. The Albany District

The CALM Albany District lies centrally in the western half of the south coast of Western Australia, extending 350 km from Irwin Inlet (between Walpole and Denmark) east to Starvation Boat Harbour (35 km east of Hopetoun) and up to ninety kilometres inland from the coast. It is bounded by CALM's Southern Forest Region to the west and north west, the Wheatbelt Region to the central north and the Esperance District to the east. The Albany and Esperance Districts form CALM's South Coast Region. The Albany District includes parts of the Shires of Denmark, Plantagenet, Cranbrook, Gnowangerup, Jerramungup and Ravensthorpe and all of Albany Town and Albany Shire. Albany is the only major town of the District, servicing the regional administration and the agricultural hinterland and has a history of continuous European occupation and settlement from 1826.

The District covers an area of 22,096 km^2 (2,209,673 ha.) including 78 conservation reserves (510,470 ha.) managed by CALM and the CALM South Coast Region Management Plan proposes further increases of 150,000 ha. before the year 2002. Ninety two percent of current CALM managed land is in National Park and approx. five percent is Nature Reserve. By 2002 the balance may change to 22% Nature Reserve, 74% National Park and the remainder in Conservation Park and State Forest.

The District includes the Stirling Range (115,000 ha.) and Fitzgerald River (320,000 ha.) National Parks, which are world renowned for the diversity of their floras and the high number of a rare and endemic plant species.

6.1 Climate

The climate of the Albany District is Mediterranean with mild, wet winters and warm, dry summers. Rainfall varies from in excess of 1100 mm at Denmark to around 900 mm at Albany, but tapers off eastward to 625 mm at Bremer Bay and 490 mm at Hopetoun. Within the Stirling Range rainfall is around 600 mm, declining to 400-500 mm immediately north, whilst Jerramungup is down to 370 mm and Ravensthorpe 418 mm. Occasional summer rainfall is a feature of coastal regions in the District.

6.2 Geology, Landforms and Soils

The four tectonic units recognised in Albany District are:

Yilgarn Craton or Block
These rocks from the Archean (2,600-3,100 million years ago) are largely composed of gneiss and granite with enclaves of highly metamorphosed and deformed sedimentary deposits. Around Ravensthorpe, older and highly metamorphosed rocks of this unit form an elongate greenstone belt which is highly prospective for minerals. Generally, the underlying granite is covered by the products of weathering, but may occasionally surface as rounded hills.

The Yilgarn Craton abuts the Stirling Range and the northern part of the Fitzgerald River National Park.

Albany-Fraser Province
This unit is composed of 1,200-1,400 million year old Proterozoic gneiss and granite which is visible in landscape as the Doubtful Islands, Porongorup Range, Manypeaks, Willyung Hill, Warriup Hill, Mt Gardner and parts of West Cape Howe. This Province extends to Point Charles.

Stirling Range Formation and Mount Barren Group
These formations are Middle Proterozoic (1,100 million year old) sequences of highly metamorphosed and deformed sediments (sandstones and shale) resulting in schist, phyllite and quartzite. This formation straddles the boundary between the Yilgarn Craton and the Albany-Fraser province. Recent fossil finds in the Stirling Range may indicate that it is of much younger Cambrian formations (540-590 million years old).

Bremer Basin
This unit was formed from about 135 million years ago when the sea extended inland for up to 100 km, over what is now land from west of Albany to east of Esperance. It overlies parts of both the Yilgarn Craton and the Albany-Fraser Province. Deposition of sediments resulted in what are generally called the Plantagenet Beds composed of sand, silt, clay and overlying sponge spicules. The latter formed deposits of spongolite which have been subsequently eroded into cliff faces along the Pallinup, Gardiner and Fitzgerald River valleys, and may form flat topped mesas such as Roe's Rock in the Fitzgerald River National Park. Other spongolite deposits are at Kamballup, north of Cape Riche and Dillon Bay.

Variation in weathering, climate and local relief of the four units of underlying geology has largely determined landforms and soils. Three landforms are recognised:

Avon Region
This region encompasses much of the southwest but only extends into the western end of the CALM Albany District to just east of Albany, and north and west of the Stirling Range. It is dominated by lateritised plateaux and a variety of soils with associated soil horizons of red earths, yellow sands and duplexes.

Stirling Region
This landscape, which covers the bulk of the District, is also characterised by lateritised plateaux and is dominated by yellow duplex soils on the plains and dissected terrain. Shallow sandy or silty soils and rocky detritus generally surround the various hills and ranges from which they have weathered.

Coastal Region
The landforms of the coast are a series of headlands and intervening sandy beaches. The headlands are most frequently granitic, but may also be overlain by limestone as at Limestone Head in Torndirrup National Park, or are bluffs of schist and quartzite as is common in Fitzgerald River National Park (e.g. Point Ann and Quoin Head). The headland at West Cape Howe is composed of dolerite. The soils which may form consolidated or mobile dunes are mostly siliceous sands of granitic origin or calcareous dunes blown inland from the recently exposed seabed.

6.3 Vegetation

The Albany District includes some of the most species rich and varied areas of Australia and indeed the world, with as many as 3,000 species. It has such a wide range in rainfall (1100 mm to <400 mm; west to east), topography, geology and soils that the vegetation associations and species composition are very diverse. The entire District falls within the South-West Botanical Province (Beard, 1979), and includes parts of the Darling, Avon, Eyre and Roe Botanical Districts.

To the west of Albany (Warren Botanical Subdistrict), the CALM Albany District is composed of pockets of tall Karri forest on sandy loams, Jarrah-Sheoak low forest on shallow sands over laterite, heath on sand, coastal scrub-heath on limestone and woodland of Yate-Karri-Peppermint on consolidated siliceous dunes. Sedgeland, heath and Paperbark woodlands occur in seasonally/permanently inundated areas of peaty sands on the coastal plain.

Between Albany and the Porongurup Range (Menzies Botanical Subdistrict) Jarrah-Sheoak low forests predominate, giving way to Jarrah-Marri-Wandoo toward the Stirling Range. The Porongurup Range itself includes areas of tall Karri forest on the upper slopes of heavy loam and Jarrah low forest on the surrounding sands and laterites.

The Stirling Range vegetation is mainly composed of thickets on the upper slopes, Jarrah and Marri-Spearwood mallee-heaths on the upper and lower slopes, Jarrah-Marri woodland in the deep valleys and Wandoo woodland on the lower slopes and flats. To the north of the Stirling Range there are remnants of true mallee communities which have been mostly cleared for agriculture.

East and south-east of the Stirling Range (Eyre Botanical District) through to Ravensthorpe, Tallerack mallee-heath and Banksia scrub-heath occur extensively on sandy plains. The heavier gravel and clay soils and breakaways support Swamp Yate, Moort or Mallet woodlands, mallee or mallee-heath. Swamp Yate woodland, Sheoak woodland and broombush thickets occur on shallow loams overlying granites of the Yilgarn Craton. The Barren Ranges are dominated by dense thickets, and mallee heath. Shallow depressions in clay soils, which are inundated in winter are widespread and common and support tall woodland of Swamp Yate. Saline water courses and lakes, more common north and immediately south-east of the Stirling Range support Samphire, sedgeland and Paperbark communities. While areas of spongolite near Kamballup, Cape Riche and the Fitzgerald and Hamersley Rivers support low heath or scrub when flat and mallet woodlands are eroded into breakaways.

The Ravensthorpe Range is mainly dense thicket and scrub with mallet woodlands on the flanks and breakaways and scrub-mallee on the lower slopes. Pockets of deeper soil around Ravensthorpe support Salmon Gums and/or Swamp Yate woodland. East of the Ravensthorpe Range the vegetation (still within the Eyre Botanical District) is largely composed of extensive mallee-heaths on gravelly sands and Banksia woodlands on deeper sands.

The coastal vegetation east from Albany consists of coastal heath and scrub on dunes and limestone, scrub-heath and mallee heath on granite and scrub-heath on quartzite in the Fitzgerald area.

7. Botanical History of the Albany District

The first European botanical exploration in the Albany area was made in September 1792 by Archibald Menzies, surgeon and botanist aboard H.M.S. *Discovery*. In December 1801 the *Investigator*, captained by Matthew Flinders anchored in King George Sound for four weeks for maintenance. On board was Robert Brown, naturalist to this expedition, who was to become perhaps the most important collector in the history of Australian botany. He took advantage of this opportunity and collected some 500 taxa from the Albany area.

Allan Cunningham, Colonial Botanist to N.S.W., arrived in 1818 at King George Sound aboard the *Mermaid*. This cutter was captained by Phillip King, who had been sent from the new colony at Sydney to chart the northern coasts. They were anchored in Oyster Harbour and Cunningham made a large collection. King also returned for a month in November 1822 and collected flowering specimens of *Kingia*.

A French expedition, led by Dumont d'Urville in *L'Astrolabe*, visited the region in 1826 and two scientists, Lesson and Richards, collected a number of plant specimens from the area. William Baxter collected, for both private interests and the Colonial Office, in the Albany region from 1823 to 1835 and Charles Fraser, Botanist to N.S.W., visited the new settlement at King George Sound in 1827 with James Stirling. Surgeon, Alexander Collie who was appointed to Albany at this time also collected between Albany and the Swan River Colony. A few years later an Austrian collector Baron von Huegel collected around Albany and inland to the King and Kalgan Rivers in 1834 and he was followed in 1836 by Charles Darwin during his voyage in the *Beagle*.

James Drummond, the most important botanical collector in Western Australia, visited King George Sound in 1840 and collected in the district with Ludwig Preiss (who had already been out to Cape Riche). Preiss, a German botanist, was a rival collector to Drummond and remained in the colony from 1838 to 1842. When he left he took a large collection of 2000 specimens which eventually found their way to European herbaria. Drummond completed six major collections from 1841 to 1851. The third, from November 1843 to February 1844 with his son Johnston, covered Albany, Manypeaks, Cape Riche, Porongurup and skirted the Stirling Range. His fourth collection in late 1846 to 1847, encompassed the Stirling Range, Cape Riche and West Mount Barren Range. He was accompanied by George Maxwell who later became a collector in his own right until the 1870s. The fifth collection, May 1848 to 1849 was largely made on the way to and around the Stirling Range, Albany, Cape Riche, Pallinup River and into what is now the western side of the Fitzgerald River National Park.

Ferdinand von Mueller appointed as Victorian Government Botanist, visited Albany, Porongurup and the Stirling Range in 1867 and during the 1860s and 1870s, Maxwell and Augustus Oldfield collected for him throughout the region, sending their specimens to Mueller in Melbourne.

Toward the end of the 19th century, and to the current era, many people have contributed to the knowledge of the flora of the Albany District. Colonel B.T. Goadby, who was engaged as an engineer made a number of collections around 1897. Later, Cecil Andrews, an education administrator who travelled widely throughout the south west in the early 1900s, described Albany species from his own collections. While Ludwig Diels, a travelling German botanist collected through to the Fitzgerald region in 1901. Diels' publication with Pritzel, Fragmenta Phytographiae Australiae Occidentalis (1905) was of great importance and of value to many Botanists.

A.A. Dorrien-Smith, from the U.K., collected from Yallingup to the Stirling Range in 1905. A number of new species were subsequently described from his collections by Karl Domin who described and studied the nomenclature of many plants of the Stirling range.

From the early 1920s, Charles Gardner (Government Botanist) began his collections and studies of the Western Australian flora which extended to the 1960s. He collected extensively in the Albany District, and published many species names in the Journal of the Royal Society of W.A.

In 1964, an overall mapping project of the State, the Vegetation Survey of Western Australia, was established. John Beard systematically described and mapped the vegetation, defining distinct regions on the basis of characteristic landscape and vegetation. Vegetation maps were prepared for the area covered by this plan (Beard, 1973, 1976 and 1979). Sherwin Carlquist (1974) investigated evolution and adaptation of the South West flora with particular reference to *Darwinia* in the Stirling Range National Park. Recently various aspects of the flora of the Stirling Range have been covered by Thomson *et al.* (1992).

A number of recent collections have contributed to the botanical survey of the Albany region. Most of these were staff of the CALM Western Australia Herbarium. Collections of the Albany flora have also been made by CSIRO staff studying the avifauna and by Ken Newbey who made comprehensive collections from the Fitzgerald River National Park, Corackerup Nature Reserve and the area around the Stirling Range. His collections are now part of some 11,000 sheets in the Albany Regional Herbarium, most of which were collected by Mrs E. Croxford and a dedicated team from the Albany Wildflower Society.

PART TWO : DECLARED RARE FLORA IN THE ALBANY DISTRICT

In 1993, 63 taxa of Declared Rare Flora were known to be extant within the boundaries of the Albany District. Five species listed as presumed extinct on the Declared Rare Flora schedule are also included. While they have been collected from the Albany District in the past, no extant populations are recorded.

A brief description of the morphology, distribution, habitat, and conservation status is provided for each taxon. Where appropriate, the impact of certain factors such as fire, mechanical disturbance, weed invasion and *Phytophthora* dieback is noted from observations made in the field during routine monitoring and from discussion with District and research staff. Recommendations are made for management and protection action to ensure the continued survival of populations of each taxon.

Descriptions of taxa were compiled by consulting references and from discussion with botanists. Distribution and habitat were recorded from Departmental Rare Flora files. Emphasis was placed on the particular habitat characteristics of locations in the Albany District. Conservation status was determined from field observations, and population and location data on Departmental files. It is a brief summary of the number and condition of populations throughout the range of the taxon and threats to population survival. A table for each taxon lists the location, land status, date of last survey, number of plants and condition for populations. The list of known populations generally refers to those in the Albany District only although there may be some populations listed which occur outside the District. Only populations which have been surveyed are included. Precise locality details are contained on Departmental files and a computerised database. Populations with numbers in brackets are newly discovered populations which are still to be incorporated into the CALM rare and threatened flora database. Herbarium records may indicate a wider range and larger numbers of populations, some of which are known to have been destroyed since the time of collection.

Acacia argutifolia Maslin

MIMOSACEAE

East Barrens Wattle

Acacia argutifolia is a low spreading, intricately branched shrub, frequently up to 1 m across and 0.3 m high. The old woody branches are grey, tending reddish toward the growing tip. The mid green phyllodes (6-13 mm) are roughly trigonous, less than 1 mm wide, with grooves either side of the prominent midrib, and are scattered to crowded, spreading or slightly reflexed. The phyllodes are also rigid with a 1 mm, pointed mucrone, yellow turning brown toward the apex. The globular inflorescences are simple, 1 per node, on a 5 mm peduncle with 23-25 pale yellow flowers. Pods are up to 4 cm long and slightly curved.

This species is closely related to *Acacia simulans*, which has longer verticillate phyllodes and a sprawling, less dense habit. *Acacia ingrata* is another widespread species with a very similar habit, but differs in having slightly flattened, elongated triangular phyllodes.

Flowering Period: July-January, -intermittent.

Distribution and Habitat

Acacia argutifolia occurs from East Mount Barren, north through the Eyre Range and No Tree Hill and east to Kundip. A record from Thumb peak needs to be verified as there is no herbarium specimen. The type specimen was collected by Maslin from the northern slopes of Whoogarup Range in 1975. This species is known from seven populations extending over 30 km within National Park and proposed Nature Reserve, and is not perceived to be under any immediate threat.

It occurs in shallow soils over quartzite on hills, peaks and ridges supporting an association of open mallee over scrub.

Conservation Status

Current: Declared Rare Flora

Recommended: Priority 4

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. East Mt Barren	Albany	Rav	NP	9.8.92	+2000	good
2. Whoogarup Range	Albany	Rav	NP	1965	-	-
3. Thumb Peak	Albany	Rav	NP	-	-	-
4. Annies Peak	Albany	Rav	NP	24.10.88	+30	healthy
5. Kundip	Albany	Rav	WAWA	15.11.87	3	healthy
6. W of Kundip	Albany	Rav	VCL	20.2.85	-	-
7. No Tree Hill	Albany	Rav	NP	7.1.92	+500	healthy
8. Sepulcralis Hill	Albany	Rav	NP	8.6 93	+300	healthy

WAHerb: 14 records (Dec. 1992).

Response to Disturbance

Unknown; has regenerated successfully after fire from seed.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

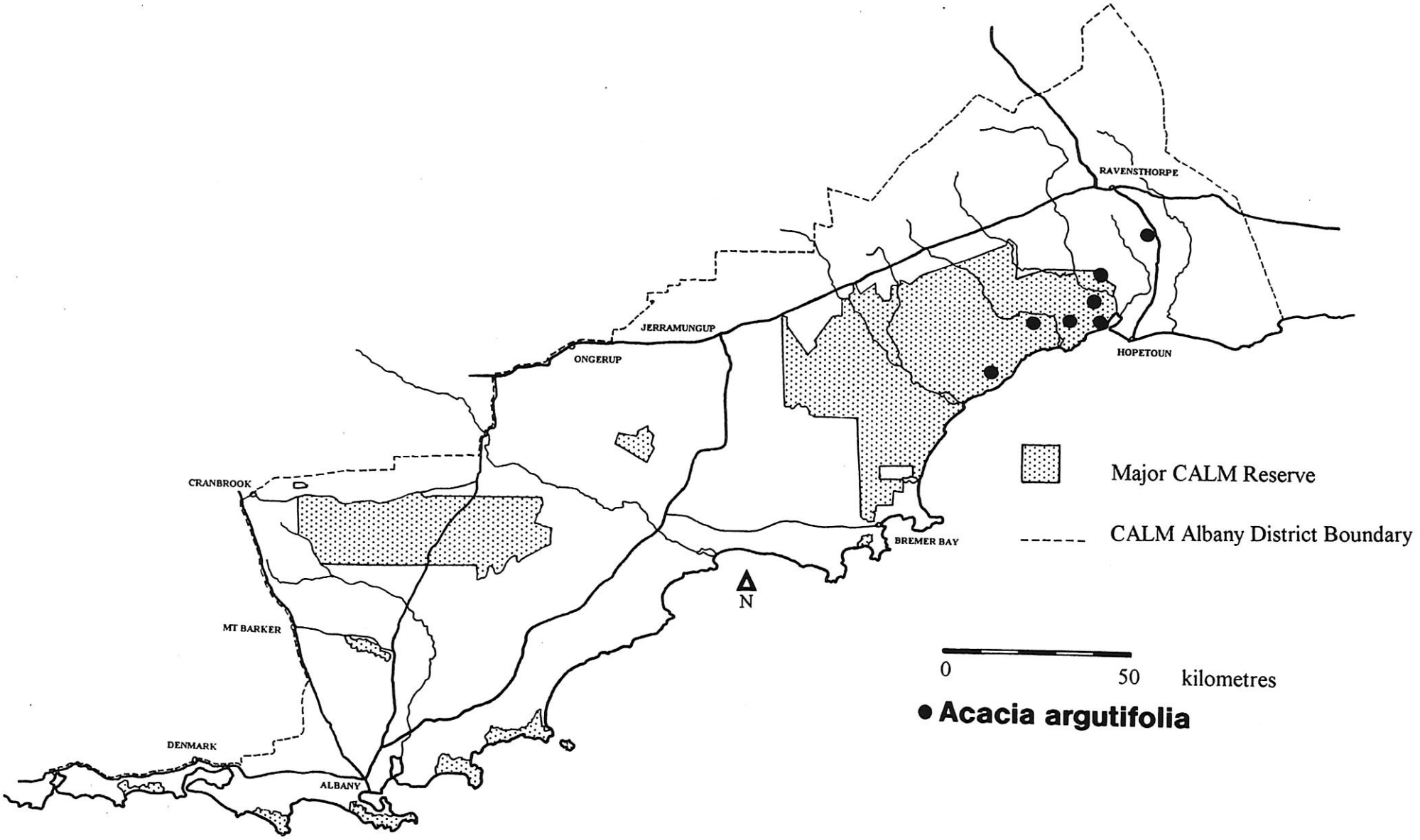
- inspect populations periodically
- exclude fire from recently burnt or disturbed sites

Research Requirements

- further survey within FRNP (Thumb Peak) and proposed reserves
- assessment of fire regime impacts and inter-fire period for adequate seed production

References

Maslin (1976).


RAVENSTHORPE
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Acacia argutifolia

Acacia simulans Maslin

MIMOSACEAE

Barrens Kindred Wattle

Acacia simulans is an open sprawling shrub to 0.5 m high and across , with its stems divided at ground level. The 12 mm phyllodes are four sided, rigid, pungent pointed, and arranged in whorls which are spreading or slightly reflexed. The pale yellow flowers are usually in pairs, in the whorl axil toward the branch end. Phyllodes are pale green and stems silver grey.

Following wildfire in Fitzgerald River National Park in 1990 this species regenerated successfully from seed.

Flowering Period: July-September.

Distribution and Habitat

Acacia simulans is very widespread in the western portion of Fitzgerald River National Park in the region between Point Ann and the Gordon Inlet and inland through Mt Bland, West Mt Barren to Mt Maxwell. It also occurs in other lands to the north of Bremer Bay. Typically it occurs in low open mallee over scrub or heath in white or grey sands over quartzite. This habitat is widespread and recent survey has indicated that this species is more common than originally thought.

Conservation Status

Current: Declared Rare Flora

Recommended: Priority 4

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Mt Maxwell	Albany	Jer	NP	11.8.63	-	-
2. Pt Ann	Albany	Rav	NP	16.9.92	+500	healthy
3. Mt Bland	Albany	Jer	NP	12.3.92	+2000	healthy
4. West Mt Barren	Albany	Jer	NP	15.9.92	+1000	healthy
5. Tooregullup	Albany	Jer	VCL	-	-	-
7. Trigelow Beach	Albany	Rav	NP	16.9.92	+2000	healthy
8. Pullitup	Albany	Jer	VCL	1.2.92	+10	healthy

WAHerb: 11 records

Response to Disturbance

Will regenerate from seed after fire.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

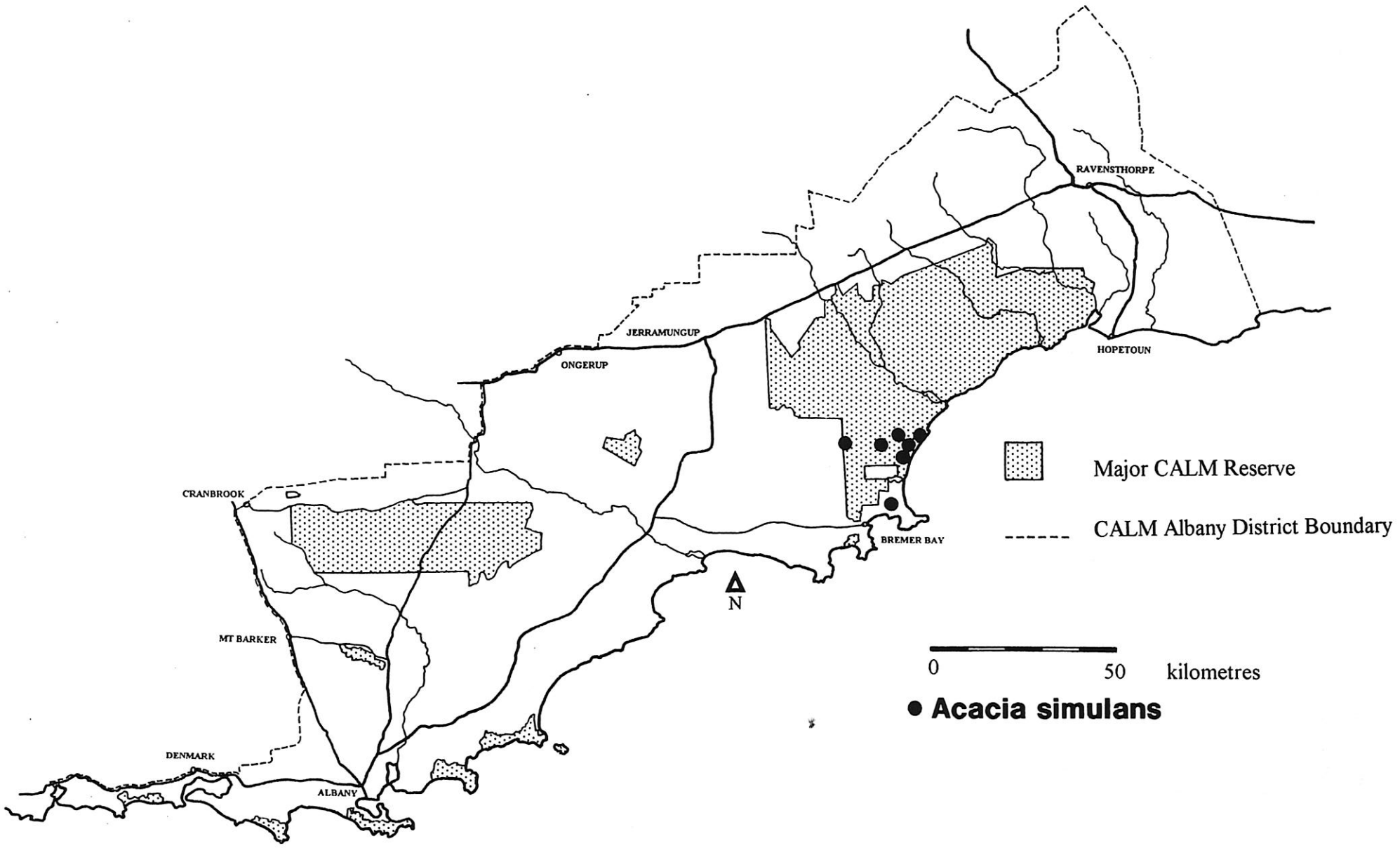
- periodic monitoring (5-10 years)

Research Requirements

- assessment of fire regime impacts and inter-fire period for adequate seed production

References

Maslin (1976).


RAVENSTHORPE
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BREMER BAY
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CALM Albany District Boundary
0
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kilometres
● Acacia simulans

Adenanthos cunninghamii Meisn.

PROTEACEAE

Albany Woollybush

Adenanthos cunninghamii is an erect bushy shrub to 2 m tall, with soft, finely hairy, divided grey-green leaves, with slightly flattened laciniae. The flowers are crimson. Individuals of this taxon generally occur scattered through populations of *A. sericeus* and *A. cuneatus* and do not form homogenous stands. This fact combined with a leaf form somewhat intermediate between the other two species, has led to the suggestion that it may be a hybrid. Nelson (1978) notes that the type specimens were most likely to have originated from plants cultivated at Sydney Botanic Gardens around 1835. Meissner would therefore have been unaware of the possibility that this taxon may be a hybrid.

Flowering Period: Sept-Oct

Distribution and Habitat

The Albany Woollybush occurs from Cheyne Beach to Sand Patch (10 km SW of Albany) in deep sand in association with heath or low scrub

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Isthmus Hill	Albany	Alb	NP	11.4.90	6	undist.
2. Snake Hill	Albany	Alb	NP	11.5.90	53	-
3. Vancouver Pen.	Albany	Alb	Shire res.	11.1992	1	healthy
4. Two Peoples Bay	Albany	Alb	NR	3.11.88	6	-
5. Ledge Beach	Albany	Alb	Shire res.	13.8.92	1	undist.
6. Little Grove	Albany	Alb	various	21.6.91	13	-
7. Sand Patch	Albany	Alb	Shire res.	12.2.91	6	-
8. Gap Road	Albany	Alb	NP	10.1992	3	healthy
9. Torndirrup	Albany	Alb	NP	12.2.91	6	-
10. Newhills Harbour	Albany	Alb	NP	30.11.92	1	burnt
11. Little Grove	Albany	Alb	various	30.11.92	6	undist.
12. Mermaid Point	Albany	Alb	NP	1992	-	-

WAHerb: 28 records (20 from one location) 12.2.93

Response to Disturbance

Killed by fire and regenerates from seed.

Susceptibility to *Phytophthora* Dieback

Presumed susceptible (moderate)

Management Requirements

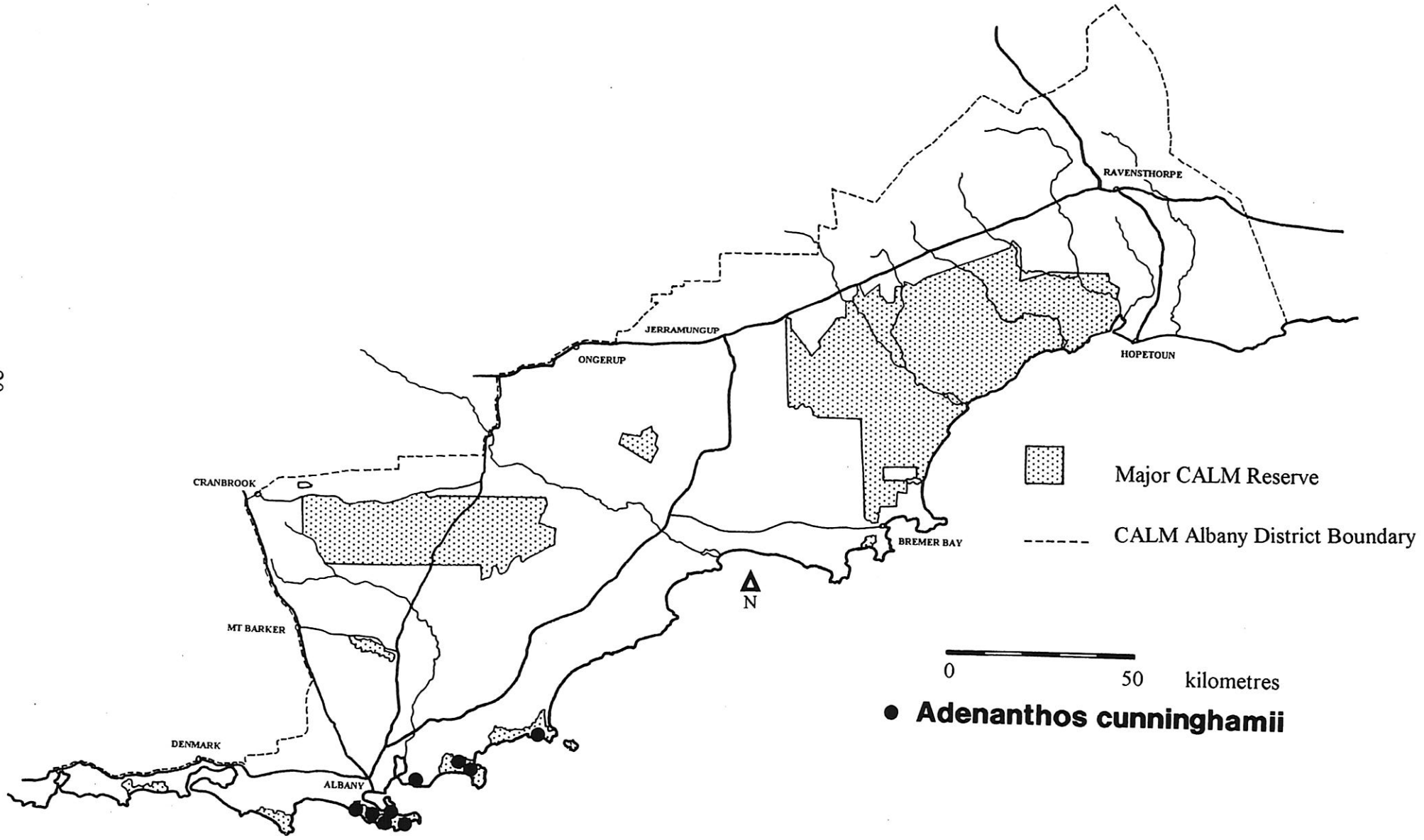
- if this species is shown to be a hybrid, then the status and appropriate management of hybrids will need to be established and applied accordingly.
- monitor regularly

Research Requirements

- morphometric, genetic and pollen sterility analysis to determine taxonomic status and ability of taxon to self-perpetuate.
- assess response to dieback
- assess respone to fire

References

Nelson (1978).


RAVENSTHORPE
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CALM Albany District Boundary
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kilometres
Adenanthos cunninghamii

Adenanthos dobagii E.C.Nelson

PROTEACEAE

Fitzgerald Woollybush

Adenanthos dobagii is a diffuse, non lignotuberous spreading shrub with ascending branches to 1.5 m tall. The bright pale green leaves, crowded at the branch ends are divided into 3 sparsely hairy lobes; the lateral lobes usually divided into two or three laciniae, 8-20 mm long and 0.5 mm in diameter with an apical gland. The flowers are mainly terminal, cream and pale pink and sparsely hairy. This species is infrequently visited and its biology is poorly known. This species is closely related to and of similar appearance to *Adenanthos flavidiflorus* which is widespread through Fitzgerald River National Park.

Flowering Period: August-November

Distribution and Habitat

Known from one extensive population (spread over approx. 10 km) in sandy soil among low shrubs in the Fitzgerald River National Park from Telegraph Track to Quoin Head and from scattered coastal plants between Quoin Head and Marsh's Beach. Part of the Quoin Head population was burnt in late 1989 and is now regenerating as seedlings.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Quoin Head	Albany	Alb	NP	9.93	1,000's	healthy
2. Quoin-Marsh's	Albany	Alb	NP	6.10.93	scattered	healthy

WAHerb: 2 records (both KRN; Nelson also collected from this location, specimens in CANB)

Response to Disturbance

Killed by fire and regenerates from seed.

Susceptibility to *Phytophthora* Dieback

Presumed susceptible (moderate)

Management Requirements

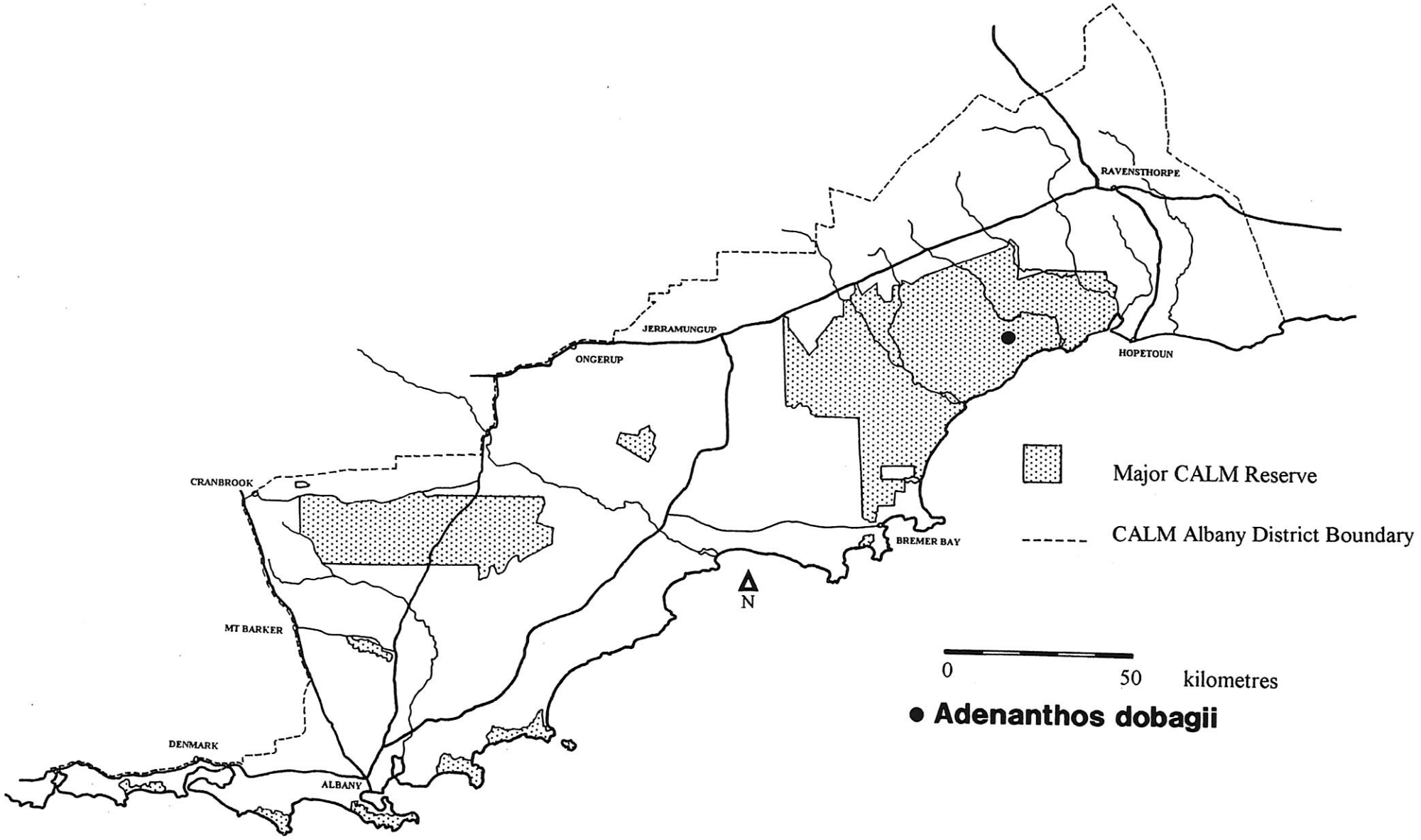
- monitor regularly
- collect seed

Research Requirements

Oportunistic search for other populations

References

Nelson (1978).


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0
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kilometres
● Adenanthos dobagii

Adenanthos ellipticus A.S.George

PROTEACEAE

Oval Leaf Adenanthos

Adenanthos ellipticus is a tall, slender open shrub (to 5 m), without a lignotuber. The leaves are elliptic, 2-5 cm long and 5-15 mm wide and may be slightly lobed at the tip. Branchlets and young leaves have short appressed hairs, tending to glabrous with age. The solitary, axillary flowers are orange-red, 2.5 cm long on 0.8 cm pedicels.

A 1992 survey of the East Mount Barren locality failed to locate any mature plants following the 1989 wildfire. However several thousand seedlings with large deeply lobed hairy leaves were recorded and are now thought to be the postfire regeneration of *Adenanthos ellipticus.* Currently the seedlings are only 3-400 mm tall and have very few elliptic leaves. More recently several flowering specimens were collected in May 1993 from plants which still had the large lobed leaves and were developing smaller, mature elliptic leaves. This collection enabled positive identification of *Adenanthos ellipticus.*

Flowering Period: August-January, possibly intermittent, including May.

Distribution and Habitat

The Oval Leaf Adenanthos grows in shallow siliceous soils over outcropping quartzite in association with dense scrub, including *Adenanthos cuneatus* and *A. venosa.* It has been collected from East Mount Barren many times, and collected once from Thumb Peak in January 1994 (confirming a report by Newbey). Seedlings similar to those on East Mount Barren (and assumed to be *A. ellipticus*) have been found on the minor summits below West Mount Barren. These plants had not flowered in September 1993.

A small remnant of prefire mature plants has since been located in a protected gully, immediately above the ocean below East Mount Barren.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. East Mt Barren	Albany	Rav	NP	9.9.92	+2000	good
2. Thumb Peak	Albany	Rav	NP	1.94	+10000	good
3. West Mt Barren	Albany	Jer	NP	15.9.92	+1000	good
(4) East Mt Barren	Albany	Rav	NP	7.9.93	12	adults

WAHerb: 18 records (includes 3 *A. cuneatus* x *ellipticus* hybrids)

Response to Disturbance

Killed by fire and regenerates readily from seed; grows relatively slowly in natural habitat.

Susceptibility to *Phytophthora* Dieback

Field observation suggests high susceptibility

Management Requirements

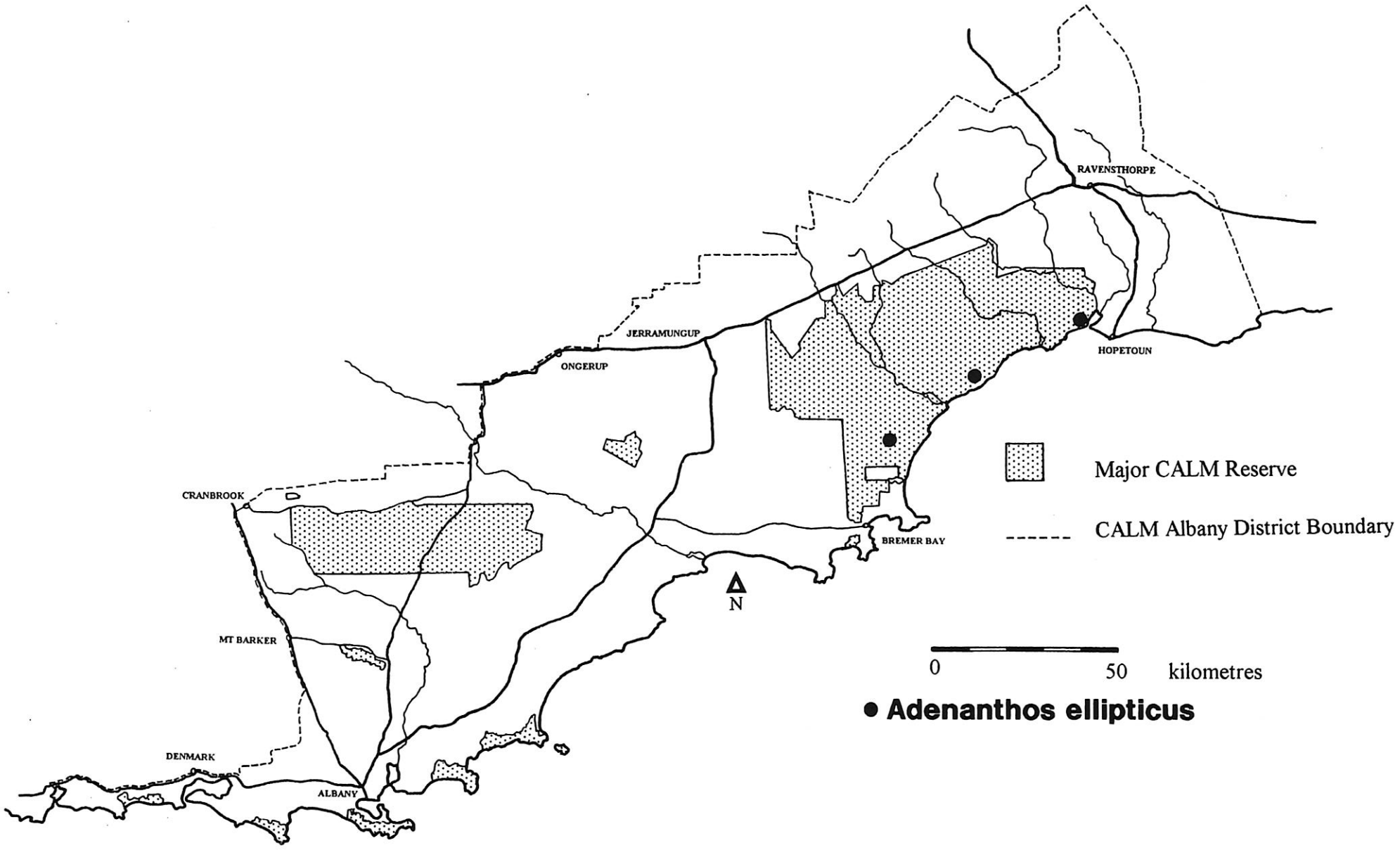
- exclude fire for at least until 1998
- monitor seedling development
- monitor impact of tourist/climbers on this species and associated vegetation
- monitor locations for impact and spread of *Phytophthora* dieback; apply phosphonate spray if necessary

Research Requirements

Collect flowering specimens from West Mt Barren

References

George (1974), Nelson (1978).


RAVENSTHORPE
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0
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kilometres
● Adenanthos ellipticus

Adenanthos pungens Meisn. subsp. *pungens* PROTEACEAE

Spiky Adenanthos

This *Adenanthos* is a tall, erect shrub up to 3 m with rigid, terete leaves (3 cm long and 1-2 mm in diameter), usually divided into three pungent pointed segments up to 12 mm. The flowers are pale to dark pink, numerous and aggregated at the tips of whorled branchlets on 4 mm peduncles and surrounded by up to 6 ovate-triangular involucral bracts. When flowering it is a very attractive and obvious species. When not in flower it could easily be mistaken for an *Isopogon* or *Daviesia*.

Nelson (1978) recognised and described *Adenanthos pungens* subspecies. *pungens* and *effusus* based upon erect and prostrate habits respectively. However, M Graham (pers. comm.) has observed erect, semi-erect and prostrate plants within the one population at Chinocup, and believes the taxonomic separation may not be warranted.

Flowering Period: August-November

Distribution and Habitat

Within Stirling Range National Park *A. pungens* subsp. *pungens* occurs in shallow, rocky pink soil over pink sandstone, supporting an association of dense *Kunzea montana* and *Banksia oreophila* scrub. It was collected by C.A. Gardner in 1934 from near Donnelly Peak (Hedge Hill) and by Nelson from Hamilla Hill in 1973. Both Nelson and Keighery (1982) noted that the Hamilla Hills population was severely affected by dieback. It was relocated in August 1993 after considerable survey effort in the Hamilla Hills. There it had regenerated densely from seed after a fire (3-4 years previously) in a tall thicket of *Kunzea* and *Banksia*. The young plants were erect (to 1.5 m), flowering and were far more advanced than most other regenerating species. In an adjacent unburnt thicket there were very few, old *A. pungens* becoming decumbent and the scattered remains of many long dead plants. It is possible that these plants had senesced naturally, in the shade of the much taller associated shrubs. In the open situation at Lake Chinocup, older plants persist.

An 1880 collection by Muir, lodged at Melbourne is from "toward Tone River". A large population exists at Chinocup in the Katanning (CALM) District. Subspecies *effusus* occurs near Cranbrook, Tambellup and Katanning.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Hamilla Hill	Albany	Cb	NP	24.8.93	+2500	healthy
2. Chinocup	Katanning	Kent	NR	25.3.91	+1000	good

WAHerb: 13 records

Response to Disturbance

Regenerates from seed after fire

Susceptibility to *Phytophthora* Dieback

Field observation suggests high susceptibility

Management Requirements

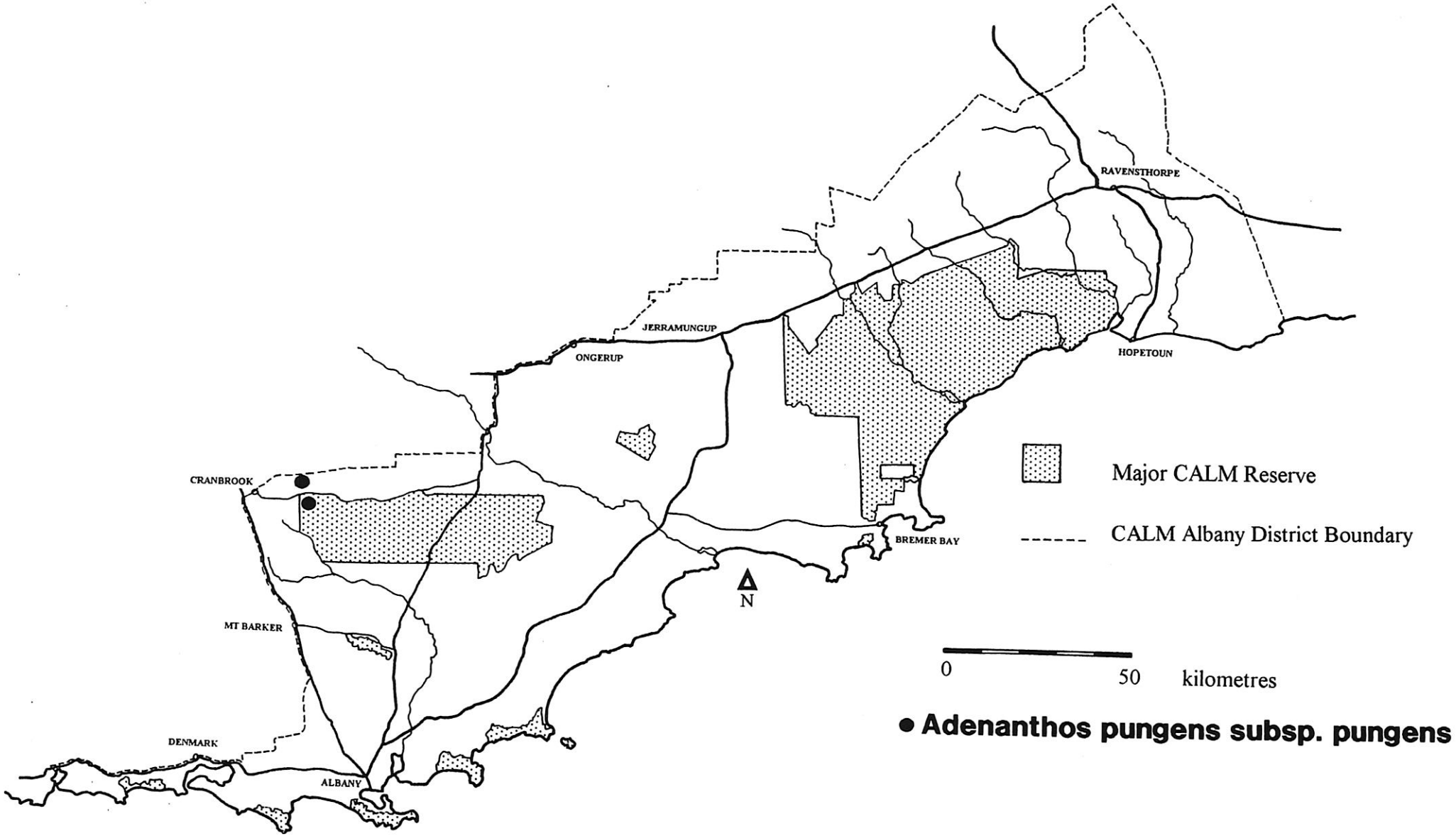
- protect any new or relocated populations from *Phytophthora*
- monitor Hamilla Hills population regularly
- liaise with adjacent landowners at Hamilla Hills

Research Requirements

- relocate Hedge Hill population
- search for new populations
- investigate use of phosphonate for dieback protection from *Phytophthora* if necessary
- review status of subspecies
- collect propagation material for storage and cultivation
- investigate 1880 Muir location

References

Nelson (1978), Meissner (1845).


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● Adenanthos pungens subsp. pungens

Andersonia sp. Two Peoples Bay (G.J.Keighery 8229) EPACRIDACEAE

Boulder Hill or Pine Tree Andersonia

This undescribed species of *Andersonia* which was discovered by G.J. Keighery in 1986 is believed to be related to *A. caerulea*. It forms a compact, bushy shrub to 400 mm and appears like a small pine. The dark green, densely packed leaves (to 15 mm) are slightly contorted with adnate sheathing bases. The corolla tube is pale blue outside, bearded white inside and surrounded by acuminate, white calyx lobes. Extensive deaths (up to 50% or more) at all known populations are believed to be the result of *Phytophthora* dieback with some limb death caused by aerial canker.

Flowering Period: August-December

Distribution and Habitat

Andersonia sp. Two Peoples Bay (G.J.Keighery 8229) is restricted to deep sands supporting low, open heath in the vicinity of Betty's Beach-Norman's Beach-Boulder Hill (north of Two Peoples Bay) and the proposed Nature Reserve at Goodga River. At the former location, emergent *Banksia coccinea* is common, but is suffering from dieback. The Goodga River population is relatively small and current impact of disease is so great that survival of the species at this site is unlikely. McDonald (pers. comm) has located a large population of three to four year old post fire seedlings along the Goodga River track, closer to the Two People Bay Road than the original population. The majority of this population is healthy and disease free, although a dieback front is nearby.

A search in similar habitat north and east of Norman's Inlet has failed to find further populations. This species is known to produce prodigious quantities of seed (10,000 seeds per gram, McDonald pers. comm.) and may increase in numbers in the short term in areas opened up by dieback, before succumbing to the disease.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Betty's Beach	Albany	Alb	Shire res.	4.9.92	2000	poor
2. Herring Bay	Albany	Alb	various	20 8.92	500	poor
3. Goodga Weir	Albany	Alb	WAWA	12.11.92	22	poor
4. Norman's Beach	Albany	Alb	Shire res.	13.11.92	2000	poor
5. Goodga Sth	Albany	Alb	WAWA	6.93	+1000	seedlings

WAHerb: 5 records

Response to Disturbance

Soil disturbance and fire are likely to promote seedling germination. Fire will kill mature plants.

Susceptibility to *Phytophthora* Dieback

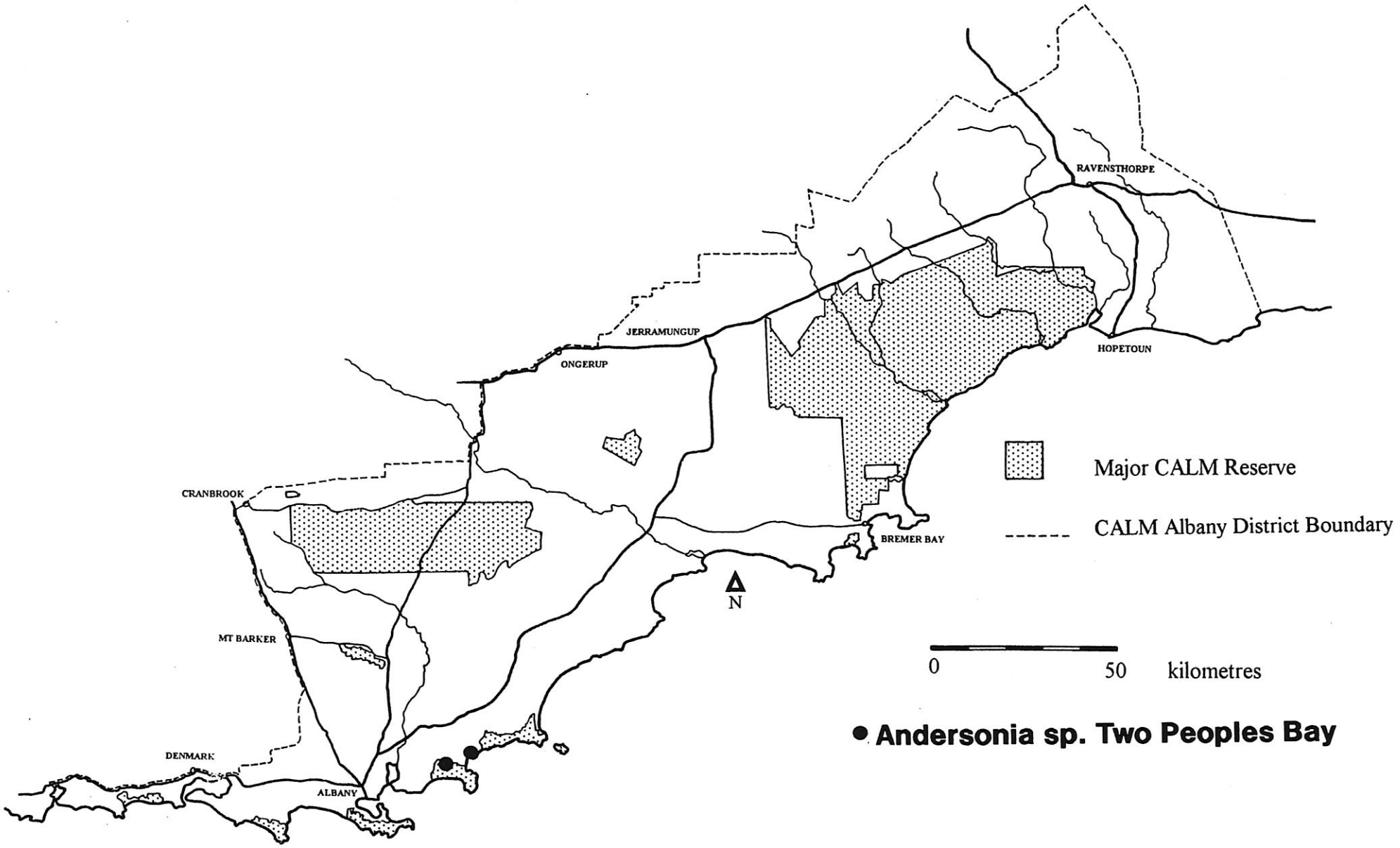
Field observation suggests very high susceptibility

Management Requirements

- treat diseased areas with phosphonate
- ensure that land managers/owners are aware of this species and that areas are managed appropriately
- liaise with Shire to close track from above Betty's Beach to Norman's Beach in Shire reserve
- collect seed for propagation and storage
- monitor closely

Research Requirements

- determine if phosphonate can prevent attack by *Phytophthora* and what application rate is appropriate
- determine current mortality rate
- survey for additional populations; particularly east of Normans Beach inlet and in the Angove Creek catchment


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● Andersonia sp. Two Peoples Bay

Apium prostratum subsp. *phillipii* Keighery ms

APIACEAE

Porongurup Celery

This species is a clearly recognisable taxon in the *Apium prostratum* complex, differing from common Sea Celery by its tall slender habit (leaves to 400 mm; stem to 1 m) and very finely divided leaves. The fruits are deeply ribbed. It flowers in summer with an umbel of small white flowers. Little is known about its biology but it may have the ability to resprout from lignotuber after fire.

The original collection was made in 1867 by an anonymous collector and relocated again in 1986 after extensive search by Keighery (pers. comm.)

Flowering Period: January

Distribution and Habitat

Apium prostratum subsp. *phillipii* ms is known from three localities within the Porongurup Range. Typically it favours creeklines in wooded gullies with shallow loamy soil over granite supporting moss, sedges and other herbaceous plants. In two locations invasion of weeds is seen as a major threat. Although the Porongurup Celery produces large amounts of seed which would normally utilise any open ground competition from introduced species is severly limiting recruitment.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Millinup Pass	Albany	Pl	NP	1988	<100	weeds
2. Cockatoo Creek	Albany	Pl	NP	14.3.93	+500	healthy
(3) Bolganup Creek	Albany	Pl	NP	3.2.93	9	good

WAHerb: 3 records

Response to Disturbance

Normally may be favoured by disturbance, however the presence of introduced weed species which are more vigorous competitors makes disturbance a threat.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

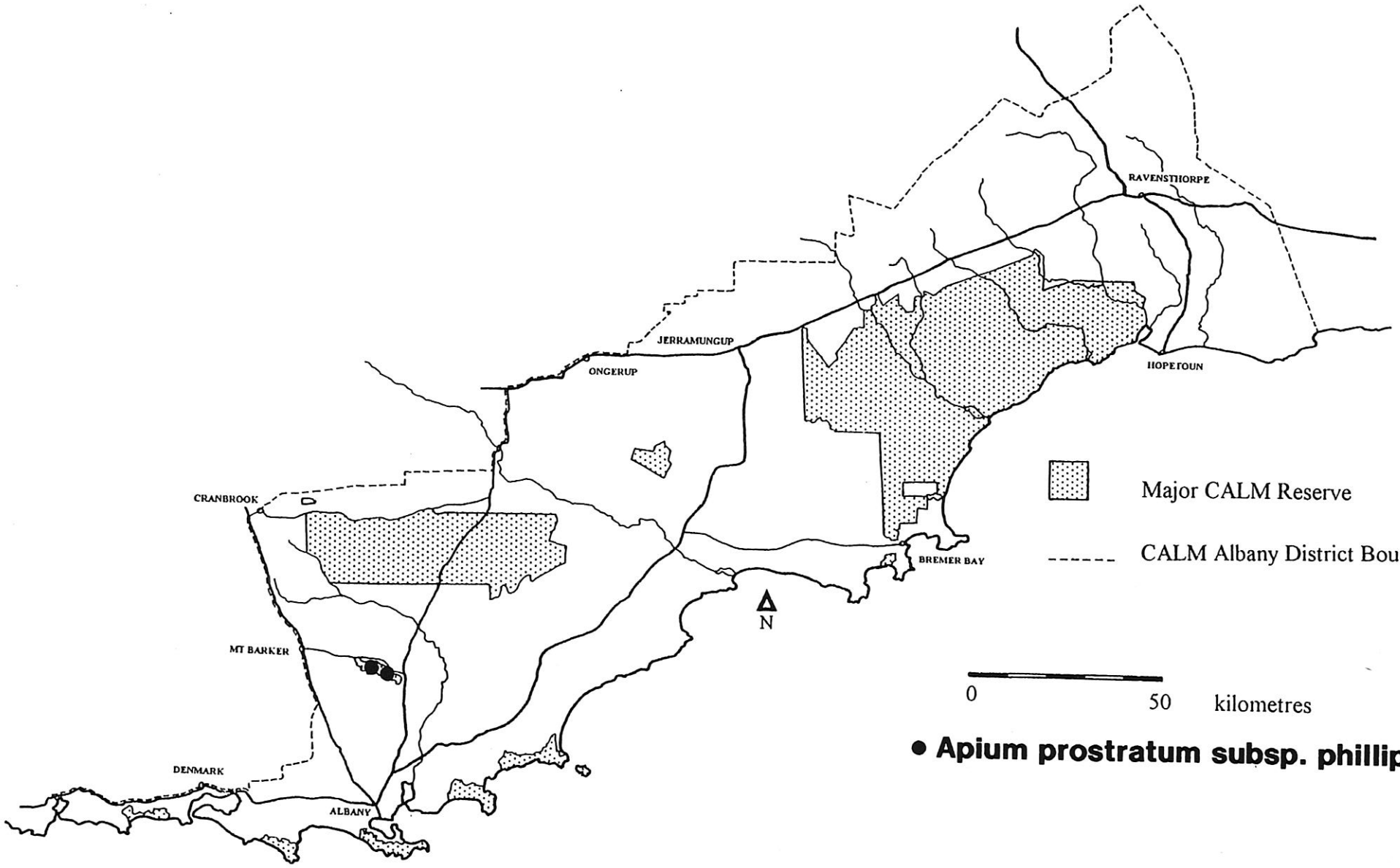
- weed control
- exclude fire and other disturbance
- monitor regularly
- collect seed and encourage Kings Park to propagate

Research Requirements

- survey for new populations
- research its biology
- develop weed control

References

Keighery (1984).


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• Apium prostratum subsp. phillipii ms

Asplenium obtusatum G.Forst.

ASPLENIACEAE

Shore Spleenwort

Asplenium obtusatum is a fern with thick, erect, glossy dark green leaves, once divided (to 50 cm) and with a shortly creeping rhizome covered with purplish-brown scales. The leaflets are stalked, up to 4.5 cm with notched margins; the oblong sori are parallel to the midrib, not extending to the leaflet margins.

Fruiting Period: possibly year round

Distribution and Habitat

The Shore Spleenwort has a wide distribution, scattered along temperate and sub-antarctic coasts of the Southern Hemisphere. It occurs in very exposed locations in shallow pockets of soil on maritime granite cliffs. In Australia it is widespread in NSW, Victoria and Tasmania but is currently only known in WA from Chatham Island and mainland cliffs near Albany. It was recorded from Breaksea Island in 1866, but recent survey has failed to relocate it. However, it is likely that the inaccessibility of its habitat has kept many locations secret.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Breaksea Is.	Albany	Alb	NR	16.2.89	0	-
2. Chatham Is	Walpole	Manj	NR	3.11.89	91	good
3. PeakHead	Albany	Alb	NP	18.2.90	2	undist.
4. Waychinicup	Albany	Alb	NP	29.7.90	70	undist.

WAHerb: 4 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

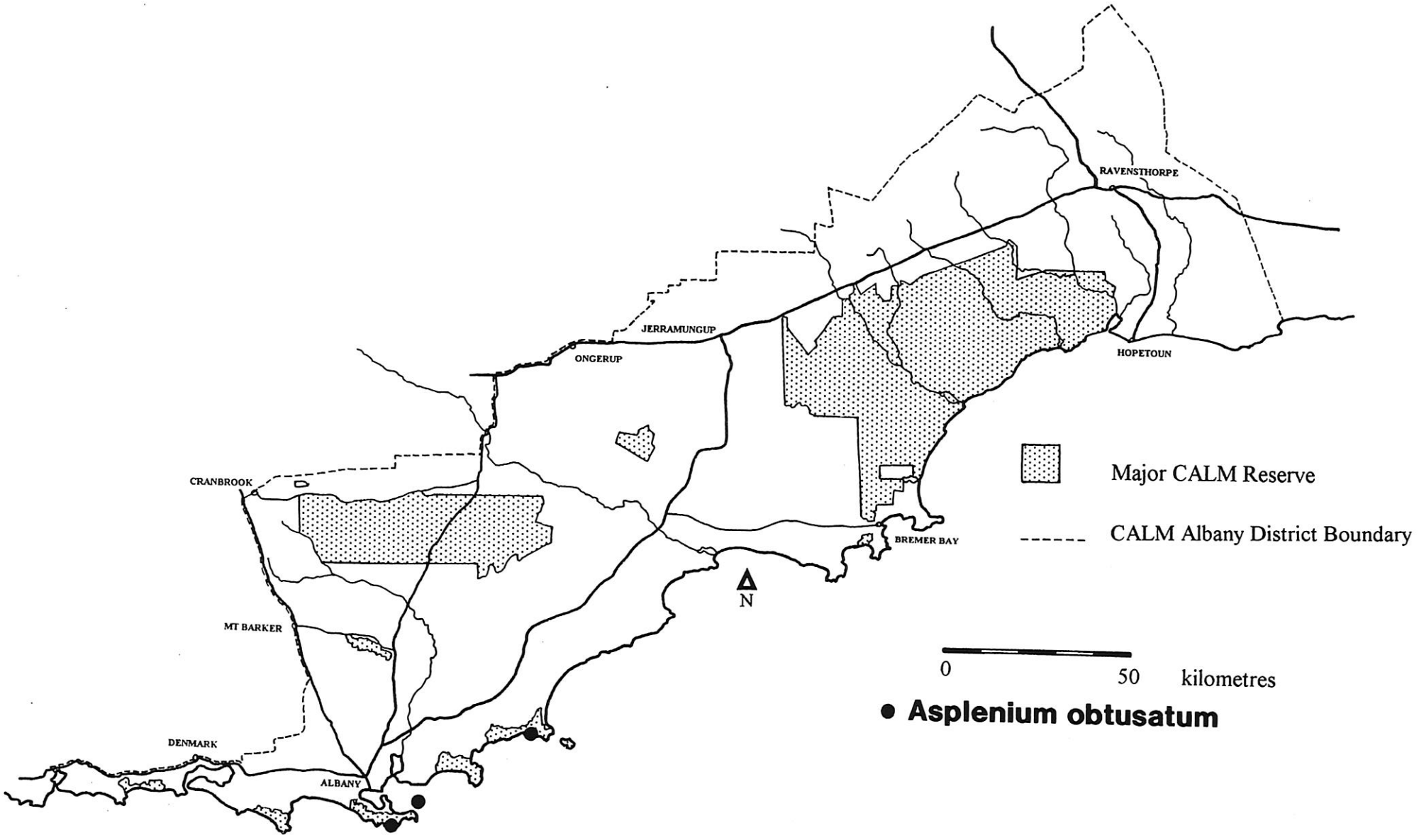
- collect specimens from Albany locations
- monitor populations opportunistically

Research Requirements

Relocate and record exact location of Breaksea Island population

References

Jones & Clemesha (1976).


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Asplenium obtusatum

Baeckea arbuscula R.Br. ex Benth. MYRTACEAE

Albany Baeckea

Baeckea arbuscula is a small shrub to 300 mm with tiny pale pink flowers, with petals less than 1 mm across, and up to five stamens. The dark green terete leaves are 2 mm long, in opposite pairs. Although conspicuous when in flower, it can be mistaken for species of *Astartea* or *Pericalymma* (which are similar but much bigger) vegetatively. This taxon may be reclassified as an *Astartea* (Trudgen, pers. comm.).

Flowering Period: December-February and sporadic.

Distribution and Habitat

This species occurs in seasonally wet peaty sands from around Black Point (D'Entrecasteaux NP) to Albany. Generally it occurs in open flat spaces between larger shrubs (*Banksia quercifolia*) or clumps of sedges (*Evandra pauciflora*). As this summer flowering species occurs across a wide range, in a habitat that has until recently been poorly surveyed, it is likely to be found in other locations.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Millbrook	Albany	Alb	NR	14.4.89	20	deaths
2. Marbellup	Albany	Alb	Shire res.	2.9.92	+500	good
3. Mitchell	Walpole	Manj	SF	8.12.90	-	-
4 Collis	Walpole	Denmark	SF	29.11.90	+500	-
5. Lake Smith	Pemberton	Nannup	NP	20.10.90	+500	-
6. Black Point	Pemberton	Nannup	NP	1990	-	-

WAHerb: 10 records

Response to Disturbance

Killed by fire and is likely to be sensitive to alteration of natural drainage.

Susceptibility to *Phytophthora* Dieback

Presumed susceptible (low to moderate)

Management Requirements

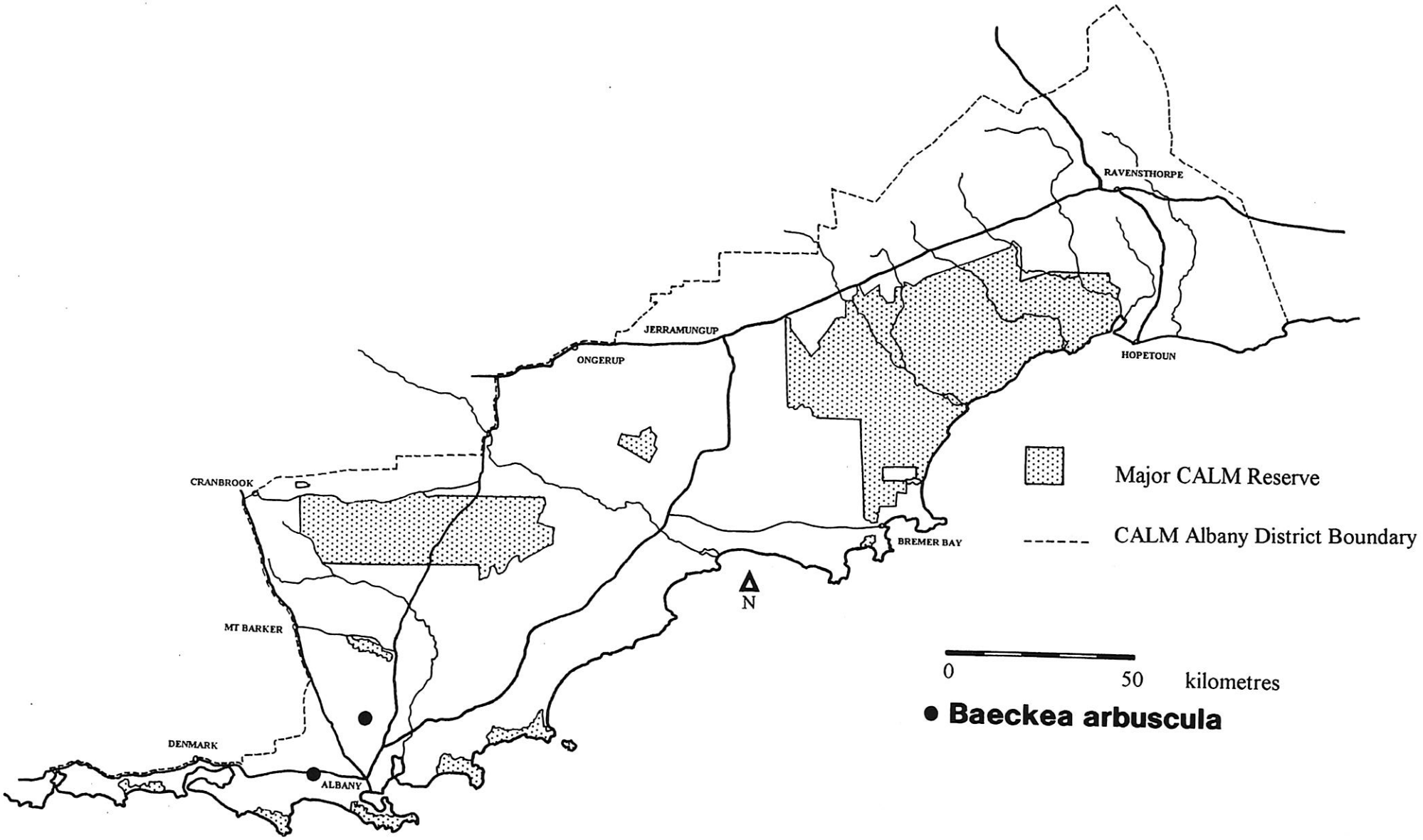
Monitor regularly

Research Requirements

- monitor the discovery of new populations and impact on Conservation Status
- survey opportunistically for new populations
- determine response to dieback

References

Bentham (1867).


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Baeckea arbuscula

Banksia brownii Baxter ex R.Br.

PROTEACEAE

Feather Leaved Banksia

Banksia brownii is a handsome, smooth barked shrub or small tree to 6 m. The linear leaves (3-12 cm long and 5-10 mm wide) are finely divided to the midrib giving a feathery appearance. Upper leaf surfaces are dark green glabrous, woolly white below. The cylindrical inflorescences are red-brown, terminal and subtended by the upper branchlets.

Currently it is known from only sixteen populations over a limited range; all are under threat from active infections of *Phytophthora* dieback. The extent of *Phytophthora* in this species is such that *B. brownii*t could become extinct in the wild within a decade although the recent application of phosphonate shows promise for control of the disease in some populations. Reasonable quantities of extracted seed, and seed in the cone have been stored in CALM's TFSC.

Flowering Period: May-July

Distribution and Habitat

Banksia brownii extends in small isolated populations from Cheyne Beach, inland to the Stirling Range, and south to Albany. It occurs in a variety of soils from shallow sand over laterite, sandy loam over granite to shallow sand over schist on slight rises, gullies or mountain tops. It occurs in open scrub over heath or low open woodland.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Millbrook	Albany	Alb	NR	28.2.90	200	diseased
2. Hassell Hwy	Albany	Alb	NP	23.6.93	84	seedlings
3. Millbrook	Albany	Alb	Shire res.	16.7.92	11	diseased
4. Res.35381	Albany	Alb	Shire res.	1.4.93	3+1	brnt/dbk
5. Sth Sister	Albany	Alb	NR	28.2.89	200	diseased
6. Hazard Rd	Albany	Alb	Shire res.	19.5.92	13	diseased
7. Phillips Rd.	Albany	Alb	Shire res.	31.7.92	3	diseased
8. Vancouver Pen	Albany	Alb	Shire res.	28.5.91	58	Armil&Pc
9. Hassell Beach Rd	Albany	Alb	NP	31.3.93	65	diseased
10. Waychinicup	Albany	Alb	WAWA	23.6.93	41	seedlings poor
11. Mt Hassell	Albany	Alb	NP	7.93	+200	30 dead
12. Yungermere	Albany	Alb	NP	20.6.90	ca.100	disease
13. Bluff Knoll	Albany	Alb	NP	1993	0	postfire
14. Mt Success	Albany	Alb	NP	1988	-	-
15. Mondurup	Albany	Alb	NP	27.5.85	>10	-
16. Ellen Peak	Albany	Alb	NP	29.9.93	+300	fair seedlings
(17) Mt Hassell Sth	Albany	Alb	NP	7.93	+300	?

WAHerb: 35 records

Response to Disturbance

Killed by fire and and regenerates from seed

Susceptibility to *Phytophthora* Dieback

Very high susceptibility

Management Requirements

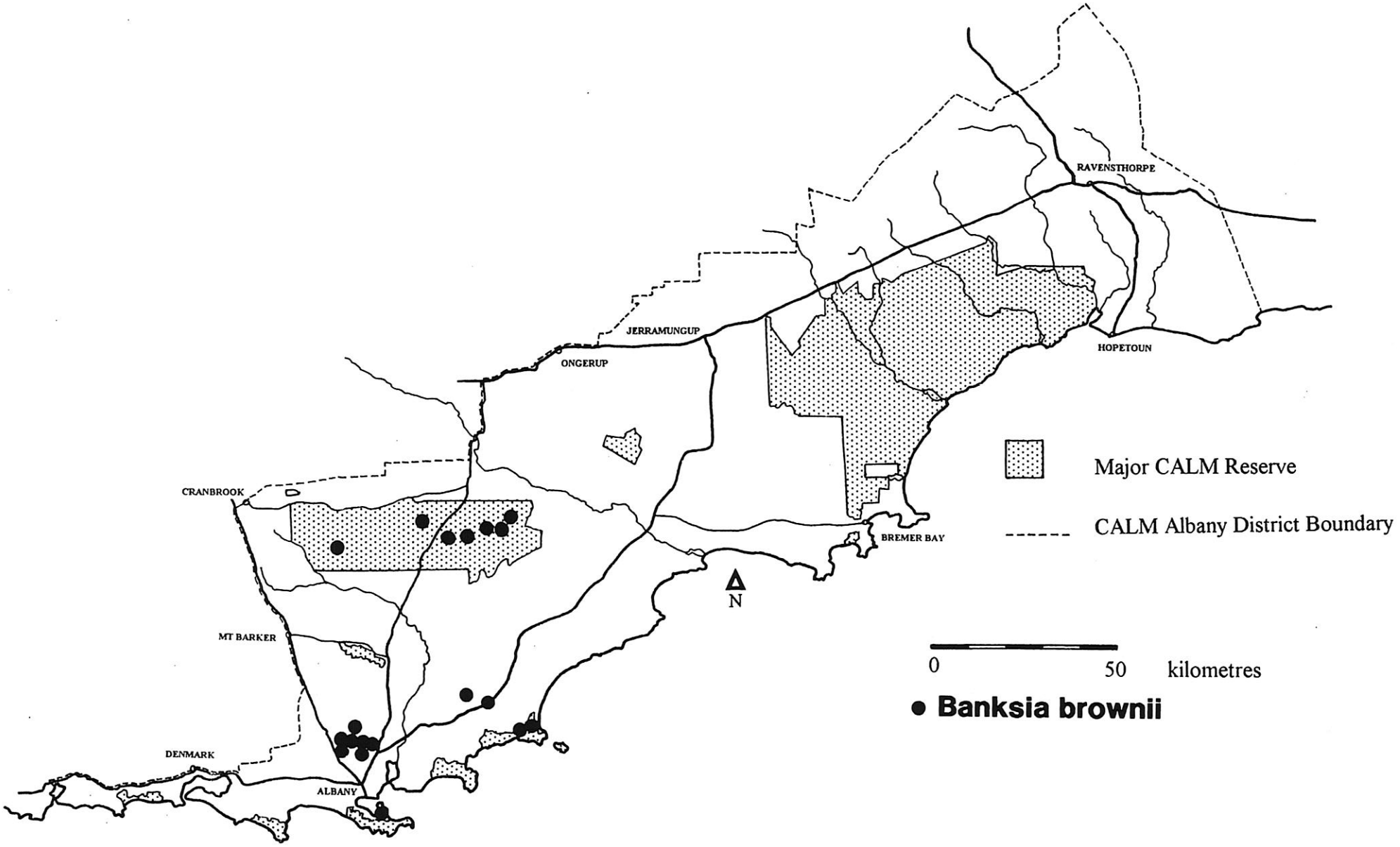
- *phosphonate* application either by aerial spray or backpack application at proven rates to all wild populations
- collect and store seed from all known populations
- monitor populations regularly
- liaise with Shire regarding protection of the Vancouver population

Research Requirements

- monitor effectiveness of phosphonate application
- opportunistic survey for new populations in appropriate areas

References

George (1987).


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kilometres
● Banksia brownii

Banksia goodii R.Br.

PROTEACEAE

Good's Banksia

Banksia goodii is a lignotuberous shrub, with prostrate stems, usually at or just below the soil surface. It is a slow growing plant which often occurs in spreading clumps where the exact number of individuals is difficult to determine. The dull green leaves are erect, undulate and irregularly dentate with an elongated petiole. The leaves of the more common, prostrate *B. gardneri* var. *brevidentata* are similar but slightly narrower (2-6 cm) and more coarsely dentate. The rusty-brown, erect inflorescences are borne at ground level at the end of the prostrate branches, surrounded by leaves. Older plants in dense, unburnt vegetation frequently carry numerous dead leaves, few flowers and appear to lack vigour. Following fire, fresh growth appears and flowering is enhanced which may be a direct response to increased light and nutrient. Although considered sensitive to *Phytophthora* dieback, susceptibility is regarded as low to variable (Wills pers. comm.).

Flowering Period: November-December

Distribution and Habitat

Banksia goodii occurs in sand over laterite in low open woodland of Sheoak and Jarrah over heath (*Agonis parviceps* and *A. hypericifolia)* in a limited range from Redmond through to south of the Porongurup Range.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Millbrook Rd	Albany	Alb	private	6.11.91	+70	-
2&15. Bailey Rd	Albany	Alb	Shire res.	16.7.92	+40	fair
3. Millbrook	Albany	Alb	NR	11.85	300	-
4. Redmond Rd	Walpole	Pl	Shire res.	2.12.92	28	healthy
5. Redmond Rd	Walpole	Pl	Shire res.	2.12.29	3	healthy
6. Chorkerup Rd	Walpole	Pl	private	25.11.92	1	undist.
7. Jackson Rd	Albany	Alb	Shire res.	28.10.92	17	undist.
8,10&13. Millstream Rd	Albany	Alb	Shire res.	18.12.92	+30	undist.
9. Granite Hill	Albany	Alb	private	8.7.81	5	?dead
11. Chorkerup Rd	Walpole	Pl	Shire res.	9.11.88	0	-
12. Nth Hnwk Rd	Walpole	Pl	Shire res.	9.11.88	0	-
14. Millbrook Rd	Albany	Alb	Shire res.	6.4.92	2	undist.
16&20. Millbrook	Albany	Alb	NR	21.5.90	+150.	-
17. Millbrook	Albany	Alb	NR	9.3.87	-	-
18. Millbrook	Albany	Alb	NR	9.3.87	340	-
19. Millbrook	Albany	Alb	NR	15.6.85	-	-
21,22&23. Millbrook	Albany	Alb	NR	1985	-	-

WAHerb: 14 records

Response to Disturbance

Will resprout and produce vigorous new growth after fire

Susceptibility to *Phytophthora* Dieback

Presumed susceptible (low to moderate)

Management Requirements

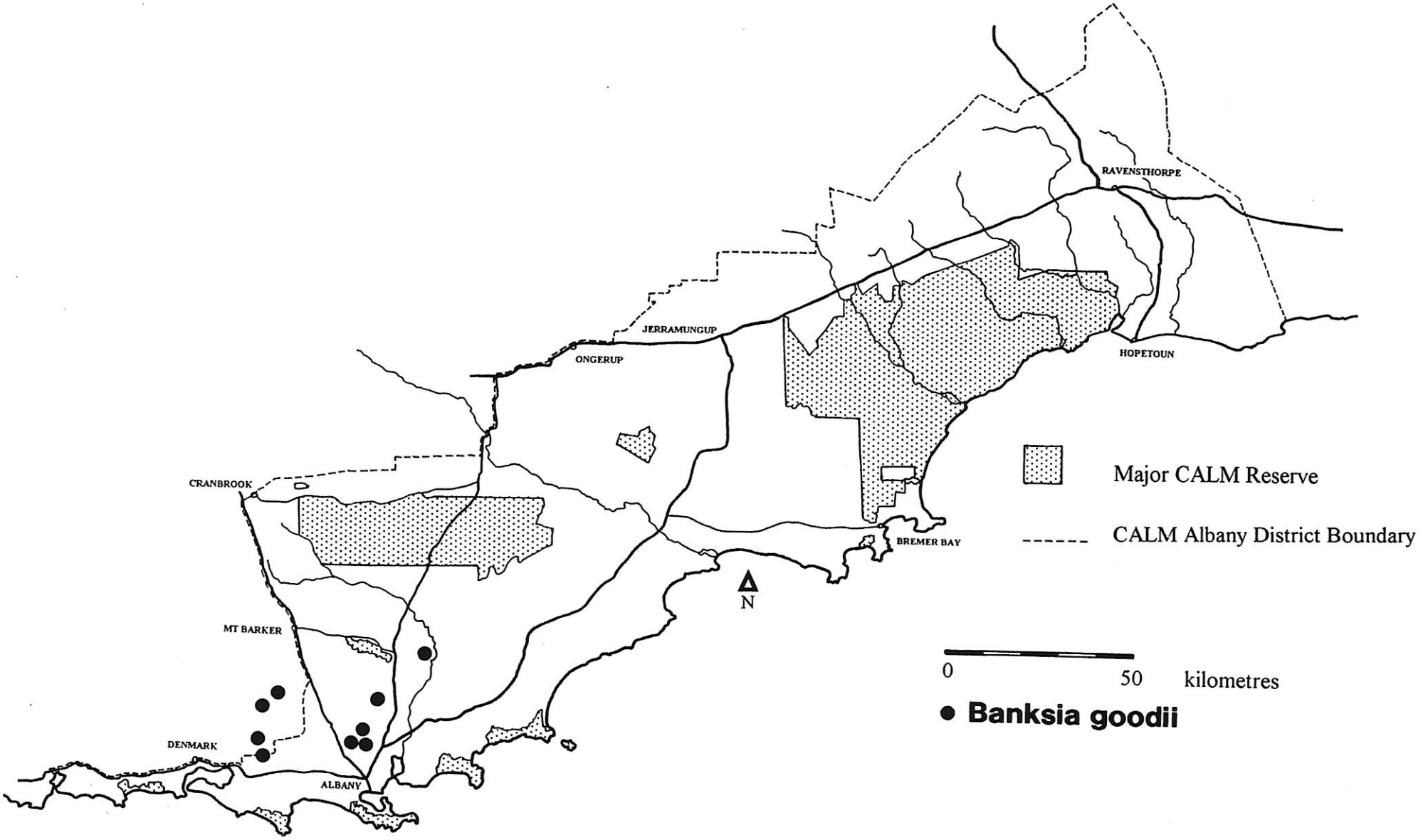
- resurvey and clarify locations of populations at Millbrook NR (seven), Chorkerup Road (two) and Granite Hill populations
- monitor other populations
- investigate necessity and possibility of land acquisition
- maintain liaison with landowners

Research Requirements

- assess impact of *Phytophthora* dieback
- collect and store seed from known populations

References

George (1987), Lamont *et al.* (1993).


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Banksia goodii

Banksia verticillata R.Br.

PROTEACEAE

Granite Banksia

Banksia verticillata forms a dense spreading shrub or small tree, non-lignotuberous, to 5 m. The trunk is short, stout with fissured grey bark. The linear narrow-elliptic, whorled leaves with recurved, entire margins are dark green above and conspicuously white matted below, obtuse, 3-9 cm long and 7-12 mm wide. The terminal inflorescences are golden and subtended by a whorl of branchlets.

This species is regarded as highly susceptible to *Phytophthora* dieback (R.T. Wills pers comm.) and its disappearance from Mt. Gardner, Mt. Adelaide and Herald Point has been attributed to this disease (M.J. Grant pers. comm.). However, its wide range, relatively high number of populations (26) and usually inaccessible habitat have ensured that this species is currently less threatened than some other *Banksia* species. During 1991 impact by aerial canker disease was observed in some populations in the form of partial limb deaths and yellowing of leaves. Subsequently, most have recovered well.

This species was described by Robert Brown in 1810, from material he collected from King George Sound in 1801.

Flowering Period: January-April

Distribution and Habitat

The Granite Banksia grows on and around granite outcrops (mostly they grow directly in cracks in the rock) usually close to the coast from the Woolbale Hills (west of Walpole) to just east of Mount Manypeaks. There it occurs immediately above the rocks running into the ocean and below the heath above (e.g. Herald Point) where it is likely to be vulnerable to dieback moving downslope.

A record of 75 plants at Gull Rock is believed to be an incorrect identification of *B. praemorsa*.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population		District	Shire	Land Status	Last Survey	No. of Plants	Condition
1.	Mt Manypeaks	Albany	Alb	NP	16.8.89	2	-
2.	Mt Manypeaks	Albany	Alb	NP	16.8.89	6	-
3.	Stoney Hill Summit	Albany	Alb	NP	30.11.92	+100	good
4.	Bald Head	Albany	Alb	NP	5.1.93	70	undist.
5.	Two Peoples Bay	Albany	Alb	NR	10.93	1	poor
6.	Mt Hopkins	Walpole	Manj	NP	10.12.84	300	-
7&18.	Waychinicup	Albany	Alb	NP	12.1.93	+2000	undist.
8.	Waychinicup	Albany	Alb	NP	23.8.93	7&15	fair
9.	Gap	Albany	Alb	NP	1985/6	35	-
10.	Peak Head	Albany	Alb	NP	6.11.93	+180	good
11.	Mt Manypeaks	Albany	Alb	NP	12.10.84	5	-
12.	Salmon Holes	Albany	Alb	NP	27.1.87	50	-
13.	Stoney Hill East	Albany	Alb	NP	27.1.87	+200	fair
15.	Woolbale Hills	Walpole	Manj	SF	14.3.89	600	-
16&17	Mt Manypeaks	Albany	Alb	NP	23.11.79	19	-

Known Populations (cont.)

Population		District	Shire	Land Status	Last Survey	No. of Plants	Condition
19.	Newhills	Albany	Alb	NP	19.8.92	128	canker
20.	Aldridge Cove	Walpole	Manj	NP	23.8.82	200	-
21.	Thompson Cove	Walpole	Manj	NP	23.8.82	400	-
22.	Mt Manypeaks	Albany	Alb	NP	7.8.85	-	-
23.	Waychinicup	Albany	Alb	NP	23.8.93	187	good
24,25.	Niggerhead Rock	Albany	Alb	NP	27.1.87	112	-
(26)	Poison Hill	Walpole	Manj	NP	1992	300	disease
(27)	Herald Point	Albany	Alb	NP	27.8.93	4 dead	disease
(28)	Mermaid Pt	Albany	Alb	NP	23.8.93	133	fair

WAHerb: 34 records

Response to Disturbance

Killed by fire and regenerates from seed.

Susceptibility to *Phytophthora* Dieback

Field observation suggests very high susceptibility

Management Requirements

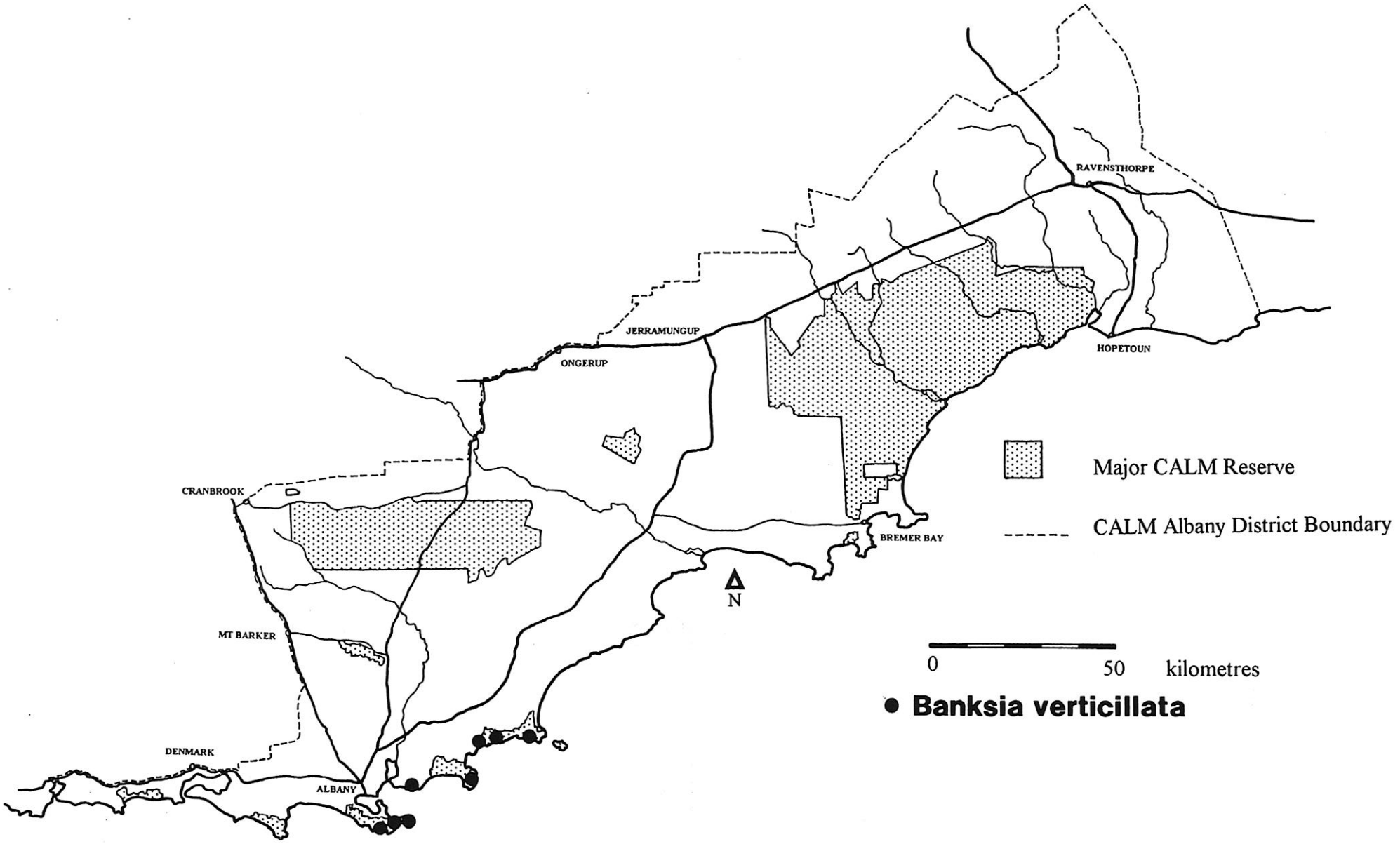
- resurvey and map populations not visited recently; especially Mt Manypeaks and Two Peoples Bay and rationalise population location/recording system
- treat any dieback diseased population with phosphonate
- collect and store seed from each location

Research Requirements

- conduct phosphonate application trials
- opportunistic survey for new populations

References

George (1987).


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Banksia verticillata

Billardiera mollis E.M.Benn. PITTOSPORACEAE

Hairy Fruited Billardiera

Billardiera mollis is a low spreading shrub to 50 cm tall, with red-brown stems (finely white hairy) becoming glabrous and grey with age. The ovate-lanceolate leaves (to 20 mm by 11 mm wide) become glabrous, with persistent hairs along margins and midveins. Leaf margins are flat and the petiole very short. The deep blue flowers are usually solitary on slender axillary peduncles (15-25 mm). The petals have 3-4 distinct purple lines on the outer surface with a pale throat. The fruit capsules are covered with white hairs; this is a major diagnostic character of this species as all other capsule fruiting Billardiera species have glabrous capsules.

B. villosa closely resemble *B. mollis,* however the latter is straggly not compact, has flat not recurved leaf margins and white not blue anthers.

Flowering Period: August-September

Distribution and Habitat

Billardiera mollis has a scattered distribution over the Ravensthorpe Range about Kundip and Desmond (in gravelly sands over laterite or ironstone) and east along the Rabbit Proof Fence (in sand over laterite). It occurs in a variable association of proteaceous scrub and mallees, usually in open areas which have been subjected to soil disturbance (i.e. tracks). Currently this species is unknown on conservation land and some populations could be under the threat from mining. The Desmond population is covered by the nature reserve vesting proposed in the South Coast Region Plan (1991).

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Rabbit Proof Fence	Albany	Rav	UVR & VCL	12.1988	+700	good
2. Mt Desmond	Albany	Rav	UVR	1981	+50	healthy
3. Kundip	Albany	Rav	VCL	14.1.82	+150	healthy

WAHerb: 5 records

Response to Disturbance

Disturbed sites adjacent to tracks indicate that regeneration by suckering and from seed is enhanced by soil disturbance.

Susceptibility to *Phytophthora* Dieback

Unknown

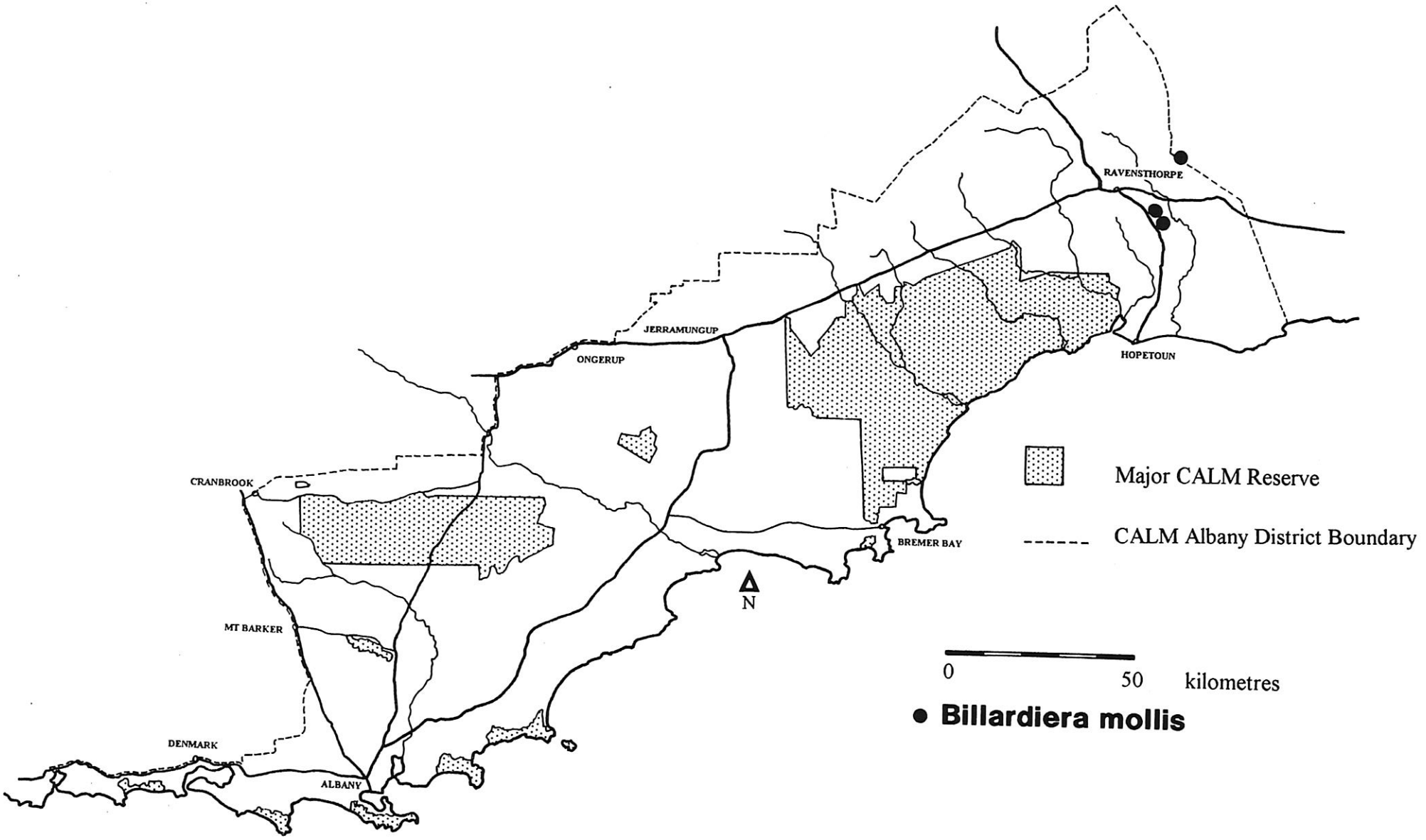
Management Requirements

- resurvey known populations
- determine adequacy of conservation on proposed reserves and acquire further reserves if necessary

Research Requirements

References

Bennett (1983), Lewis (1982).


RAVENSTHORPE
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Billardiera mollis

Caladenia bryceana R.S.Rogers subsp. *bryceana* ORCHIDACEAE

Dwarf Spider Orchid

This species is one of the smallest flowered Western Australian orchids and is consequently not easily noticed in new locations and often difficult to relocate in known locations. The petals, labellum and sepals are usually green but are occasionally apricot in colour. A distinctive band of glossy, dark globular calli run down the centre of the labellum. The flower stem and leaf rarely exceed 50 mm, whilst the flower itself is only about 10 mm across, the petals and sepals being not much longer than the column.

Flowering Period: August-early October

Distribution and Habitat

C. bryceana subsp. *bryceana* grows in open woodland of Wandoo, Yate or Sheoak with a sparse association of low shrubs, sedges and herbs. Soils are sandy clays to red loam over granite. In the Albany district it occurs from Ongerup, north Stirling Range to the mid reaches of the Pallinup River.

Currently this subspecies is known from only five general locations but is believed to have been widespread before extensive clearing for agriculture and subsequent weed introduction. Populations occurring in the narrow vegetated strip along the banks of the Pallinup River are being swamped by weeds coming down river and from adjacent farms.

C. bryceana subsp. *cracens* occurs in a restricted distribution near Kalbarri.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Marra Bridge	Albany	Alb/Jer	various	10.1992	0	-
2. Wild Horse Swamp	Collie	Collie	VCL	1979	30	poor
3. Nth SRNP	Albany	Gno	NP	24.9.92	56	good
4. Toompup	Albany	Gno	private	24.9.92	500	good
(5) Toompup NR	Albany	Gno	NR	24.9.92	66	good

WAHerb: 5 records

Response to Disturbance

Under natural conditions many orchids are favoured by disturbance. However as *C. bryceana* subsp. *bryceana* is so small and mostly occurs near cleared farmland, soil disturbance or fire is likely to be followed by loss of habitat to invasive weeds.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

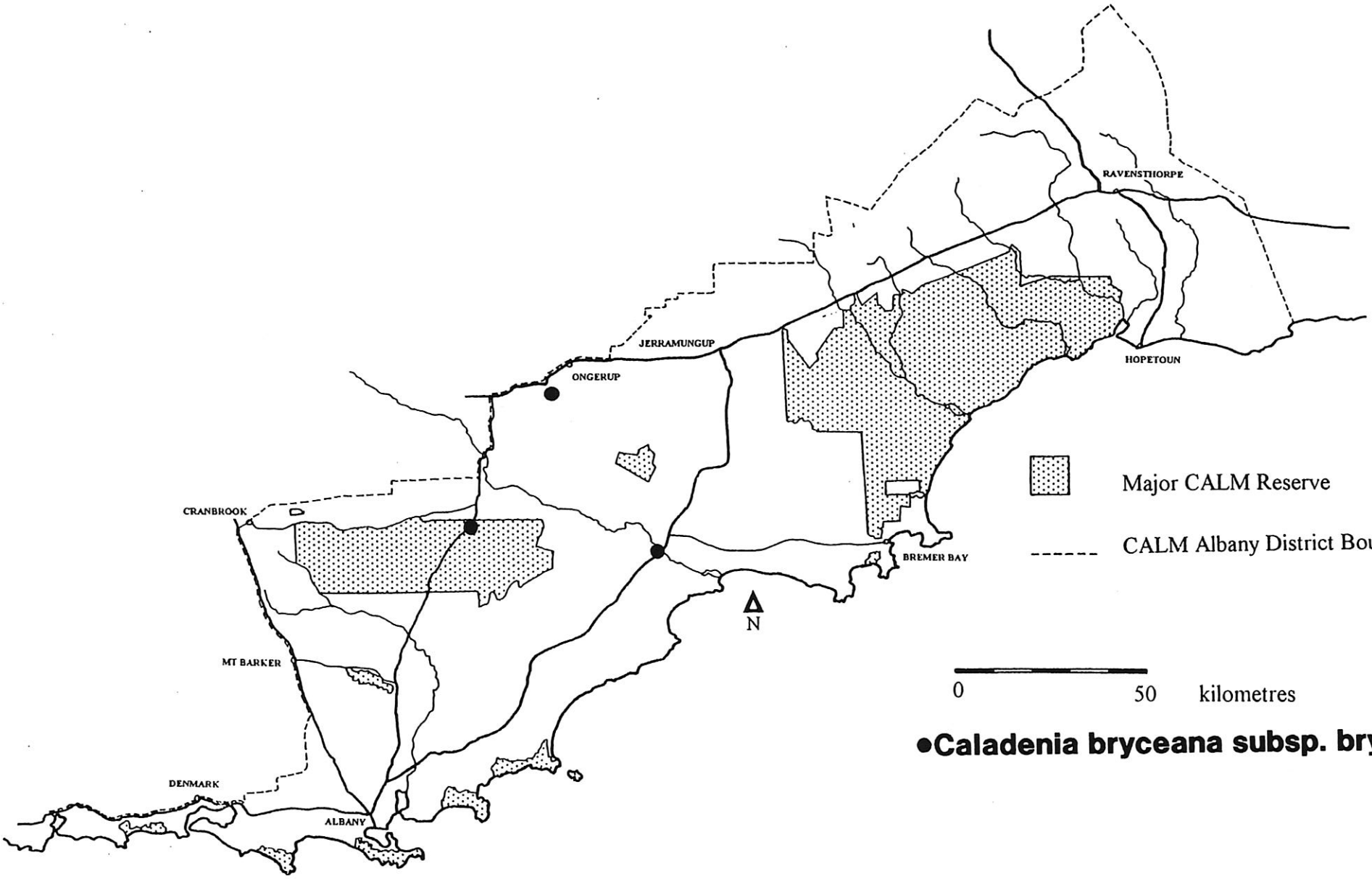
- control invading weeds
- liaise with private land holder each spring
- monitor known populations and relocate Marra Bridge populations
- investigate possibility of shifting Information Bay in SRNP away from population of *C. bryceana*

Research Requirements

- survey for new populations
- conduct research on weed control

References

Hoffman and Brown (1992).



•Caladenia bryceana subsp. bryceana

Caladenia harringtoniae Hopper & A.P.Brown ms

ORCHIDACEAE

Pink Spider Orchid

Caladenia harringtoniae ms, one of smallest of the *C. longicauda* group , grows to ca. 30 cm tall, with flowers 7-10 cm across and leaves 15-25 cm. Petals and sepals are pink, edged white. The labellum is also pink and white with deep pink labellum fringe and calli.

Flowering Period: October-November

Distribution and Habitat

The Pink Spider Orchid's preferred habitat is winter wet flats under open Banksia and paperbark. However the Mt Clarence population is in scrub in shallow loamy clay over a granite outcrop. The species is known from a few populations scattered between Nannup and Albany.

Conservation Status

Current: Declared Rare Flora

Known Populations (Albany District)

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
7. Mt Clarence	Albany	Alb	Shire res.	30.10.92 17.6.88	0 10	- healthy

WAHerb: 6 records

Response to Disturbance

Flowering is stimulated by summer fire.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

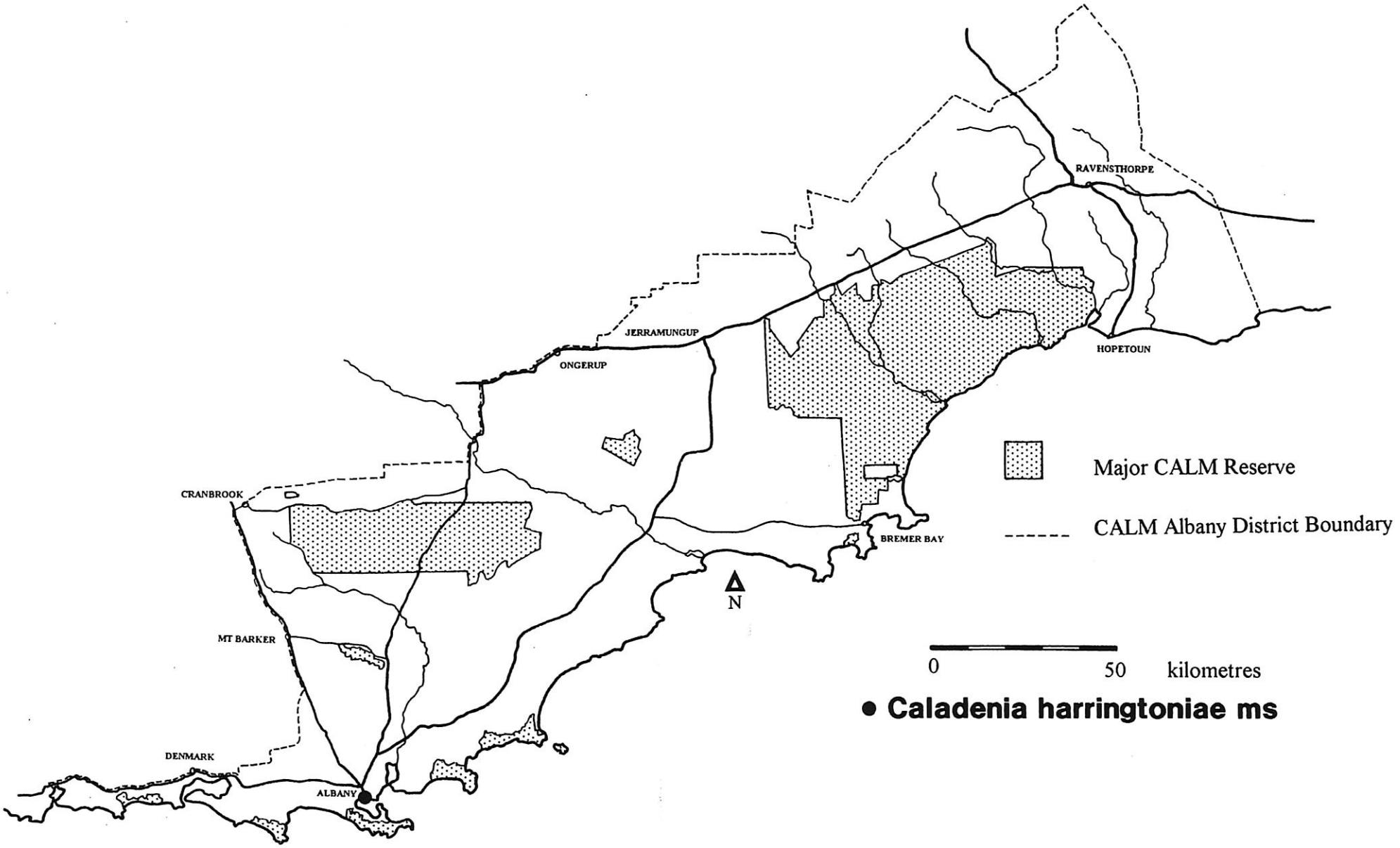
Monitor Mt Clarence population

Research Requirements

- review taxonomic status of Mt Clarence population
- survey other locations of similar habitat

References

Hoffman and Brown (1992).


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kilometres
• Caladenia harringtoniae ms

Conostylis misera Endl.

HAEMODORACEAE

Grass Conostylis

Conostylis misera is a small tufted prostrate perennial herb which generally grows in colonial groups, forming mats up to 400 mm across. The soft green flat leaves (5-18 cm long, 2-6 mm wide) are falcate and striate, with thin glabrous margins. Frequently the old leaves remain attached to the plant, blackened and twisted. The relatively large flowers are conspicuous, solitary with a 3 cm scape with 2-3 acuminate, spreading sheathing bracts. The bright yellow flowers have a perianth tube 12-19 mm long with lobes to 18 mm. Flowers and fruit are covered with an indumentum of short branched hairs and longer hairs.

This species has disappeared from several sites from which it was recorded in the mid 1970's and is in poor condition at all other known sites. Increased runoff due to road works and agricultural clearing may have contributed to "black spot" disease, affecting vigour and blackening the leaves. Weed invasion, possibly exacerbated by frequent fire is another major threat. All of the known locations are affected by environmental disturbance.

Flowering Period: October-November

Distribution and Habitat

Conostylis misera occurs in seasonally waterlogged (but not inundated) flats of brown sandy clay loams from just north of the Stirling Range, to Narrikup and across to South Stirling. It grows under an association of shrubs (*Pericalymma ellipticum, Hakea* spp., *Melaleuca* spp.) and sedges. Research is currently being conducted into weed control at the North Narrikup site (Pigott pers. comm).

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Narrikup Nth	Albany	Pl	MRD verge	21.12.92	30	weeds
2. Chillinup Rd	Albany	Pl	Shire res.	23.10.68	-	-
3. Stirling Ra	Albany	?	NP	31.10.68	-	-
4. Kamballup	Albany	Pl	Shire res.	7.12.92	0	-
5. YellanupRd	Albany	Alb	Shire res.	28.10.92	0	weeds
6. YellanupRd	Albany	Alb	Shire res.	28.10.92	0	weeds
7. Jackson Rd	Albany	Alb	Shire res.	28.10.92	0	weeds
8. Sth Stirling	Albany	Alb	NR	1.9.92	+50	flooded
9. Camel Lake	Albany	Gno	NR	2.10.78	-	-
(10) Gnowangerup	Albany	Gno	private	3.12.92	+100	undist.
(11) Narrikup	Albany	Pl	MRD verge	11.11.93	17 clumps	good

WAHerb: 19 records

Response to Disturbance

Under natural conditions it may re-establish successfully from seed after fire. However in areas adjacent to cleared farmland and roads, invading weeds and altered drainage are major threats to survival.

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

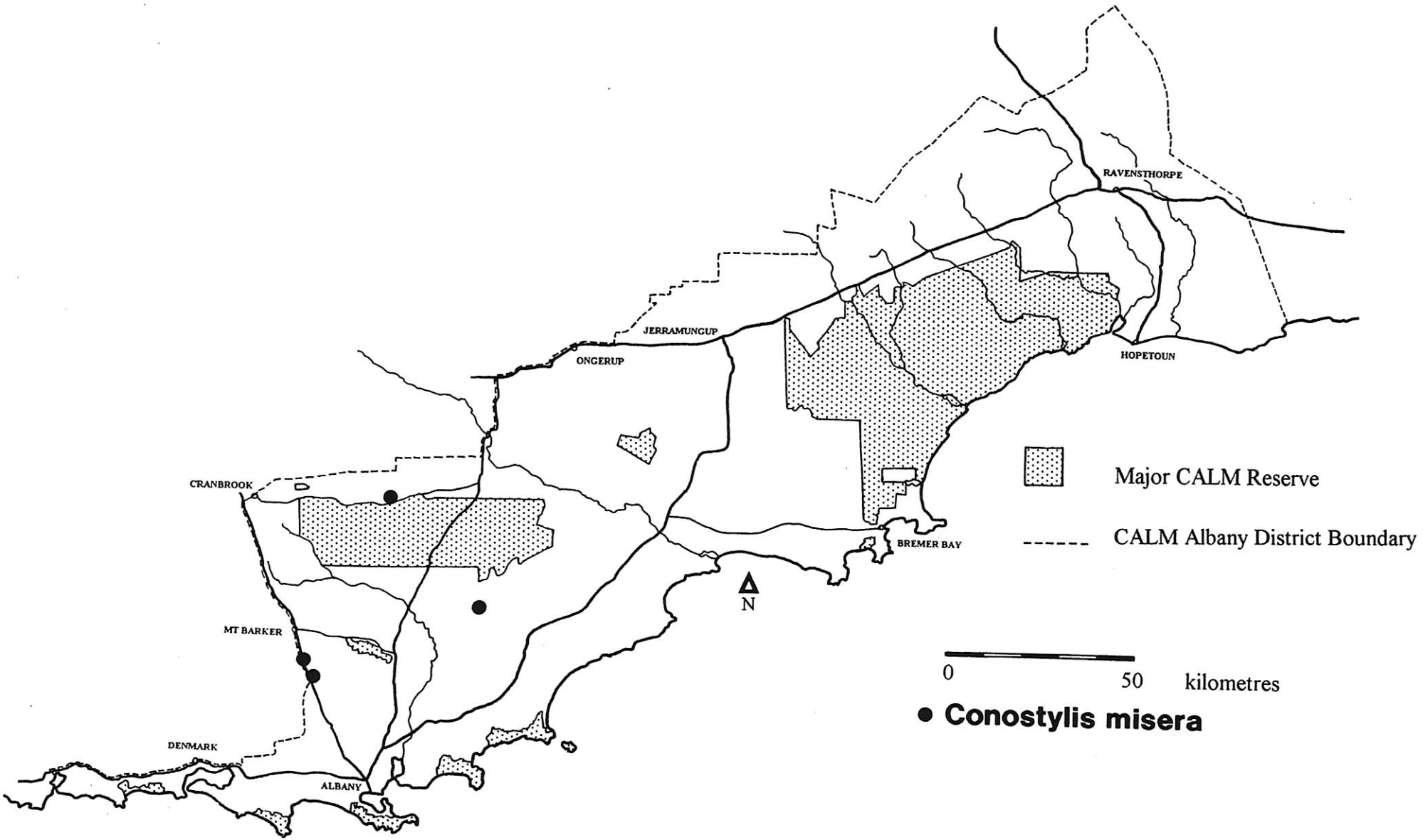
- relocate South Stirling Townsite, Chillinup Rd and Camel Lake populations
- contact land owners of Narrikup population (?MRD/Shire)
- control weed infestation at Narrikup and Gnowangerup populations

Research Requirements

- search for new populations, preferably on conservation land, unaffected by adjoining disturbance
- investigate impact of increased runoff into South Stirling Nature Reserve population from adjacent road.

References

Hopper (1987).


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kilometres
Conostylis misera

Coopernookia georgei Carolin

GOODENIACEAE

Mauve Coopernookia

Coopernookia georgei is a poorly known and poorly collected species confined mostly within the Wilderness management zone of the Fitzgerald River National Park. It is a slender, erect shrub to 1.5 m tall with shallow toothed elliptic leaves, 2-5 cm long. The 2 cm long solitary mauve flowers occur in the leaf axils toward the end of the branches. The two outer petals split off much lower than the central three.

None of the populations, except the Eyre Range population (Sandiford pers. comm.) have been accurately surveyed and locations have been extracted from herbarium records,. The Eyre and Whoogarup Range populations were burnt in November 1989, and the Mid Mt Barren population may have been burnt at the same time.

Flowering Period: July-November

Distribution and Habitat

Coopernookia georgei is known from shallow siliceous soils over quartzite in stony or rocky gullies, supporting thick scrub in the Eyre, Whoogarup and Mid Mt Barren Ranges. This terrain and vegetation is difficult to negotiate for flora surveys and the Wilderness management zone is permanently closed to vehicle access.

Survey in similar habitat is considered likely to reveal further populations.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Thumb Peak	Albany	Rav	NP	31.10.65	-	-
2. Mid Mt Barren	Albany	Rav	NP	17.7.70	-	-
3. Eyre Range	Albany	Rav	NP	10.1989	-	-
4. Whoogarup Range	Albany	Rav	NP	1.11.65	-	-

WAHerb: 6 records

Response to Disturbance

Unknown; probably killed by fire and regenerating from seed

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

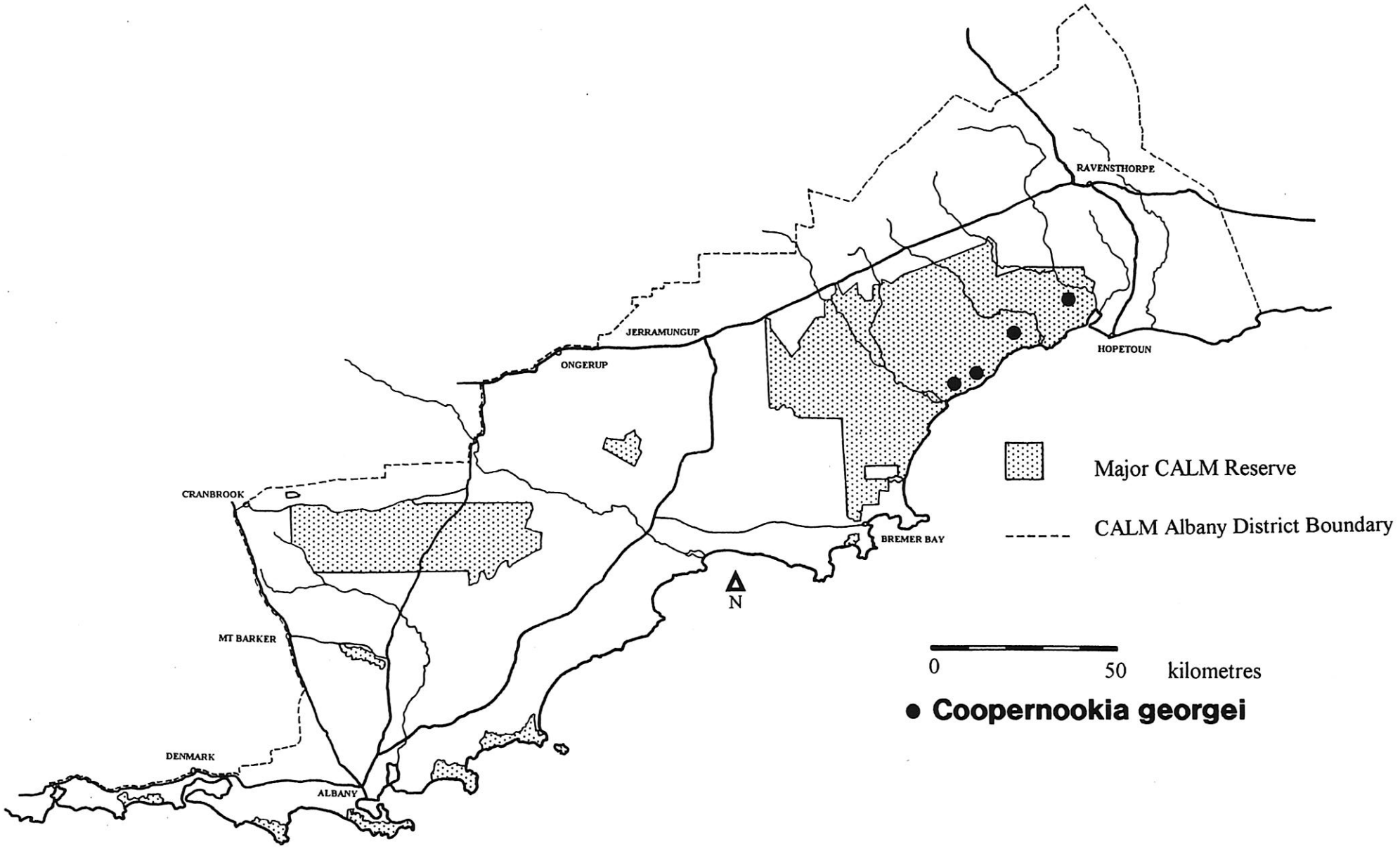
Relocate and survey all populations

Research Requirements

- search for new or extended populations in similar habitat
- determine susceptibility to *Phytophthora*

References

Carolin (1992).


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kilometres
● Coopernookia georgei

Corybas limpidus D.Jones

ORCHIDACEAE

Crystal Helmet Orchid

Corybas limpidus was discovered by Albany school teacher Laurie Byrne in the early 1970's and described in 1991. It is a very small orchid (circular ground hugging leaf, 1-2 cm across) which forms dense colonies. The flowers, which sit directly on the flat leaf are composed of a spreading labellum shaped like a ship's ventilator with the dorsal sepal closely appressed. The flowers are up to 1 cm across and are translucent green, mottled with burgundy. The petals and lateral sepals are reduced and inconspicuous. The labellum calli have a granular appearance.

Flowering Period: September-October (Albany); August (Hamersley Inlet)

Distribution and Habitat

Corybas limpidus occurs in the Fitzgerald River National Park in deep sands adjacent to coastal inlets, in deep leaf litter accumulated under *Melaleuca lanceolata*, *M. nesophila* and or *Eucalyptus* spp. Surprisingly, near Albany it occurs on the exposed ocean face of coastal dunes under very low wind pruned heath, with little or no accumulated litter. Mostly, however, it occurs under *Adenanthos sericeus* in deep leaf litter in the lee of the first coastal sand dune. *Corybas despectans* and *C. recurvus* occur near or with *C. limpidus*, however of these two species flower before *C. limpidus*.

This species is also reported to occur near Wilson Inlet, Walpole and also around Esperance; however these locations have not been verified.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Ledge Beach	Albany	Alb	NP	21.9.92	5000	healthy
2. Fitzgerald Inlet	Albany	Rav	NP	15.8.88	2000	undist.
3. Hamersley Inlet	Albany	Rav	NP	8.9.92	-	burnt

WAHerb: 5 records

Response to Disturbance

Corybas orchids are not favoured by fire and take considerable time to recolonise after fire as litter and moss beds slowly accumulate.

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

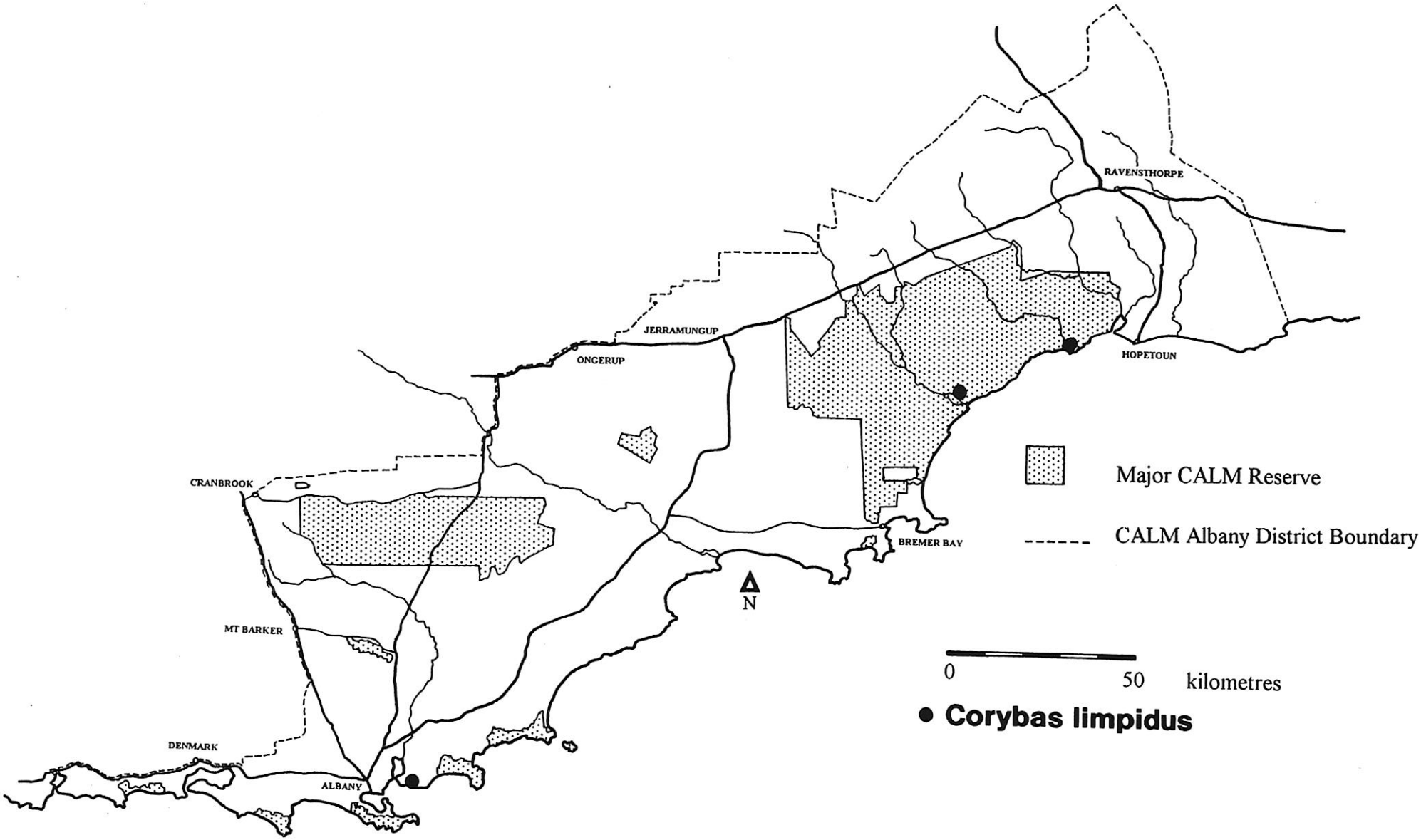
- monitor populations regularly
- control possible weed escapes and vehicle movement in camping grounds adjacent to populations at Fitzgerald and Hammersley Inlets

Research Requirements

Survey for new populations in similar habitat (Wilson Inlet, Walpole and Esperance).

References

Hoffman and Brown (1992).


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kilometres
Corybas limpidus

Darwinia collina C.A.Gardner

MYRTACEAE

Yellow Mountain Bell

Darwinia collina is possibly the most spectacular species of the group of *Darwinias* confined to the Stirling Range. It is a bushy shrub to 1 m high, with the most rounded leaves (1 cm by 5 mm; minutely toothed) and bracts of any of the Mountain Bells. The flowers form terminal drooping clusters, surrounded by broad lemon yellow, obtuse floral bracts. The inconspicuous petals are white; stigmas are up to 2 cm long, enclosed within the bracts.

This species is known to hybridise with *D. lejostyla*.

Flowering Period: March-April; August-November

Distribution and Habitat

Darwinia collina is confined to the summits and upper slopes of peaks in the eastern end of the Stirling Range. It occurs in dense low heath on shallow siliceous soils over schist.

All known populations, through the eastern peaks of the Stirling Range, were burnt in April 1991. It appears to regenerate successfully from seed.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Bluff Knoll	Albany	Gno	NP	1993	-	drought
2. Pyungoorup	Albany	Gno	NP	9.79	-	healthy
3. Moongoongoonderup	Albany	Gno	NP	9.79	-	healthy
4. Isongerup	Albany	Gno	NP	9.79	-	health
(5) Ellen Peak	Albany	Gno	NP	9.6.89	+100	disease
(6) 3rd Arrow	Albany	Gno	NP	9.6.89	+100	disease

WAHerb: 26 records

Response to Disturbance

Will re-establish from seed after fire.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible. However, the loss of susceptible species which may form a protective canopy over the *Darwinia* may be critical to its survival.

Management Requirements

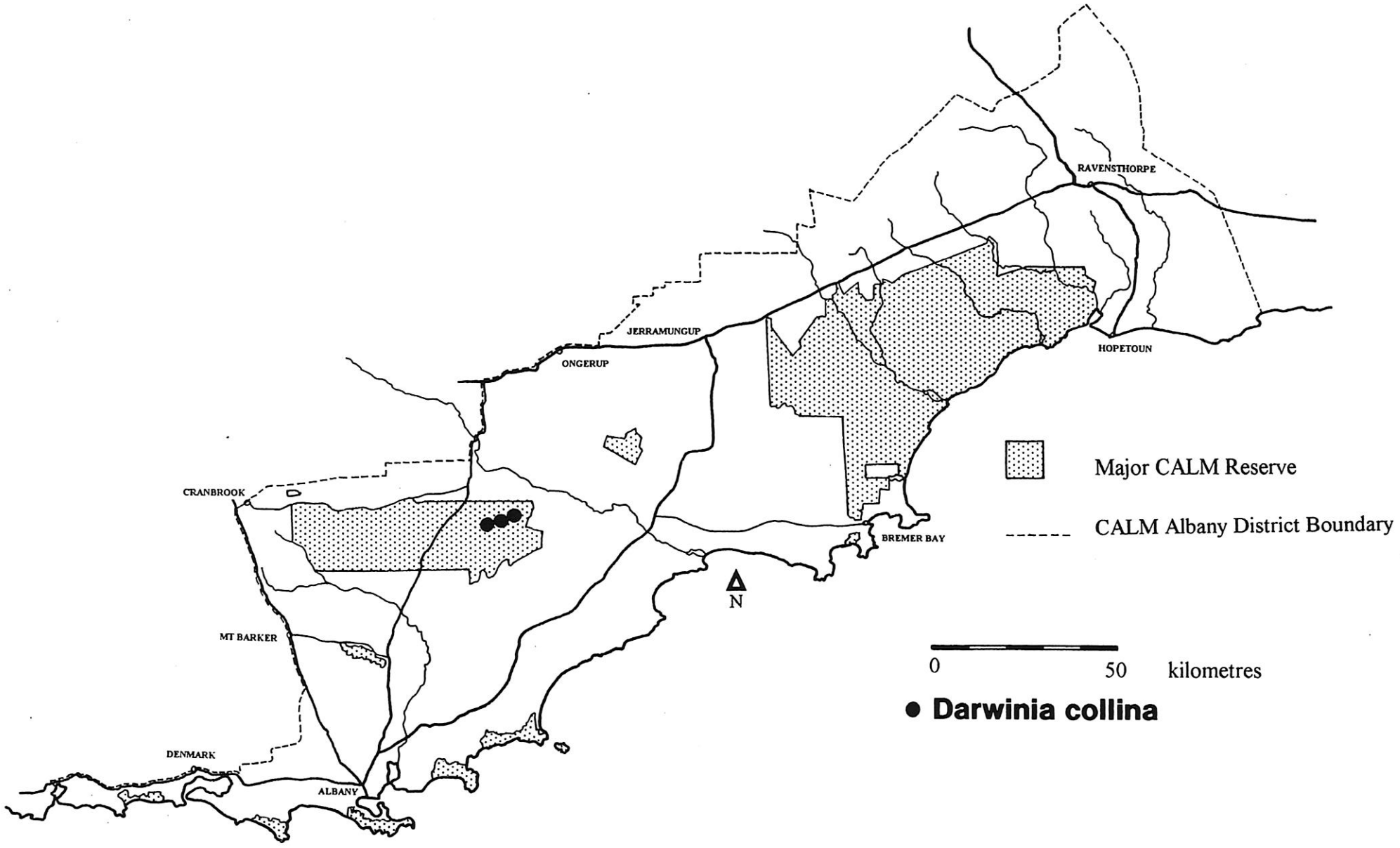
- exclude fire from populations for at least ten year intervals
- protect from introduction of *Phytophthora*
- monitor regularly

Research Requirements

- access susceptibility to *Phytophthora* in laboratory and field trials
- resurvey each population and monitor post fire regeneration

References

Gardner (1923), Keighery (1985).


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BREMER BAY
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CALM Albany District Boundary
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kilometres
● Darwinia collina

Darwinia macrostegia (Turcz.) Benth. MYRTACEAE

Mondurup Bell

Darwinia macrostegia has the largest inflorescences of the Mountain Bells, with red outer bracts subtending the spectacular inner bracts, which are cream streaked with red up to 4 cm long. It is an erect spindly shrub to 2 m with lanceolate to ovate obtuse leaves, 1-2 cm long with recurved margins. The heads contain 6-8 flowers with white petals and 3-4 cm styles, not protruding beyond the bracts.

Flowering Period: March-May, August-November

Distribution and Habitat

Mondurup Bells grow on hillsides and valleys in the western part of the Stirling Range above the 300 m contour. They grow in acid sandy clay soil over schist.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Hume Peak	Albany	Cb	NP	10.77	-	healthy
2. Ross Peak	Albany	Cb	NP	10.77	-	healthy
3. Res 6980	Albany	Cb	NP	16.6.88	10	healthy
4. unnamed hill	Albany	Cb	NP	10.77	-	healthy
5. unnamed hill	Albany	Cb	NP	10.77	-	healthy
6-8. Mondurup	Albany	Pl	NP	9.91	-	healthy
9. Little Mondurup	Albany	Pl	NP	10.78	-	healthy
(10) Mt Mistake	Albany	Cb	NP	10.77	-	healthy
(11) W of Red Gum Springs	Albany	Cb	NP		-	-

WAHerb: 34 records

Response to Disturbance

Darwinia macrostegia will re-establish from seed after fire, but may take 4-5 years before flowering and seeding again. Fire frequency at 5-6 years or less is likely to eliminate this species.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible. However, disturbance may introduce *Phytophthora* dieback which can destroy the protective cover provided by susceptible species.

Management Requirements

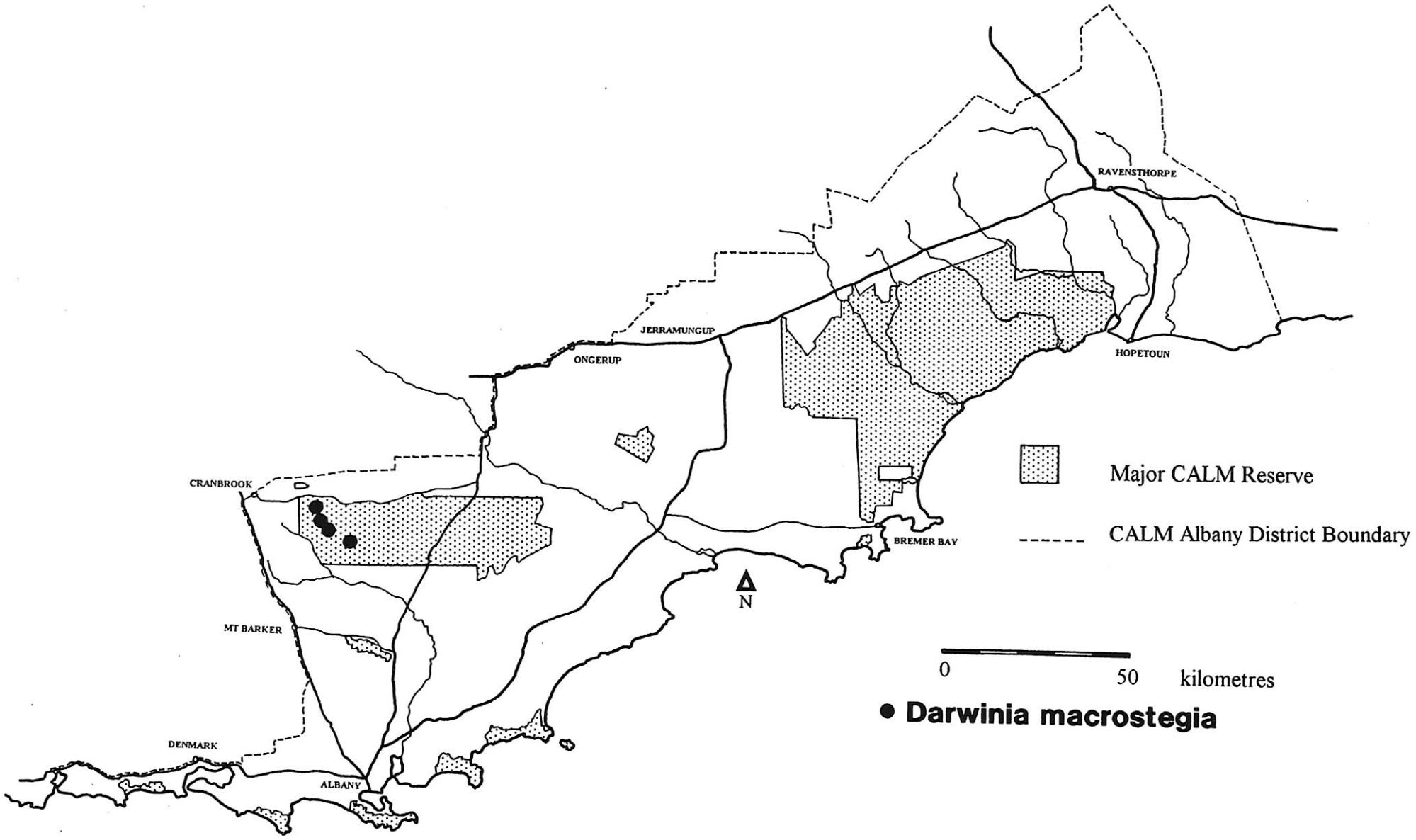
- strict dieback hygiene should be observed at all locations
- ensure that fire frequency is more than 10 years.
- relocate and monitor all populations

Research Requirements

Assess susceptibility to *Phytophthora* in field and laboratory trials

References

Keighery and Marchant (pers. comm.)


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kilometres
● Darwinia macrostegia

Darwinia meeboldii C.A.Gardner

MYRTACEAE

Cranbrook Bell

Darwinia meeboldii is a rigid, erect shrub 2-3 m tall, and like all Mountain Bells has pendulous flower heads. The 9 mm linear leaves are dark green, and densely crowded up to and around the green outer floral bracts. The conspicuous 40 mm inner bracts are pale green or white, with spreading tips of red-purple, surrounding 6-8 deep purple flowers. The 20 mm dark red-purple styles are almost exserted with 4 mm tips which are shortly hairy. There are two colour forms; a pale form and a yellowish one.

Flowering Period: October-November

Distribution and Habitat

This species is confined to rocky hillsides in the western end of the Stirling Range National Park. At Hamilla Hills it occurs in tall heath of *Kunzea montana, Banksia oreophila* and other shrubs. Numbers of plants apparently decline with time after fire.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1-3. Hamilla Hills	Albany	Cb	NP	24.8.93	+50	in flower
4-5. W SRNP	Albany	Cb	NP	10.86	+500	in flower

WAHerb: 29 records

Response to Disturbance

Darwinia meeboldii will re-establish from seed after fire, but may take 4-5 years before flowering and seeding again. Fire frequency at 5-6 years or less may eliminate this species.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible. However, the loss of susceptible species which may form a protective canopy over the *Darwinia* may be critical to its survival.

Management Requirements

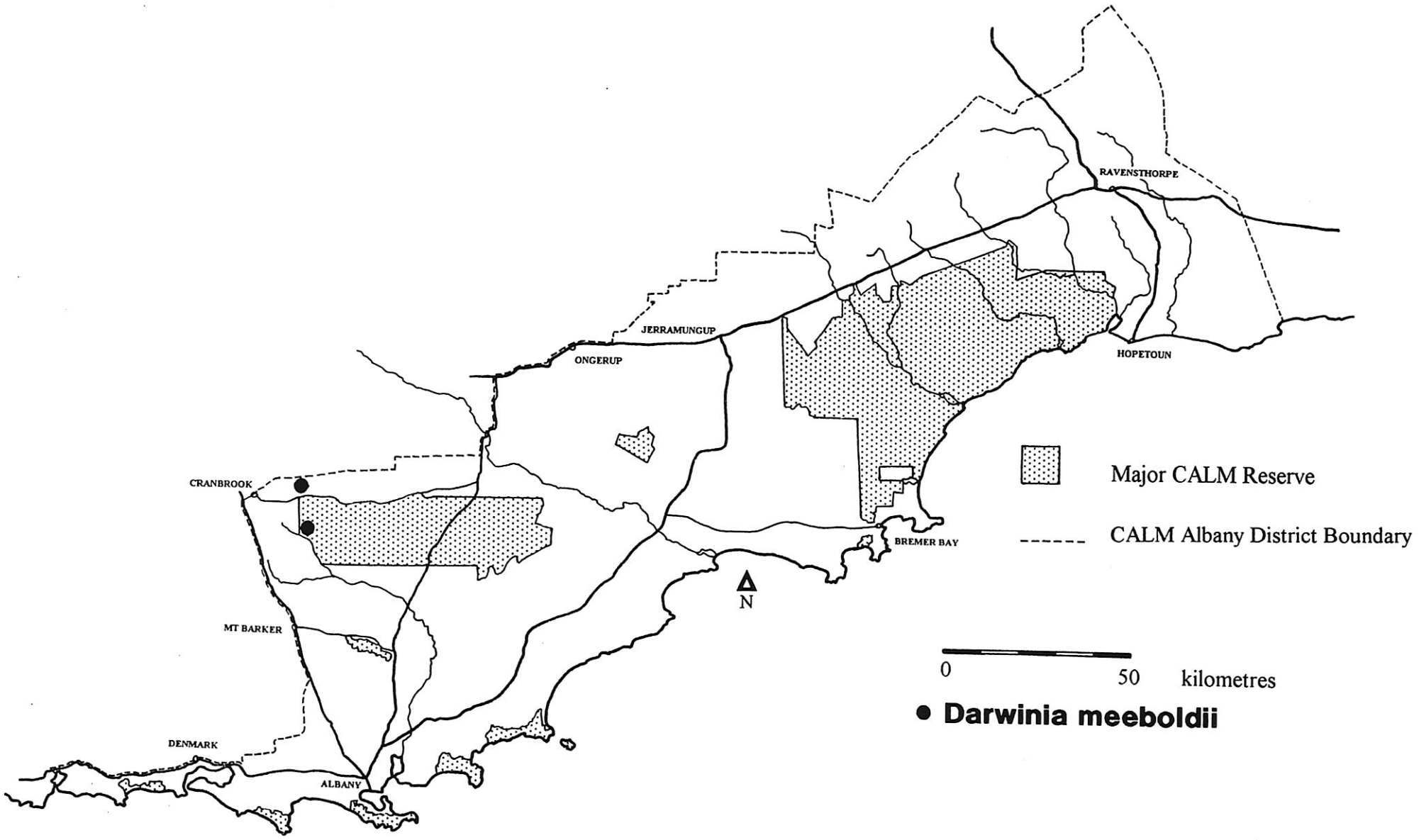
- monitor population especially for the impact of dieback
- ensure fire frequency is greater than ten years

Research Requirements

- search for populations at locations given on older herbarium collections
- assess susceptibility to *Phytophthora* in field and laboratory

References

Keighery and Marchant (pers. comm.)


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Darwinia meeboldii

Darwinia oxylepis Benth. MYRTACEAE

Gillham's Bell

Darwinia oxylepis is an erect shrub to 1 m, with scattered linear leaves 6-8 mm long. The campanulate inflorescences are large (to 20 mm) with scarlet bracts surrounding 8-10 flowers in the head. This species was initially believed to be a form of *D. lejostyla* which, although restricted to the Stirling Range is relatively common. However, it has recently been examined by Marchant and Keighery and considered to be a separate species, more closely related to *D. meeboldii.* James Drummond collected material of it in 1848 which was subsequently described by Turczaninow in 1852 as *Genetyllis oxylepis*; the specific name now resurrected.

One population on Stirling Range Drive has become a well known tourist attraction as it is probably the most accessible of the famous Mountain Bells. The population is suffering from a degree of trampling and illegal picking and has recently been found to have some deaths due to *Phytophthora.*

Flowering Period: August-November

Distribution and Habitat

Gillham's Bell is confined to the Stirling Range, in scrub in peaty sands and clays over schist and is restricted to lower areas above 300 m and not the mountain peaks.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Baby Barnett	Albany	Cb	NP	20.10.89	+250	disturbed
2. Mondurup Pass	Albany	Pl	NP	1986	+2000	seedlings
3. Red Gum Hill	Albany	Cb	NP	1986	+2000	seedlings

WAHerb: 20 records

Response to Disturbance

Darwinia oxylepis will re-establish from seed after fire, but may take 4-5 years before flowering and seeding again. Fire frequency at 5-6 years or less may eliminate this species.

Susceptibility to *Phytophthora* Dieback

Field observation suggests high susceptibility. The loss of susceptible species which may form a protective canopy over the *Darwinia* may also be critical to its survival.

Management Requirements

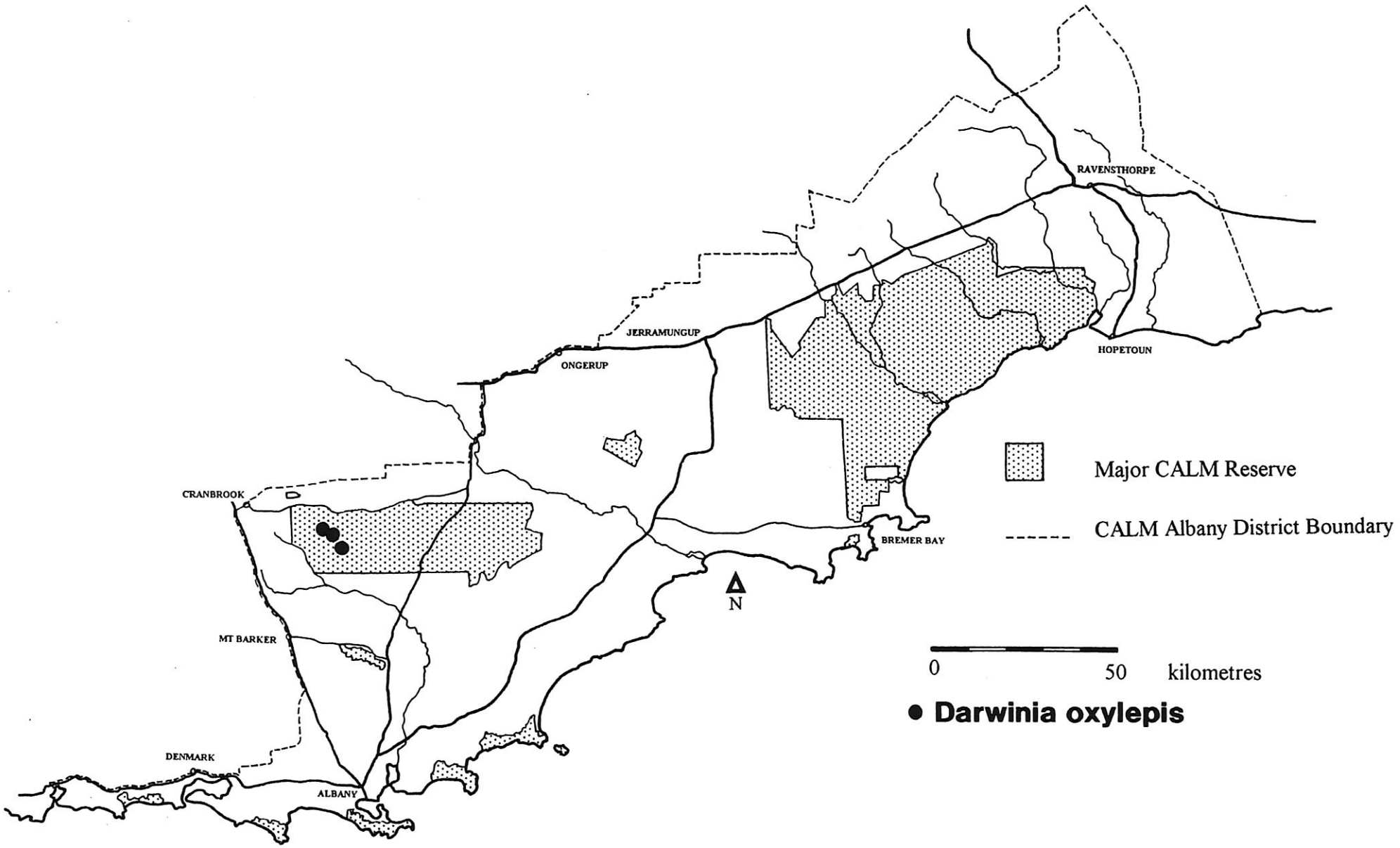
- monitor impact of tourists on Stirling Range Drive population and erect barriers if necessary
- spray population on Stirling Range Drive with phosphonate
- monitor other populations
- maintain liaison with tour operators

Research Requirements

- relocate populations previously known from Ross Peak and Mount Pass
- determine the effectiveness of phosphonate spray in prevention of dieback

References

Keighery and Marchant (1980).


RAVENSTHORPE
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0
50
kilometres
● Darwinia oxylepis

Darwinia squarrosa (Turcz.) Domin

MYRTACEAE

Fringed Mountain Bell

Darwinia squarrosa is an erect, bushy shrub to 1 m, with crowded ovate-elliptical leaves to 10 mm. The leaf margins are ciliate, which gives rise to the common name. The flower heads are surrounded by 20 mm pink floral bracts and squarrose pink-green outer bracts.

Flowering Period: September-November

Distribution and Habitat

Darwinia squarrosa is restricted to peaty soil amongst schist rocks in the eastern peaks of the Stirling Range. The associated vegetation is dense scrub.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
(1) Ellen Peak	Albany	Pl	NP	1988	-	Good
(2) Bakers Knob	Albany	Pl	NP	1988	-	Good
(3) Isongerup Peak	Albany	Pl	NP	1988	-	Good
(4) Moong.derup Hill	Albany	Pl	NP	1988	-	Good
(5) Bluff Knoll 1	Albany	Pl	NP	1988	-	Good
(6) W. Bluff Knoll 1	Albany	Pl	NP	1988	-	Good
(7) W. Bluff Knoll 2	Albany	Pl	NP	1988	-	Good
(8) SE Bluff Knoll	Albany	Pl	NP	1988	-	Good
(9) Coyanerup Peak	Albany	Pl	NP	1988	-	Good
(10) Sth Coyanerup	Albany	Pl	NP	1988	-	Good

WAHerb: 18 records

Response to Disturbance

Darwinia *squarrosa* will re-establish from seed after fire, but may take 4-5 years before flowering and seeding again. Fire frequency at 5-6 years or less may eliminate this species.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible. However, the loss of susceptible species which may form a protective canopy over the *Darwinia* may be critical to its survival.

Management Requirements

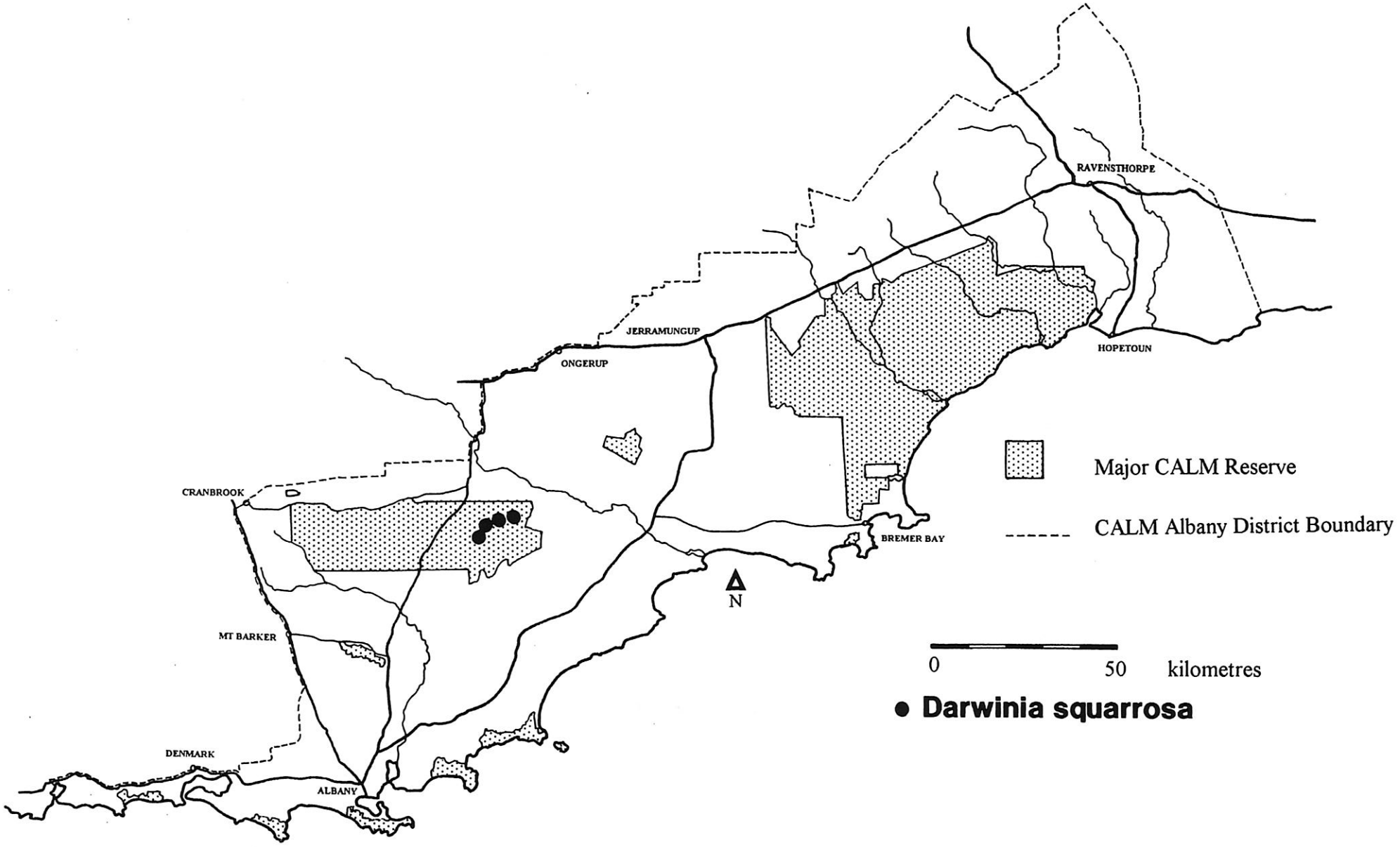
- monitor post fire regeneration
- ensure that fire is excluded at least until 2001

Research Requirements

Resurvey all previous WAHerb locations

References

G.J. Keighery and N.G. Marchant (pers. comm.)


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● Darwinia squarrosa

Darwinia wittwerorum N.G.Marchant & Keighery

MYRTACEAE

Wittwer's Mountain Bell

Darwinia wittwerorum is an erect spindly shrub to 75 cm, with fine scattered linear triquetrous leaves 5-10 mm long. The inflorescence of 5-9 flowers is ovoid, with cream elliptic outer and rose pink obovate inner floral bracts, 18-21 mm. *D. wittwerorum* is similar to *D. lejostyla* , however the latter has campanulate, brighter red inflorescences.

Flowering Period: September-November

Distribution and Habitat

Wittwer's Mountain Bell is restricted to only three locations, at low elevation in the central Stirling Range. It occurs in open mallee over scrub in sandy clays over schist.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Hostelliers	Albany	Pl	NP	1979	+100	healthy
2. Talyuberlup	Albany	Pl	NP	7.12.92	+1000	healthy
3. Stirling Rge Drive	Albany	Pl	NP	-	-	-
(4) Arthurs Knob	Albany	Pl	NP	1990	+200	healthy

WAHerb: 8 records

Response to Disturbance

Darwinias will re-establish from seed after fire, but may take 4-5 years before flowering and seeding again. Fire frequency at 5-6 years or less may eliminate this species.

Susceptibility to *Phytophthora* Dieback

Field observation suggests high susceptibility. The loss of susceptible species which may form a protective canopy over the *Darwinia* may also be critical to its survival.

Management Requirements

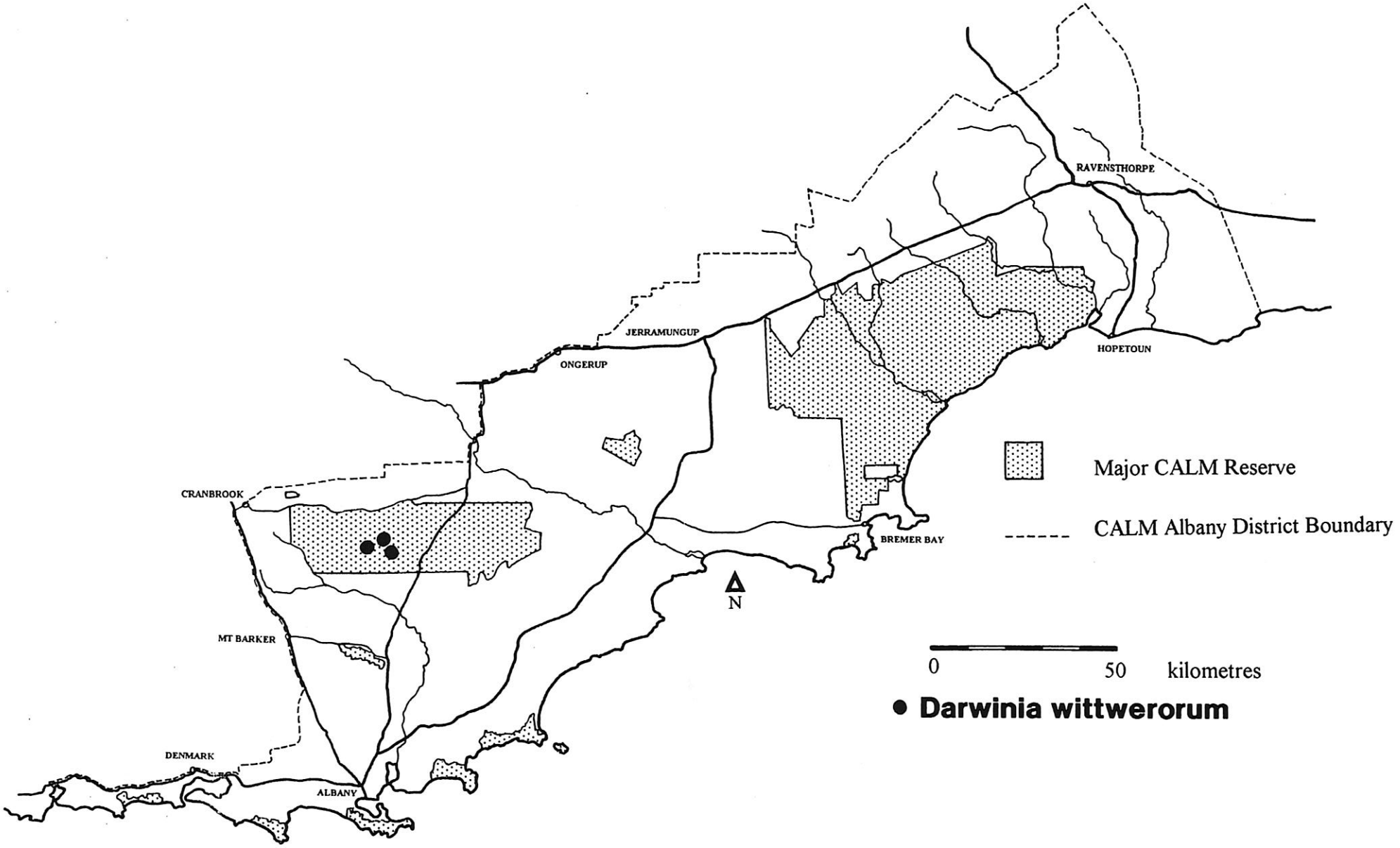
- monitor Talyuberlup population to ensure tourist impact is eliminated
- spray Talyuberlup population with phosphonate
- monitor other populations
- maintain liaison with tour operators

Research Requirements

- survey Hostelliers and Stirling Range Drive populations
- access effectiveness of phosphonate spray in controlling or preventing dieback

References

Keighery and Marchant (1980).


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● Darwinia wittwerorum

Darwinia sp. Stirling Range (G.J.Keighery 5732) MYRTACEAE

Red Mountain Bell

This species is the most recently discovered of the Mountain Bells, being found by G.J. Keighery in October 1982. It is also the rarest, confined to only one location. *Darwinia* sp. Stirling Range (GJK 5732) is closely related to *D. squarrosa*, however it is bright red (not pink), has fewer flowers (4 not 6-9) per inflorescence, and is the only Mountain Bell with styles exserted beyond the floral bracts.

It is an open straggly shrub to 1.5 m with two rows of almost sessile, ovate, 6 mm dark green leaves with shortly ciliate margins.

It is known to hybridise with *D. lejostyla*.

Flowering Period: October-November

Distribution and Habitat

The Red Mountain Bell is confined to one population in dense heath on shallow, peaty, brown loamy sand over schist in a saddle in the centre of the eastern part of the Stirling Range National Park. This population was burnt in April 1991, but has regenerated strongly from seed with up to 100 seedlings per square metre.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Mt Success	Albany	Gno	NP	22.9.93	10,000	good

WAHerb: 2

Response to Disturbance

Darwinia sp. Stirling Range (G.J. Keighery 5732) will re-establish from seed after fire, but may take 4-5 years before flowering and seeding again. Fire frequency at 5-6 years or less may eliminate this species.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible. However, the loss of susceptible species which may form a protective canopy over the *Darwinia* may be critical to its survival.

Management Requirements

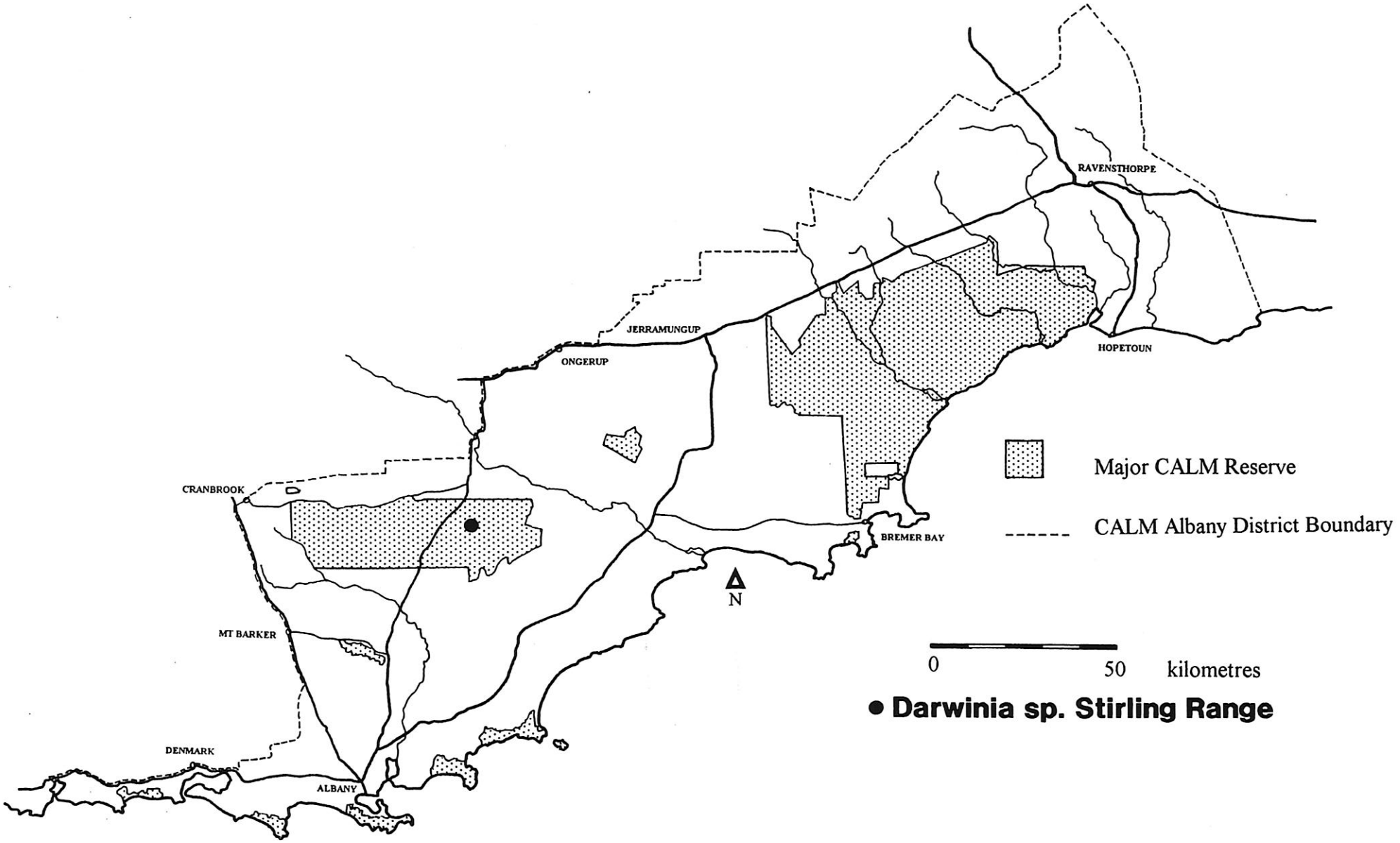
Monitor regularly

Research Requirements

- exclude fire from Mt Success for at least ten years
- conduct trials to determine susceptibility to dieback

References

G.J. Keighery and N.G. Marchant (pers. comm.).


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kilometres
● Darwinia sp. Stirling Range

Daviesia megacalyx Crisp ms

FABACEAE

Large Sepalled Daviesia

Daviesia megacalyx ms is an erect bushy shrub to 1.5 m, with angular branchlets and flat, obtuse, broadly lanceolate, erect, dull green leaves (4-8 cm). The flowers (10 mm yellow standard with yellow centre surrounded by red; the keel is deep red) are in axillary clusters. The 15 mm triangular fruits are subtended by large conspicuous calyces, which persist on the plant and turn black, long after the pods have shed.

Flowering Period: August-September

Distribution and Habitat

Daviesia megacalyx ms is confined to the Ravensthorpe Range in heavy red gravelly clay over laterite. It occurs in gravel pits and along tracks in disturbed areas which formerly supported an association of mallee scrub. Apparently germination of this species is favoured by soil disturbance. The district in which this species occurs is rich in various minerals and has been extensively traversed by a maze of tracks. Further survey on these tracks and associated areas of disturbance may lead to the discovery of further populations.

The bulk of the Ravensthorpe Range is proposed to be vested as Nature Reserve in CALM's South Coast Regional Management Plan. Currently the area is either VCL or Other Reserve and this species may come under threat from mineral exploration and associated activities.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Elverdton	Albany	Rav	VCL	21.8.92	+200	healthy
2. Elverdton	Albany	Rav	VCL	21.8.92	2	cleared
(3) Floater Rd	Albany	Rav	Other res.	21.8.92	34	healthy
(4) Mt Iron Track	Albany	Rav	VCL	16.12.92	33	healthy
(5) Mt Benson	Albany	Rav	VCL	3.6.93	+50	healthy

WAHerb: 7 records

Response to Disturbance

Likely to be killed by fire but regenerate from seed after fire or soil disturbance.

Susceptibility to Phytophthora Dieback

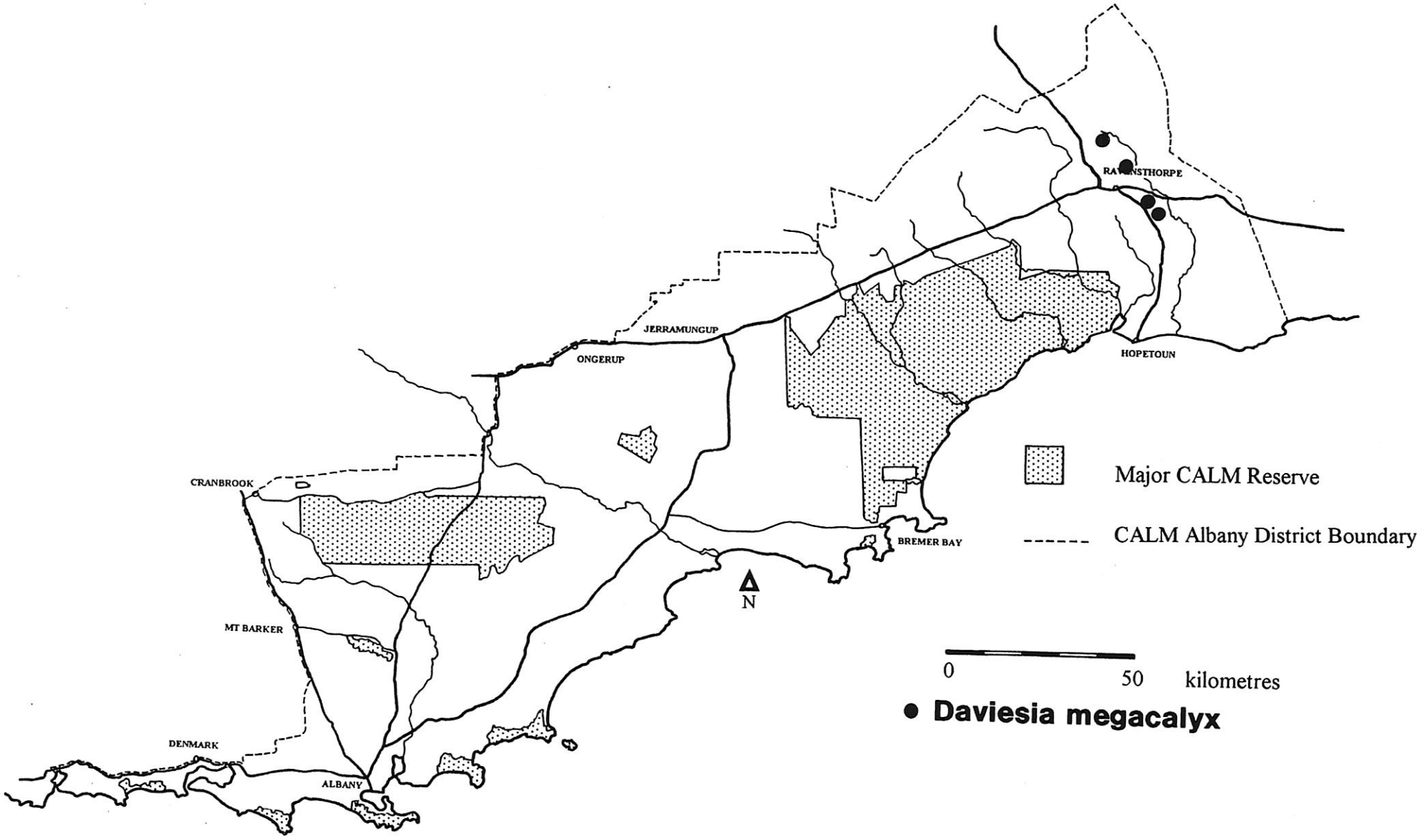
Unknown

Management Requirements

- ensure secure reservation of populations in conservation land
- monitor occasionally
- collect and store seed
- maintain liaison with Shire

Research Requirements

- search along old mineral survey lines and in gravel pits in the Ravensthorpe Range for new populations
- determine susceptibility to dieback


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Daviesia megacalyx

Daviesia pseudaphylla Crisp ms

FABACEAE

Stirling Range Daviesia

Daviesia pseudaphylla ms is a low, spreading spindly shrub (0.3 m wide by 1.3 m tall) with procumbent stems which appear leafless but in fact bear phyllodes deceptively similar to the branchlets. The phyllodes are ascending, gently upcurved, terete, up to 300 mm long by 0.75-1.5 mm in diameter. On some branchlets the phyllodes are reduced to minute scales. The inflorescences are axillary, 2-3 flowered on a very reduced rachis. The 10 mm corolla standard is yellow-orange ventrally, dark purple with a central trilobed yellow streak dorsally. The 8 mm dark red wings are elliptic and the dark red keel is half elliptic.

Flowering Period: July-September

Distribution and Habitat

Daviesia pseudaphylla ms is known only from the type locality in the south east of the Stirling Range. It grows in an association of heath and open mallee on a gentle slope of shallow stony clay over schist. This location was burnt by wildfire in April 1991. Surveys in April 1993 located older plants, but only on the track and not in surrounding heath.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. E Pillenorup Track	Albany	Pl	NP	1.4.93	+20	-

WAHerb: 4 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

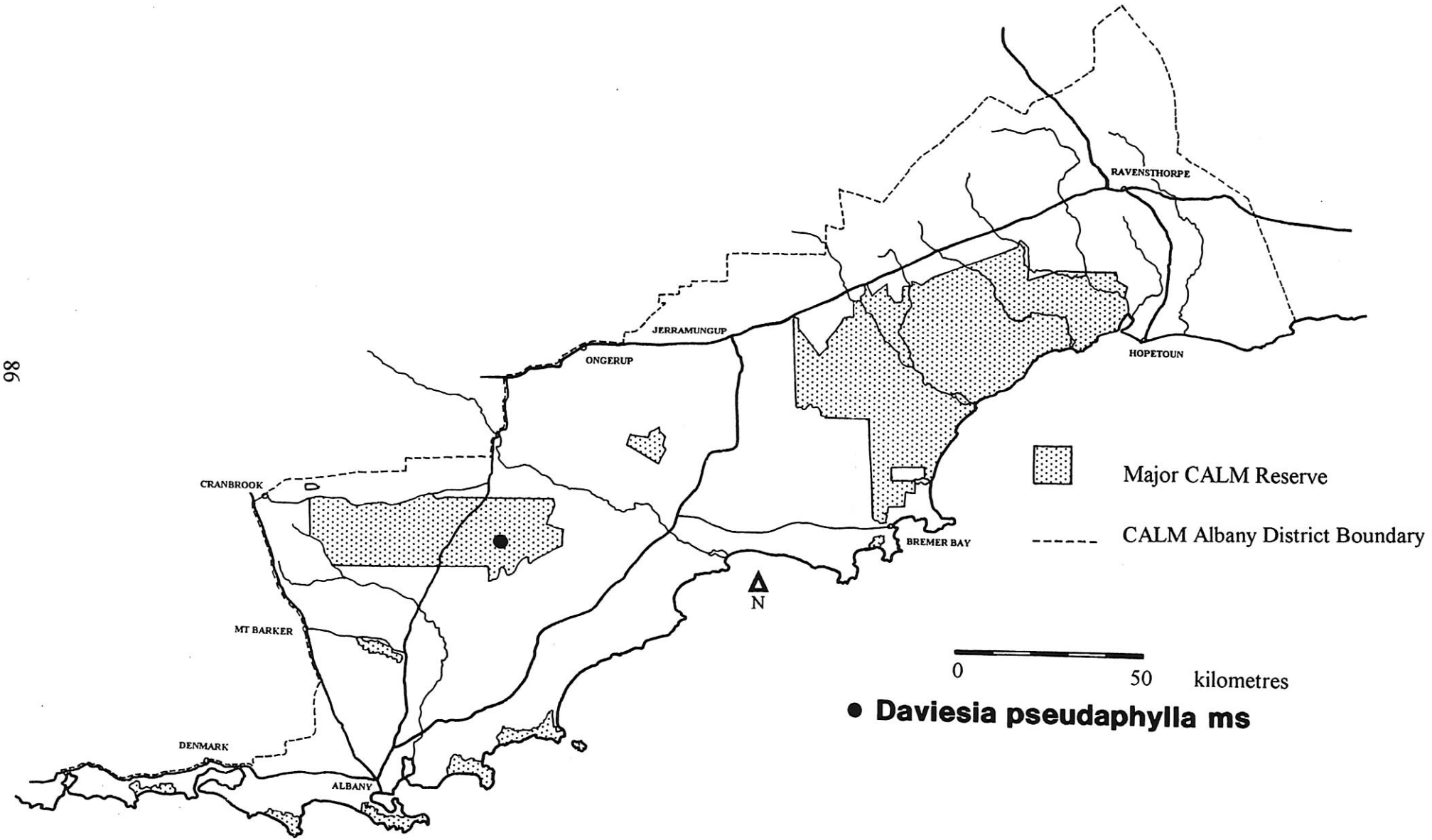
Presumed susceptible

Management Requirements

- monitor post fire regeneration
- collect seed for storage

Research Requirements

- search other areas of similar habitat in the south east Stirling Range for new populations
- determine response to fire and soil disturbance
- determine susceptibility to dieback


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● Daviesia pseudaphylla ms

Drakaea confluens Hopper & A.P.Brown ms

ORCHIDACEAE

Late Hammer Orchid

Drakaea confluens ms is an erect, tuberous herb with a single 1-2 cm grey-green cordate leaf (which may be covered in short hairs), held flat on the ground. The flower stem is up to 25 cm high and supports the inflorescence which is a female wasp mimic. It is differentiated from other *Drakaea* species by its two coloured labellum which usually has several spots on a pale swollen section.

Flowering Period: late October-November

Distribution and Habitat

The Late Hammer Orchid is known from only two, widely separated areas at Boyup Brook and Stirling Range. It grows in deep sandy soil in openings in Jarrah-Banksia woodland.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Mondurup	Albany	Pl	NP	7.10.83	2	in flower
2. Red Gum Pass	Albany	Cb	NP	7.10.83	1	in flower
3. Chinocup	Katanning	Kent	NR	-	+200	-
4. Dinninup	Bunbury	Collie	private	18.4.88	+100	-
5. Dinninup	Bunbury	Collie	private	16.8.88	+100	-

WAHerb: 7 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

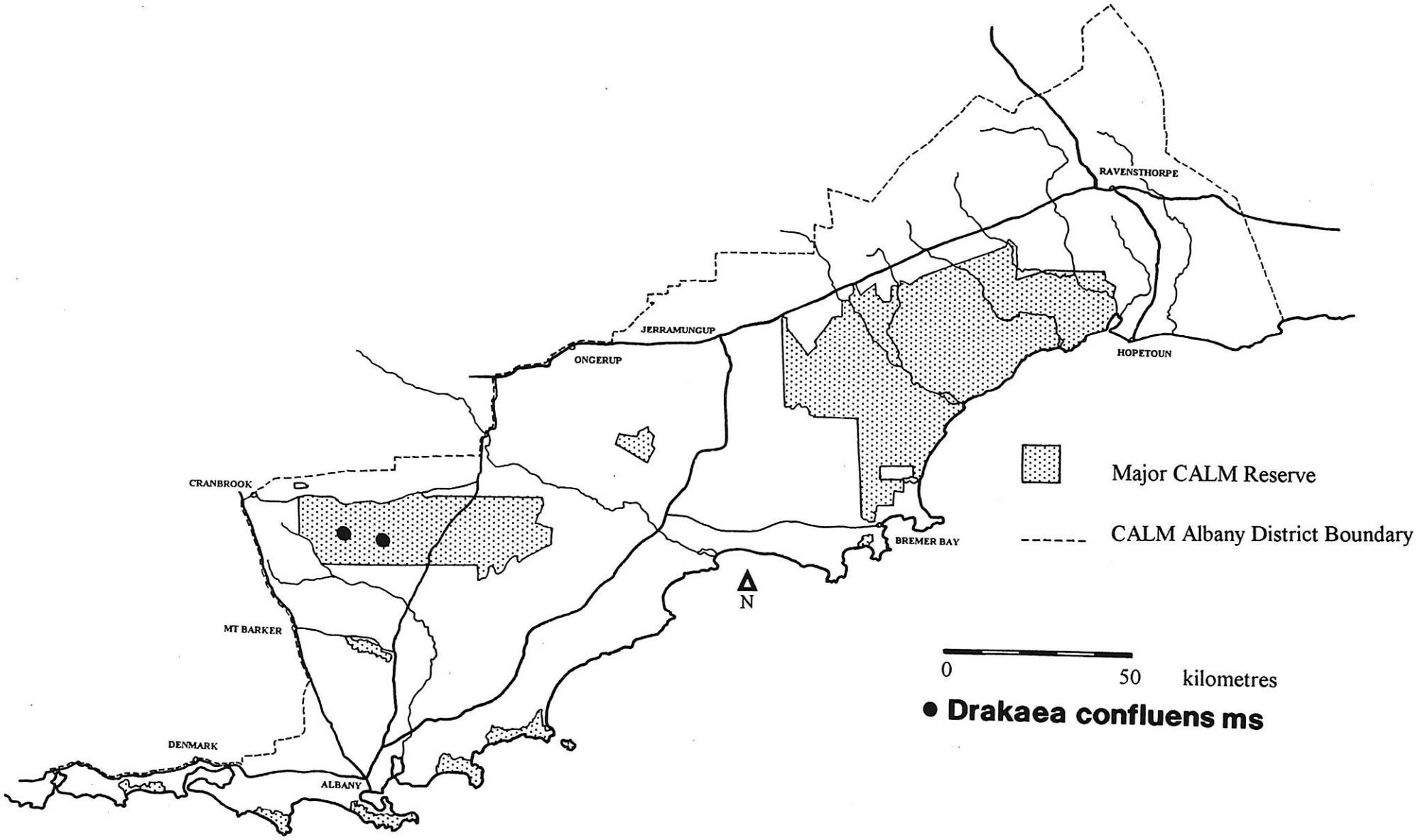
Resurvey Stirling Range populations and inform National Park Rangers

Research Requirements

Opportunistic survey for new populations

References

Hoffman and Brown (1992).


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● Drakaea confluens ms

Drakaea micrantha Hopper & A.P.Brown ms

ORCHIDACEAE

Dwarf Hammer Orchid

Drakaea micrantha ms is a tuberous herb which, due to its inconspicuous nature, has been collected infrequently. First collected in 1930 from East Porongurup, it was not collected again until 1970. Since then it has been collected spasmodically. The diminutive flower is only 12-25 mm long on a stem up to 30 cm. The 15 mm cordate leaves are silver grey with prominent green veins. The female wasp mimicking flowers are very similar to both the more common species *D. thinniphila* and *D. glyptodon* but differs sufficiently in small size and labellum (wasp abdomen) detail to be a separate species.

Flowering Period: September-October

Distribution and Habitat

The Dwarf Hammer Orchid has been collected spasmodically over a wide range from Perth to Albany in open sandy patches in Jarrah-Banksia woodland. Generally, populations are very difficult to relocate, especially as they do not necessarily flower every year. Two populations that had previously been recorded near Albany could not be relocated in 1992. This species is currently known from several thousand plants over wide geographical range, with secure populations in the Frankland NP.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Bakers Jn	Albany	Alb	NR	10.82	-	in flower
2. Gull Rock	Albany	Alb	NP	1972	-	in flower

WAHerb: 15 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

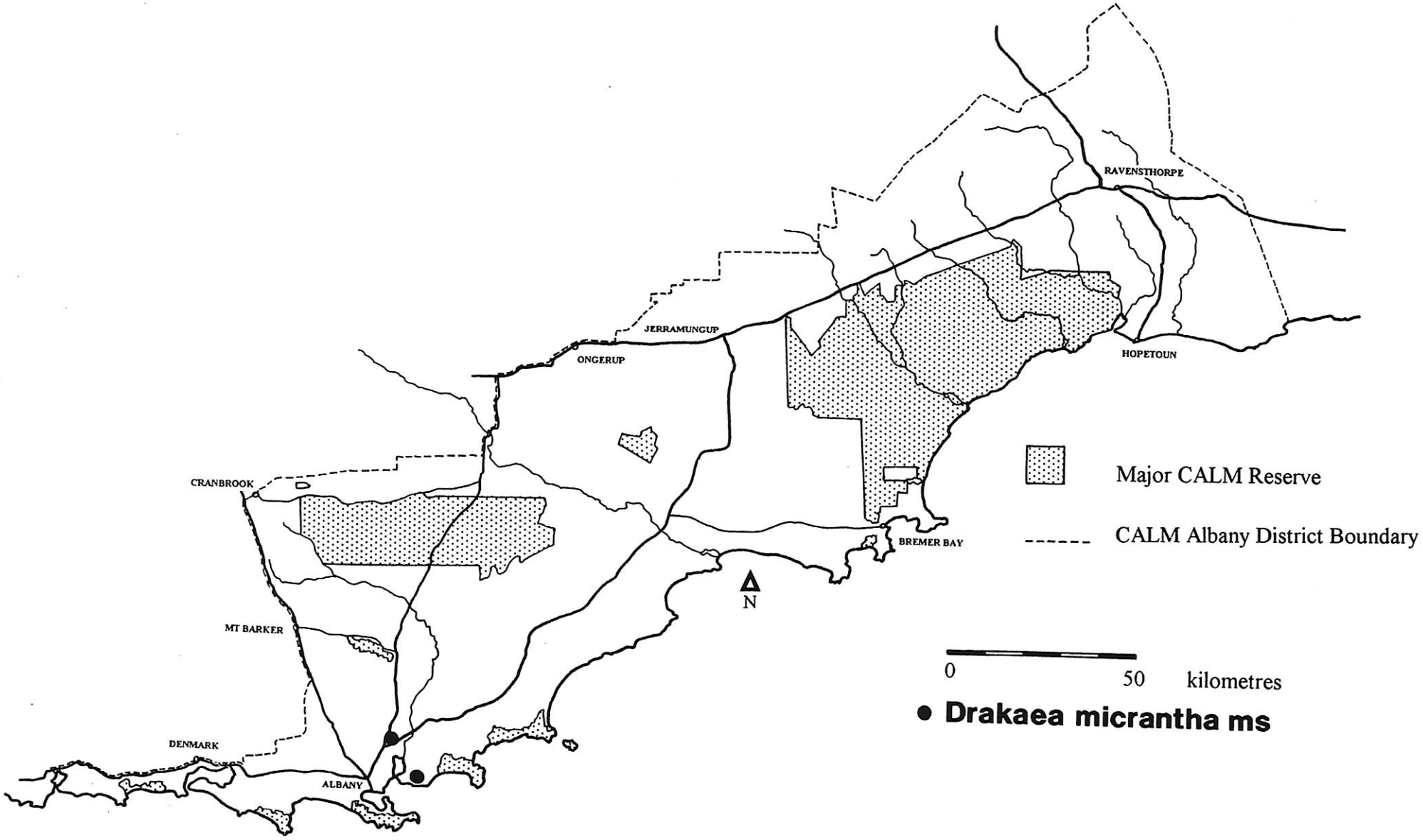
Attempt to relocate populations

Research Requirements

Survey opportunistically for new populations

References

Hoffman and Brown (1992).


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Drakaea micrantha ms

Drosera fimbriata DeBuhr

DROSERACEAE

Manypeaks Sundew

Drosera fimbriata is distinguished by 3-4 whorls of fimbriate, linear leaves (possibly modified petioles) without an insectivorous lamina, at the base of the stem. Above the fimbriate leaves are whorls of insectivorous lamina, above which are alternate solitary insectivorous leaves. The 5-15 white flowers (15 mm across), are arranged in a raceme which may be branched. The whole plant is reddish, up to 15 cm tall, but generally around 70 mm.

The aerial parts of the plant die off over summer and resprout from an orange, ellipsoid tuber (7 by 10 mm) encased in a brown papery sheath which is inturn matted in coarse root fibre. A vertical stolon 10 cm is produced each year to the soil surface.

Flowering Period: October-November

Distribution and Habitat

Until recently, this species was recorded from several locations from Albany east to the Manypeaks-Cape Riche region where it occurs in deep white sandy patches in an association of *Eucalyptus staeri-Banksia attenuata* over heath. It is now also known from William Bay growing in moss over granite and also in the surrounding heath in white sand. It is an inconspicuous plant, very similar to other small sundews and is likely to occur more widely than is currently recorded.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Hassell	Albany	Alb	NP & MRD verge	9.10.92	+2000	healthy
2. Oyster Harbour	Albany	Alb	-	-	-	
3. Venns Rd	Albany	Alb	-	-	-	
(4) William Bay	Albany	Dnmk	NP	16.10.92	+400	healthy

WAHerb: 4 records

Response to Disturbance

Numbers are greatest in open areas of disturbed sand; fire may also provide more space for establishment of seedlings.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

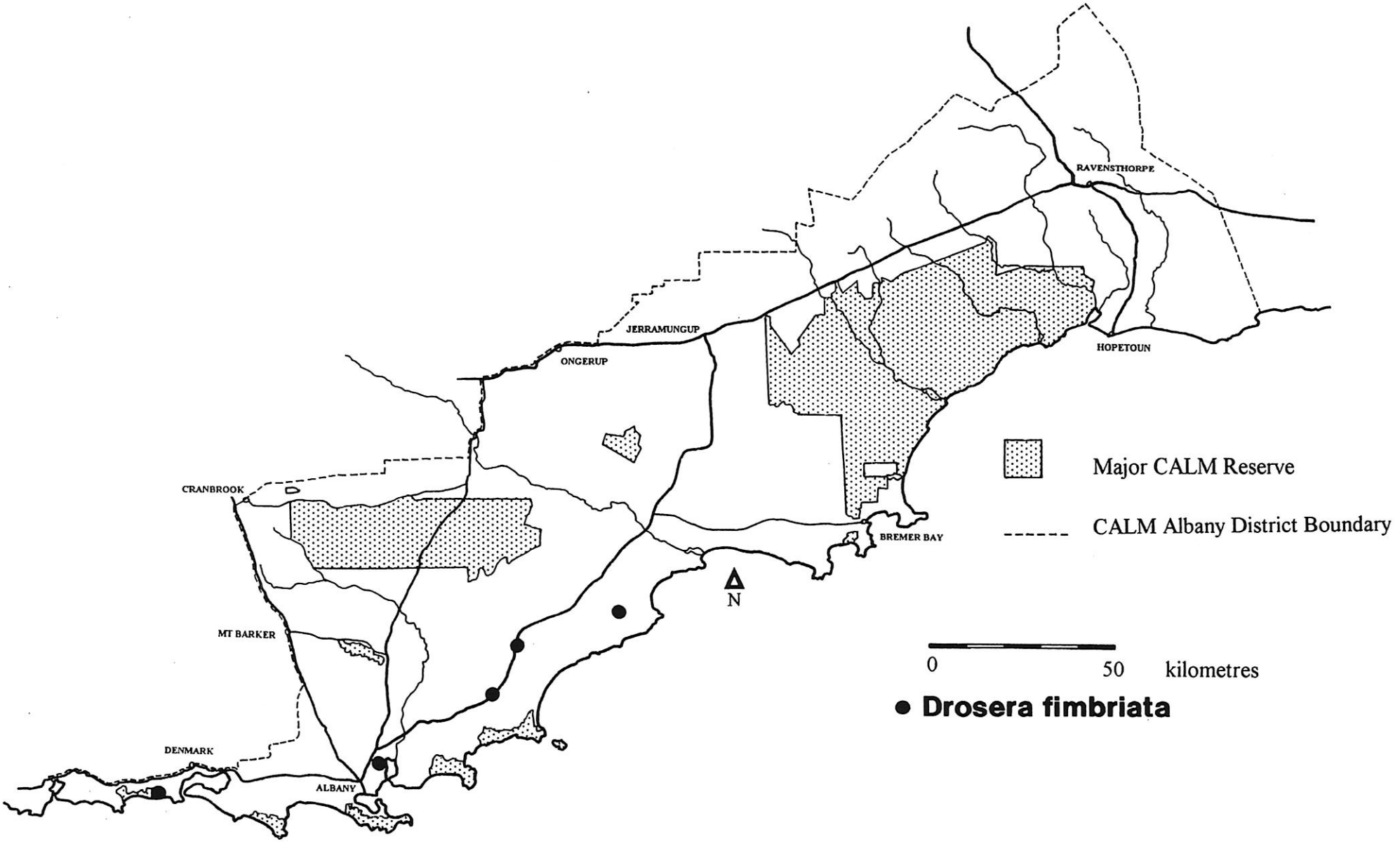
Monitor populations regularly

Research Requirements

- relocate Oyster Harbour and Venns Road populations
- survey opportunistically for new populations

References

Lowrie (1987).


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Drosera fimbriata

Dryandra montana A.S. George ms

PROTEACEAE

Stirling Range Dryandra

This *Dryandra* is an erect woody shrub, 2-2.5 m tall with very dense, rough foliage. The leaves are up to 18 cm long, with elongated, triangular, close fitting 5-8 mm lobes, cut to the midrib, pointing toward the apex. The flowers are not terminal, but borne on the old wood, inside the foliage. The fruits and upper stems are covered by short red hairs. The oval follicles are about 9 mm tall and 7-8 mm broad with a hairy base at the point of attachment.

Note: this is the same taxon as *D.* sp. 12 aff. *plumosa*; listed as Priority 2. (M. Pieroni pers. comm.) and was previously listed as *D.* sp Stirling Range.

Flowering Period: November

Distribution and Habitat

This *Dryandra* is known only from two locations in the vicinity of Bluff Knoll in the Stirling Range where it occurs in montane heath in shallow soil over schist. These populations were burnt in 1991 and these locations are known to be affected by *Phytophthora*. Surveys in January and April 1994 found seven adult plants and 5 presumed seedlings.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
(1) Bluff Knoll	Albany	Gno	NP	1.94	12	good

WAHerb: 3 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Field observation suggests high susceptibility

Management Requirements

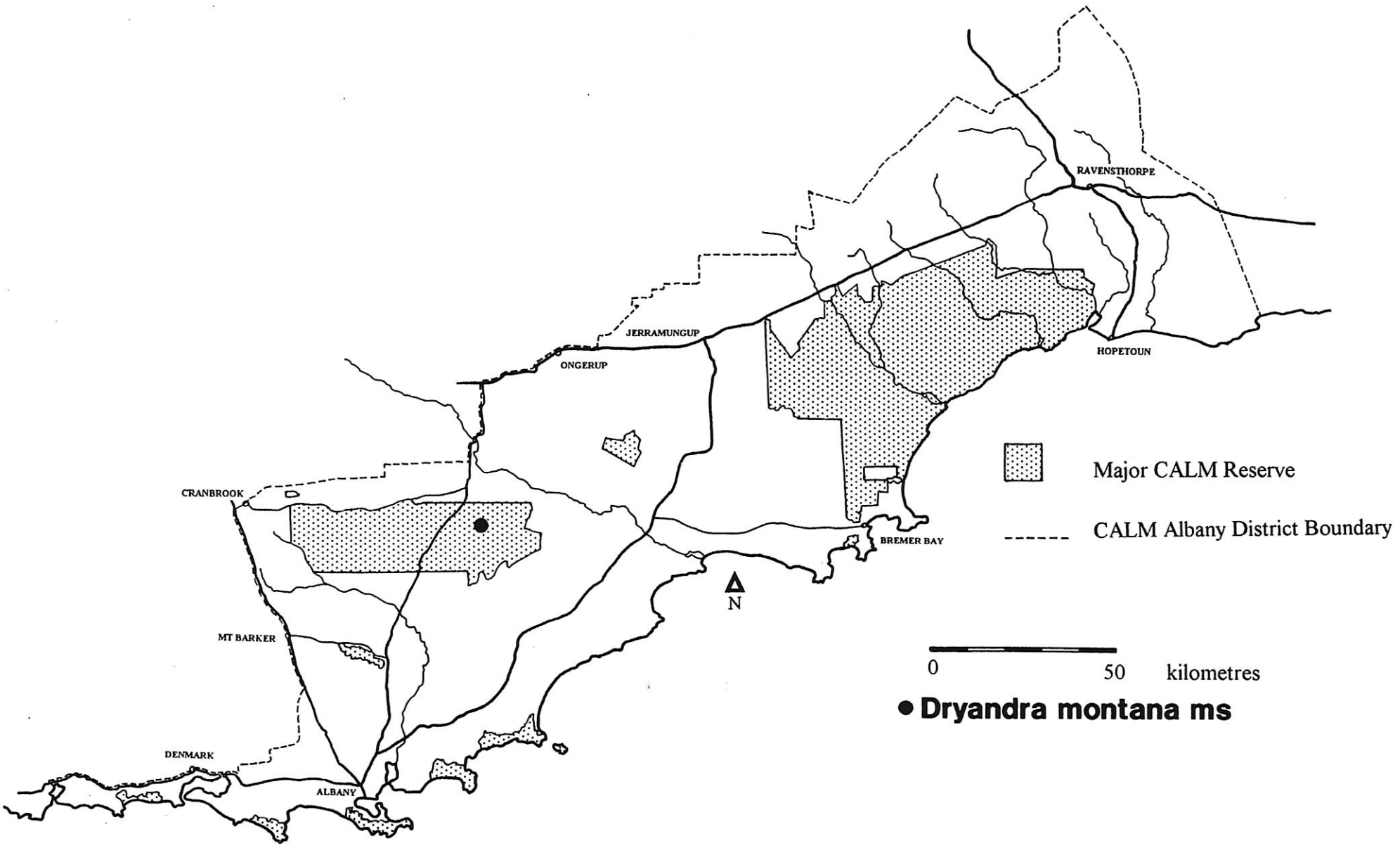
- resurvey populations and monitor postfire regeneration and disease impact
- consider application use of phosphonate to adult plants and seedlings

Research Requirements

- opportunistically survey for new populations
- collect seed
- monitor effectiveness of phosphonate spray

References

Dryandra Study Group Newsletter No. 22. July 1992.


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kilometres
● Dryandra montana ms

Dryandra ionthocarpa M.Pieroni ms

PROTEACEAE

Kamballup Dryandra

This *Dryandra* is a distinct taxon, discovered by P. Luscombe in 1987. It is a caespitose, tufted prostrate shrub with leaves up to 30 cm long and with a very short stem. The leaf lobes are broadly triangular, up to 8 mm and cut to within 1.5 mm of the midrib. Superficially it resembles *D. nivea.* The characteristic follicles are about 5 mm with 7-8 mm long erect hairs. The flowers are borne close to the ground within the leaves.

This taxon was previously listed as *D.* sp Kamballup.

Flowering Period: October

Distribution and Habitat

The Kamballup Dryandra is known from only two populations on reserves near Kamballup. It grows in very open low heath in gravelly brown loam over spongolite. One population (1A) occurs in a reserve vested in the Plantagenet Shire for the purpose of golf. The other population (1B) occurs in an unvested reserve, part of which has been subjected to mining for spongolite stone and is still under lease for that purpose. The mining lessees agreed in August 1989, to construct a fence between an access track to the mine and the population, however this fence has not been erected. Local farmers have expressed a desire to burn this reserve.

Deaths located in both populations are believed to be a result of drought stress (Malcolm grant pers. comm.). *Phytophthora* dieback is not present.

Considerable survey effort in the surrounding district has failed to find another population. However M Pieroni (pers. comm.) believes a population may be present on a spongolitic plateau in cleared farmland just north east of Kamballup.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1A. Kamballup	Albany	Pl	Shire res.	30.5.94	682	475 dead
1B. Kamballup	Albany	Pl	VCL	30.5.94	475	18 dead

WAHerb: 3 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible

Management Requirements

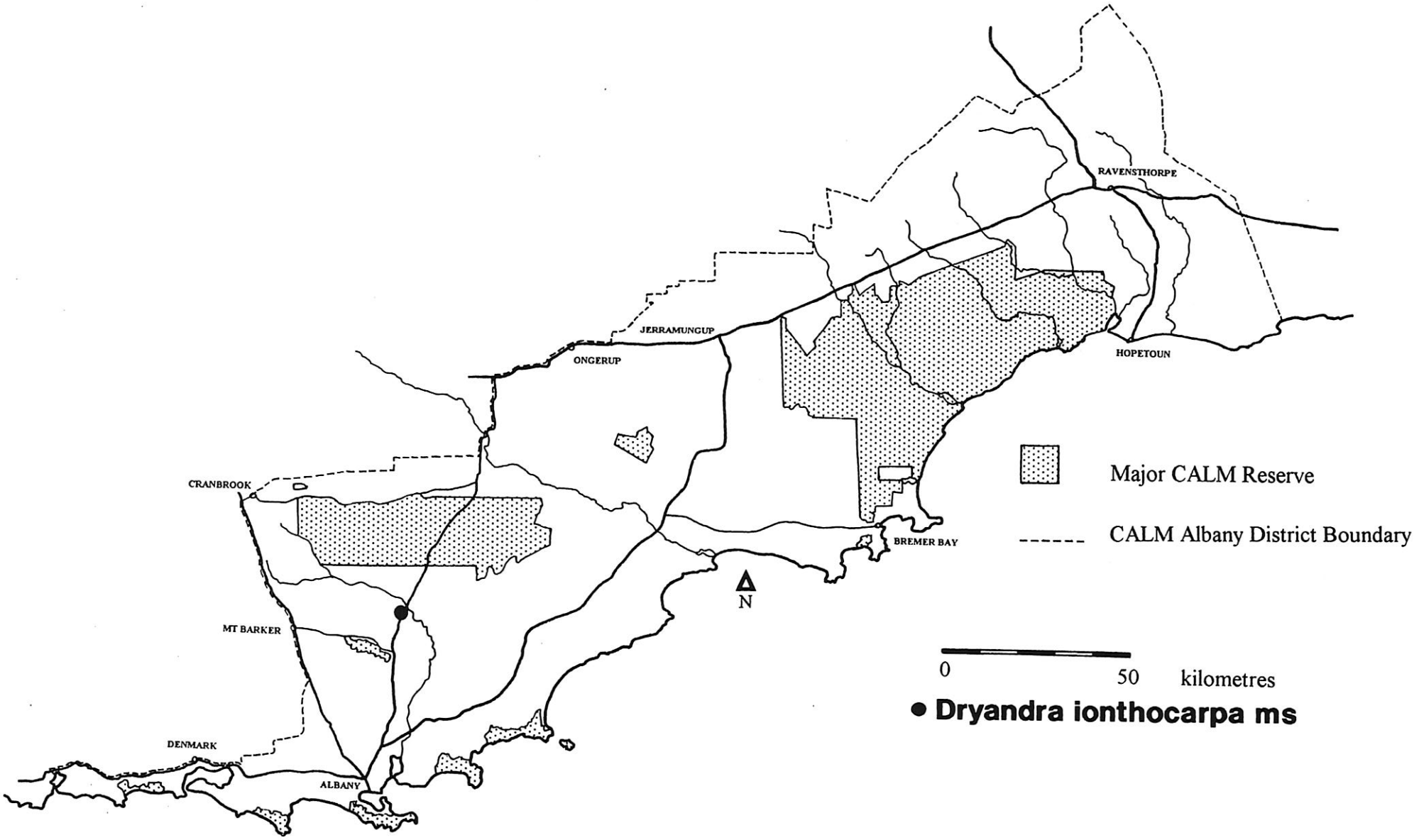
- spray with phosphonate if necessary
- ensure that firebreaks are adequate and maintained
- obtain a change of vesting or purpose of reserves to ensure adequate conservation of this species
- maintain liaison with Plantagenet Shire, Bushfires Board, and adjacent private land holders to ensure current operations do not threaten this species
- maintain efforts to have protective fence built
- approach Department of Minerals and Energy to cancel lease if conditions of lease are not complied with.
- monitor activities in the reserves
- monitor populations regularly

Research Requirements

- determine the fire ecology as a prerequisite for a reserve management plan to be developed in conjunction with other vested authorities and assess the impact of weeds on population 1B
- survey for new populations
- confirm dieback susceptibility
- determine effectiveness of phosphonate to prevent dieback in this species
- collect seed material

References

Dryandra Study Group Newsletter No. 22. (July 1992).


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kilometres
● Dryandra ionthocarpa ms

Eremophila denticulata F.Muell. subsp. *denticulata* MYOPORACEAE

Fitzgerald or Toothed Eremophila

Eremophila denticulata subsp. *denticulata* is a tall rangy shrub to 2 m, which is characterised by attractive red tubular flowers (the lower corolla lobe rolled back to form a distinct lip) on long curved stalks, and the sticky glutinous nature of leaves and upper stems. The leaves are 3-5 cm long, with conspicuously denticulate margins. The plants are more leafy and compact when young but on older plants the leaves are gathered around branch ends. It is apparent that populations begin to senesce after about ten years.

Flowering Period: October-January

Distribution and Habitat

Until recently, the only known large population of this species was located on private property in the middle of a cleared paddock. This population was fenced off by the property owner in 1989. When surveyed in January 1986 this population numbered 8-10,000 plants, but by December 1992 had declined to some 300 plants. The biggest population is known from a chained firebreak in the north east of Fitzgerald River National Park (this population was burnt in Autumn 1993). To date no plants have been located in the tall mallet woodland adjacent to this firebreak, although it is speculated that a seed bank is present in the soil. Originally it was thought to occur only on alluvial soils along rivers, but is now known to occur more widely on loamy clay over granite.

The distribution of this species is potentially much wider than is currently known and more populations may be found with post fire and post disturbance survey.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1A. Biddulph	Albany	Rav	private	14.12.92	300	senescing
1B. Biddulph	Albany	Rav	NP	14.12.92	500	senescing
2. Moir Track	Albany	Rav	NP	6.1.92	15	healthy
3. Cheadanup	Esp	Rav	NR	11.93	+2,000	seedlings
(4) W of Biddulph	Albany	Rav	NP	10.2.93	5-10,000	senescing

WAHerb: 6 records

Response to Disturbance

Germination of soil borne seed bank is stimulated by soil disturbance and/or fire.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

- monitor known populations

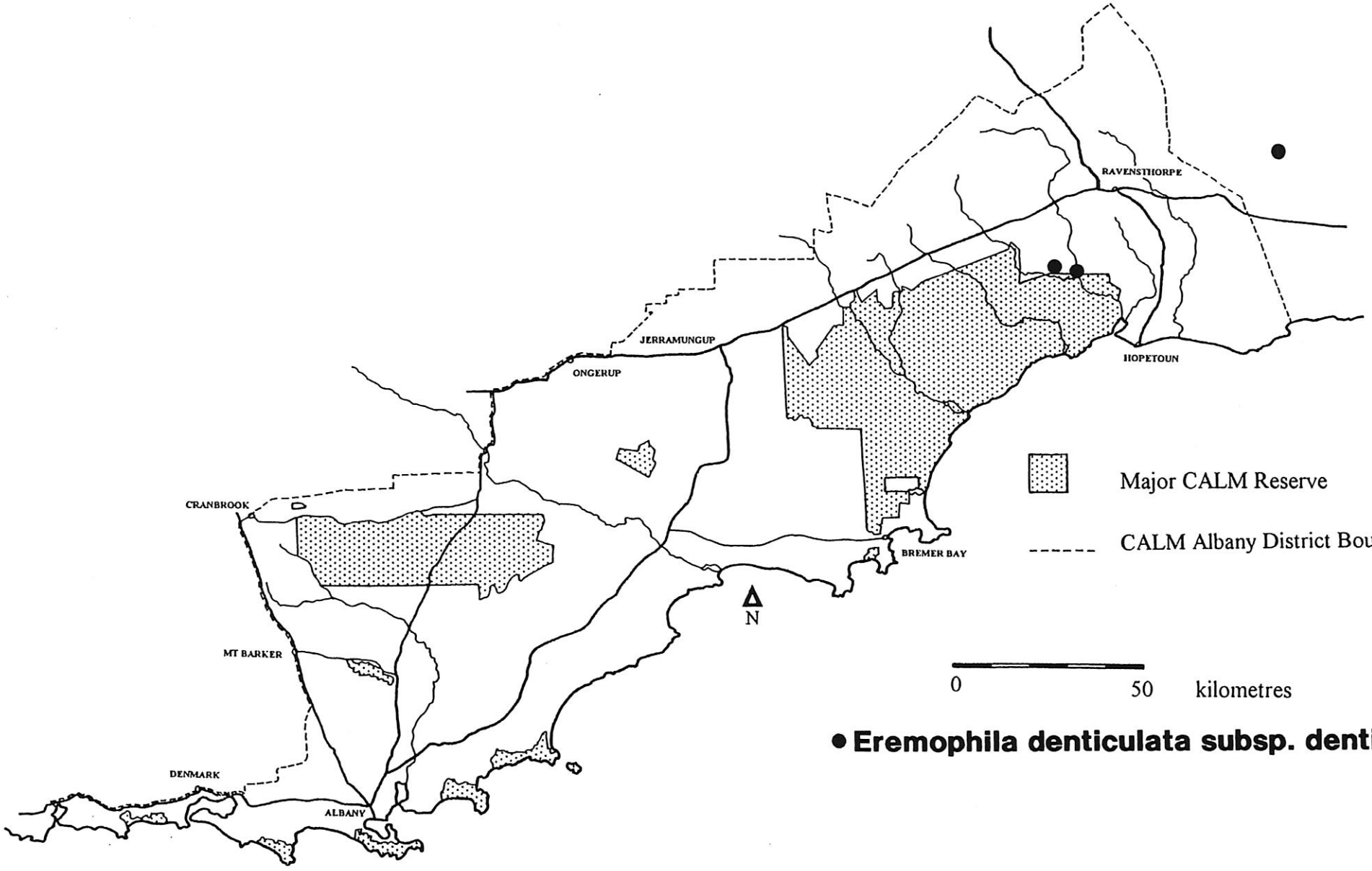
- relocate Hamersley River population
- monitor regeneration after fire on chained firebreak NE FRNP

Research Requirements

- establish plots in any populations subjected to fuel reduction burns to access postfire regeneration relative to prefire densities. These plots may also be used to determine rates of senescence
- survey for new populations in areas of similar habitat (especially those recently burnt or otherwise disturbed)

References

Mueller (1859).


RAVENSTHORPE
JERRAMUNGUP
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BREMER BAY
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
● Eremophila denticulata subsp. denticulata

Eucalyptus bennettiae D.J. & S.G.M.Carr

MYRTACEAE

Bennett's Mallee

This Eucalypt, discovered by E. Bennett in the 1970's, is a small, lignotuberous mallee known only from a few plants. Carr and Carr recognise that it is superficially similar to *E. lehmannii* and *E.* sp. aff. *occidentalis* (sp.F: Brooker & Kleinig 1990, p.153), but they consider it to be sufficiently different to warrant species status. It is most similar to *E. lehmannii*, but differs from it in having unfused flowers and fruits. Generally this taxon is regarded by botanists as a hybrid of the two species above, and appears so in the field. It is only known from three locations, each of only a few plants and is not a common hybrid, even though the putative parents are widespread and common.

Flowering Period: June, August-September

Distribution and Habitat

This taxon was originally known from one location near Mt Desmond, south of Ravensthorpe growing in a rocky gully of low mallees over scrub in brown sandy loam. Two other populations of one or several plants were located in FRNP (McQuoid, pers comm.) in 1988/9 north of Whalebone beach and Twin Bays.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Mt Desmond	Albany	Rav	VCL	15.12.92	1	healthy
2. Nth Twin Bays	Albany	Rav	NP	1989	5	resprouting
3. Nth Whalebone	Albany	Rav	NP	12.1988	1	-

WAHerb: 8 records

Response to Disturbance

Likely to resprout from lignotuber

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

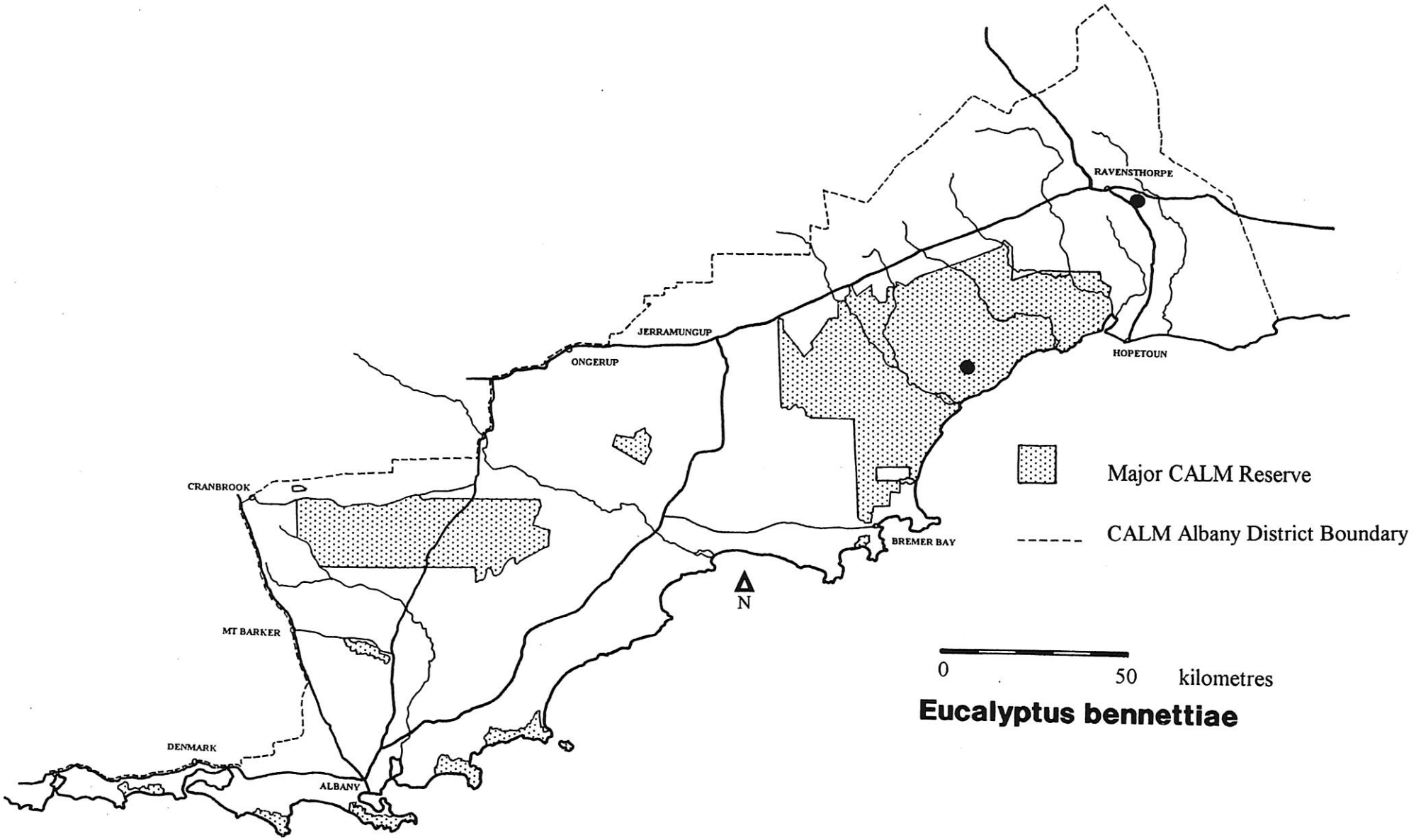
Monitor occasionally

Research Requirements

- Confirm hybrid status and determine whether this species is capable of being self-perpetuating
- relocate populations in FRNP

References

Brooker and Kleinig (1990), Carr and Carr (1980), Napier *et al.* (1987).


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Eucalyptus bennettiae

Eucalyptus burdettiana Blakely & Steedman

MYRTACEAE

Burdett's Mallee

Eucalyptus burdettiana is a multistemmed mallee to 4 m, of very restricted distribution being known only from East Mount Barren. It is in the series *Cornutae,* and typically has sessile clusters of 7-11 flowers on a flattened peduncle, unfused hypanthia and very long horn-shaped opercula. Originally, this species was thought to be more widely distributed, however the other possible populations are of the closely related *E. newbeyi*. Burdett's Mallee differs from *E. newbeyi* in having a slightly warted operculum instead of the smooth operculum of the latter. It is also closely related to *E. megacornuta*, which has grossly warted opercula, and more bell shaped fruits.

Flowering Period: intermittent

Distribution and Habitat

Burdett's Mallee grows only on the lower and intermediate slopes around East Mount Barren in shallow soil over quartzite in association with other mallees and scrub.

A severe wildfire burnt this area in November 1989 consumed most aerial parts, including fruits. Plants are now resprouting from lignotubers, but have not yet flowered. No seedling recruitment has been observed after this fire.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. East Mt Barren	Albany	Rav	NP	9.9.92	2-300	resprouting

WAHerb: 13 records

Response to Disturbance

Will resprout from lignotuber

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

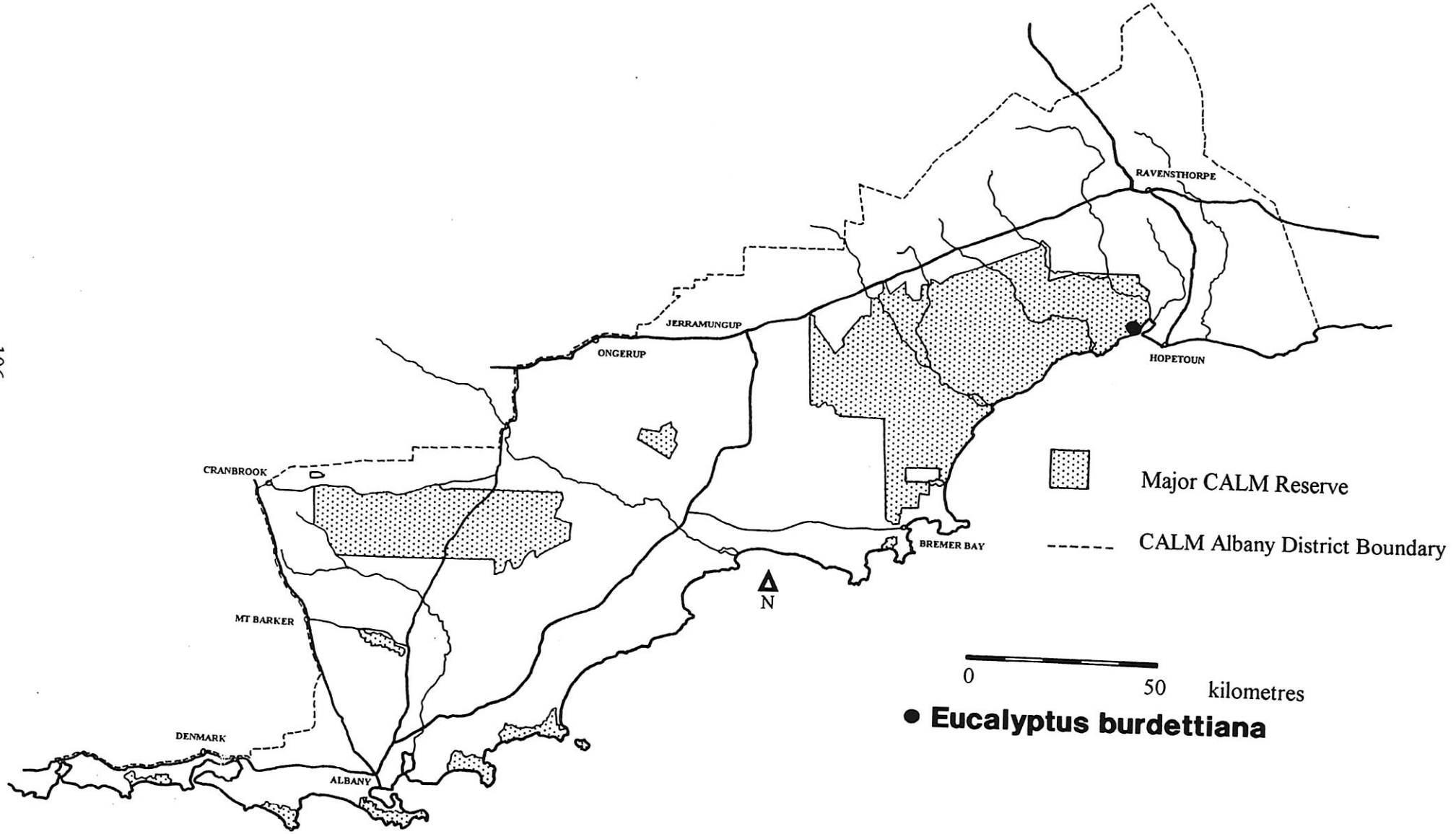
Monitor population regularly

Research Requirements

Survey opportunistically in similar habitat (e.g. Eyre Range, Whoogarup Range) for new populations

References

Brooker and Kleinig (1990), Napier *et al.* (1987).


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Eucalyptus burdettiana

Eucalyptus coronata C.A.Gardner

Crowned Mallee

Eucalyptus coronata is a small mallee to 2 m, characterised by its large fruit (to 5 cm), with broad disc and domed, protruding valves that look like a crown. The operculum and hypanthium are deeply ribbed.

Flowering Period: July-August

Distribution and Habitat

The crowned Mallee is confined to slopes and summits of peaks in the eastern part of Fitzgerald River National Park. It grows in shallow soil over quartzite in association with other mallee Eucalypts and scrub.

All East Mt Barren (and Eyre Range) populations of this eucalypt were burnt in the 1989 wildfire. Plants are now resprouting from lignotubers but there appears to be very little germination of seed postfire . No flowers or buds have formed since the fire. A 1923 record by C.A. Gardner from Mid Mt Barren has not been seen since and needs relocation and survey.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. E Mt Barren	Albany	Rav	NP	9.9.92	+150	resprouting
2. E Mt Barren	Albany	Rav	NP	-	-	-
3. Eyre Range	Albany	Rav	NP	16.9.86	-	healthy
(4) Whoogarup Ra	Albany	Rav	NP	-	-	-

WAHerb: 33 records

Response to Disturbance

Will resprout from lignotuber. Regeneration from seed is poor after extreme fire as fruits and seed may be consumed.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

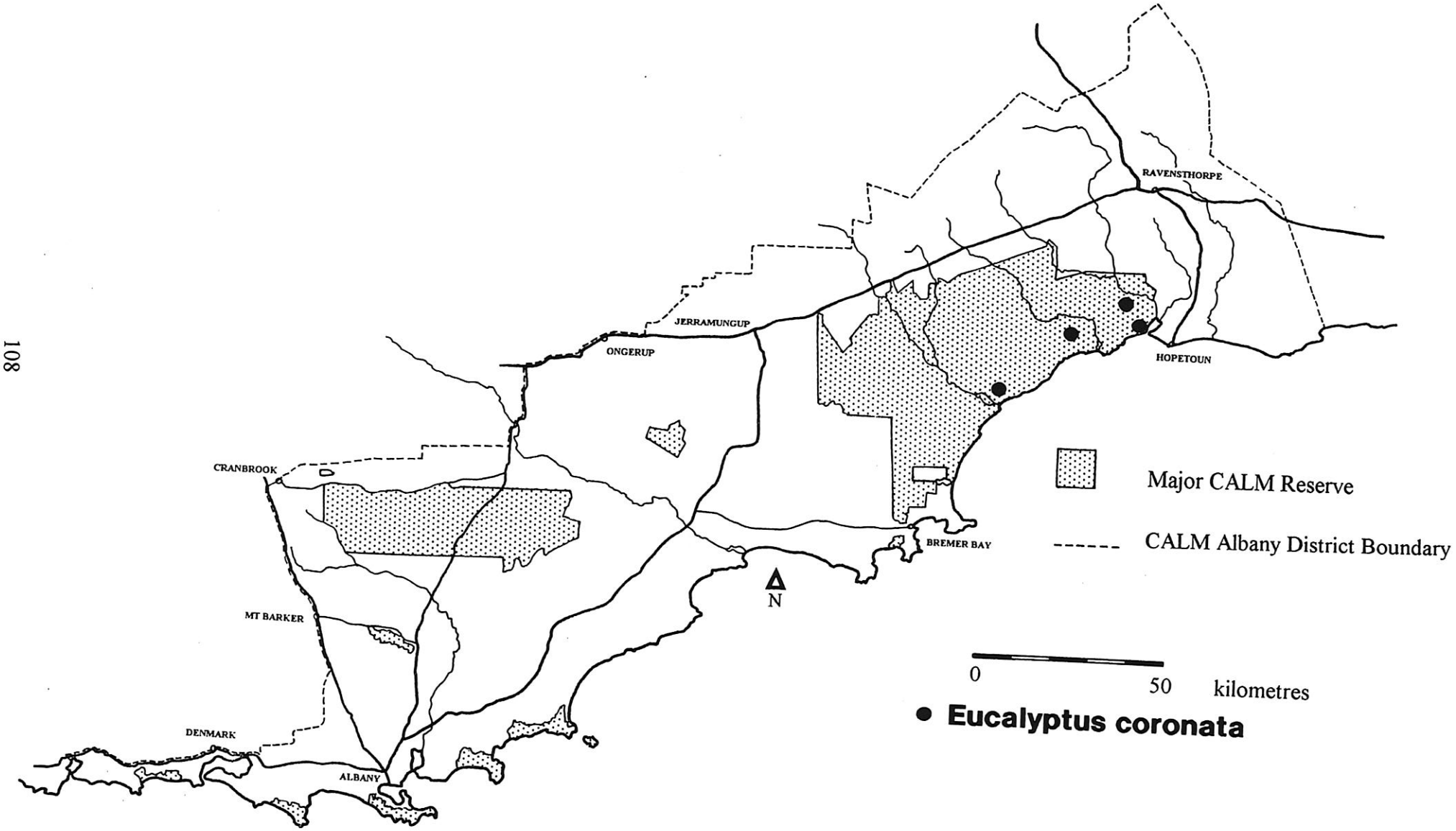
- exclude fire from all populations for at least five years.
- monitor post fire regeneration, especially flowering and fruiting.
- relocate and survey Whoogarup Range and Eyre Range populations.

Research Requirements.

Relocate and survey Mid Mount Barren population collected by Gardner in 1923.

References

Brooker and D.A. Kleinig (1990), Napier *et al.*(1987).


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Eucalyptus coronata

Eucalyptus erectifolia Brooker & Hopper

MYRTACEAE

Stirling Mallee

Eucalyptus erectifolia is a smooth, grey barked, small, multistemmed mallee which may form dense spreading clumps. Clumps up to 25 m diameter have been investigated using allozyme assay and found to be comprise one genetic individual. *E. erectifolia* is characterised by its conspicuously erect foliage of dull, light green leaves with contrasting yellow midveins and branchlets. The fruits are cupular hemispherical (disc flat) to 18 mm in diameter and also held erect. It frequently occurs with other and similar mallees with close affinities; *E. buprestium* which has a larger globular fruit, and *E. pachyloma* with a smaller fruit with ascending disc.

Flowering Period: March-April

Distribution and Habitat

Eucalyptus erectifolia is endemic to the Stirling Range where it grows on lowland sandplain of scattered mallee over heath. Napier *et al.* (1987) noted that it was known from 15 isolated populations. In is currently recorded from 26 populations. Although restricted to the Stirling Range, this species is more common and widespread than at first thought.

Conservation Status

Current: Declared Rare Flora

Recommended: Priority 4

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
26 populations: all SRNP.						

WAHerb: 34 records (includes 10 hybrids).

Response to Disturbance

Will resprout from lignotuber

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

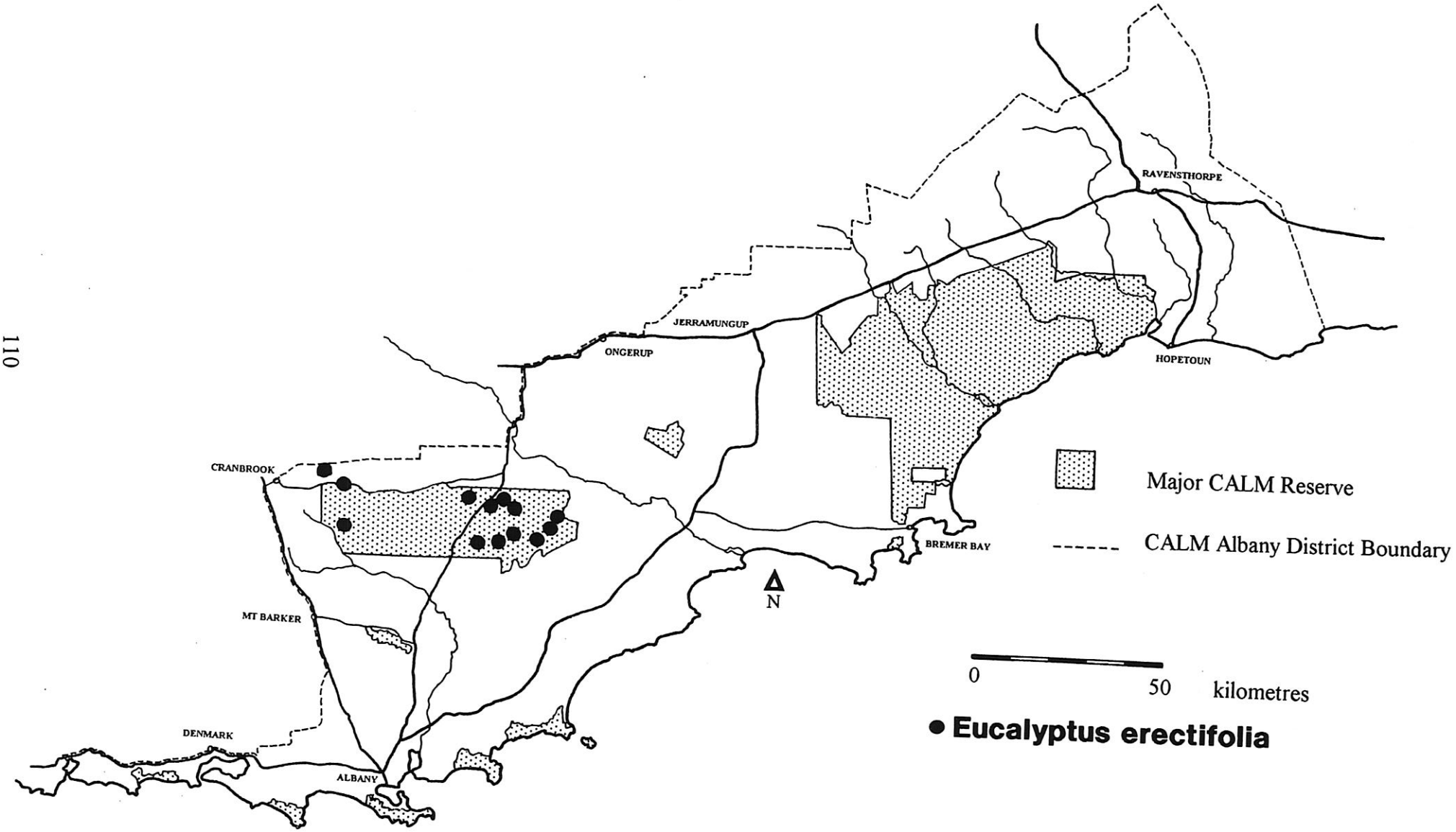
Monitor locations occassionally

Research Requirements

Survey opportunistically for new populations

References

Brooker and Hopper (1986), Brooker and. Kleinig (1990), Napier *et al.* (1987).


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● Eucalyptus erectifolia

Eucalyptus goniantha Turcz. subsp. *goniantha*

MYRTACEAE

This Eucalypt is a small tree or mallee, with smooth grey to coppery bark, shedding in patchily adherent scales, especially on the lower trunk. The leaves are broad-lanceolate, acute to acuminate, 6-15 cm long and 10-50 mm wide. The buds are in axillary umbellasters, with 7-11 flowers on strongly winged peduncles 7-16 mm long and 7 mm wide. The operculum is conical with a distinct median constriction and is 1-1.5 times longer than the 8-17 mm (5-7 mm wide) hypanthium. The buds are shallowly ribbed. The fruits are globular-hemispherical to 9 mm, conspicuously ribbed with exserted valves. Superficially this species is similar to the very common *E. decipiens* which is quickly distinguished by its persistent, rough bark at the base of the trunk. The similarity of these two species possibly accounts for more populations of *E. goniantha* subsp. *goniantha* not being discovered earlier, and it being considered more rare than it actually is now known to be.

A similar subspecies, *E. goniantha* subsp. *notactites* occurs from Two Peoples Bay east, and is recognised chiefly by having pedicels less than 1 mm long or absent. *Eucalyptus semiglobosa* which was regarded by Brooker as another subspecies of *E. goniantha,* occurs in scattered populations from Cape Le Grand to Cape Arid. It is distinguished by its elongate pedicels.

Flowering Period: November-January

Distribution and Habitat

Eucalyptus goniantha subsp. *goniantha* grows in gravelly, sandy loams over laterite in association with other mallees and open heath. Habitat may vary from the margins of depressions which are seasonally damp to the top of low breakaways. Napier *et al.* (1987) stated that it was known from only three populations. Now it is known from at least eighteen locations, many having been discovered in 1992 by opportunistic survey and others from WAHerb database. Further survey, especially in the proposed additions to Waychinicup National Park, is considered likely to reveal even greater numbers.

Hill and Johnson (1992) note that a specimen collected by Brooker from 26 km East of Bakers Junction is an intergrade between *E. falcata* and *E. goniantha* subsp. *goniantha.* A population at Whalebone Beach (FRNP) thought by McQuoid (pers. comm.) to be *E. goniantha* is indicated as *E. balanopelex* (Hill and Johnson, 1992)

Conservation Status

Current: Declared Rare Flora

Recommended: Priority 4

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
(1) Mlbrk 5801	Albany	Pl	private	6.4.92	13	healthy
(2) Mlbrk 5215	Albany	Pl	private	18.12.92	7	healthy
(3) Hassell Hwy	Albany	Alb	private	8.8.92	25	undist.
(4) Snake Hill	Albany	Alb	NP	-	-	-
(5) Betty's Beach	Albany	Alb	Shire res.	2.2.93	20	healthy -
(6) Wedge Hill	Albany	Cb	NP	-	-	-
(7) Takalarup Road	Albany	Alb	Shire verge	-	-	-
(8) Wellstead	Albany	Alb	Shire res.	-	1	healthy
(9) Kamballup	Albany	Pl	Shire res.	1986	common-WH	-
(10) Cheyne Bch	Albany	Alb	private	29.7.92	19	remnant
(11) Deep Creek	Albany	Alb	Shire res.	23.1.92	40	undist.
(12) Waychinicup	Albany	Alb	private	23.9.92	+500	remnant
(13) Waychinicup	Albany	Alb	NP	23.9.92	+200	healthy

Known Populations (cont.)

(14) Hassell NP	Albany	Alb	NP	9.10.92	20	healthy
(15) Mutton Bird	Albany	Alb	Shire res.	21.12.92	+10	healthy
(16) Herring Bay	Albany	Alb	priv & Shire res.	4.9.92	+5,000	healthy
(17) South Sister	Albany	Alb	NR	4.3.93	4	healthy

WAHerb:16 records

Response to Disturbance

Likely to resprout from lignotuber

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

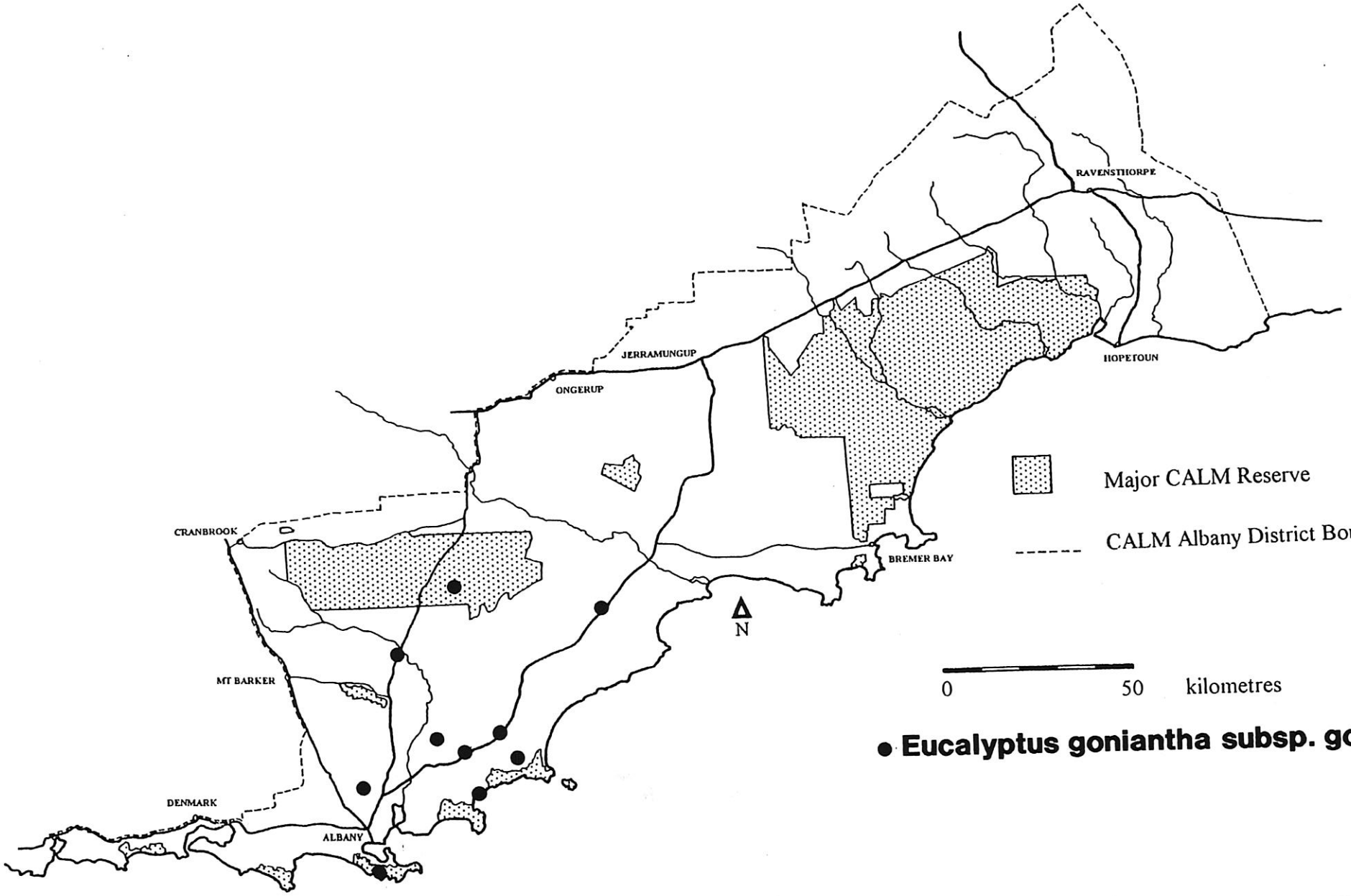
Monitor populations occassionally

Research Requirements

- survey for new/extended populations; especially in areas of proposed National Park north and west of Mt Manypeaks
- relocate and survey Snake Hill and Wedge Hill populations

References

Brooker and Kleinig (1990), Hill & Johnson (1992), Napier *et al.* (1987).


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kilometres
● Eucalyptus goniantha subsp. goniantha

Grevillea infundibularis A.S.George

Funnel Leaf Grevillea

PROTEACEAE

Grevillea infundibularis is a sprawling shrub to 1 m, distinguished by its hemispherical-flabelliform, almost sessile, concave stem clasping leaves to 30 mm wide. The leaves are dentate with mucronate teeth, prominently veined and funnel shaped when fresh. The red flowers (perianth 8 mm, style 17 mm) are borne in a small terminal raceme. It is allied to *G. platypoda*, a shrub to 2 m with pinnatifid leaves.

Flowering Period: July-October

Distribution and Habitat

The Funnel Leaf Grevillea is only known from a limited range in the central coastal section of Fitzgerald River National Park around Mid Mt Barren and Thumb Peak. It grows in shallow soil amongst quartzite boulders in association with scrub. It was first collected by Newbey in 1967. Recent survey to the upper shoulder of the ocean side of Thumb Peak, revealed that the leaves are smaller at higher altitude, becoming larger and less perfoliate closer to the coast

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Thumb Peak	Albany	Rav	NP	1.94	-	small
2. Mid Mt Barren	Albany	Rav	NP	4.87	+100	fair
(3) Twin Bays	Albany	Rav	NP	2.5.92	8	deaths

WAHerb: 11 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

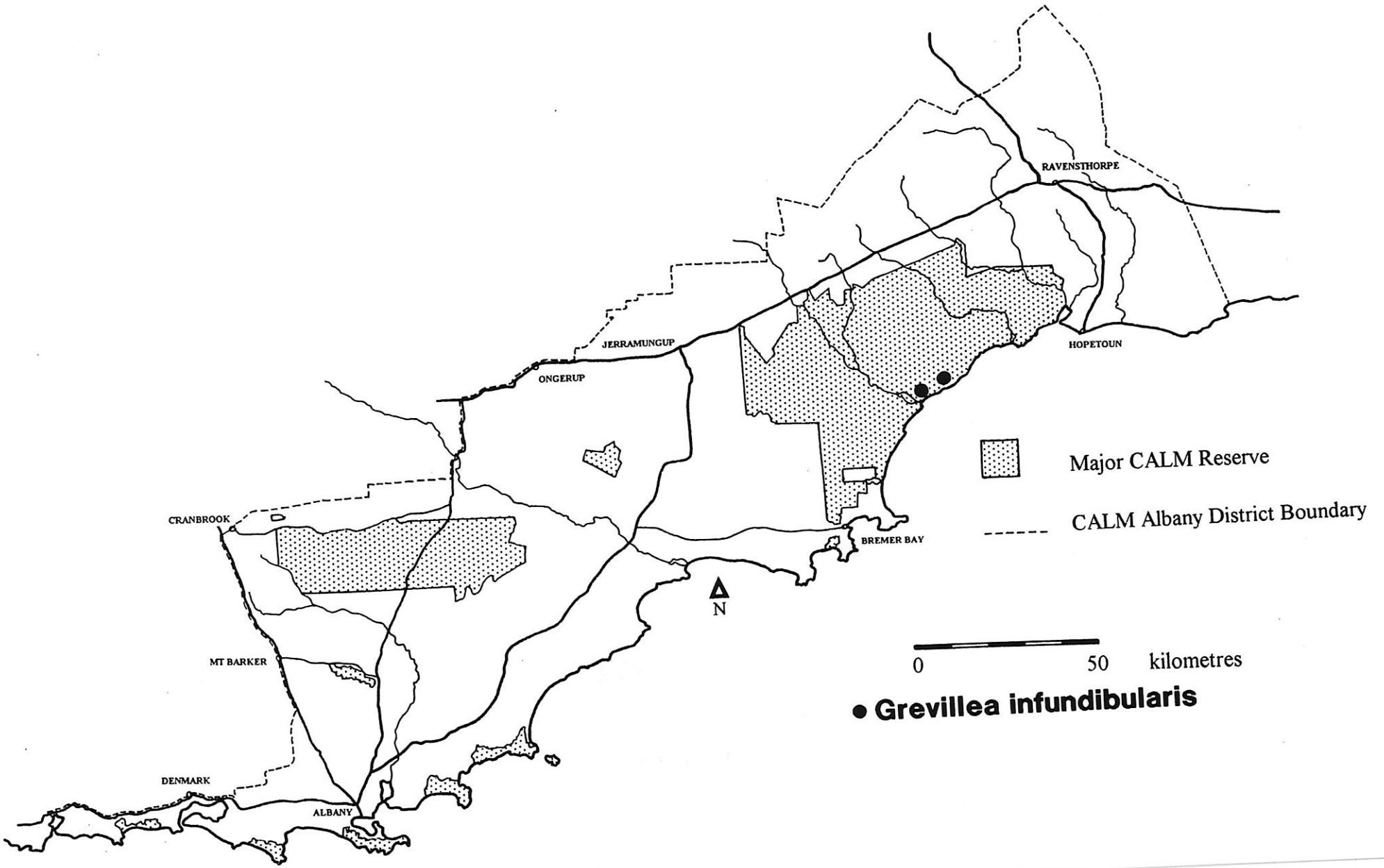
Relocate, resurvey and assess postfire regeneration (if applicable) of all populations

Research Requirements

- determine fire ecology
- determine susceptibility to dieback

References

George (1974).


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● Grevillea infundibularis

Hibbertia sp. Porongorups (R. D. Hoogland 12186)

DILLENACEAE

Porongurup Hibbertia

Previously thought to be *Hibbertia bracteosa,* this undescribed *Hibbertia* is a medium shrub to 1 m. The 30 mm leaves are broadly ovate, obtuse with minutely dentate wavy margins. The sessile lamina is dull green and relatively thick and stem clasping with projecting auricles. The stems are conspicuously four sided. The large yellow flowers are supported upon axillary peduncles up to 25 mm long. The sepals are ovate to 12 mm and petals broadly obcordate. The ovary has 5 carpels and is surrounded by very numerous stamens and a few filiform staminodes.

Flowering Period: September-October

Distribution and Habitat

This species is only known from the Porongurup Range where it is recorded from a number of populations in very shallow soil in cracks and crevices in granite peaks and slopes. In periods of drought these pockets of soil may dry out leading to the high mortality imany summer deaths have been recorded. The drought affected plants do not appear to resprout.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
(1) Devils slide	Albany	PI	NP	24.7.92	9	drought
(2) Marmabup Peak	Albany	PI	NP	24.7.92	+30	drought
(3) Hayward Peak	Albany	PI	NP	22.9.93	+200	in flower

WAHerb: 13 records

Response to Disturbance

Not known; however where fire went through the Angwin Peak and Devil's Slide populations, good recovery of seedlings was evident three years later.

Susceptibility to *Phytophthora* Dieback

Unknown

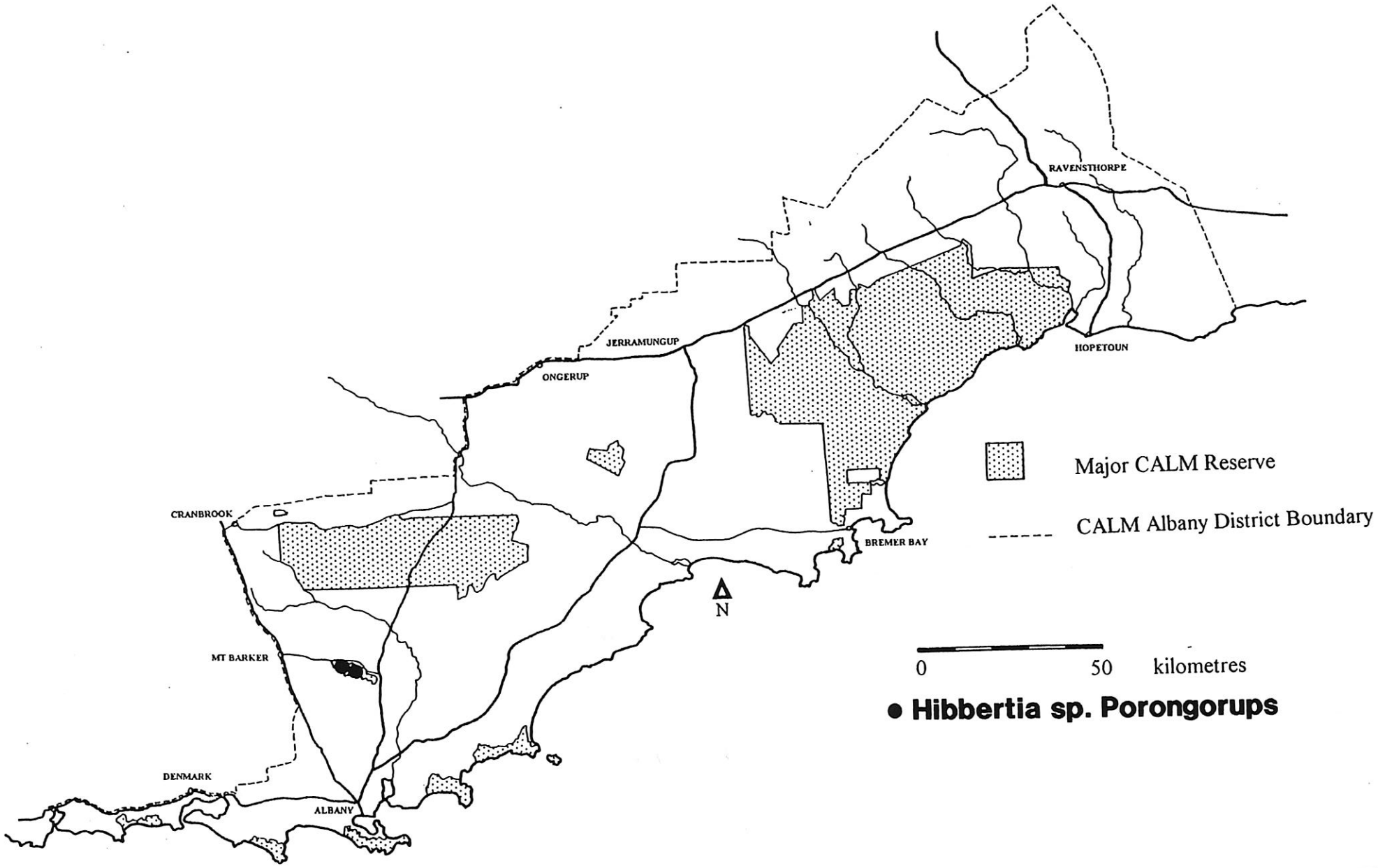
Management Requirements

- resurvey all populations
- monitor closely; especially the impact of drought/changing rainfall patterns
- collect seed

Research Requirements

References

Bentham (1863).


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Isopogon uncinatus R.Br

Hook Leaf Isopogon

PROTEACEAE

Isopogon uncinatus is a small tufted shrub, usually about 100 mm tall but may reach 400 mm when old plants are growing through low heath. The leaves are long (to 200 mm) and narrow (12 mm) with a small but obvious hook at the apex, at right angles to plane of the lamina. Young leaves are red-pink and hairy, becoming pale green and glabrous with age. The stem is usually very short but may elongate to 150 mm in closed heath. The clusters of pale lemon flowers are borne at ground level or just above, at the base of the leaves. Old fruits remain packed together on the short woody stem. This species is quite inconspicuous and difficult to locate, especially when not in flower.

This species was first collected by William Baxter in 1829, from "near Albany" and described by Robert Brown from that collection in 1830.

Flowering Period: October-December

Distribution and Habitat

Isopogon uncinatus occurs on seasonally damp, shallow sandy clay over granite or gravelly soils from decomposed laterite over granite. Associated vegetation is closed to very open low heath, in the saddles between summit rocks, to mid slope.

Plants in Torndirrup are very small and many are seedlings growing out of the remains of larger old plants which appear to have died about five years ago. These deaths have not been caused by fire and the area is believed to be free of infection by *Phytophthora* dieback (M. Grant, pers. comm.). A recently discovered population west of Albany includes some large old plants growing up through the surrounding closed heath. In more open areas some plants had died, possibly from heat stress.

The latter population is located in a minor gully immediately below a 4WD track and is consequently at considerable risk should *Phytophthora* be introduced.

The Vancouver Peninsula plants are growing more as an understorey, have longer, narrower, darker green and more prominently hooked leaves than the other populations. The area is subject to active *Phytophthora* and *Armillaria* infections, but dead *Isopogon* plants have not been seen.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Willyung Hill	Albany	Alb	private	25.8.92	1	dead
2. Torndirrup	Albany	Alb	NP	29.10.92	+200	small
3. Mutton Bird	Albany	Alb	Shire res.	22.10.92	+70	fair
4. Vancouver Pen	Albany	Alb	Shire res.	16.6.93	9	good

WAHerb: 3 records

Response to Disturbance

Not known

Susceptibility to *Phytophthora* Dieback

Presumed susceptible (high)

Management Requirements

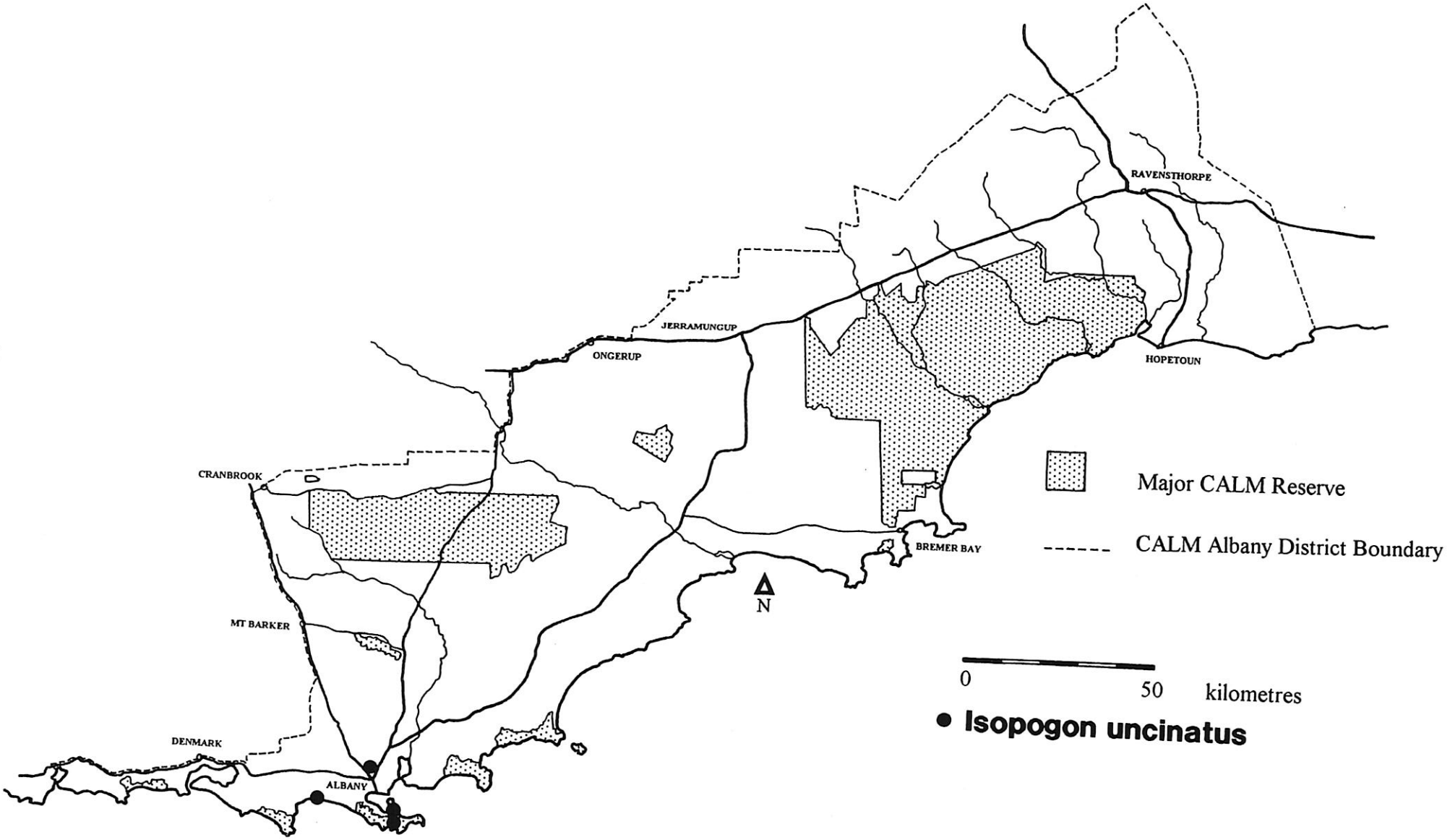
- Mutton bird population to be protected from possible introduction of *Phytophthora*; possibly by re-routing 4WD track
- spray populations with phosphonate where necessary
- populations to be monitored frequently
- collect seed
- limit visitation to prevent trampling by curious/interested persons
- liaise with Shire to protect both Mutton Bird and Vancouver populations

Research Requirements

- determine fire ecology
- determine reproductive biology
- examine possibility of reintroduction to Willyung Hill
- survey for new populations, particularly in the area between Mutton Bird and Torndirrup
- determine causes of deaths of older plants in Torndirrup
- investigate feasibility of preventing dieback disease by phosphonate spraying
- determine susceptibility to *Phytophthora* dieback

References

Brown (1830), Sainsbury (1987).


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Isopogon uncinatus

Kennedia glabrata (Benth.) Lindl.

PAPILIONACEAE

Northcliffe Kennedia

Kennedia glabrata is a prostrate creeper, with glossy undulate trifoliate leaves; the petiole subtended by small leafy stipules. The inflorescence is a simple umbel of up to 5 flowers on an erect peduncle up to 15 cm. The standard is scarlet red with a yellow "eye"; the keel is cerise.

Flowering Period: September-November

Distribution and Habitat

Prior to 1989 it was only known from two locations near Northcliffe. It has since been found east of Esperance (Hopper, pers. comm.), and in William Bay National Park (Hamersley, pers. comm.). It occurs in shallow pockets of soil on granite outcrops in association with mosses and herbs. A recent discovery of this species was made on a granite island in Broke Inlet (Lyons pers. comm.).

Conservation Status

Current: Declared Rare Flora

Known Populations (Albany District)

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Wilm Bay Granite	Albany	Dnmk	NP	16.10.92	14	in flower
2. Wilm Bay Peat	Albany	Dnmk	NP	20.10.93	9	in flower

WAHerb: 8 records

Response to Disturbance

Killed by fire; seed germination enhanced by fire

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

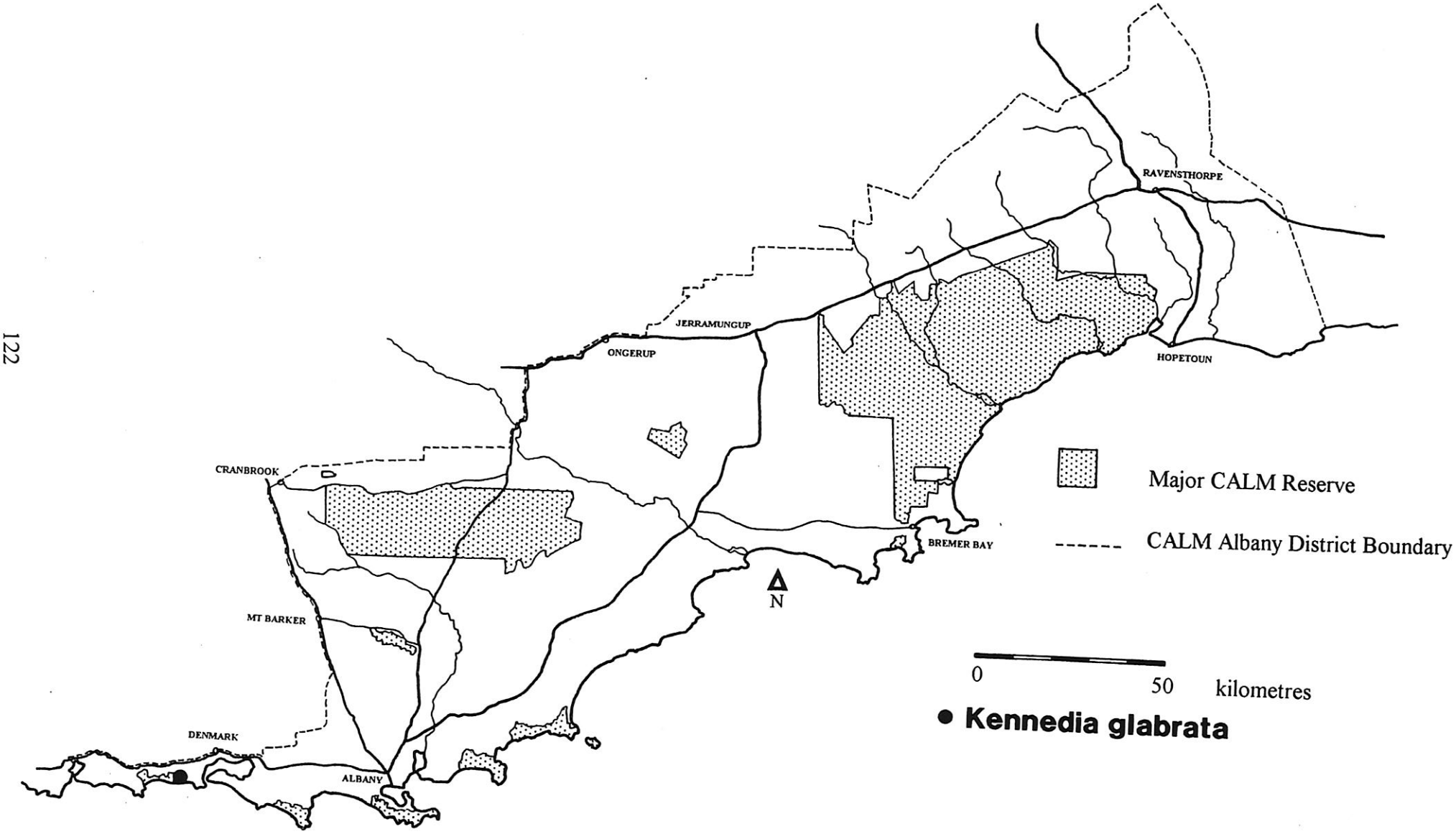
- monitor annually
- collect seed
- ensure that frequency of fire is such that several seasons of seed production may occur between fires

Research Requirements

Research population ecology

References

Lindley (1836), Bentham (1864).


RAVENSTHORPE
JERRAMUNGUP
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● Kennedia glabrata

Lambertia fairallii Keighery

Fairall's Honeysuckle

Lambertia fairallii is an erect, very dense and compact shrub to 1.5 m. Young branches and leaf bases are loosely covered with long white hairs. The rigid leaves are crowded on short branchlets, are almost sessile, linear to 4 cm and mucronate. Mature leaves are glabrous and reticulate on the upper surface and covered underneath by a soft indumentum. Leaf margins are entire and markedly incurved. The foliage of young plants is much less compact, and some leaves may have several lobes at the apex. The inflorescences are terminal and may be solitary or clustered 2-3 together; each being composed of 5-7 tubular, golden-yellow flowers and enclosed in 17-27 brown, scarious bracts. The 8 mm fruits are two-horned and glabrous dark brown.

This species was named in honour of Arthur Fairall, the first Superintendent of Kings Park, who discovered it in 1968.

Flowering Period: May-July

Distribution and Habitat

Fairall's Honeysuckle was until recently known from only one confirmed, and one unconfirmed location around Ellen's Peak in the Stirling Range. It occurs on ridges in dense scrub on shallow soils over schist. The Ellen's Peak populations were burnt in March 1991. In September 1993 an extensive population of ten year old (0.5 m young plants in flower) were discovered near Mount Gog.

Recent surveys (A Cochrane, pers comm.) located 9 adults (in an unburnt patch of vegetation) and 2 seedlings (in the burnt margins) at the lower spur of the south east ridgeline from Ellen's Peak.

Note: a collection location by S.D. Hopper on 7.5.82 is given as west of Ellen's Peak in WAHerb; however this location is incorrect (Hopper, pers. comm.) and should be recorded the same/similar as Keighery's of 11.5.82.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. N Ellens	Albany	Gno	NP	1.79	-	-
2. SE Ellens	Albany	Gno	NP	11.5.82	50	healthy
3. Mt Gog	Albany	Pl	NP	17.9.93	+300	healthy
4. SE Ellen's-Lower	Albany	Gno	NP	1994	11	healthy

WAHerb: 5 record

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Field observation suggests high susceptibility

Management Requirements

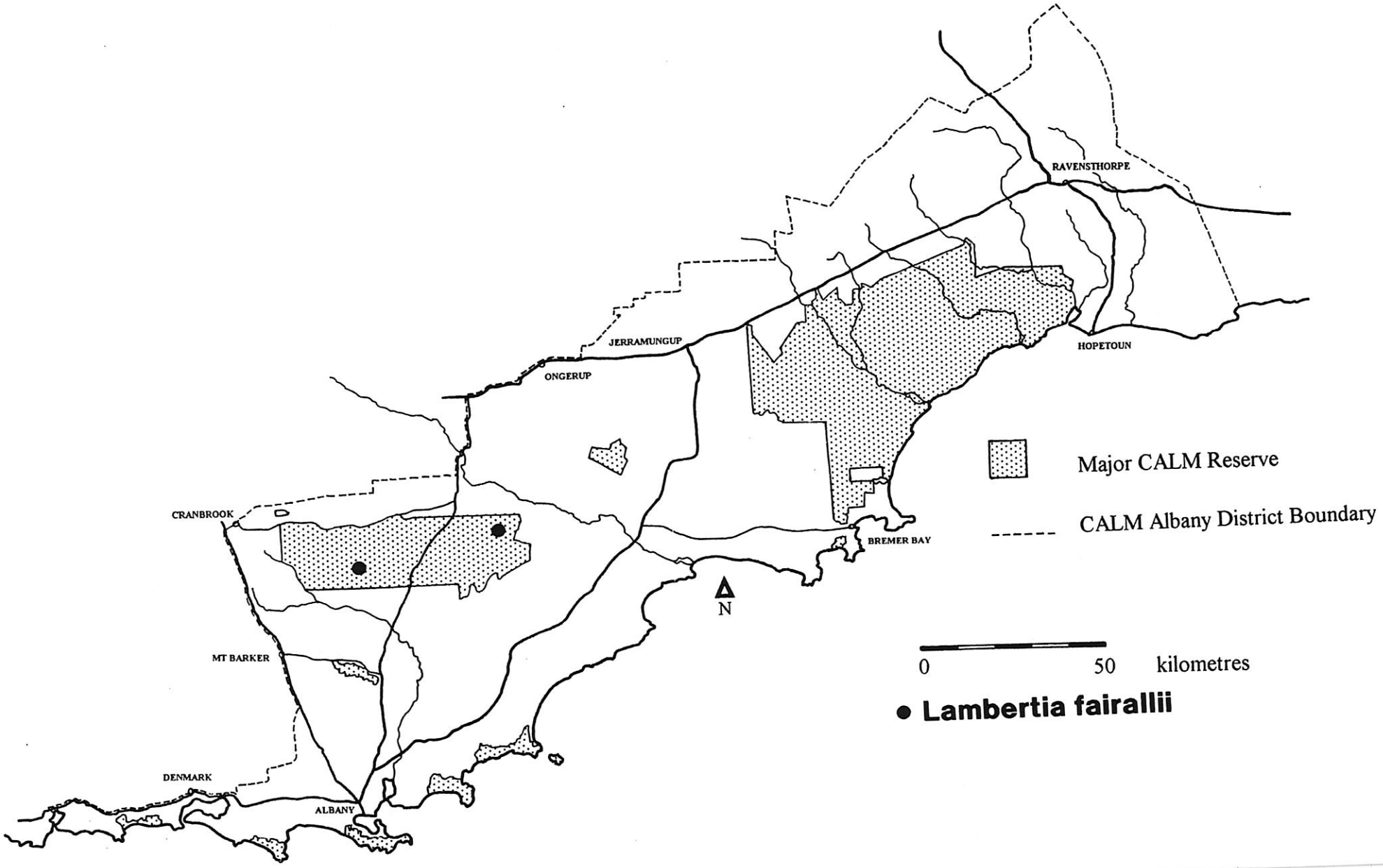
- monitor postfire regeneration and any impact of dieback disease
- spray with phosphonate if necessary
- locate and verify Barnsley population if possible
- collect seed when postfire regeneration has matured

Research Requirements

- survey for new populations around Ellen's Peak
- determine susceptibility to dieback
- research population ecology

References

Keighery (1983).


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kilometres
• Lambertia fairallii

Laxmannia jamesii Keighery

James's Paperlily

LILIACEAE

Laxmannia jamesii is a stilted, rambling perennial herb with very slender wiry stems to 20 cm tall, which may spread to 300 mm. The narrow linear leaves which are scattered along the stems and clustered at the ends are terete, 9-20 mm long, acute with a translucent sheath. The inflorescences of this "Paper Lily" are both 4-8 pedunculate terminal flowers and often sessile axillary flowers. The inflorescences are surrounded by 5 brown outer bracts (3-4 mm) and a single translucent inner bract 2-3 mm long. *L. sessiliflora* ssp *australis* which also occurs around Albany is easily confused with James's Paperlily, but has only sessile inflorescences.

Flowering Period: May-July

Distribution and Habitat

Laxmannia jamesii occurs in sandy peaty soils which may be seasonally damp, in an association of low closed heath over sedges.

Currently it is known from nine locations around Albany, one from near Walpole and two unconfirmed locations from near Busselton. This species is very cryptic and requires an experienced eye to recognise it. As its favoured habitat is very common across the south coast, it is considered possible that with specific survey more populations will be found and it may prove not to be as rare as first thought.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. TwoPeoplesRd	Albany	Alb	Shire verge	3.9.92	21	disturbed
2. Norwood Rd	Albany	Alb	?private	3.9.92	0	disturbed
3. Goode Beach	Albany	Alb	NP	7.2.92	4	undist.
4. Narrikup	Walpole	Pl	NR	21.12.92	+5	healthy
5. SthCstHwy	Albany	Dnmk	Shire verge	5.1991	+150	undist.
(6) Gull rock	Albany	Alb	NP	13.10.92	+5	healthy
(7) Bayonet Head	Albany	Alb	private	13.10.92	+5	healthy
(8) Sheepwash	Walpole	PL	SF	9.93	1.8 km	in fruit
(9) Down Road	Albany	Alb	NR	14.9.93	20	in fruit
(10) Millbrook	Albany	Alb	NR	27.9.93	+10	healthy

WAHerb: 6 records

Response to Disturbance

This species is known to regenerate from seed after fire which kills the parent plants. Response to soil disturbance is unknown.

Susceptibility to *Phytophthora* Dieback

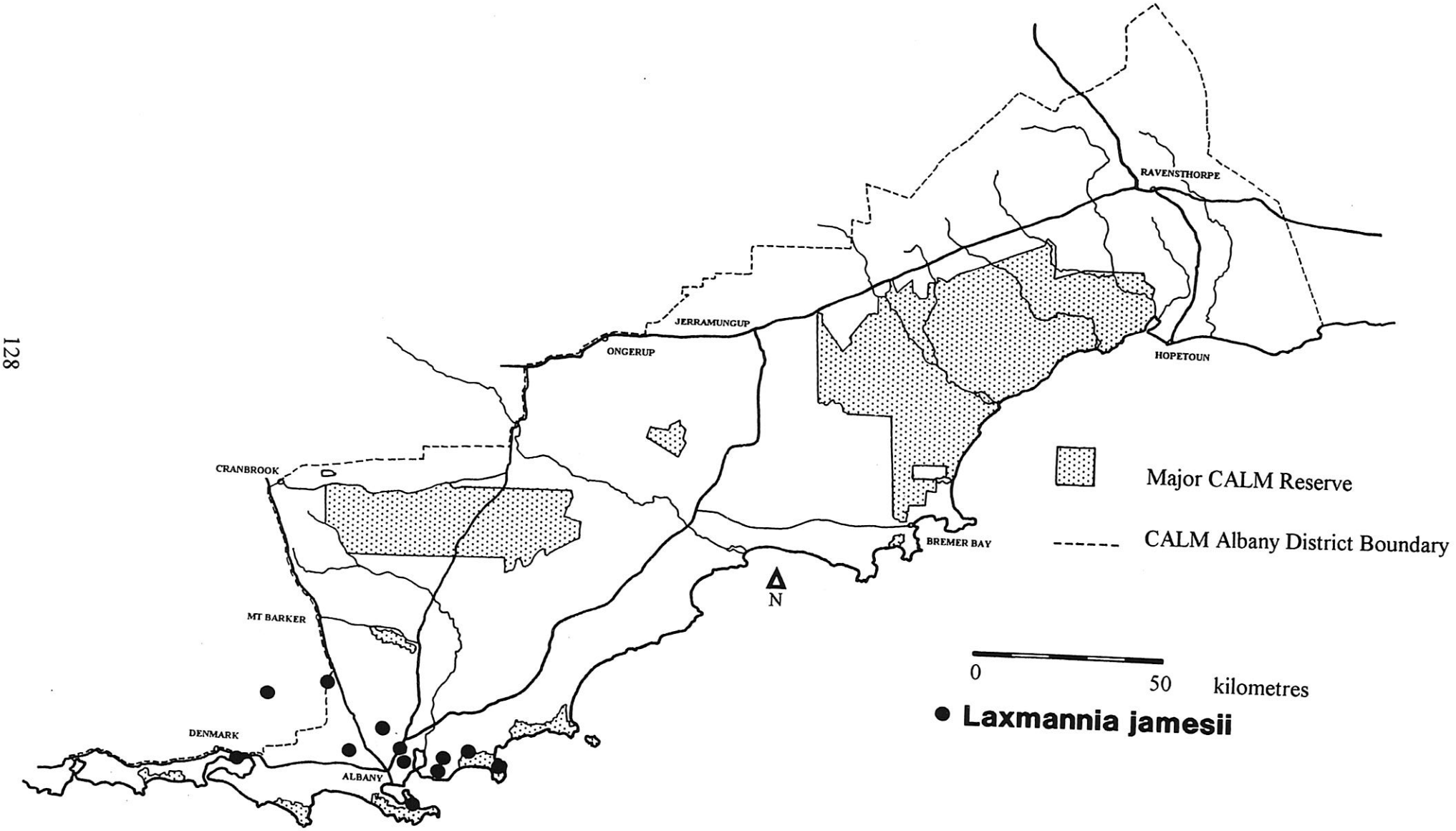
Presumed not susceptible

Management Requirements

Research Requirements

References

Keighery (1987).


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Laxmannia jamesii

Lechenaultia superba F.Muell

GOODENIACEAE

Barrens Lechenaultia

Lechenaultia superba is a low (to 70 cm) shrub which may vary from slender, erect to bushy compact depending upon situation. The blue-green leaves are soft, fleshy, linear terete to 15 mm and crowded towards the end of branches. The spectacular orange-red flowers (17-23 mm corolla) are solitary and terminal, or sometimes in compact groups of solitary inflorescences. The corolla tube is densely pilose inside

Flowering Period: October-December and intermittent

Distribution and Habitat

The Barrens Lechenaultia occurs in very shallow siliceous soil in cracks and crevices of quartzite rock which frequently is jutting from the ground to form jagged crags in hills and peaks of eastern Fitzgerald River National Park. In some situations this species appears to "cascade" down the rocks. The associated vegetation is of sparse shrubs and herbs.

In the eastern end of FRNP this species is relatively common and not perceived to be under any immediate threat.

Conservation Status

Current: Declared Rare Flora

Recommended: Priority 4

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
(1) Mid Mt Barren	Albany	Rav	NP	1926	-	-
(2) Whoogarup Range	Albany	Rav	NP	5.1959.	-	-
(3) East Mt Barren	Albany	Rav	NP	8.9.92	+1000	healthy
(4) Mylies Beach	Albany	Rav	NP	5.6.91	+70	undist.
(5) Eyre Range	Albany	Rav	NP	24.10.88	common	healthy
(6) No Tree Hill	Albany	Rav	NP	9.1988	+100	healthy
(7) Phillips River	Albany	Rav	private	2.2.86	+140	healthy

WAHerb: 17 records

Response to Disturbance

Unknown; East Mt Barren population has regenerated prolifically after wildfire in November 1989, from seed.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

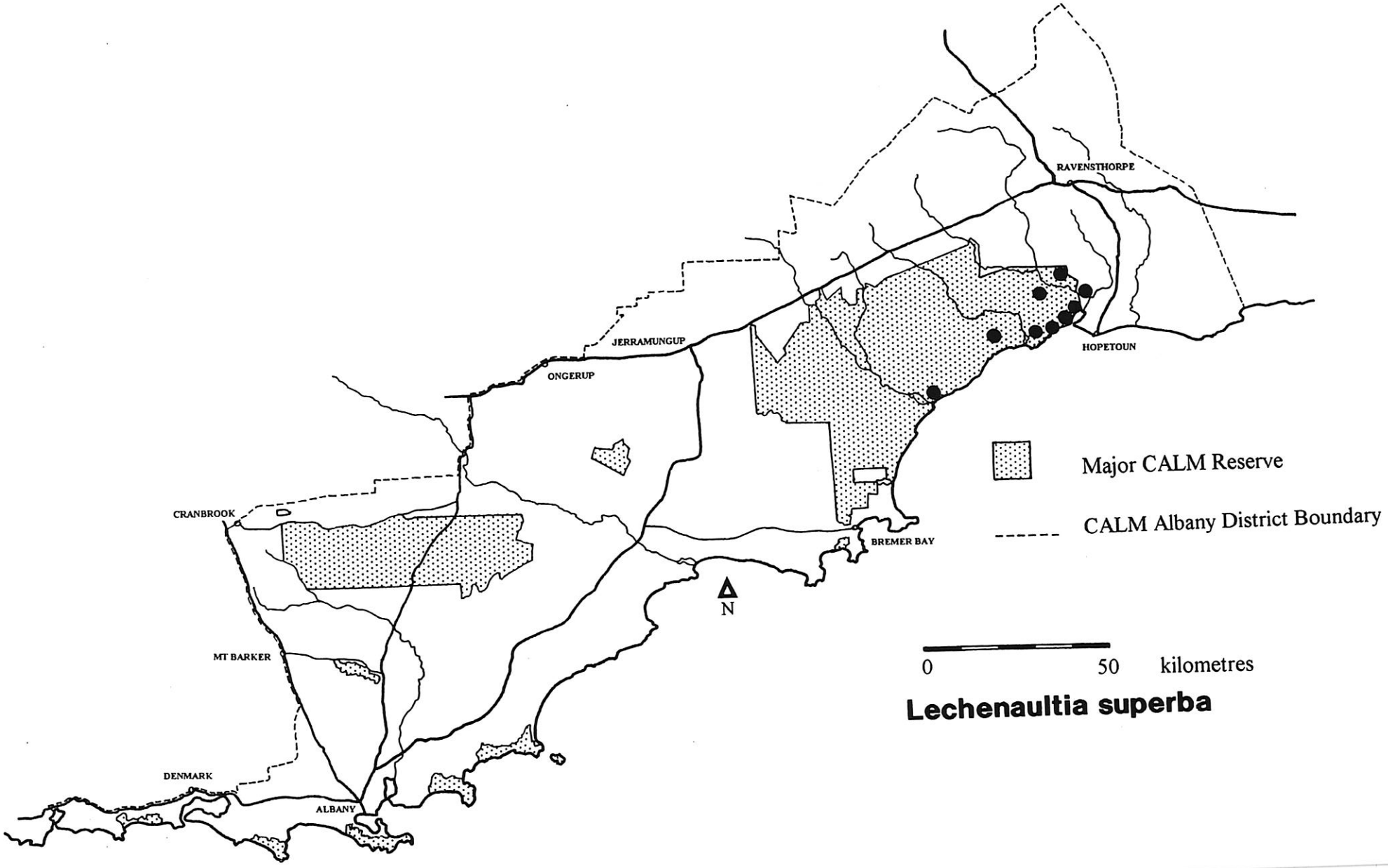
Management Requirements

- monitor known populations occasionally
- relocate Mid Mt Barren and Whoogarup Range populations.
- collect seed

Research Requirements

References

Morrison (1992).



Lechenaultia superba

Meziella trifida (Nees) Schindler

HALORAGACEAE

Meziella trifida is a decumbent, semi-aquatic annual herb, rooted at the nodes which may become a erect, rooted perennial aquatic in *situations* of permanent inundation. The stems and leaves are mostly reddish, but larger plants in water may have green leaves. The leaves are alternate, subfleshy, narrow linear 3-5 mm at the stem base becoming 10 mm trifid toward the apex. The leaf lobes are generally equal in length with the acute tip possessing a hydathode (water secreteing gland). The inflorescence is an indeterminate spike of flowers borne singly in the axils of the upper reduced bract-like leaves. Each sessile 4 merous flower is small (3 mm overall) composed of two 1 mm lanceolate to deltoid bracteoles subtending the 1.7 mm sepals which almost enclose the petals; all parts are red. There are four red stamens and four red styles. The ovary is 0.5 mm globular, developing short subulate processes. As the fruit develops, 6-7 soft radiating spines develop below the sepals and the sepals themselves are persistent and elongate, to form a terminal corona on the fruit. The mature fruit is a four locular pericarp. 2.7 mm long and across.

Flowering Period: October-November

Distribution and Habitat

The type of this species was collected near Albany by Preiss in 1840. Until recently, it had not been relocated (despite considerable search effort by G. Keighery, pers comm.) and was presumed to be extinct. However, in 1992 *Meziella trifida* was rediscovered (G. Keighery pers. comm.) on the edge of the Scott Plains, over 200 km west of Albany. It grows there in open depressions on winter saturated flats of grey sandy clay supporting very low heath of *Pericalymma* and sedges (*Restio* and *Leptocarpus*).

Keighery (pers. comm.) believes it may inhabit shallow *Melaleuca* depressions between Denmark and Albany (especially around Youngs Siding).

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
Not relocated in Albany District						

WAHerb:1 record

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

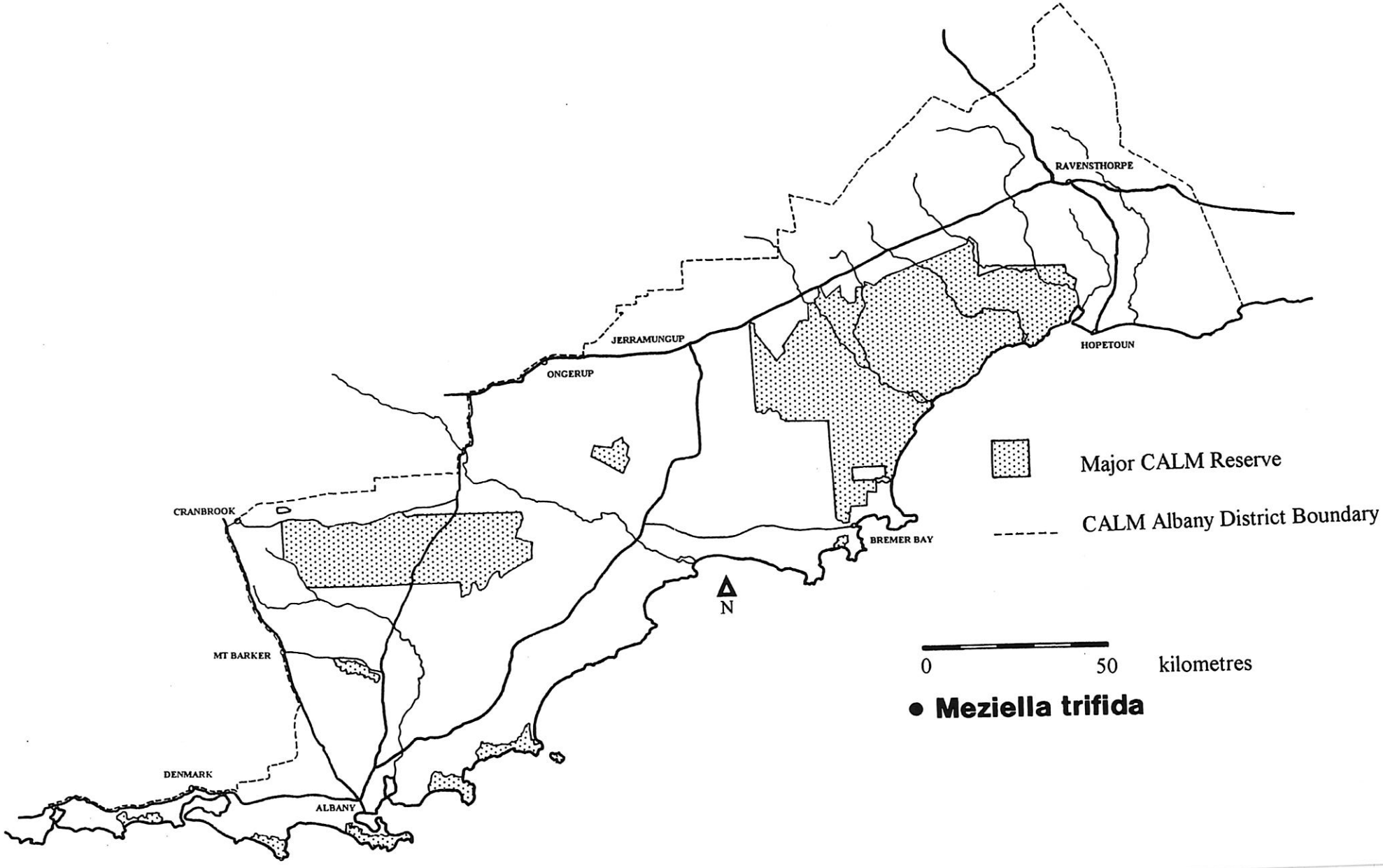
Management Requirements

Research Requirements

Survey in suitable habitat around Albany

References

Orchard and Keighery (1993).


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Meziella trifida

Microtis globula R.J. Bates

Globular Mignonette Orchid

ORCHIDACEAE

Microtis globula is superficially like most other Mignonettes, however orchid experts will readily distinguish it by its prominently incurved lateral sepals which confer the globular appearance. It has up to 40 pale yellow-green flowers, 2 mm wide and long, crowded on a stem up to 35 cm. The single terete leaf (2-4 mm wide) is up to 25 cm. This species is one of the last *Microtis* to flower.

Flowering Period: December-January

Distribution and Habitat

The Globular Mignonette Orchid has been recorded from a few locations near Albany and Walpole where it occurs in peaty soils of swamps with several other species of *Microtis*. *M. globula* is believed to flower only after a hot summer fire in January or February. R. Heberle (pers. comm.) maintains that this species is very common in swamps around Albany and he has recorded it from three locations in one reserve. The similarity of this species to other common *Microtis* may also explain why it has been collected so infrequently.

The reserve at Bakers Junction was subjected to a summer fire in 1989, however no *M. globula* were found.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
(1) William Bay	Albany	Dnmk	NP	6.12.89	0	-
(2) Bakers Jnctn	Albany	Alb	NR	12.10.92	0	-

WAHerb: 2 records

Response to Disturbance

Known to flower only after summer burning

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

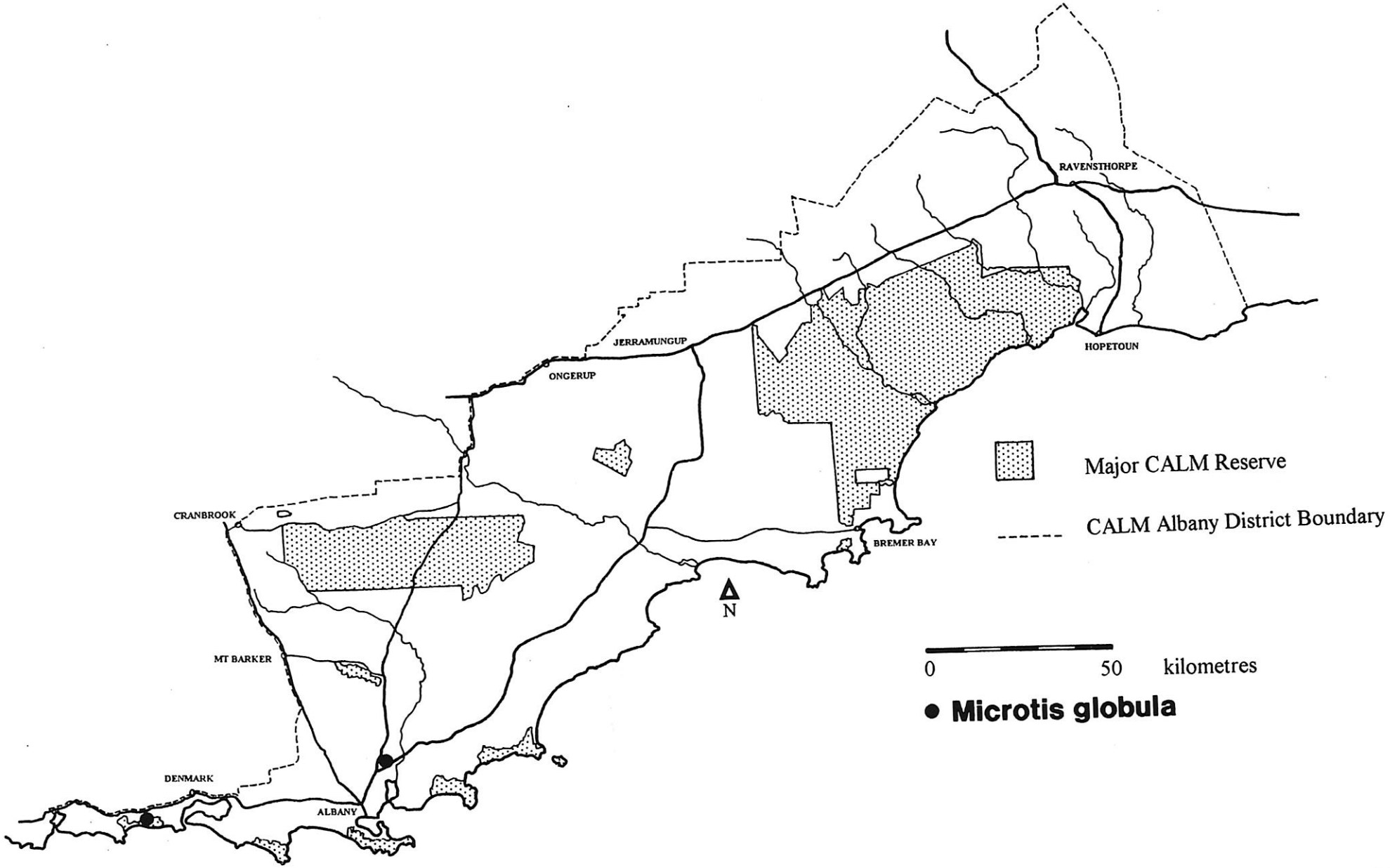
Resurvey known populations if they should be subjected to summer fire

Research Requirements

Survey for new populations in any areas of swamp that have been subjected to summer fire.

References

Bates (1984), Hoffman and Brown (1992).


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● Microtis globula

Myoporum cordifolium (F.Muell.)Druce

MYOPORACEAE

Jerramungup Myoporum

Myoporum cordifolium is a divaricately branched, twiggy spreading shrub to 1 m. The dark green leaves are very small (2 mm), cordate, reflexed and crowded along the resinous, tuberculate stems. Its white flowers are solitary, axillary and with a corolla tube up to 5 mm divided into five lobes. The four stamens are conspicuously exserted.

Flowering Period: June-November

Distribution and Habitat

The Jerramungup Myoporum is mainly known from sites that have been disturbed and most locations are on road verges, fire breaks or chained bush. It occurs on loamy-clays which prior to disturbance supported open Eucalypt Woodland over tall shrubs. At Corackerup Nature Reserve it occurs scattered through mallee woodland which is occasionally disturbed by sheet flooding over sandy clay.

M. cordifolium is probably short lived (around ten years) with seeds which must have a longevity of at least thirty years. This is based on the observation that *M. cordifolium* has appeared after disturbance in mature woodland (estimated to be at least thirty years old) in which there was no sign of it prior to disturbance. There is also a relatively high rate of annual mortality (e.g. from 85 plants on 4.11.91 to 37 on 4.11.92 in one population).

The potential for undiscovered populations, persisting as soil stored seed, at other locations is high.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Marra Bridge	Albany	Alb	priv & verge	4.6.91	0 live	dead
2. Corackerup Rd	Albany	Gno	Shire verge	4.11.92	37	healthy
3. Norman Rd	Albany	Jer	Shire verge	4.11.92	0	-
4. Twertup	Albany	Jer	NP	14.9.92	+10,000	healthy
5. Toompup Sth	Albany	Gno	priv & verge	13.11.87	1000	
6. Corackerup	Albany	Jer	NR	15.12 93	+10	healthy

WAHerb: 2 records

Response to Disturbance

Chaining and burning is known to stimulate seed germination.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

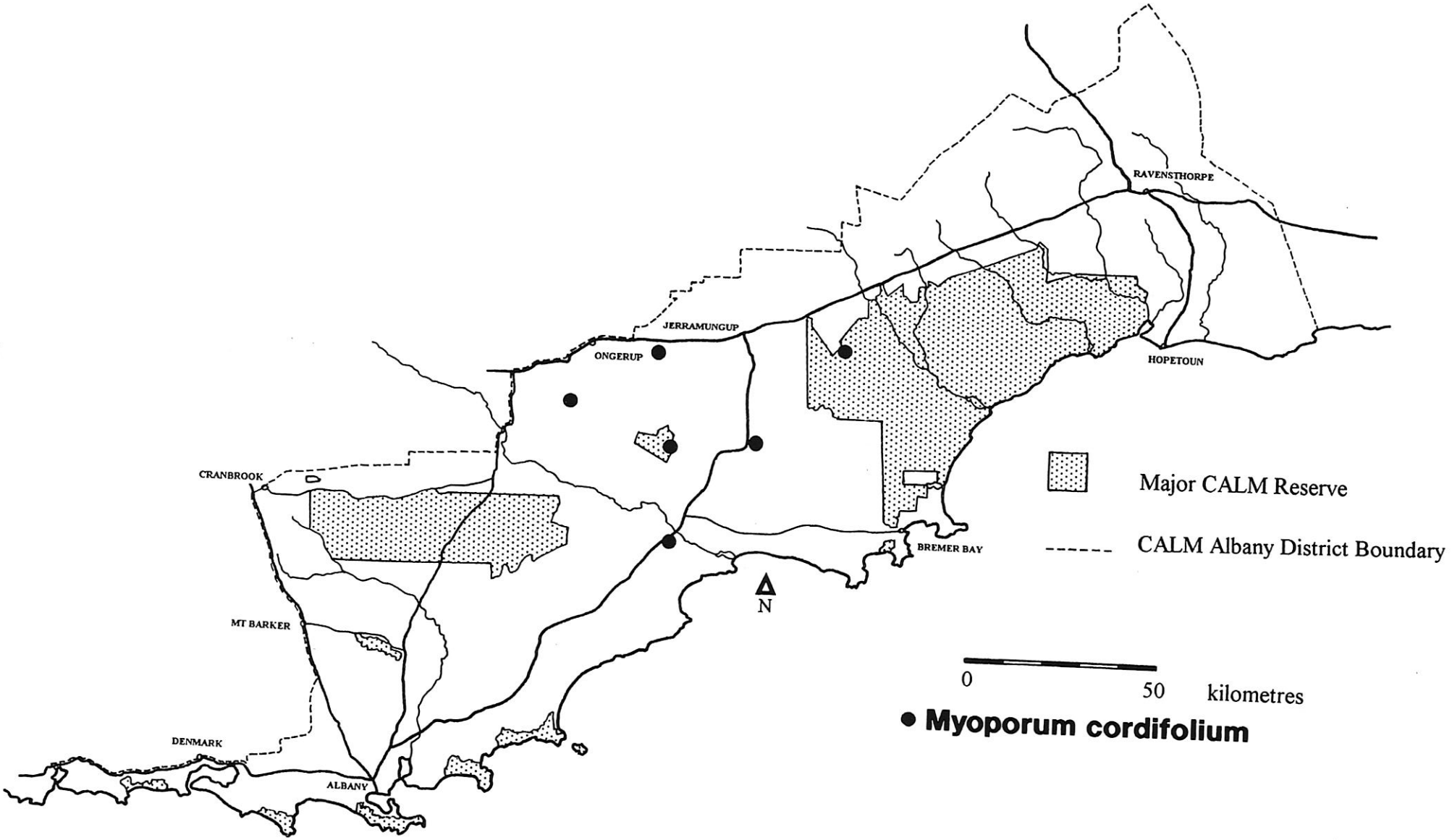
Management Requirements

- monitor Marra Bridge population to see if slight soil disturbance has stimulated germination
- relocate and resurvey Toompup South population (mostly on private property)

- monitor known populations

Research Requirements

- determine life cycle; especially longevity of plants and seed
- determine if germination is stimulated by either fire or soil disturbance or both
- survey opportunistically for new populations


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● Myoporum cordifolium

Pleurophascum occidentale R.E.Wyatt & A.H.Stoneb PLEUROPHASCACEAE

Two Peoples Bay Moss

This distinctive moss was discovered in 1984 and has been included in what was previously a monotypic genus. It is considered to be endemic to Western Australia which is known to have a low level of Bryophyte endemism. *P. occidentale* is related to *P. grandiglobum* which grows in subalpine peat of Tasmania and New Zealand. The former is a much larger species in all aspects. The plant is 2-3 cm tall, with elliptic leaves about 6 mm long and 2.5 mm wide. The acute apex narrows into a flexuose, hoary, serrate hairpoint.

Sporophytes of this species have not yet been seen.

Sporulating Period: unknown

Distribution and Habitat

This moss is only known from Two Peoples Bay area where it occurs on shallow soil at the edge of exposed granite with other mosses under the cover of Myrtaceous shrubs.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Two Peoples Bay	Albany	Alb	NR	7.5.90	10,000	healthy

WAHerb: 8 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

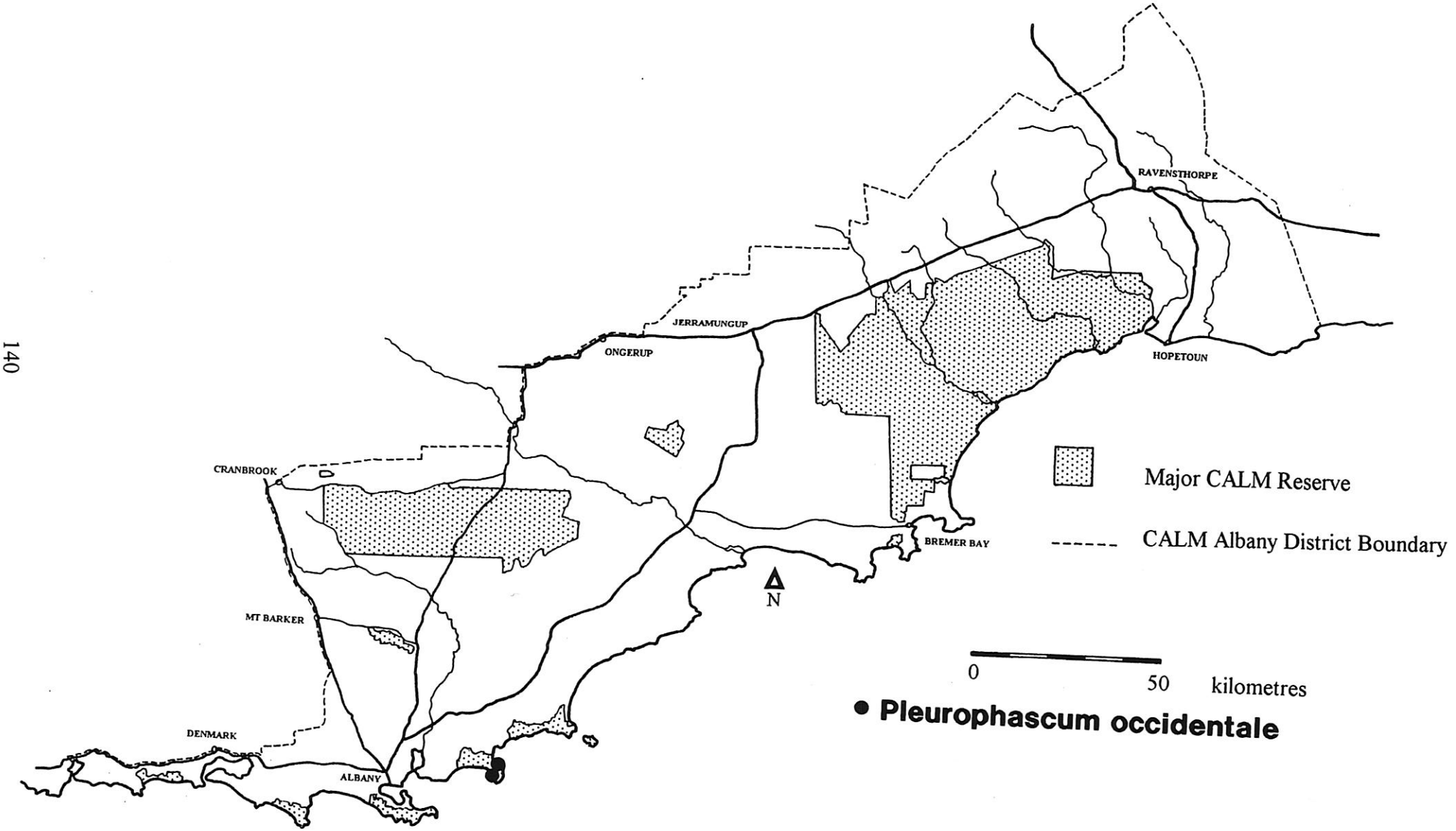
Monitor populations annually

Research Requirements

- survey for new populations
- collect specimens with sporophytes

References.

Wyatt and Stoneburner (1989), Scott *et al.* (1976).


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Pleurophascum occidentale

Restio abortivus Nees

Cheyne Beach Restio/Waychinicup Sedge

This sedge was originally collected in 1840 at Cape Riche by Preiss and described by Nees from that one collection housed in Melbourne.

Restio abortivus is a dioecious (but sexes not easily distinguished) perennial herb to 60 cm, erect to slightly spreading. The olive green culms (1 mm dia.) are multi-branched, with each branch divided again into branchlets terminating in spikelets. Obovate bracts (with hairy tips) are present on the stem at the base and subtending the branchlets. Male plants have ovoid spikelets (4-5 mm long), and females have slightly longer spikelets, falcate at the tips. Spikelets are rust red, and retained on the plant so that old and new spikelets are present. Seed set is very low at 11% (Dixon and Meney, pers. comm.)

This species is related to *R. crispatus* which occurs east of Albany to Esperance.

Flowering and seed dehiscence: August-October

Distribution and Habitat

Restio abortivus is only known from one location near Cheyne Beach in sand over gravelly clay supporting an association of scrub over sedges. It is not easy to locate. A 1992 survey found only one plant.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Cheyne Beach	Albany	Alb	Shire verge	9.90	+100	healthy.

WAHerb: 1 record

Response to Disturbance

Killed by fire; response to soil disturbance is unknown

Susceptibility to *Phytophthora* Dieback

R. abortivus will form a root lesion in pot trials, however the plant will form a new root above the infection and does not exhibit any gross symptoms of disease. In the field, sedges have the capacity to invade areas after a dieback front has moved through (I. Sieler, Kings Park, pers. comm.).

Management Requirements

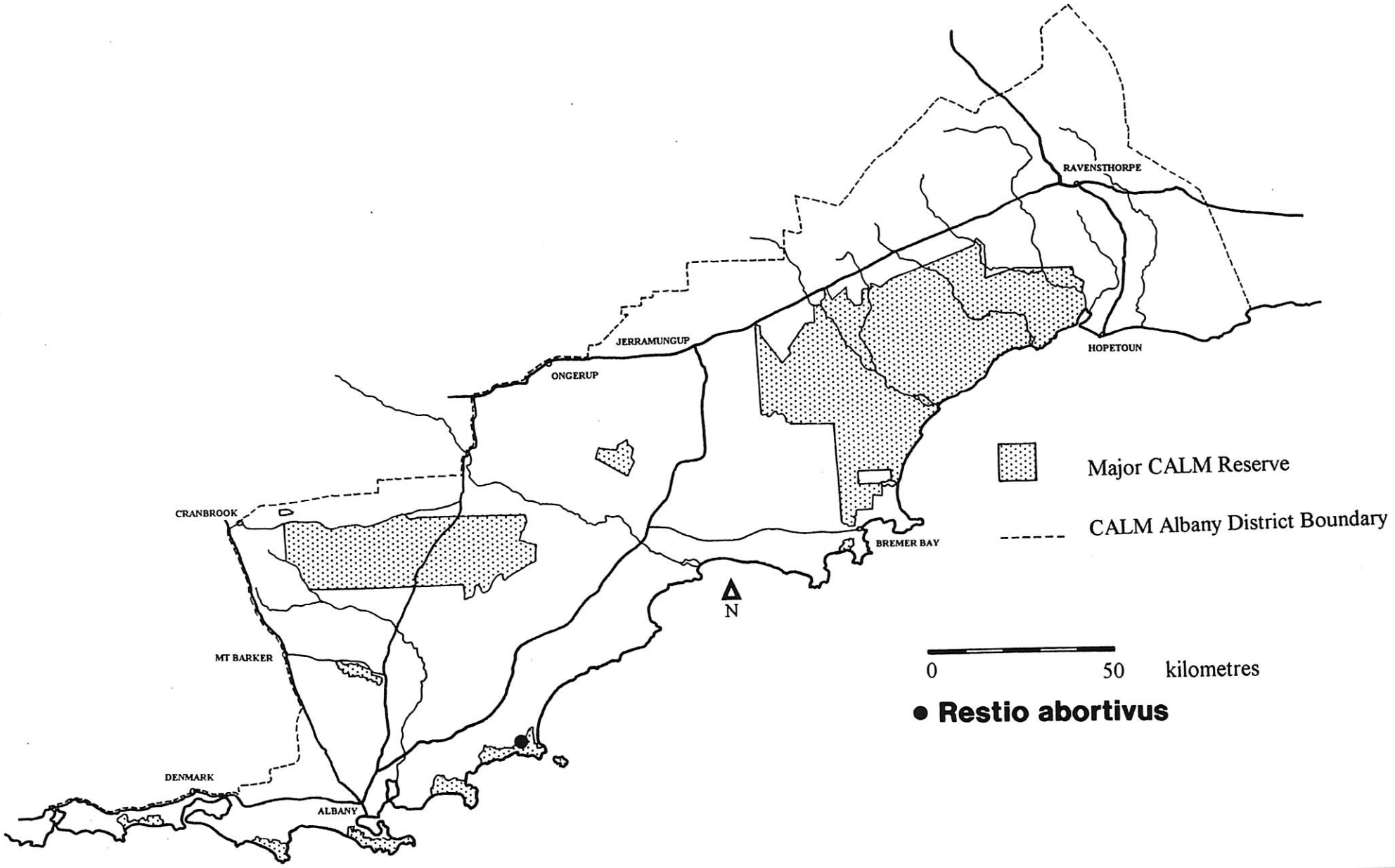
- locate main population and ensure Rare Flora Markers are correctly positioned
- exclude fire
- monitor population at least annually
- collect seed

Research Requirements

- survey for new populations
- determine ecology

References

Lehmann (1846), Meney (1993).


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● Restio abortivus

Ricinocarpos trichophorus Muell.Arg.

EUPHORBIACEAE

Barrens Wedding Bush

Ricinocarpos trichophorus is an open, erect shrub to 1.6 m. The leaves are up to 50 mm and are olive green, sparsely hairy above with recurved margins and very hoary underneath. New growth (buds and shoots) is covered with a rusty red indumentum, which is persistent on the stems turning silver grey with age. The flowers which are either male or female are creamy yellow, and borne in short terminal racemes of about five. The fruits are obovoid to 15 mm and persistently hairy.

Flowering Period: intermittent

Distribution and Habitat

This species is known from river valley floors and slopes in the Fitzgerald River National Park and one population on each of Mt Beaumont and Mt Heywood, north east of Esperance. Typically it is a common but localised component of post fire regeneration in alluvial soil of riverbeds, below granite rocks or breakaways supporting mallee shrubland. Plants set seed after four years.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Twertup	Albany	Jer	NP	17.3.93	3	healthy
(2) Twertup east	Albany	Jer	NP	7.12.93	20	healthy
(3) FitzgValley	Albany	Jer	NP	24.5.85	dense-WH	healthy

WAHerb: 1 record

Response to Disturbance

Regenerates from seed after fire

Susceptibility to *Phytophthora* Dieback

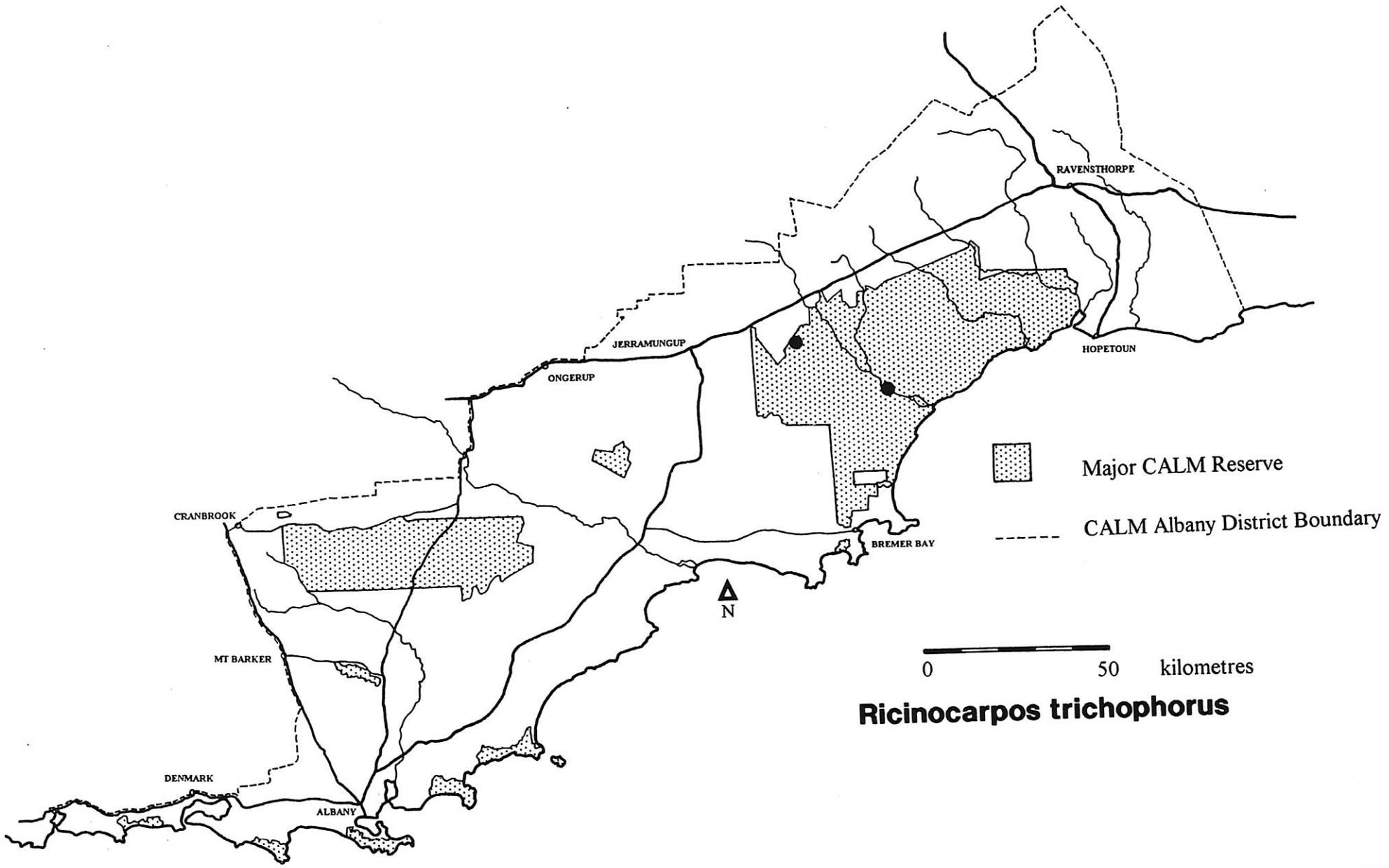
Unknown

Management Requirements

- exclude fire from regenerating populations for at least five years
- relocate and monitor known Populations

Research Requirements

Survey intensively for new populations


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Ricinocarpos trichophorus

Stylidium galioides C.A.Gardner

STYLIDIACEAE

Yellow Flowered Mountain Triggerplant

Stylidium galioides is a prostrate, spreading (to 50 cm), perennial plant with widely spaced whorls of 8 or more, 3 cm lanceolate leaves. The trailing stems may be rooted at the nodes. The pale yellow flowers are clustered in terminal racemes.

Flowering Period: September-November

Distribution and Habitat

This species is confined to the summits of mountain peaks in the eastern section of Fitzgerald River National Park. It occurs in shallow soil amongst quartzite rocks supporting an association of scrub and mallee Eucalypts. Three year old plants which had regenerated from seed following wildfire in November 1989 had not flowered in September 1992.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. E Mt Barren	Albany	Rav	NP	9.9.92	+500	healthy
2. Fort Hill	Albany	Rav	NP	18.9.86	scattered-WH	healthy
3. Annie Hill	Albany	Rav	NP	24.10.88	common-WH	healthy

WAHerb: 26 records

Response to Disturbance

Regenerates from seed after fire

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

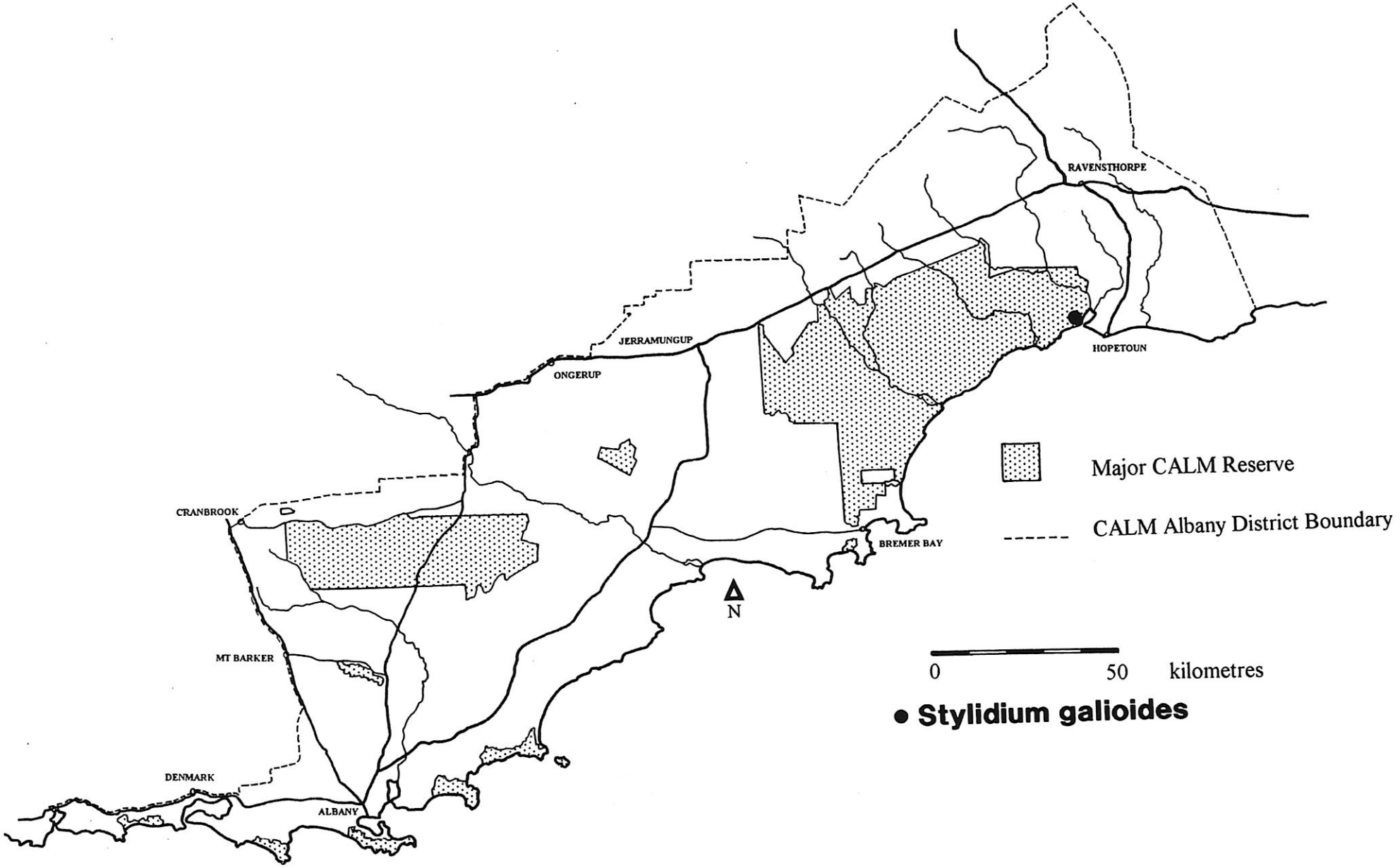
- exclude fire until after at least several years of seed set.
- monitor impact of tourist/climbers on this species and associated vegetation

Research Requirements

- survey other peaks for new populations
- monitor East Mount Barren population to determine age at first flowering
- determine susceptibility to dieback

References

Gardner (1942).


RAVENSTHORPE
JERRAMUNGUP
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BREMER BAY
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DENMARK
ALBANY
Major CALM Reserve
CALM Albany District Boundary
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kilometres
• Stylidium galioides

Stylidium plantagineum Sond.

STYLIDIACEAE

Plantagenet Triggerplant

Stylidium plantagineum is a perennial herb with erect leaves. The tough, broadly linear, slightly convex leaves to 40 cm are dark glossy green above and dull green beneath. They are clustered around a stemless base, subtended by dark red scale leaves. The showy scape grows to 80 cm and is densely glandular hairy with subsessile pink-lilac flowers in a spike like raceme.

This species only flowers very occasionally in unburnt vegetation, however following fire almost 100% flowering is achieved.

Flowering Period: November-December

Distribution and Habitat

The most common habitat for *S. plantagineum* around Albany is mid slope in shallow grey sands over surfacing laterite supporting Jarrah-Sheoak over tall shrubs. However it is also known to occur in scrub on sandy clay over laterite in the Stirling Range and in coastal heath on sand east of Albany.

When this species was gazetted as Declared Rare Flora it was known from a number of scattered populations of a few plants, on land without secure conservation tenure. Recent survey in late 1992 has found large populations in several Nature Reserves and revealed much larger and more widely distributed populations at several existing locations.

Conservation Status

Current: Declared Rare Flora

Recommended: Priority 4

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Betty's Beach	Albany	Alb	Shire res.	9&11.92	+300	healthy
2. Nannarup	Albany	Alb	Shire res.	24.4.90	7	undist.
3. Yungermere	Albany	Gno	NP	15.9.80	?	in bud
4,6.TPB Rd	Albany	Alb	Shire verge	23.4.90	3	undist.
5. Mt Hassell	Albany	Gno	NP	7.12.92	1	poor
7. Goodga R	Albany	Alb	WAWA & NP	23.12.92	+1000	healthy
8. TwoPeoplesBay	Albany	Alb	NR	12.11.92	+2000	healthy
9. Gull Rock	Albany	Alb	NP	23.4.90	+15	undist.
10. Albany TAFE	Albany	Alb	private	21.5.91	+500	undist.
11. Mt Melville	Albany	Alb	Shire res.	1.1992	+20	undist.
12. Elleker	Albany	Alb	Shire res.	2.9.92	+400	healthy
13. Milpara	Albany	Alb	private	16.12.92	+70	undist.
14. Howell Rd	Albany	Alb	Shire res.	21.12.92	+10	healthy
15. Marbellup	Albany	Alb	NR	21.12.92	+2000	healthy

WAHerb: 7 records

Response to Disturbance

Flowering is stimulated by fire

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

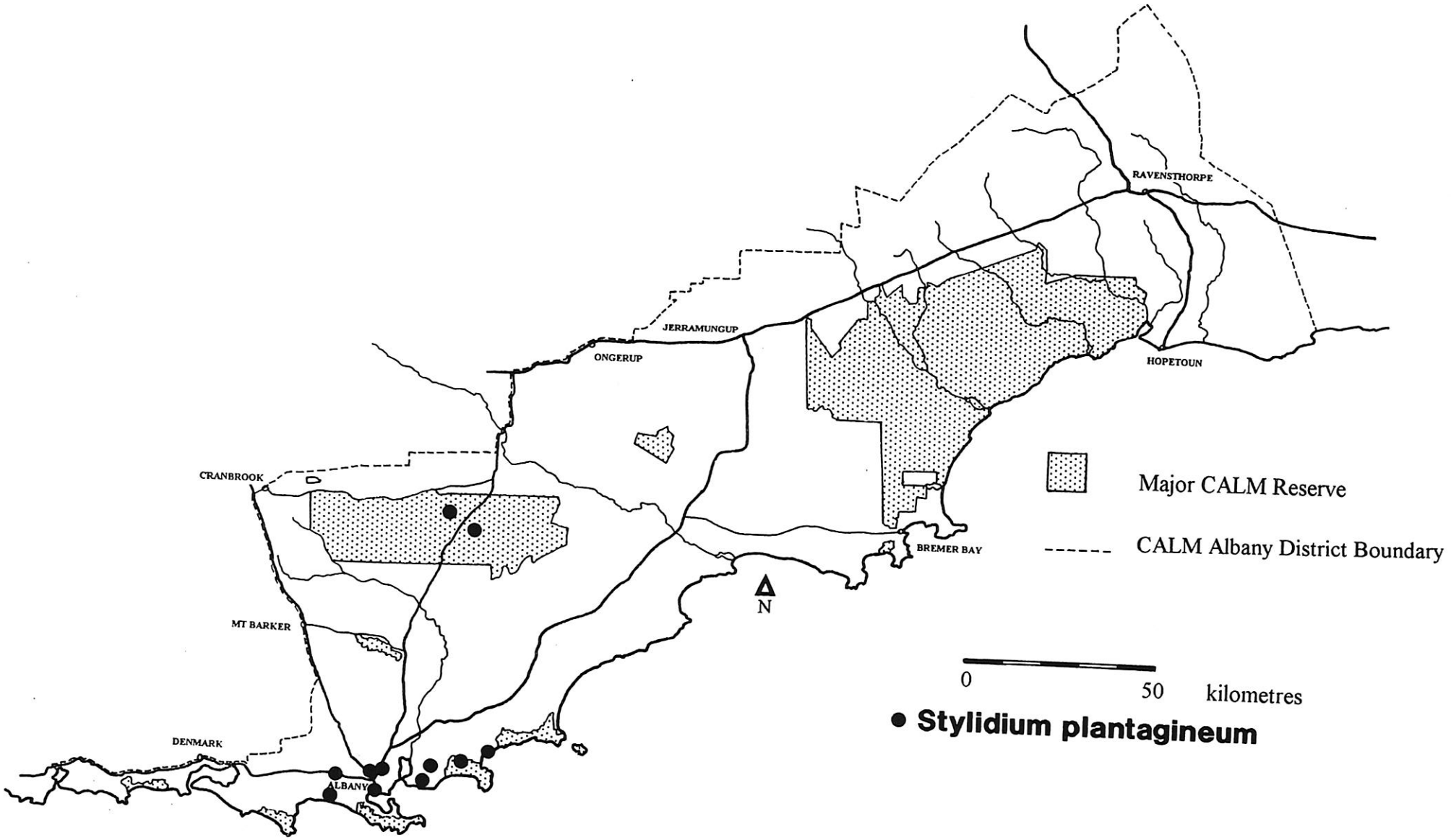
Management Requirements

- reduce status from DRF to Priority 4
- monitor occasionally

Research Requirements

References

Lehmann (1844-8).


RAVENSTHORPE
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CALM Albany District Boundary
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kilometres
Stylidium plantagineum

Thelymitra psammophila C.R.P.Andrews

ORCHIDACEAE

Sandplain Sun Orchid

This orchid is a perennial herb (aerial parts die over summer) with a long thin leaf (4 mm wide by 5-7 cm long) and up to five lemon yellow flowers in a loose raceme. The flowers are small (14-18 mm) on a stalk up to 25 cm. The lateral lobes of the column are triangular and brown without any tufts of hair or combings. *T. psammophila* is similar to *T. antenifera* and *T. flexuosa,* and regarded by some as a hybrid between these two species.

Flowering Period: September-October

Distribution and Habitat

This species is known from only a few locations between the Stirling Range and Ravensthorpe, where it occurs in seasonally wet sandy clay in very open heath and sedges.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Mallee Road	Albany	Jer	verge	7.9.92	7	in bud
2. Borden Tip	Albany	Jer	Shire res.	24.9.92	0	-
3. FRNP	Albany	Jer	NP	9.9.88	+200	in flower
4. Kalgan Plains	Albany	Pl	NR	10.92	0	-
5. Jacup	Albany	Jer	Shire res.	10.10.88	+2000	in flower
6. Hassell Hwy	Albany	Jer	MRD verge	-	-	-

WAHerb: 4 records

Response to Disturbance

Unknown; however its cannot be relocated at the disturbed rubbish tip site near Borden.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

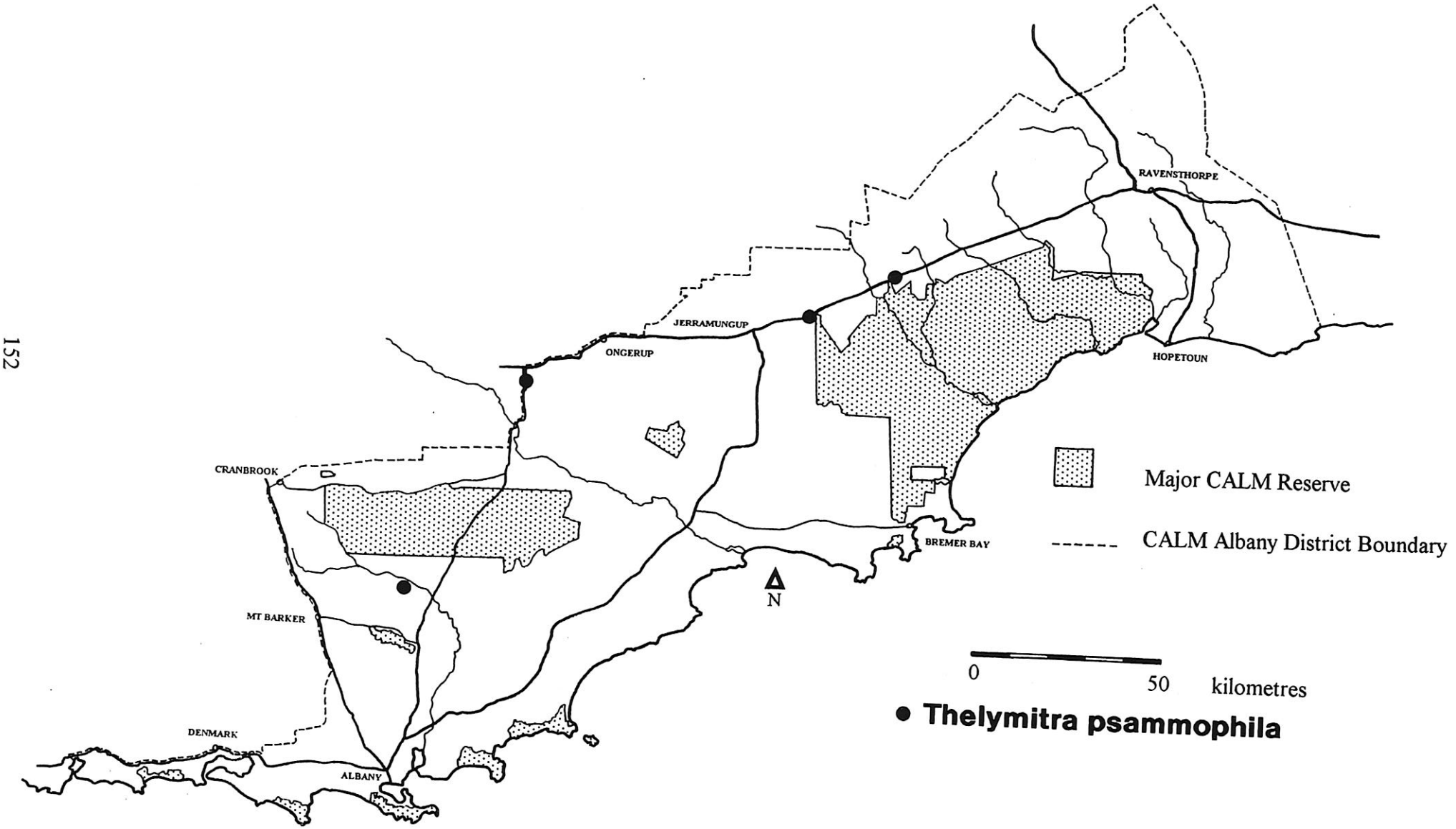
Monitor known populations annually

Research Requirements

Survey opportunistically for new populations

References

Hoffman and Brown (1992), Andrews (1905).


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kilometres
Thelymitra psammophila

Tribonanthes purpurea T.Macfarlane & Hopper

HAEMODORACEAE

Granite Pink

This species is unlike others of the genus *Tribonanthes* in that it is virtually glabrous and has colourful flowers with erect perianth lobes. It is a dwarf, perennial herb with solitary flowers enclosed in two broad, overlapping leaf-like pinkish bracts. The pink perianth lobes (7.5-8 mm long by 2.3-3.4 mm wide) are narrowly elliptic to narrowly obovate, erect and minutely ciliate.

Flowering Period: August

Distribution and Habitat

Tribonanthes purpurea grows in moss swards and herbfields in seasonally wet, shallow loam over granite outcrops. Prior to a 1990 collection from Granite Hill on the Kalgan River near Albany, it was only known from granite rocks around Pingaring, about 250 km north. The Granite Hill population is in a C class Conservation Reserve, which is relatively inaccessible and is a secure location. The population is confined, however, to a small part of the outcrop.

It is considered likely that this species may occur on other granite outcrops between Pingaring and Albany.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
(1) Granite Hill	Albany	Alb	UVR	27.8.93	81	good

WAHerb: 3 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

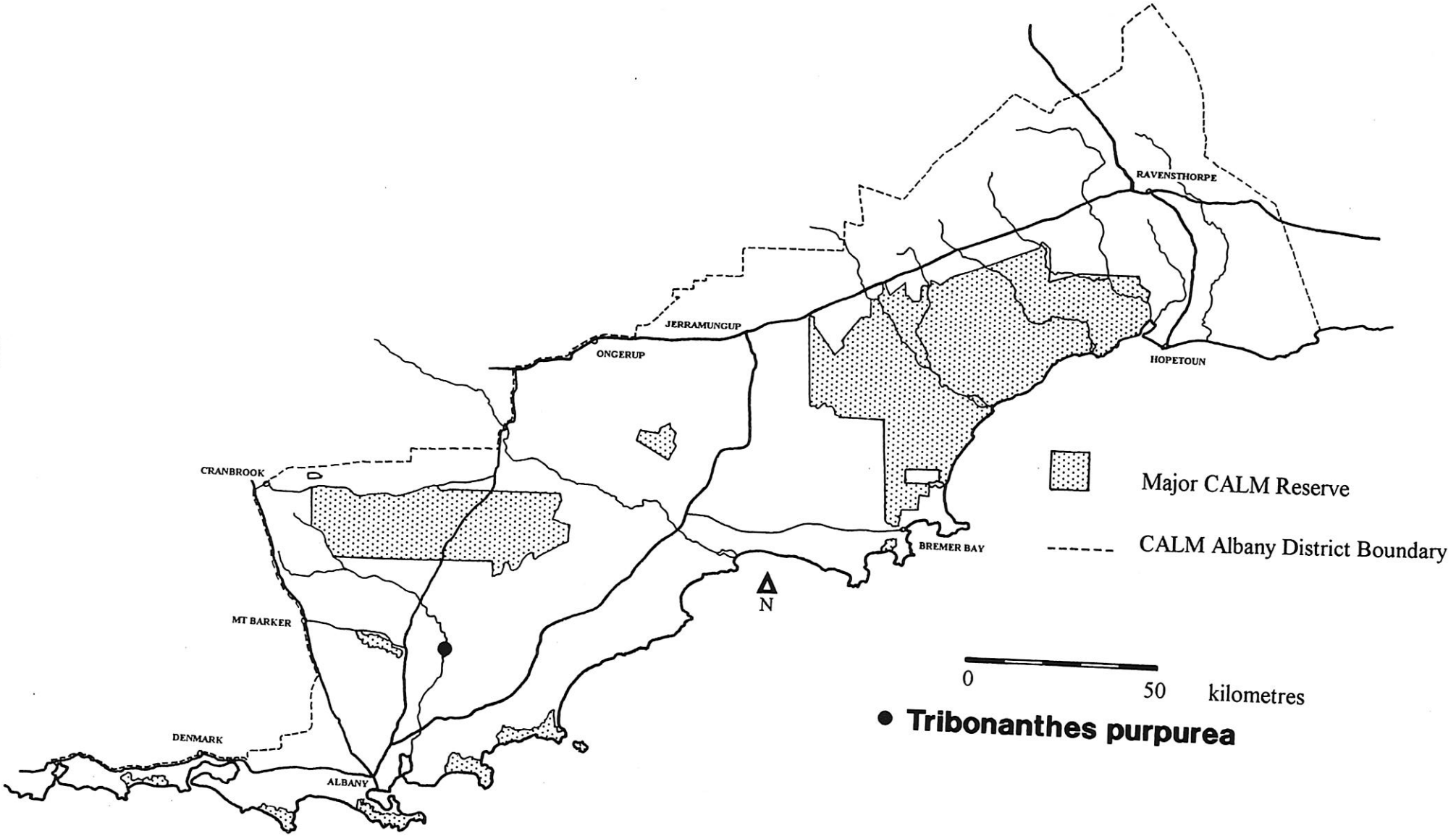
Monitor regularly

Research Requirements

- survey granite rocks across Kalgan River from Granite Hill
- survey opportunistically for new populations on similar granite outcrops

References

Macfarlane and Hopper (1987).


RAVENSTHORPE
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Tribonanthes purpurea

Verticordia crebra A.S.George

MYRTACEAE

Twertup or Barrens Featherflower

Verticordia crebra is an erect, few branched shrub to 60 cm, which appears somewhat like a miniature pine tree. The dark green leaves are very crowded over the entire plant, and are fine, pointed and linear to 15 mm long. The pale yellow flowers have short petals (3 mm) and are largely hidden by the leaves, except the style which is grossly exserted to 22 mm. The flowers are axillary and scattered toward the end of the branches.

Prior to being described by George (1991), this taxon was known as *V.* sp. aff. *helichrysantha* as it is closely related to *V. helichrysantha* but differs in having a more compact habit, longer style, crowded leaves and hidden flowers. The specific name refers to the leaves and is derived from the Latin *creber* - close together.

Flowering Period: July-September

Distribution and Habitat

The Twertup Featherflower occurs in heavy red loams over decomposed spongolite, above and on the slopes of breakaways along drainage lines in Fitzgerald River National Park. Generally it is found in open areas surrounded by scrub and mallee. It was first collected by Gardner from Mid Mt Barren in 1948. It was collected from near Woolbernup Hill in 1981 (Keighery, pers. comm.). All other collections, including the type have been made in the vicinity of Twertup. As this habitat is not uncommon within FRNP, its is likely that other unrecorded populations exist.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Woolbernup	Albany	Rav	NP	5.1981	-	in flower
2. Twertup	Albany	Jer	NP	15.9.92	+600	healthy
(3) Twertup Sth	Albany	Jer	NP	16.9.92	+2000	healthy

WAHerb: 20 records (including 10 duplicates of Gardner's 1948 collection)

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible (low to moderate)

Management Requirements

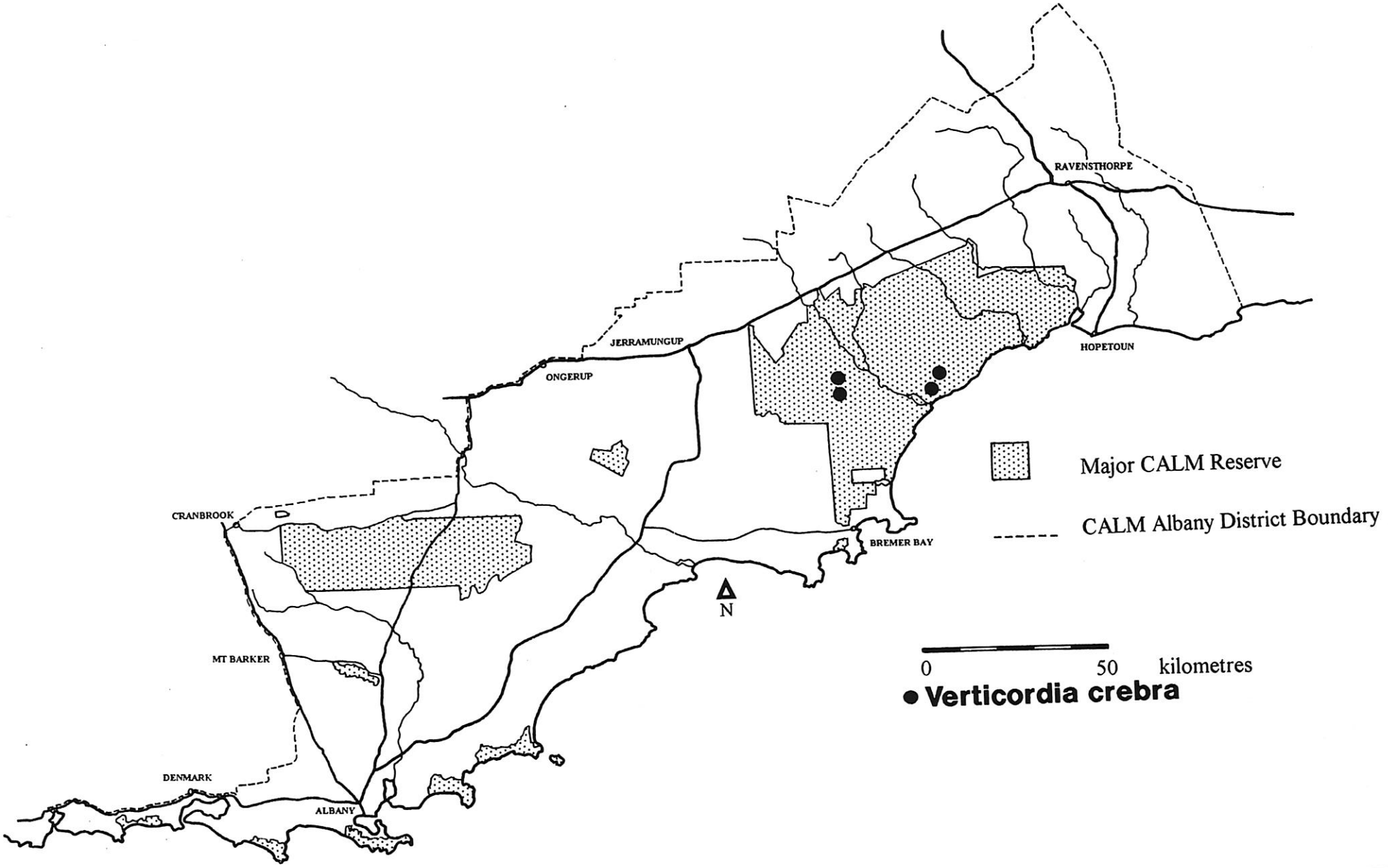
- monitor populations annually
- relocate Mid Mt Barren and Woolbernup populations

Research Requirements

- determine fire ecology and Response to Disturbance
- survey for new populations in similar habitat
- determine susceptibility to dieback

References

George (1991).


RAVENSTHORPE
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kilometres
● Verticordia crebra

Verticordia fimbrilepis subsp. *australis* A.S.George

MYRTACEAE

Shy Featherflower

The shy featherflower is an erect spindly shrub with slender branches to 60 cm. The small flowers are pink with deeply fringed petals and staminodes, and are arranged loosely in an umbel with persistent, connate bracteoles. The linear leaves are semi-terete, or triquetrous, up to 10 mm long and are mostly opposite or in clusters.

The other rare subspecies, *fimbrilepis,* occurs near Woodanilling, but subsp. *australis* differs in having a longer peduncle, narrower more coarsely lobed petals and more fringes on the staminodes.

Flowering Period: late October-November

Distribution and Habitat

Verticordia fimbrilepis subsp. *australis* occurs in low heath in brown loam around outcropping granite.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Willyung	Albany	Alb	private	25.8.92	1	alive
2. Kent R	Walpole	Dnmk	SF	6.12.90	+2750	regen

WAHerb: 7 records

Response to Disturbance

Regenerates from lignotuber and seed after fire

Susceptibility to *Phytophthora* Dieback

Presumed susceptible (low to moderate)

Management Requirements

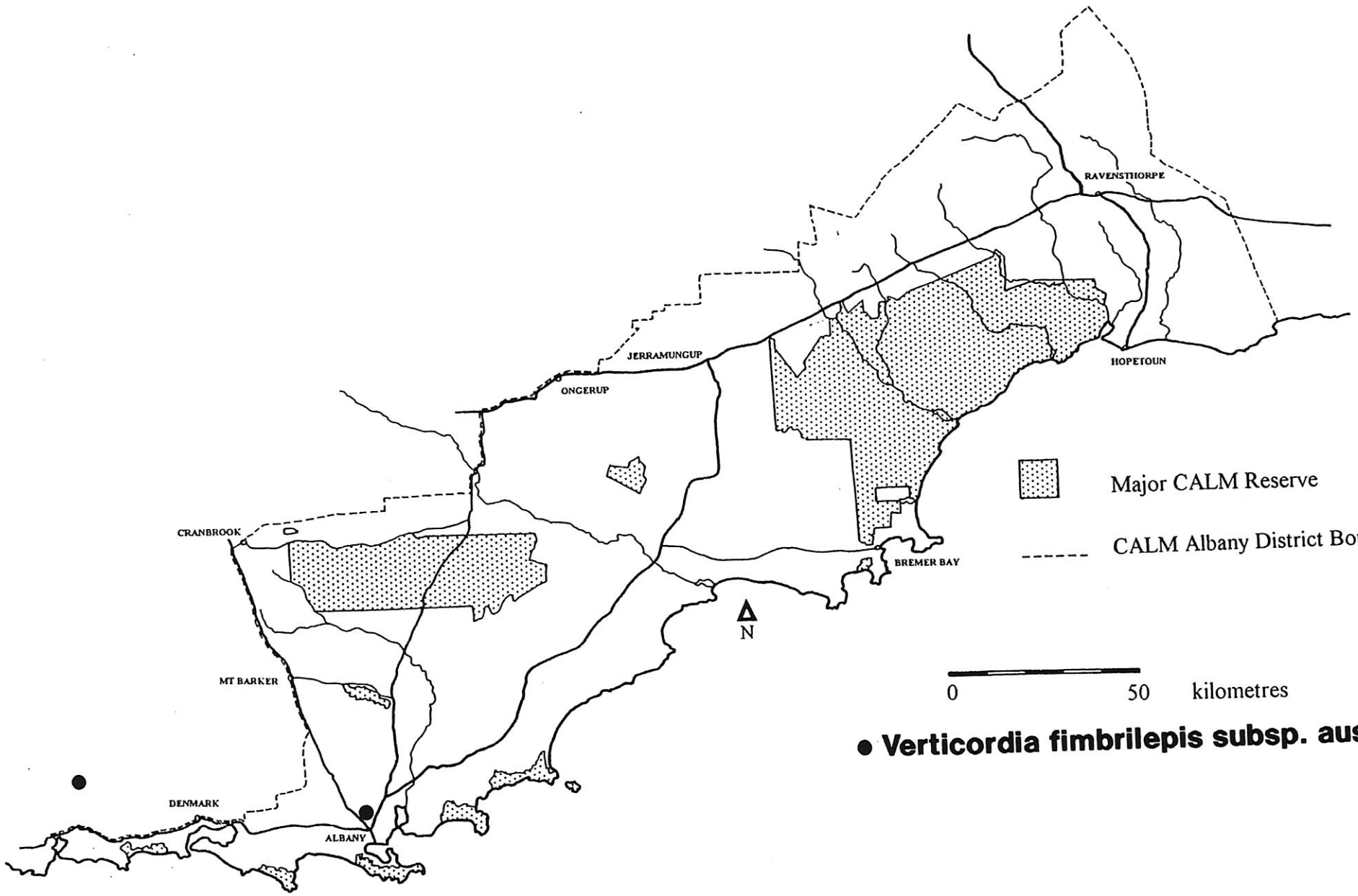
- monitor known population and liaise with mine operators
- liaise with Southern Forest Region to organise cuttings to be sent to Kings Park

Research Requirements

- survey for new populations.
- determine susceptibility to dieback

References

George (1991).


RAVENSTHORPE
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kilometres
● Verticordia fimbrilepis subsp. australis

Verticordia harveyi Benth.

Autumn Featherflower

MYRTACEAE

Verticordia harveyi is a spindly, few branched shrub to 1 m tall, with fine linear leaves (to 10 mm) clustered towards at the ends of branchlets. The small white to pink flowers with hairy calyx lobes form corymbs, surrounded and exceeded by the terminal leaves. This species is very similar to *V. sieberi* which differs only in having slightly larger flowers and staminodes which are entire, not fringed. At the Pfeiffer Road location of *V. harveyi*, *V. sieberi* is also reported to occur.

Verticordia harveyi was first collected by W.H. Harvey from near Cape Riche, in March 1854. It was collected again in the 1950's by S.D. Pfeiffer "near Manypeaks" but its exact location remained unknown until N. Stevens rediscovered it in March 1991. A huge effort has been put into surveying for additional populations by members of the Verticordia Study Group and interested members of the Manypeaks-Wellstead community, so far without success.

Flowering Period: March

Distribution and Habitat

The Autumn Featherflower was known from only one location on Pfeiffer Road, in 18 hectares of remnant vegetation on private land and the adjoining road verge. It grows in deep white sand supporting scattered *Banksia coccinea, B. attenuata* and *B. baxteri* over closed heath. Most of the land in the vicinity has been cleared for farming. The landowner is fencing this area to exclude livestock.

In April 1993 two populations were discovered in the south east Stirling Range, in habitat almost identical to the Pfeiffer Road location.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Pfeiffer Road	Albany	Alb	priv & verge	15.3.93	+1000	healthy
2. E Pil Track	Albany	Pl	NP	1.4.93	+500	in flower
3. Sth East track	Albany	Pl	NP	29.4.93	+5000	in flower

WAHerb: 12 records(10 from pop.1)

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible (low to moderate)

Management Requirements

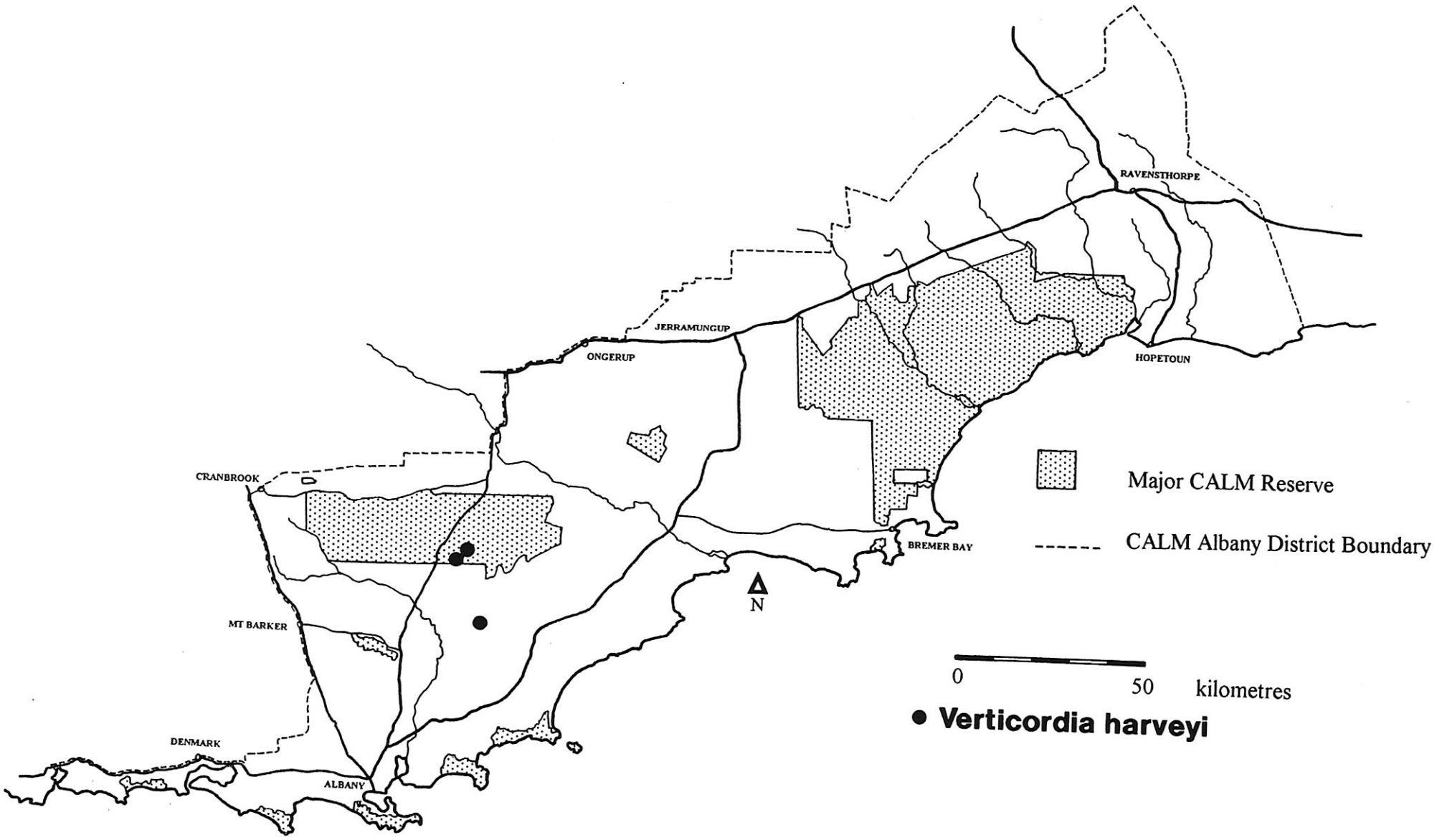
- monitor populations annually
- maintain contact with Verticordia Study Group and others who are surveying for new populations
- maintain liaison with Pfeiffer Road landowners

Research Requirements

- survey opportunistically for new populations
- confirm susceptibility to dieback

References

Bentham (1867), George (1991).


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kilometres
Verticordia harveyi

Verticordia helichrysantha F.Muell.ex Benth

MYRTACEAE

Coastal Featherflower

Verticordia helichrysantha is a shrub of small stature growing to only 200 mm, with clustered crowded linear, semiterete leaves to 6 mm. The pale lemon yellow flowers (7 mm across) have a hairy calyx tube 3 mm deep, and a very long (to 15 mm) exserted pale pink style, slightly hooked at the apex with very fine hairs just below the stigma. The ovate 3 mm petals are minutely serrate and the calyx lobes are finely ciliate and separated almost to the base.

Flowering Period: September-October and intermittent.

Distribution and Habitat

Currently this species is known from only two locations. One near Cape Riche, and one behind Trigelow beach in FRNP. The soil conditions at both locations are very similar even though about 80 km apart. It grows in very shallow grey/brown sand over lateritic gravel over spongolite in association with very low open heath close to the coast.

A collection made by Fairall in 1964 from "near Kamballup" which is included in WAHerb as *V. helichrysantha* is however "slightly different, bushier" (George, pers. comm.). Spongolitic soils do occur around Kamballup, however this species has not been found there again. There has been considerable clearing for agriculture in that area since 1964.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Cape Riche	Albany	Alb	VCL	3.11.92	+2,000	healthy
2. Trigelow Beach	Albany	Rav	NP	9.93	+5,000	healthy

WAHerb: 7 records

Response to Disturbance

Regenerates from seed after fire.

Susceptibility to *Phytophthora* Dieback

Presumed susceptible (low to moderate)

Management Requirements

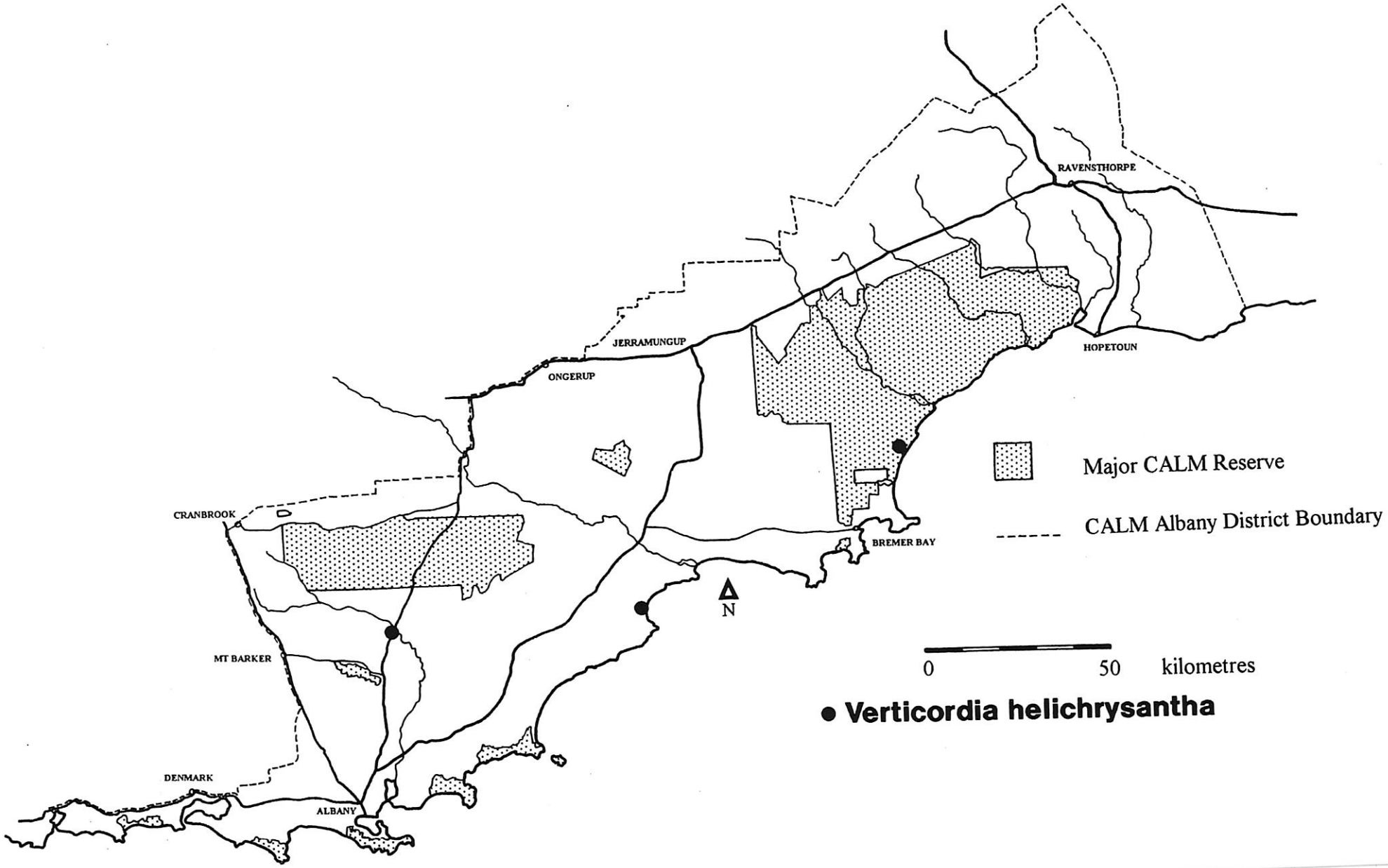
- survey and define populations in Cape Riche area (Reserve 31240)
- monitor populations occasionally
- collect material for propagation

Research Requirements

- search Shire reserves at Kamballup for "Fairall" location
- survey other areas of coastal spongolite near Cape Riche and in FRNP for new populations
- determine susceptibility to dieback

References

Bentham (1867), George (1991).


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kilometres
● Verticordia helichrysantha

Villarsia calthifolia F.Muell.

Mountain Villarsia

MENYANTHACEAE

Villarsia calthifolia is a large, robust, fleshy perennial herb with a tuberous rootstock. It is recognised by its glossy kidney or round shaped leaves (to 20 cm across) with minutely toothed margins and broadly funnel shaped lamina. The leaves are supported on a thick petiole (to 450 mm.) arising from the the basal stock. Smaller leaves are also present up the flowering stem which may exceed 1 m tall. The inflorescence stem is a much branched panicle bearing clusters of bright yellow flowers, each 10 mm across with broad sepals. This *Villarsia* is the largest in the genus.

The Mountain Villarsia sets abundant seed.

Flowering Period:September-December

Distribution and Habitat

Villarsia calthifolia is restricted to the Porongurup Range, where it occurs in crevices of upper drainage lines and under overhangs on granite peaks and outcrops. The shallow soil consists of sandy loams with accumulated organic material. In winter these locations are very wet with water constantly percolating through. Although moisture is normally retained in the crevices and peat during summer, periods of drought may dry them out and some plants die. This effect was recorded following a period of extreme heat in January 1991.

Villarsia marchantii a similar but much smaller species, occurs in seasonally wet loams over granite in lower watercourses, mid slope and below the populations of *V. calthifolia.* Hybrids between the two species occur in the overlap zone.

V. calthifolia has been recorded from sixteen locations, however only one (at Devils Slide) has been monitored regularly.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Devils Slide	Albany	Pl	NP	24.7.92	+50	healthy
Populations are known from 8 other peaks; none of which have been surveyed in detail						

WAHerb: 12 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

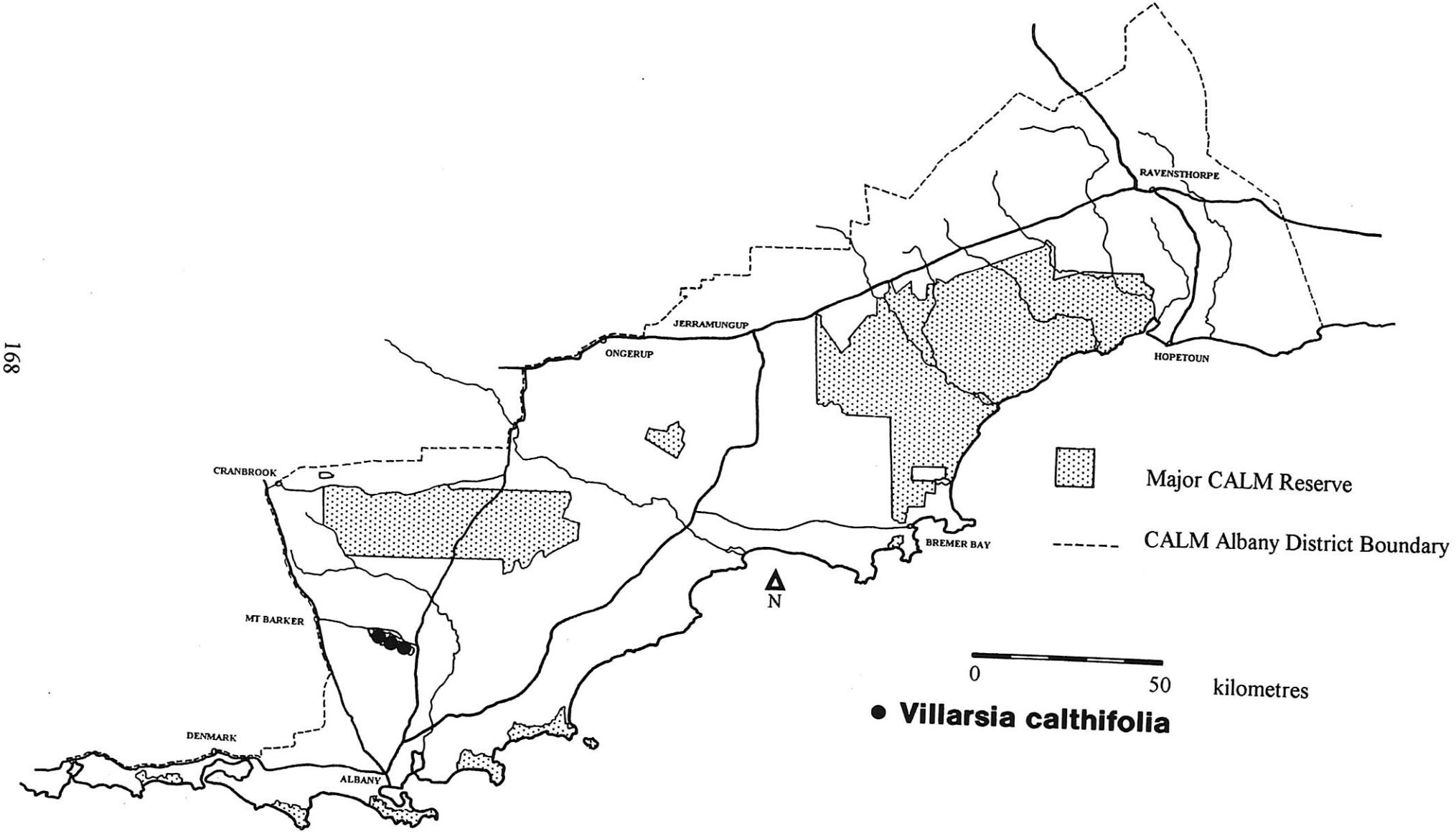
- monitor annually
- collect seed

Research Requirements

- a complete survey of all known locations is required
- monitor populations closely over time to determine if changes in weather patterns (i.e. more frequent periods of drought) are impacting upon population numbers

References

Mueller (1868).


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kilometres
Villarsia calthifolia

Xyris sp. Stirling Range (G.J.Keighery 7951)

XYRIDACEAE

Stirling Range Xyris

This very attractive, and as yet undescribed *Xyris* is a slender, tufted perennial herb to 40 cm. Its general appearance is that of a sedge, with up to 20 terete leaves. It produces a globular terminal inflorescence which is composed of a series of dark brown curved floral bracts. The bright yellow flowers appear one at a time from behind the bracts. The old inflorescences are retained on the plant.

This species was discovered by G. Keighery in 1986.

Flowering Period: November-December

Distribution and Habitat

The Stirling Range *Xyris* is known from only one location near Bluff Knoll in the Stirling Range. There it occurs in shallow peaty waterlogged soil, on a series of schist ledges which jut out to form little waterfalls. It occurs with moss, sedges and small herbs immediately below a *Homalospermum* bog, which provides a year round flow of water.

Although the location was burnt by wildfire in March 1991, approximately half the adult plants did survive in the moist conditions and many seedlings have appeared. The seedlings have not yet flowered.

Conservation Status

Current: Declared Rare Flora

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Bluff Knoll	Albany	Gno	NP	3.2.93	100/1000	adult/ seedling

WAHerb:1 record on loan

Response to Disturbance

Killed by fire; regenerates from seed

Susceptibility to *Phytophthora* Dieback

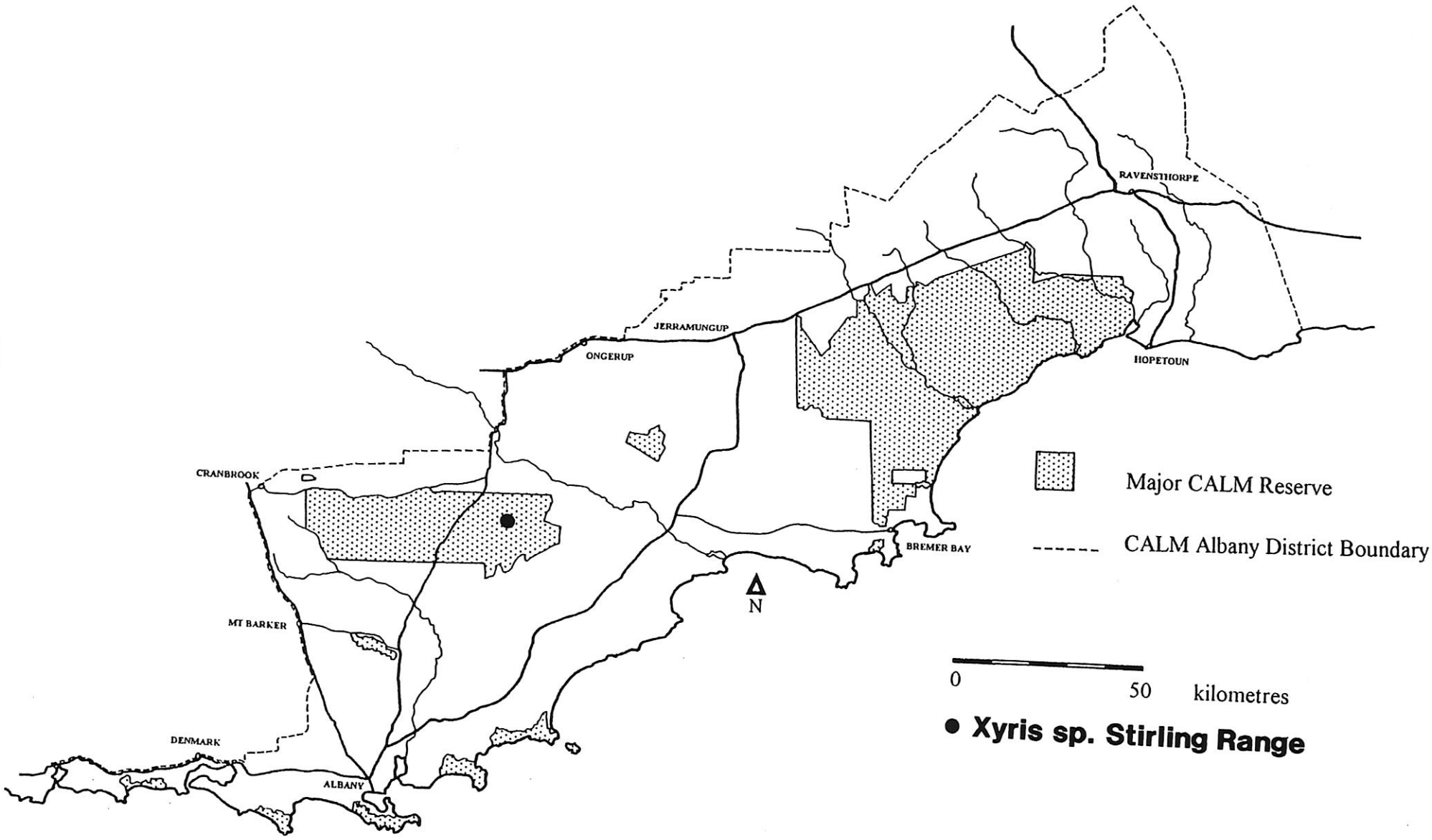
Presumed not susceptible

Management Requirements

- exclude fire from location until several years after current seedling generation has flowered and produced seed.
- monitor annually
- collect seed

Research Requirements

Survey for new populations around Bluff Knoll and other similar habitat.


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kilometres
● Xyris sp. Stirling Range

Acacia prismifolia E.Pritz.

MIMOSACEAE

Acacia prismifolia is a shrub, 15-30 cm tall with branchlets densely villous with long hairs. The 5-9 mm linear phyllodes are rotund obtuse with a short mucrone, and with the midribs and marginal veins strongly raised. They are rigid, ascending, straight or weakly curved with villous veins. The 1-1.5 mm stipules are persistent, subulate and ciliate. The inflorescences are crowded in the upper axils, two per axil on 3-4 mm villous peduncles per axil subtended by a basal rostriform, villous bract as long or longer than the peduncle. The flower heads are 3-4 mm in diameter with 9-10 flowers. The legume has not been collected.

Flowering Period: August

Distribution and Habitat

This species is only known from the type collected by Diels in the western end of the Stirling Range and one other collection from "Albany" by Meebold in 1933. No further information is available on its habitat.

Conservation Status

Current: Declared Rare Flora-Presumed Extinct

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No populations located						

WAHerb: 3 records (2 Diels 1901 and Meebold 1933)

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

Research Requirements

Extensive search is required in the western end of the Stirling Range

Coleanthera virgata Stschegl.

EPACRIDACEAE

Coleanthera virgata is a shrub with elongated or flexuose branches which are usually loosely pubescent. The concave obtuse leaves are shortly petiolate, linear lanceolate and loosely pubescent to glabrous. The main stem leaves are up to 12 mm long and shorter on the branchlets. The pink flowers are small, solitary or 2-3 together on a short axillary peduncle. The corolla lobes, which are bearded only at the base, are spreading and reflexed, revealing the exserted style, around which the anthers are coherent above the middle, in a cone. The base of the calyx which extends above the corolla tube is subtended by very small bracts and bracteoles.

The other species, *C. myrtifolia* and *C. coleophylla*, have much broader orbicular or ovate leaves.

Flowering Period: Spring

Distribution and Habitat

This species is only known from the type collection made by Drummond (ca. 1850). CALM file records show the location as Cape Riche, however this may be an abbreviation of "from Swan River to Cape Riche" which was the usual information on his specimens. No further habitat information is available.

Conservation Status

Current: Declared Rare Flora-Presumed Extinct

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No populations located						

WAHerb: 3 Drummond records; no location

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

Research Requirements

Survey opportunistically to relocate

References

Bentham (1869).

Deyeuxia drummondii (Steud.) Vick.

Drummond Grass

Drummond Grass is a hairless, decumbent, annual grass, with sprawling stems to 25 cm high and flat linear leaves up to 8 cm long and 1.5 mm wide. The leaf sheath is smooth with a membranous ligule, 2-3 mm long with a lacerated apex. The inflorescence is a contracted 4 cm panicle, which is sub-dense and spike-like, green or purplish. The 8 mm spikelets are solitary, pedicellate with a bisexual floret. The 5 mm glumes are sub-equal, membranous, acuminate and without an awn. The lemma (4-5 mm) is shorter than the glumes and scabridulous with a stout dorsal awn attached near the base and is distinctly 4-toothed at the apex. The palea is shorter than the lemma, membranous and two keeled.

Flowering Period: unknown

Distribution and Habitat

The type was collected by Drummond in 1854 somewhere between Swan River and Cape Riche. Further collections were made from King Georges Sound and the Porongurup Range in 1867 by Mueller. Macfarlane (pers. comm.) believes these collections to differ slightly from the type; however, they have not been critically examined. *Deyeuxia drummondii* has not been collected since.

Little is known about its habitat, however Macfarlane (pers. comm.) noticed some fragments of moss and peaty soil with shiny mineral fragments around the roots of the duplicate of the type. He suggests that it may have been collected on or around a rocky outcrop, such as in the Porongurup Range.

Conservation Status

Current: Declared Rare Flora-Presumed Extinct

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No populations located						

WAHerb: 1 record (fragments of duplicate of type)

Response to Disturbance

May be favoured by soil disturbance but may not compete with introduced grasses

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

Unknown

Research Requirements

Survey the Porongurup Range and other rocky locations to relocate

References

Gardner (1952).

Frankenia decurrens Summerh. FRANKENIACEAE

Frankenia decurrens is a small salt tolerant shrub with ascending to erect, greatly branched stems. The opposite 3-6 mm leaves are united by a ciliate stipular sheath, sessile, crowded, narrow linear and slightly curved and may be encrusted or dotted with salt. The leaves are minutely scabrid above and pubescent underneath within revolute margins. The flowers are subtended by a leaf-like pair of bracts and bracteoles also united into a ciliate stipular sheath. The flowers are solitary or in a 3-5 flowered dichasia. The five lobed calyx is 5 mm long, grooved and papillose in the upper part. The five petals are 9 mm long, with six stamens and a three branched style; the stigmas are clavate-capitate.

Barnsley (1982) states that this species is very similar to both *F. cinerea* and *F. brachyphylla*, and that *Frankenia* is renowned as a genus in which it is difficult to separate taxa. It is therefore possible that the one specimen (the type) collected of this species may in fact be a minor variant of a more common species. This genus is in urgent need of revision to determine the status of *Frankenia decurrens*.

Flowering Period: unknown

Distribution and Habitat

The type and only collection was made by Drummond in 1850 near Cape Riche.

Conservation Status

Current: Declared Rare Flora-Presumed Extinct

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No populations located						

WAHerb: no record

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

Research Requirements

The genus *Frankenia* requires revision to determine if *F. decurrens* is a separate taxon.

References

Barnsley (1982).

Scaevola macrophylla Benth.

GOODENIACEAE

Scaevola macrophylla is an erect perennial herb to 60 cm tall with a woody based stem, covered with spreading yellow hairs. The 20-40 mm long by 10-20 mm wide leaves are stem clasping, ovate to oblong with dentate margins and are densely hairy with ciliate margins. The large blue flowers are in dense racemes up to 5 cm long, subtended by leaf like bracts which are smaller and less stem clasping than the leaves. The corolla is ca. 22 mm long with 2 mm wings, pubescent outside and with a yellowish beard inside. The 0.5 mm basally connate sepals are broadly ovate. The indusium which encloses the stigma is 3 mm wide, bearded with long purplish hairs exceeding yellowish bristles on the lip. The ovary is bi-locular.

This species is similar to *S. auriculata* which has a more ascending habit, brownish hairs on the indusium and a more elongated spike.

Flowering Period: unknown (Flora of Aust. Vol. 35); Sept-Nov. (Blackall & Grieve, 1975).

Distribution and Habitat

The type was collected by Drummond without a precise location given. A further anonymous undated collection was made at Konkoberup Promontory, Cape Riche, which may be above Cape Riche itself or Mt Melville nearby. Nothing further is known about the habitat.

Conservation Status

Current: Declared Rare Flora-Presumed Extinct

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No populations located						

WAHerb: no record.

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

Research Requirements

Search Cape Riche promontory and Mt Melville to relocate

References

Carolin (1992).

PART THREE : PRIORITY FLORA IN THE ALBANY DISTRICT

The taxa treated in this section are those listed (P1, P2, and P3) on CALM's priority flora list (October 28 1992) for the Albany District. The priority categories are outlined in part 1.4. The treatments follow the format in Part 2 but generally do not include detailed recommendations for management and research actions.

Priority One, Two and Three taxa require further surveys to determine their conservation status as they do not meet the requirements for gazettal as Declared Rare Flora (Appendix 3). They may be added to the Declared Rare Flora schedule if they prove to be truly rare, in danger of extinction or deemed to be threatened and in need of special protection. Where possible, populations of these taxa, particularly those listed as priority one and two, should be protected from damage or destruction.

Priority four taxa have been adequately surveyed and have not been further treated in this document. They are usually represented on conservation reserves and are not presently threatened or in need of special protection. Their status may change if present circumstances alter (e.g. land clearing, introduction or spread of *Phytophthora* dieback disease) and they may go onto (or back onto) the Declared Rare Flora schedule. These species should be monitored during routine operations.

Descriptions of species were compiled by consulting references and from discussion with botanists. Distribution and habitat were recorded from Departmental Rare Flora files. Emphasis was placed on the particular habitat characteristics of locations in the Albany District. The list of known populations generally refers to those in the Albany District although there may be some populations listed, which occur outside the District. Populations with numbers in brackets are newly discovered populations which are still to be incorporated into the CALM rare and threatened flora database. Herbarium records may indicate a wider range and larger numbers of populations, some of which are known to have been destroyed since the time of collection.

A. Priority One Taxa

Acacia auratiflora Cowan & Maslin ms

MIMOSACEAE

Acacia auratiflora ms is a rounded shrub, 0.3 to 1 m tall. Phyllodes are narrowly oblong-elliptic, apiculate 2-4 cm long and 4-8 mm wide, coriaceous, patent to ascending. There are scattered red resinous hairs on the main nerves (three) on the face of the phyllodes. Secondary white-resinous nerves form a reticulum. The branchlets are compressed, angular and usually resinous; scattered hairs occur but are soon obscured by resin. Inflorescences are single, axillary reduced racemes with golden puberulous axes 3 mm long. Peduncles are 1.5-2.5 mm long, also golden puberulous. Heads are 32-42 flowered, globular, golden, 6-7 mm diameter. The legume is long and villous when young; no information is available on the mature pod.

This species is related to *A. cassicula* and *A. recurvata.*

Flowering Period: August-October

Distribution and Habitat

Acacia auratiflora ms has been collected from between Lake Grace and Newdegate (Wheatbelt Region) in the early 1970's, and from "Coracerup" (Diels, 1901) S.E. of Ongerup in the Albany district. It occurs in scrub on light brown loamy clay. It does not appear to have been collected recently and no population has been surveyed.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent survey						

WAHerb: 6 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

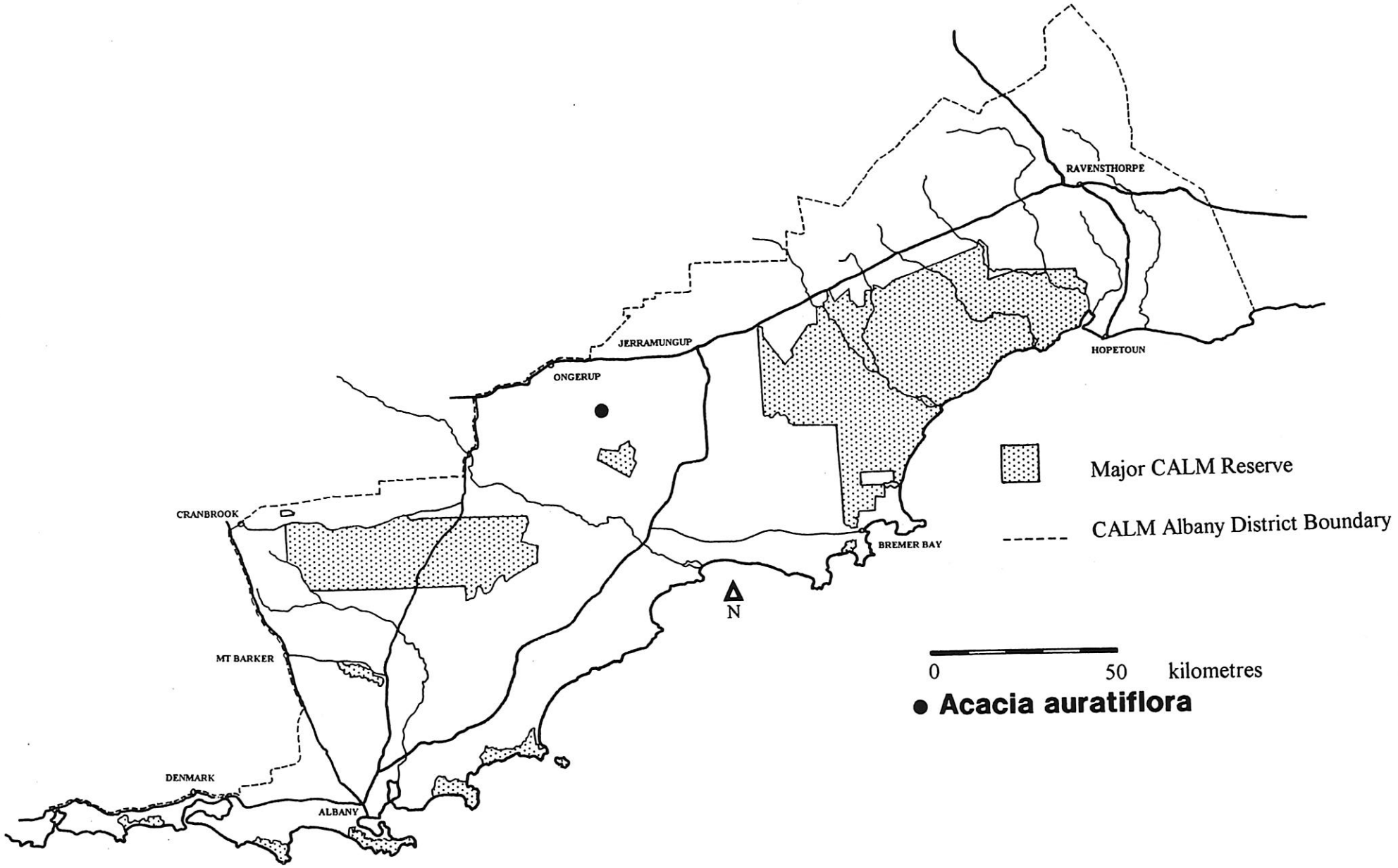
Survey required

Research Requirements

- survey in Corackerup area to attempt to relocate Diels' locality or new populations
- determine Response to Disturbance
- liaise with Katanning District staff to view in the field if necessary

References

R.S. Cowan and B.R. Maslin (pers. comm.).


RAVENSTHORPE
JERRAMUNGUP
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CRANBROOK
BREMER BAY
MT BARKER
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
● Acacia auratiflora

Acacia microneura Meisn.

MIMOSACEAE

Acacia microneura is a slender shrub with resinous angled young branches which are white puberulous between the angles. The phyllodes are linear, compressed-rhombic, acute, 4-11 cm long and 1-2 mm wide, ascending straight to curved with appressed hairs at the base and between the nerves. The midnerve and marginal nerves are more prominent than the (three) finer nerves between. The inflorescence is globular to broadly ellipsoid, 6 mm long and 5.5 mm in diameter, on a short 1 mm peduncle, two per node. The legume has not been seen.

Flowering Period: September-October

Distribution and Habitat

All collections have been made around Cranbrook and Stirling Range where it grows in sand heath. Of the 8 records in WAHerb, only one (Ashby, 1972) has been made more recently than 1901.

Conservation Status

Current: Priority 1.

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent survey.						

WAHerb: 8 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

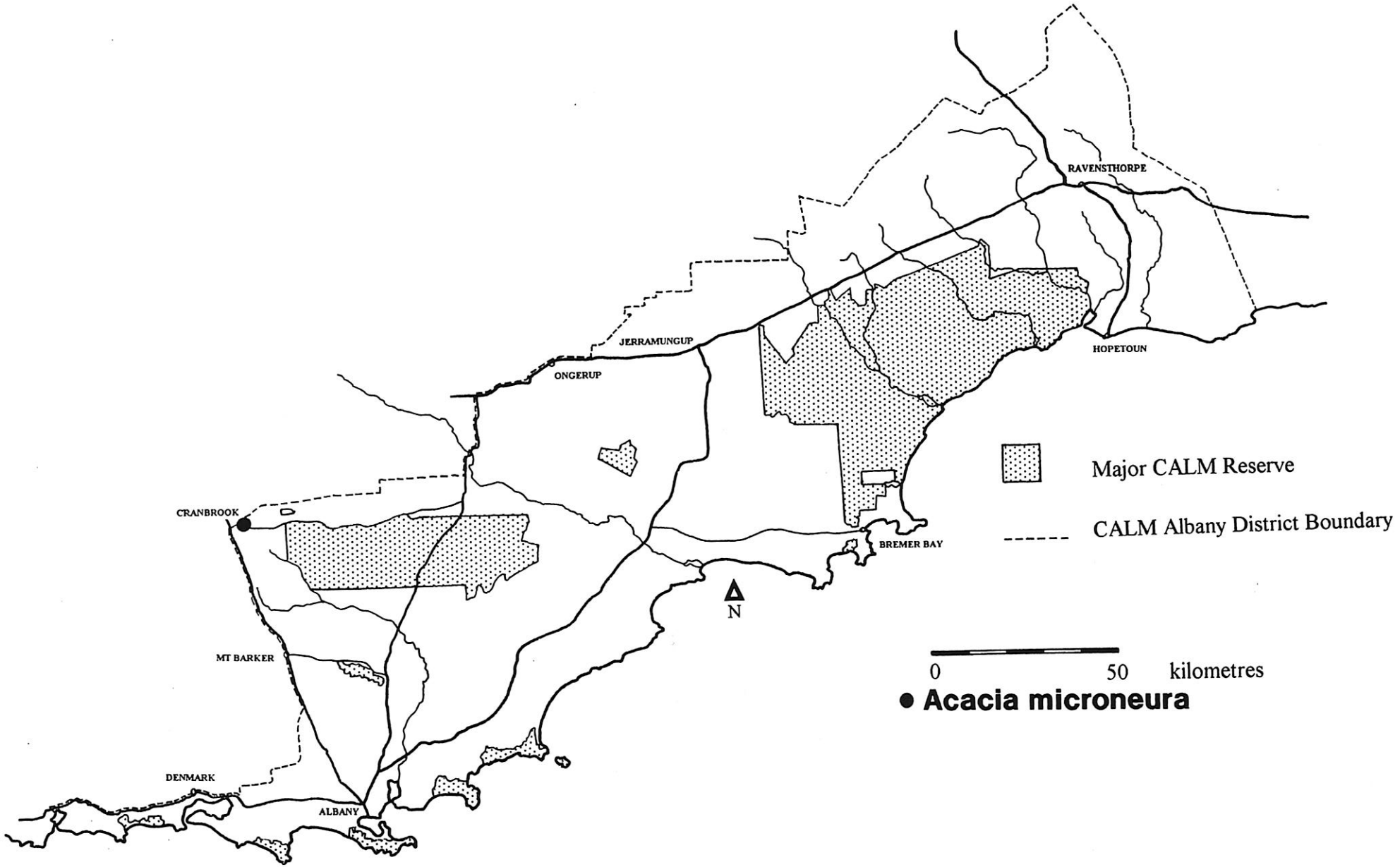
Survey required

Research Requirements

- survey around Cranbrook and NW Stirling Range for old or new locations and populations
- collect specimen with legumes (pods)

References

Lehmann (1844).


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CALM Albany District Boundary
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50
kilometres
● Acacia microneura

Acacia mutabilis subsp. *incurva* Maslin ms

MIMOSACEAE

Acacia mutabilis subsp. *incurva* is a shrub/small tree 1.6-2 m tall. It has linear-oblanceolate phyllodes, 3-5.5 cm long and 3-4 mm wide, acute and apiculate, subdistant and incurved. There are five nerves with midrib being prominent. The gland is situated 1-5 mm above the pulvinus. Stipules (2 mm) are occasionally persistent. The inflorescence is composed of globular, golden heads of 16-32 flowers, on glabrous peduncles 3-18 mm long. Racemes are short (1 mm) and generally two headed. The black legumes are almost terete, 7 cm long by 2-3 mm wide and only slightly or not constricted between the seeds and curved to once coiled.

Flowering Period: August-September

Distribution and Habitat

This wattle has been collected by K. Newbey (at 3 locations around Ongerup and Pingrup) and Tindale and Maslin (Needilup). It occurs in gently undulating well drained sandy loam over clay supporting low open woodland and shrubs, or mallee on white sand plain..

It appears not to have been collected since 1975 and has not been surveyed.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent survey.						

WAHerb: 7 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

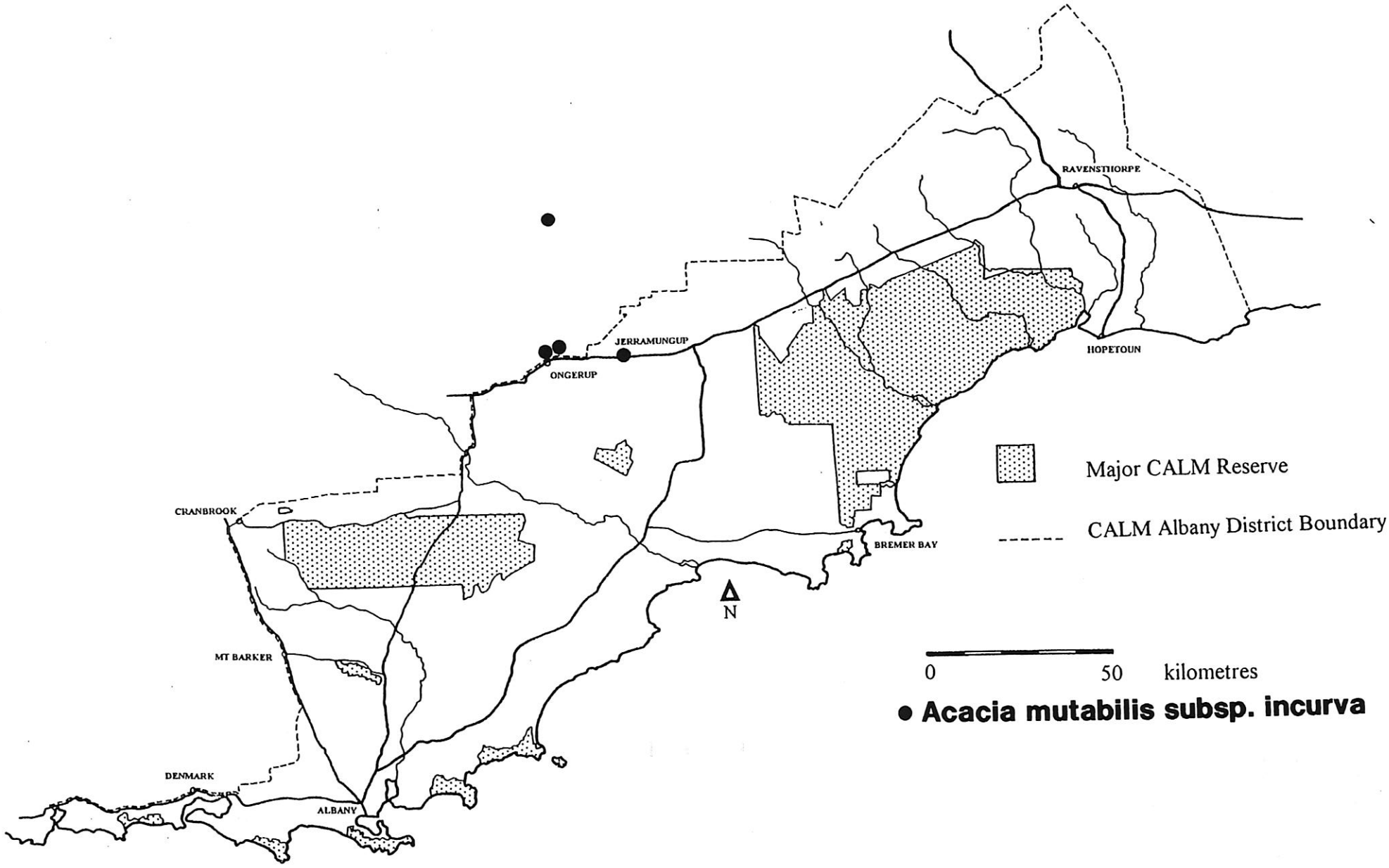
Survey required.

Research Requirements

Survey around Ongerup and Needilup for WAHerb locations and new populations

References

B.R. Maslin (pers. comm.).


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ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
● Acacia mutabilis subsp. incurva

Acacia pusilla Maslin ms

MIMOSACEAE

Acacia pusilla ms is a decumbent to erect dome-shaped small shrub, 20-30 cm tall with puberulous branchlets. The crowded phyllodes which arise on raised stem projections are sub-terete, 5-10 mm long and 1 mm wide with an eccentric mucrone. The phyllodes are erect to patent, glabrous and incurved from the base. The nerves are usually submerged and not evident. The setaceous stipules (1.5-3 mm long) are persistent and recurved. The inflorescences are globular, bright-light golden, 2-2.5 mm in diameter, 8-12 flowered on axillary peduncles 6-8 mm long and one per axil. The black legumes are linear, 2 mm wide, tightly and irregularly coiled and may be glabrous to resinous.

Flowering Period: September

Distribution and Habitat

This species is restricted to, and regarded as an endemic of the Ravensthorpe Range, particularly the Mt Desmond area. It occurs in rocky clay on the lower slopes of watercourses, in dense mallee scrub.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent survey						

WAHerb: 16 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

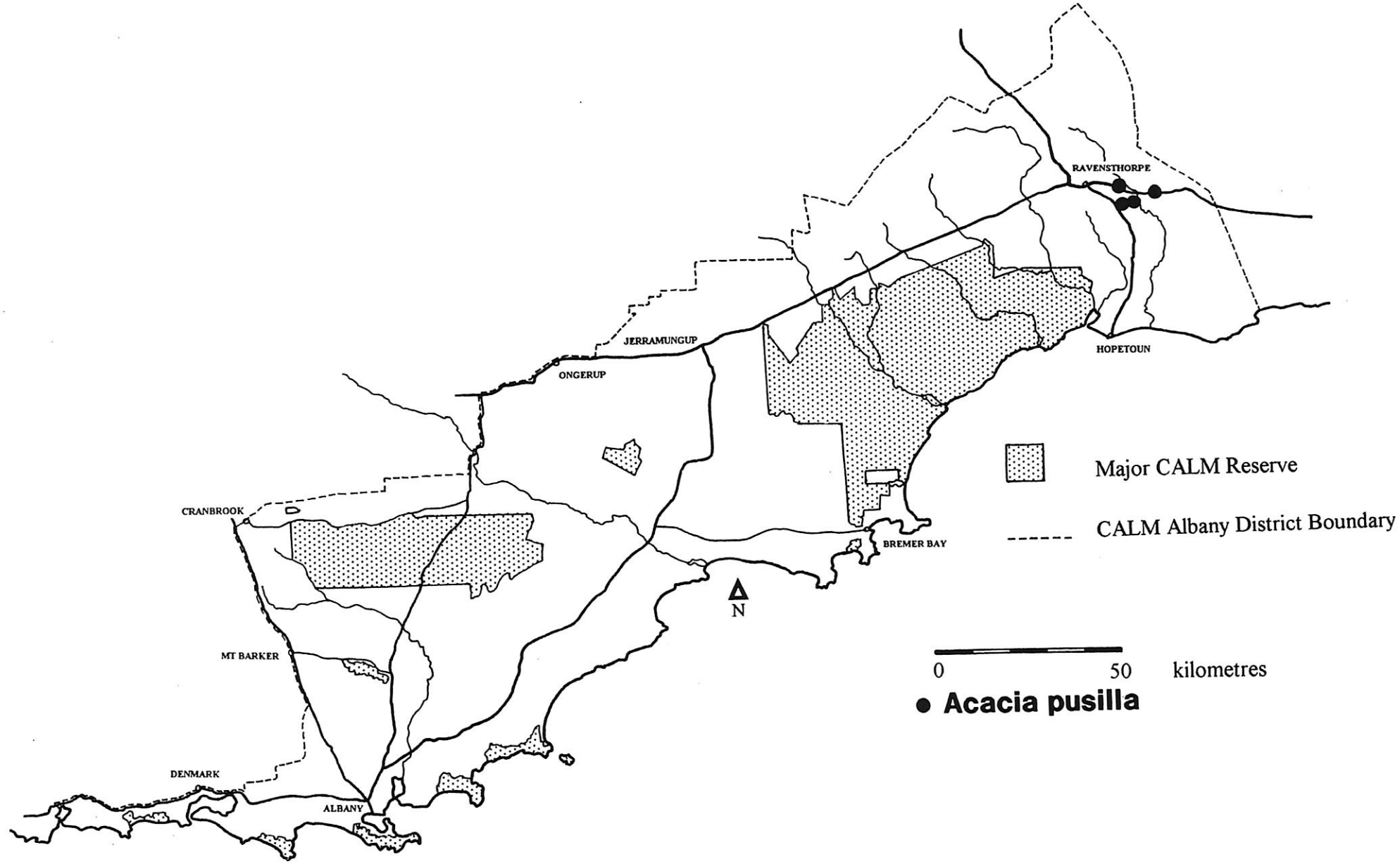
Survey required

Research Requirements

Locate and survey populations

References

B.R. Maslin (pers. comm.).


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CALM Albany District Boundary
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kilometres
Acacia pusilla

Acacia rhamphophylla Maslin ms

Kundip Wattle

MYRTACEAE

This wattle is an erect shrub to 70 cm, with woody stems, densely crowded with spreading phyllodes (11-17 mm long). The grey-green phyllodes are prominently grooved (abaxial midrib raised), round ended with a short point below the tip (eccentrically rostellate). The stems appear black from a covering of short hairs and thin black, recurved setaceous stipules (5 mm long). The globular yellow flower heads (2.5-3 mm), on peduncles to 12 mm are solitary in the axils of the terminal leaves. Legumes are subterete, 10-15 mm long, thinly crustaceous and blackish.

Flowering Period: August-September.

Distribution and Habitat

The Kundip Wattle has been collected on only two occasions, both near Kundip in the Ravensthorpe Range. It occurs in open mallee scrub on stony slopes and well drained sandy clay. Gillian Craig discovered it during a flora survey in a mining lease and it could therefore be considered under threat from that activity. However, further survey is required in similar habitat in the Ravensthorpe Range, before its true conservation status can be determined.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
(1) Kundip Mine	Albany	Rav	VCL	8.9.92	+100	in flower
(2) Kundip NE	Albany	Rav	VCL	1982	common-WH	in flower

WAHerb: 4 records.

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

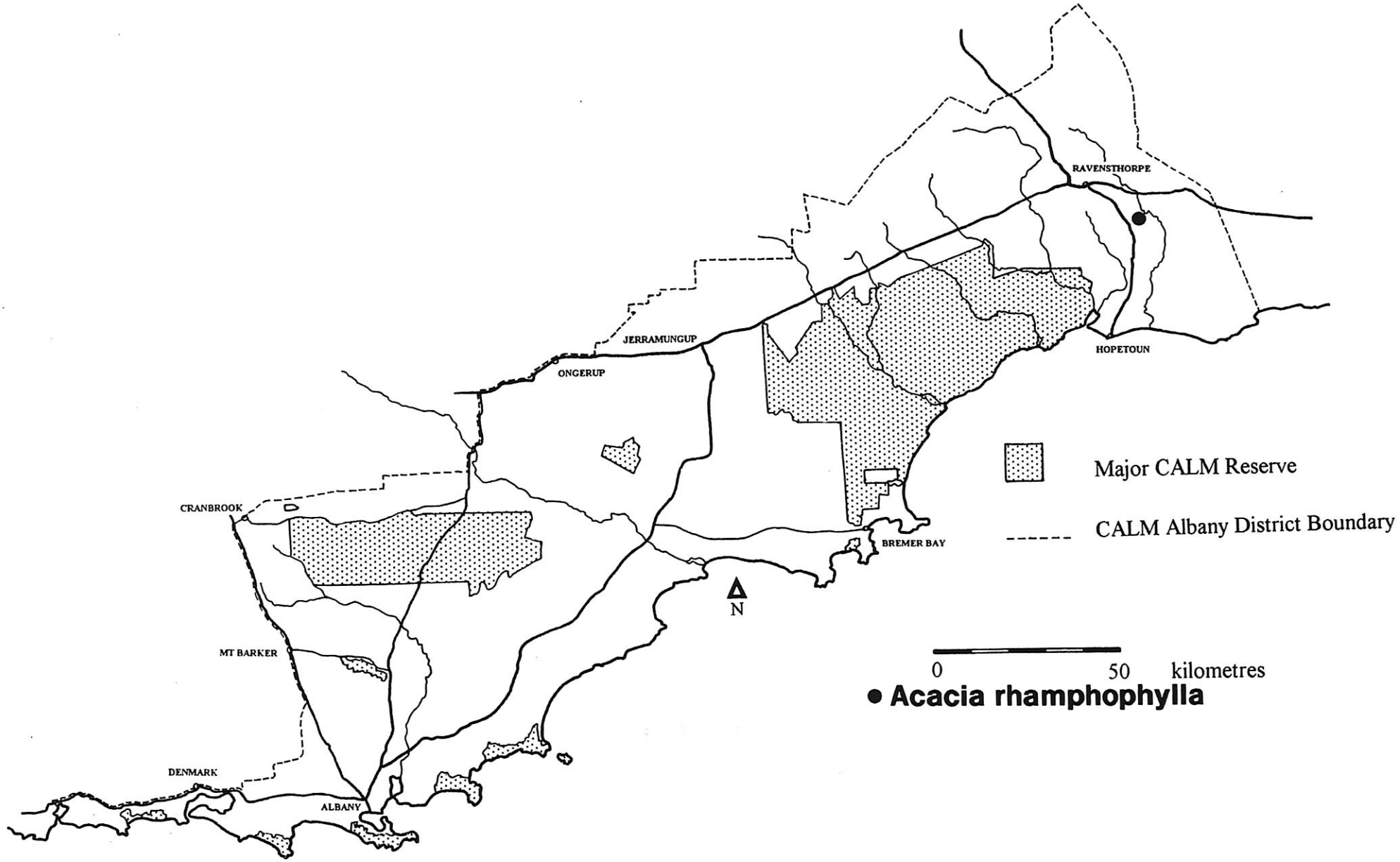
Survey required

Research Requirements

- survey for new populations in similar habitat to known Populations
- determine response to disturbance

References

B.R. Maslin (pers. comm.).


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CRANBROOK
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
● Acacia rhamphophylla

Acacia trulliformis Cowan & Maslin ms

MIMOSACEAE

Acacia trulliformis ms is a woody, spreading to rounded shrub to 2.5 m with angled puberulous branchlets. The glossy dark green phyllodes (1.8-4.5 cm long and 8-16 mm wide) are elliptic to oblong-elliptic, tending to inequilateral, obtuse to truncate-obtuse and apiculate. There are 3-4 main nerves per phyllode face which are glabrescent except the marginal nerve which is puberulous. Secondary nerves anastomose to form a reticulum. Inflorescences are 1 or 2 headed racemes (2-8 mm long), puberulous with globular golden heads, 5-6 mm in diameter and 62-75 flowered on peduncles 8-13 mm long. The legume is oblong 3.5 cm long, raised over but not constricted between the seeds and 5-6 mm wide. It is straight to sigmoidally curved, pilose and resinous.

Flowering Period: September

Distribution and Habitat

This species occurs in moderately to well drained pale brown sandy loams in drainage lines, in association with open *Eucalyptus occidentalis* woodland. It has been collected by K. Newbey on three occasions south east of Ongerup, and once by Maxwell from Gordon Range.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
Ongerup SE	Albany	Gno	?	10.12.87	common-WH	-

WAHerb: 4 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

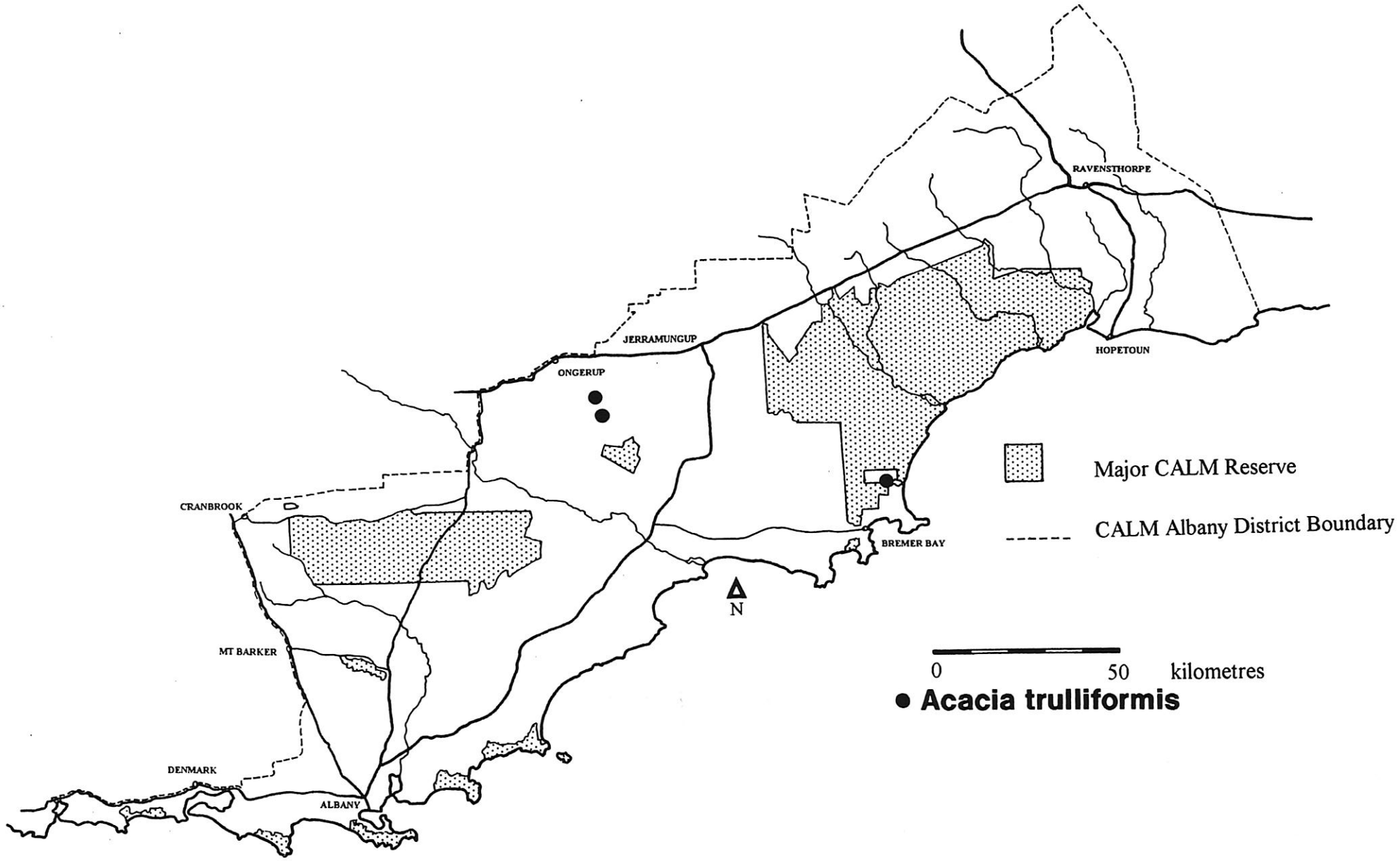
Monitor populations occasionally

Research Requirements

- survey to find new populations and determine range and rarity of this species.
- relocate Ken Newbey population(s) south east of Ongerup.
- determine response to disturbance

References

R.S. Cowan and B.R. Maslin (pers. comm.).


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kilometres
● Acacia trulliformis

Bossiaea strigillosa Benth.

PAPILIONACEAE

Bossiaea strigillosa is a low spreading to erect, divaricately branched slender shrub 25 cm tall and 60 cm across. The branchlets are minutely hairy, becoming glabrous and barked with age. The stipule bases and leaf scars remain as knobby protuberances on the older stems. The 1.5 mm dark green leaves are opposite, broadly obovate-orbicular with a recurved point, minutely hairy below and glabrous above. Subulate stipules are present, four per node. The yellow flowers are solitary on 1-2 mm pedicels. The corolla is 3 mm. The calyx is composed of two longer, broader 2.5 mm lobes, and three acuminate 0.5 mm lobes. The calyx tube is 1 mm long. The pod is broad, flattened, sparsely hairy with conspicuous hairs around the distal pointed end.

Flowering Period: October

Distribution and Habitat

The type was collected by Drummond (unknown locality) and it has only been collected once since, by Gardner (1961) from somewhere on the Jerdacuttup River, possibly in clay. No further information is available in its preferred habitat.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent survey						

WAHerb: 2 records (one location)

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

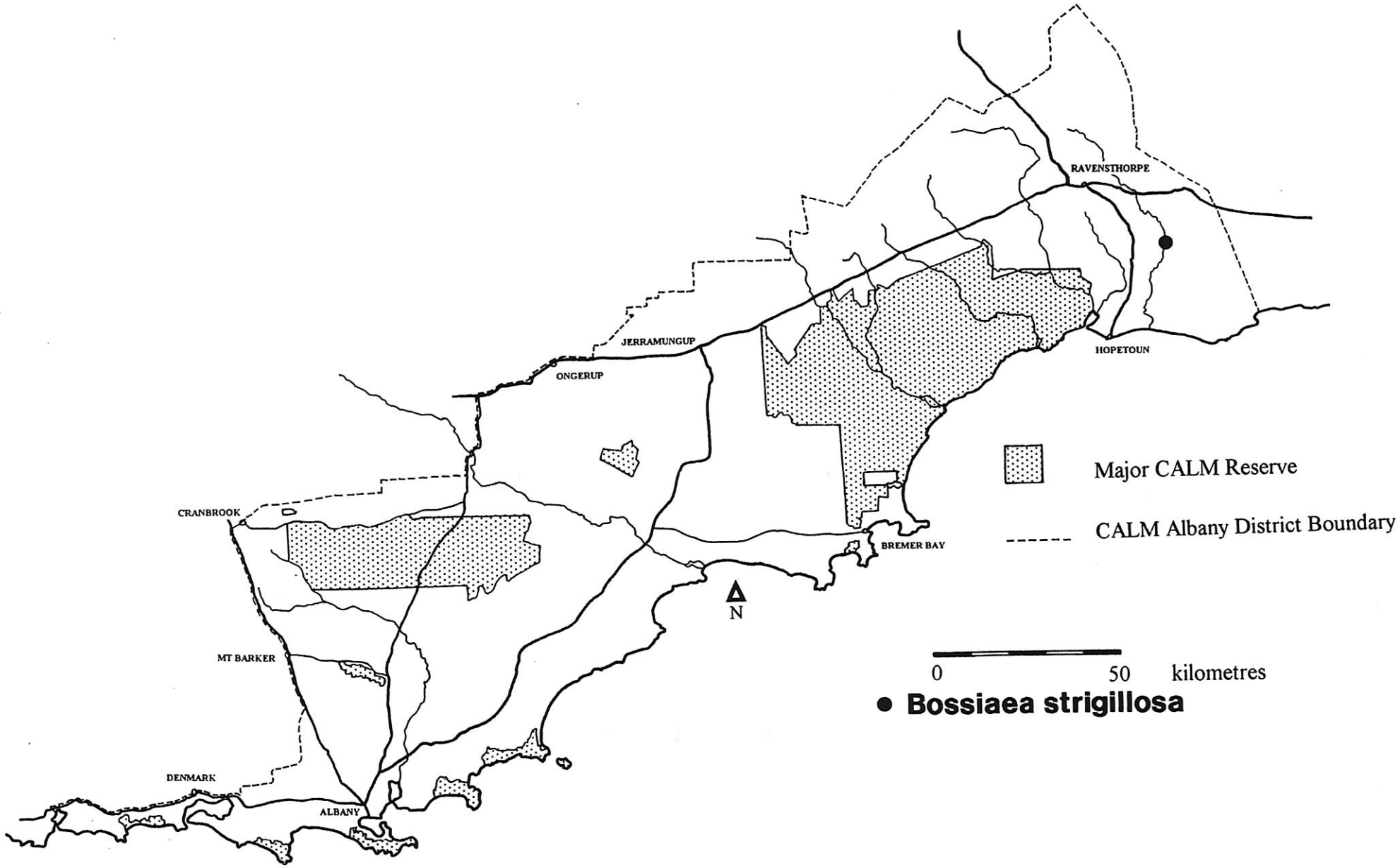
Survey required

Research Requirements

Survey to relocate; particularly around Jerdacuttup

References

Bentham (1864).


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Major CALM Reserve
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kilometres
● Bossiaea strigillosa

Coleanthera coelophylla (A.Cunn.) Benth. EPACRIDACEAE

Coleanthera coelophylla is an erect bushy shrub,30-60 cm tall. It has typical epacrid leaves, pale green, broadly ovate-lanceolate to 12 mm, covered in short hairs and strongly striate below with parallel veins. The small 4-5 mm flowers are single (or sometimes two) in the axils of the upper leaves. The pink corolla lobes are reflexed and curled back to reveal the exserted purple anthers which are connate around the style. The 2 mm sepals are about the same length as the corolla tube.This species is very similar to the more common *C. myrtoides*, which is less strongly ribbed on the leaves and glabrous.

Flowering Period: October-November.

Distribution and Habitat

This species has been collected from Nyabing, Borden and Gibson Soak - a range of 350 km. It grows in sandy gravels in heath. The majority of collections in WAHerb were made in 1928.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent survey						

WAHerb: 8 **records**

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

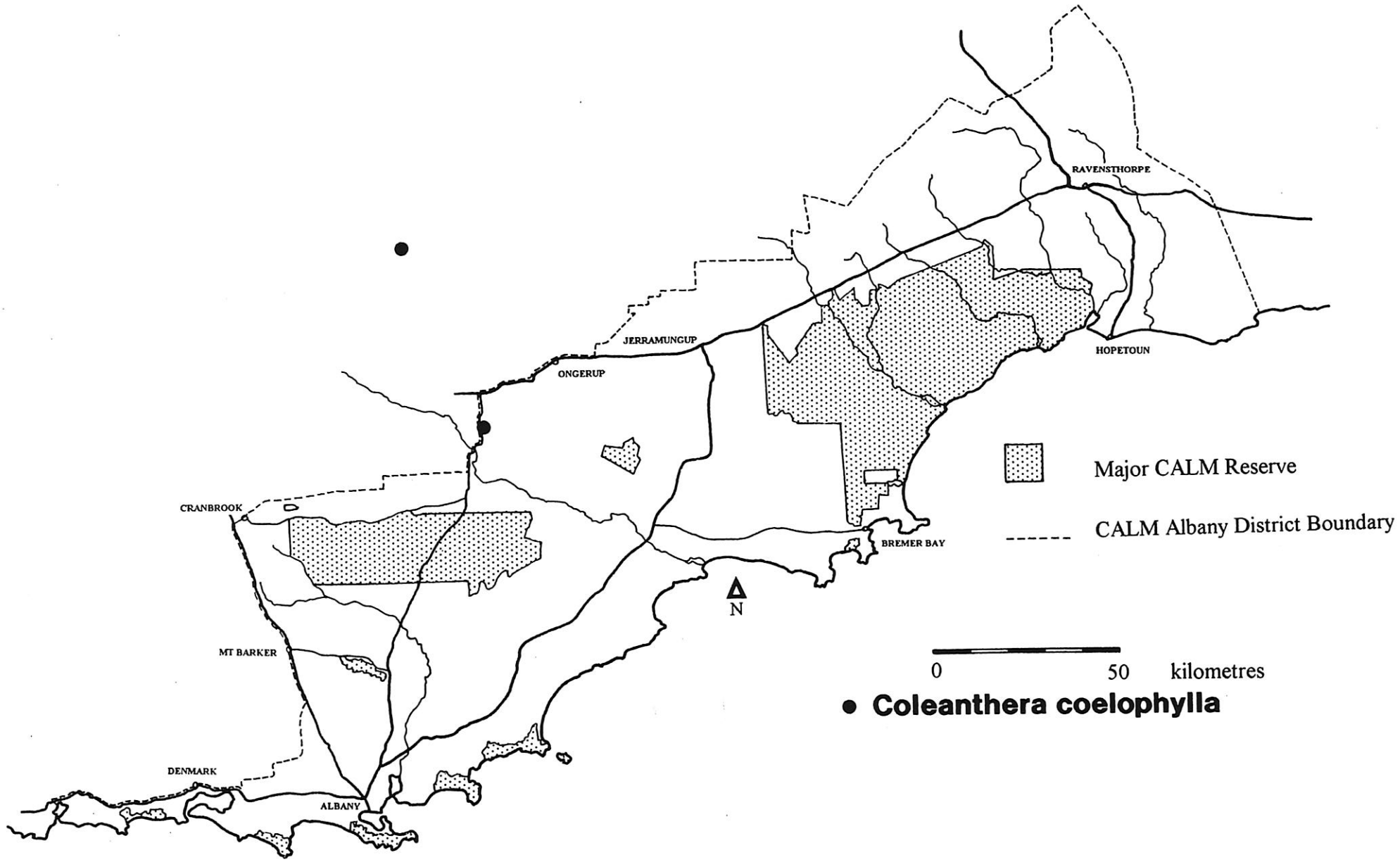
Survey required

Research Requirements

- relocate populations and survey new areas
- determine response to dieback

References

Bentham (1869).


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Major CALM Reserve
CALM Albany District Boundary
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kilometres
● Coleanthera coelophylla

Conospermum coerulescens F.Muell. subsp. *coerulescens* PROTEACEAE

Conospermum coerulescens is an erect to spreading shrub to 1 m tall. The ascending to spreading leaves are filiform to slightly lanceolate, 7-25 mm long and 0.4-1.5 mm wide, glabrous and tending velutinous at the base. The inflorescence is of up to ten flowers in the upper axils on peduncles 7-60 mm long. The 1.5-3 mm bracteoles subtending the base of the flower are ovate to orbicular, tomentose with a ciliate margin and acute apex. The tubular perianth is grey-blue to deep blue, puberulous or tomentose. The perianth is lobed. The upper lobe 3-4.6 mm long and 1.5-2.5 mm wide lobe forms an ovate, acute and recurved lip becoming less pubescent. The lower deltoid lobes are united to form a 2.2-3.2 mm lip. The tan to orange nut (fruit) is 2-2.8 mm long and 1.8-2.4 mm wide. It is puberulous with 1 mm cream to orange hairs on the rim, and a central tuft of rusty/orange hairs to 1.8 mm long.

The species occurs as subspecies (Bennett, pers. comm.). Subspecies *coerulescens* has incurved vegetative and floral leaves which are spreading; the perianth is greyish blue and bracteoles densely white tomentose. Subspecies *dorrienii* has regularly incurved leaves and a bright blue perianth while subspecies *adpressum* has ascending leaves which are appressed and not incurved or recurved.

Flowering Period:October

Distribution and Habitat

This subspecies has been collected from about 50 km west of Bremer Bay by A.S. George, and the type was collected by Maxwell from Salt (Pallinup) River and Cape Knob (Bremer Bay). It grows in sandy heath and scrub.

Conservation Status

Current: Priority 1.

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent survey						

WAHERB: 1 record

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible (high)

Management Requirements

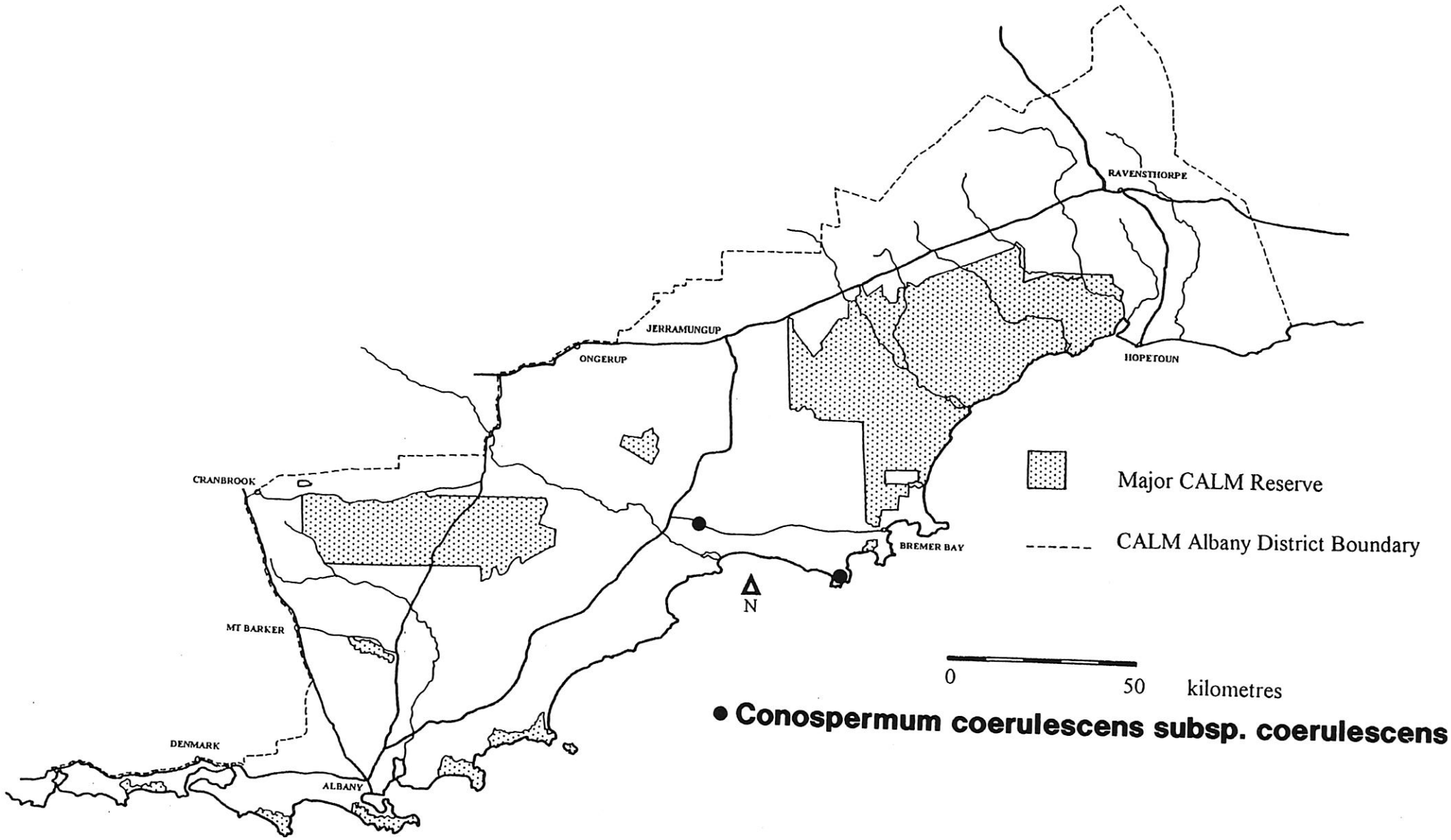
Survey required

Research Requirements

- survey to locate known population
- assess susceptibility to *Phytophthora* and within populations

References

Eleanor Bennett (pers. comm.).


RAVENSTHORPE
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CALM Albany District Boundary
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50
kilometres
• Conospermum coerulescens subsp. coerulescens

Diuris heberlei D.Jones

Heberle's Donkey Orchid

Diuris heberlei is related and very similar to *D. emarginata* which also flowers in January. The species is slightly variable as populations isolated from the type location (by 1 km or more) have an additional small lobe on the lower side of the lateral lobes of the labellum. The photograph on page 408 of Hoffman and Brown (1992) is of the variant, not from the type location, but still regarded by Heberle and Brown as being *D. heberlei.*

The plant has 2-3 long narrow (150 mm x 1-2 mm) erect spreading basal leaves and several slightly broader leaves clasping the flower stem, up to 35 cm tall. Usually there are 1-2 flowers about 30 mm across. The plants in populations closer to the coast than the type location were more robust, taller and had up to four flowers.

This species like many other orchids is clonal.

Flowering Period: January-February

Distribution and Habitat

Diuris heberlei occurs on flats of loamy clay between stabilised and mobile dunes near Two Peoples Bay, within several kilometres of the coast. The orchids are scattered amongst *Baumea juncea* sedgefield and occasional shrubs of *Agonis juniperina* and *Hakea oleifolia.*

This habitat is thought to be quite unusual and this species is likely to be rare.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Moates SW	Albany	Alb	NR	20.1.93	+1000	healthy
2. Moates Sth	Albany	Alb	NR	20.1.93	+50	healthy
3. Nanarup E	Albany	Alb	Shire res.	1.1991	+30	in flower

WAHerb: 2 records

Response to Disturbance

Unknown; does not require a fire to stimulate flowering

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

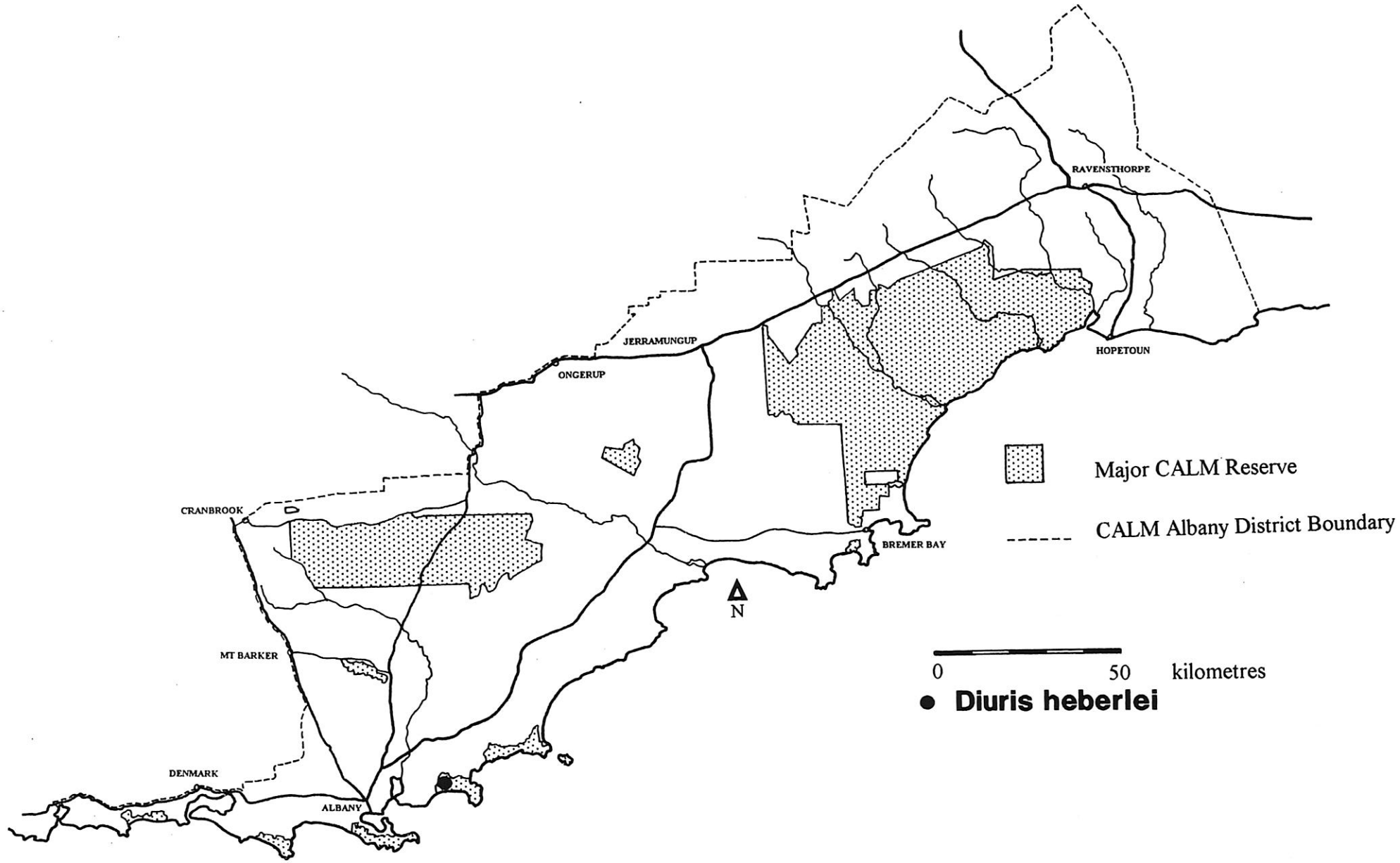
Monitor known populations occasionally

Research Requirements

- use aerial photography to determine other areas of likely habitat and survey in January for new populations
- research the ecology and biology

References

Jones (1991), Hoffman and Brown (1992).


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kilometres
Diuris heberlei

Dryandra corvijuga George ms

PROTEACEAE

This *Dryandra* is a dense and rounded shrub to 1 m tall. The leaves are very crowded, up to 30 cm long with a prominent midrib, lamina up to 10 mm wide with spreading triangular sharp lobes extending up to 5 mm from the midvein. The sinus between lobes is 5-20 mm. The 6 cm long flower heads (4 cm across) are borne on the older stems amongst the crowded leaves. The flowers are surrounded by a series of dark red-brown shiny bracts, which extend to be as long as the styles inside, which are not exerted.

This species is similar to *D. ferruginea* but differs in being taller, more rounded and not as tufted. The leaves of *D. ferruginea* are longer and have much broader (12 mm) lobes.

Flowering Period: September-October

Distribution and Habitat

This species appears to be confined to the Ravensthorpe Range (Mt Short to Mt Desmond), and occurs on slopes and hills on shallow gravelly soil, in association with mallee heath.

Mt Short Water Reserve (which is proposed as Nature Reserve in the South Coast Region Management Plan) is considered to contain suitable habitat for this species (Hopper, pers. comm.). It has not yet been surveyed.

Conservation Status

Current: Priority 1.

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1A. Elverdton	Albany	Rav	VCL	14.10.60	-	in flower
1B. Mt Desmond	Albany	Rav	VCL	1.79	occas.	-
2. Mt Short	Albany	Rav	Shire res.	9.88	1,000	-
2. Mt Short	Albany	Rav	Shire res.	1991	-	burnt

WAHerb: 4 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

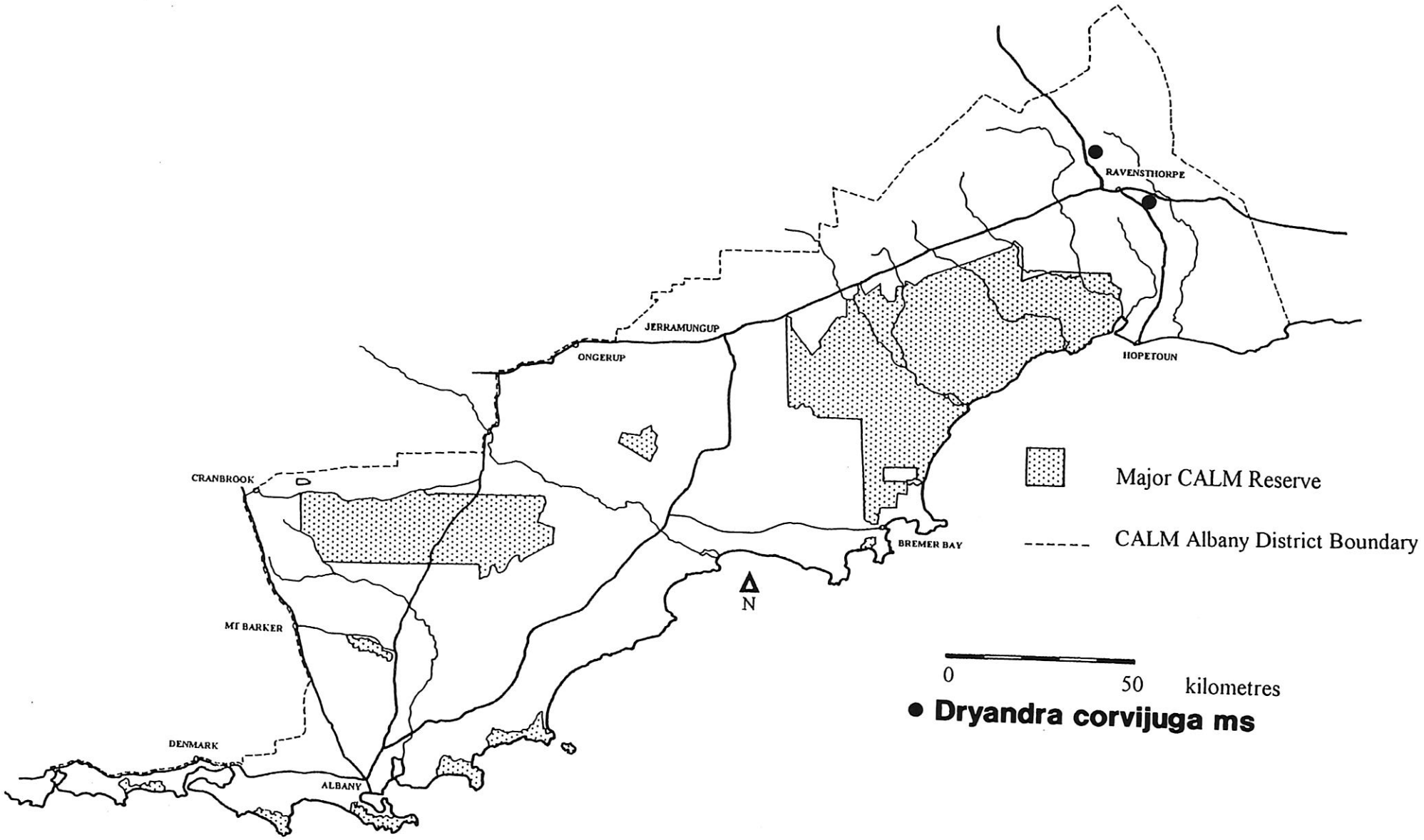
Presumed susceptible

Management Requirements

- monitor Mt Short gravel pit regeneration
- notify Shire re gravel pit population

Research Requirements

- survey Mt Short area
- relocate and survey WAHerb populations
- survey opportunistically for new populations
- determine susceptibility to dieback


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● Dryandra corvijuga ms

Eremophila sp. Lake Magenta (M.S. Graham s.n. 7.3.90) [aff. *serpens*]

Confusion currently surrounds the identity of this taxon. A population of a prostrate, green flowered *Eremophila* is known from firebreaks on the northern boundary of Fitzgerald River National Park, however, it is not known whether this is the same or different from *E.* sp. aff. *serpens* from Lake Magenta collected by M. Graham.

The FRNP *Eremophila* is a semi prostrate, spreading shrub to 400 mm, with ascending branches with scattered flowers in the upper axils. The corolla tube and filaments are pale green. This species is in the *E. serpens-E. biserrata* group but differs in the flowers and stamen colour from these two; the fruits are very similar to *E. biserrata* but the leaves are more like *E. serpens* (B. Chinnock pers. comm.).

Flowering Period: September

Distribution and Habitat

This species (if it is different from *E.* sp. aff. *serpens* M. Graham) is only known from a chained and burnt firebreak near Twertup in the FRNP and one plant near Moir track. It occurs at Twertup with regenerating *Eucalyptus praetermissa* and *Myoporum cordifolium* in pale red loamy clays. It does not occur in the undisturbed woodland either side of the firebreak.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Twertup	Albany	Jer	NP	14.9.92	+2000	healthy
2. Moir Track	Albany	Rav	NP	1992	1	healthy

WAHerb: not located

Response to Disturbance

Dormant seed stimulated to germinate by chaining and/or burning

Susceptibility to *Phytophthora* Dieback

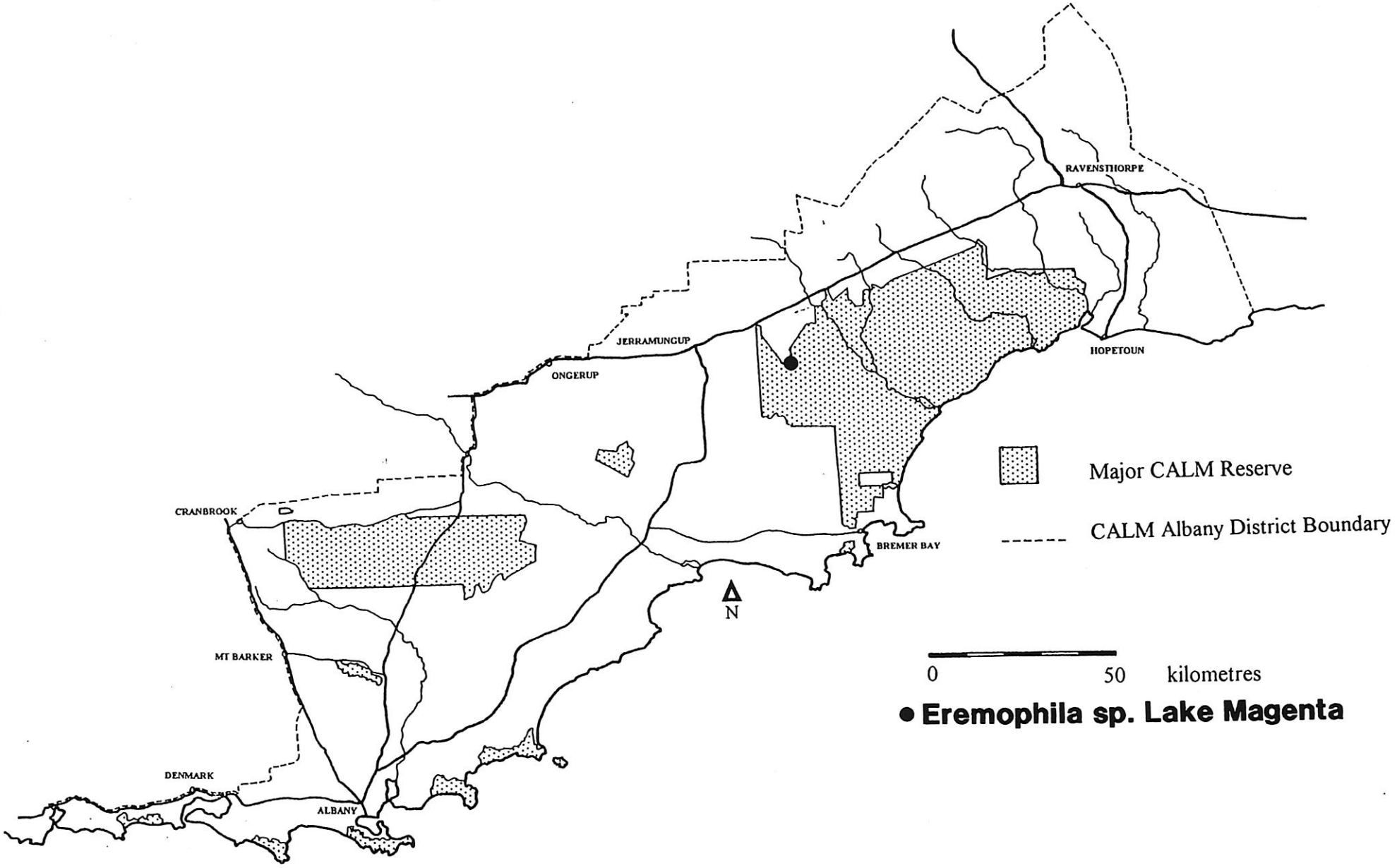
Presumed not susceptible

Management Requirements

- monitor populations occasionally
- ensure that burning or upgrading of firebreak is conducted on a time scale which permits plants to re-establish seed bank in the soil
- collect specimens of flowers/fruit from 6-10 individuals and send to B. Chinnock for taxonomic study

Research Requirements

- determine longevity of plants post disturbance
- survey opportunistically for new populations in similar habitat
- maintain contact with Chinnock and taxonomic developments


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● Eremophila sp. Lake Magenta

Eucalyptus praetermissa Brooker & Hopper

Fitzgerald Mallet

MRYTACEAE

Eucalyptus praetermissa is a tall mallet (terminally crowned) to 10 m with dark grey or pinkish bark, with loosely held non-decorticated bark at the base of the trunk. Frequently, black horizontal insect scars are present on the trunk. The operculum is an elongated conical horn shape to 10 mm tapering to a fine point on a hypanthium which is barrel shaped and fractionally wider than the operculum. The creamy white-lemon yellow flowers are in axillary groups of up to fifteen, pedicellate on flattened peduncles. Adult leaves are petiolate, alternate, lanceolate 10 x 2 cm and concolourous dull green.

It is closely related to *E. xanthonema* (a mallee) and *E. melanophitra,* which is a very similar mallet but with persistent, rough black bark. These species all belong to the superspecies "*xanthonema*" in the series *Reduncae.*

Flowering Period: January

Distribution and Habitat

Eucalyptus praetermissa usually occurs on breakaways and slopes above drainage courses, on red loamy clays. Initially it was only known from near Beaufort Inlet, the type locality, (where it occurs with *E. newbeyi* and *E. redacta*), but recent collecting (McQuoid, pers comm) has extended its range right through the Fitzgerald River National Park in numbers exceeding 100,000.

Conservation Status

Current: Priority 1

Recommended: Remove from Priority Flora List.

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Beaufort Inlet	Albany	Jer	Shire res.	17.11.92	+500	healthy
2. Twertup	Albany	Jer	NP	1992	50,000	healthy
3. MoirTrack	Albany	Rav	NP	1993	+2000	healthy
4. Fitz RValley	Albany	Jer	NP	1992	50,000	healthy

WAHerb: 5 records

Response to Disturbance

Unknown; mallets are usually killed by fire

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

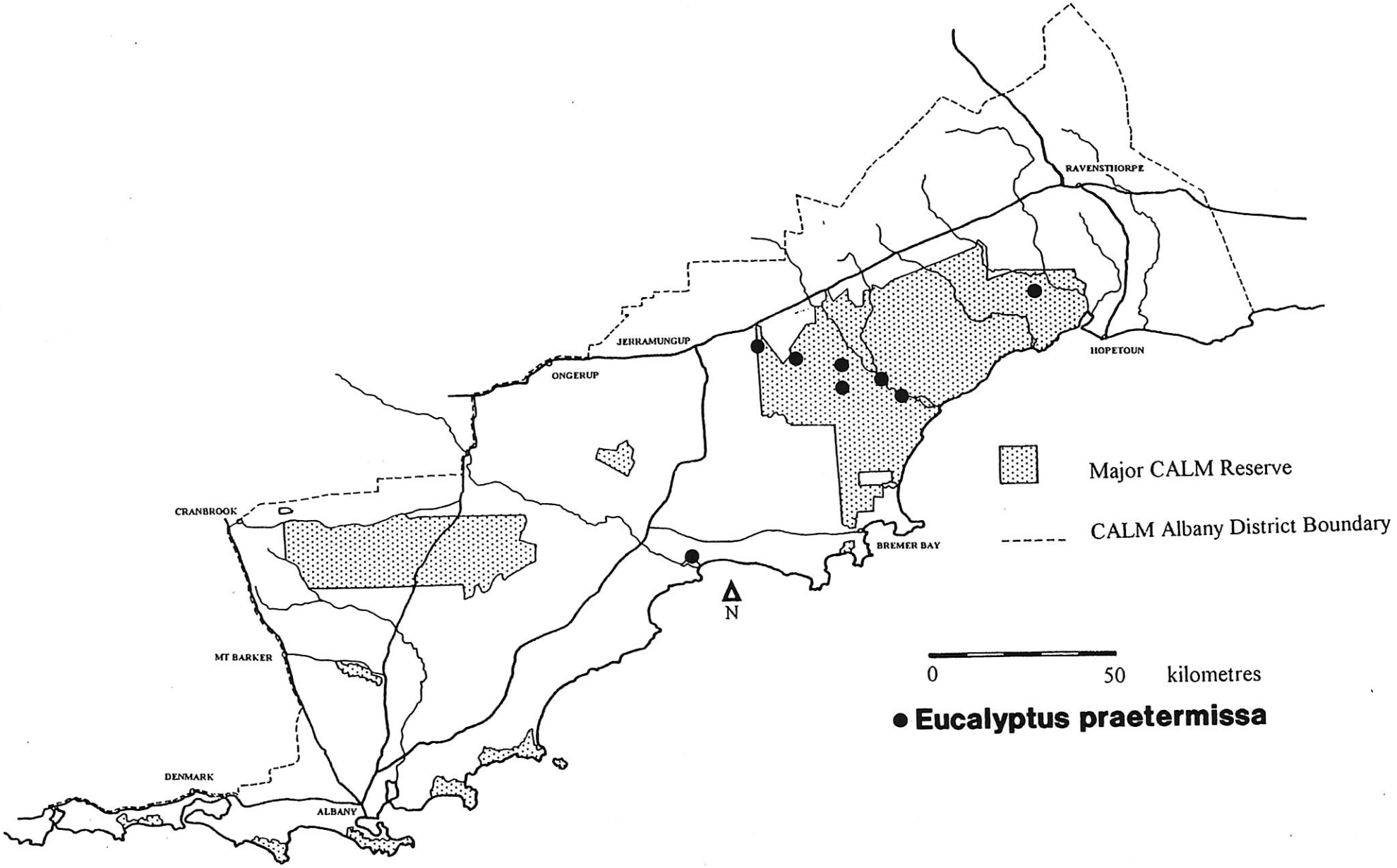
Management Requirements

Monitor occasionally

Research Requirements

References

Brooker and Hopper (1991).


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kilometres
● Eucalyptus praetermissa

Gonocarpus hispidus Orchard

Hairy Gonocarpus

HALORAGACEAE

Gonocarpus hispidus is a small subshrub, usually about 100 mm high, but may reach 160 mm. It has a single main stem with crowded spreading alternate green leaves 6-7 mm long. The inflorescence is a series of lateral spikes which commence half way up the stem and are very floriferous. The brown flowers are borne singly in the axils of ovate bracts (2.5 mm) on the spikes. Each flower is quite small and inconspicuous with four green sepals (0.6 mm) and four red-brown petals (2.2 mm) on a 0.7 mm pedicel. The stem, leaves and flowers are covered with simple hairs (0.5 mm) which impart a brown fuzzy appearance. The fruit has not yet been collected.

Flowering Period: September

Distribution and Habitat

This species is only known from the summit and slopes of East Mount Barren and immediate surrounding hills where it occurs in shallow, stony soil over quartzite. It is probable that it may occur on other peaks and hills in eastern FRNP which have not been surveyed. It does not occur on West Mt Barren.

The East Mount Barren population is extremely large following post fire regeneration from seed after fire in November 1989.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. East Mt Barren	Albany	Rav	NP	9.9.92	100,000+	healthy

WAHerb: 2 records(1 dubious determination.)

Response to Disturbance

Massive germination stimulated by fire

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

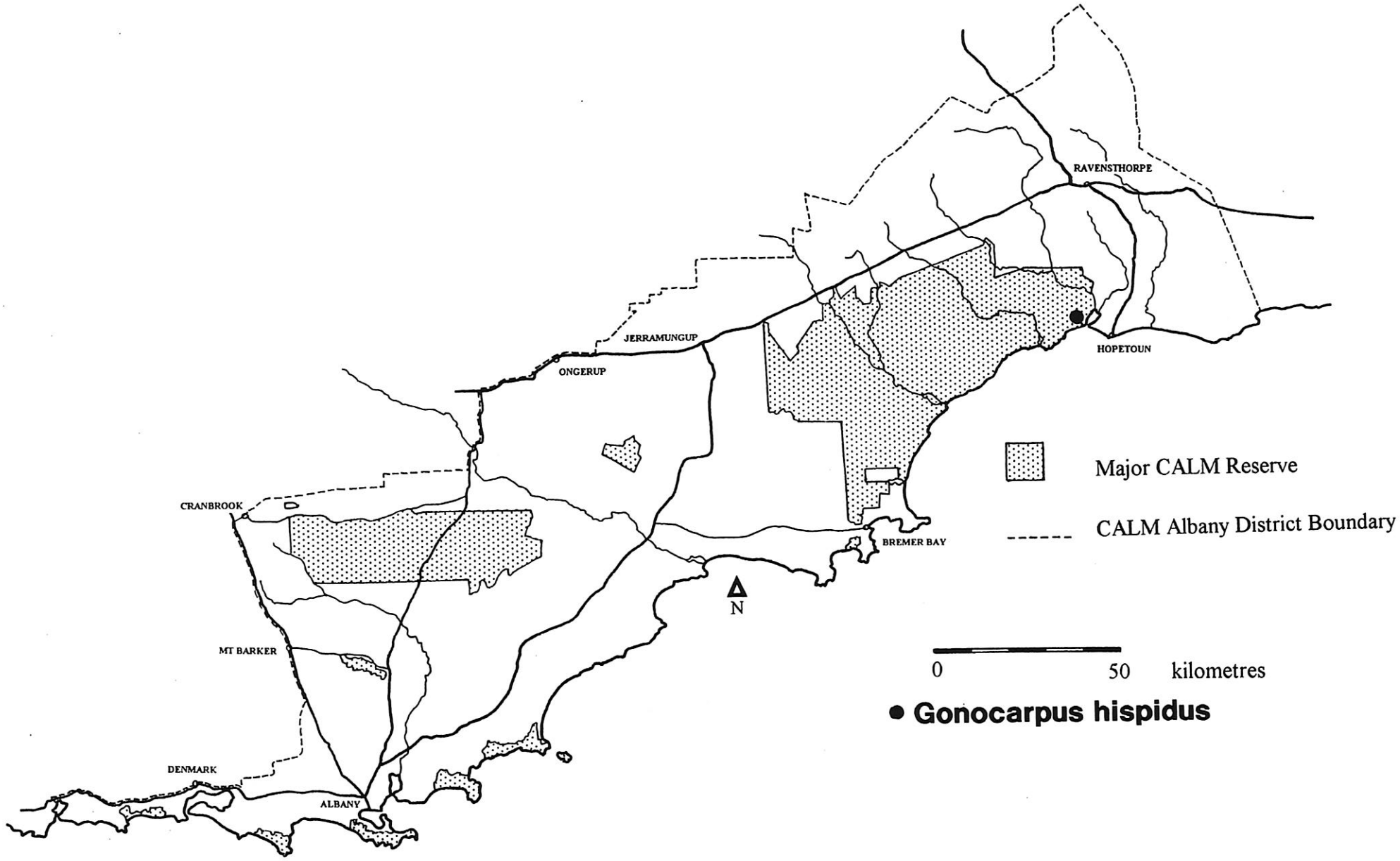
Monitor occasionally

Research Requirements

- survey for new populations in similar habitat (especially likely in Eyre and Whoogarup Ranges)
- collect fruiting specimen
- determine dieback susceptibility

References

Orchard (1986).


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kilometres
● Gonocarpus hispidus

Grevillea maxwellii McGill.

PROTEACEAE

Maxwell's Grevillea

Grevillea maxwellii, previously known as *G.* sp. aff *asparagoides* was first collected by Drummond from the Salt (Pallinup) River about 100 years ago.

After extensive searching by G. Keighery in 1986, it was finally relocated in two sites on the Pallinup River. It had already been collected by Newbey in 1966, but that specimen was initially determined as *G. asparagoides.*

Grevillea maxwellii is an intricately branched, prostrate to spreading shrub, 0.4 m high to 2.0 m across. The leaves are ascending to spreading, sessile to shortly petiolate, 2-7.5 cm long. Each leaf is segmented into ascending or spreading lobes, 3-9 per leaf, tripartite to almost pinnatisect. The lobes are angularly revolute, enclosing the lower surface except the midvein. The upper surface is glabrous but sometimes with an open hairy indumentum; the lower packed with slender flexuose hairs. The inflorescences are terminal or axillary, erect to deflexed and pedunculate, simple to three branched, to 4.5 cm long. The peduncles and rachises are tomentose. The flowers are on a short, tomentose (with glandular hairs) pedicel 3-5.5 mm long; the red perianth is 2-3 mm across with tepals to 13 mm, loosely tomentose inside and glabrous outside. The style has numerous to few spreading, multicellular, glandular hairs, becoming less frequent towards the base. The pollen presenter is elliptical (or round), 1-1.5 mm long.

Flowering Period: May-September; sporadic.

Distribution and Habitat

It grows in small areas on very rocky hilltops, in brown loamy soil over granite, in association with a low open heath. It disappears as soon as the soil depth increases downslope to accommodate mallees and taller Yate and Jam. Much of the suitable habitat along the Pallinup River has been cleared.

Conservation Status

Current: Priority 1

Recommended: Priority1 (with highest priority for further survey and consideration for gazettal as DRF)

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Greaves Hill	Albany	Alb	VCL	16.9.93	33	good
2. Arrino	Albany	Alb	private	16.9.93	48	good

WAHerb: 4 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible (moderate)

Management Requirements

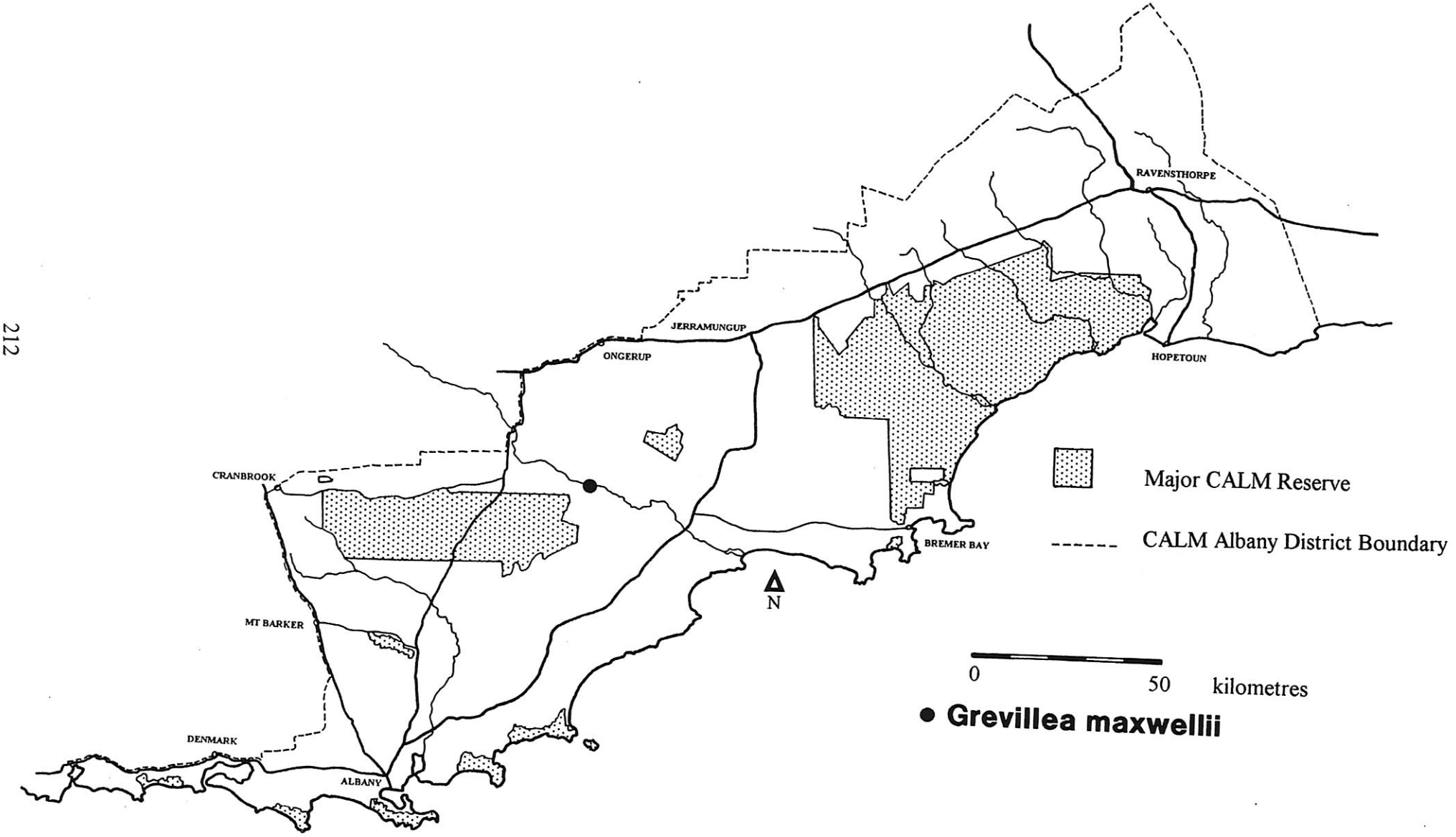
- gazette as Declared Rare Flora
- monitor regularly and maintain liaison with Bob Millard on Arrino farm
- if necessary, institute measures to protect it from *Phytophthora* dieback
- investigate possibility of ensuring secure tenure if necessary

Research Requirements

- survey for new populations in similar habitat and along the Pallinup River
- determine response to disturbance and susceptibility to dieback

References

McGillivray (1986 & 1993).


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Grevillea maxwellii

Guichenotia apetala A.S.George

STERCULIACEAE

Ravensthorpe Range Guichenotia

Guichenotia apetala is a low, compact woody shrub to 30 cm high. It has distinctive pendent pink "bell" flowers composed of the coloured, fused calyx lobes which are prominently ribbed after flowering. In most members of this genus the petals are greatly reduced relative to the calyx, however the petals of this species are so reduced as to appear absent. The anthers are dark purple-pink, large and conspicuous. The leaves are small (3 mm), roughly triangular with markedly revolute margins.

Flowering Period: October-November

Distribution and Habitat

This species is confined to lateritic soils in the Ravensthorpe Range supporting an association of closed scrub and mallee. Most collections have come from around Mt Desmond (south of Ravensthorpe), however, one collection was made near Mt Short (north of Ravensthorpe). The Mt Short specimens appear slightly different having longer non-triangular leaves and a slightly later flowering period, but are definitely apetalous. Further collection on lateritic soils throughout the Range is likely to find new locations. Most collecting to date has concentrated on the more obvious features of the landscape such as Mt Desmond.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
(1) Mt Desmond	Albany	Rav	VCL	15.12.92	+300	healthy
(2) Elverdton Rd	Albany	Rav	VCL	15.12.92	+100	healthy
(3) Mt Short	Albany	Rav	VCL	16.12.92	+10	healthy

WAHerb: 13 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

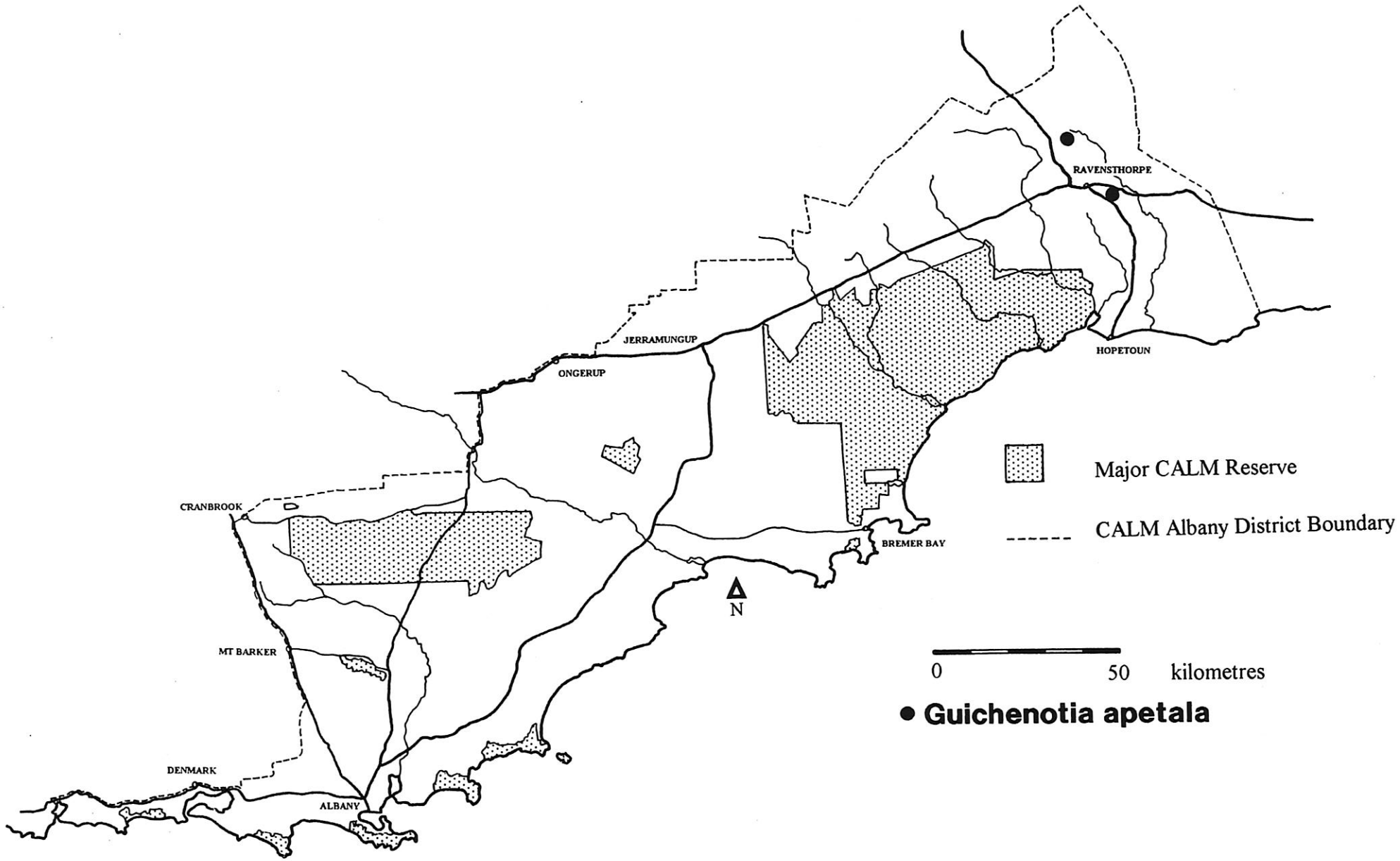
Monitor regularly

Research Requirements

- survey Ravensthorpe Range for more populations
- investigate taxonomic relationship between Mt Short plants and other locations
- determine Response to Disturbance

References

George (1967), Keighery (1992).


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● Guichenotia apetala

Hydatella australis Diels

HYDATELLACEAE

Hydatella australis is a small, tufted sedge like aquatic annual herb. It has several lax, filiform terete leaves to 25 mm arising from the base of the plant. The reproductive structures, capitula, are either male or female, both being present on the same plant. The capitula are on scapes 3-5 mm long and are composed of 2 (rarely 4) loosely sheathing lanceolate bracts. There are fewer male capitula (than female) which have 4-8 flowers with purple stamens exserted from the bracts. The females have 8-14 flowers, each with 4-10 stigmatic hairs exserted.

Like most minute aquatic plants, this genus has been poorly collected. Cooke (1987) believes *H. australis* and *H. leptogyne* may be geographical extremes of the one taxonomic entity.

Flowering Period: October

Distribution and Habitat

Hydatella australis occurs in silt or mud in shallow pools and seasonal swamps. The type was collected by Diels from the Hamersley River in 1901, possibly from its intersection with Telegraph Track, and has not been collected there since. This may be a function of increased salinity (due to clearing upstream for agriculture) or lack of survey. Keighery (pers. comm.) has collected it from granite rock pools near Cape Arid and believes his collection and that of Deils to be the same species but different from all material collected from around Perth. The Perth material is probably *H. leptogyne* Keighery (pers. comm.)

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
(1) Hamersley River	Albany	Rav	NP	1901	-	-
(2) Cape Arid	Esp	Esp	NP	1985	-	healthy

WAHerb: 3 records (one possibly *H. leptogyne*)

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

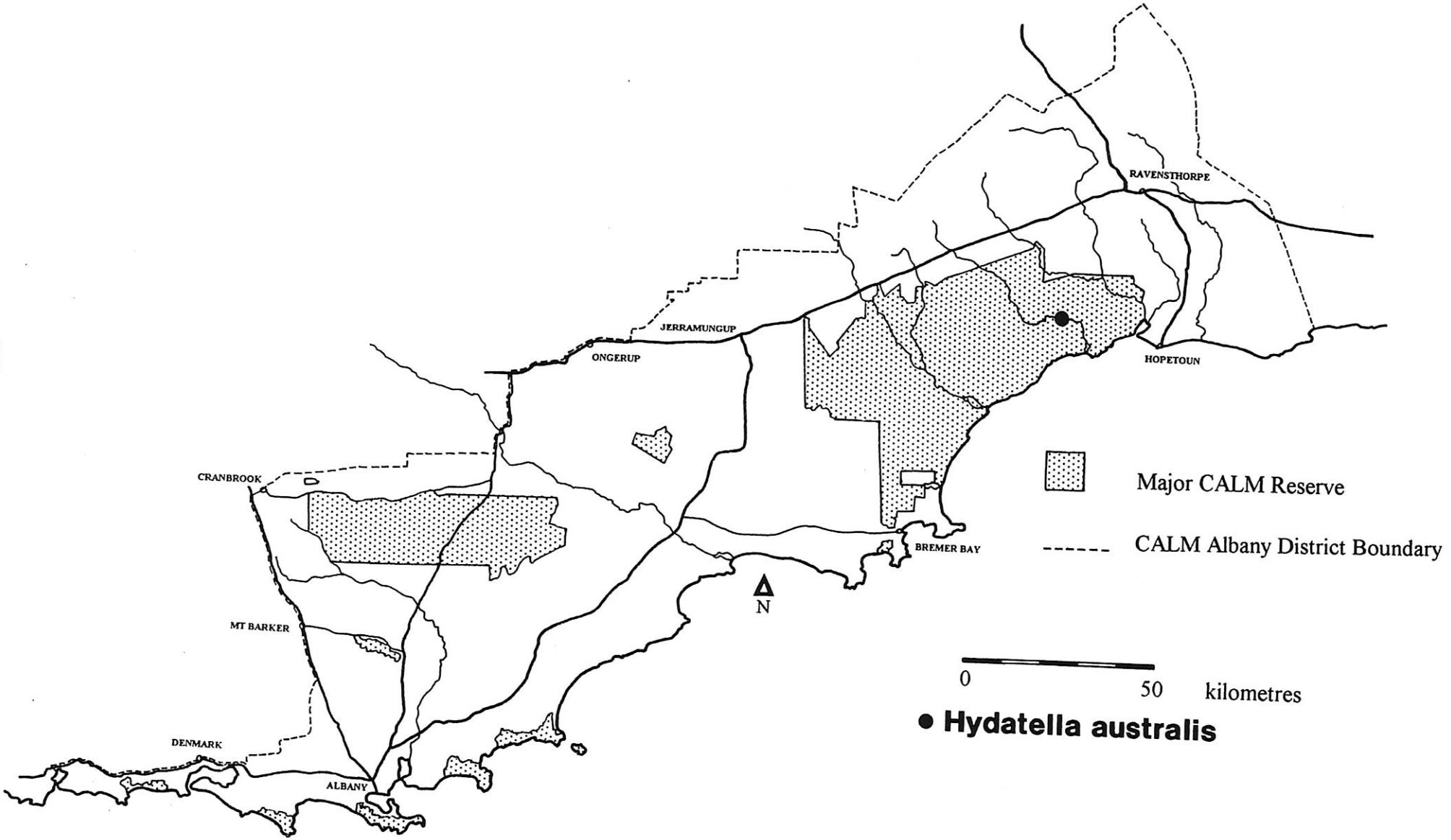
- little is known of the range and environmental requirements of this species and hence management needs are also unknown
- protect pools from vehicles and unnatural silting due to road works etc.

Research Requirements

- survey the Hamersley River and other similar (natural) waterbodies for new populations
- determine environmental requirements to permit Management Requirements to be established

References

Cooke (1987); Diels and Pritzel (1905).


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● Hydatella australis

Kunzea pauciflora Schauer

MYRTACEAE

The specific name of *Kunzea pauciflora* refers to the fact that flowers may be solitary (or 2-6) in the terminal head and not more numerous as in many other Kunzeas. This species does however have many flowers over the whole bush which are very bright pink and showy, which makes the name seem inappropriate. The plant is a low bushy shrub (60 cm to 1 m) with dense dark green foliage of 4-6 mm linear leaves.

Flowering Period: August-October

Distribution and Habitat

Kunzea pauciflora occurs in rocky loamy soils over spongolite in association with heath and scrub. The type was collected by Preiss in 1840 from Cape Riche, and has been collected there several times since. It has also been collected from Boat Harbour, 12 km north of Cape Riche although recent survey around Boat Harbour has failed to relocate it. It is still common around the lower slopes of Mt Melville at Cape Riche (in Shire Recreation Reserve) but is not known from anywhere else.

In the early 1980s, a single plant was growing on the road verge of Cheyne Beach Rd. Cuttings were taken from this plant and successfully propagated. This was probably brought in as seed from Cape Riche on machinery and was eventually destroyed by road works (Eileen Croxford, pers comm). Mrs Croxford has collected extensively in vicinity of Cape Riche and has not seen *Kunzea pauciflora* in other locations.

Conservation Status

Current: Priority 1

Recommended: Priority 1 (With highest priority for further survey and consideration for gazettal as DRF)

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Cape Riche	Albany	Alb	Shire	3.11.92	+2000	healthy

WAHerb: 3 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

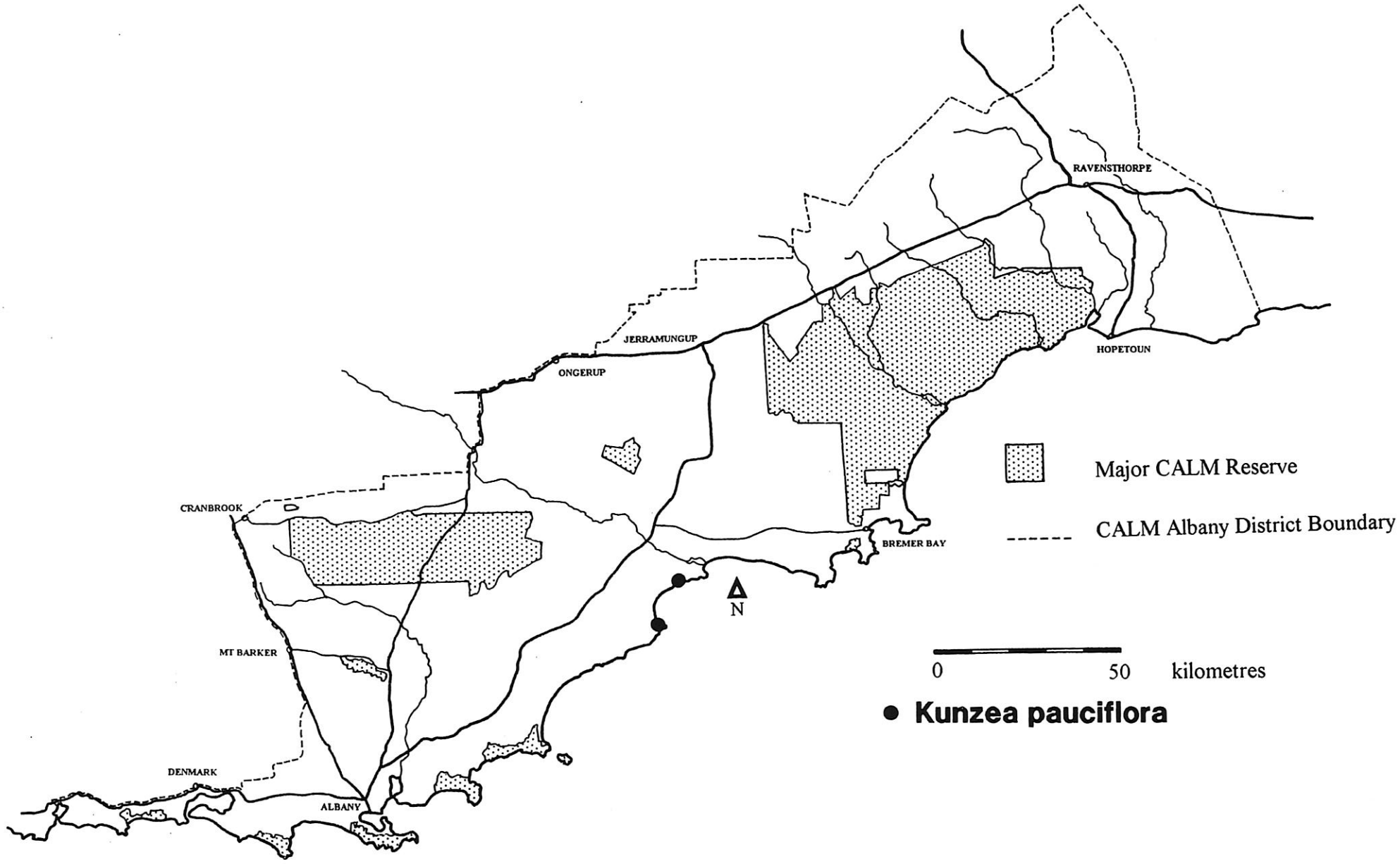
- monitor population occasionally
- inform Shire

Research Requirements

- survey area around Cape Riche and Boat Harbour for new populations
- determine response to disturbance

References

Lehmann (1844).


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Kunzea pauciflora

Lepidium aschersonii Thell.

BRASSICACEAE

Spiny Peppercress

The Spiny Peppercress is an intricately branched perennial herb to 30 cm tall, arising annually from an underground rootstock. The plant is covered with short hairs and the smaller branchlets become spinescent. In more dry conditions the plant becomes woody and more spinescent. The basal leaves (12 cm bipinnate) are not persistent; persistent stem leaves become smaller with height up the stem and are awl to lance shaped, minutely toothed, sessile with basal appendages. The small (to 0.8 mm) flowers are greenish and borne on a spiny raceme. The pedicelate fruits are a more conspicuous (4 mm), two chambered, slightly flattened, mitre-shaped pod with a small notch at the tip.

Flowering Period: ?December-March

Distribution and Habitat

No detail is available on its habitat in Western Australia, however in Victoria it occurs on grey clays on the edge of salt lakes in a salt marsh vegetation association of chenopods, sedges and grasses.

Lepidium aschersonii was known to be widespread in eastern Australia, but is now regarded as close to extinction in NSW and very rare in Victoria (Leigh et al., 1984), due to land clearing, erosion, and grazing by stock and feral animals. In Western Australia it has only been collected by C. Andrews from somewhere along the Salt (Pallinup) River in 1903 and there is an unconfirmed report by K. Newbey (but not collected) from Corackerup.

Although it has been collected only once, it is somewhat similar to introduced Brassicaceous weeds and could therefore have been easily overlooked by botanists in Western Australia. Some effort has recently gone into looking for this species (particularly at Corackerup) without success.

Conservation Status

Current: Priority 1

Recommended: Priority 1 (with highest priority for further survey and consideration for gazettal as DRF)

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No known Populations						

WAHerb: 2 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

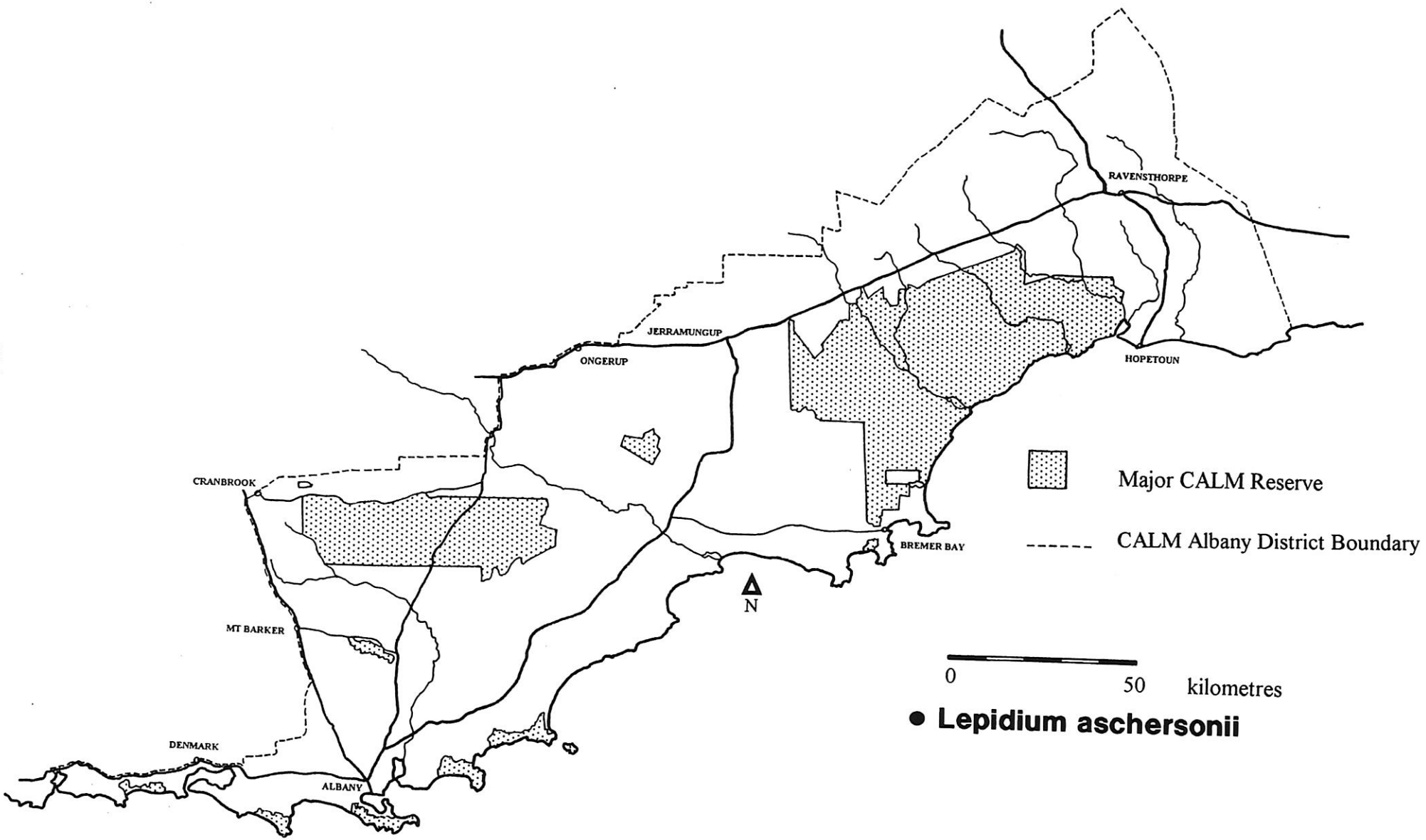
If relocated, protect from grazing and vehicle damage and collect seed and monitor populations

Research Requirements

- survey along Pallinup River and in Corackerup Nature Reserve
- determine Response to Disturbance

References

Hewson (1982), Leigh *et al.* (1984).


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Lepidium aschersonii

Leptomeria ericoides Miq.

SANTALACEAE

Leptomeria is an endemic genus of southern Australia of 17 species of glabrous, apparently leafless greenish yellow root-hemiparasitic shrubs. *L. ericoides* is an erect shrub to 50 cm tall, with angled striate stems and small 2-3 mm appressed leaves which are mostly persistent. The bisexual flowers are partly sunken in terminal and lateral thickened spikes (3-7 mm long) of 3-10 flowers. Each flower is subtended by a lanceolate bract (1-2 mm) and has orange-brown tepals 0.5 mm. The fruit is a dry globose drupe, 2-3 mm long.

L ericoides is similar to *L. scrobiculata*, but differs from that species in having glabrous not papillose stems, a finer more virgate structure and fewer, less robust spikes.

Flowering Period: October

Distribution and Habitat

This species is only known from the type location at Willyung Hill (L. Preiss 1840) near Albany and one other collection from Cowaramup. The type is housed in Melbourne and the only specimen in WA Herbarium is that collected by Royce in 1948 from sandy soil at Cowaramup. The area around Mt Willyung and the summit itself (which is being mined for granite) is severely modified.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
Currently there is no population information on file.						

WAHerb:1 record

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

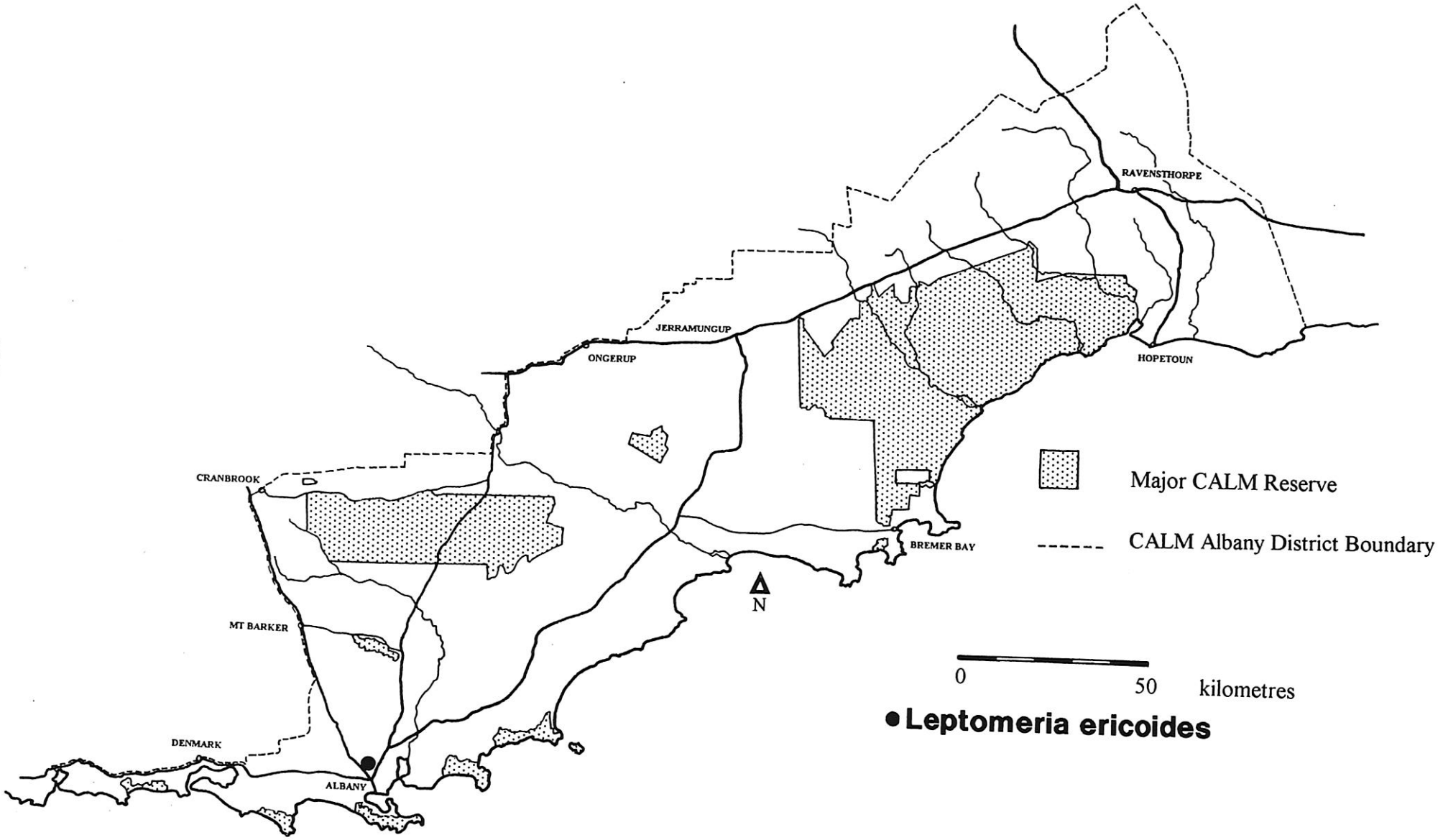
Survey required

Research Requirements

- survey Willyung Hill
- survey any other sites opportunistically

References

Hewson (1984), Lehmann (1845).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Leptomeria ericoides

Leucopogon florulentus Benth. EPACRIDACEAE

Leucopogon florulentus is an erect branched shrub to 50 cm with compact, dense terminal spikes of small (1-2 mm) white flowers. The leaves are also small (2 mm), broadly ovate, sessile, and thick with conspicuous radiating stria.

Flowering Period: February, November, intermittent

Distribution and Habitat

Two confirmed Herbarium specimen locations are east of Esperance and near Ongerup, where it grows in heath or mallee heath on grey-white sands. This habitat is quite common and also common for many species of *Leucopogon.*

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No population has been accurately surveyed.						

WAHerb: 3 records & 1 aff.

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible (moderate)

Management Requirements

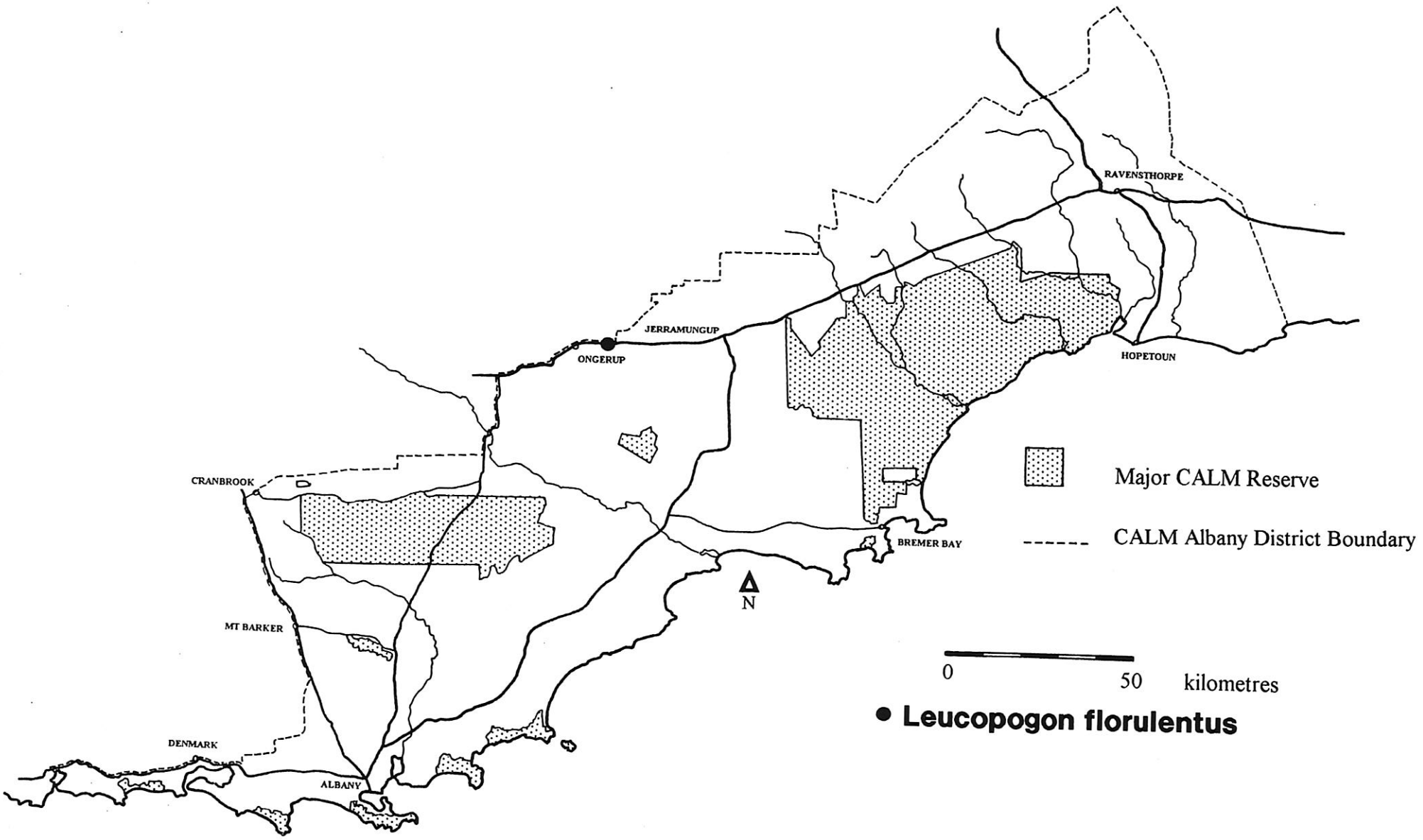
Survey required

Research Requirements

- relocate Ongerup population and survey for new populations
- determine response to disturbance
- determine susceptibility to *Phytophthora*

References

Bentham (1868).


RAVENSTHORPE
JERRAMUNGUP
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CRANBROOK
BREMER BAY
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ALBANY
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Major CALM Reserve
CALM Albany District Boundary
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50
kilometres
Leucopogon florulentus

Leucopogon pogonocalyx F.Muell. ex Benth. EPACRIDACEAE

Leucopogon pogonocalyx is an erect twiggy shrub. It has ovate-lanceolate, concave, rigid striated leaves (3-4 mm) with a short pungent point. Inflorescences are axillary, toward the branch tips, and composed of 2-3 flowers on an erect peduncle. Each flower is white with a densely bearded corolla (inside) and relatively short sepals which are conspicuously ciliate at their obtuse ends (hence the specific name).

Flowering Period: December

Distribution and Habitat

The type specimen was collected from near Mt Manypeaks and it has subsequently been collected from around Porongurup National Park and the Stirling Range. It grows in an association of heath and scrub.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
This species has not been accurately surveyed.						

WAHerb: 4 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible (moderate)

Management Requirements

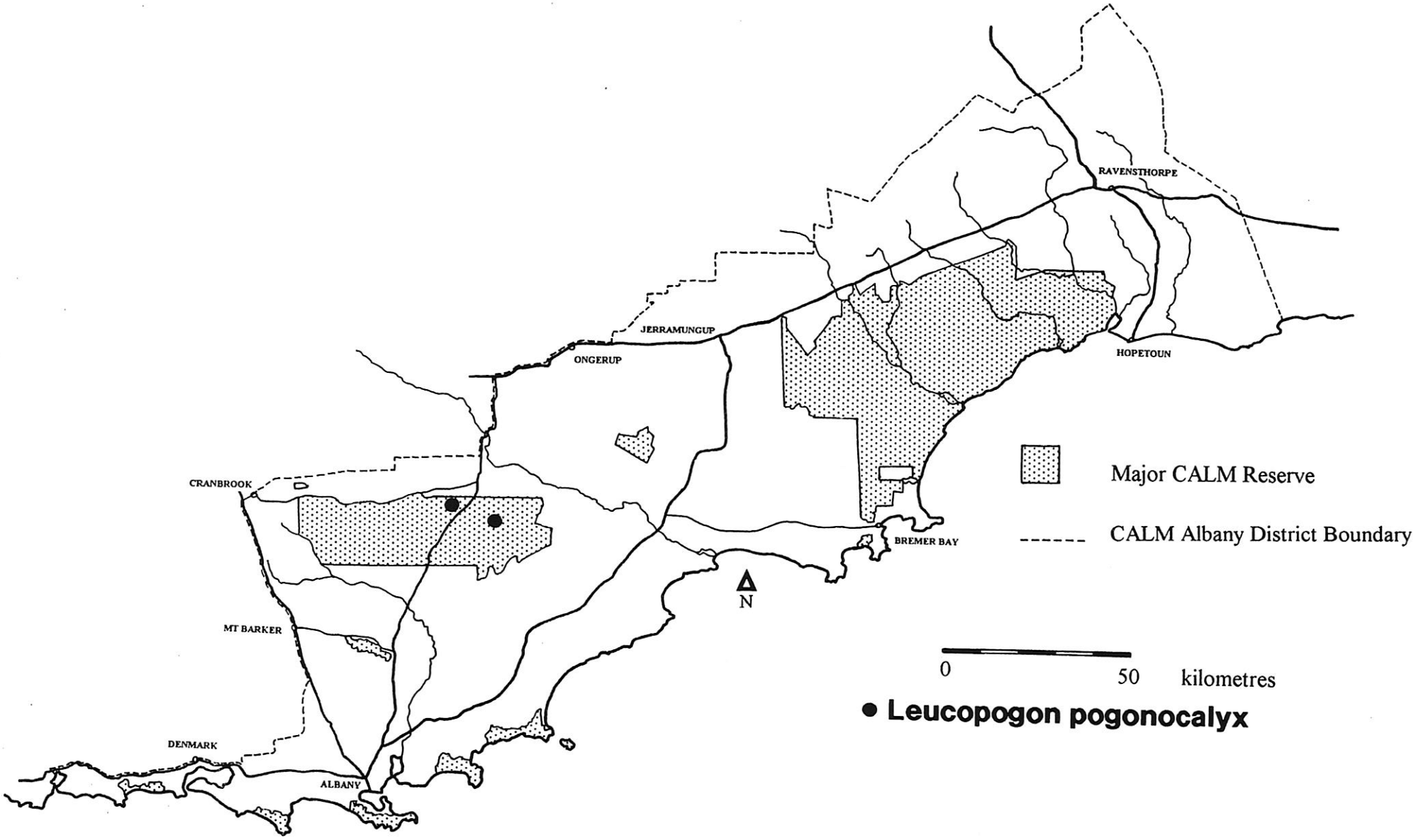
Survey required

Research Requirements

- relocate populations in Porongurup, Stirling Range, and Manypeaks areas
- determine response to disturbance and susceptibility to *Phytophthora*

References

Bentham (1868).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
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DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
● Leucopogon pogonocalyx

Melaleuca ordinifolia Barlow MYRTACEAE

Melaleuca ordinifolia is a low spreading woody shrub, becoming rounded, to 80 cm. The foliage is dense dark green with leaves to 6 mm, narrow linear erect and opposite and decussate, slightly constricted at the base into a stout petiole. The young shoots are moderately pubescent becoming glabrous. The inflorescence axis and hypanthium are also pubescent, the rest of the plant is glabrous. The inflorescence of small pale yellow flowers is a lateral cluster of 1-3, mostly borne on the older woody stems, but some may occur amongst the leaves toward the branch ends. The broadly cylindric woody fruits up to 5 mm are loosely grouped on the old wood.

Flowering Period: September-October

Distribution and Habitat

This species occurs in sandy loams over clay or red-brown gravelly clay in association with low heath or open scrub mallee (*E.* aff. *occidentalis*) or mallees over dense heath. It has been collected from near Cranbrook, north Stirling Range and mid-slope above the Hamersley River. Quinn *et al.* (1992) note that the range may be disjunct, and that it occurs in specific and localised habitat and has only been collected once since 1977.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Salt River Rd	Albany	Cb	NP	1.12.92	+1000	healthy
2. Hamersley River	Albany	Rav	verge	4.5.93	+150	healthy

WAHerb: 8 records (1 cultivated; two doubtful determinations.)

Response to Disturbance

Need to check Salt River Road population as part had been burnt, to determine if it reseeds or resprouts

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

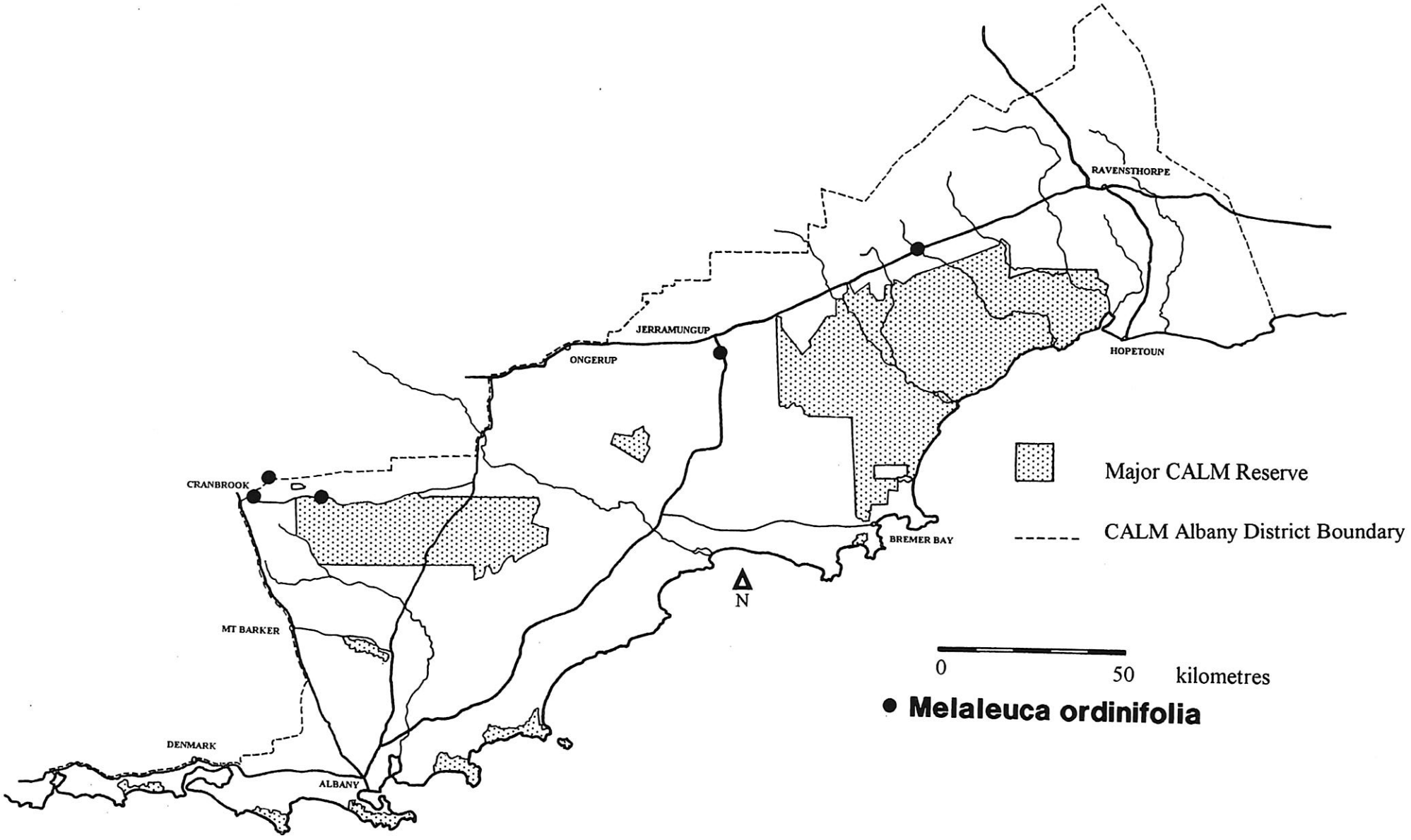
Monitor occasionally

Research Requirements

- survey opportunistically for new populations
- determine response to fire

References

Quinn *et al.* (1992.).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
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MT BARKER
DENMARK
ALBANY
Major CALM Reserve
CALM Albany District Boundary
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50
kilometres
Melaleuca ordinifolia

Melaleuca pritzelii (Domin) Barlow MYRTACEAE

Melaleuca pritzelii was previously regarded as a subspecies of *M. densa,* but has now been elevated to species rank. It is a medium woody shrub to 2 m, spreading and becoming rounded or domed. The moderately dense foliage is light to medium green, with younger leaves having reddish margins. The flat keeled leaves vary from 2-5 mm, are broadly ovate, very shortly petiolate and in whorls of three or in pairs (i.e. ternate or decussate). The flowers are light cream and mostly borne on the old wood, but some may be terminal or close to the shoot tips. Stamens are 3-6 mm including the claw. The 3.5-4 mm cup shaped fruits are borne on the old wood, free of leaves and are in globular clusters of up to 20.

Flowering Period: August-September

Distribution and Habitat

This species has been collected from near Cranbrook, north Stirling Range and around Ongerup. It occurs in sandy loam over clay which is poorly drained and seasonally damp, and supports an association of low heath.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Salt River Rd	Albany	Cb	private	1.12.92	+30	healthy

WAHerb: 9 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

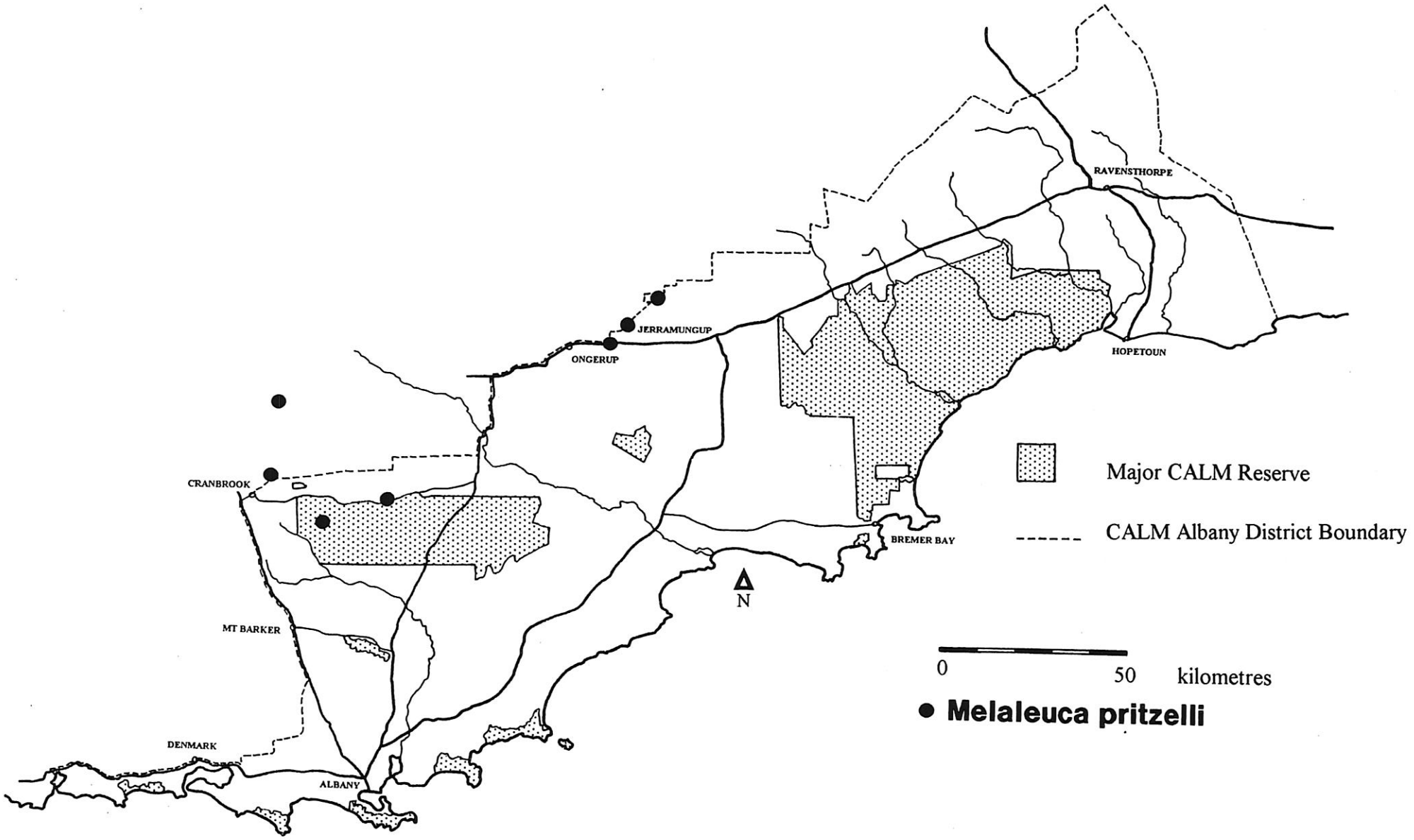
Monitor occasionally

Research Requirements

Survey opportunistically for new populations and relocate older populations on WAHerb

References

Quinn *et al.* (1992).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
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DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Melaleuca pritzelli

Melaleuca sculponeata Barlow MYRTACEAE

Wooden Shoe Leaved Melaleuca

Melaleuca sculponeata is a small, multistemmed lignotuberous shrub to 0.4 m. The leaves are decussate, erect to 3 mm long and 1.1 mm wide, obtuse or shortly mucronate, sessile or peltately attached at the base and with upper surface concave and lower surface convex. The inflorescence is a lateral cluster of up to 10 flowers on the old wood. The fruit is depressed-globular, slightly compressed, 3-4 mm across by 2-2.5 mm long with valves deeply enclosed. The flower is not known.

It is considered to be possibly related to *M. brevifolia*, differing in the decussate, peltate leaves which do not have prominent glands.

Flowering Period: Unknown; presumed to be early summer (Rob Smart pers. comm. - had not flowered by early December 1993).

Distribution and Habitat

The type locality is open mallee over low heath (composed mainly of *Melaleuca* species) on light grey sand over clay. Although the area has been extensively cleared for agriculture, this habitat is considered common and *M. sculponeata* is considered likely to be found at other uncleared locations in the vicinity.

This species was only known from one non flowering collection from road verge surrounded by cleared farmland. Another specimen was recently (May 1993) collected from the type location.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Mallee Rd.	Albany	Jer	verge	5.93	8	healthy

WAHerb: 1 record

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

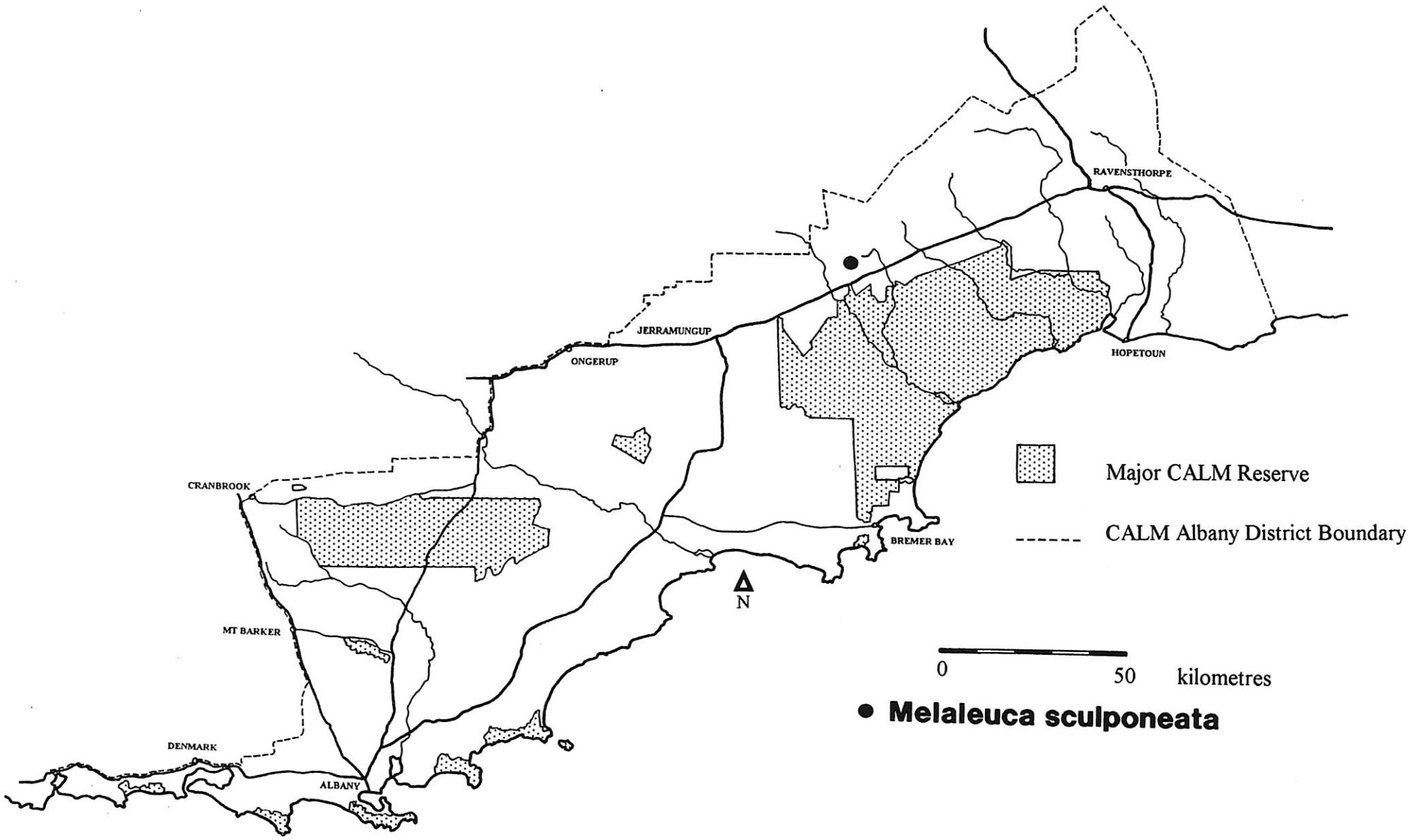
Monitor type location occasionally

Research Requirements

- survey for new populations
- collect flowering specimen

References

Quinn *et al.* (1992).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
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DENMARK
ALBANY
Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Melaleuca sculponeata

Microcorys pimeleoides F.Muell. LAMIACEAE

Microcorys pimeleoides is a robust, glabrous (except opposite lines of pubescence along the branches) shrub to 1 m tall. The oblong-lanceolate, obtuse to acute 7 mm leaves are crowded in whorls of three. The floral leaves are broader and almost ovate. The blue flowers are almost sessile, crowded at the branch ends and presumably take on the appearance of a *Pimelea* flower. The 5 mm calyx is subtended by small, linear bracts. The 10 mm corolla is shortly pubescent outside and irregularly shaped with a hooded upper lip and broad spreading lower lobes.

Flowering Period: October

Distribution and Habitat

The type was collected in 1850 from the "Phillips Range" area and it has been collected once since, in 1968, from just east of Ravensthorpe. There is no information on its habitat.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent survey						

WAHerb: 1 record

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

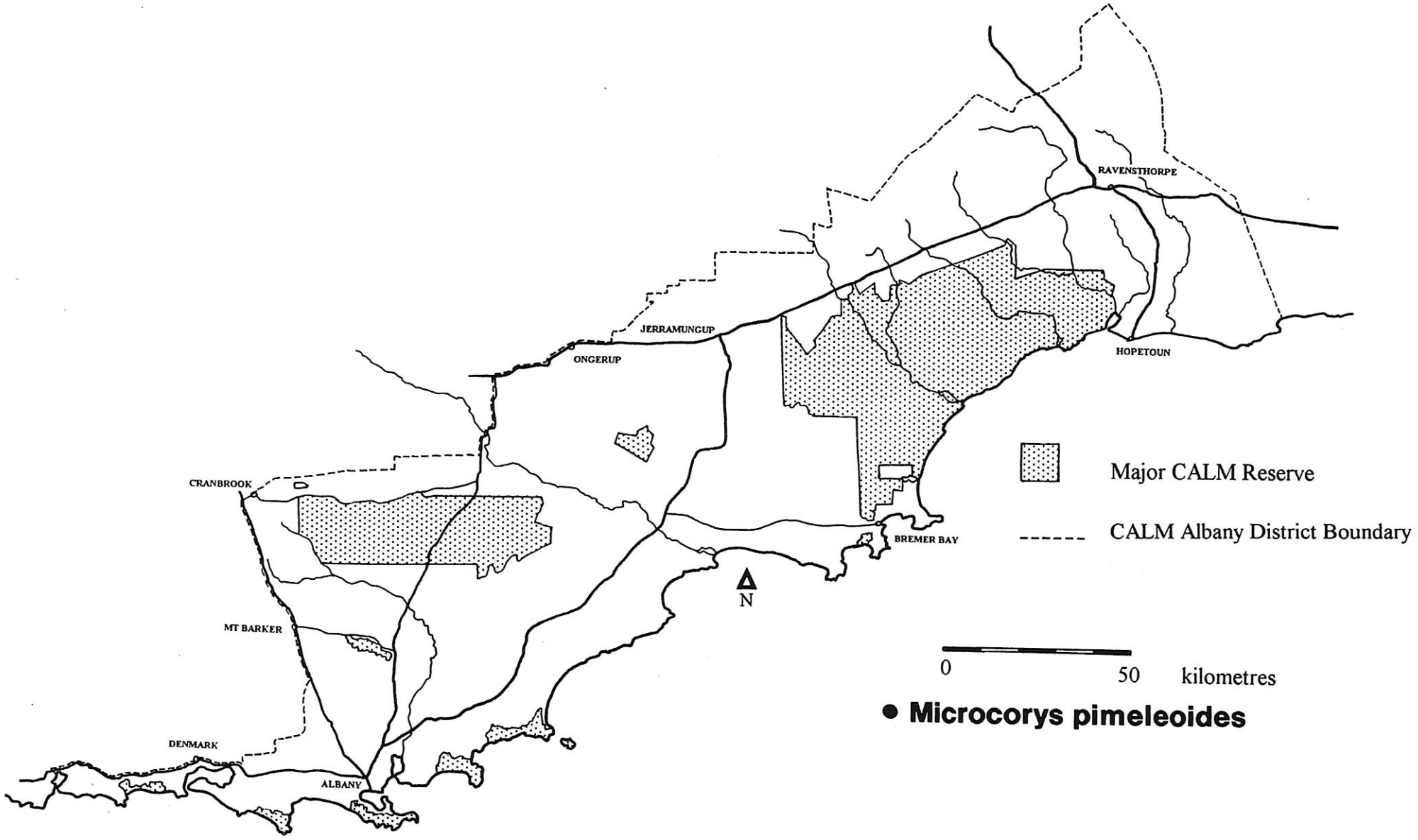
Survey required

Research Requirements

Survey around Ravensthorpe and Phillips River.

References

Bentham (1870).


RAVENSTHORPE
JERRAMUNGUP
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CRANBROOK
BREMER BAY
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DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Microcorys pimeleoides

Microcorys wilsoniana Conn

LAMIACEAE

Wilson's Microcorys

This species is a shrub to 0.6 m tall with densely hairy branches. The almost sessile, broadly ovate, 8-16 mm obtuse leaves are in whorls of three or in opposite pairs, densely hairy at the base becoming less so toward the apex. The inflorescence is a 6-12 flowered raceme of mauve to purple flowers (with a white median stripe and yellow throat) in a densely hairy, 3 mm, triangularly lobed calyx. The 11-14 mm corolla is glabrous at the base becoming densely hairy toward the lobes both inside and out. The corolla is irregular with broad, obtuse, spreading lobes. The stamens are attached toward the base of the corolla and are not exerted.

Flowering Period: September-November

Distribution and Habitat

Microcorys wilsoniana is only known from the type location at Mt. Short in the Ravensthorpe Range where it occurs in association with Mallee scrub.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent survey						

WAHerb: 1 record

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

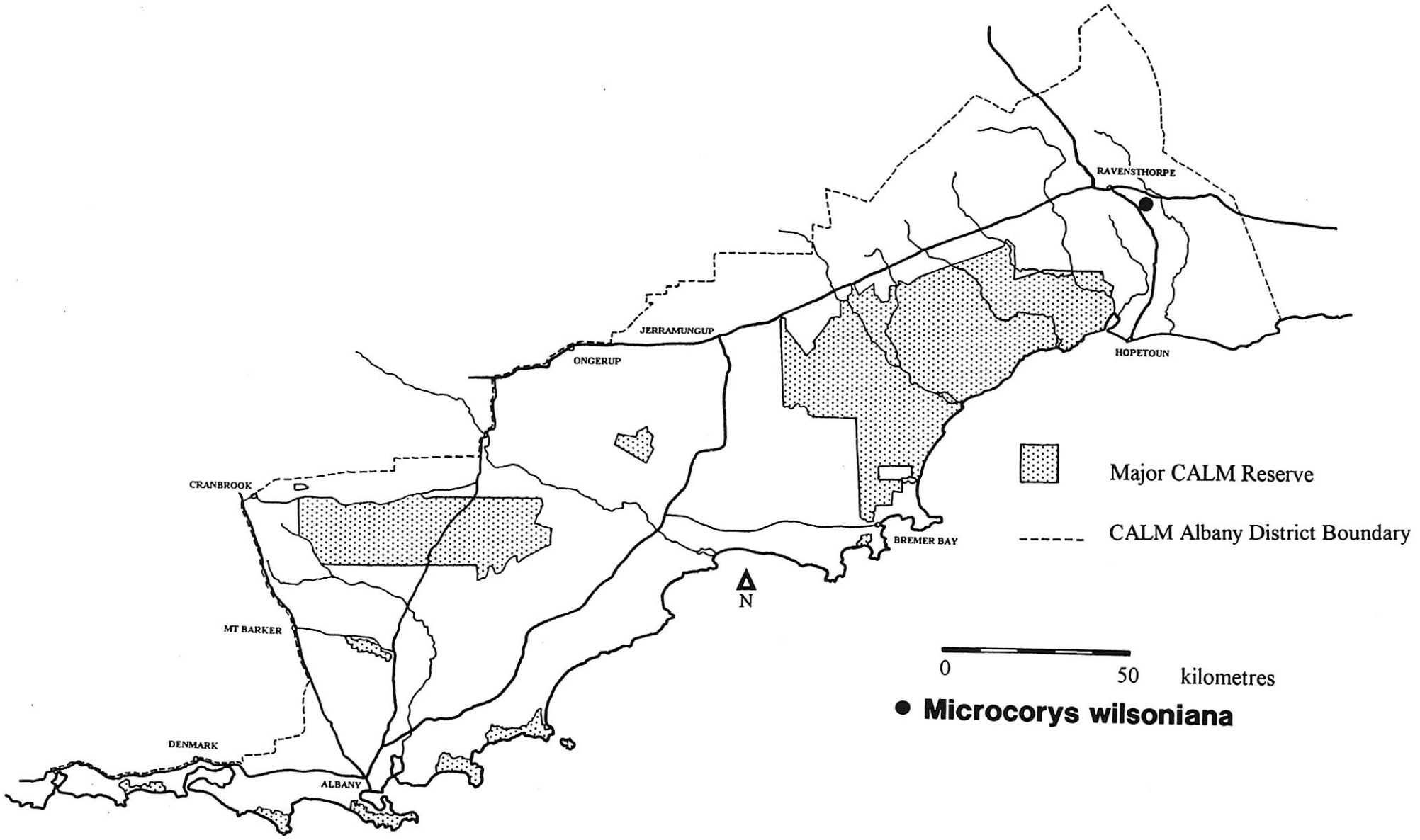
Survey required

Research Requirements

- relocate and survey Mt Short population
- survey for new populations in similar habitat (around Ravensthorpe)

References

Conn (1986).


RAVENSTHORPE
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CRANBROOK
BREMER BAY
MT BARKER
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ALBANY
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Major CALM Reserve
CALM Albany District Boundary
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50
kilometres
Microcorys wilsoniana

Monotoca sp. Mt Maxwell (K.R. Newbey 4727) EPACRIDACEAE

This taxon is an erect shrub with a woody stem to 30 cm. The upper branches are densely clothed in very small (1 x 0.5 mm) closely overlapping, stem clasping, imbricate leaves. The leaves are grey-green, broadly ovate with acute, inwardly curved tips and the margins are minutely denticulate. The small cream flowers are numerous, solitary in the upper axils, 1 mm long on a similar length bracteate pedicel, which carries the flowers out beyond the leaves where they are pendulous. The 0.7 mm petals are erect, not spreading; the calyx is very short, triangular and ciliate and is subtended by several bracts.

The differences between this and other taxa requires clarification.

Flowering Period: October-November

Distribution and Habitat

The habitat at Mt Maxwell is open shrub mallee over heath on shallow rocky quartzite soil. No other location is known.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
(1) Mt Maxwell	Albany	Jer	NP	16.9.92	scattered	in flower

WAHerb: 1 record

Response to Disturbance

Unknown

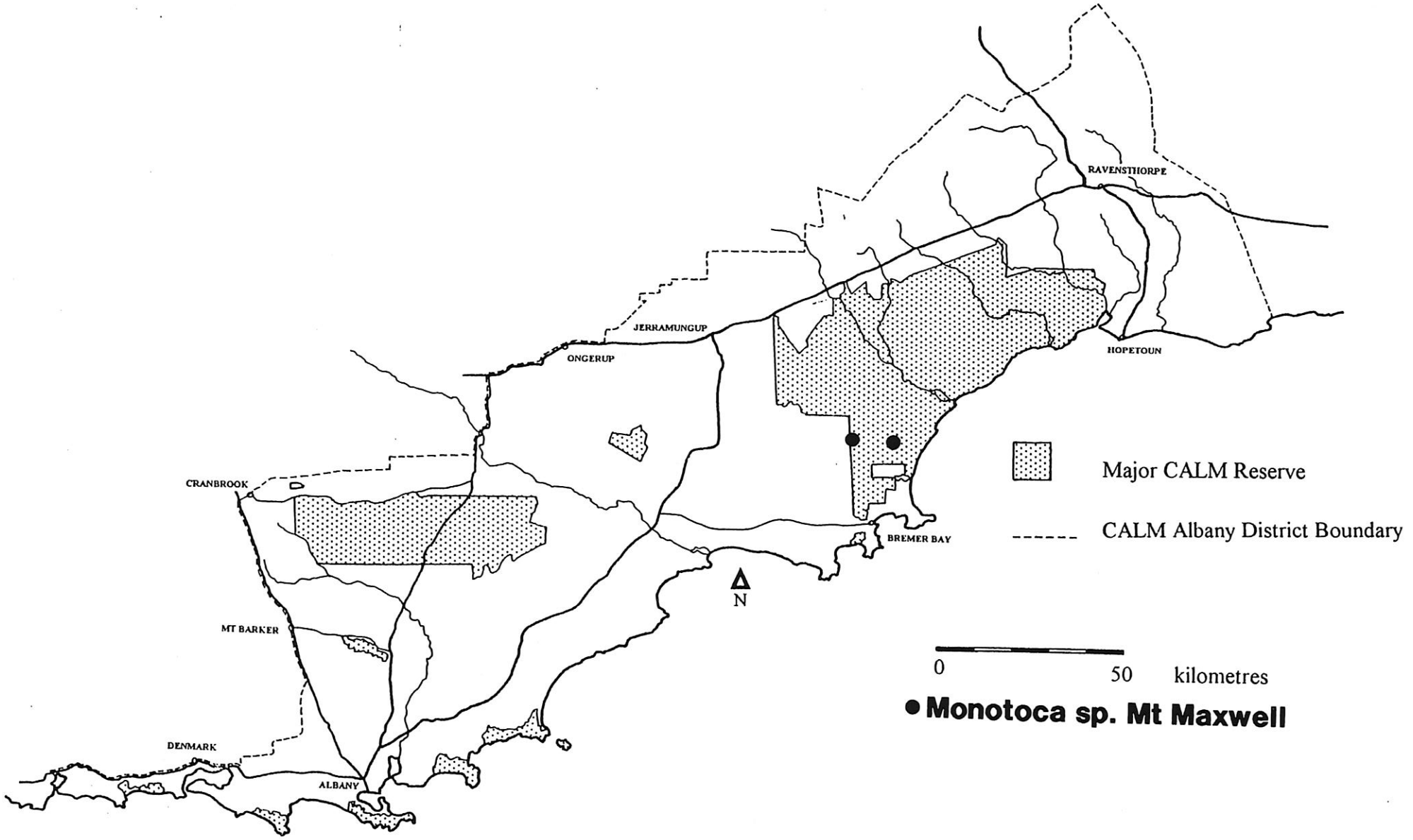
Susceptibility to *Phytophthora* Dieback

Presumed susceptible (moderate)

Management Requirements

Research Requirements

- clarify taxonomic status
- survey


RAVENSTHORPE
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CRANBROOK
BREMER BAY
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DENMARK
ALBANY
Major CALM Reserve
CALM Albany District Boundary
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kilometres
Monotoca sp. Mt Maxwell

Persoonia micranthera P.H.Weston ms

PROTEACEAE

Bluff Knoll Persoonia

Persoonia micranthera ms is a decumbent shrub, branching from the base to 0.1-0.4 m tall, without well developed bark and is thought not to be lignotuberous. The branches become terete and glabrous with age. The spreading to erect leaves are alternate or opposite, often in seasonal growth clusters of 2-5 leaves separated by long leafless internodes. The leaf lamina is flat, held horizontally, spathulate to obovate, acuminate to obtuse mucronate, 4-8 cm long and 3 cm broad, soft and flexible, glabrous (when mature) with a prominent midvein. The inflorescence is terminal, 4-15 flowers on a 1-6 cm rachis. The flowers are regular, upright on 2.5-8 mm pedicels subtended by scale leaves. The acute narrow (1.7-2 mm wide) oblong 14 mm long tepals are yellow, moderately hairy outside and glabrous inside except for rows of papillae on the proximal half. The 7.5-11 mm glabrous gynoecium are slightly lower than the anthers and are exserted. The fruit is an ellipsoid smooth drupe 6-6.5 mm long and 3 mm wide.

This is a distinctive species, easily distinguished by its long staminal filaments which are 7/10 as long as the tepals.

Flowering Period: February

Distribution and Habitat

This taxon has only been recorded from Coyanarup Peak and Bluff Knoll where it occurs in scrub or heath on shallow soils over schist. The Bluff Knoll location has been surveyed (Keighery, pers. comm.) to assess postfire regeneration after the wildfire of March 1991. There has been no seedling germination; the adult plants were killed by the fire. Any subsequent seedlings establishment is likely to be under immediate threat from *Phytophthora* in the area.

Conservation Status

Current: Priority 1

Recommended: Priority 1 (with highest priority for further survey and consideration for gazettal as DRF)

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Coyanarup	Albany	Alb	NP	24.10.92	0	gone

WAHerb: 1 record

Response to Disturbance

Killed by fire

Susceptibility to *Phytophthora* Dieback

Presumed susceptible

Management Requirements

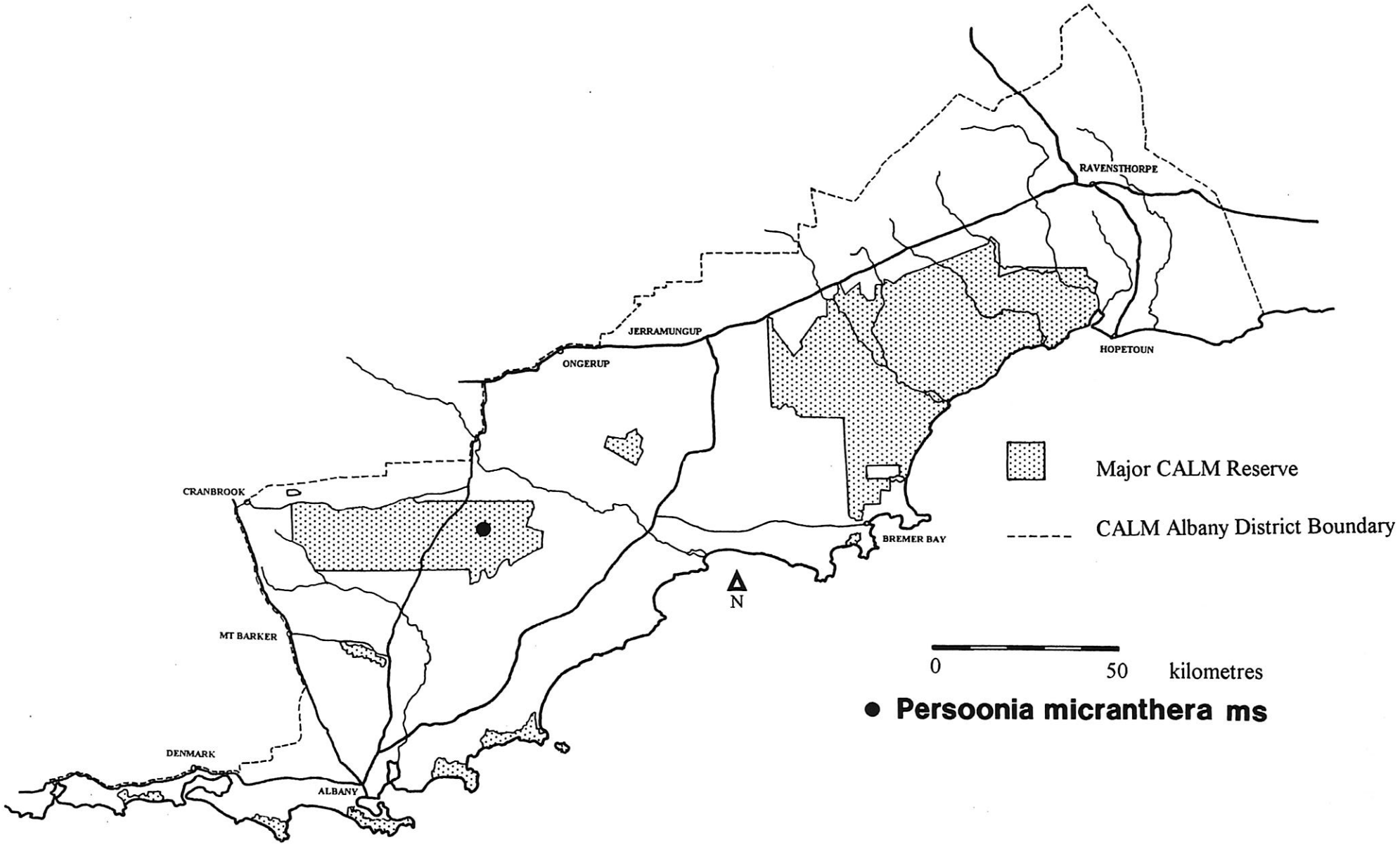
- monitor Coyanarup and Bluff Knoll sites closely for seedlings and apply phosphonate if appropriate

Research Requirements

- survey for new populations in similar habitat
- investigate response to phosphonate
- investigate *Phytophthora* susceptibility

References

P. Weston (pers. comm.).


RAVENSTHORPE
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
Persoonia micranthera ms

Picris wagenitzii Lack

ASTERACEAE

Picris wagenitzii is an annual herb, to 2 m tall with yellow flowers. The unbranched stems are around 6 mm in diameter, with erect spiny hairs to 1 mm. The leaves, which are concentrated lower down the stem, are up to 20 cm long, 35 mm wide and have shallow toothed lobes. The flower heads are borne on long peduncles, arising from along the stem. Each head is composed of many small tubular yellow flowers, surrounded by 40-50 broadly ovate, toothed floral bracts.

Flowering Period: October

Distribution and Habitat

The original collection of the type specimen was made by Drummond around 1850 and it was not collected again until 1986, when it was relocated it from Millinup Pass (Keighery, pers. comm.). There it occurs in abundance in brown loam over granite under burnt tall Karri woodland.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Millinup Pass	Albany	Pl	NP	1986	-	in flower

WAHerb: 2 records (both GJK 1986)

Response to Disturbance

Germination is stimulated by fire

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

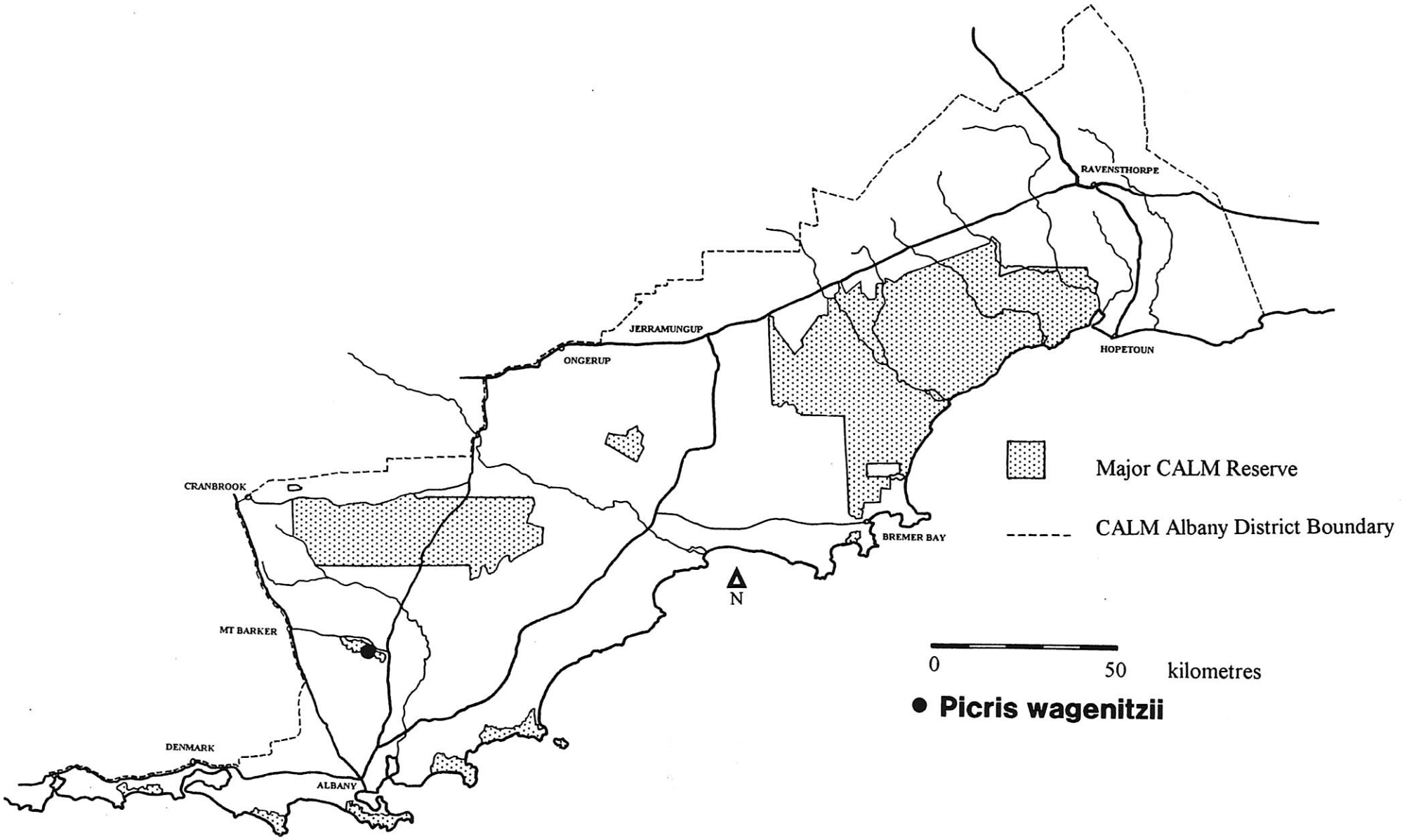
- monitor occasionally.

Research Requirements

- survey for new populations in similar habitat within the Porongurup Range and at other granitic outcrops.
- collect flowering specimen
- collect seed.

References

Lack (1987).


RAVENSTHORPE
JERRAMUNGUP
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BREMER BAY
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DENMARK
ALBANY
Major CALM Reserve
CALM Albany District Boundary
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kilometres
● Picris wagenitzii

Pterostylis turfosa Endl.

ORCHIDACEAE

Bearded Bird Orchid

This orchid, being one of the Bird Orchids, has its dorsal sepal and united petals swept up into an erect, curved and finely pointed hood, expanded at the base over the column. The lower pair of sepals are very long and fine and project directly down. The labellum is elongated into a long fine knob ended structure, covered in long yellow hairs and is conspicuously exserted from the lower opening in the hood. The flowers are 5-7 cm (including the sepals) long and 8-10 mm wide. The entire plant is up to 18 cm tall with a 15-25 mm long and 4-5 mm wide leaf.

This species was reduced to synonymy with *P. barbata* (George, 1971) but later reinstated after examination of the type (Clements, 1989). It is related more to *P. plumosa* than *P. barbata* (Andrew Brown pers. comm.).

Flowering Period: late September-October

Distribution and Habitat

This species has only been found in coastal areas west of Albany where it grows in scrubby forest and shrubland in moist peaty soils.

It was rediscovered at Torndirrup and West Cape Howe National Parks (Clements, pers. comm.) however the exact locality has not been formally recorded. It is believed to be of restricted distribution, but not rare within its range.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent survey						

WAHerb:-

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

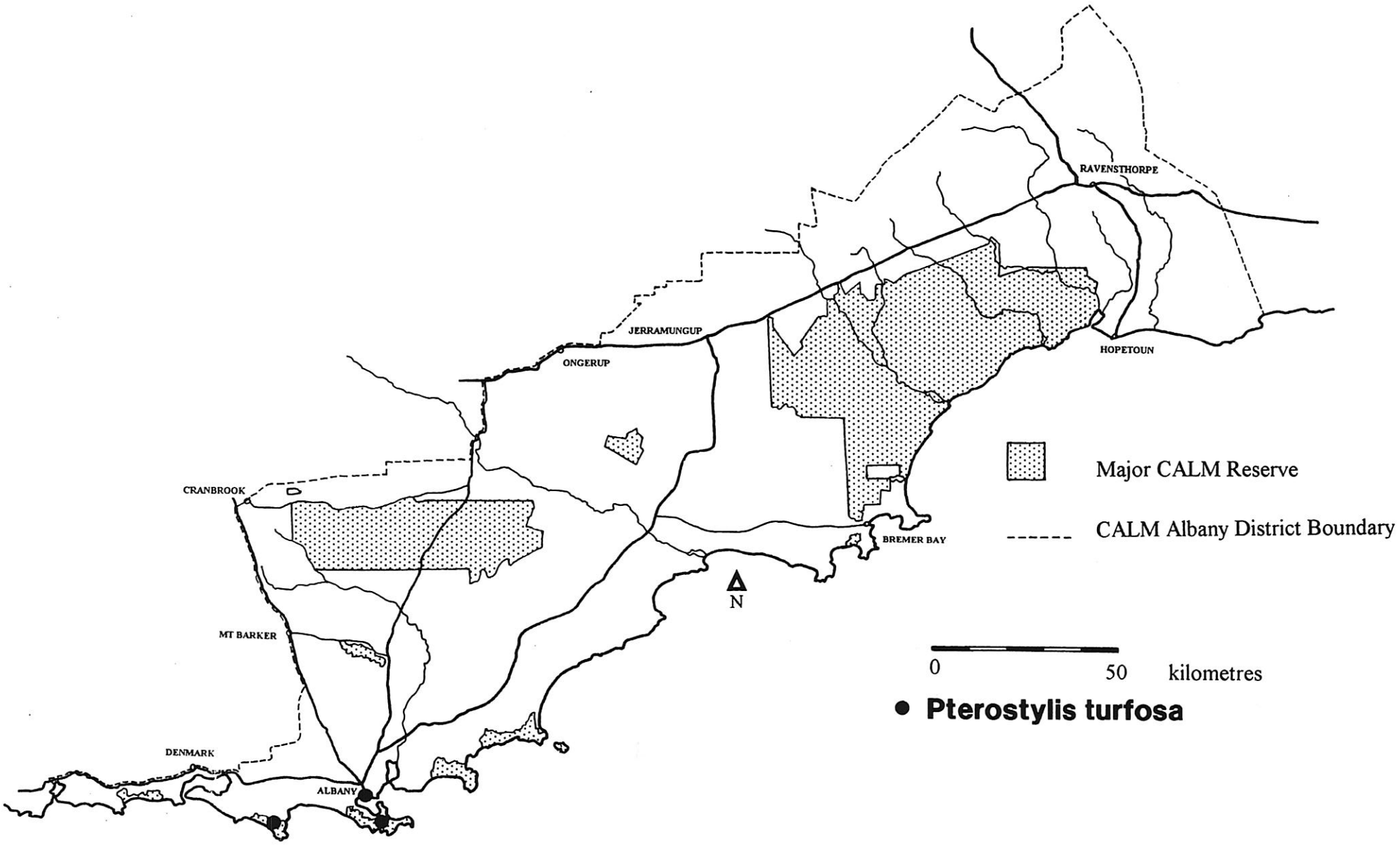
Management Requirements

Research Requirements

- confirm locations and survey

References

Hoffman and Brown (1992), George (1971), Clements (1989).


RAVENSTHORPE
JERRAMUNGUP
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CRANBROOK
BREMER BAY
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
Pterostylis turfosa

Restio leucoblephara Gilg **RESTIONACEAE**

Restio leucoblephara is a rhizomatous sedge which forms circular or radiating clumps. The aerial stems up to 400 mm, are terete (1 mm diameter), light green and are variously spaced along the rhizome. Tan-brown spreading sheathing scales are evenly spaced up the stems, and are obtuse with a short mucrone and densely silver hairy at the tips. Occasionally flexuose vegetative stems may arise from within the axils of the scales. The inflorescences (and plants) are either male or female and both are similar in appearance, being composed of a series of up to six heads (12 mm), each subtended by a broad bract and composed of a series of smaller ciliate bracts, from behind which the stigmas or styles emerge.

Flowering Period: December

Distribution and Habitat

Restio leucoblephara occurs in open areas of yellow sandy soils supporting an association of mallee heath including *Melaleuca, Lambertia, Eucalyptus* and *Nuytsia.*

It has been collected from around the north Stirling Range and to the south east from Chillinup Road. It is likely to be more common than the four WAHerb collections indicate; a concerted survey effort would be required to show this.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Camel Lake	Albany	Gno	NR & verge	1.12.92	+100	healthy

WAHerb: 4 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

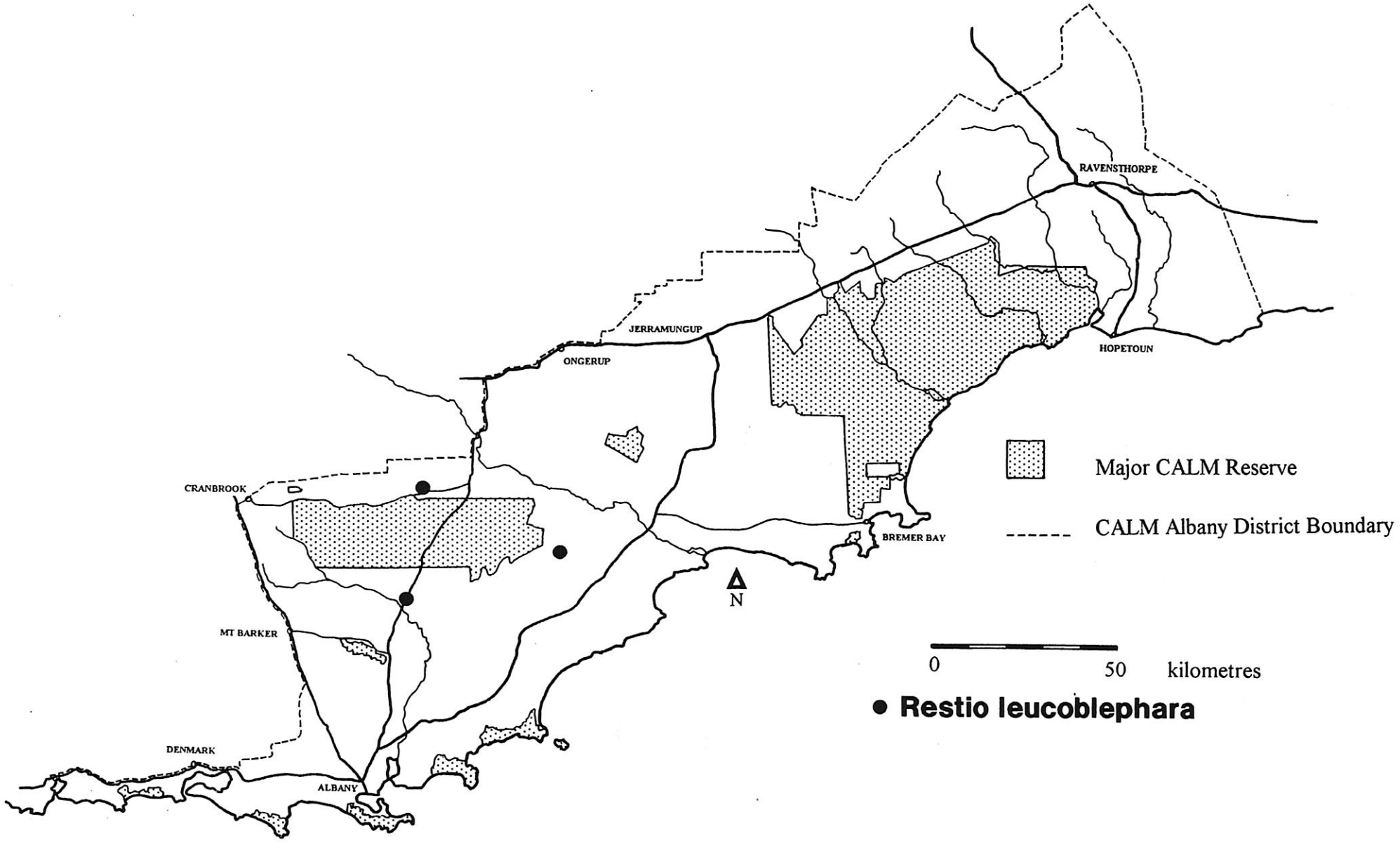
Presumed susceptible

Management Requirements

Monitor occasionally

Research Requirements

Survey sandy areas around the Stirling Range and South Stirlings for new populations


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
N
Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
● Restio leucoblephara

Rinzia longifolia Turcz. MYRTACEAE

Rinzia longifolia is a sprawling shrub, up to 80 cm across with prostrate stems which bear short erect branchlets. The flat broadly lanceolate leaves to 9 mm are crowded on the erect stems, dark green above (lighter below) and often reddish. The pale pink or white flowers, up to four or more per branchlet, are borne singly in the axils of the upper leaves on elongated pedicels up to 20 mm. The 14 mm flowers are composed of five petals, inside which is a ring of shortly united, flattened filaments of the 10 to 12 stamens.

The genus *Rinzia* was included by Bentham (1867) in *Baeckea.* Previously, this taxon was regarded as *Baeckea schollerifolia,* however it was reinstated as *Rinzia. longifolia* by Trudgeon (1986). *Rinzia* differs from *Baeckea* in having flattened, not terete filaments, adaxially (not terminally) attached anthers and ten stamens and a well developed pedicel (or anthopodium). *Rinzia schollerifolia* is a related species, but has a slightly shorter anthopodium, less spreading petals and fewer ovules (4-5) per locule.

The type specimen was collected by James Drummond (no date or locality), probably about 1840.

Flowering Period: August-October

Distribution and Habitat

This species has been collected around Ongerup, Jerramungup and recently from Corackerup. At the latter location it occurs in sandy soils supporting open mallee scrub. Most plants were very close to the road verge and may be favoured by the disturbance in that situation.

Although much of the suitable habitat would have been lost to clearing for agriculture, Nature Reserves near Ongerup and Corackerup may harbour more populations than are currently known. Trudgen (1986) considered this species to be threatened, and in need of survey to enable protection of any remaining populations.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Norman Rd	Albany	Jer	NR & verge	4.11.92	26	healthy

WAHerb: 4 records

Response to Disturbance

Unknown, but may be favoured by soil disturbance and also will regenerate from the stem after light grading.

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

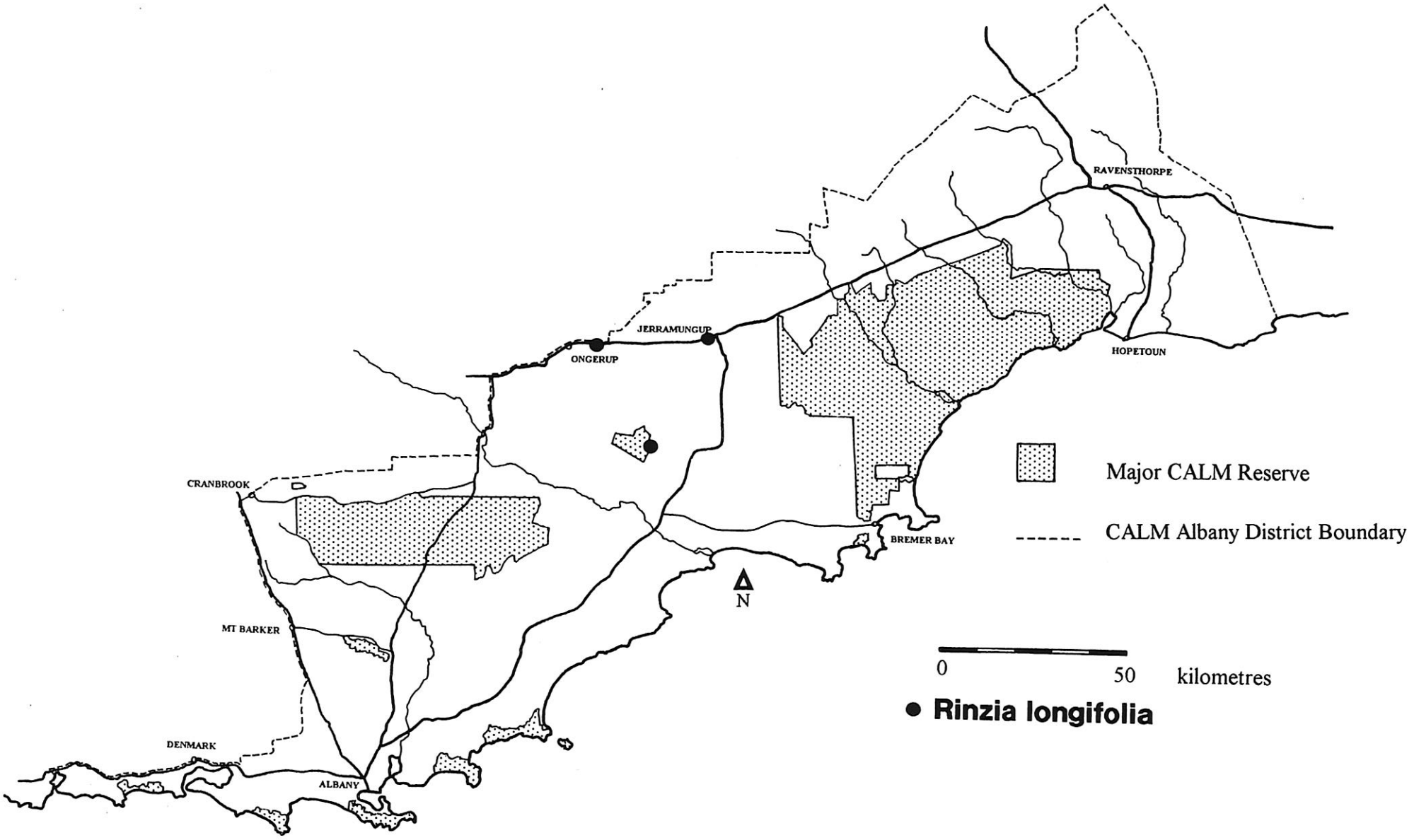
Monitor occasionally taking particular note of roadworks in the vicinity

Research Requirements

- relocate old populations from WAHerb details and survey for new populations in Ongerup (corner of Corackerup Road and Ravensthorpe-Jerramungup highway) and Corackerup Nature Reserves
- determine response to disturbance

References

Trudgen (1986).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
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MT BARKER
DENMARK
ALBANY
Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Rinzia longifolia

Rumex drummondii Meisn. POLYGONACEAE

Native Dock

Rumex drummondii is a perennial herb, 60-90 cm high with erect stems, branched in the upper half to form an open, divaricate panicle. The basal leaves are oblong lanceolate (10 x 2 cm) from a subcordate or truncate base with a flat lamina. The petiole of the basal leaves is about the same length as the lamina. The stem leaves are shorter, narrower and have relatively shorter petioles. The inflorescence is a panicle, each branch of which is composed of many whorls of flowers, each of 8 to 12 small reddish flowers. The pedicelate fruits are brown, 1.5-2 mm broad, with prolonged valves with an acute apex, somewhat recurved to 5 mm long.

There are eight indigenous and nine introduced species of *Rumex* recognised in Australia (Rechinger, 1984). The agricultural weeds *R. crispus* and *R. acetosella* are very conspicuous and common in WA; both these species have winged not pointed or horned valves. Indigenous species are "either rare or geographically restricted" - Rechinger found only two species (of a possible five) in three months field work in WA.

Flowering Period: October

Distribution and Habitat

Little is known of the ecology and possible habitat of *R. drummondii,* which was described in 1856 from a Drummond collection (no location). It has since been collected from Gingin in 1938 and from Kalgan River (undated). It was recently re-discovered in the Kalgan area and at Regans Ford in 1993 (Scott pers comm).

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
Rediscovered in the Kalgan area and at Regans Ford north of Perth in 1993.						

WAHerb: 1 record

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

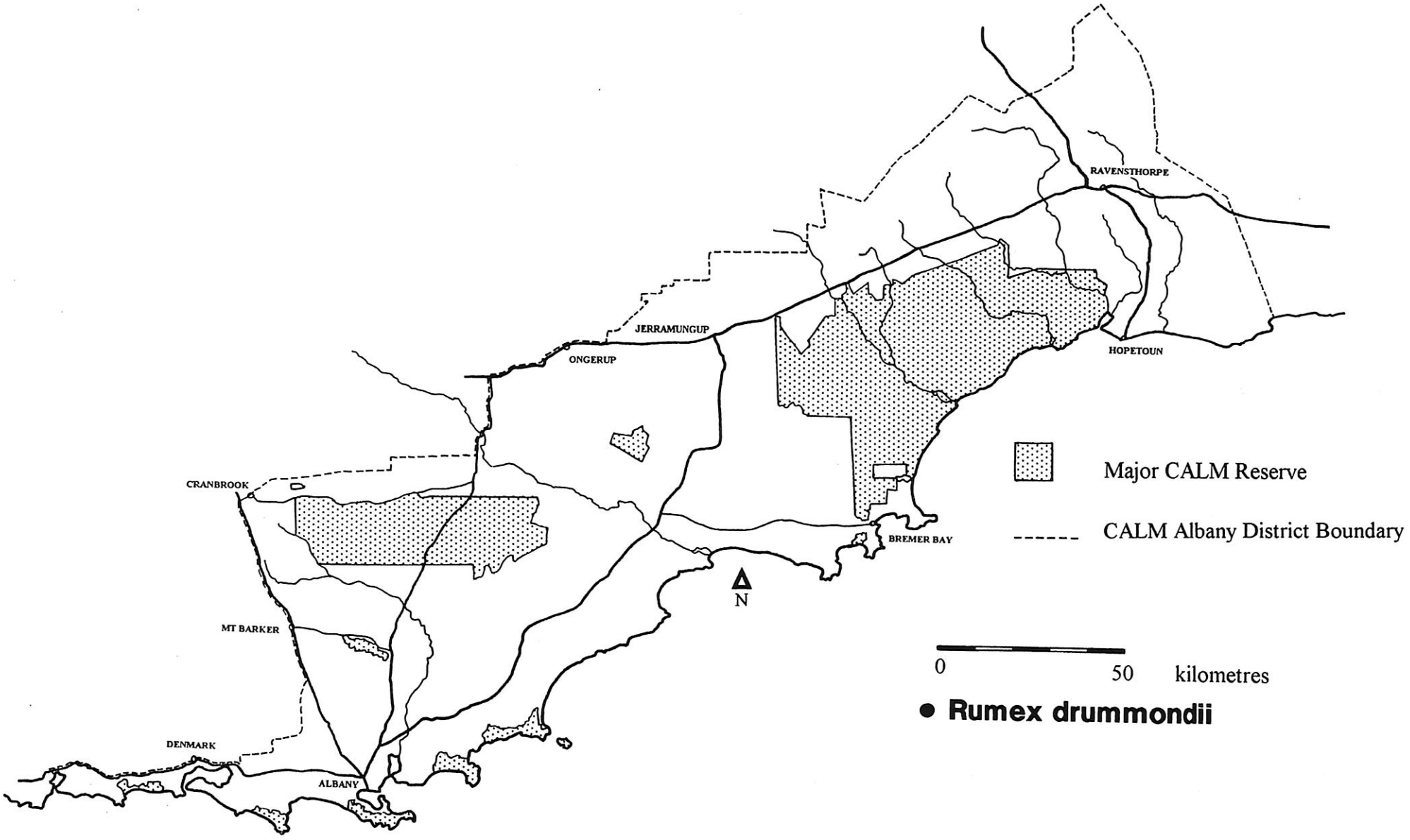
Presumed not susceptible

Management Requirements

Research Requirements

References

Rechinger (1984).


RAVENSTHORPE
HOPETOUN
JERRAMUNGUP
ONGERUP
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
● Rumex drummondii

Schoenus multiglumis Benth. CYPERACEAE

Schoenus multiglumis is a robust rhizomatous sedge, to 70 cm tall, forming clumps to 15 cm wide. The stiff stems, 2 mm wide are slightly flattened and sheathed at the broadened base by a series dark reddish leaves; the last of which forms a shortly mucronate cylinder to just above the soil level. The spikelets (2-3 per axil) arise on 30 mm pedicels from the axils within two sheathing, pale brown, shortly mucronate bracts. The 20 mm spikelet is sheathed in ten or more purplish brown glumes.

This species is similar to and may occur with *S. rodwayanus*, which is however much less robust (to 50 mm) and has up to ten pendulous spikelets.

Flowering Period: September-November

Distribution and Habitat

This species occurs in open heath over sedges in seasonally damp peaty sands. Most sedges have been poorly collected in WA and it is likely that this species may prove to be more common than is currently indicated by the four specimens in the WA Herbarium. It has been collected from Albany (Torndirrup and Bakers Junction), Bow Bridge and Windy Harbour; this is a considerable range with large tracts of suitable habitat in seasonally inundated or damp flats.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Torndirrup	Albany	Alb	NP	30.11.92	+5	healthy
2. Bakers Jctn	Albany	Alb	NR	12.10.92	+50	healthy

WAHerb: 4 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

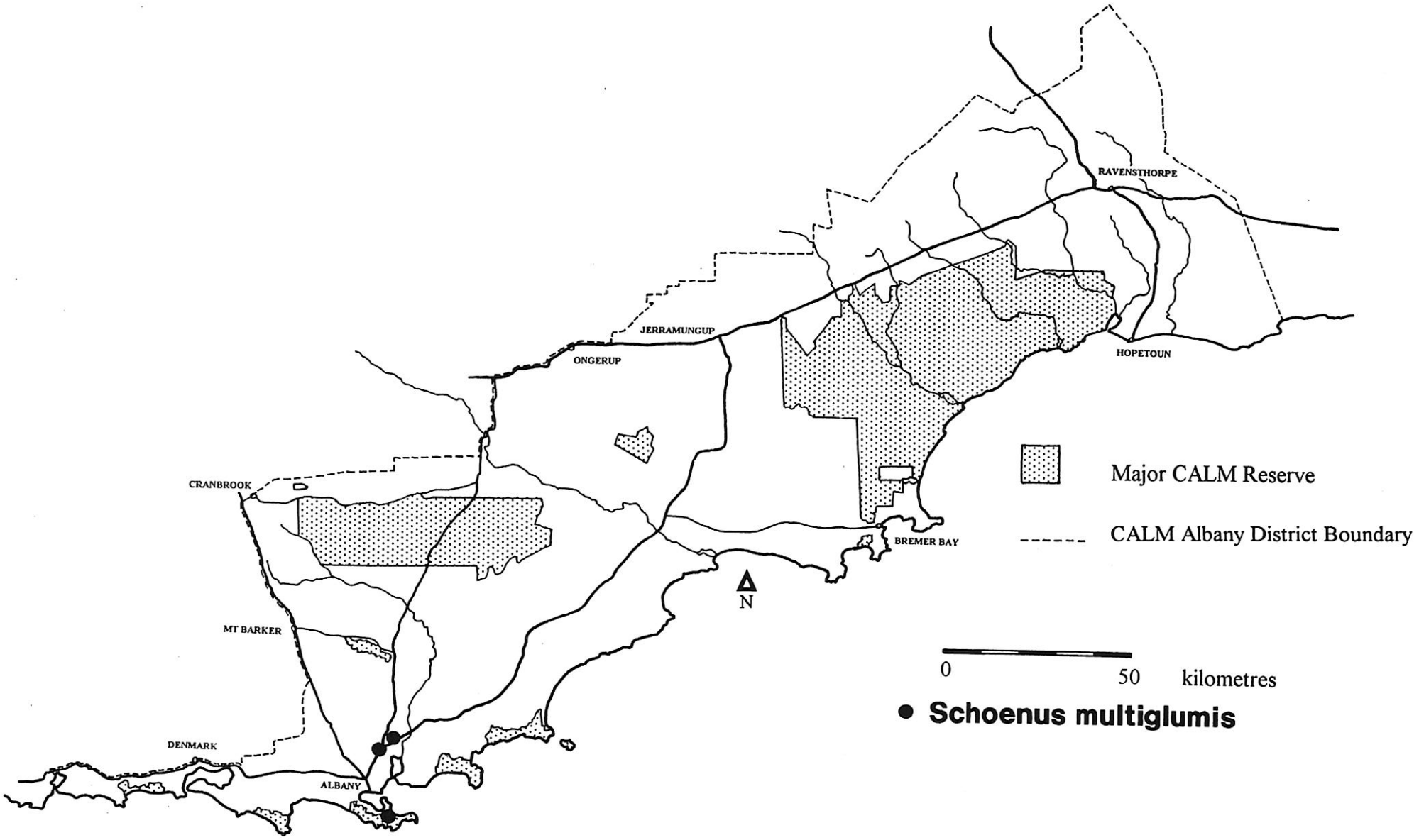
Monitor occasionally

Research Requirements

Survey areas of suitable habitat for new populations

References

Bentham (1878).


RAVENSTHORPE
JERRAMUNGUP
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HOPETOUN
CRANBROOK
BREMER BAY
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DENMARK
ALBANY
Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Schoenus multiglumis

Sollya drummondii Morren

PITTOSPORACEAE

Sollya drummondii is a rambling, twining creeper which may form dense mats within the supporting vegetation. The thin stems are red-brown and the narrow linear leaves to 15 mm, are dull green above and grey-green below with very fine marginal hairs. The 6 mm flowers are bright blue on 12 mm peduncles which are 1 to 3 flowered. The 5 mm torpedo shaped fruits are densely silky hairy. This species is more similar in general appearance to a *Billardiera* than *S. heterophylla* with which it frequently occurs.

Flowering Period: February-March

Distribution and Habitat

Sollya drummondii occurs growing through and over thicket, heath and sedges in creek lines and in river flats in loamy alluvial soils. It is restricted to around Denmark and the immediate hinterland of forest. Recent discoveries indicate that there may be more populations in situations of more secure tenure than road verge or Shire reserve along the river.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Denmark West	Albany	Dnmk	MRD verge	16.10.92	+5	healthy
2. Denmark River	Albany	Dnmk	Shire res.	17.3.92	17	healthy
3. Harewood Frst	Walpole	Dnmk	SF	3.93	2	good
4. Mitchell River	Walpole	Dnmk	SF	1993	+5	-

WAHerb: 4 records

Response to Disturbance

Unknown; parts of the population along the Denmark River have been burnt and regeneration from seed has occurred.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

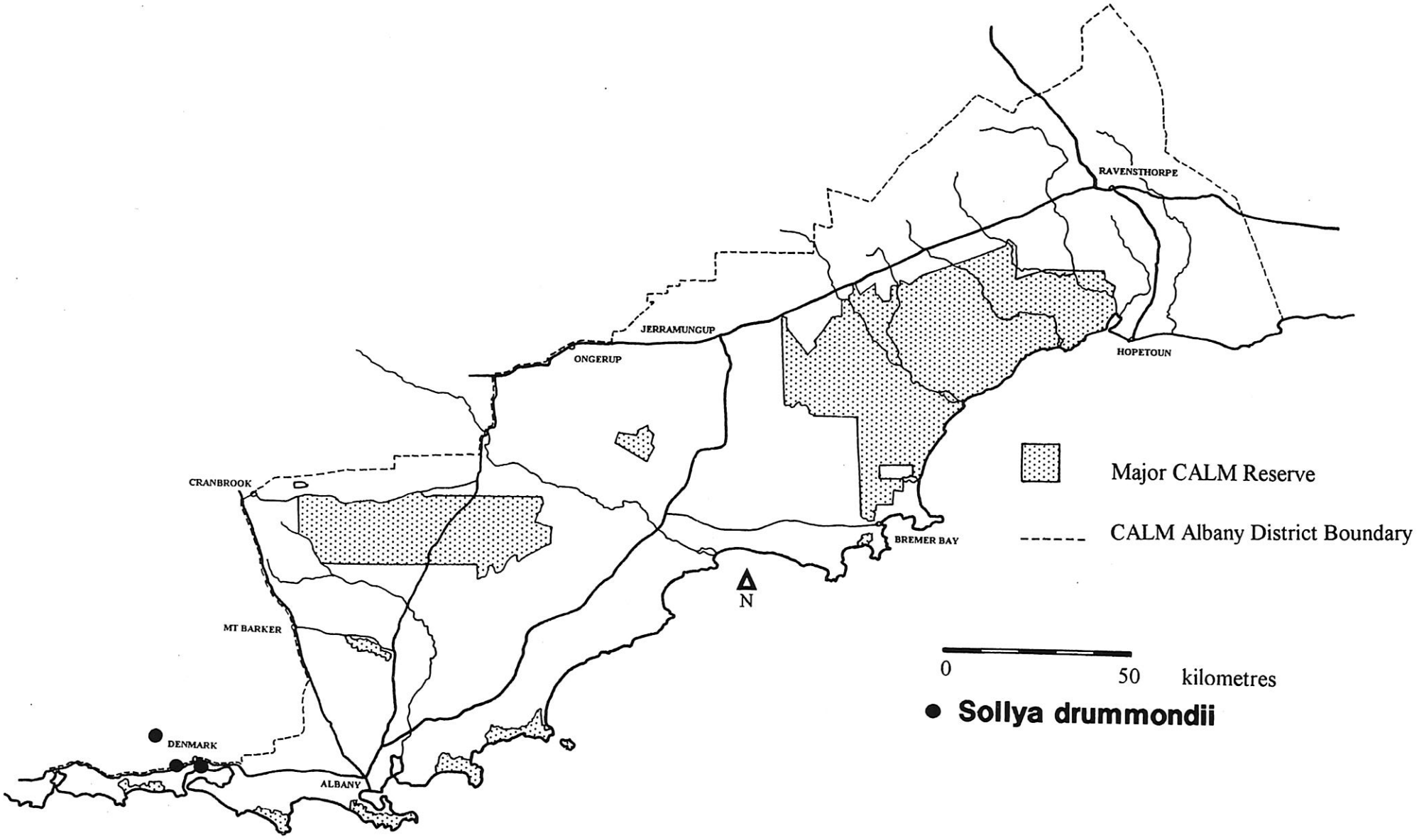
Monitor occasionally

Research Requirements

Survey for new populations in State forest blocks and conservation land around Denmark.

References

Bentham (1863).


RAVENSTHORPE
JERRAMUNGUP
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HOPETOUN
CRANBROOK
BREMER BAY
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DENMARK
ALBANY
Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Sollya drummondii

Stachystemon sp. Mt. Baring (K.R.Newbey 9773) EUPHORBIACEAE

This *Stachystemon* is a low, spreading to rounded shrub 8-18 cm tall with a contorted woody stem with grey rough flaky bark. The 8 mm dark green leaves are very shortly petiolate, lanceolate (1.2 mm wide), crowded, spreading to patent, rigid and pungent, slightly keeled with a prominent midrib underneath. The terminal male inflorescences are numerous and composed of a group of flowers of deep red 3 mm androecium, surrounded by deep red-purple 7-8 mm lanceolate petals and short, broad, deep red sepals. The male flowers have an appearance similar to a *Darwinia*. The female flowers (on the same plant) are apparently few, and the position on the plant not known. The fruit is an elongated top shape, 6 mm long and 3 mm at the base with two small horns (stigmas) at the apex.

Flowering Period: September-October.

Distribution and Habitat

This taxon has been collected only twice; once from north of Mt. Baring from loamy mallee sand plain and once from near Bandalup Hill from a lateritised spongolite breakaway under low Eucalypts and scrub.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
(1) Bandalup Hill	Albany	Rav	VCL	8.9.93	1	healthy

WAHerb: 1 record

Response to Disturbance

Unknown

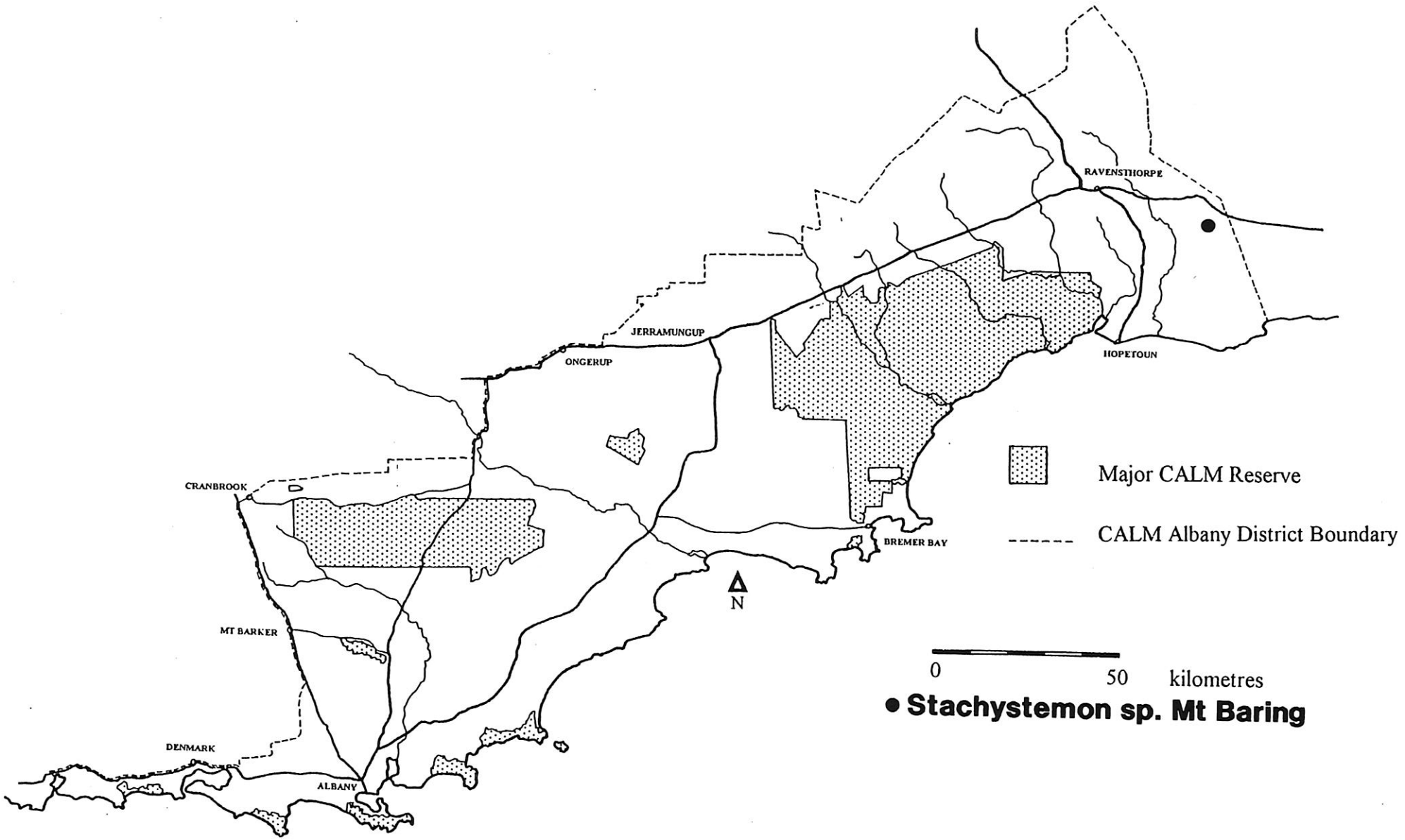
Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

Research Requirements

Survey for new populations around Bandalup Hill and other similar habitat


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
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MT BARKER
DENMARK
ALBANY
Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
● Stachystemon sp. Mt Baring

Stackhousia sp. Stirling Range (W.R.Barker 2399) STACKHOUSIACEAE

This *Stackhousia* is a slender shrub, 5-15 cm, with several to many unbranched stems arising from the base of the plant. The leaves are linear lanceolate to approximately 15 mm. The inflorescence is a one sided simple raceme, with flowers horizontal to slighlty ascending. The flowers appear blackish; the calyx tube is mid-green to black and the corolla light green, tending to greatly blackened with deep yellow anthers. The extremely long slender tips of the corolla, calyx lobes and bracts distinguish it from all other members of the family. The fruit has never been collected, however Barker (pers. comm.) believes "there is a chance that it may not have the obovoid wingless nutlets of *Stackhousia*, but the winged ones of *Tripterococcus*".

Flowering Period: August-September

Distribution and Habitat

This species was first from near Red Gum Pass in 1902. Since then it has been collected from Kamballup (1977 and 1986) and Wellstead (1980). It occurs in mallee-heath on deep white sand or sandy clay over clay. Most recent collections have been made only after the vegetation has been burnt (and rolled); the plant is presumably short lived (less than ten years).

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition

There is currently no known population existing: Three plants were recorded from the now cleared "type" locality (10 km NNE of Kamballup) and it has been reported as "common" 1 km west of Kamballup, in burnt mallee (Keighery, pers. comm.).

WAHerb: 3 records

Response to Disturbance

Seed germination appears to be stimulated by fire (and rolling).

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

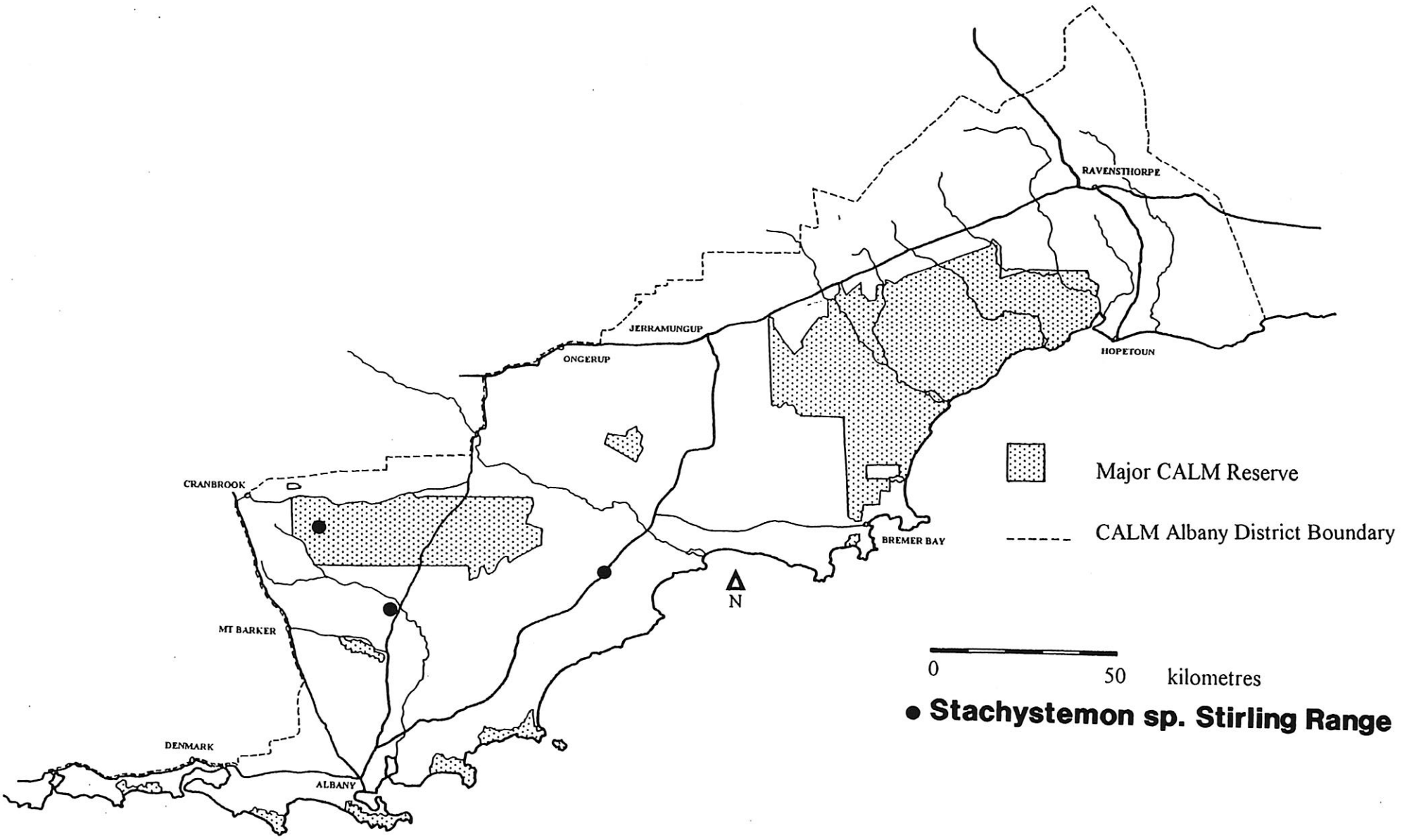
Management Requirements

Research Requirements

Survey for new populations in any recently burnt mallee-heath in sandy soil around the Stirling Range and south east to Wellstead.

References

W.R. Barker (pers. comm.)


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
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MT BARKER
DENMARK
ALBANY
Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
● Stachystemon sp. Stirling Range

Thomasia dielsii E.Pritz. STERCULIACEAE

Thomasia dielsii is a low sprawling shrub, to 50 cm tall with oblong-elliptical leaves 15-20 mm long with a slightly undulate and minutely toothed margins. This species appears very similar in habit to *T. purpurea* but differs in having leaves more densely tomentose below than above, rather than equally hairy (Paust pers. comm), and having a four-(rarely five) celled ovary, not three-celled as in *T. purpurea.*

The flowers are arranged in a loose panicle, and are composed of a broadly united, conspicuous purple-mauve calyx, and almost absent corolla. The ovary is glabrous.

Further taxonomic work is required. E. Bennett (pers. comm.) and student botanists will be revising this group in the near future.

Flowering Period: September-November.

Distribution and Habitat

This species occurs in sandy or gravelly loam, supporting woodland of Marri and Flat Topped Yate. It occurs near and east of Cranbrook, north of the Stirling Range.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Salt River Rd	Albany	Gno	WAWA	1.12.92	12	healthy

WAHerb: 3 records (includes 2 isosyntypes).

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

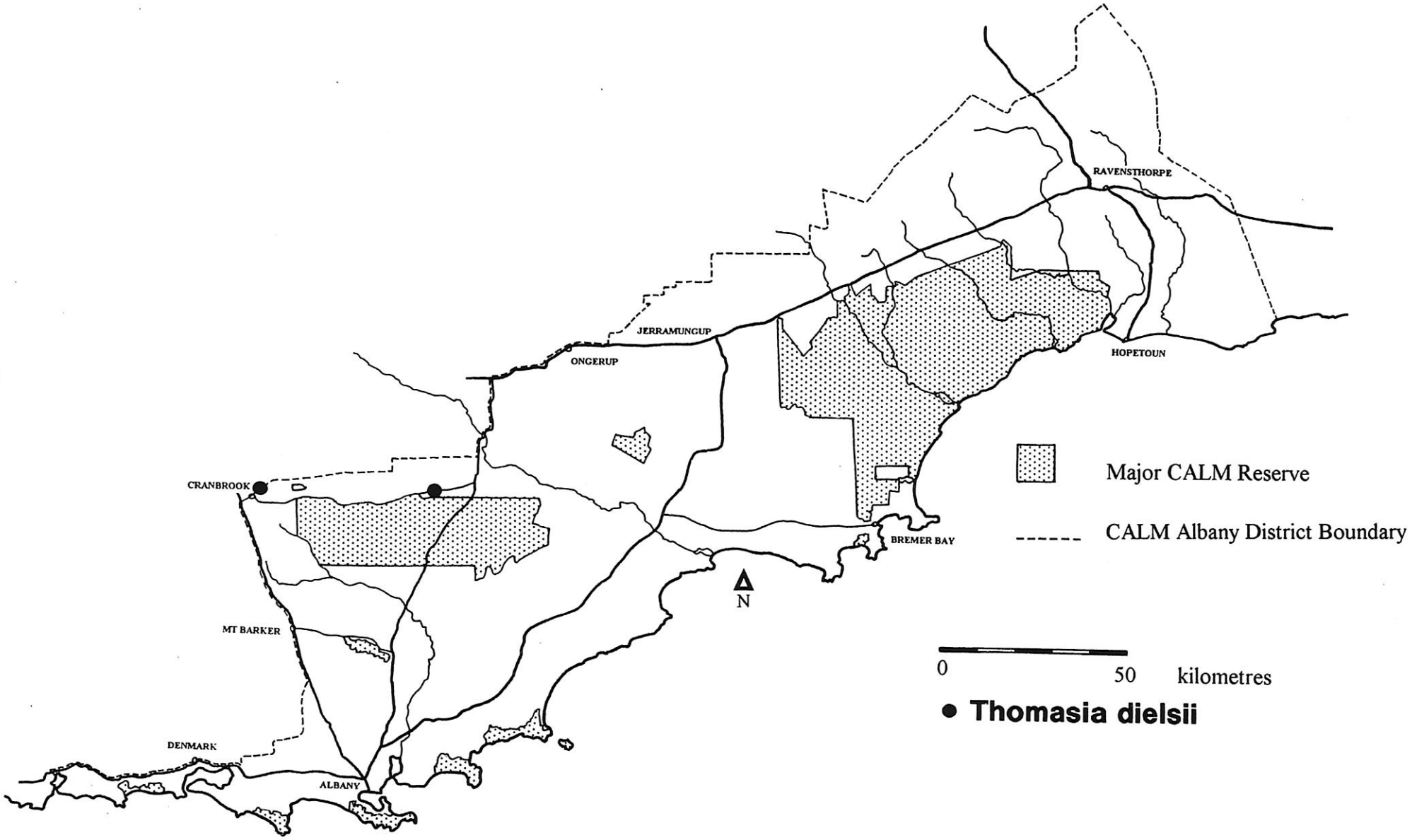
Monitor Water Reserve population and notify WAWA

Research Requirements

- survey for new populations around Cranbrook and along Salt River Road
- a taxonomic revision of the genus *Thomasia* is required

References

Diels and Pritzel (1904), S. Downes (pers. comm.).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
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DENMARK
ALBANY
Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Thomasia dielsii

The isotype (Diels 5528) of this species of *Thomasia* is very similar in appearance to the common *T. purpurea,* but apparently differs (Susan Paust pers. comm.y) in having a tomentose or glandular, not papillate ovary. A specimen collected (November 1992) on the slopes of Warriup Hill could not be keyed to *T. multiflora* using as the ovary was papillate, not tomentose. However the original (Pritzel) description "ovario globoso breviter tomentoso" could possibly be interpreted as the ovary being papillate.

This species is a low sub-shrub to 50 cm, with dense mid green leaves (15-30 mm), with scattered stellate hairs on the lower and upper surfaces and margins. The inflorescences are axillary racemes of 6-12 flowers, 4-6 cm long. Each flower has very reduced petals and a conspicuous, globular (to 5 mm), membranous, purple calyx. The ovary is shortly tomentose, and of three (sometimes four) locules.

Further taxonomic clarification is required to distinguish this species.

Flowering Period: October-November

Distribution and Habitat

Little is known of the habitat of this species except for the collection from Warriup Hill which was made from brown loam over granite supporting an association of Marri-Yate woodland over shrubs (including *T. foliosa*). A white flowered form was present at the Warriup location.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Warriup Hill	Albany	Alb	private	2.11.92	+100	healthy

WAHerb: 3 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

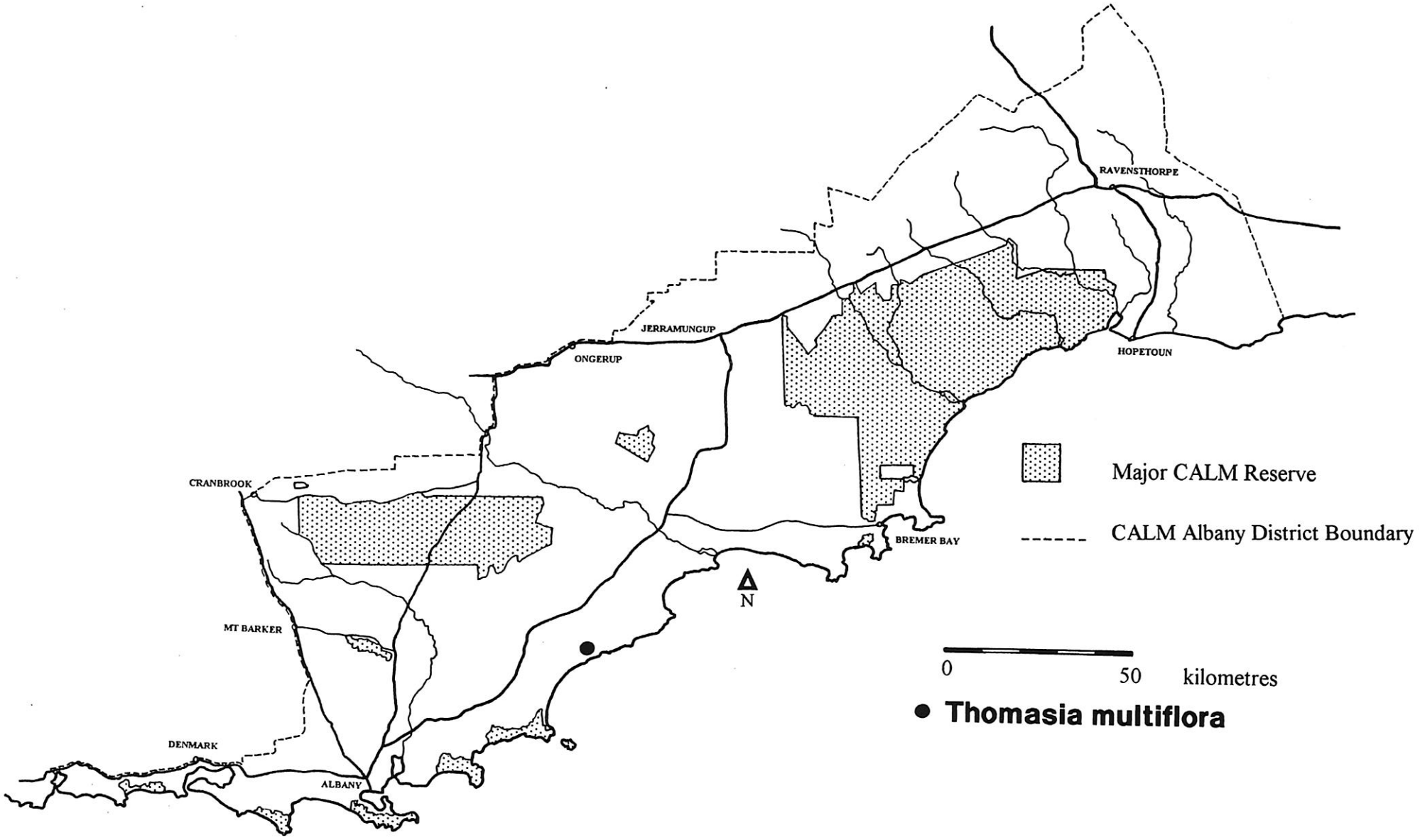
Monitor occasionally

Research Requirements

- a taxonomic revision is required for *Thomasia*
- a resurvey for this species may be required, depending upon the taxonomic revision

References

Diels and Pritzel (1904), S. Downes (pers. comm.).


RAVENSTHORPE
JERRAMUNGUP
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BREMER BAY
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DENMARK
ALBANY
Major CALM Reserve
CALM Albany District Boundary
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kilometres
Thomasia multiflora

Thomasia quercifolia (Andrews) Gay STERCULIACEAE

This species was initially described as *Lasiopetalum quercifolium* (Andrews, 1812) apparently from material cultivated in England. There is no record of the existence of a type specimen. A drawing of the cultivated plant is included in the original description, and there is an indication that the plant was "introduced from New South Wales".

Subsequently, Gay (1821) reclassified it into the genus *Thomasia*, still with no reference to a type specimen. He gives the origin as "Nova Hollandia" and states that it was introduced to England for cultivation in 1803. This early date makes it highly unlikely that it was of Western Australian origin, as only one British collector, Menzies, had been to Albany (in 1791). Gay's description is more detailed than Andrews', and he indicates that this species was also grown in France.

Bentham (1863), however sites collections of *T. quercifolia* by Drummond, Brown, Preiss, Maxwell and others as coming from Western Australia.

In the WA Herbarium there were three specimens. Two were quite clearly *T. triloba* and the third, collected from Big Grove, Albany in the 1950's (originally determined as *T. foliosa,* and later redetermined by Paust as *T. quercifolia*) looks very similar to the drawing in Andrews (1812). Several specimens were collected from Big Grove, in 1992, which were also very similar to the original drawing, but may be hybrids between *T. purpurea* and *T. solanacea* (which has large oak shaped leaves).

A revision is required to clarify the status of this taxon.

Flowering Period: Spring

Distribution and Habitat

Distribution and Habitat cannot be determined until the taxonomic uncertainties for this species have been resolved.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Big Grove	Albany	Alb	WAWA	30.11.92	4?hybrids	healthy

WAHerb: 3 records (2 definitely not *T. quercifolia*)

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

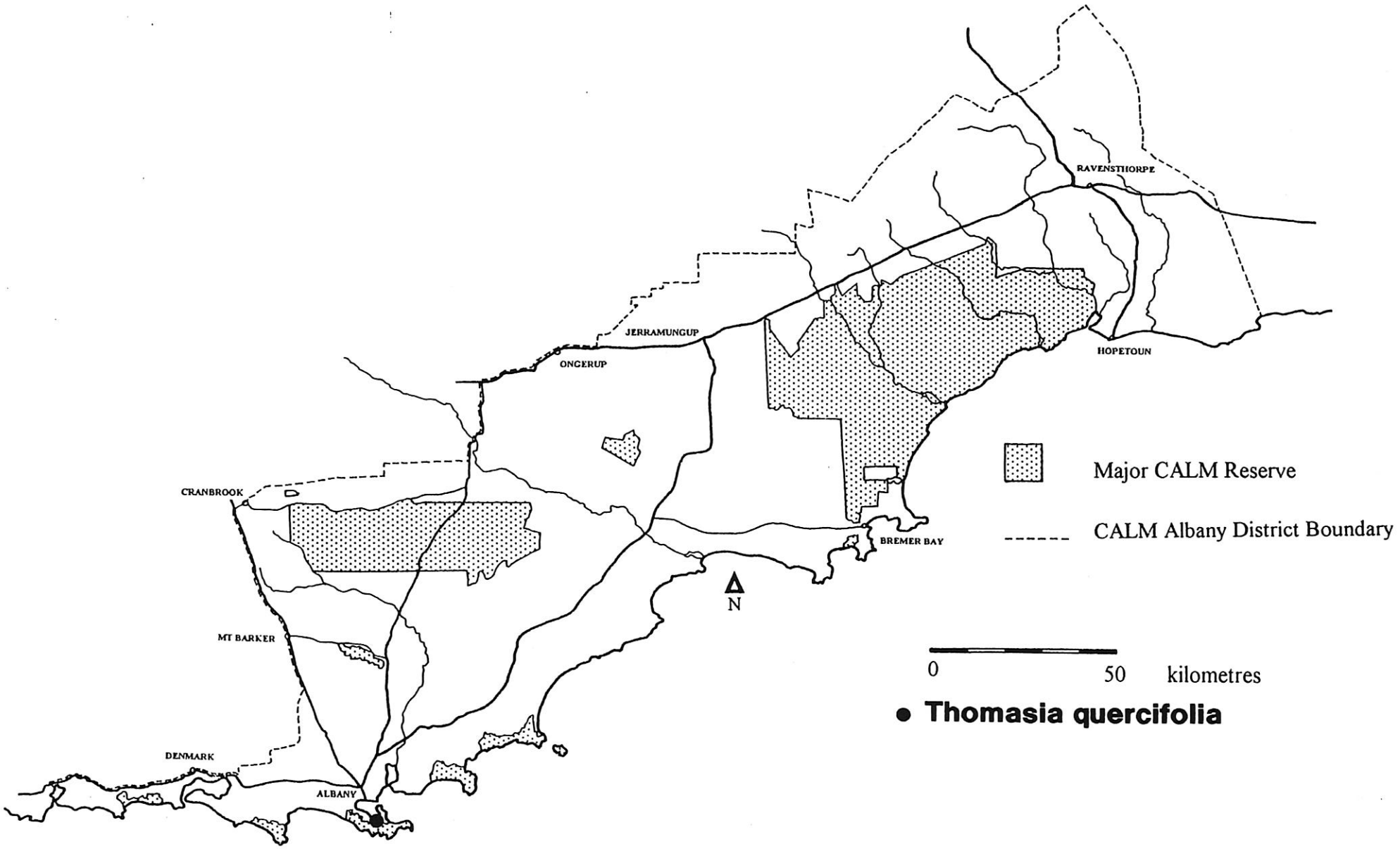
Management Requirements

Research Requirements

Taxonomic revision is required for the genus *Thomasia*

References

Andrews (1812), Bentham (1863), Gay (1812), Labillardiere (1804).


RAVENSTHORPE
JERRAMUNGUP
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CRANBROOK
BREMER BAY
MT BARKER
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ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Thomasia quercifolia

Thysanotus isantherus R.Br.

ANTHERIACEAE

Granite Fringe-Lily

Thysanotus isantherus is a small, perennial herb with tuberous roots; the aerial parts desiccate each summer. The tubers are ellipsoidal, 8x4 mm and 10-15 mm from the stock of the plant. The annual leaves (up to six) are dark green, filiform terete to 15 cm long and slightly curled at the apex. There are one or two inflorescences per plant, composed of an often procumbent scape not exceeding the leaves, supporting an umbel of 1-5 flowers. The purple-mauve perianth segments are 7 mm long; the petals fringed by fimbriae to 1.5 mm are twice as broad as the sepals. The six anthers are equal length.

Flowering Period: November

Distribution and Habitat

This Fringe Lily occurs in moss swards on granite outcrops immediately around Albany Town, west of Denmark and on Shannon Rock. This a wide range and it is expected that it may occur on other outcrops in this area. Granite outcrops at Two Peoples Bay and Warriup Hill were surveyed for this species without success.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Mt Clarence	Albany	Alb	Town	8.10.92	35	good
2. Mt Melville	Albany	Alb	Town	25.10.93	+30	in bud
3. Niggerhead Rk	Albany	Alb	NP	29.10.92	22	good
4. Mehniup Hill	Albany	Alb	NR	10.10.93	+60	in bud
5. Vancouver Pen.	Albany	Alb	Shire res.	5.10.93	6	-
6. Mt Taylor	Albany	Alb	NP	2.9.93	+100	-

WAHerb: 4 records

Response to Disturbance

Unknown; however their survival is dependent upon the moss sward they live in and hence any factors (such as weed invasion) which adversely affect the moss will be detrimental to this species.

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

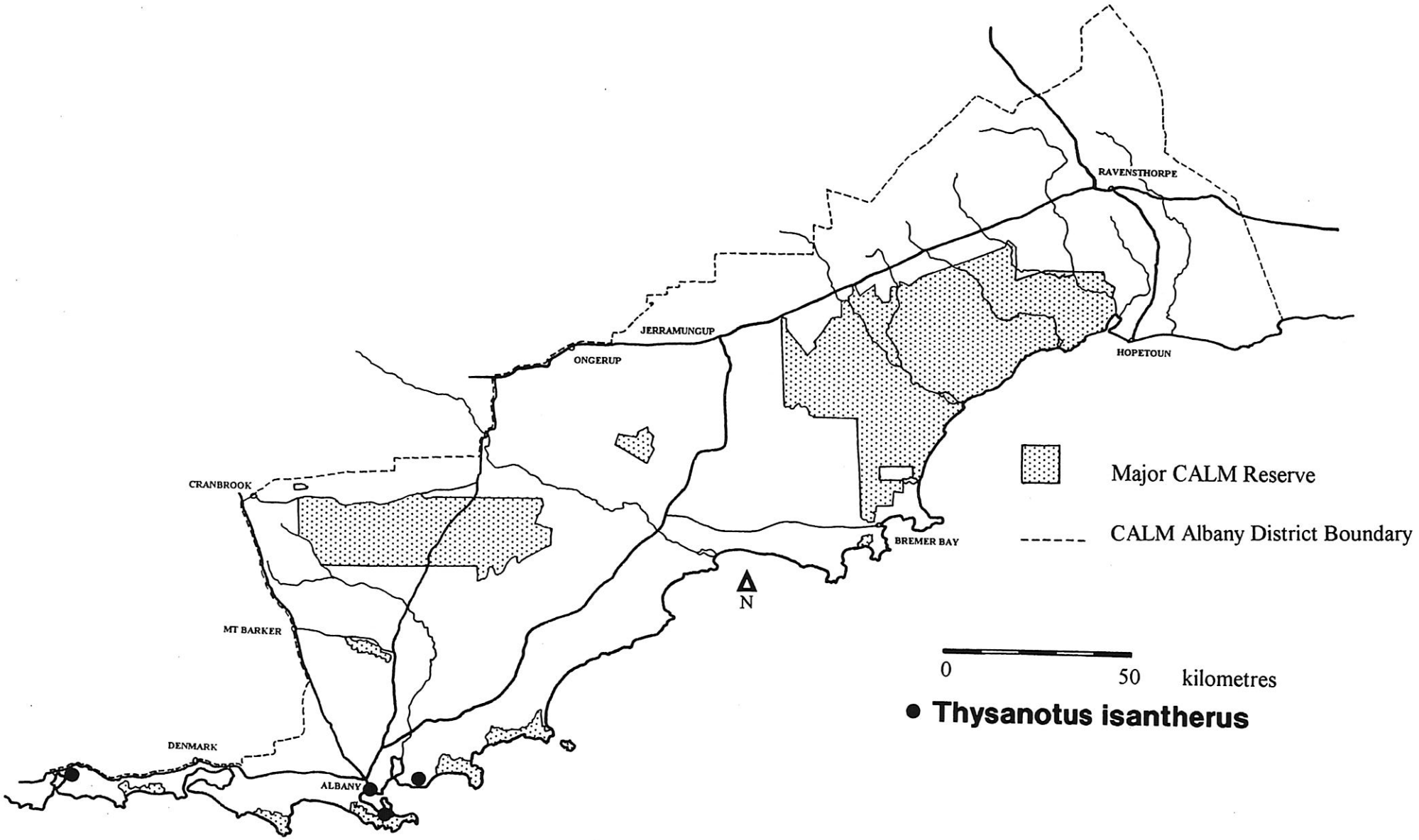
Monitor populations occasionally.

Research Requirements

Survey for new populations, particularly on granite outcrops in conservation land between Albany and Shannon Rock.

References

Brittan (1981, 1987).


RAVENSTHORPE
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CALM Albany District Boundary
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kilometres
Thysanotus isantherus

Verticordia huegelii Endl. var. *tridens* A.S.George MYRTACEAE

Variegated Featherflower

This species is an erect, slender spreading shrub to 40 cm. *Verticordia hugelii* is a variable species, with four varieties recognised by George (1991). Variety *tridens* is distinguished from other varieties by having linear-subulate staminodes (which are usually trident), not acuminate fringed as in the other subspecies. The flowers are pale lemon yellow, turning red with age. The petals and calyx lobes are deeply fringed, with ciliate reflexed lobes on the latter. The buds are covered by large, deciduous pale bracteoles. The linear leaves (to 12 mm) are crowded on lateral shoots.

Flowering Period: October-November

Distribution and Habitat

This variety has been collected over a wide range, from Wongan Hills to Kamballup. However almost all locations have been small populations on road verges and only one collection (Tutanning) was made on conservation reserve. Four locations are recorded in the Albany District on WAHerb, however, only two very small populations were relocated following detailed survey. The Takalarup population was located less than one metre from the gravel road surface. Road verges are unlikely to provide long term security for this species. Two populations on Woogenilup Road could not be relocated from relatively precise location information.

Conservation Status

Current: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Kamballup	Albany	Pl	Shire res.	21.10.92	6	small
2. Takalarup	Albany	Alb	Shire verge	28.10.92	3	fair

WAHerb: 17 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

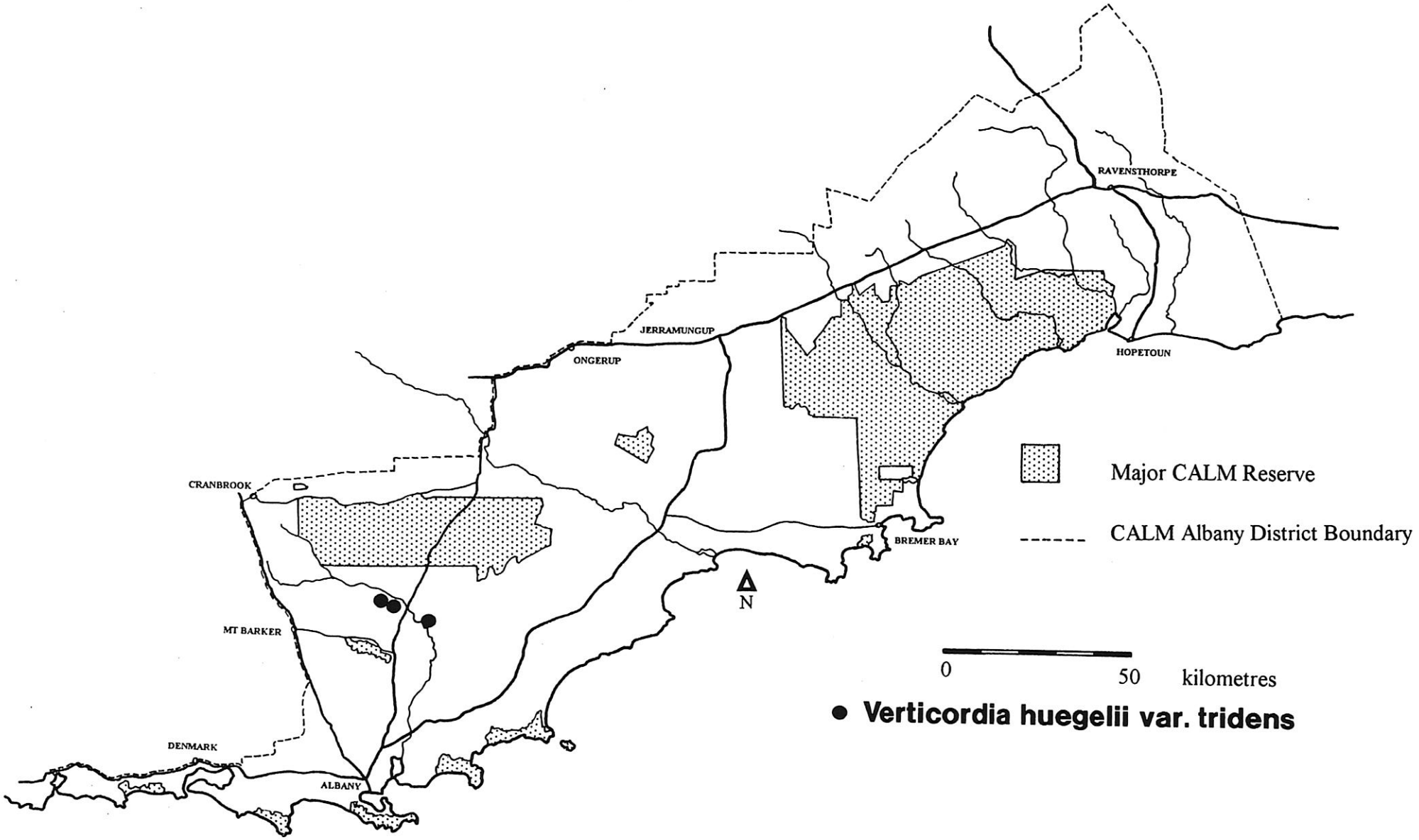
- monitor known populations occasionally
- change purpose of Kamballup Reserve to Nature Conservation

Research Requirements

Survey opportunistically to locate new populations, especially on conservation reserves.

References

George (1991).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Verticordia huegelii var. tridens

B. Priority Two Taxa

Acacia awestoniana Cowan & Maslin — MIMOSACEAE

Arthur's Wattle

This wattle is a tall, openly branched spreading shrub to 3 m, branching just above ground level. The bark is longitudinally fissured at the base of the trunk and grey to red-brown on the branchlets. The branchlets are terete and heavily resinous apically and at the nodes. The obliquely ovate stipules, 2-2.5 mm long are persistent. The phyllodes are patent, undulate, ovate to elliptic, 15-30 mm long with a shortly acuminate tip. The glabrous lamina has 3-4 distant, longitudinal raised nerves, which anastomose openly with secondary nerves. The inflorescences are on short 2-7 mm racemes which are puberulous and resinous supporting up to three heads on peduncles 12-20 mm long. Flower heads are globular, golden, 5-6 mm in diameter and composed of 54-60 flowers. The legumes are narrowly oblong, 10-22 mm long, straight, villous with strongly thickened margins.

It is closely related to *A. dictyoneura* but differs from that species in having much larger phyllodes, stipules and bracts.

Flowering Period: October-November

Distribution and Habitat

Acacia awestoniana has been collected from three locations within the Stirling Range National Park, where it grows in open Wandoo woodland or watercourses, growing in clay soils. Currently the species is only known from the nine plants at the type location (which have not produced seed), and another unconfirmed report of three plants in Papa Colla Creek. This location may have been burnt in April 1991. Considerable survey effort has been directed to finding more populations, but without success.

Conservation Status

Current: Priority 2

Recommended: Priority 2 (with highest priority for further survey and consideration for gazettal as DRF)

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Chester Pass Rd	Albany	Gno	NP	3.2.93	9	healthy
2. Papa Colla	Albany	Gno	NP	1990	3	unconfirmed

WAHerb: 8 records

Response to Disturbance

Killed by fire and regenerates from seed.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

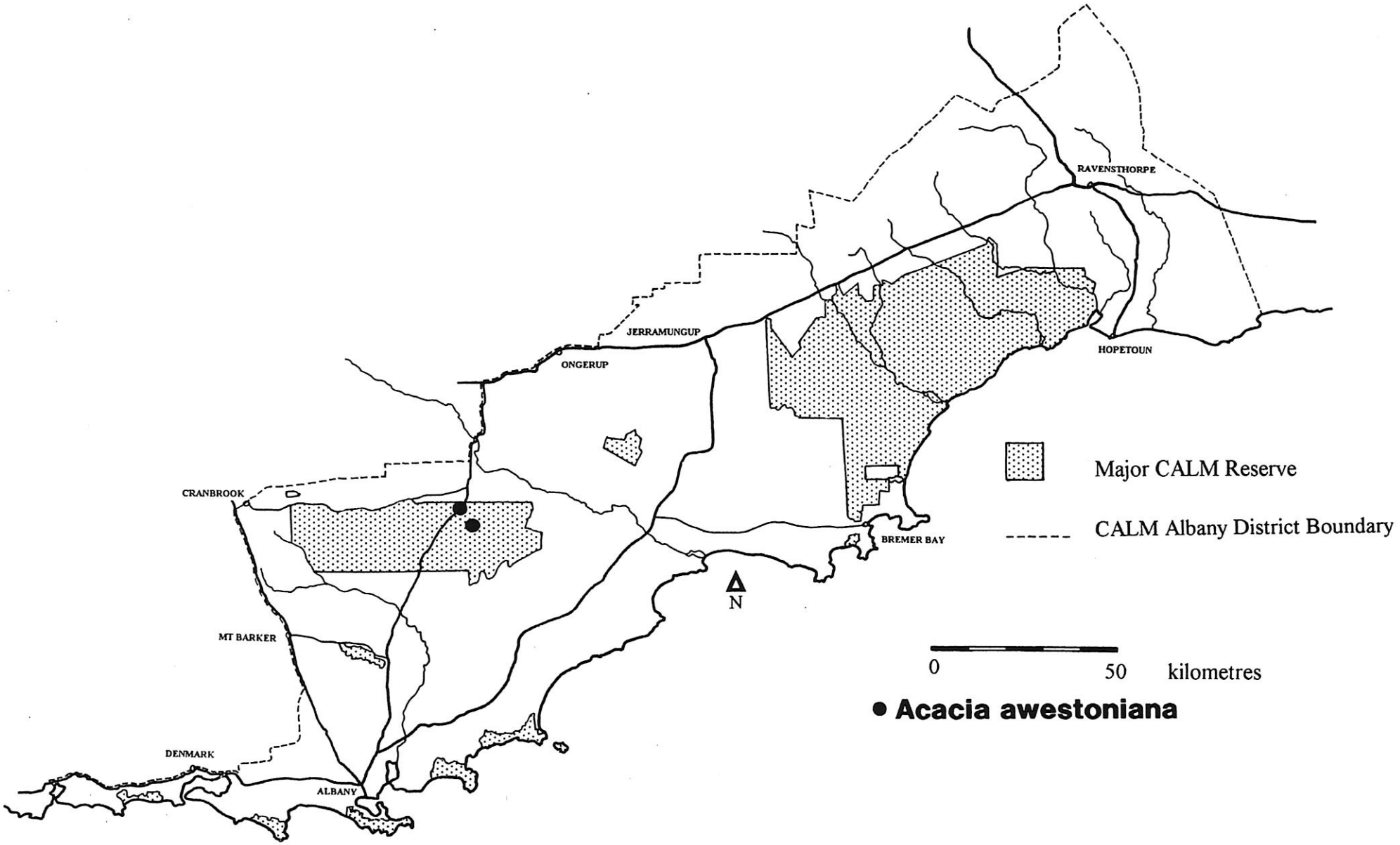
- monitor occasionally
- collect seed for storage

Research Requirements

- relocate and confirm Papa Colla Creek Population
- survey for new populations

References

Cowan and Maslin (1990a).


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CALM Albany District Boundary
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kilometres
● Acacia awestoniana

Acacia dictyoneura E.Pritz. MIMOSACEAE

Acacia dictyoneura is a small, compact shrub to 1.5 m tall. The phyllodes are broadly ovate with undulate margins, and are less than 2 cm long with a raised reticulate network of nerves. The phyllodes are dark green coriaceous, generally tending to ascending and with a short, blunt, upwardly curved point. The stems are slightly angled and are shortly puberulous. The inflorescences are axillary on short branchlets at the ends of the main branches. The golden heads are globular, 5 mm in diameter and borne on 6 mm peduncles which are solitary in the axils of the branchlets.

Flowering Period: September

Distribution and Habitat

Acacia dictyoneura occurs from Borden, through to Cape Riche and the mouth and upper reaches of the Pallinup River to the Fitzgerald River area. It grows in heavy to sandy loam as an understorey to mallets and taller Eucalypts. WAHerb records indicate it occurs in the FRNP.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Millers Point	Albany	Jer	Shire res.	17.11.92	+100	healthy
2. Marra Bridge	Albany	Jer	?	9.83	+100	in flower
3. Greaves Hill	Albany	Gno	private	16.9.93	+100	in flower

WAHerb: 15 records

Response to Disturbance

Unknown; presumed to be killed by fire and regenerate from seed.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

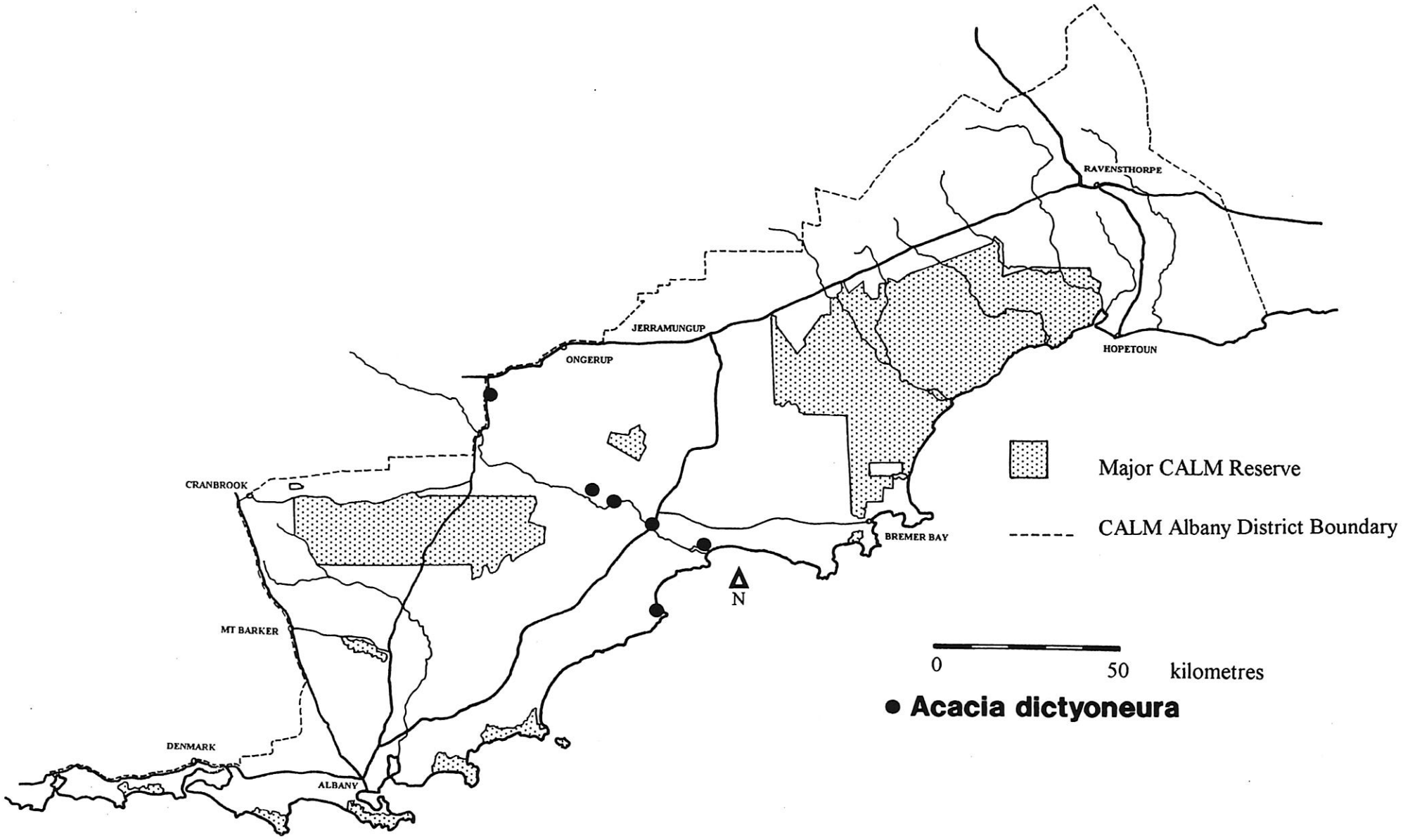
Monitor occasionally

Research Requirements

- relocate and survey WAHerb locations
- survey opportunistically for new populations

References

Diels and Pritzel (1904).


RAVENSTHORPE
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BREMER BAY
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Major CALM Reserve
CALM Albany District Boundary
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50
kilometres
● Acacia dictyoneura

Acacia disticha Maslin ms

MIMOSACEAE

Acacia disticha ms is a glabrous shrub to 2 m tall (in sheltered situations). The stems are reddish-green and flattened considerably, with conspicuous scars from deciduous stipules. The dull green phyllodes (reddish when young) are distichous (arranged in opposite rows) along the two flattened edges of the stems, but may tend to spiral on older, terete branchlets. The phyllodes are elliptic, obtuse, with one major and one minor nerve, and a very short mucrone. Phyllode size is considerably variable, 30-45 mm long and 5-25 mm wide. The inflorescence is on a peduncle 7-11 mm long, one or two in the axils of the phyllodes or on a two headed raceme. The heads are globular, bright cream and composed of 6-7 flowers. The legume is narrowly oblong 35-40 mm long, slightly twisted with thickened margins and no gross constrictions.

This species is in the *A. myrtifolia* group.

Flowering Period: August-October

Distribution and Habitat

Acacia disticha ms has been collected over a range of 150 km from Corackerup Creek area, through Thumb Peak (FRNP) to near Kundip. It occurs in creeklines in sandy or loamy clay, supporting woodland over dense heath.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Kundip	Albany	Rav	VCL	8.9.92	common*	healthy

WAHerb: 7 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

Monitor occasionally

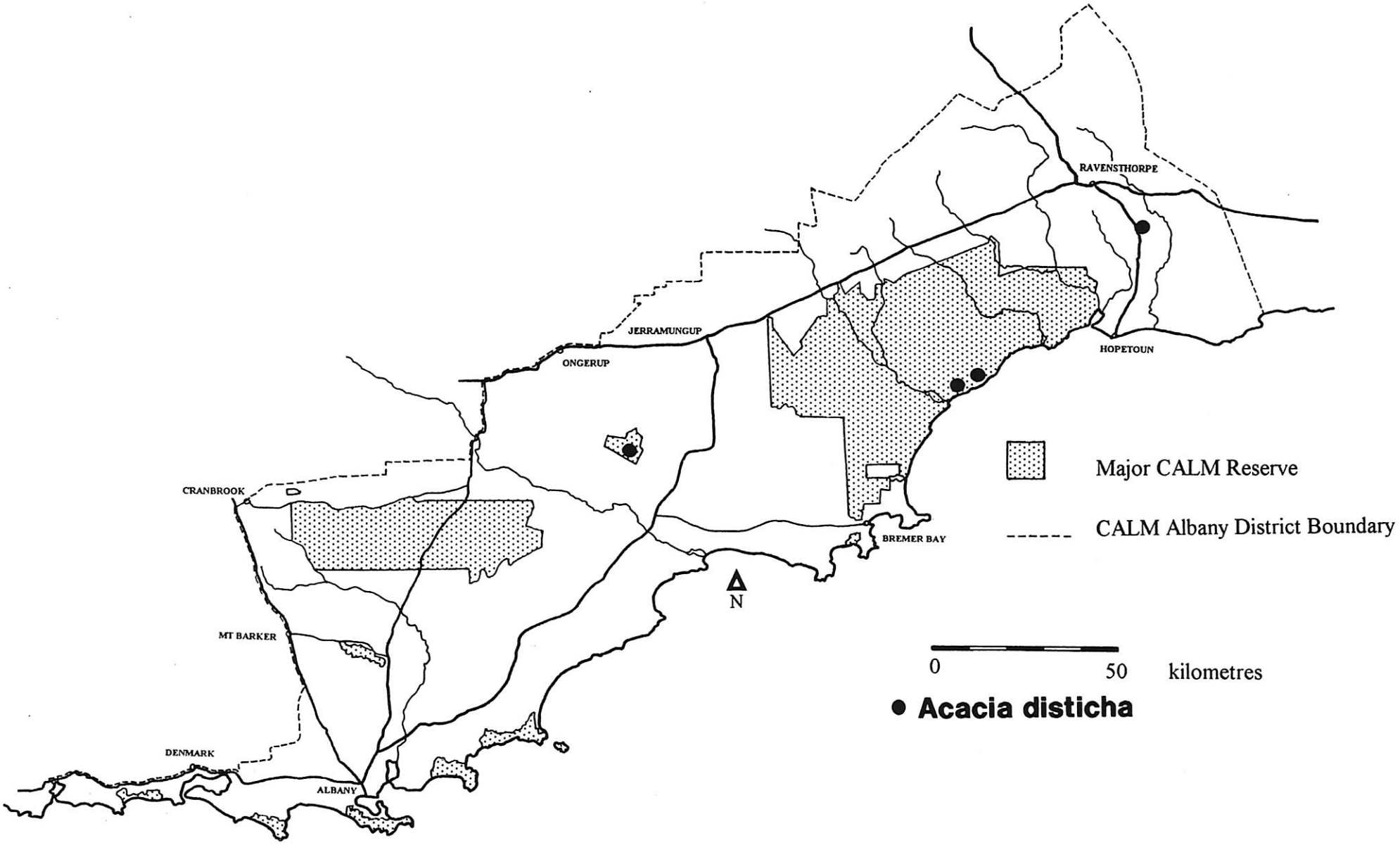
Research Requirements

- relocate and survey WAHerb locations
- survey opportunistically for new populations

References

B.R. Maslin (pers. comm.).

* G.F. Craig (pers. comm.).


RAVENSTHORPE
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
● Acacia disticha

Acacia heteroclita subsp. *valida* Maslin ms MIMOSACEAE

This wattle is a small tree to 4 m tall. Branchlets are compressed to terete, glabrous to sparsely appressed-puberulous with new growth being golden yellow, silky hairy. The phyllodes are linear, acutely-acuminate 5-9 cm long and 4-9 mm wide and rigid-coriaceous, patent to ascending and tending to be curved. The phyllodes are puberulous becoming glabrous, except at apex and have three main nerves strongly raised. The globular, golden flower heads are one or two per axil on a peduncle 5-12 mm long, and composed of 25-60 densely congested flowers. The legume is 75-80 mm long, 7-9 mm wide, straight to sometimes flexuose and glabrous to sparsely appressed-puberulous.

Subspecies *heteroclita* ms has narrower (3-4 mm) phyllodes and a shorter and narrower legume (55 mm).

Flowering Period: September-February.

Distribution and Habitat

This subspecies is considered to be an endemic of the Porongurup Range, where it occurs in shallow loams over granite.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Below Gib. Rock	Albany	Pl	NP	3.2.93	+500	healthy

WAHerb: 10 records

Response to Disturbance

Unknown; likely to resprout from seed after fire.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

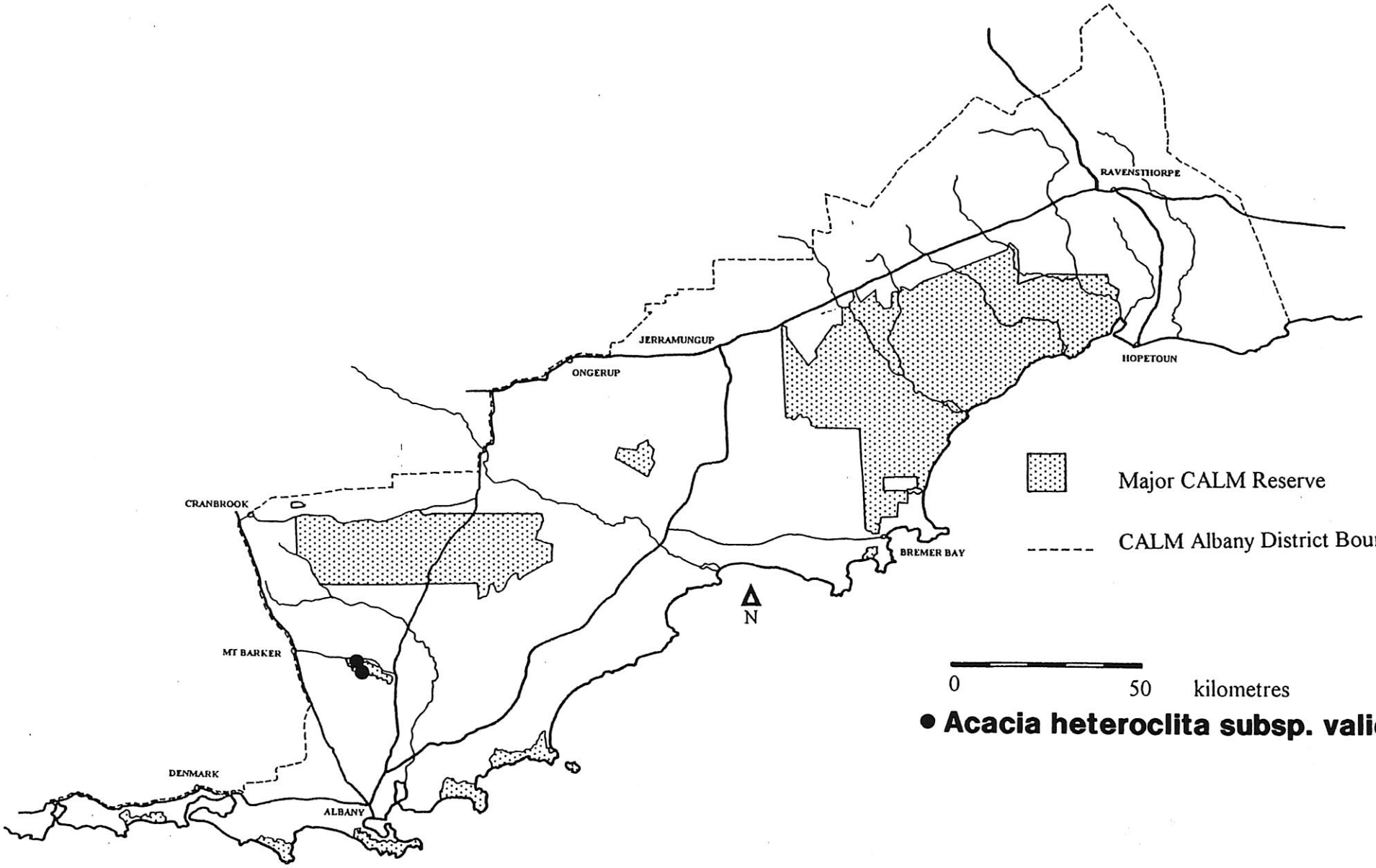
Management Requirements

Monitor occasionally

Research Requirements

References

Lehmann (1844), B.R. Maslin (pers. comm.).


RAVENSTHORPE
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CRANBROOK
BREMER BAY
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ALBANY
Major CALM Reserve
CALM Albany District Boundary
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kilometres
● Acacia heteroclita subsp. valida ms

Acacia ophiolithica Cowan & Maslin ms

MIMOSACEAE

Acacia ophiolithica ms is a rounded shrub, 0.3 to 2 m tall with yellowish green foliage. The glabrous branchlets are terete to slightly angled. The crowded, terete phyllodes are obliquely mucronate, 2-4.5 cm long and 0.7-1 mm in diameter, ascending to erect becoming patent, straight, glabrous with 4 or 6 distant nerves which are immersed and obscure. The globular golden flower heads are axillary, two per axil, on filiform peduncles to 13 mm long. The heads are 10-15 flowered and up to 3.5 mm in diameter. The straight or slightly curved legume is linear (to 3.7 cm) and slightly raised over but not constricted between the seeds.

Flowering Period: August-November

Distribution and Habitat

This species is restricted to, but locally common in the area around the Jerdacuttup River, and east to south east of Ravensthorpe in the Ravensthorpe Range and Kundip. It is not known from any conservation land although it has been collected from 6 locations. It grows in yellow brown clay or loamy clay on or near rocky riverbanks in association with mallee scrubland.

Conservation Status

Current: Priority 2

Recommended: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Ravensthorpe 36km E	Albany	Rav	verge	27.11.81	dense-WH	good
2. Ravensthorpe Range	Albany	Rav	VCL	27.10.87	scattered-WH	in flower
3. Ravensthorpe 23km E	Albany	Rav	verge	25.9.83	loc common-WH	in flower

WAHerb: 16 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

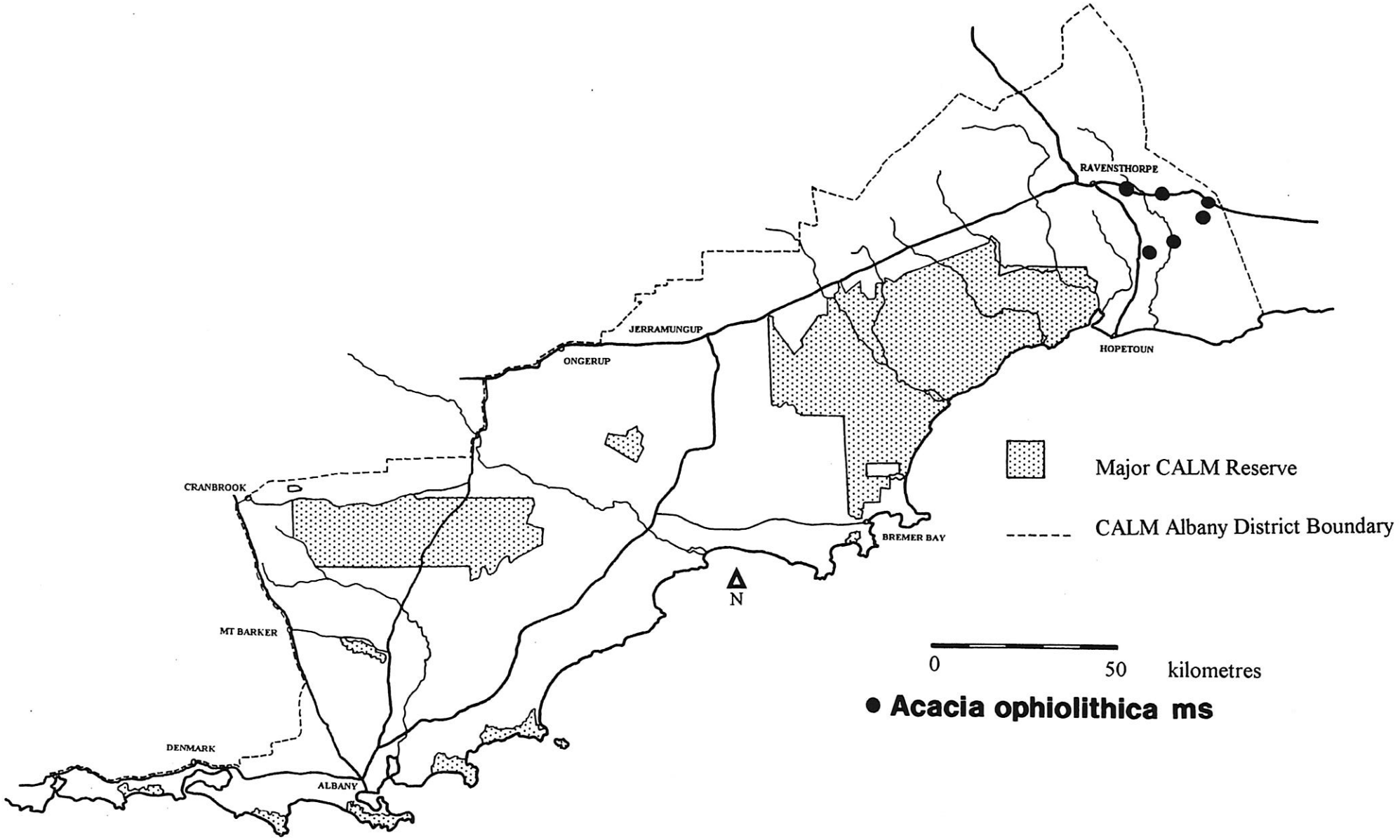
Management Requirements

Monitor occasionally

Research Requirements

References

B.R. Maslin (pers. comm.).


RAVENSTHORPE
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BREMER BAY
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
● Acacia ophiolithica ms

Acacia papulosa Cowan & Maslin ms

MIMOSACEAE

Acacia papulosa is a dense bushy shrub to 2 m tall. The branchlets are slender, glabrous to papulose. The phyllodes are terete, deeply 8 sulcate (nerved), subpungent apiculate, 2-6 cm long and 0.7-1 mm diameter. They are ascending to erect, slightly incurved and glabrous, except on the raised internerves which are papulose. The globular to oblong flower heads (2.5-3.5 mm long) are 10-20 flowered, two per node on peduncles 3.5-5 mm long. The legumes are slightly curved, glabrous resinous, linear (4 cm long and 2.5 wide), with slight constrictions between the seeds.

Flowering Period: August-November

Distribution and Habitat

This species has been collected from only two locations; Boxwood Hills and Fitzgerald River gorge. It occurs in spongolitic soil in woodland.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent population survey.						

WAHerb: 9 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

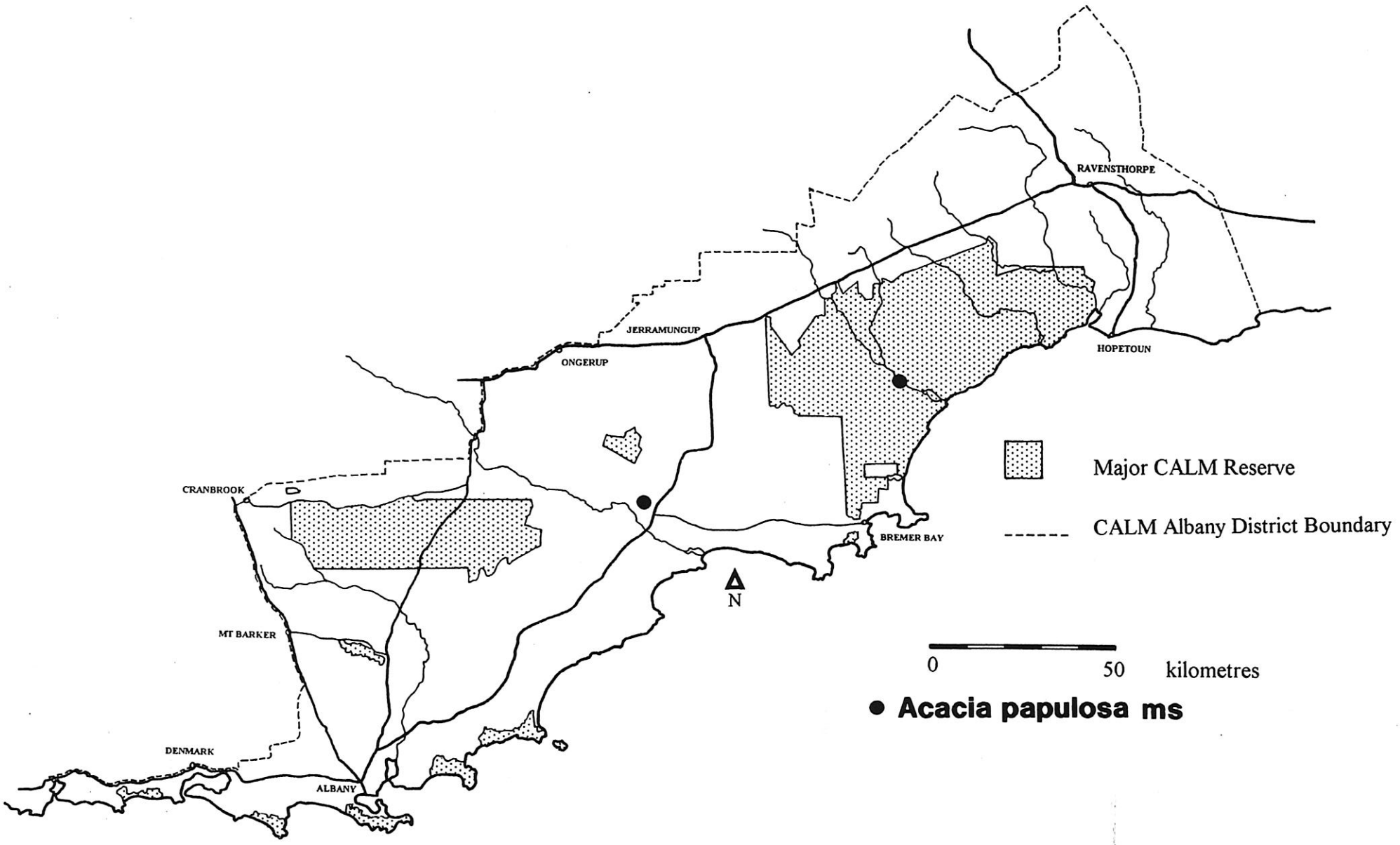
Management Requirements

Research Requirements

- relocate Boxwood Hills and Fitzgerald River populations
- survey opportunistically for new populations

References

R.S. Cowan and B.R. Maslin (pers. comm.).


RAVENSTHORPE
JERRAMUNGUP
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CRANBROOK
BREMER BAY
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
● Acacia papulosa ms

Acacia phlebopetala var. *pubescens* Maslin MIMOSACEAE

This species belongs to the *Acacia* series *Uninerves,* which includes those species with four-merous flowers and triangular phyllodes. It is a spindly erect shrub with open branches, 1-1.5 m tall with foliage restricted to the upper branches. The branchlets are densely puberulous with patent hairs. The phyllodes are triangular, more or less equilateral, 5-8 mm, slightly thickened, uniformly puberulous with fine, minute hairs, with the prominent principal nerve being located close to the lower (abaxial) margin. A second, less obvious nerve runs toward the dorsal apex. Narrowly triangular to setaceous stipules to 3.5 mm long are present and often persistent after the phyllodes have fallen. The creamy-white, globular inflorescences are simple, one per node on peduncles 7-12 mm. The legume is up to 70 mm long by 4 mm wide, pendulous and puberulous.

Variety *phlebopetala* is very similar but is not puberulous, and grows within 2 km of var. *pubescens*. Morphological intermediates have not been recorded.

Flowering Period: August

Distribution and Habitat

This taxon is only known in the vicinity of Whoogarup Range where it occurs in clay soil along watercourses in open mallee scrub.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent population survey.						

WAHerb: 4 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

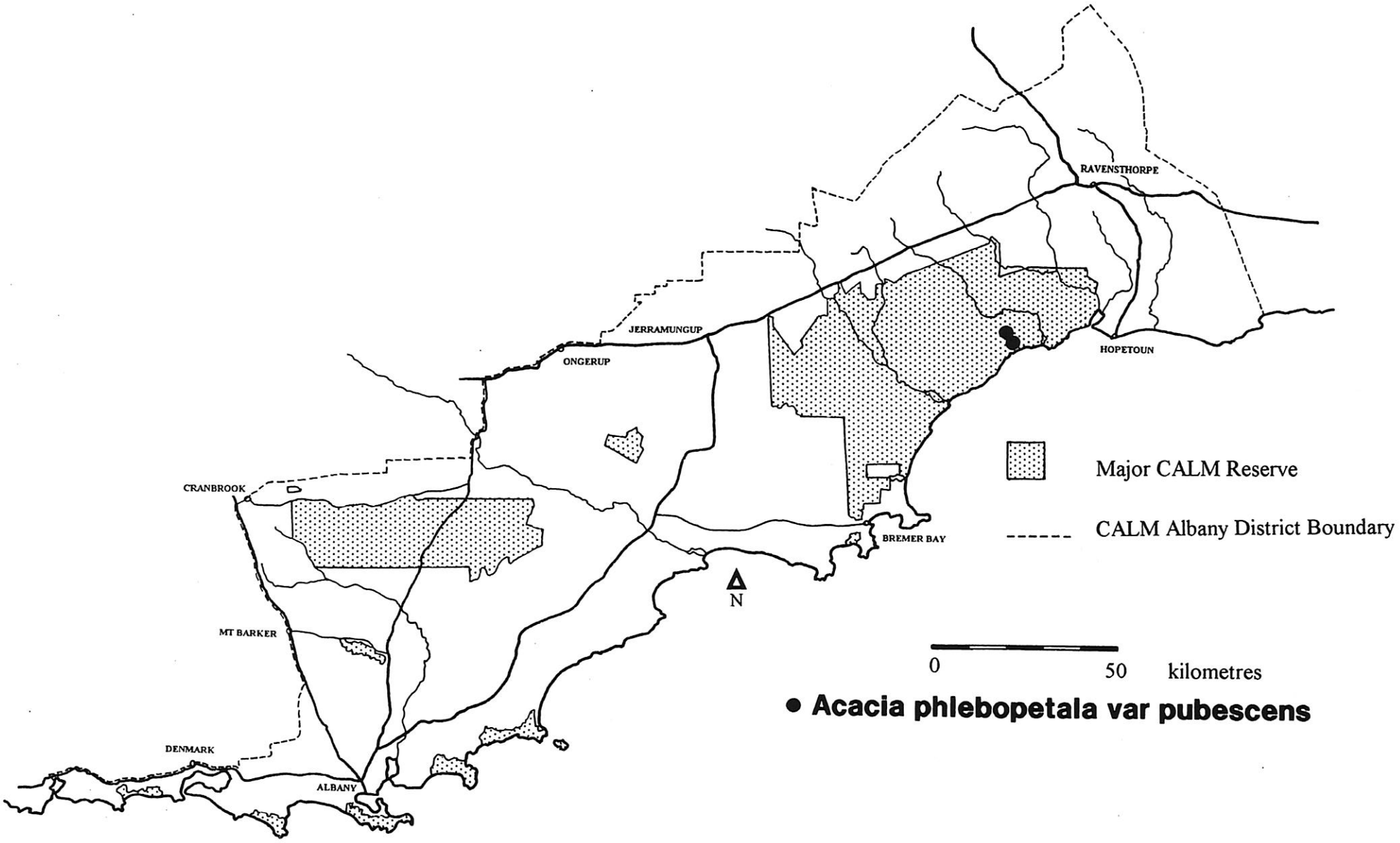
Monitor occasionally

Research Requirements

- survey Whoogarup population
- survey opportunistically for new populations

References

Maslin (1978).


RAVENSTHORPE
JERRAMUNGUP
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CRANBROOK
BREMER BAY
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
● Acacia phlebopetala var pubescens

Acacia veronica Maslin

MIMOSACEAE

Acacia veronica is a tall shrub or small tree to 10 m tall, usually with a single main trunk 10 cm or more thick, with greenish-grey bark, mostly smooth except at the base. The branchlets are glabrous, terete, finely ribbed yellow to light brown. The new shoots are resinous aromatic. The phyllodes are linear, narrowing at each end, 6-20 cm long and 3-8 mm wide, with three longitudinal nerves (the central one being most prominent), thinly coriaceous, spreading to erect, shallowly incurved to straight with an acute or sub uncinate tip. The inflorescences are borne on a short, resinous axillary raceme (2-8 mm) usually supporting two peduncles (8-15 mm) with white to cream globular heads with 24-27 flowers. The legumes are linear, 11 cm long 5.5 mm wide.

Flowering Period: March-September

Distribution and Habitat

This species is endemic to the Stirling Range and occurs in gullies along watercourses in Jarrah-Marri or Wandoo woodland and scrub in shallow soils over schist. It has been collected from thirteen separate locations.

Conservation Status

Current: Priority 2 Recommended: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Mt Trio	Albany	Gno	NP	8.12.92	+50	healthy
2. Bluff Knoll	Albany	Gno	NP	3.2.93	+200	seedlings
3. Papa Colla Ck	Albany	Gno	NP	17.9.93	+100	in flower

WAHerb: 27 records

Response to Disturbance

Killed by fire; regenerates readily from seed.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

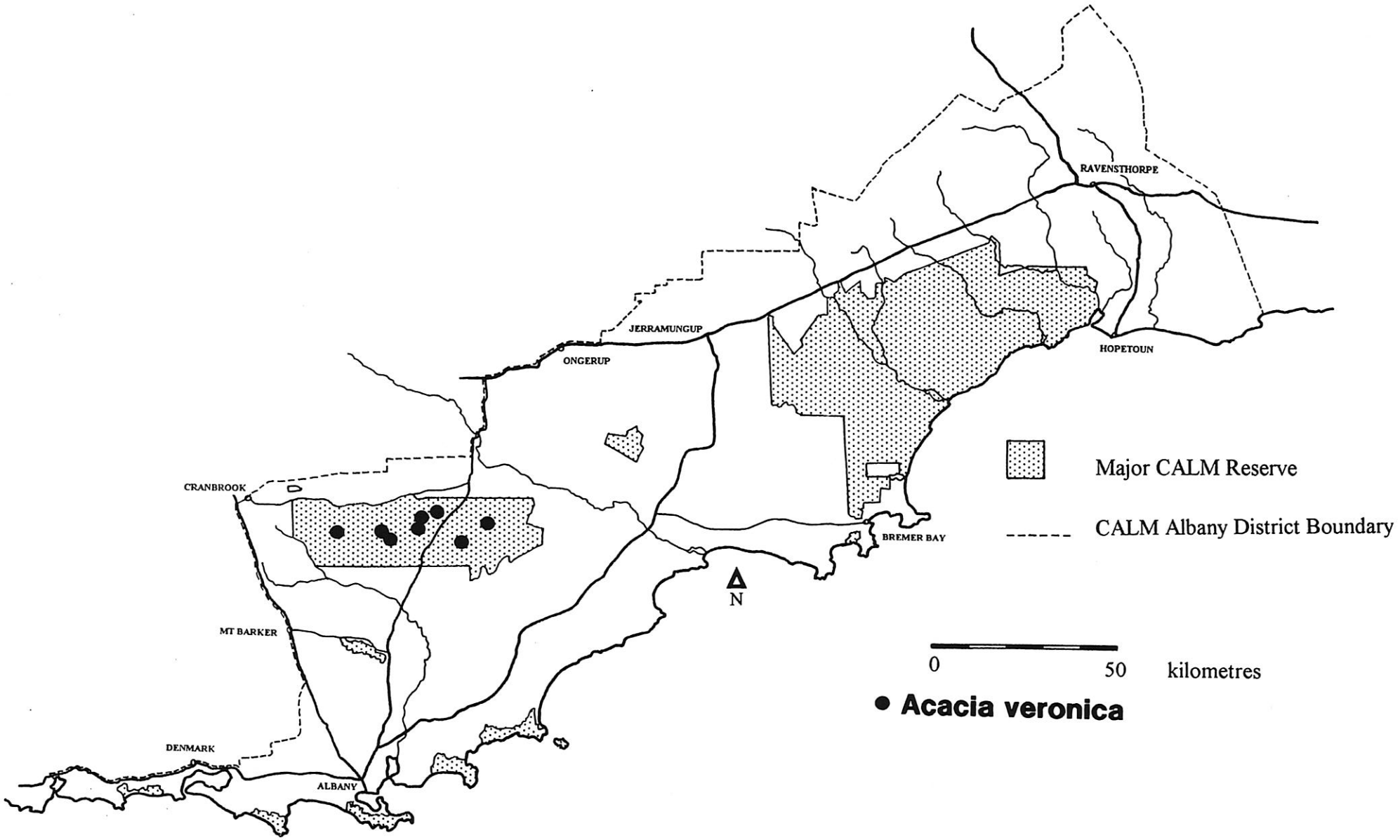
Management Requirements

Monitor occasionally

Research Requirements

References

Maslin (1989).


RAVENSTHORPE
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
● Acacia veronica

Actinotus rhomboideus (Turcz.) Benth. APIACEAE

Actinotus rhomboideus is a perennial herb, with spreading to erect stems to about 300 mm tall. The leaves are rhomboid to orbicular, with toothed margins, up to 25 mm. The young leaves are hairy, but tend to become glabrous with age. The inflorescences on long peduncles are umbellate, composed of numerous small white flowers which form a dense globular head, subtended by an involucre of 6-10 hairy bracts.

This species was originally described in 1847 as a *Xanthosia* by Turczaninow, but reclassified by Bentham in 1866.

Flowering Period: February-March

Distribution and Habitat

This species has only been recorded from Bluff Knoll and Toolbrunup Peak in the Stirling Range where it occurs in shallow rocky soil over schist supporting scrub and heath.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Bluff Knoll	Albany	Gno	NP	3.2.93	+1000	healthy
2. Toolbrunup	Albany	Gno	NP	7.12.92	+200	healthy

WAHerb: 4 records

Response to Disturbance

Killed by fire and regenerates strongly from seed; flowering after two years.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

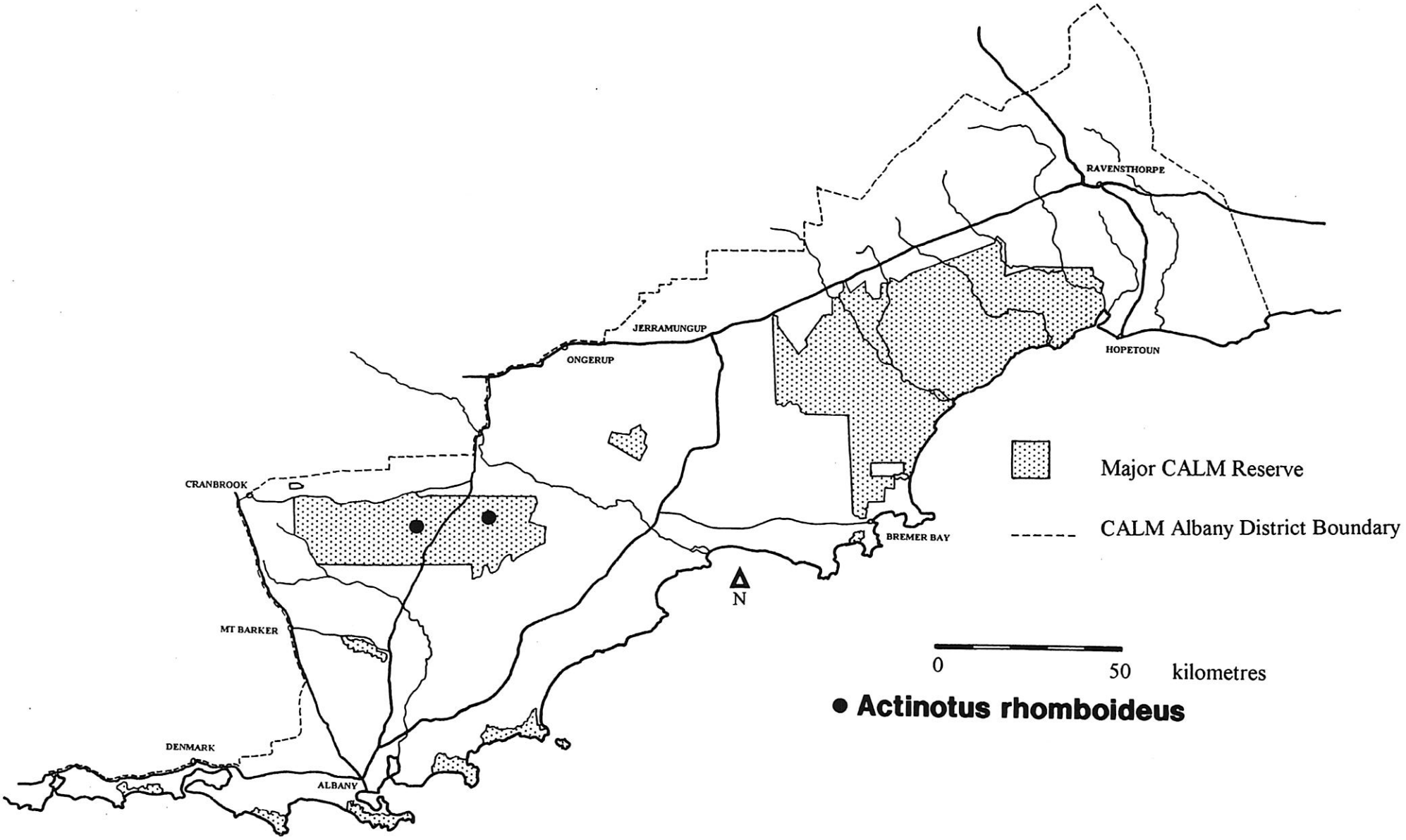
Monitor occasionally

Research Requirements

Survey for new populations on other Peaks within the Stirling Range.

References

Bentham (1866).


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Major CALM Reserve
CALM Albany District Boundary
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kilometres
● Actinotus rhomboideus

Adenanthos cacomorphus E.C.Nelson PROTEACEAE

Ugly Pollen Woollybush

Adenanthos cacomorphus is an erect lignotuberous shrub to 1 m tall, with erect branches which are minutely hairy when young, becoming glabrous with age. The simple cuneate leaves are petiolate, and the lamina is up to 15 mm long and deeply divided into 3-7 lobes, and covered with very short appressed hairs. The bright pink flowers are solitary, terminal and have a white indumentum. The specific name refers to the pollen grains which are grotesquely misshapen.

Nelson (1978) compares this species with *A. cuneatus* and *A. flavidiflorus* but does not indicate that it could be a hybrid between them. Early determinations by Nelson on other specimens suggested that this taxon could be a hybrid. Indeed misshapen pollen grains are often present in hybrids (Terry Macfarlane, pers. comm.).

Flowering Period: intermittent-year round.

Distribution and Habitat

This species has only been collected from three locations, south east of Jerramungup where it occurs in white sand or sandy gravel supporting tall mallee scrub and heath.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. FRNP	Albany	Jer	NP	1975	100	-

WAHerb: 2 records (1 specimen in CANB.)

Response to Disturbance

As this species is lignotuberous, it is likely to resprout after fire, physical damage or drought. If it is a hybrid it is likely to be favoured by disturbance.

Susceptibility to *Phytophthora* Dieback

Presumed susceptible

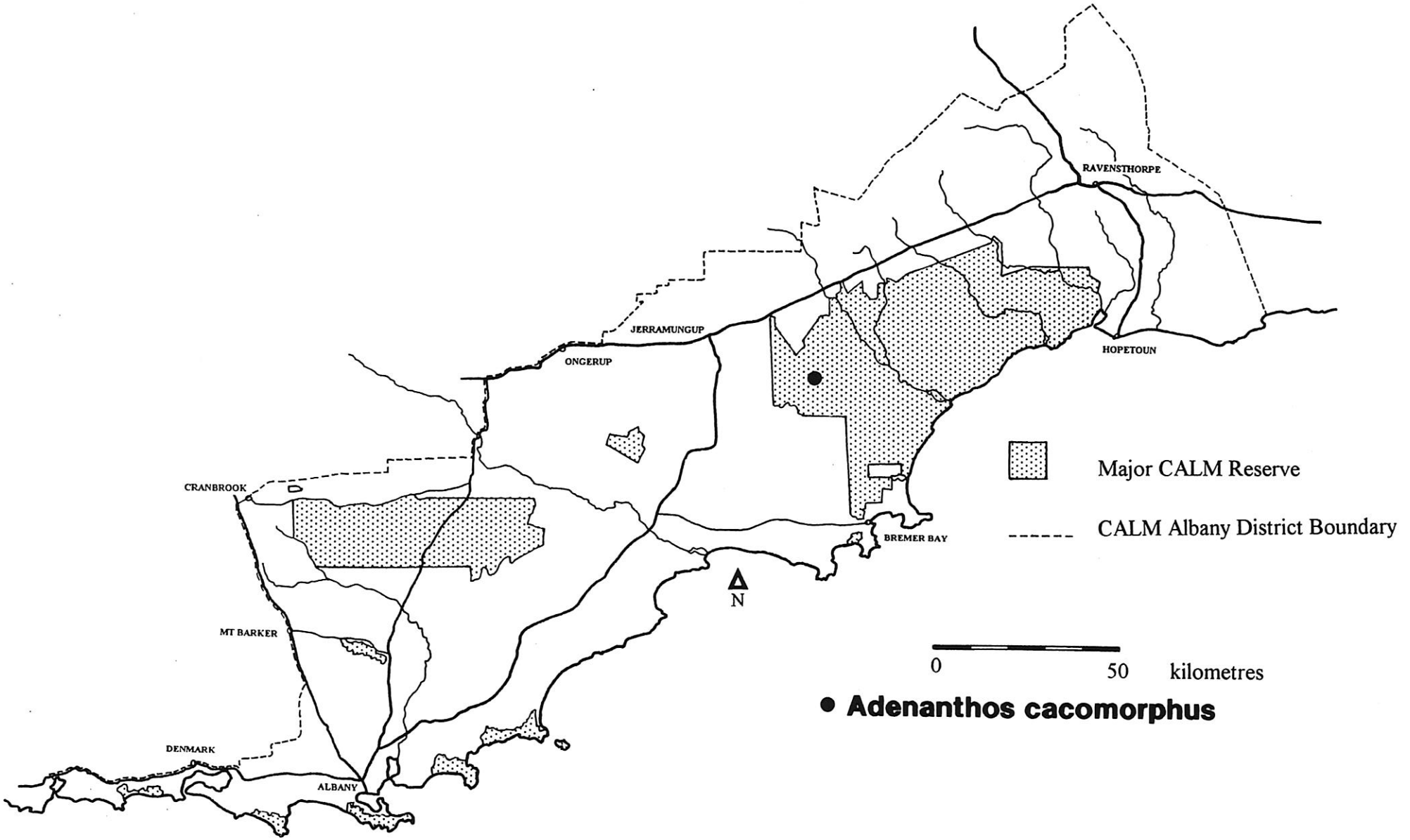
Management Requirements

Research Requirements

- relocate previously collected populations
- survey opportunistically for new populations

References

Nelson (1978).


RAVENSTHORPE
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CALM Albany District Boundary
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kilometres
● Adenanthos cacomorphus

Adenanthos linearis Meisn. PROTEACEAE

Adenanthos linearis is a non lignotuberous, prostrate, diffuse shrub to 0.3 m tall with prostrate to ascending branchlets, pubescent becoming glabrous with age. The sessile, narrow linear leaves are entire (rarely divided), to 30 mm long and 2 mm broad, with an obtuse apex which may be somewhat uncinate, with a prominent red dorsal gland. The cream flowers (with a pink apex) are in groups at the tips of the branchlets.

Flowering Period: intermittent, January-March.

Distribution and Habitat

This species is restricted to the Stirling Range where it occurs in low scrub (often with *Banksia caleyi*) in sandy gravel. Wills (pers. comm.) has recorded this species from only one plot from 110 examined. Nelson (1978) states that it is very restricted though locally common, and that land clearing has probably reduced its range.

McDonald (pers. comm.) noted many scattered presumed *Phytophthora* deaths in a population on Salt River Road. Plants under mallee canopies were healthier than those in the open heath.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Yetemerup Rd.	Albany	Cb	NP	20.10.92	17	2 dead
2. Salt River Rd.	Albany	Cb	NP	1992	scattered*	deaths

WAHerb: 5 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible

Management Requirements

- monitor regularly
- collect seed for storage
- apply phosphonate where required

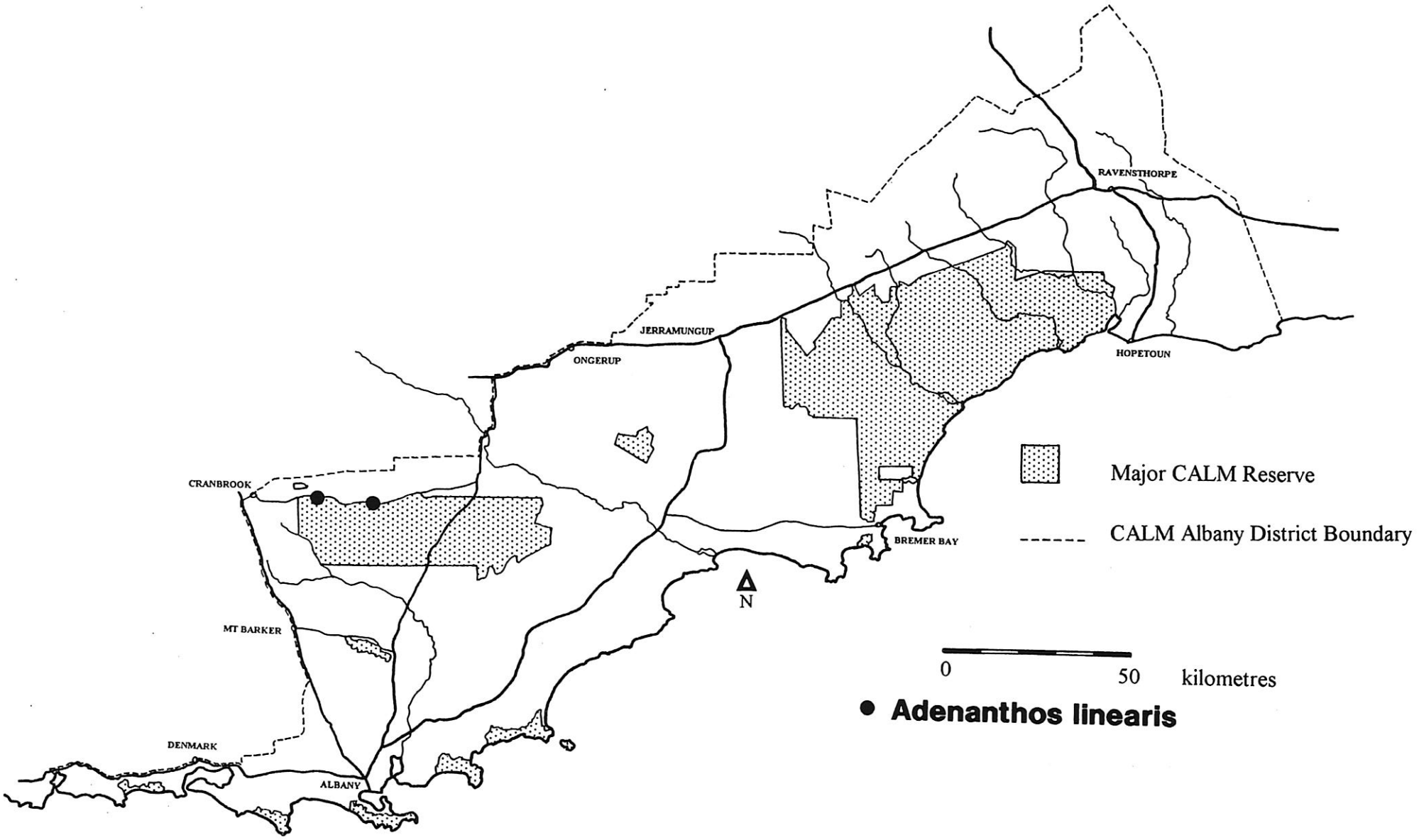
Research Requirements

- relocate populations from WAHerb data, and assess dieback impact
- determine effectiveness of controlling dieback with phosphonate
- survey for new populations.

References

Nelson (1978).

* M. McDonald (pers. comm.).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
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BREMER BAY
N
MT BARKER
DENMARK
ALBANY
Major CALM Reserve
CALM Albany District Boundary
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kilometres
Adenanthos linearis

Andersonia axilliflora (Stschegl.)Druce. EPACRIDACEAE

Giant Andersonia

Andersonia axilliflora is the largest of the genus, and is a tall sturdy shrub to 3 m with crowded leaves. The erect to spreading leaves (up to 6 cm long) are elongate triangular, broad and stem clasping at the base, tapering to a point. The floral leaves at the ends of the branches are creamy white, and extend beyond the thirty or so hidden flowers. Each cream flower, about 10 mm long is enclosed in stiff acuminate calyx lobes.

Flowering Period: October-November

Distribution and Habitat

This spectacular epacrid is confined to the upper slopes and summits of the eastern peaks of the Stirling Range, where it occurs in shallow rocky soil over schist, supporting dense low heath and scrub. WAHerb records show it has been collected from Isongerup (1929), Bluff Knoll (1982) and the SE ridgeline from Ellen's Peak (1982).

All WAHerb locations were burnt by wildfire in autumn 1991. Some presumed seedling regeneration of this species has been observed on Bluff Knoll, but many have died from what appears to be *Phytophthora* dieback.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
(1) Ellen's SE Ridge	Albany	Gno	NP	11.5.82	common-WH	-
(2) Ellen's SE Ridge	Albany	Gno	NP	29.9.93	+10	dead

WAHerb: 6 records (4 Isongerup, CAG 1928).

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

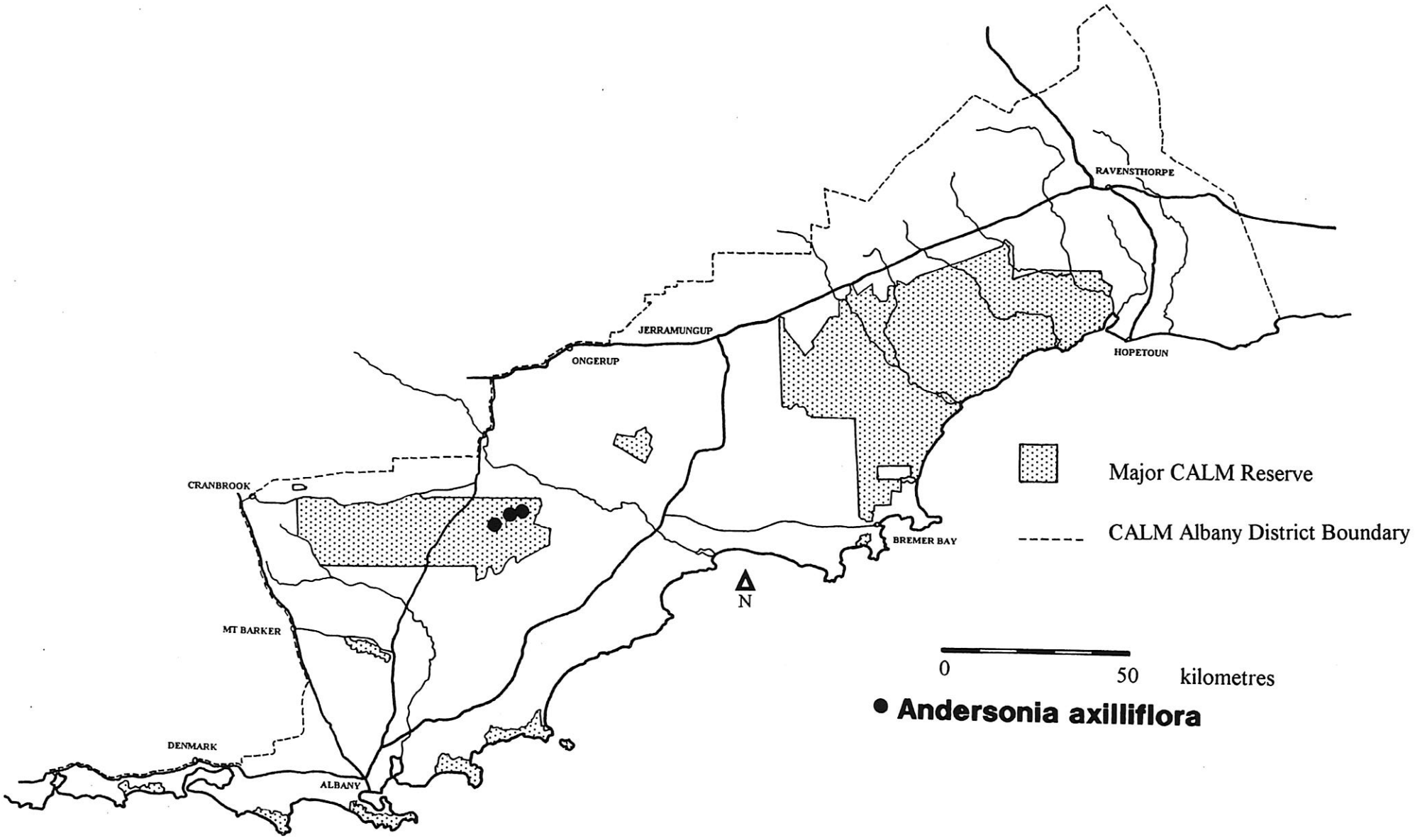
Field observation suggests high susceptibility

Management Requirements

Monitor all populations closely; especially those regenerating after fire and possibly being affected by *Phytophthora* dieback

Research Requirements

- urgent survey required to relocate all populations
- investigate *Phytophthora* impact and possible need for phosphonate application


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Andersonia axilliflora

Anthocercis fasciculata F.Muell. SOLANACEAE

Anthocercis fasciculata is a tall spindly viscid shrub, to 2 m tall which is relatively short lived - around five years. It has a main stem, about 25 mm thick and several very open and ascending branches with scattered oblanceolate leaves. The small tubular white flowers (obtuse lobes shorter than the tube) are arranged in an open panicle; the calyces are glandular hairy.

Flowering Period: September-December

Distribution and Habitat

This species is confined within the Fitzgerald River National Park, on quartzite outcrops and slopes of West Mount Barren, Mt Bland, Mid Mount Barren, Whoogarup Range and East Mount Barren. It may also occur on other minor quartzite hills and possibly the Eyre Range. It occurs in shallow rocky soil supporting an association of scrub and heath. It is a species which responds to fire and has appeared in great numbers following the wildfire of November 1989. It grows rapidly after fire, compared with most other associated species. As these other species reach maturity the *Anthocercis* numbers will probably diminish, leaving a seed bank in the soil.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. East Mt Barren	Albany	Rav	NP	8.9.92	+1000	healthy
2. West Mt Barren	Albany	Jer	NP	15.9.92	+500	healthy

WAHerb: 18 records

Response to Disturbance

Post fire regenerative

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

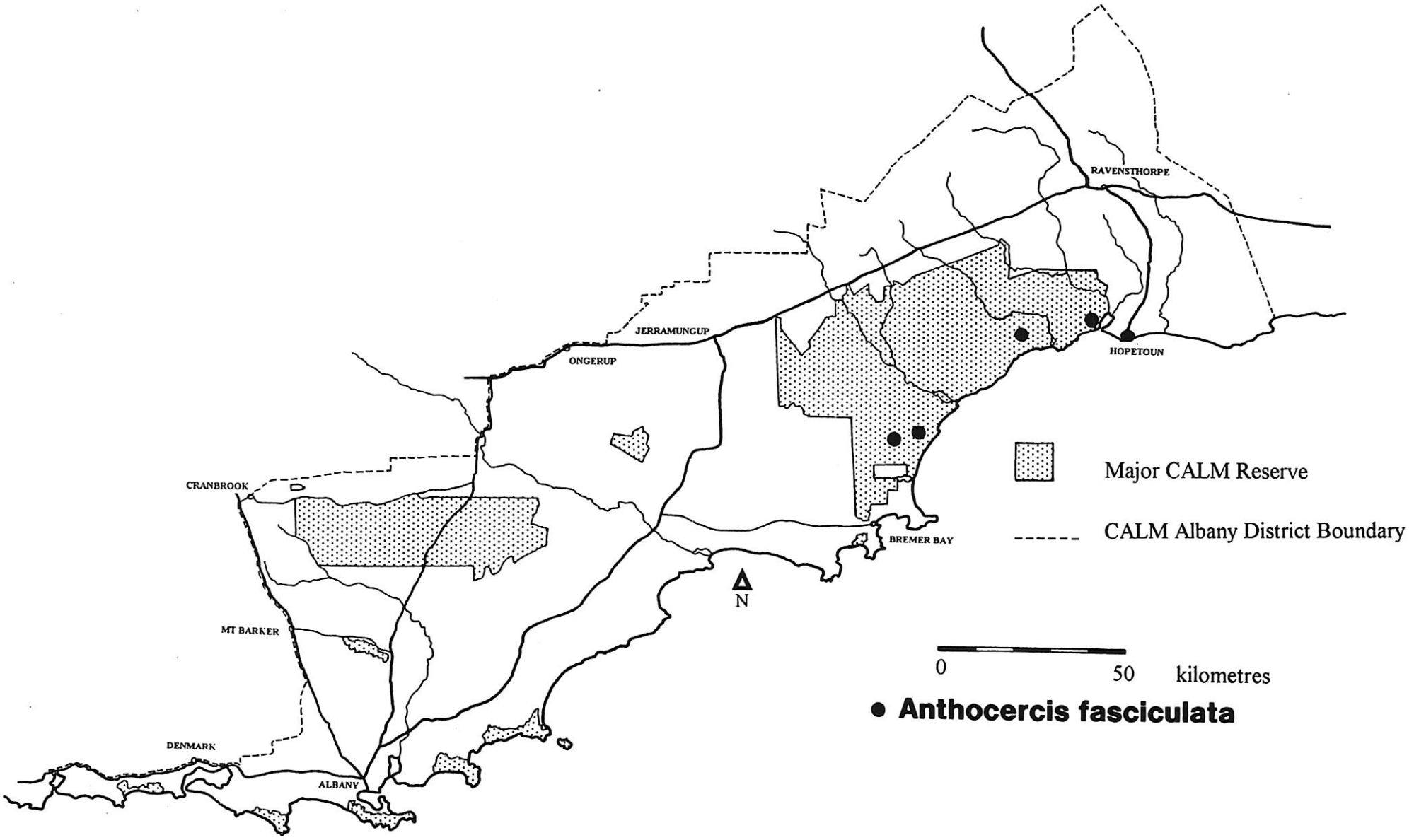
- consider Priority 4, following more detailed survey results
- monitor occasionally

Research Requirements

- relocate and survey Whoogarup, Mt Bland and Mid Mt Barren populations
- survey opportunistically for new populations.

References

Mueller (1859).


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CALM Albany District Boundary
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kilometres
Anthocercis fasciculata

Astroloma sp. Fitzgerald (G.J.Keighery 8376)

EPACRIDACEAE

Fitzgerald Astroloma

This *Astroloma* is a multistemmed, erect shrub. The erect grey green leaves are lanceolate to 8 mm long and 1.2 mm wide, with a very fine, sharp clear yellow mucrone. The flowers are solitary in the leaf axils and concentrated midway on the branches, distal from the tip. Each flower is brick red, 10 mm long with stiff, acute calyx lobes to 4 mm. The corolla tube is narrowly tapered at its apex and white hairy at the throat, glabrous below.

Flowering Period: May

Distribution and Habitat

This species is only known from one collection made in 1986 from burnt mallee heath, in flat terrain of white clay over lateritic clay in the Thumb Peak region of FRNP.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent population survey						

WAHerb: 4 records.

Response to Disturbance

Unknown

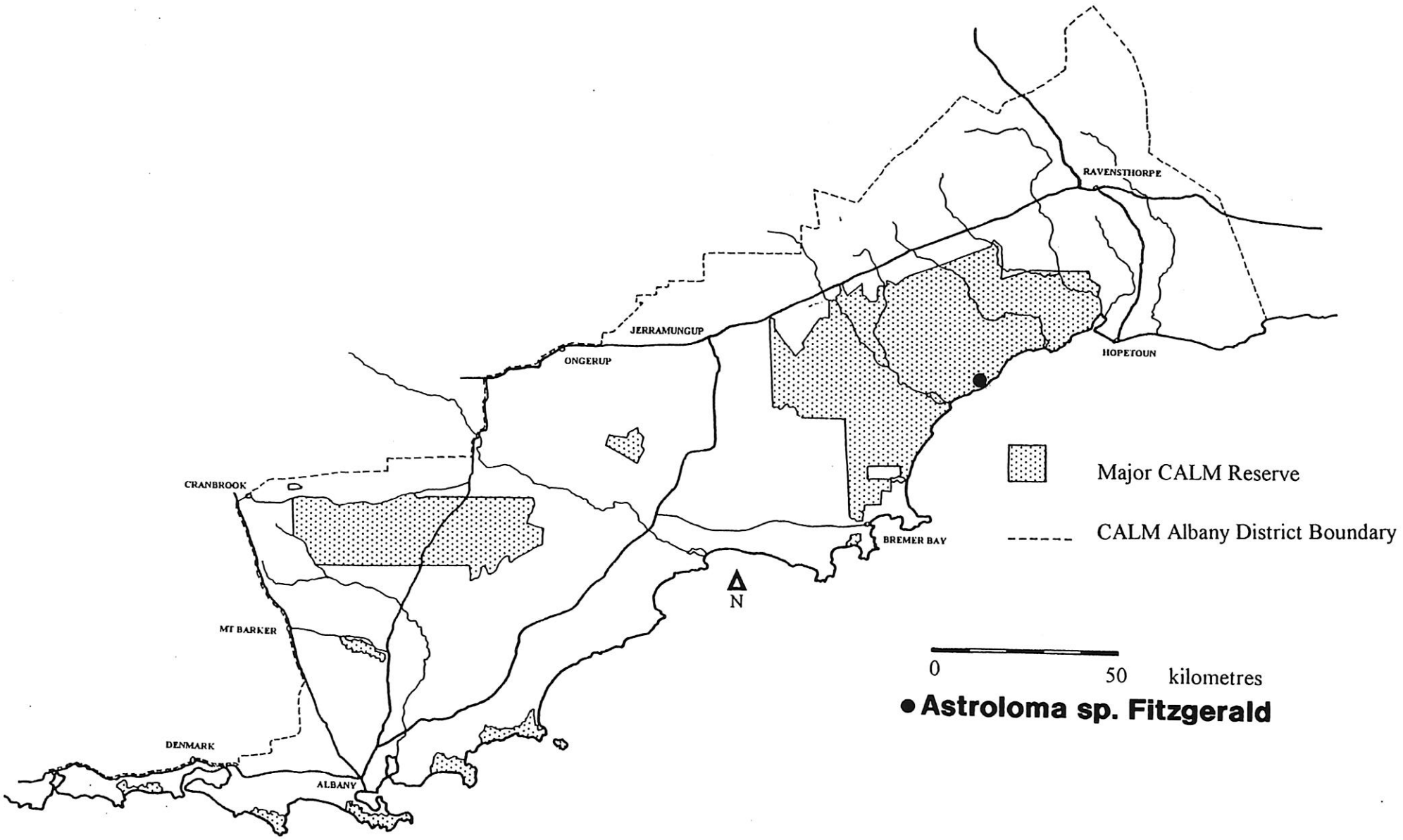
Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

Research Requirements

Survey the Thumb Peak area and other similar habitat to determine range, population numbers and possible threats


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kilometres
● Astroloma sp. Fitzgerald

Astroloma microphyllum Stschegl. EPACRIDACEAE

Small Leaved Astroloma

Astroloma microphyllum is a low, almost prostrate, spreading domed shrub, 20-30 mm high. The spreading leaves are crowded, ovate-lanceolate, minutely pointed, flat, striate and up to 6 mm long. The scarlet flowers are about 15 mm long, with constricting sepals to 3 mm. The corolla tube has densely bearded lobes inside, and is glabrous below, except for a ring of five hairy tufts toward the base.

Flowering Period: April-June

Distribution and Habitat

This species is widespread with locations recorded from Lake Grace through to Peak Charles and down to Lake Magenta and the Fitzgerald area. Generally it is recorded as being abundant, common or very common at most locations. It occurs in mallee scrub in sandy gravelly soils.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Twertup	Albany	Jer	NP	16.9.92	9	healthy

WAHerb: 13 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible (moderate)

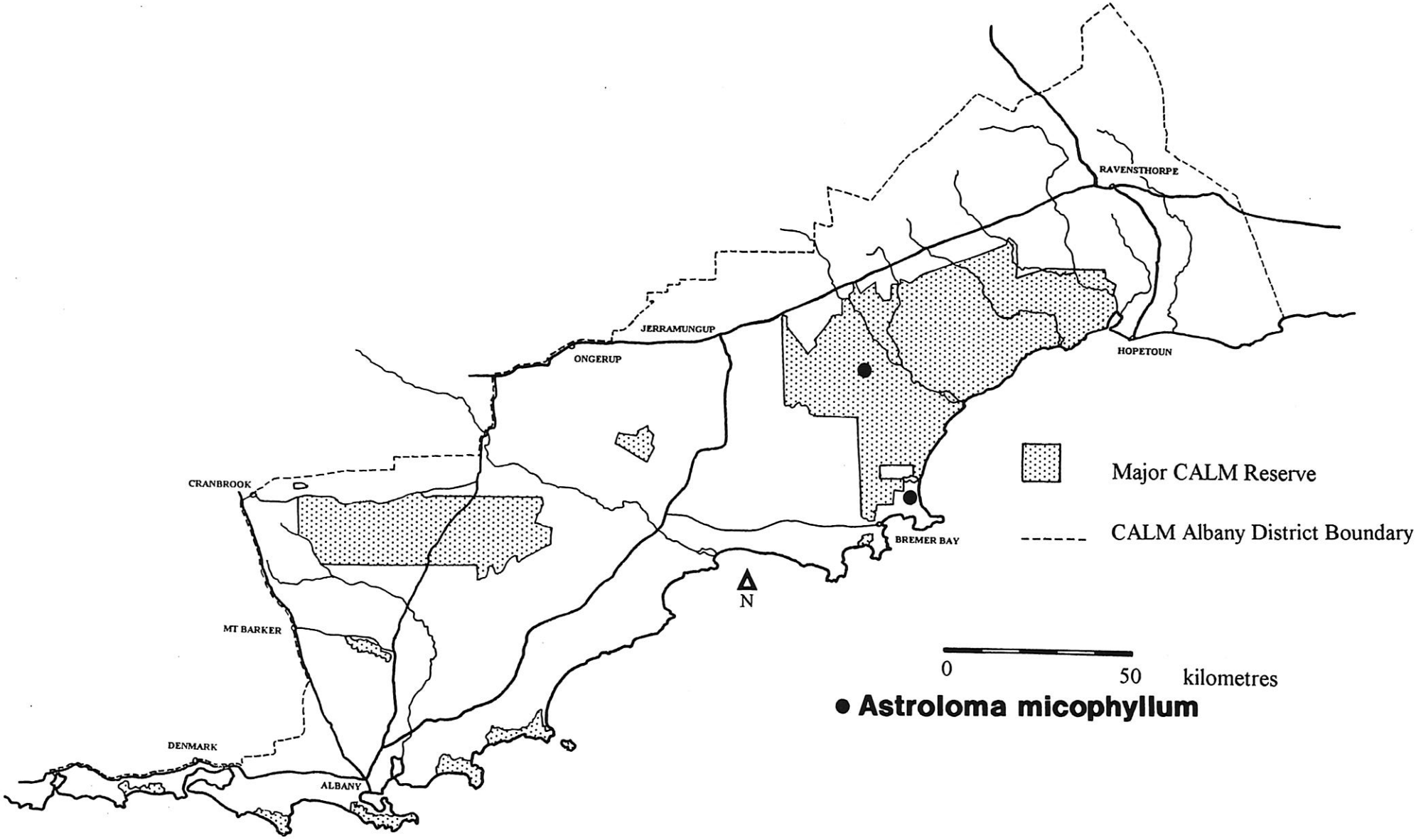
Management Requirements

Research Requirements

Locations at Lake Magenta, Lake Grace, Nyabing and Pullitup need to be surveyed to establish if this species is still common and whether it should be removed from the Priority list.

References

Bentham (1869).


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● Astroloma micophyllum

Banksia occidentalis R.Br. subsp. *formosa* Hopper PROTEACEAE

B. occidentalis subsp. *formosa* is differentiated from subspecies *occidentalis* by Hopper as having shorter, broader leaves and a more dense habit, and being coastal. After examination of the *Banksia occidentalis* populations on the mainland at Shelter Island, plants could not be found which appeared significantly different from the subspecies *occidentalis* individuals which occurred downslope. The only variation noticed was a reduction in height from 4 m to 1.5 m tall, when moving from the protected seepage at the base, to the more exposed site upslope. This variation is expected within one taxon exposed to different conditions. The *B. occidentalis* plants at Shelter Island do not appear to fit the description of subspecies *formosa.*

Flowering Period: January-May

Distribution and Habitat

The type collection of *B. occidentalis* subsp. *formosa* was made at Black Point in D'Entrecasteaux National Park, where it grows as a low wind pruned mat, on exposed coastal limestone seepages overlying basalt.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
Was not located on Shelter Island						

WAHerb: 2 records (both Black Point).

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Field observation suggests high susceptibility

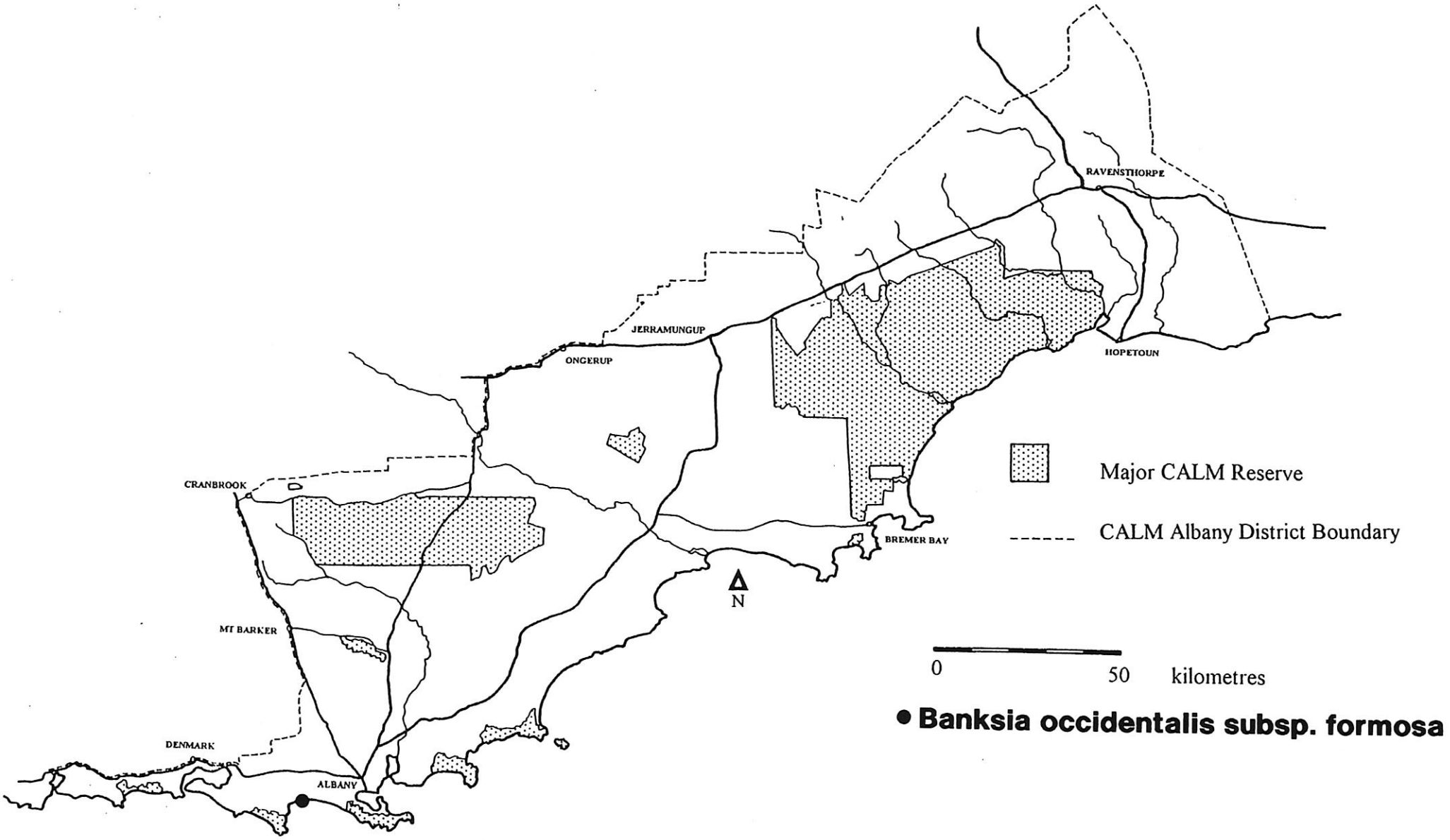
Management Requirements

Research Requirements

Confirm taxonomic status of the plants at Shelter Island

References

George (1987), Hopper (1989).


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kilometres
• Banksia occidentalis subsp. formosa

Billardiera granulata (Turcz.) E.M.Benn. PITTOSPORACEAE

Porongurup Billardiera

Billardiera granulata is a slender twining climber which may form dense mats over the supporting vegetation. The young shoots and leaves are covered in soft spreading hairs; the stems becoming glabrous reddish brown. The ovate-lanceolate leaves are petiolate, obtuse to acute tipped, dull greenish grey and ovate at the base. The small flowers are arranged 3 to 5 in slender racemes or cymes on slender pedicels. The corolla tube opens out into five spreading acuminate lobes which are pale mauve with dark purple spots on the lobes. The sepals are hirsute with long spreading hairs. The ovary and subsequent turgid capsule are glabrous

Flowering Period: October-December

Distribution and Habitat

This species occurs widely on granite peaks and outcrops, slopes and gullies in the Porongurup Range. It grows in shallow loamy soil over granite in association with tall shrubs and sometimes small trees.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Castle Rock	Albany	Pl	NP	10.3.67	abundant-WH	-
2. Collier Peak	Albany	Pl	NP	20.11.87	abundant-WH	-
3. Bates Peak	Albany	Pl	NP	15.12.86	colony-WH	in flower
4. Devils Slide	Albany	Pl	NP	24.7.92	+500	healthy
5. below Gib Rock	Albany	Pl	NP	24.7.92	+100	healthy

WAHerb: 6 records

Response to Disturbance

Killed by fire; regenerating from seed.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

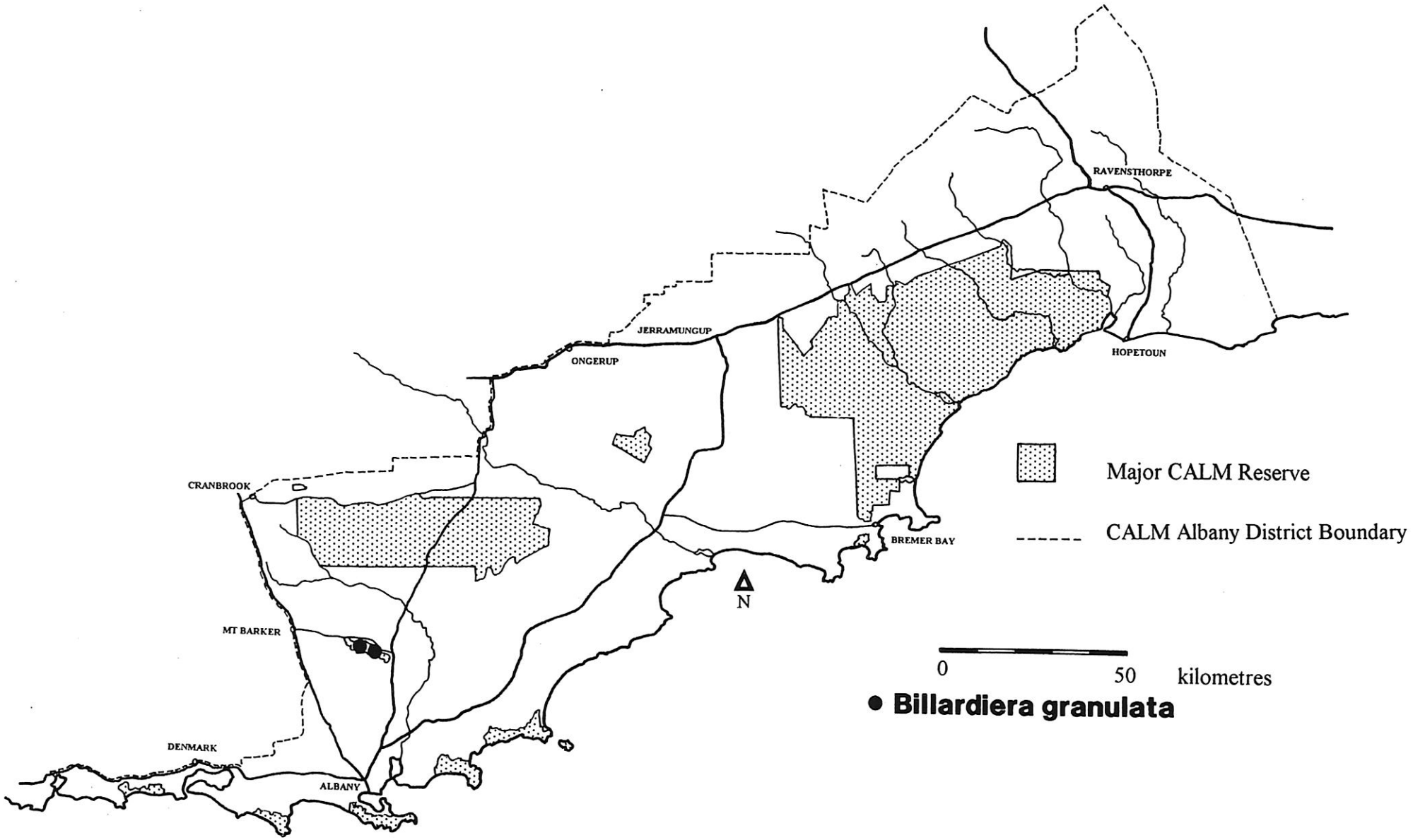
Management Requirements

Monitor occasionally

Research Requirements

References

Bentham (1863), Bennett (1972).


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kilometres
● Billardiera granulata

Boronia clavata P.G.Wilson

RUTACEAE

Boronia clavata is an upright to spreading shrub, usually 1.5-2 m tall but may reach 2.1 m. The glabrous leaves are sub-sessile, pinnate with 3-7 linear, obtuse leaflets, 10-20 mm long on a short 3 mm rachis. The pale yellowish green flowers are solitary, erect in the axils on 3 mm pedicels which are minutely puberulous with medial bracteoles. The obovate petals are imbricate to 8 mm long and glabrous. The stamens are dimorphic; sepaline filaments being thick and clavate, 2.5 mm long and the petaline filaments being terete, 1.8 mm long. The sepaline anthers are sterile or almost so. The style and ovary are massive, clavately columnar and longitudinally grooved, 4 mm long.

Flowering Period: October

Distribution and Habitat

This species is restricted to the vicinity of the lower reaches of the Bremer and Gairdner Rivers where it occurs in narrow alluvial floodplains in association with thickets of other shrubs.

Conservation Status

Current: Priority 2 Recommended: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
Gairdner River	Alb	Jer	VCL	6.9.93	1	healthy
BremerRvrGordonRd	Alb	Jer	VCL	1993	4	healthy

WAHerb: 8 records (3 cultivated).

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

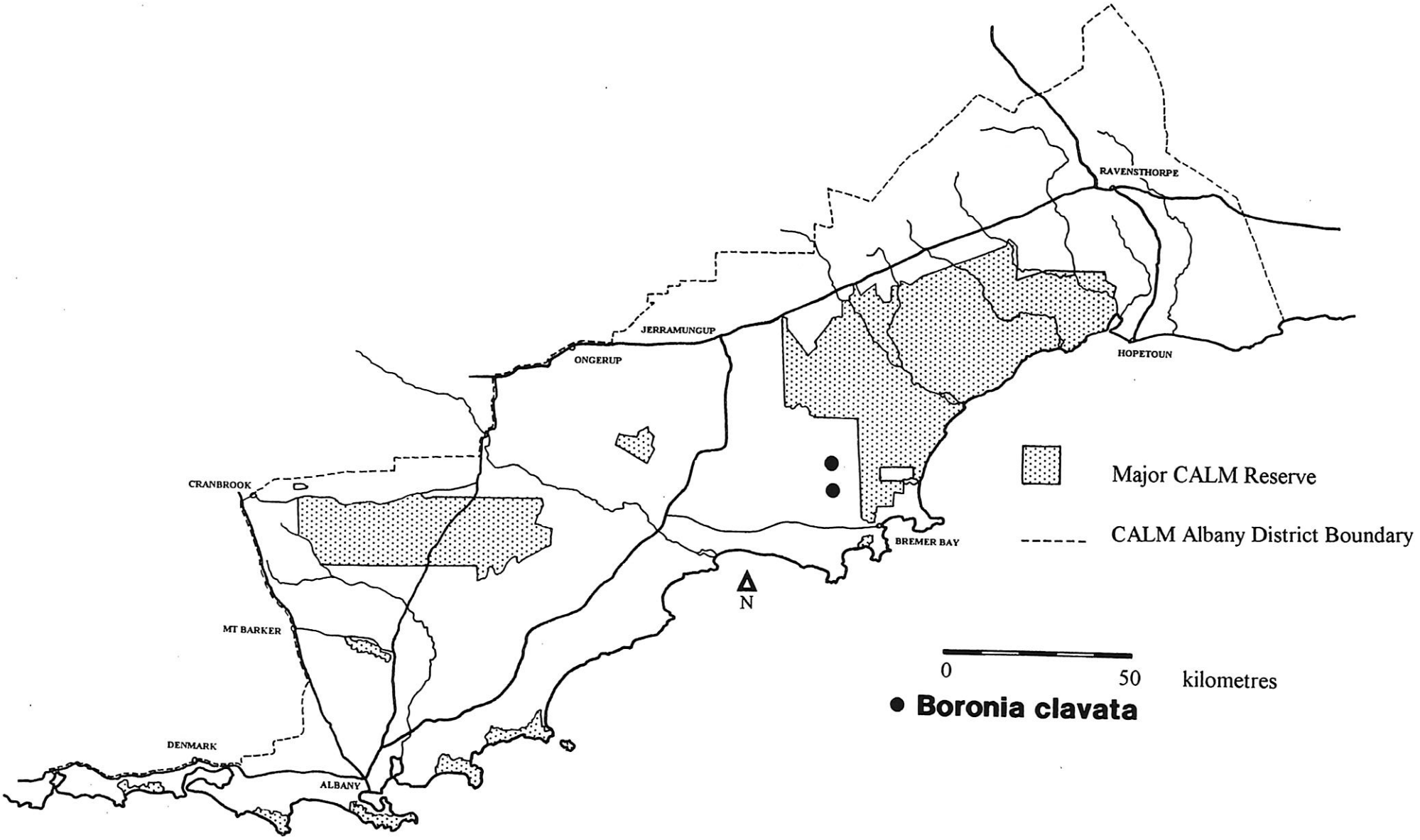
Monitor occasionally

Research Requirements

- relocate populations from WAHerb records and survey
- survey opportunistically for new populations

References

Wilson (1971).


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kilometres
Boronia clavata

Boronia crassipes Bartling

RUTACEAE

Boronia crassipes is an erect shrub with elongated, slender virgate branches. The acute leaves (1-1.5 cm long) are simple, lanceolate with minutely serrate margins, and are arranged in opposite pairs. The flowers which may vary from red to white are very numerous in the upper axils. They are solitary (two per node) in the axils on a 6 mm clavate pedicel; the petals are 7 mm, about twice as long as the very narrow triangular sepals. The anthers are all fertile and more or less equal with slender ciliate filaments.

Flowering Period: August-September

Distribution and Habitat

This species has only been collected from the immediate surrounds of Albany, and up to 12 km north. It is likely that it was once very common within this range but settlement and clearing (particularly of wetlands) has resulted in the disappearance of most populations. *Boronia crassipes* grows in seasonally wet peaty sand or sandy clay soil, in association with heath over sedges.

Recent intensive survey has rediscovered *B. crassipes* in Millbrook and Gledhow Nature Reserves. The latter is a very small reserve (3.6 ha.) surrounded by mostly cleared farmland. Survey in Down Road and Phillips Brook Nature Reserves and Marbellup (Shire) Reserve was not successful. The largest and most extensive populations occur on creek lines in private property. These populations are considered extremely vulnerable to clearing, grazing, draining and invasion by exotic shrubs (Blue Broom) and grasses.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
(1) Link Road	Albany	Alb	private	3.9.93	+10,000	healthy
(2) Millbrook	Albany	Alb	NR	27.9.93	+10,000	good
(3) Yakamia Crk	Albany	Alb	private	28.9.93	+50,000	good
(4) Gledhow	Albany	Alb	NR	9.93	+200	in flower
(5) Gledhow	Albany	Alb	private	9.93	+2,000	

WAHerb: 9 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

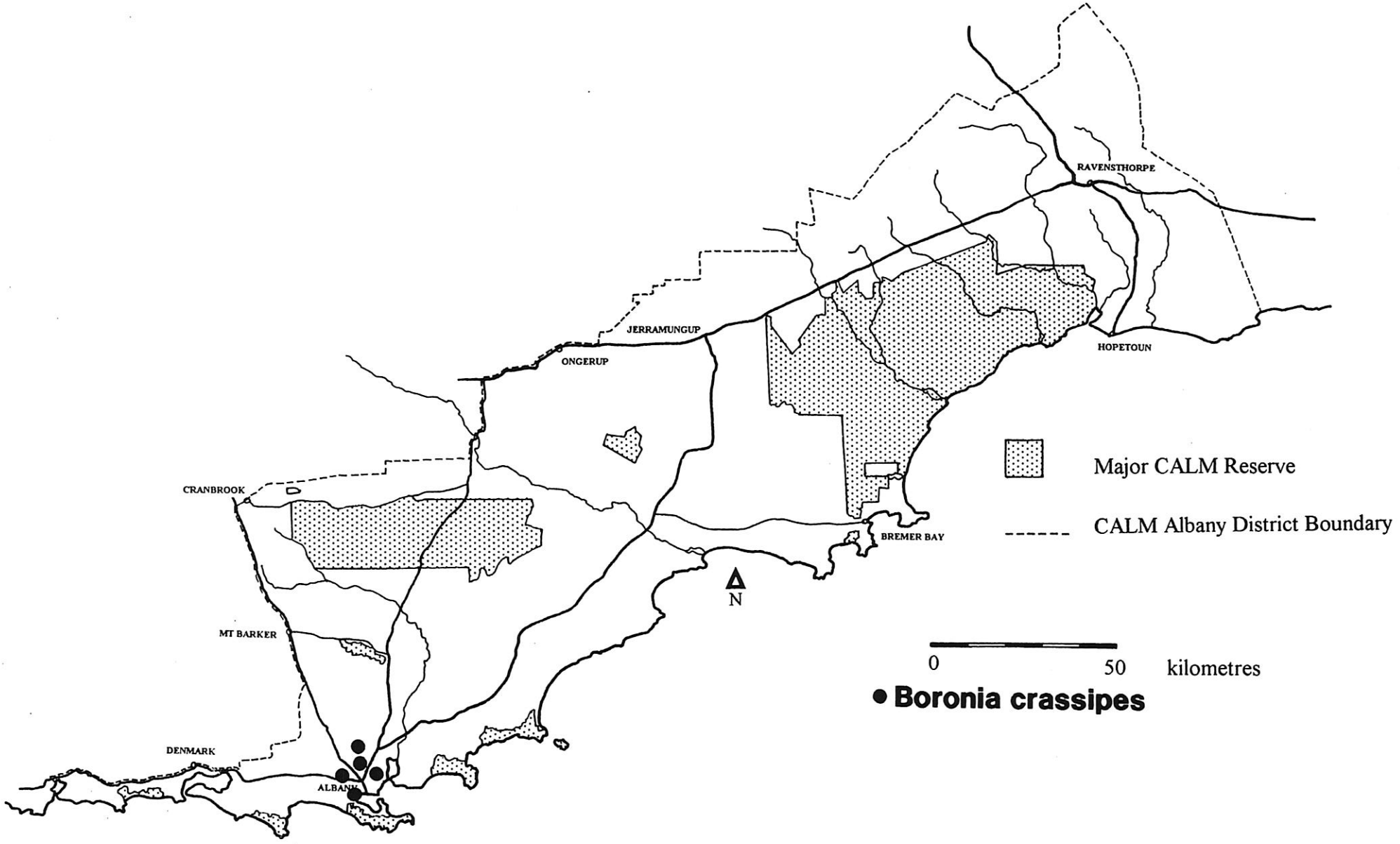
- contact owners of largest populations to determine security
- closely monitor populations in Yakamia creek and Link Road

Research Requirements

Survey for new locations.

References

Bentham (1863), P.G. Wilson (pers. comm.).


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Boronia crassipes

Boronia oxyantha Turcz.

RUTACEAE

Boronia *oxyantha* is a low shrub to 0.5 m, with compound leaves to 10 mm, composed of 3-5 almost terete leaflets. The flowers are pink and anthers are all fertile and more or less equal.

Paul Wilson (1971) recognised that *Boronia lanuginosa* var. *brevicalyx,* described by Bentham was in fact a variety of *B. oxyantha.* This variety is conspecific with var. *oxyantha,* but differs from it in having hirtellous (coarse stiff hairs), not puberulous (soft hairs) branches, and acute, short 2 mm sepals not acuminate 5 mm sepals.

Flowering Period: August-December.

Distribution and Habitat

This species occurs from Chillinup on the Pallinup River to the Ravensthorpe Range and occurs in gravelly soil or clay over laterite supporting scrub and open mallee woodland. Recent survey has shown it to be widespread and common in Fitzgerald River National Park. It is not currently perceived to be under any threat.

There are fifteen collections of var. *brevicalyx* and only one of var. *oxyantha* in WA Herbarium.

Conservation Status

Current: Priority 2 Recommended: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
var *brevicalyx*						
1. Kundip	Albany	Rav	VCL	15. 12.92	+50	regen.
2. Mt Desmond	Albany	Rav	VCL	15.12.92	+50	healthy
5. East Mt Barren	Albany	Rav	NP	8.9.93	100	in flower
var *oxyantha*						
3. Quoin Head	Albany	Rav	NP	7.9.93	100	in flower
4. Mt Maxwell	Albany	Jer	NP	6.9.93	+50	in flower

WAHerb: 17 records (15 var. *brevicalyx,* 1 var. *oxyantha,* 1 no var.)

Response to Disturbance

Killed by fire; regenerates from seed.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

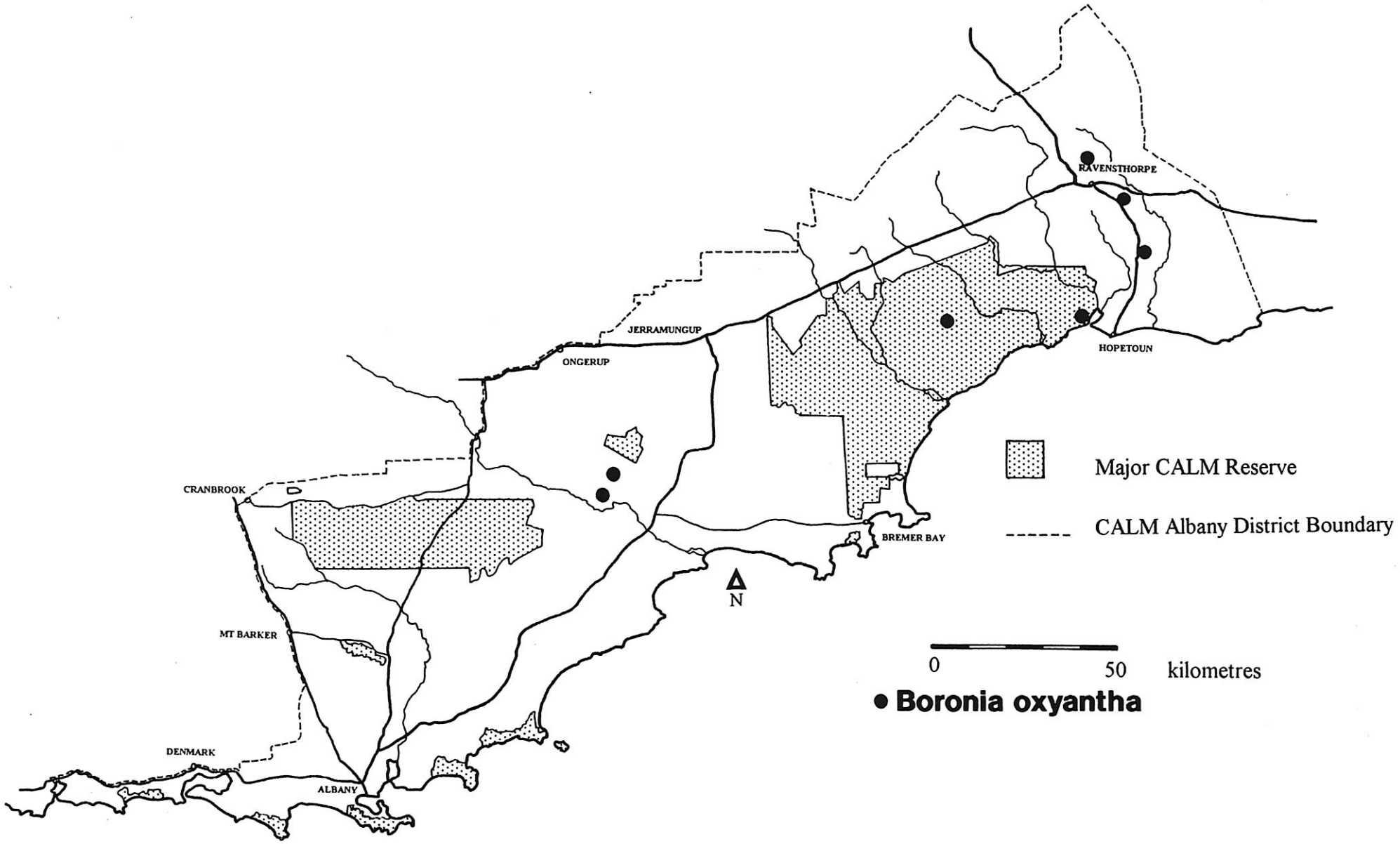
Management Requirements

Research Requirements

Survey to determine the relative rarity of each subspecies

References

Wilson (1971).


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kilometres
● Boronia oxyantha

Caladenia granitora Hopper & A.P. Brown ms

ORCHIDACEAE

Granite Spider Orchid

This spider orchid is distinguished by its flattened, outwardly projecting labellum, the tip of which is markedly folded under and coloured red. The remainder of the labellum is white with red calli and fringes. The petals and sepals are pale greenish. It is closely related to *C. infundibularis*, which is bigger and more strongly coloured. It was first collected in 1982, and recognised as a new species in 1987.

Flowering Period: October-November.

Distribution and Habitat

Caladenia granitora ms is only known from near Norman's Beach east of Albany, where it occurs in shallow soil over granite, supporting low heath or mallee heath. A specimen collected from Misery Beach in Torndirrup National Park is believed to be a possible hybrid involving *C. granitora* ms but this parent has not been found there.

Coastal areas of granite have been reasonably well surveyed for orchids west of Albany, but not to the east.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Norman's Beach	Albany	Alb	NP	8.10.87	>30	-

WAHerb: 3 records (includes one hybrid)

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

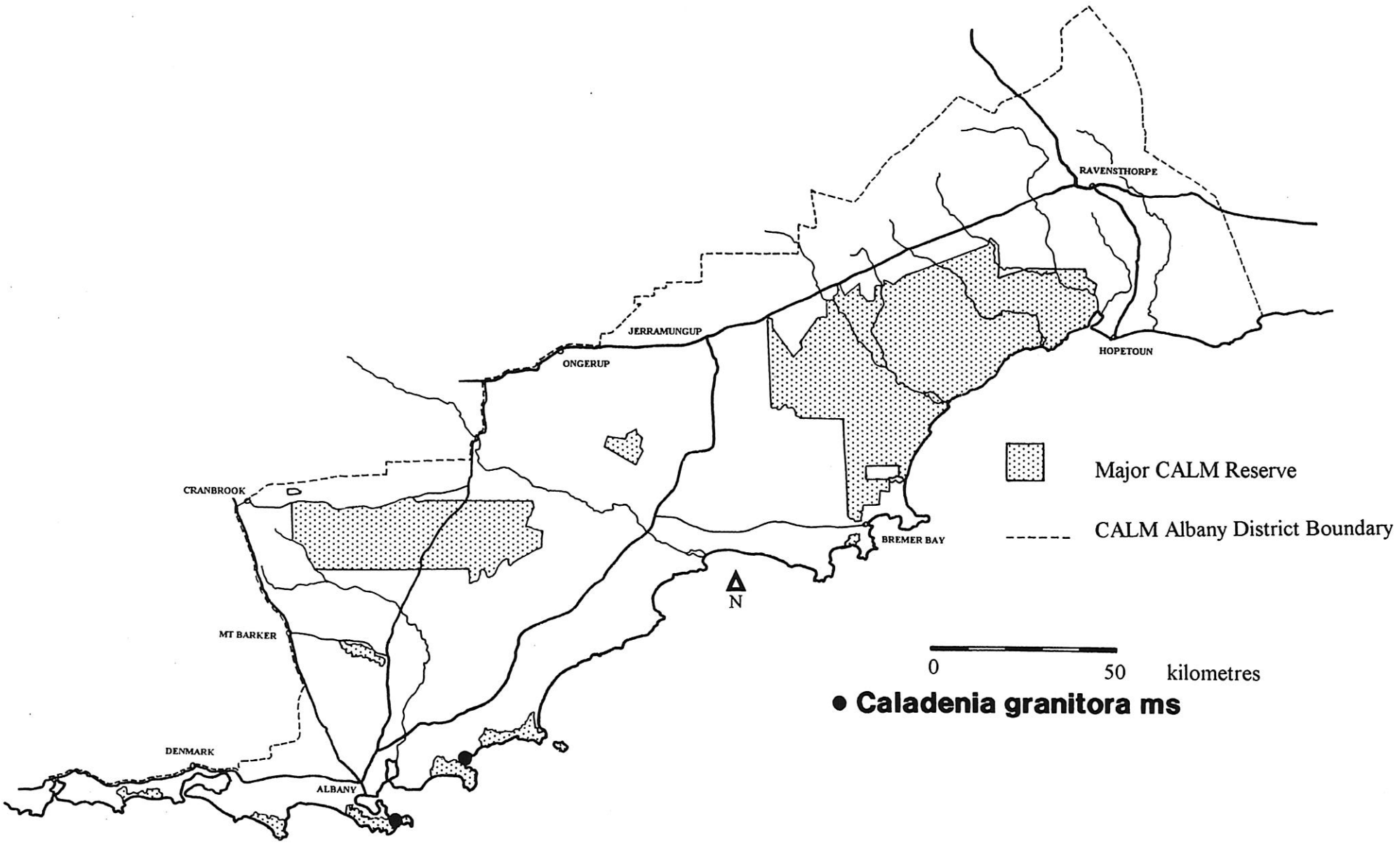
Monitor occasionally

Research Requirements

- relocate and survey Norman's Beach population
- survey opportunistically for new populations; especially granitic coastal areas east of Albany

References

Hoffman and Brown (1992).


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● Caladenia granitora ms

Calochilus sp. Hopetoun (H.Taylor s.n.) [aff. *campestris*] ORCHIDACEAE

Hopetoun or Mallee Beard Orchid

Hoffman and Brown (1992) recognise three species (all undescribed) of *Calochilus* in Western Australia. This species, *C.* sp. Hopetoun, is distinguished by having a shorter labellum and shorter labellum hairs (than aff. *robertsonii*) and insignificant leaves reduced to a tiny bract. The dorsal and lateral sepals are bluntly pointed to about 5 mm and are pale green with dark red stripes. The petals and column are similarly coloured and contained within the sepals. The small flowers of this species appear to self pollinate, do not open fully and there is rarely more than one flower (of a spike of 10-12) open at once.

Flowering Period: August-early October.

Distribution and Habitat

Calochilus sp. Hopetoun was originally collected from within the Hopetoun townsite, where it grows in dense scrub under mallees in well drained limestone soil. This population is not secure as it occurs in an area which the Shire of Ravensthorpe considers of strategic importance to the fire protection of Hopetoun.

A photograph of a plant collected from Chillinup Road (near Kojaneerup Rd) in October 1983 has been confirmed as this taxon (Brown pers. comm.). It has not been recorded in this vicinity since. Another population of five plants was located in low coastal heath in quartzite grit at Point Charles, west of Hopetoun in 1992. It has also recently been discovered at Eyre Bird Observatory in similar habitat to the Hopetoun population (Andrew Brown pers. comm.).

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Hopetoun	Albany	Rav	VCL	26.10.92	30	in flower
2. Point Charles	Albany	Rav	NP	22.10.92	5	in flower

WAHerb: 1 record (N. McQuoid; det. *C. robertsonii* Hopetoun)

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

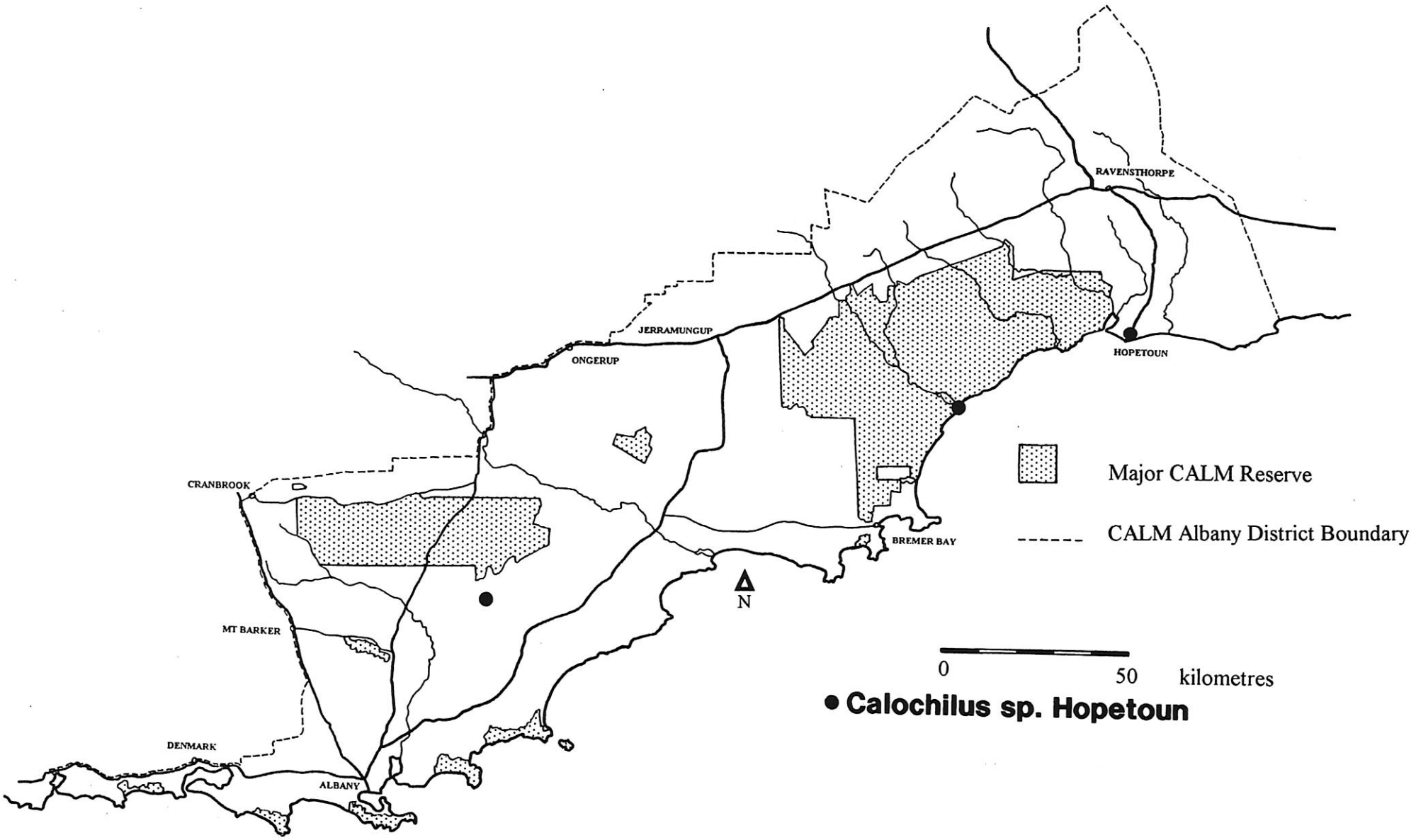
- maintain contact with Hopetoun residents and Ravensthorpe Shire to ensure population is not destroyed by Shire activities
- monitor regularly

Research Requirements

- survey Point Charles population
- survey Chillinup Road area
- survey other similar habitat opportunistically

References

Hoffman and Brown (1992).


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kilometres
● Calochilus sp. Hopetoun

Calothamnus macrocarpus Hawkeswood MYRTACEAE

Calothamnus macrocarpus is an erect, branched shrub, 2-3 m tall. The 2-3 cm leaves are sessile, crowded, erect or spreading, linear terete (1-2 mm wide) and somewhat succulent with prominent oil glands. The 5-merous flowers are grouped together (2-8) on the stems amongst the leaves (not axillary). They have small obovate petals, 6-8 mm long, which are pink to brown, papery thin with ciliate margins. The much bigger scarlet staminal claws are more or less equal, 28-35 mm long with 1.5 mm yellow anthers. The calyx tube is broadly campanulate and glabrous. The large sessile fruits which characterise this species are almost globular, 13-18 mm in diameter, with equal valves. *C. validus* which also occurs in Fitzgerald River National Park can be distinguished by being four merous and having unequal valves in the fruit.

Flowering Period: August-October.

Distribution and Habitat

Calothamnus macrocarpus is only known from East Mount Barren, and its immediate environs, where it occurs in shallow soil over rocky quartzite in association with mallee scrub.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. East Mt Barren	Albany	Rav	NP	9.9.92	+200	healthy

WAHerb: 15 records.

Response to Disturbance

Resprouts after fire

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

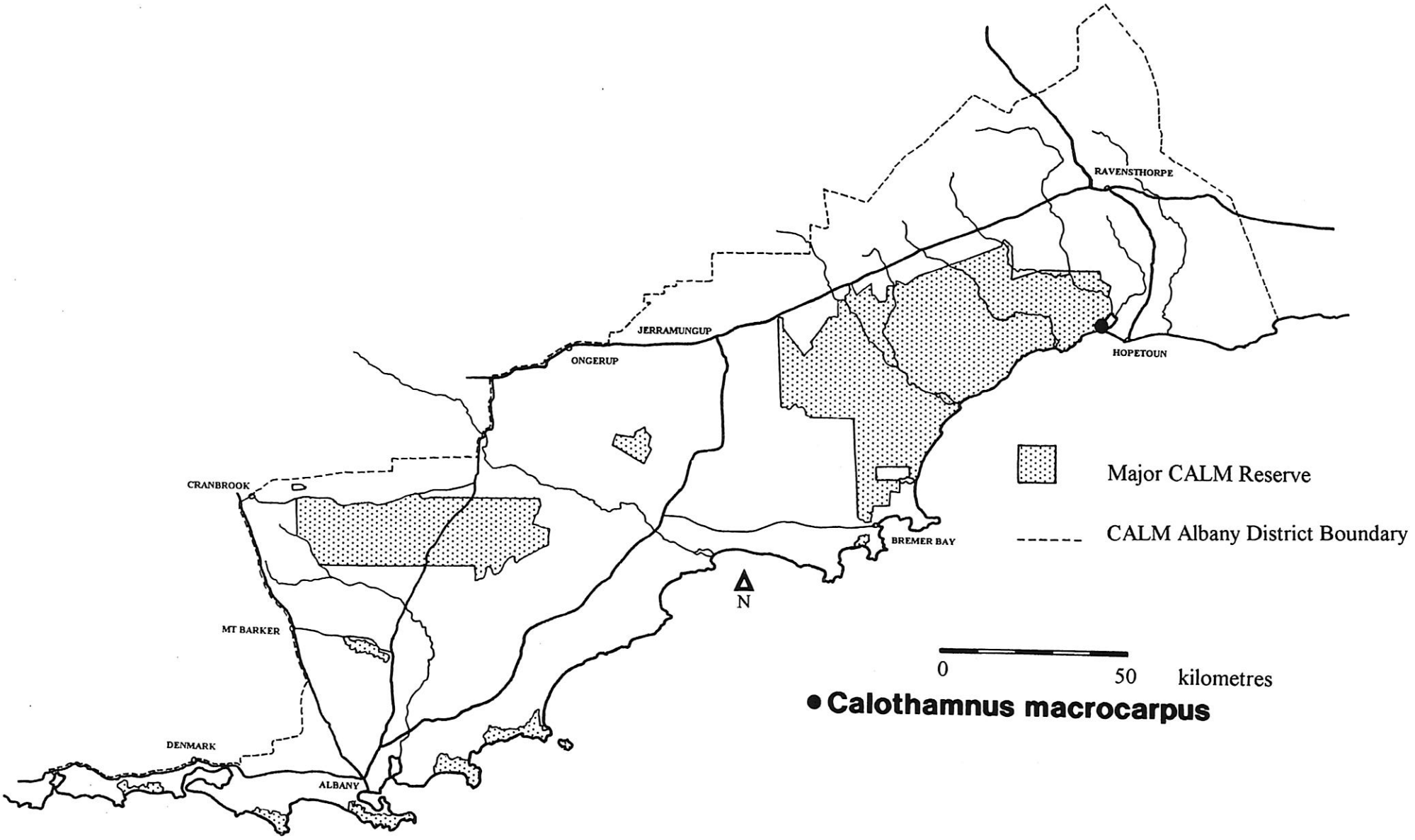
Monitor occasionally

Research Requirements

Survey opportunistically for new populations on other peaks in FRNP

References

Hawkeswood (1984).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
N
MT BARKER
DENMARK
ALBANY
Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
● Calothamnus macrocarpus

Chamelaucium juniperinum (Turcz.) Marchant & Keighery ms MYRTACEAE

Chamelaucium juniperinum ms is a partly compact shrub with erect, spindly branches to 130 cm tall. The linear narrowly obovate leaves (3-7 mm long and 0.6-1 mm wide) are opposite, crowded toward the branch ends and slightly recurved. The leaves are tending to terete in section, but may be slightly concave channelled above. The 0.4-0.6 mm petiole is appressed to the stem. The flowers, 2-6 are in opposite decussate pairs in the upper axils but may appear to be scattered or in terminal heads. The flowers are subtended by floral leaves which are usually shorter and flatter than the stem leaves. The buds are encased in brown scarious deciduous bracteoles which are very shortly pointed with a blunt horn. The calyx tube is campanulate-turbinate, 4 mm long with indistinct ribs which may become more apparent on dried material. The calyx lobes are minute (>1 mm), green with oil glands in the middle with white, shortly ciliate margins. The corolla lobes are white, often tinged red or pink, broadly obovate to 5 mm with very minutely denticulate or entire margins. There are 10 0.8-1.4 mm stamens and 10 staminodes, shortly united at the base into a tube 0.3-0.7 mm long. The terete style, with a ring of papillae around the stigma, is not exserted.

The flowers of *C. megalopetalum* are much larger (up to 25 mm across) and the floral bracteoles have a conspicuously raised ridge like a Roman helmet.

Flowering Period: October-December

Distribution and Habitat

This species was first collected by Drummond in 1849, presumably from near Cape Riche. It has since been collected from Cape Riche again, near Chillinup Pool and west of Bremer Bay. Survey in spring 1993 could not relocate it at Cape Riche or the Boxwood-Bremer road. The Bremer road verges are, in places, seriously degraded. It occurs in a variety of soils from sand, light brown sand over laterite to clay over limestone in association with other shrubs.

It is not known from any conservation land

Conservation Status

Current: Priority 2 Recommended: Priority 1

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Cape Riche	Albany	Alb	VCL	4.10.79	common-WH	in flower
2. Chillinup Road	Albany	Alb	verge	21.10.93	+400	in flower

WAHerb: 11 records.

Response to Disturbance

Many Chillinup Road plants were occurring on previously disturbed white or brown sands.

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

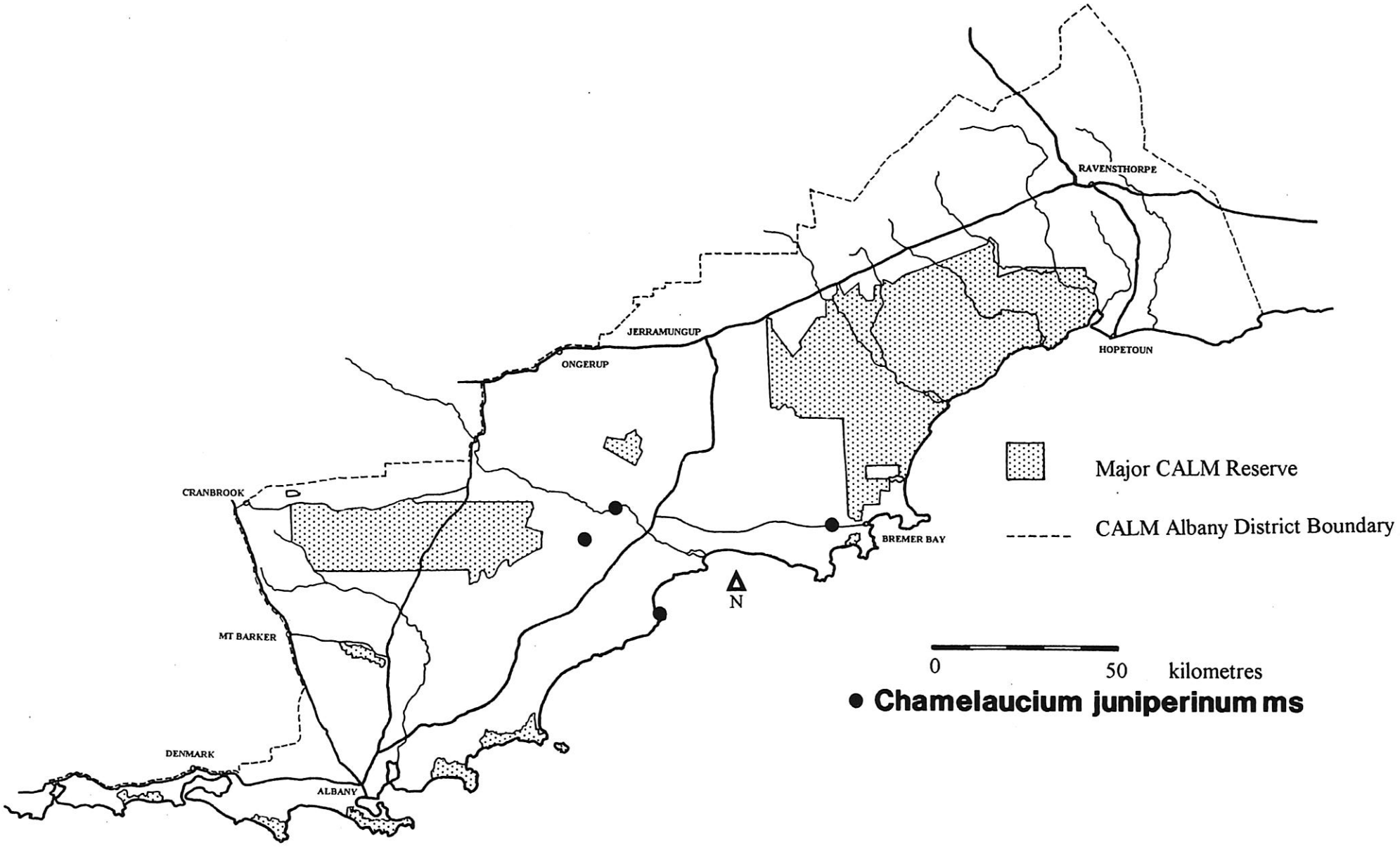
Monitor occasionally

Research Requirements

- relocate Cape Riche populations and survey
- survey for new populations

References

N.G. Marchant and G.J. Keighery (pers. comm.).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
● Chamelaucium juniperinum ms

Chorizema reticulatum Meisn. PAPILIONACEAE

Chorizema reticulatum is a low, multistemmed shrub to 400 mm. The green leaves are broadly ovate, with a prominent yellow midrib and rigid reticulum and are shortly pointed. The inflorescence is an elongated leafless terminal spike, 150 mm long. The flowers form a spectacular display with their lolly pink standards (10 mm) and orange wings and keel.

Flowering Period: August-September.

Distribution and Habitat

This species is known from west of Denmark, through to Mt Manypeaks via Mount Barker and Porongurup. It occurs as part of the shrub understorey beneath woodland of Jarrah, Marri, Albany Blackbutt and Sheoak growing in grey sands over laterite (i.e. a very common habitat).

Although there are only six records in WAHerb, a significant range is indicated, including major conservation areas at Marbellup and Manypeaks. It is also known to be very common in the proposed area of National Park west of the Denmark to Mt Barker Road (Hamersley, pers. comm.). It was also found to be common along the North Marbellup-Chorkerup Siding Roads.

Conservation Status

Current: Priority 2 Recommended: Remove from priority list

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Marbellup	Albany	Alb	NR	25.8.78	-	-
2. Bonaccord Rd	Albany	Alb	Shire res.	1985	common-WH	in flower
3. Chorkerup	Albany	Alb	verge	2.9.92	+30	healthy
4. DenBarker	Albany	Alb	NP	1992	common*	healthy

WAHerb: 6 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

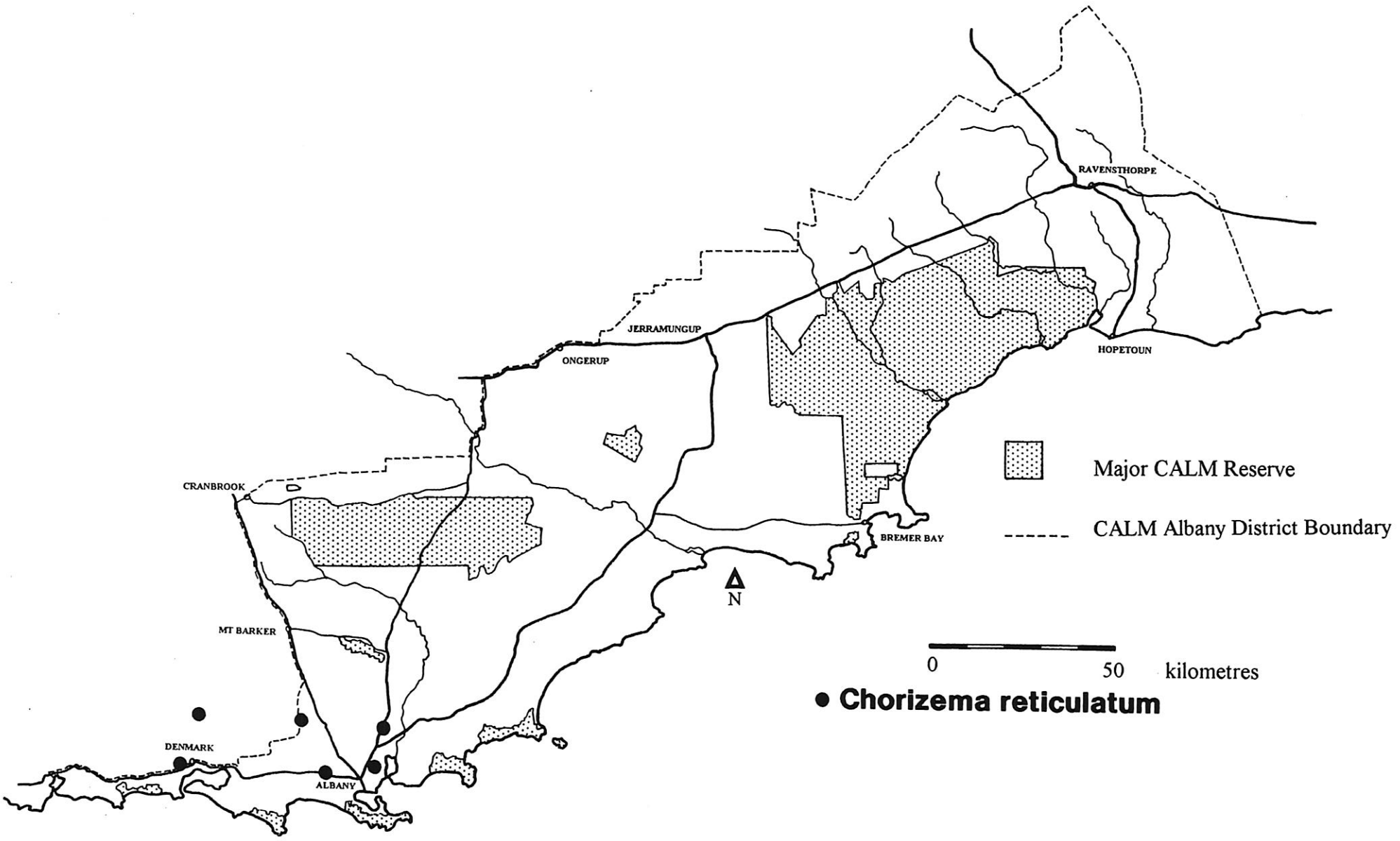
Management Requirements

Research Requirements

References

Bentham (1864).

* B.G. Hammersley (pers. comm.).


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CALM Albany District Boundary
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kilometres
● Chorizema reticulatum

Comesperma lanceolatum R.Br POLYGALACEAE

Comesperma lanceolatum is a slender, glabrous, spreading shrub to 200 mm. The dull green leaves are small, narrow linear, rigid, erect and acute. The inflorescence is a short raceme of blue flowers, with two wings and a keel. The fruit is an elliptical capsule, tapering toward the base.

Flowering Period: November

Distribution and Habitat

WAHerb shows two locations, one from Esperance and one from Woolbernup Hill where it occurs in *Banksia baxteri* shrubland in white sand. Further extensive survey is required to determine its conservation status.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Esperance	Esp	Esp	?	30.12.89	28	-
2. Woolbernup	Albany	Rav	NP	21.11.85	rare-WH	in flower

WAHerb: 2 records.

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

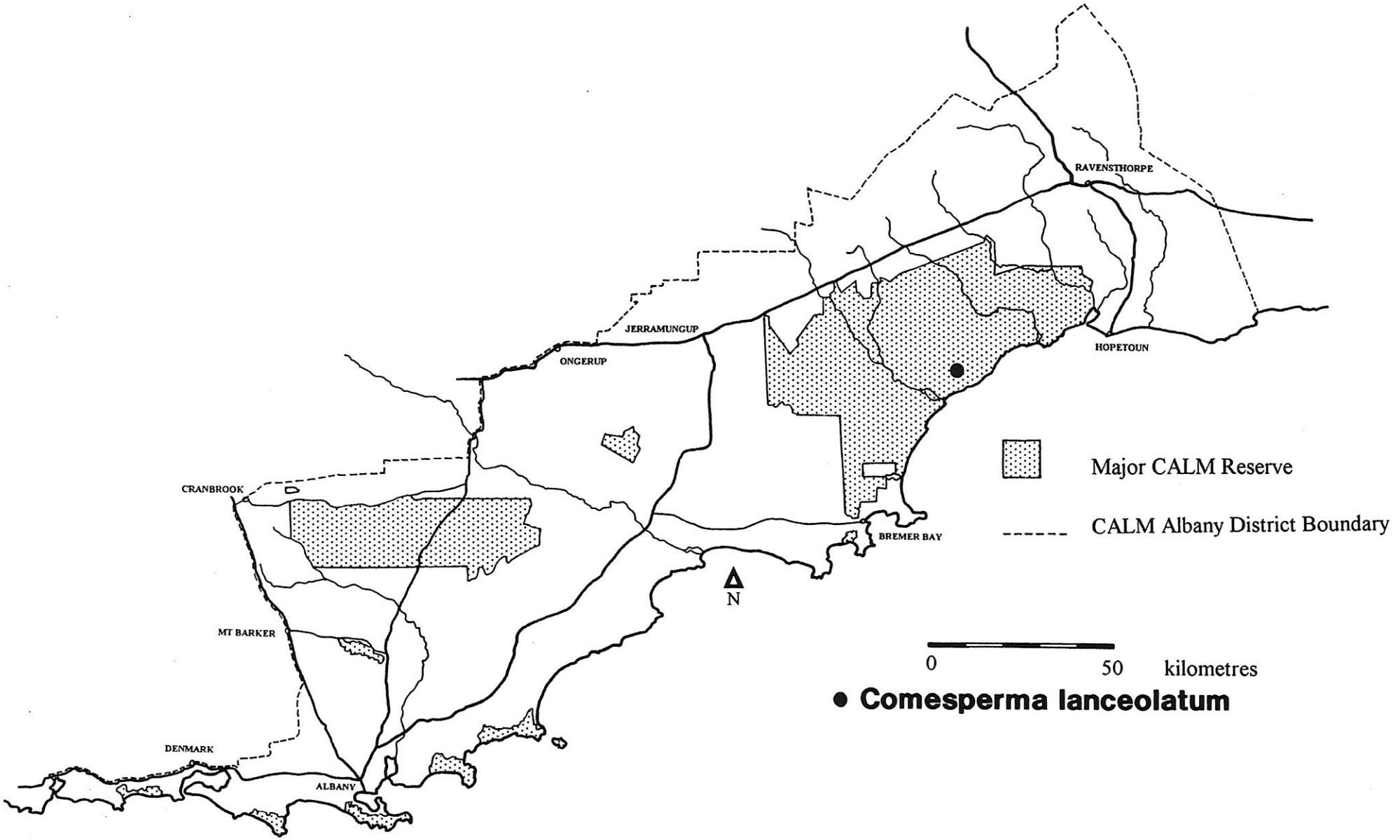
Management Requirements

Research Requirements

- relocate and survey Woolbernup Hill population
- survey for new populations

References

Bentham (1863).


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BREMER BAY
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
● Comesperma lanceolatum

Conospermum spectabilis E.M.Benn. ms PROTEACEAE

Conospermum spectabilis ms is a shrub to 0.8 m tall with terete, sigmoid leaves, 15-22 mm long and 0.2-0.4 mm wide with scattered hairs toward the base. The inflorescence is a terminal panicle of spikes. The glabrous blue bracteoles are ovate, 4.5-7 mm long and 3-4 mm wide, ciliate with an acute apex. The perianth is white and blue with a woolly 7-10 mm tube. The upper perianth lobe is a glabrous, blue, broad, ovate lip, 1.5 mm long and 3 mm wide and is recurved. The lower lobes are united into a recurved pilose lip,to 1mm long. Nuts or fruits have not been seen.

This species is similar to *C. floribundum*, but has large blue (not brown) bracteoles.

Flowering Period: later than the more common *C. floribundum*: i.e. after October.

Distribution and Habitat

This species is restricted to the western part of the Stirling Range, where it occurs in sandy soils or white lateritised clay with Jarrah-Banksia woodland or scrub or heath.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
(1) Stirling Range Drive	Albany	Cb	NP	12.11.93	occas.-WH	-
(2) Red Gum Pass	Albany	Cb	NP	12.11.93	occas.-WH	-

WAHerb:11 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Field observation suggests high susceptibility

Management Requirements

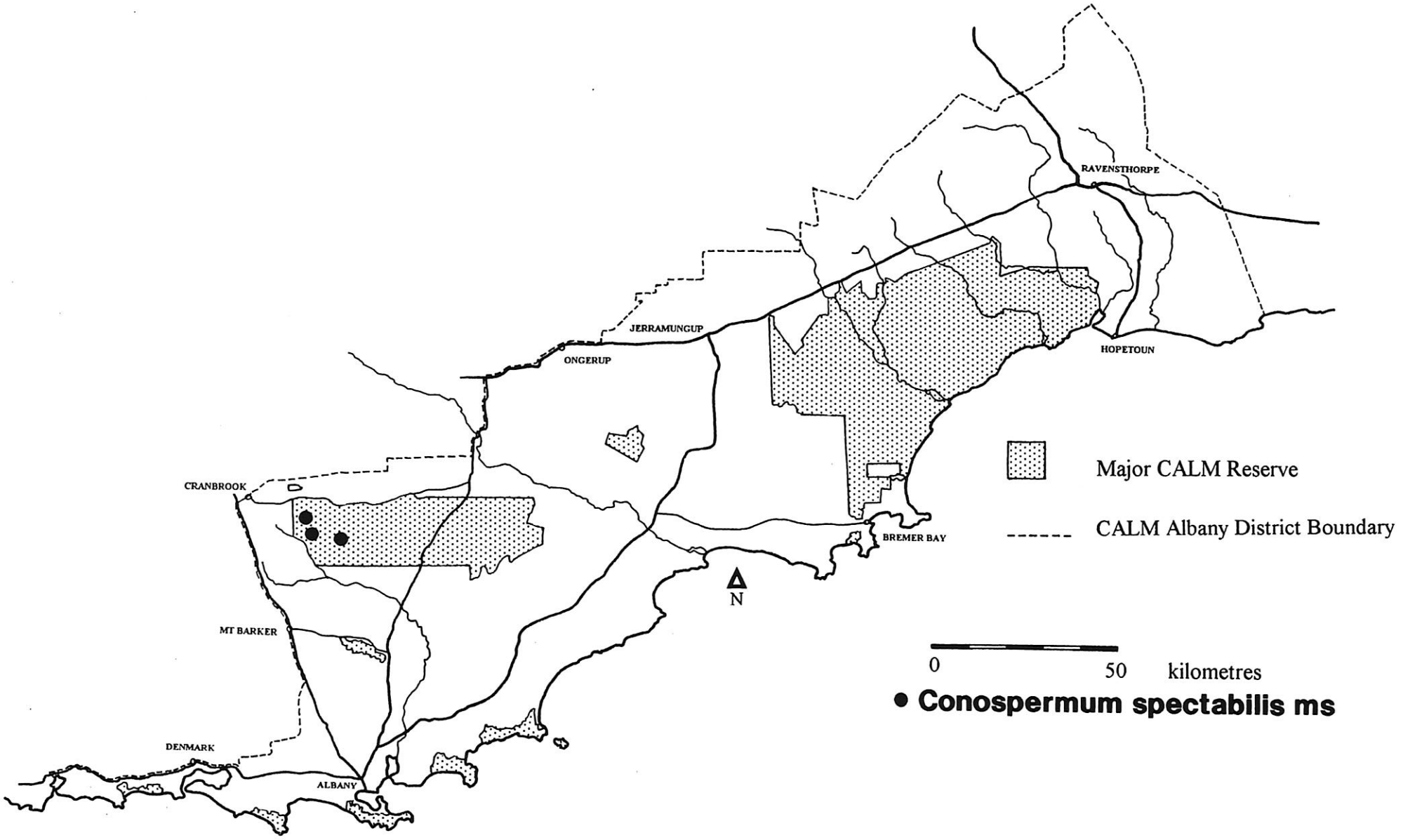
May require phosphonate application

Research Requirements

- survey old WAHERB locations
- survey for new populations
- confirm susceptibility to *Phytophthora* and assess impact

References

Eleanor Bennett (pers. comm.).


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Major CALM Reserve
CALM Albany District Boundary
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kilometres
• Conospermum spectabilis ms

Cymbonotus preissianus Steetz. ASTERACEAE

Austral Bear's Ear

Cymbonotus preissianus is a perennial herb, with radical leaves to 120 mm long. The leaves have slender petioles to 35 mm long (with broad stem clasping ciliate bases), and broad ovate blades 90 mm long and 50 mm wide with coarse lobes. The undersurface of the leaves is white tomentose, the upper dark green and scabrid. The 7-10 mm hemispherical yellow flower heads are on peduncles usually much shorter than the leaves or sessile. The peduncle and floral bracts are white tomentose. The outer bracts are narrower than the inner bracts, spathulate, glabrous above with purplish scarious margins and recurved subulate tips. The outer florets are yellow ligulate females, the inner are bisexual and tubular. The 3 mm achenes are straight, glabrous, rugose, brown or black and with a pale semi-translucent base passing into two ridges on the inner face.

Flowering Period: August

Distribution and Habitat

The only collection currently held in the WA Herbarium was made in 1966 in or near the Stirling Range National park (probably Chester Pass Road). The collector thought it was an introduced weed and was making enquiries on how to eradicate it when its identity was revealed (Paul Wilson pers. comm.). Other Kew collections from upper Kalgan and Fremantle match the WA Herbarium material (Greive pers. comm.). *Cymbonotus preissianus* is widespread in dry and wet sclerophyll habitats (often disturbed) in NSW, Victoria and SA.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent survey						

WAHerb: 1 record.

Response to Disturbance

Favoured by disturbance; likely to be somewhat "weedy"

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

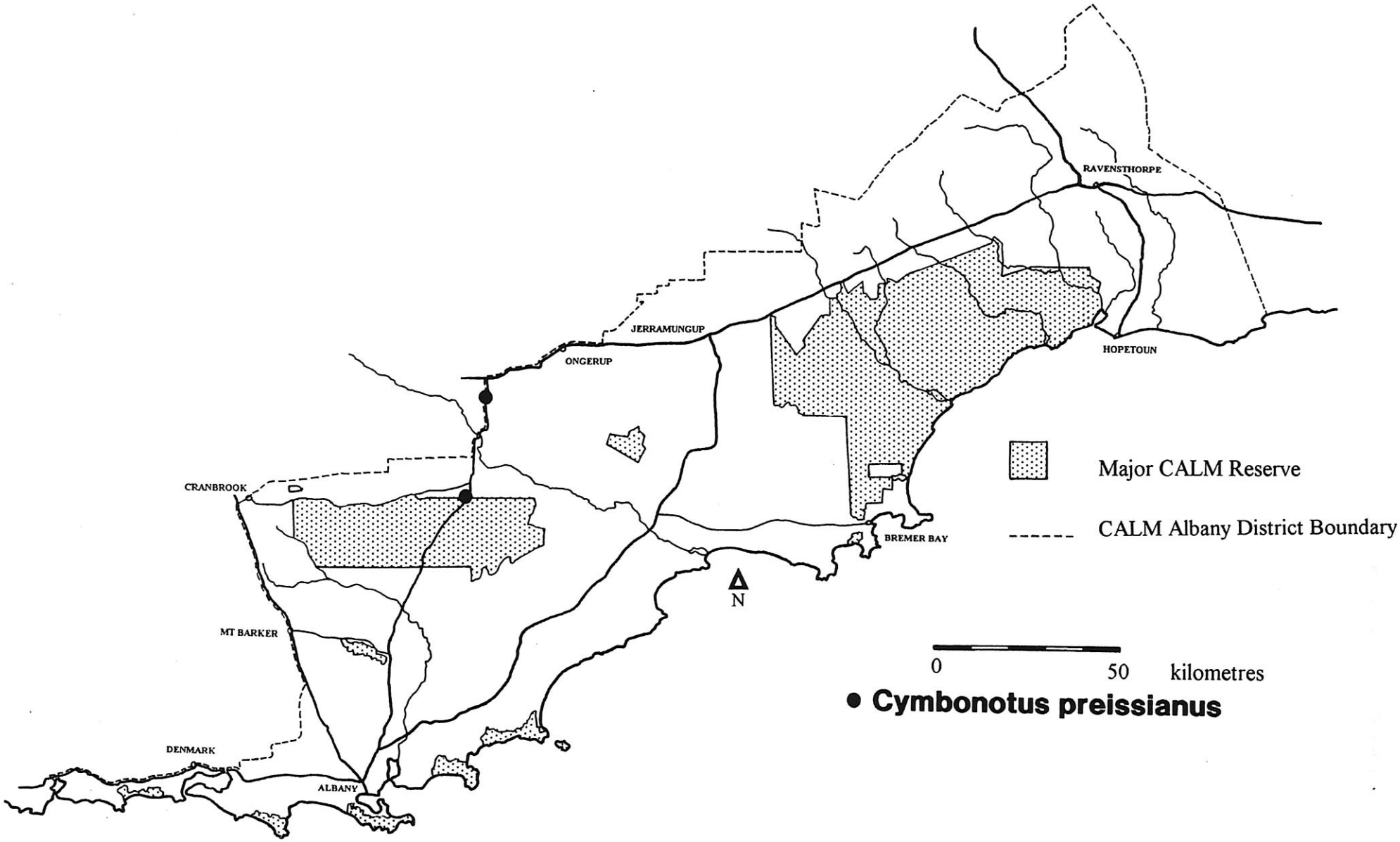
Cannot be determined until populations are relocated

Research Requirements

Search for and survey populations in Stirling Range and upper Kalgan areas

References

Burbidge and Gray (1970).


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CALM Albany District Boundary
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kilometres
• Cymbonotus preissianus

Dampiera deltoidea Rajput & Carolin GOODENIACEAE

Dampiera deltoidea is a glabrous perennial herb 25-45 cm tall. The characteristic stems (6-8 mm wide) are flat, winged and constricted slightly at the nodes. The midrib is conspicuous and raised. The stem leaves, which appear very similar to the stem, are sessile, and almost as broad as the stem at the base. The lamina is 10-16 mm long, 6-9 mm wide, obtuse tipped and occassionally with short marginal teeth. Some larger basal leaves are often present. The flowers are in clusters of three in the upper axils, on 2-2.5 mm pedicels, sepals 0.5-0.7 mm, and the deep blue-purple corolla (10-11 mm long) has appressed hairs on the outside.

Flowering Period:September-November

Distribution and Habitat

This species has been collected over a wide range from Mt Drummond, East Mt Barren, Thumb peak and Fitzgerald River in FRNP, and from Elverdton between Ravensthorpe and Hopetoun. It occurs in a variety of soils supporting mallee heath or scrub.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent survey						

WAHerb: 7 records

Response to Disturbance

Killed by fire; regenerates from seed

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

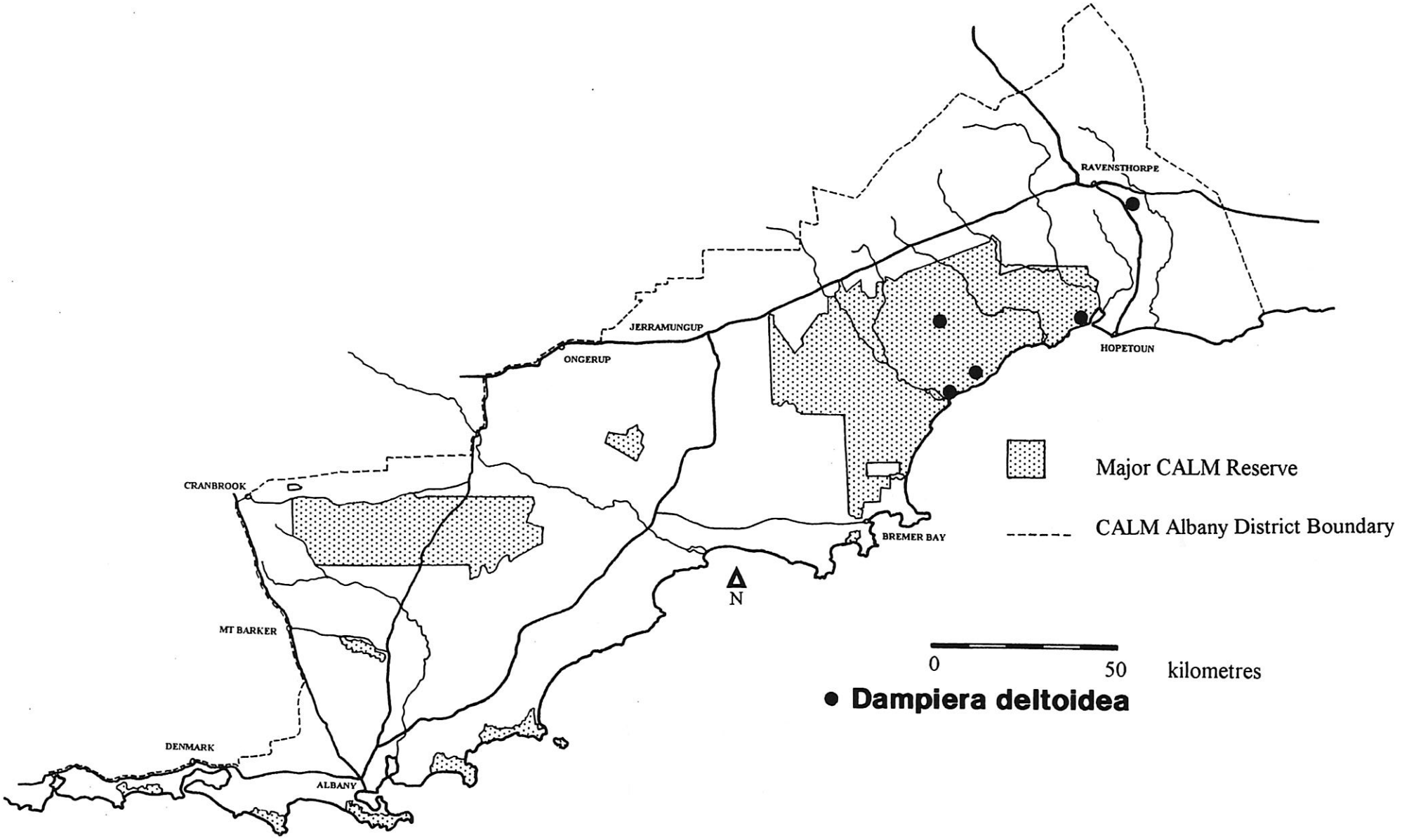
Monitor occassionally

Research Requirements

- relocate and survey WAHerb locations
- survey opportunistically for new populations

References

Rajput and Carolin (1988).


RAVENSTHORPE
HOPETOUN
JERRAMUNGUP
ONGERUP
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
• Dampiera deltoidea

Dillwynia acerosa S.Moore PAPILIONACEAE

Dillwynia acerosa is an erect shrub to 40 cm tall. The rounded (not keeled) linear leaves are 3-4 mm long and 0.5 mm wide, with recurved rounded apices. The margins are rigid revolute to form a longitudinal groove. Stipules are absent. The yellow flowers are axillary, solitary or in few flowered short clusters. Peduncles are 1-2 mm long, with obtuse linear bracteoles, 1 mm long. The pubescent calyx is 5 mm, including 1.5 mm lobes. The standard is 6 mm (nearly twice as broad as long) and the 7 mm keel is as long as the wings and retuse.

Flowering Period: August-October

Distribution and Habitat

The original description gives the location as "Prope Coolgardie". Specimens of this species could not be located at the WA Herbarium, however WAHerb records only one specimen (identity not verified) from sandy loam, supporting Eucalypt and Dryandra near Cranbrook.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent survey						

WAHerb: 1 record

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

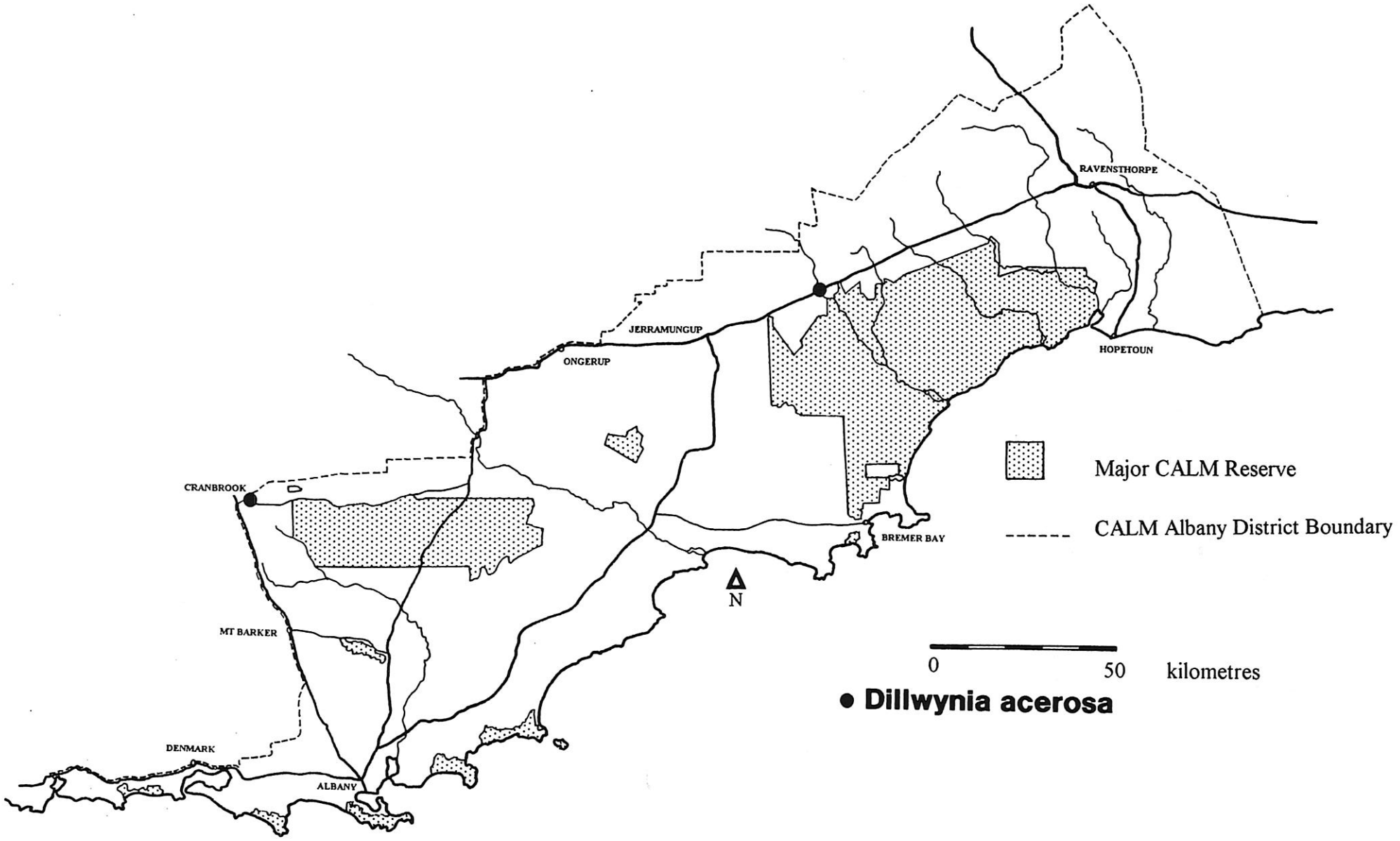
Management Requirements

Research Requirements

- relocate and survey WAHerb location and verify identification
- survey for new populations

References

Moore (1898).


RAVENSTHORPE
JERRAMUNGUP
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CRANBROOK
BREMER BAY
MT BARKER
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
● Dillwynia acerosa

Dryandra foliosissima C.A.Gardner PROTEACEAE

Dryandra foliosissima is a very dense, compact shrub to 2 m tall, and up to 3 m wide with cascading foliage. The stems are tomentose. The leaves are very numerous and crowded towards the ends of the branches. They are up to 40 cm long, less than 8 mm wide with sharply pointed triagular lobes cut to within 3 mm of the midrib, separated by up to 10 mm sinuses. The 4 cm golden inflorescences are hidden inside the foliage, and grow on short stalks from the old stem wood or within the leaves. The flowerheads are open, cup-shaped with floral bracts not exceeding the flowers. The 20 mm follicles are woody, dark brown and densely matted in ferruginous hairs.

Flowering Period: May-October; mid autumn.

Distribution and Habitat

This species has been collected twice in the Dumbleyung, Lake Grace and Harrismith region and nine times from the Ravensthorpe Range (WAHerb). It occurs on well drained gravel ridges in open scrub..

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Mt Desmond	Albany	Rav	VCL	8.9.93	30	good
2. Elverdton Rd	Albany	Rav	VCL	8.9.93	4	good

WAHerb: 12 records (1 record Albany Herb.)

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible (high)

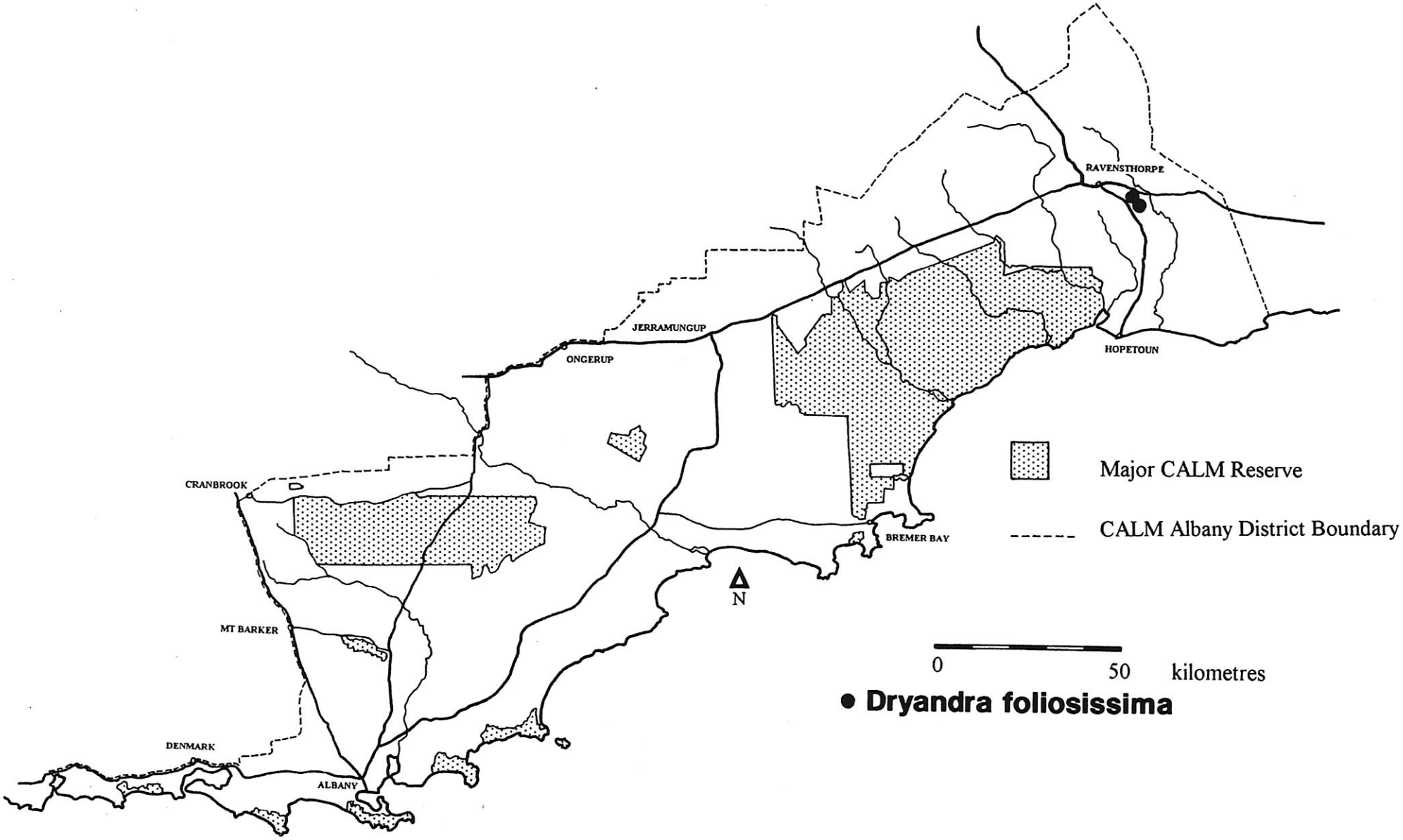
Management Requirements

Research Requirements

Survey Ravensthorpe Range populations

References

Sainsbury (1985).


RAVENSTHORPE
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CRANBROOK
BREMER BAY
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DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
● Dryandra foliosissima

Dryandra seneciifolia R.Br. PROTEACEAE

Dryandra seneciifolia is a shrub to about 1 m, with several erect, column like tomentose stems, densely covered with spreading foliage. The crowded, dark green leaves are 5-10 cm long, up to 10 mm wide across the sharp pointed triangular lobes, which are separated by long sinuses, parallel to the midrib. The greenish red inflorescences are small (2 cm) and narrow and largely hidden amongst the leaves. The outer floral bracts are leafy, the inner ones fine and hairy.

Flowering Period: late winter-early spring.

Distribution and Habitat

WAHerb records only four collections of this species. One each by Drummond (no location) and Maxwell (near Porongurup), mid nineteenth century, and two more recent collections by George (SRNP). Sainsbury (1985) states that it "occurs only between Albany and the Stirling Range". It grows in gravelly clay or rocky silt in tall shrubland.

McDonald (pers. comm.) observed it to be widespread in the North Stirling Range and Hamilla Hills, and subject to frequent deaths presumed to be due to *Phytophthora*.

It was surveyed in the Hamilla Hills (SRNP) in 1993, where it grows in shallow pink sand and pink siltstones, midslope with mallee scrub, including several other *Dryandra* species.

Seed has been collected for storage at CALM's TFSC (WA Herbarium) from both Lookout Hill and Hamilla Hills.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Hamilla Hill	Albany	Cb	NP	24.8.92	+2000	healthy
2. Lookout Hill	Albany	Pl	NP	19.8.93	+2000	healthy

WAHerb: 4 records.

Response to Disturbance

Killed by fire

Susceptibility to *Phytophthora* Dieback

Field observation suggests high susceptibility

Management Requirements

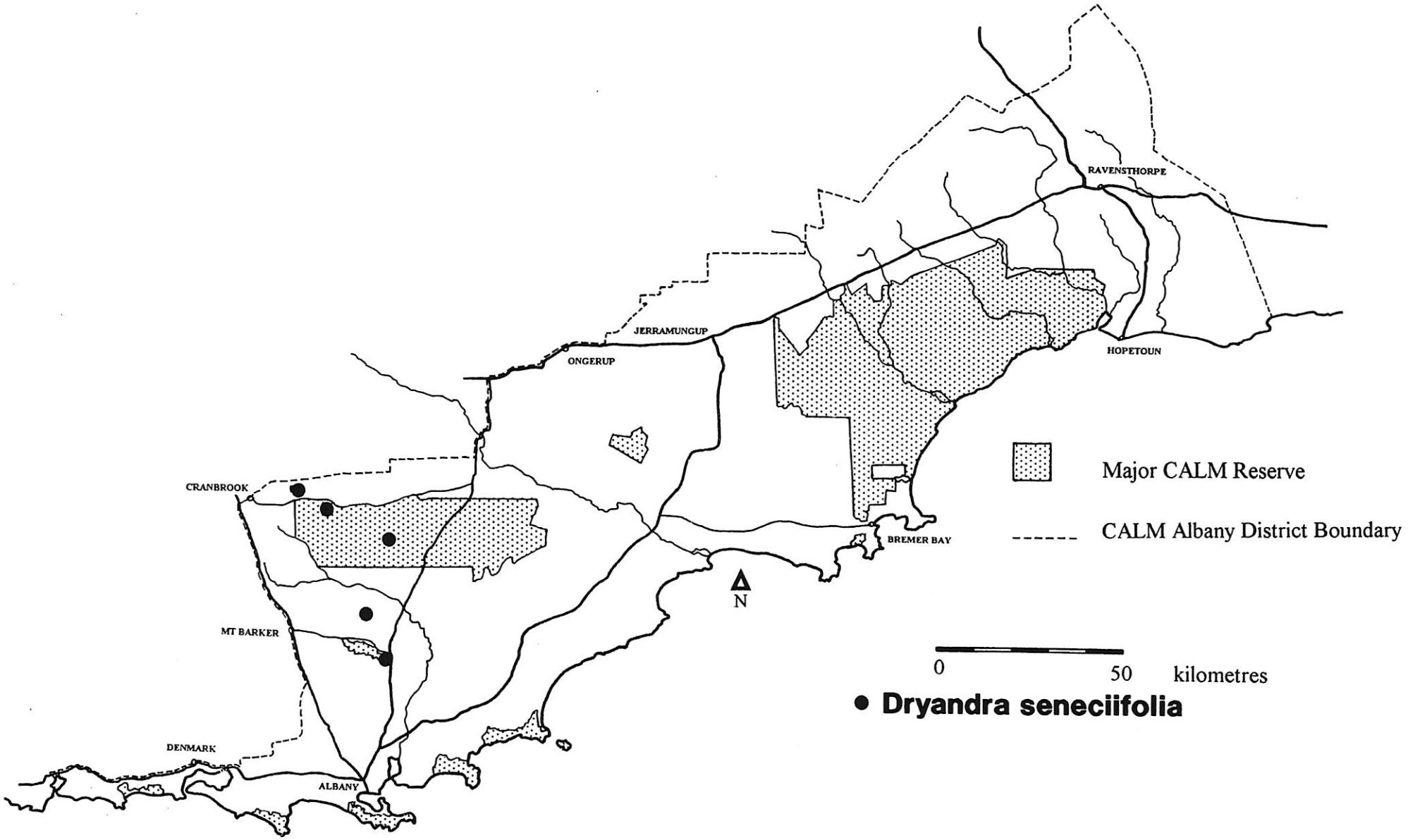
- monitor populations
- assess need for phosphonate application

Research Requirements

- locate and survey for new populations
- confirm susceptibility to *Phytophthora*

References

Sainsbury (1985).


RAVENSTHORPE
JERRAMUNGUP
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CRANBROOK
BREMER BAY
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DENMARK
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
Dryandra seneciifolia

Dryandra serra R.Br. PROTEACEAE

Dryandra serra is an erect multistemmed shrub up to 4 m tall. The foliage is mid-dense, spreading and composed of leaves 5-15 cm long, to 10 mm wide which are divided half way to the midrib into broadly triangular lobes, angled slightly toward the apex. The lower leaf surface is covered by a mat of soft hairs. The small (2 cm long, 1 cm wide) yellow inflorescences are borne on short axillary branches (toward the end of the main branches), and are surrounded by spreading floral leaves. The involucral bracts are not prominent.

Flowering Period: July-September.

Distribution and Habitat

This species occurs between Weld/Deep Rivers and Manypeaks in sandy gravel over laterite in mallee heath or under Jarrah-Sheoak woodland. Although it is known from five or more conservation reserves, *D. serra* is highly susceptible to *Phytophthora* dieback, and is severely affected in some reserves (Malcolm Grant pers. comm.). At Two Peoples Bay it is also affected by aerial canker. This species needs to be closely monitored for impact of disease.

Seed has been collected from the Hunwick Road and Mt Halliwell populations.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Mt Manypeaks	Albany	Alb	NR	17.7.86	abundant-WH	-
2. Hunwick Rd	Albany	Alb	SF	20.8.93	+1000	fair
3. South Sister	Albany	Alb	NR	4.3.93	43	seedlings
4. Millbrook	Albany	Alb	NR	1992	+1000	diseased
5. Sleeman	Albany	Alb	NR	-	-	-
6. Two Peoples	Albany	Alb	NR	2.1993	+100	diseased
7. Norman'sNth	Albany	Alb	NP	8.7.93	+200	fair
8. Mt Haliwell	Albany	Dnmk	Shire res.	9.93	+500	diseased
9. Down Road	Albany	Alb	Shire res.	14.9.93	+200	diseased
10. Hay Block	Walpole	Dnmk	SF	9.11.93	common*	diseased

WAHerb: 15 records (4 records Albany Herbarium)

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Field observation suggests high susceptibility

Management Requirements

- monitor the impact of disease
- apply phosphonate on selected populations

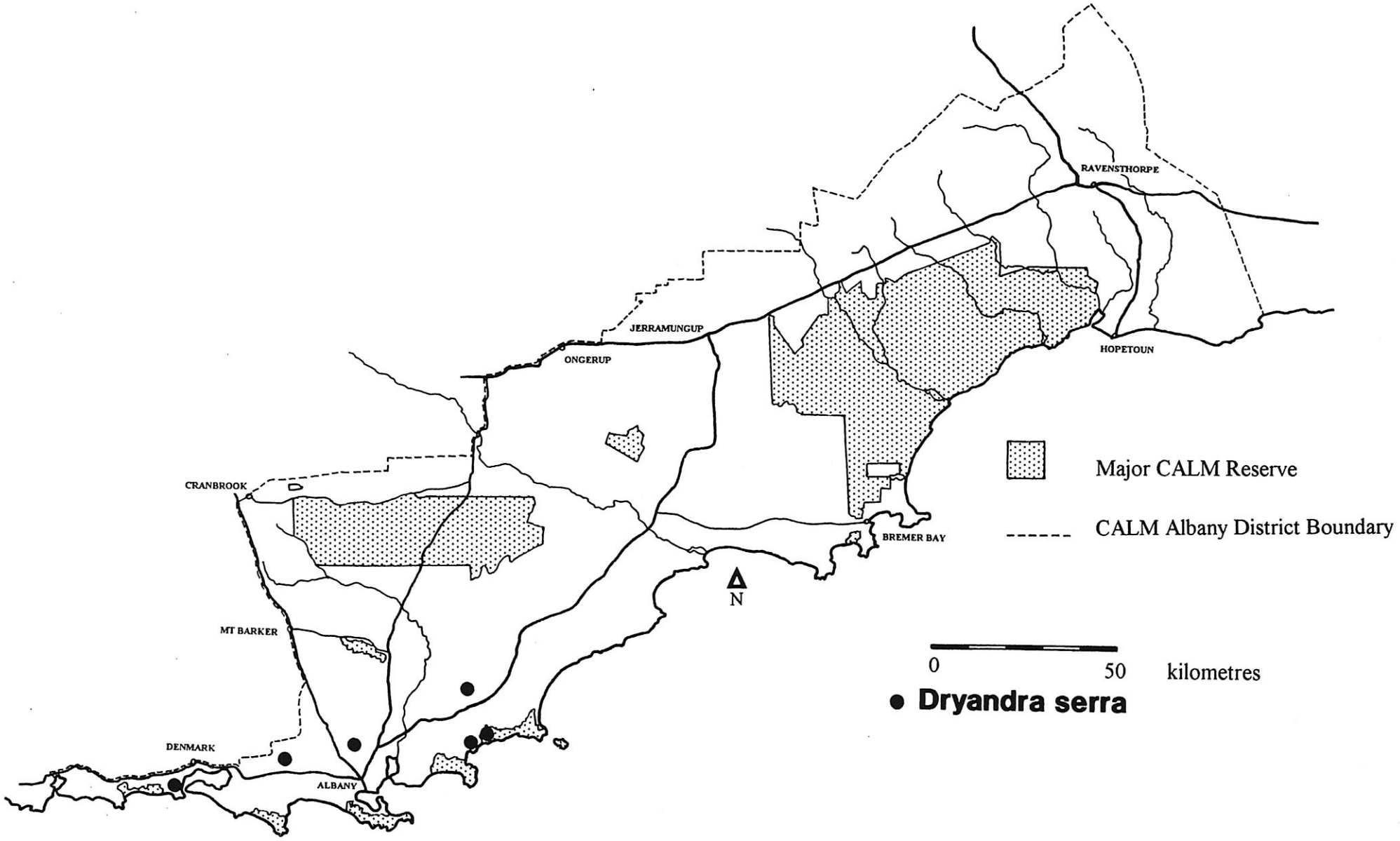
Research Requirements

- survey for new populations and fully assess impact of disease on the species across its range
- confirm susceptibility and determine application rates of phosphonate that may protect from disease

References

Sainsbury (1985).

* L.R. Anderson (pers. comm.).


RAVENSTHORPE
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kilometres
Dryandra serra

This *Dryandra* is a prickly shrub to 1.3 m tall, known within the Dryandra Study Group as the "Cactus Dryandra" due to the upright, lean habit and its branches protruding at right angles from the trunk and then turning up to grow parallel to the trunk. The leaves and flowers are similar to *D. falcata*. The leaves are deeply pinnatisect, 7-8 cm long with pungent pointed lobes, slightly recurved leaf margins and tapering at the base. The lamina is broader toward the apex and is somewhat falcate. The juvenile leaf has entire margins in the seedling stage and develop a lamina of up to 10 mm across, from which the broadly triangular lobes (5 mm) protrude. The adult leaf has a narrow lamina (5 mm) and much longer, narrowed and pungent leaf lobes up to 10 mm long each. The terminal greenish-yellow inflorescence is large (7 cm across) and surrounded by numerous floral leaves, longer than the flowers and villous floral bracts. The reddish-brown follicles are large (22 mm high by 15 mm across) and woody. The follicles of true *D. falcata* are very small and hairy with one seed .

Flowering Period: Winter or February-March.

Distribution and Habitat

This species is only known from one population near Mount Gog on Stirling Range Drive. It grows in silty sand over clayey gravel supporting scrub. Dieback disease is active in the vicinity. Seed has been collected and stored in the CALM Threatened Flora Seed Centre.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Stirling Range Drive	Albany	Pl	NP	18.8.93	6 live	9 dead

WAHerb: ASG 16886

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Field observation suggests very high susceptibility

Management Requirements

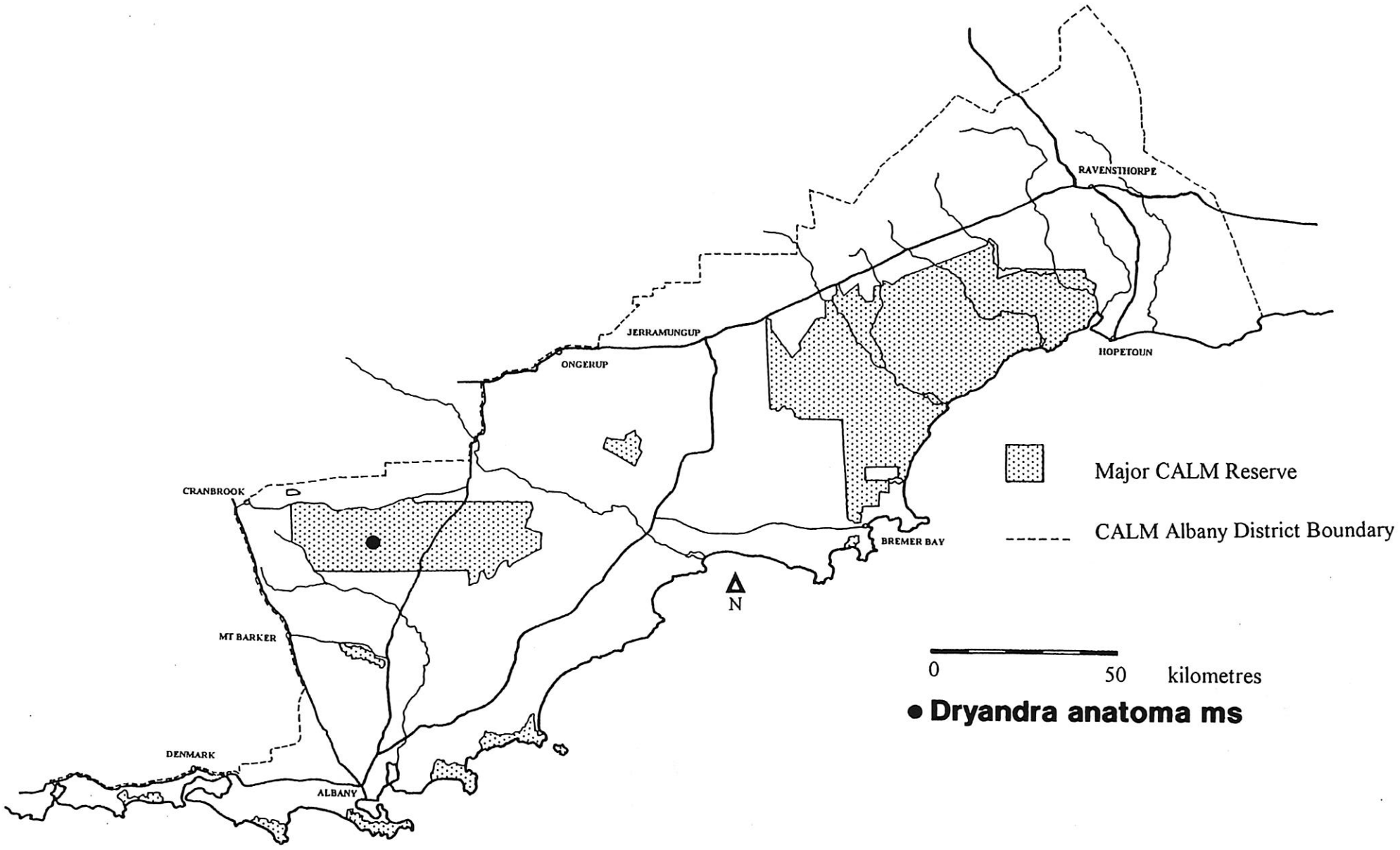
- monitor the impact of disease
- apply phosphonate on selected populations

Research Requirements

- survey for new populations and fully assess impact of disease on the species across its range
- confirm susceptibility and determine application rates of phosphonate that may protect from disease

References

Dryandra Study Group Newsletter No. 22. (July 1992).


RAVENSTHORPE
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CALM Albany District Boundary
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kilometres
● Dryandra anatoma ms

Dryandra sp. 49 (K.Alcock 472) [aff. *ferruginea*] PROTEACEAE

This *Dryandra* is a low, rounded shrub with a short, erect stem which may grow to 0.5 m. The leaves are 30 cm long with 15 cm long red petioles, before the dark green lamina of elongate narrow triangular, 15 mm long lobes, cut right into the midrib. The distance between leaf lobes is usually about 15 mm but in some older plants may elongate to be much greater than the length of the lobe. The inflorescences are hidden amongst or below the leaves on the older woody stem. The buds are up to 70 mm long, sharply pointed and composed of a series of brown to golden obtuse bracts; the inner ones elongating to 50 mm. The open inflorescence is hemispherical, 50 mm in diameter. The follicles are 18 mm tall by 10 mm across and are smooth, light brown and slightly waxy.

Dryandra ferruginea from Lake Grace to Ravensthorpe is a larger plant (to 1.5 m high and wide) with longer leaves with narrower lobes.

Flowering Period: September-October

Distribution and Habitat

This species is only known from one location within the Stirling Range, on an unnamed lookout hill near Mount Gog. It extends from just above the carpark, north east on the ridge and northern slopes for approximately 5-600 m. It grows in shallow rocky soil (and in rocky outcrops) in low heath and scrub which includes *Dryandra seneciifolia*, *D.* aff. *armata* sp. 10, and *D. drummondii*. Many plants were young and appeared to be regeneration after fire several years previous. The bigger, older plants were confined to the rocky ledges, where they may have been protected from fire.

The plants appeared to be healthy. Seed has been collected for storage in the CALM TFSC.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Lookout Hill	Albany	Pl	NP	19.8.93	+5,000	in flower

WAHerb:1 record

Response to Disturbance

Killed by fire; regenerates from seed

Susceptibility to *Phytophthora* Dieback

Field observation suggests high susceptibility

Management Requirements

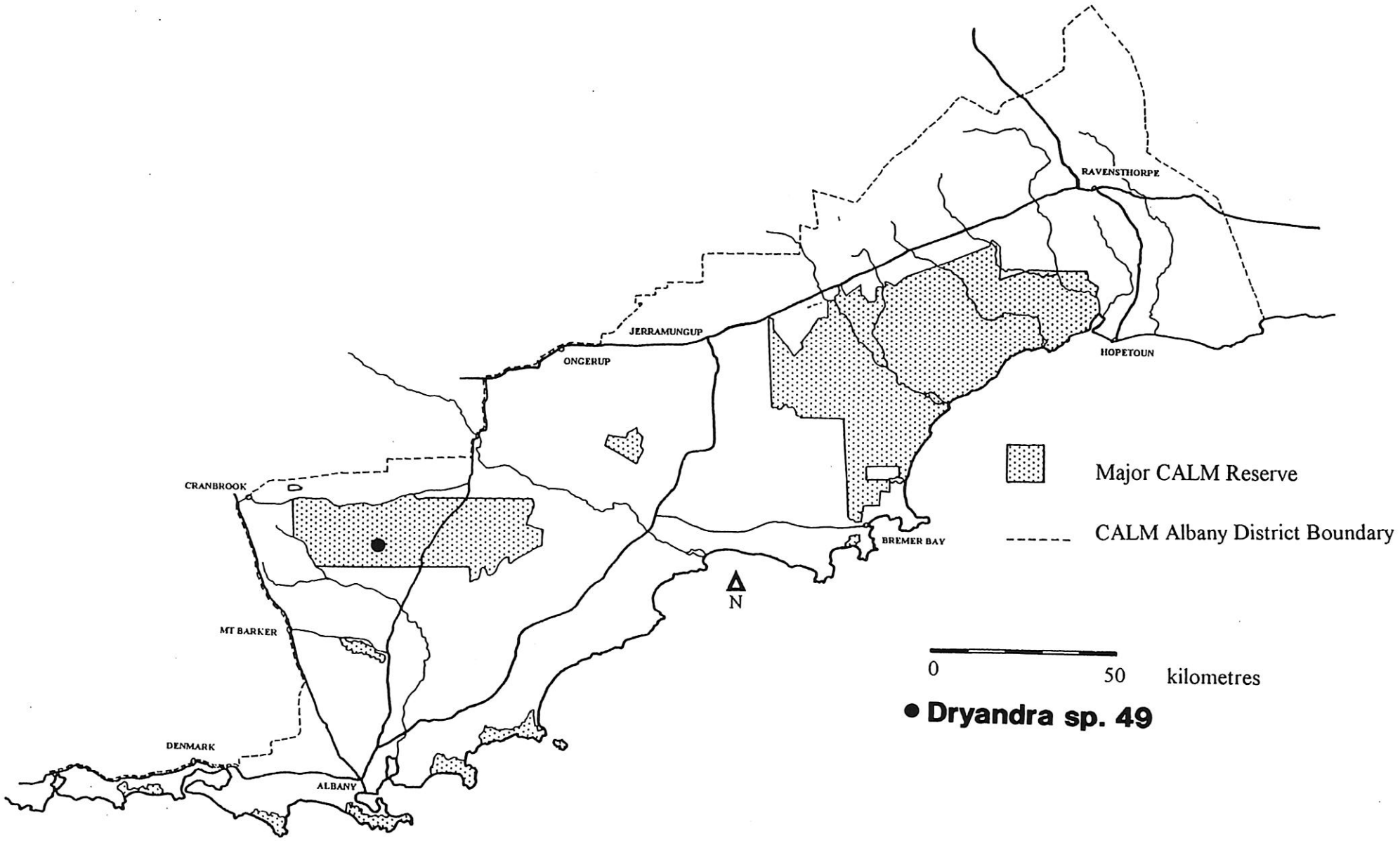
- monitor the impact of disease
- apply phosphonate on selected populations

Research Requirements

- survey for new populations and fully assess impact of disease on the species across its range
- confirm susceptibility and determine application rates of phosphonate that may protect from disease

References

Dryandra Study Group Newsletter (various).


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kilometres
● Dryandra sp. 49

Eriostemon cymbiformis P.G.Wilson RUTACEAE

Eriostemon cymbiformis is a shrub to 0.5 m tall. The blue green leaves are thick, 6-10 mm long, concave above and glandular, verrucose below. The pedicellate flowers are terminal, usually solitary and surrounded by a few leaves. The thick sepals are triangular, 1.5-2 mm long, beneath the ovate, obtuse 6 mm petals, which are puberulous white inside and glabrous white with a reddish brown strip outside. The erect stamens, slightly shorter than the petals, have linear filaments which are densely woolly in the lower half.

Flowering Period: Spring

Distribution and Habitat

This species occurs in the western end of the Fitzgerald River National Park in sandy loam or gravel supporting an association of open mallee shrubland.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Mt Maxwell	Albany	Jer	NP	7.9.93	4	in flower
2. FRNP	Albany	Jer	NP	18.11.84	1	-

WAHerb: 5 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

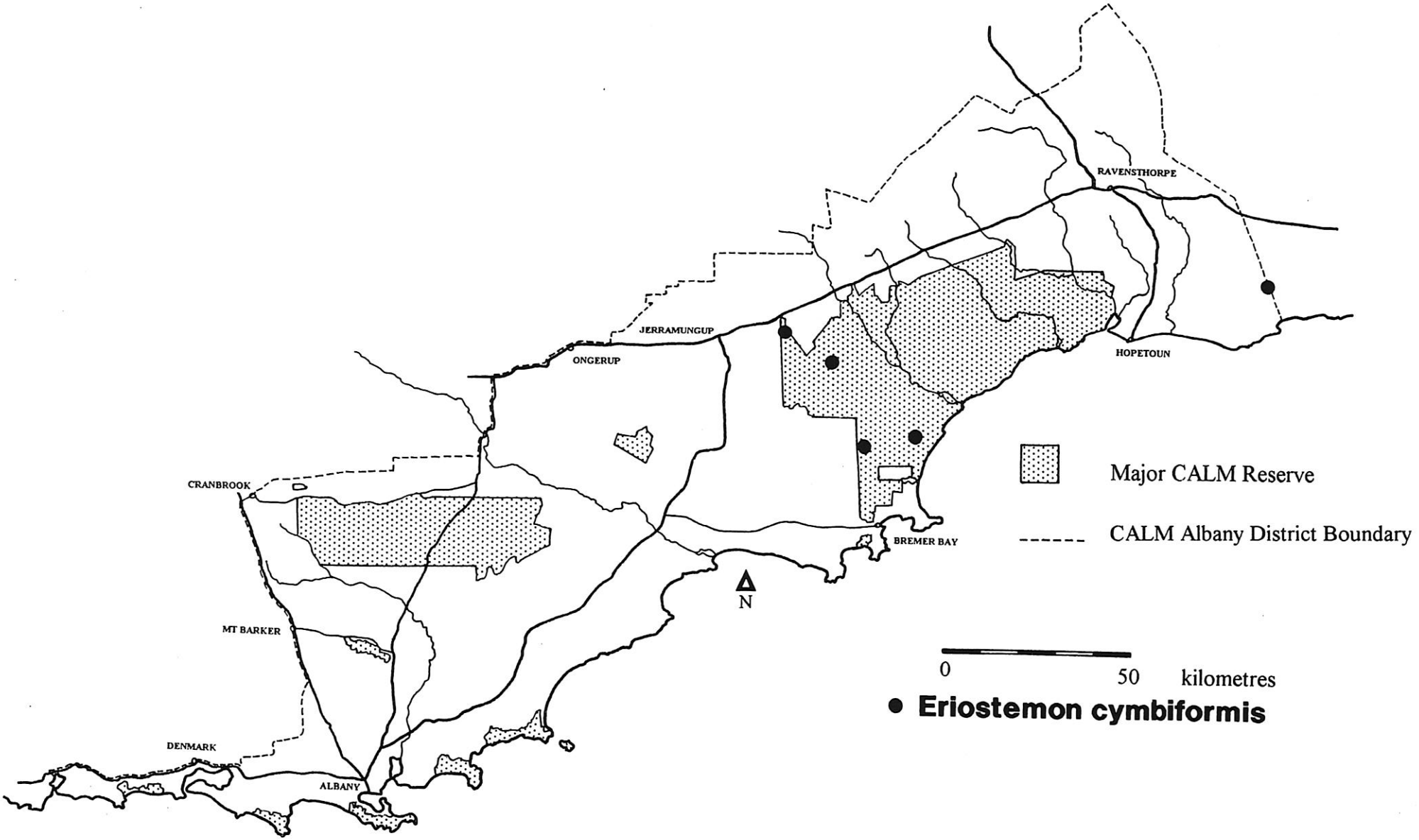
Management Requirements

Research Requirements

- relocate and survey WAHerb locations
- survey for new populations

References

Wilson (1971).


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Eriostemon cymbiformis

Eucalyptus chrysantha Blakely & Steedman MYRTACEAE

Golden Mallee

This taxon is presumed to be a hybrid of *E. preissiana* and *E. sepulcralis*, having features somewhat intermediate. On herbarium sheets it is variously described as a mallee to 3 m tall or a slender tree to 5 m, with rigid, erect angular branches and yellow flowers. A 1932 collection by Steedman is annotated "40 upright stems, 1.5 inches in diameter forming a six foot clump", which suggests that it may be lignotuberous. The buds (5-6 per inflorescence) are arranged on long peduncles up to 5 cm, are pedicellate and have smooth conical caps, shorter than the hypanthium. The fruits are urn shaped, smaller than but similar in shape to the fruits of *E. sepulcralis.* The leaves are broadly ovate to 10 cm, and more similar to those of *E. preissiana.*

Flowering Period: November

Distribution and Habitat

E. chrysantha has been collected from the Eyre Range, Whoogarup Range, north of West Mt Barren and near No Tree Hill. Most of these localities were burnt by wildfire in late 1989. It occurs in shallow soil over rocky quartzite outcrops. It does not occur in extensive populations.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent survey						

WAHerb: 10 records (1 record from near Cape Riche is *E. staeri* x *E. preissiana*)

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

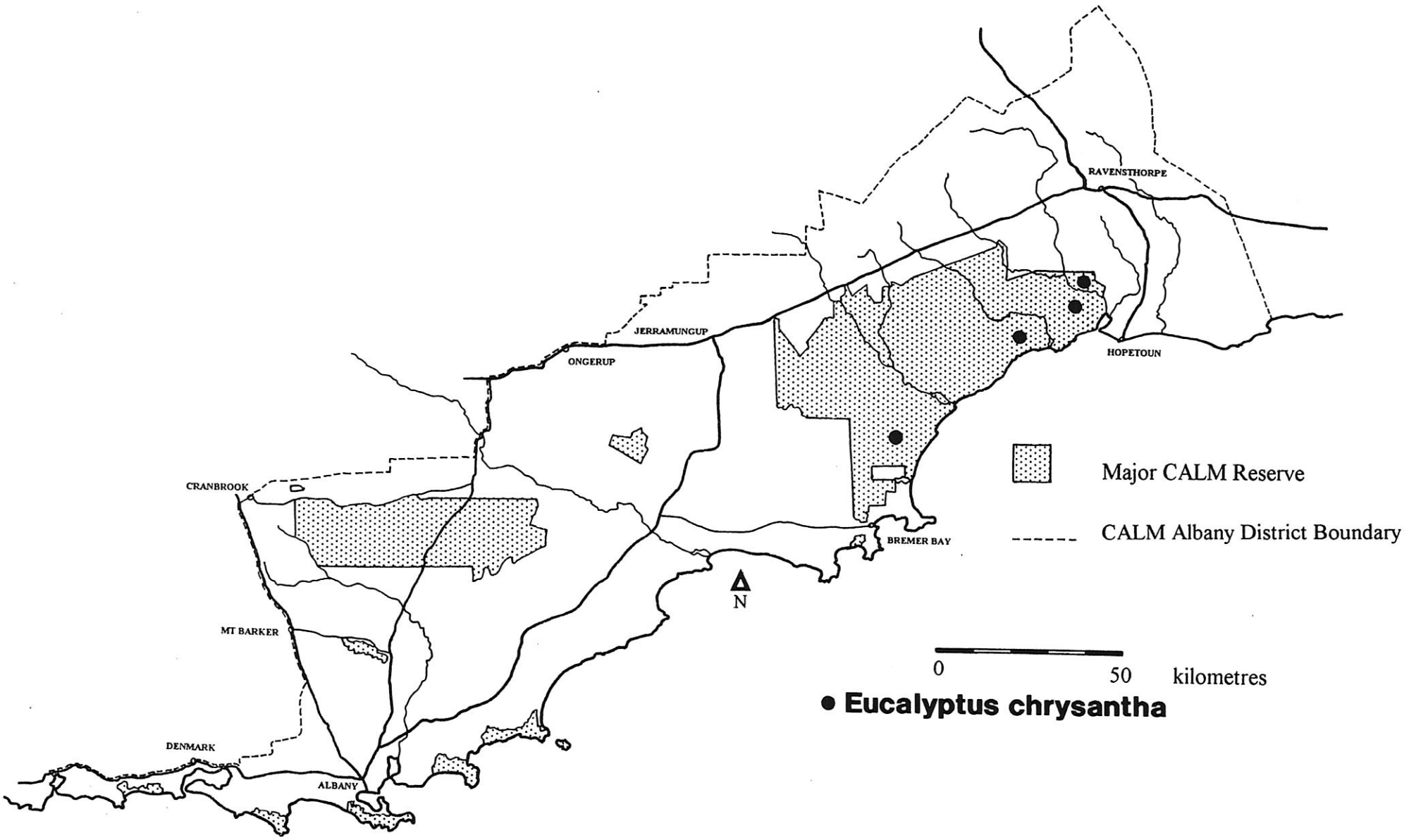
Monitor occasionally

Research Requirements

- relocate and survey at WAHerb locations and determine response to fire.
- survey opportunistically for new locations

References

Blakely *et al.* (1938), Napier *et al.* (1987).


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kilometres
● Eucalyptus chrysantha

Eucalyptus petila Brooker & Hopper ms MYRTACEAE

Eucalyptus petila ms is in the Series *Cornutae,* and closely related to *E. lehmannii.* It is a small mallee to 3 m tall, distinguished by its narrow, dark green leaves, red stems and fused buds with very elongated, tortuous opercula (which appear almost like the tentacles of an octopus) up to 90 mm long.

Flowering Period: late spring.

Distribution and Habitat

This species is known from the northern and central FRNP and south of Ravensthorpe where it occurs on the edge of the Yilgarn Craton geological formation. It also occurs in Corackerup Nature Reserve. It grows in a variety of soils from ironstone, grey sandy clay to skeletal white loam over phyllite, usually in open mallee heath or woodland.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Corackerup	Albany	Jer	NR	4.11.92	+20	healthy
2. Track 11	Albany	Rav	VCL	9.11.86	abundant-WH	-
3. Nth Frbrk	Albany	Rav	NP	1990	common-WH	healthy
4. Twertup	Albany	Jer	NP	11.91	common-WH	healthy
5. West River	Albany	Rav	NP	9.93	35	healthy

WAHerb: 7 records

Response to Disturbance

Likely to resprout from lignotuber after fire

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

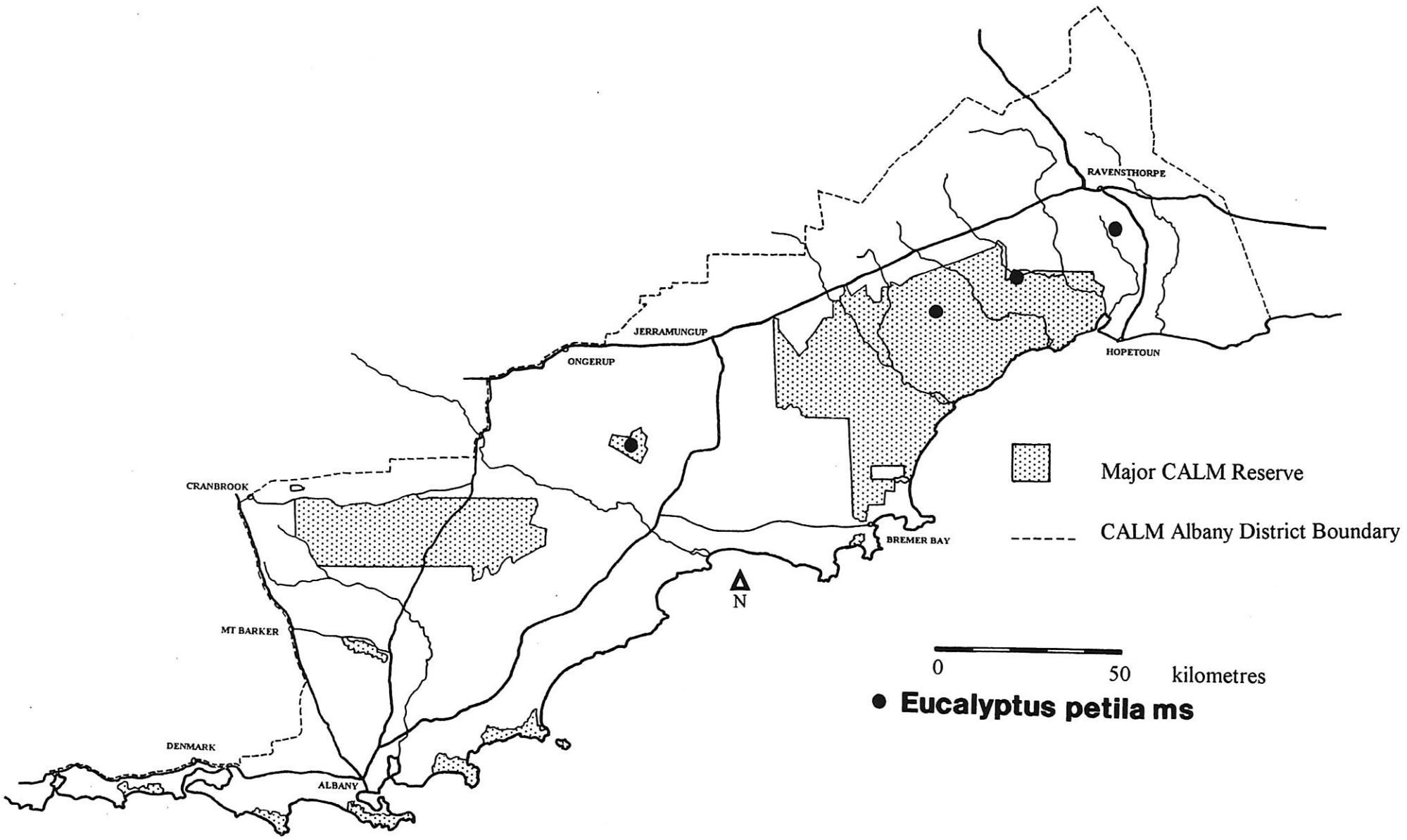
Monitor populations occasionally

Research Requirements

Survey opportunistically for new populations

References

M.I.H. Brooker and S.D. Hopper (pers. comm.).


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Eucalyptus petila ms

Gastrolobium heterophyllum (Turcz.) Crisp PAPILIONACEAE

Slender Poison

This species was originally described as a *Chorizema* by Turczaninow (1853), reclassified as *Oxylobium* by Bentham (1864) and then recombined into *Gastrolobium* by Crisp (1987). It is an erect, open, slender branched shrub (trailing rather than erect) to 1 m, minutely pubescent. The leaves are mostly opposite, oblong linear to lanceolate to 40 mm long, with recurved margins. They are glabrous reticulate above and loosely villous below. The red and yellow pea flowers (with silky villous calyx) are arranged in clusters or whorls on terminal racemes up to 10 cm. The legumes have six to eight ovules.

Flowering Period: September-December.

Distribution and Habitat

Gastrolobium heterophyllum has been collected widely, from north east FRNP, east of Ravensthorpe to Esperance, and north to Forrestania and Gibson. It occurs in clay soils in association with mallee heath, woodland, or open shrubland. From its range and the number of collections made, it would appear that this species is not rare.

Conservation Status

Current: Priority 2 Recommended: Remove from Priority Flora List

(Based on Herbarium distribution records)

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Kybalup pool	Albany	Rav	VCL	24.10.86	1	-
2. E of Ravensthorpe	Albany	Rav	-	19.9.87	scattered-WH	-
3. Mt Desmond	Albany	Rav	VCL	22.9.79	occasional-WH	-

WAHerb: 15 records

Response to Disturbance

Fire or soil disturbance is likely to stimulate seed stored in the soil to germinate.

Susceptibility to *Phytophthora* Dieback

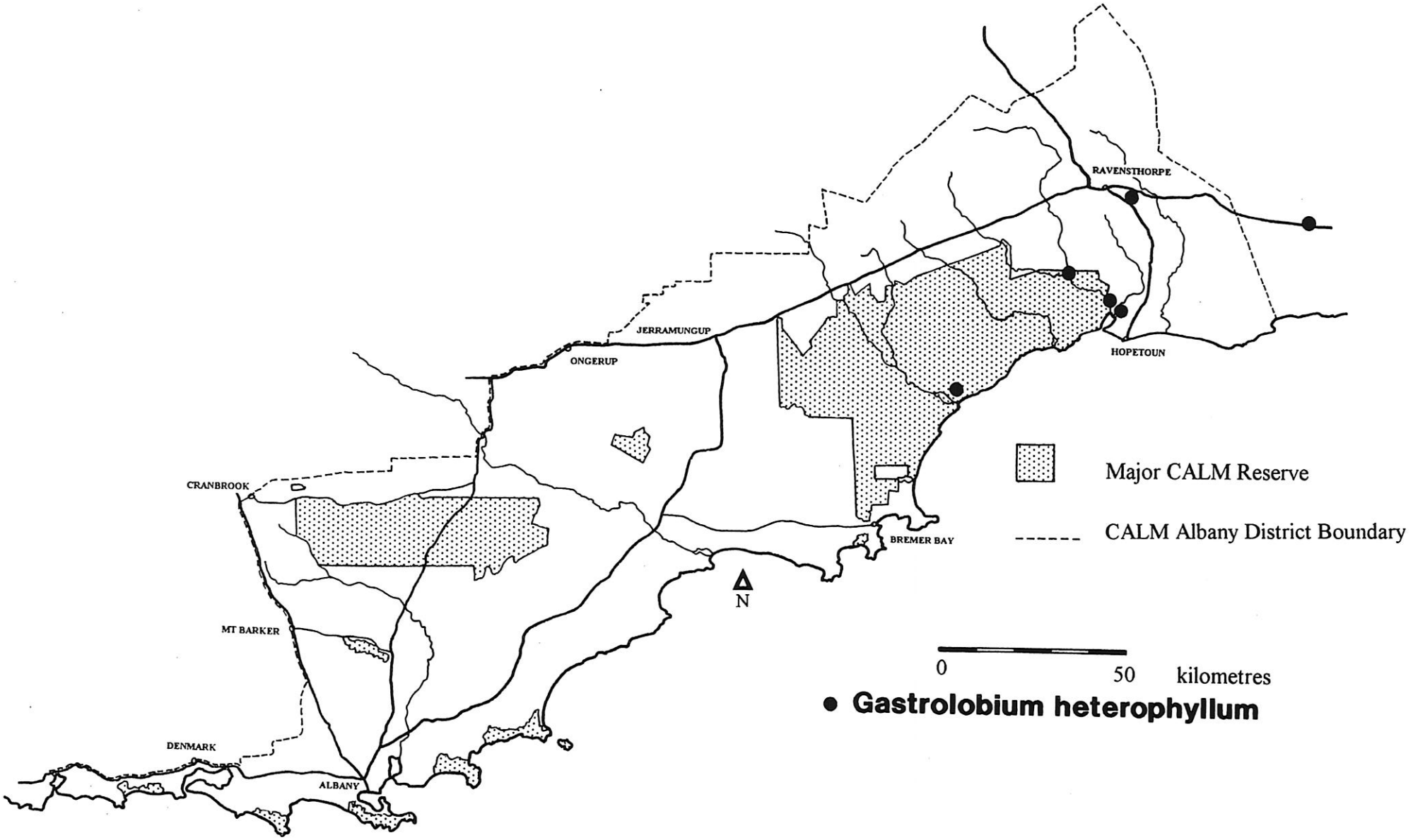
Unknown

Management Requirements

Research Requirements

References

Bentham (1864), Gardner and Bennetts (1956), Crisp and Weston in Stirton (1987).


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Gastrolobium heterophyllum

Gonocarpus rudis (Benth.) Orchard HALORAGACEAE

Gonocarpus rudis is a low, densely pillose (with long dense silky red hairs) herb to 30 cm (which may become woody), which is apparently short lived. The sessile leaves are obovate and toothed to 15 mm long, with thickened margins, opposite in the lower part of the plant, tending scattered above. The inflorescences are short, slender racemes in a terminal panicle of small inconspicuous 4-merous red flowers, to 3 mm long. The petals are about the same length (1.5 mm) as the calyx tube.

Flowering Period: October-November

Distribution and Habitat

This species is confined to the Stirling Range, where it occurs in shallow soil over schist and sand or deep red sand, and occurs in association with heath and scrub.

Like other members of the Haloragaceae, it is likely that this species responds positively to fire. *G. rudis* could not be found at two locations (not recently burnt) in SRNP where it had been collected in the past. However it was common on Bluff Knoll in early 1993, two years after severe wildfire.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Bluff Knoll	Albany	Gno	NP	3.2.93	+20	in flower

WAHerb: 4 records (1 record 1956 from Boggy Lake doubtful; not det. by Orchard.)

Response to Disturbance

Germination of soil borne seed is stimulated by fire

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

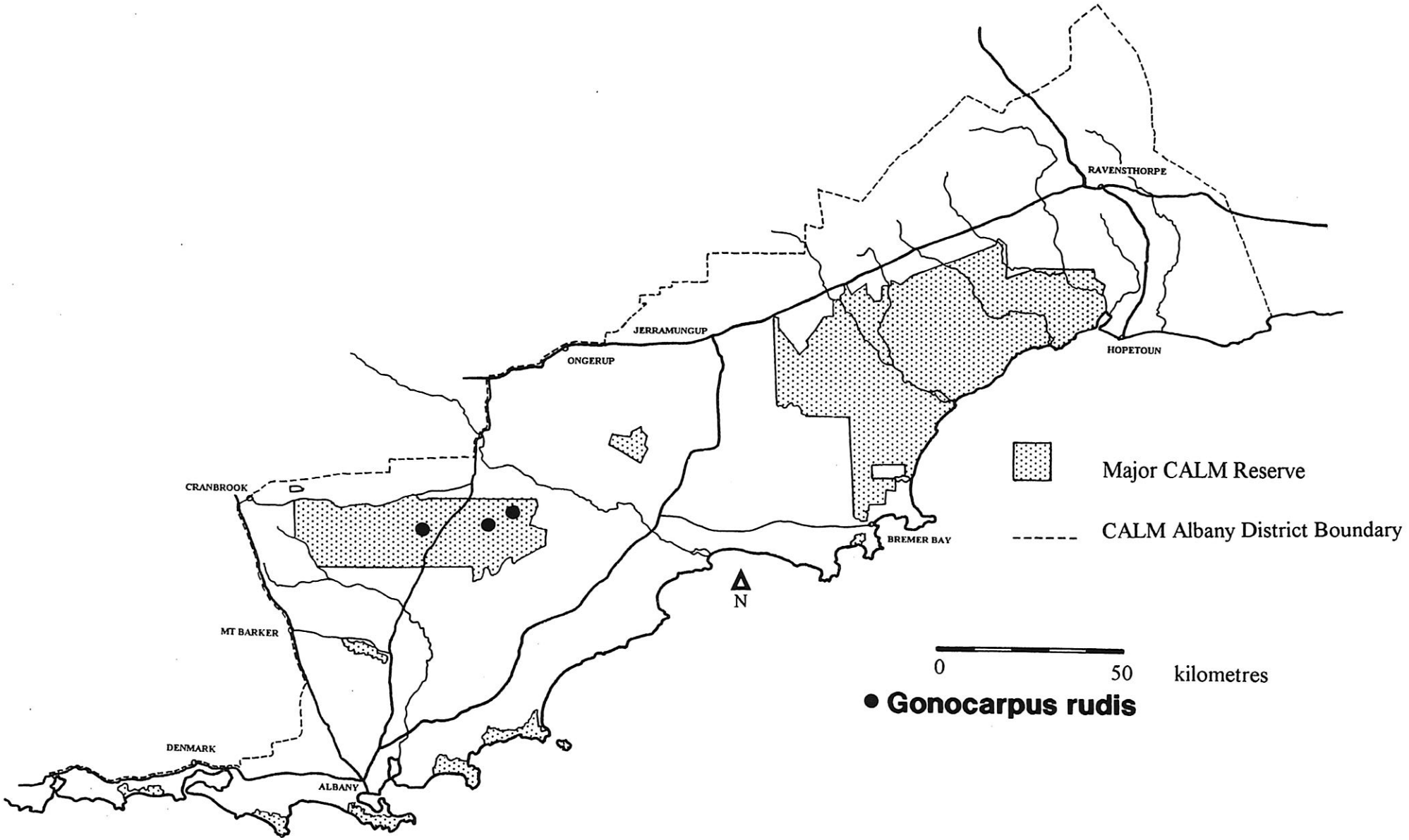
Monitor occasionally, especially in areas of SRNP which may have been burnt

Research Requirements

Survey opportunistically for new populations

References

Bentham (1864), Orchard (1990).


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Gonocarpus rudis

Gonocarpus trichostachyus (Benth.) Orchard HALORAGACEAE

Gonocarpus trichostachyus is an erect perennial herb to 17 cm tall, with smooth stems. The 10 mm leaves are decussate, sessile, oblanceolate, glabrous to sparsely strigose with thickened, crenulate, hyaline margins. The floral leaves are reduced to minute, scale-like red bracts, 1-1.3 mm long. The inflorescences are branched terminal panicles of filiform racemes. The nodding 4-merous flowers are very small; the pedicel is 0.4-0.5 mm, the reddish-green sepals 0.4-0.5 mm and the reddish purple petals 0.9-1.1 mm.

Flowering Period: September

Distribution and Habitat

This species has been collected once from Lake Wagin (1890) and the Bow River, and twice in FRNP and from near Cheyne Beach. It occurs in open situations in sandy clay or gravelly loam in open mallee shrubland. It is a small, somewhat "weedy" looking species, which may have been overlooked by collectors and hence may be more common than current data indicates.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Cheyne Beach	Albany	Alb	NP	23.9.92	+200	in flower
2. Bivouac Rocks	Albany	Jer	NP	1.10.77	rare-WH	-

WAHerb: 4 records

Response to Disturbance

Germination possibly stimulated by fire

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

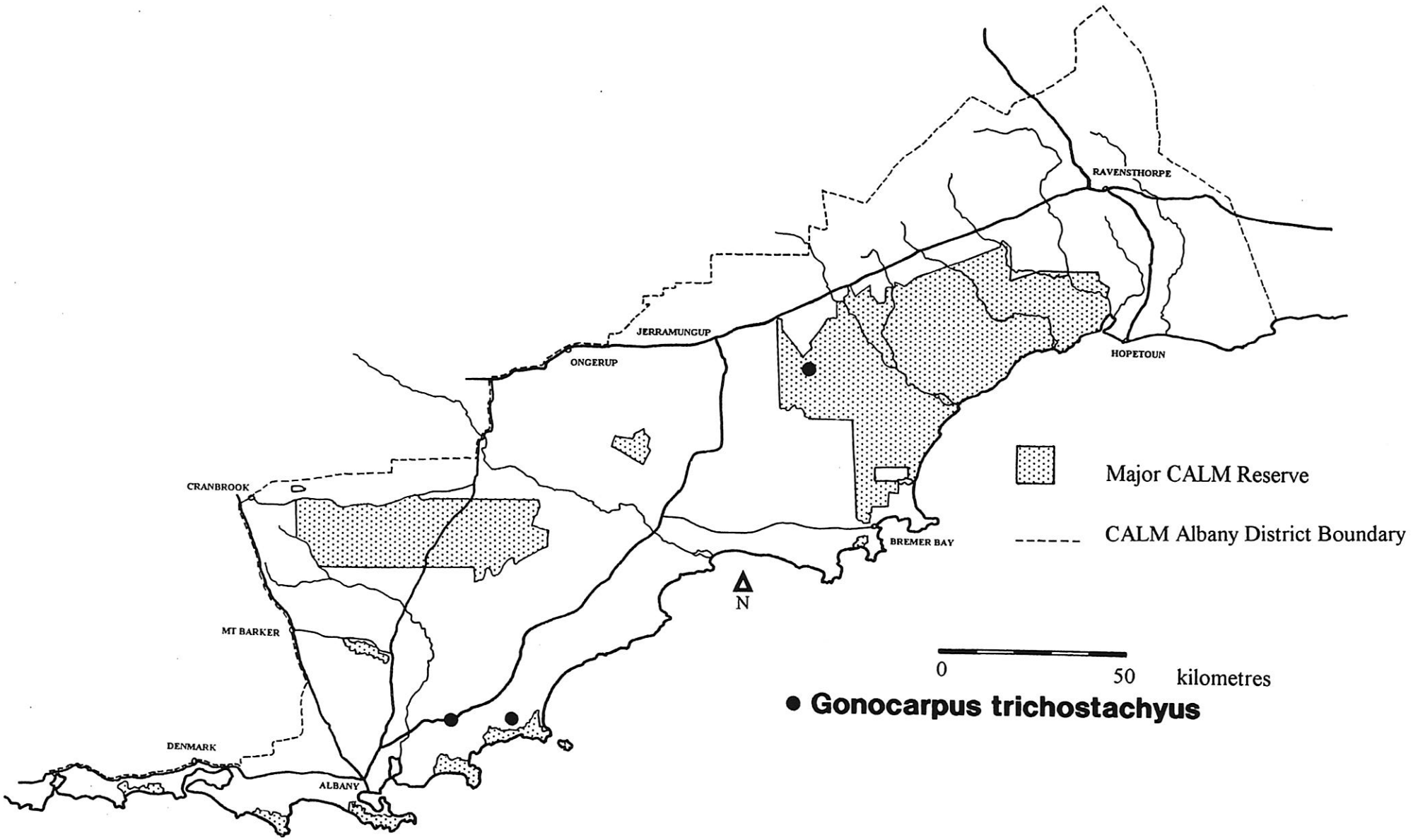
Monitor occasionally

Research Requirements

- relocate and survey FRNP populations
- survey opportunistically

References

Bentham (1864), Orchard (1975).


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Gonocarpus trichostachyus

Grevillea fistulosa A.S.George PROTEACEAE

Grevillea fistulosa is an erect shrub, with an indumentum of hairs (forked at the base) which are dense and ferruginous on new growth. The branchlets are tomentose, angular-striate becoming terete and glabrous with age. The 4-7 cm olive green leaves are oblanceolate, obtuse with a short hard mucro. Some leaves are flat, but most have recurved margins to produce a hollow tubular aspect. Mature leaves are glabrous above, but remain densely tomentose beneath. The midrib is prominent with a lateral nerve inside each margin. The inflorescences are axillary, sub-umbellate on short racemes with about ten red and brown flowers. Each flower on a 5-8 mm hirsute pedicel, has a 6-7 mm long red perianth, slightly swollen below the middle, glabrous inside and loosely hirsute outside. The styles are not conspicuously exserted. The developing fruit is olive green, pubescent and erect on a 10 mm pedicel.

Flowering Period: September-October.

Distribution and Habitat

This species is endemic to FRNP where it occurs from Mid Mt Barren and Thumb Peak through to Whoogarup Ranges and occurs on open heathland scrub in sand.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Two Bump Hill	Albany	Rav	NP	26.1.94	+20	good
2. Thumb Peak	Albany	Rav	NP	25.1.94	+20	in flower
3. Marshes Beach	Albany	Rav	NP	16.9.90	occasional-WH	-
4. Quoin Head Track	Albany	Rav	NP	7.9.93	+100	in flower & seedlings

WAHerb: 13 records (1 record from Mt Lindesay is likely to be *G. fuscolutea*).

Response to Disturbance

Quoin Head Track regeneration is from germination of seed in the soil stimulated by fire.

Susceptibility to *Phytophthora* Dieback

Presumed susceptible (moderate)

Management Requirements

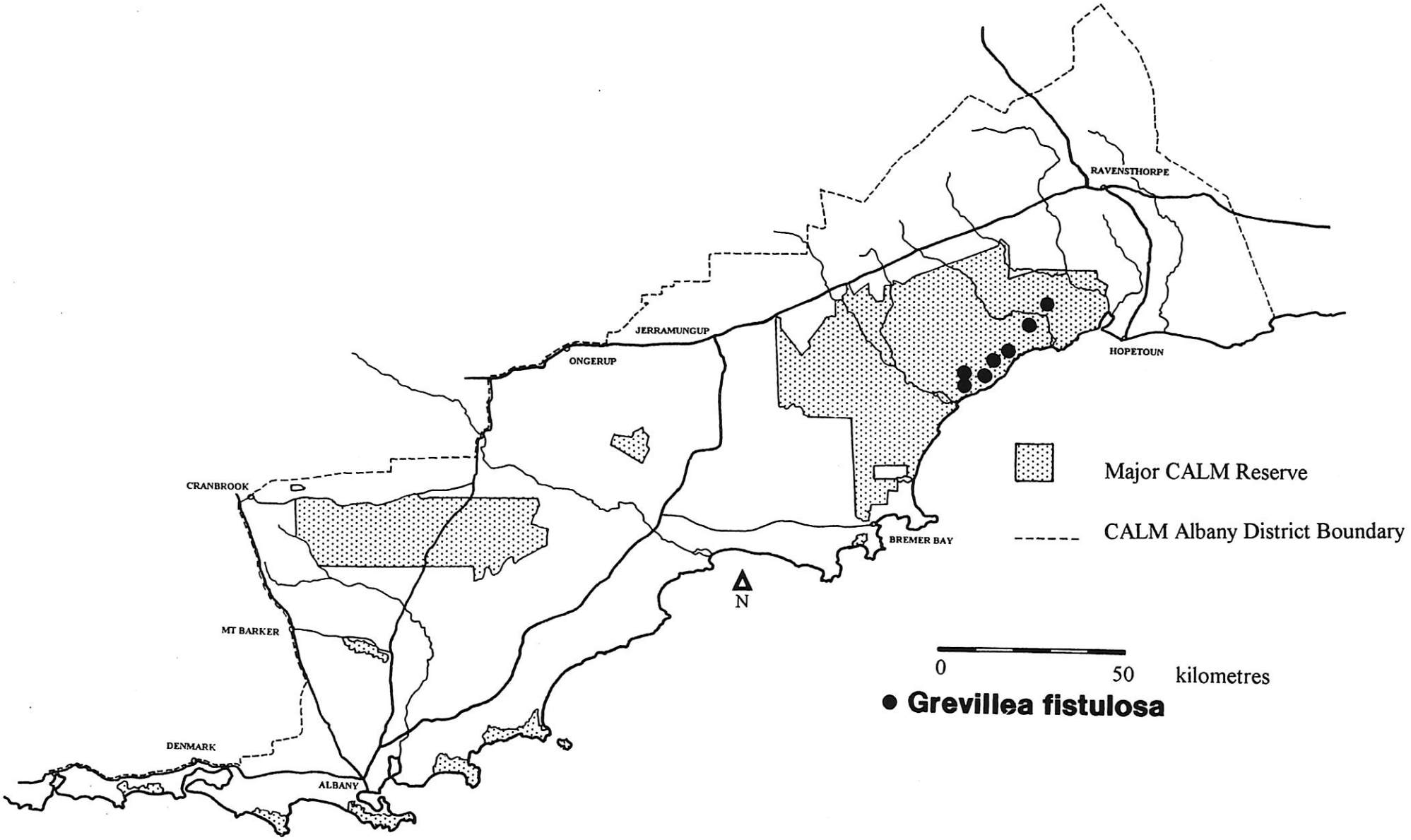
Monitor occasionally

Research Requirements

Survey opportunistically for new poulations

References

George (1974).


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Grevillea fistulosa

Grevillea wittweri McGill. PROTEACEAE

Wittwer's Toothbrush Grevillea

This *Grevillea* is a moderately dense spreading shrub to 2 m high and 3m across. The branches are terete or slightly ridged and pubescent with curled hairs. The 4-8 cm ascending leaves are biternately or tripartitely divided into narrow linear, subterete segments with revolute margins and pungent, acute apices. The ultimate lobes are 1-3 cm long. The upper leaf surface is prominently ridged, granulose and usually tomentose. The lower surface, enclosed by the margins is packed with subhelical hairs. The inflorescence is an erect, terminal, dense, one sided raceme up to 7.5 cm long on a villous to subvillous rachis. The globose to broadly ovoid perianth is greenish, subvillous outside and glabrous inside. The pistil is up to 20 mm long with scattered hairs on both the ovary and style. The style is red with a 0.5 mm oblique and broadly conical pollen presenter.

G. wittweri is similar to *G. armigera* but differs in having dark red (not purplish-black) styles and more robust dull green-grey (not yellowish green) leaves.

Flowering Period: September-November and intermittent

Distribution and Habitat

Grevillea wittweri occurs in mallee shrubland (sometimes on salt lake margins) on well drained sandplain over clay. The majority of collections have been made in the Lakes Grace, King, Cronin and Cairlocup areas in the Wheatbelt Region. Recent survey in Dragon Rocks Nature Reserve by Anne Coates has found it to be reasonably common (Mal Graham pers. comm.). Two collections (17 km and ca. 28 km north of Ravensthorpe) are in the Albany District.

It occurs over a 170 km range and in four, possibly five Nature Reserves and WAHerb records indicate that it is often common or frequent. It should be deleted from the Priority Flora List.

Conservation Status

Current: Priority 2 Recommended: Remove from Priority Flora List

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent survey						

WAHerb: 7 records (all Wheatbelt; 2 Albany District collections are in CBG)

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

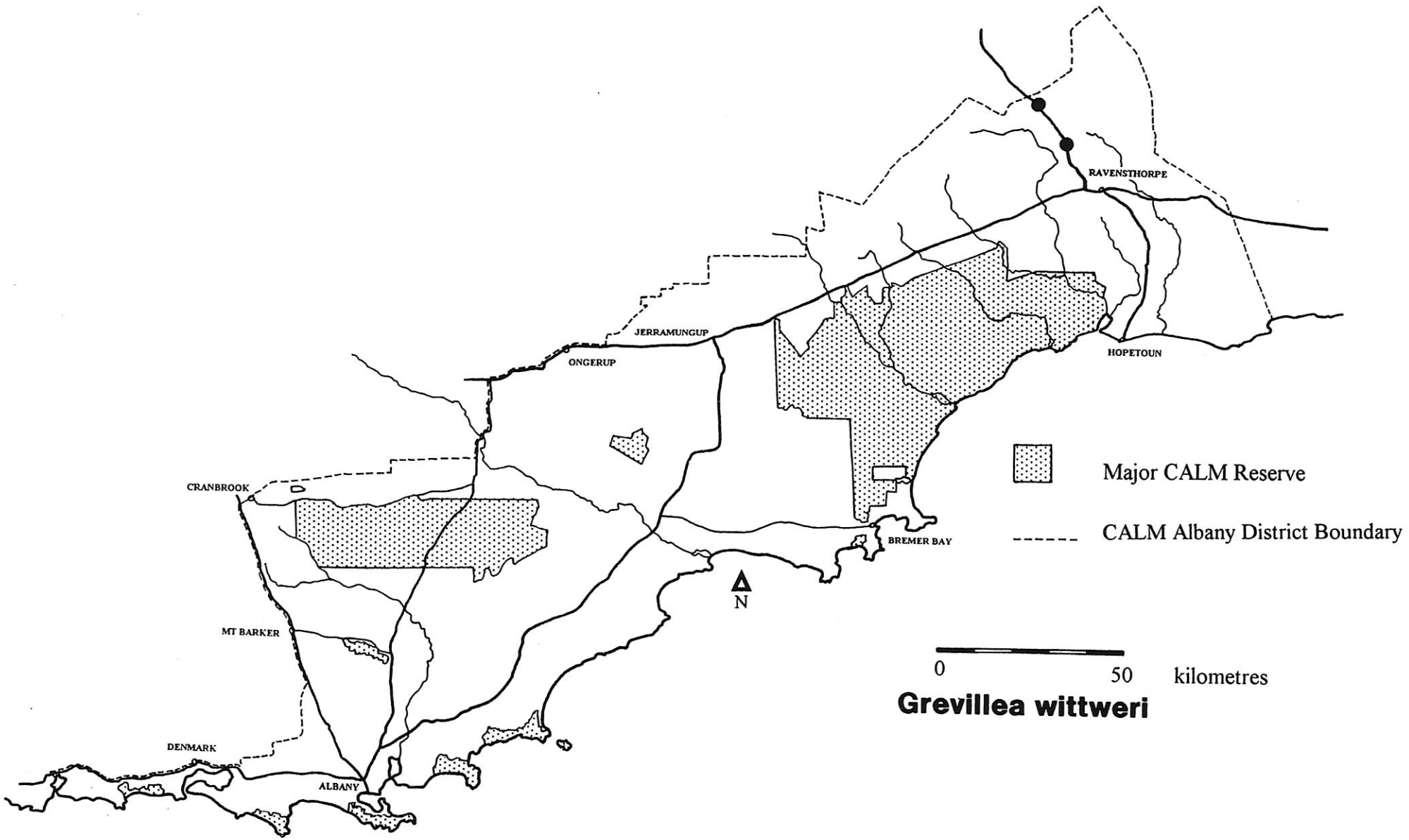
Unknown

Management Requirements

Research Requirements

References

McGillivray (1993).



Grevillea wittweri

Hakea hookeriana Meisn. PROTEACEAE

Hakea hookeriana is an open shrub to 5 m tall with dark brown smooth bark. The thick, leathery, dark green leaves are oblong-spathulate, 10-12 cm long with 7-8 sub-prominent veins, with a short point on the broadly rounded apex. The young leaves and shoots are covered with dense, silky golden red hairs. The inforescences are dense axillary or scattered (on older wood) clusters of up to 20 or more very small flowers on a very short rachis. Each 3 mm flower is silky purplish red, on a short 1-2 mm pedicel covered in stiff yellowish-white hairs. In contrast to the flowers, the fruits are large and very conspicuous. The woody 50 mm fruits are dark brown or black, rounded with a short beak, almost smooth to slightly rugose, and with a raised 3-4 mm flange running either side of the suture. Between the flanges it is very smooth and almost shiny.

Flowering Period: September-November

Distribution and Habitat

This *Hakea* appears to be confined to FRNP, being recorded from Whoogarup Range, Eyre Range, Thumb Peak and Two Bump Hill. It grows scattered in shallow, rocky quartzite soil with scattered mallee and scrub.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
(1) Thumb Peak	Albany	Rav	NP	25.1.94	+100	good
(2) Two Bump Hill	Albany	Rav	NP	26.1.94	+50	good

WAHerb:9 records

Response to Disturbance

Unknown

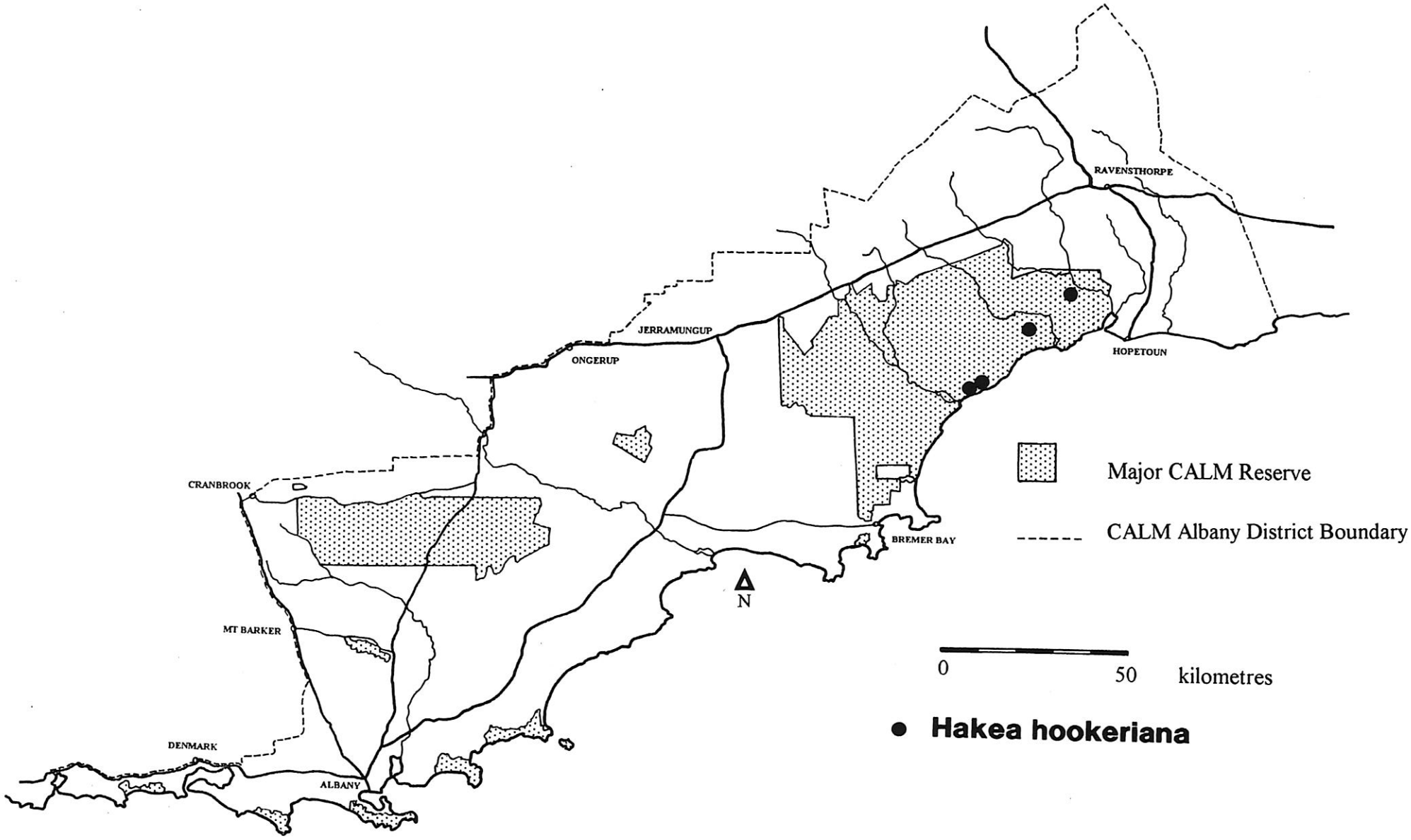
Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

Research Requirements

- survey for new locations (e.g. West Mt Barren)
- determine response to dieback


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Hakea hookeriana

Haloragis aculeolata Benth. HALORAGACEAE

Haloragis aculeolata is an erect herb to 35 cm tall with stems weakly 4 or 5 ribbed, glabrous to sparsely hirsute with curved hairs. The alternate, sessile leaves to 25 mm long, are almost pinnatifid with 6-8 long distal teeth. The foliage may be pale green to reddish. The inflorescences are clusters of 1-3 flowers, in the upper axils subtended by small green, lanceolate bracts, 5-10 mm. The small 4-merous, green flowers have ovate sepals to 1 mm and petals to 2.2 mm on 0.5 mm pedicels.

Flowering Period: October-January

Distribution and Habitat

This species occurs in sandy soils (over limestone or schist) in tall shrubland. It has been infrequently collected at the widely distributed locations of Yanchep, Cannington, Lake Preston and Toolbrunup (Stirling Range).

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent survey of Albany District locations						

WAHerb: 3 records

Response to Disturbance

Germination is possibly stimulated by soil disturbance and/or fire.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

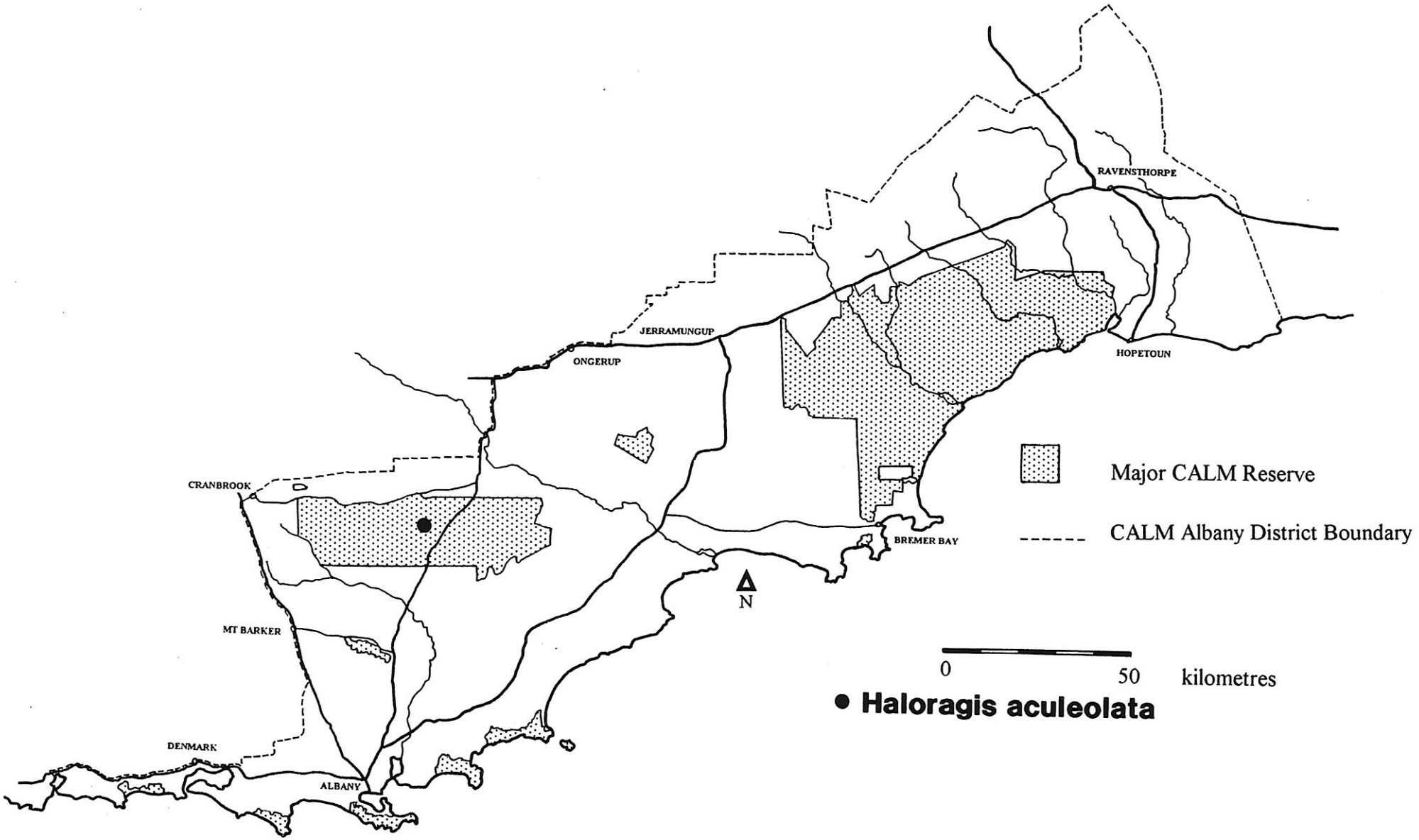
Cannot be determined until surveys have been conducted

Research Requirements

Survey to locate this species (especially around Toolbrunup)

References

Bentham (1864), Orchard (1975).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
N
Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
• Haloragis aculeolata

Hemigenia glabrescens Benth. LAMIACEAE

Hemigenia glabrescens is a small shrub with slender, slightly hoary branches. The young foliage is also hoary with short appressed hairs, becoming glabrous with age. The obtuse dark green leaves are opposite, oblong to obovate-oblong, up to 25 mm long and 10 mm wide, with a very short petiole. The flowers are small, axillary, on short pedicels with linear bracts. The 5 mm calyx is broadly campanulate, villous with spreading hairs and irregularly two lipped with subulate-acuminate teeth. The corolla is up to 10 mm long, pubescent outside, the upper lip is short and broad and the lower lip longer.

Flowering Period: not recorded

Distribution and Habitat

A 1903 specimen by C. Andrews was collected at "Albany" and another location is given as Scott River. The type was collected by Drummond with no precise location. No habitat information is known. There are two possible records at WA Herbarium, but neither has been positively identified as *H. glabrescens* and are not recorded on WAHerb.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent survey						

WAHerb: no records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

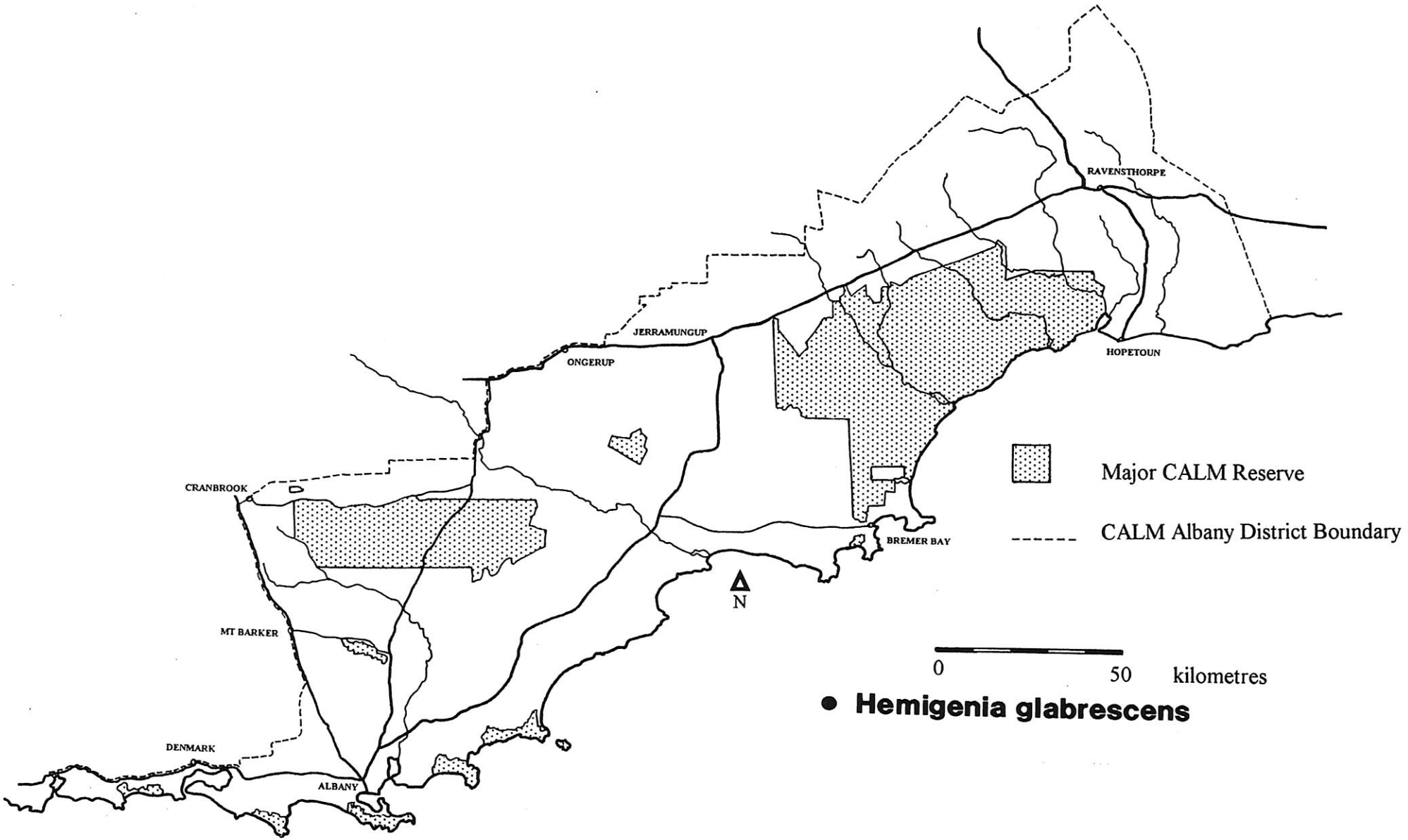
Management Requirements

Research Requirements

Survey to relocate this species and verify identity against type

References

Bentham (1870).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Hemigenia glabrescens

Lasiopetalum dielsii E.Pritz. STERCULIACEAE

Lasiopetalum dielsii is a dense, compact spreading shrub to 1.5 m tall with ferruginous tomentose branchlets. The alternate leaves to 40 mm are entire, shortly petiolate, acuminate cordate and dull green scabrous above and dense white to ferruginous tomentose below. The bracteoles are terete filiform. The inflorescence is a loosely branched raceme of small, shortly pedunculate flowers with conspicuous white to rose tomentose 5 mm sepals and minute glabrous petals. The ovary is pubescent and the style is short and glabrous.

Flowering Period: October

Distribution and Habitat

This species has only been collected on three occasions (1901, 1973 & 1992), all from Mt Toolbrunup in the Stirling Range. It occurs in schist shale, in heath below the summit where it forms dense stands.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Toolbrunup	Albany	Gno	NP	7.12.92	+500	healthy

WAHerb: 2 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

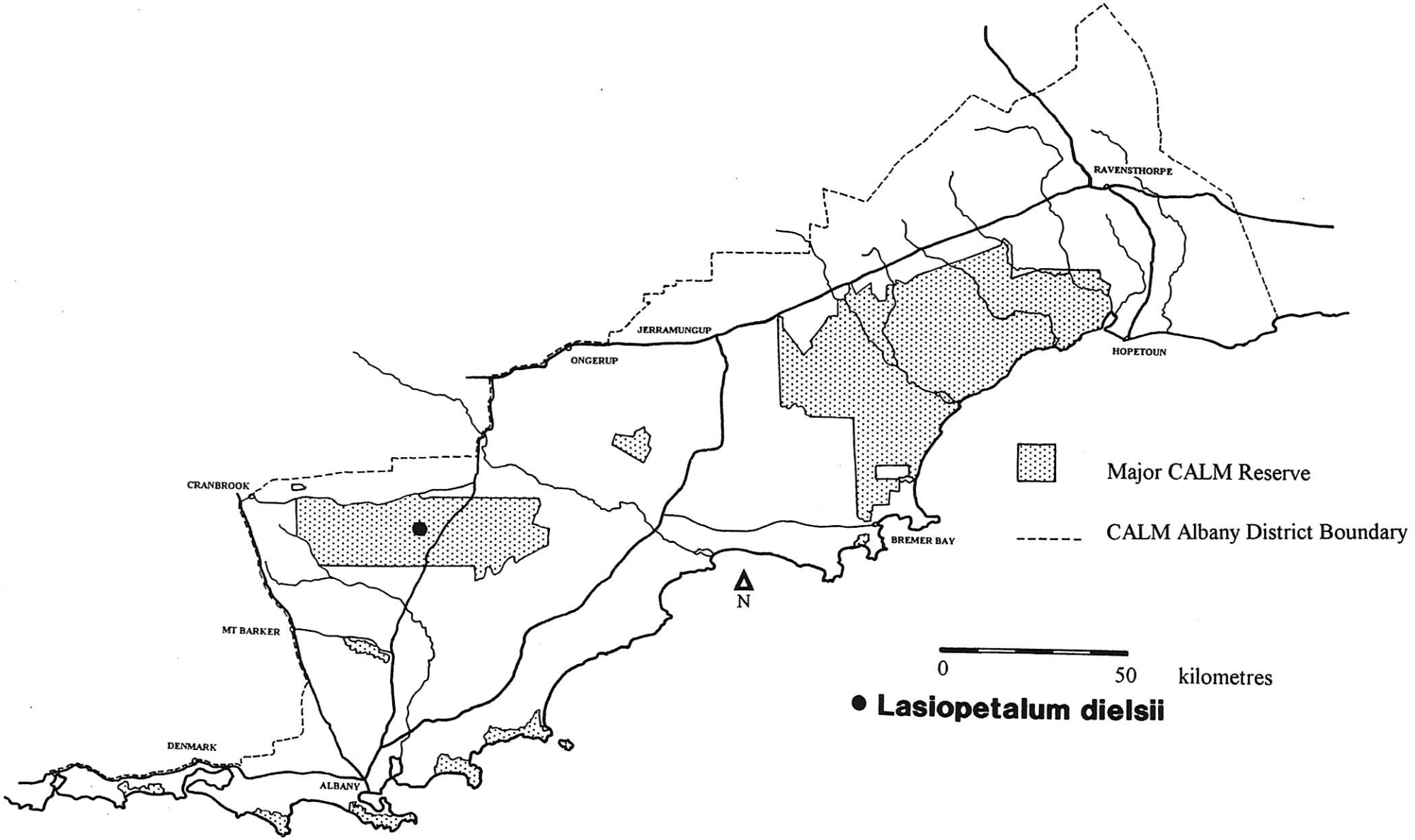
- monitor occasionally

Research Requirements

- check WAHerb specimens to ensure that the Toolbrunup collections (*L. dielsii*) are not the same as specimens determined as other species
- survey for new populations required urgently

References

Diels and Pritzel (1905).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
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ALBANY
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Major CALM Reserve
CALM Albany District Boundary
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50
kilometres
Lasiopetalum dielsii

Lechenaultia acutiloba Benth. GOODENIACEAE

Lechenaultia acutiloba is a low, spreading shrub (to 0.5 m across) with ascending branches to 200 mm. The crowded, fleshy leaves are narrow linear, ericoid to 5.5 mm long sometimes forming very tight clusters around galls. The solitary, terminal flowers have a tubular perianth 15 mm long, which has acute spreading or reflexed lobes, 5 mm long. The perianth tube is greenish-yellow, with blue lobes. The two adaxial lobes cross each other behind the exserted style. The stigma is broadly cup-shaped to 2 mm.

Flowering Period: September-December

Distribution and Habitat

This species occurs between Jerramungup and Ravensthorpe-Hopetoun, in open areas of alluvial sand or gravel along watercourses, in association with scattered shrubs.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. West River	Albany	Rav	WAWA	14.12.92	+200	healthy
2. Carracarrup	Albany	Rav	VCL	12.92	+1000	healthy

WAHerb: 17 records

Response to Disturbance

Prefers open sites and is probably favoured by soil disturbance and deposition.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

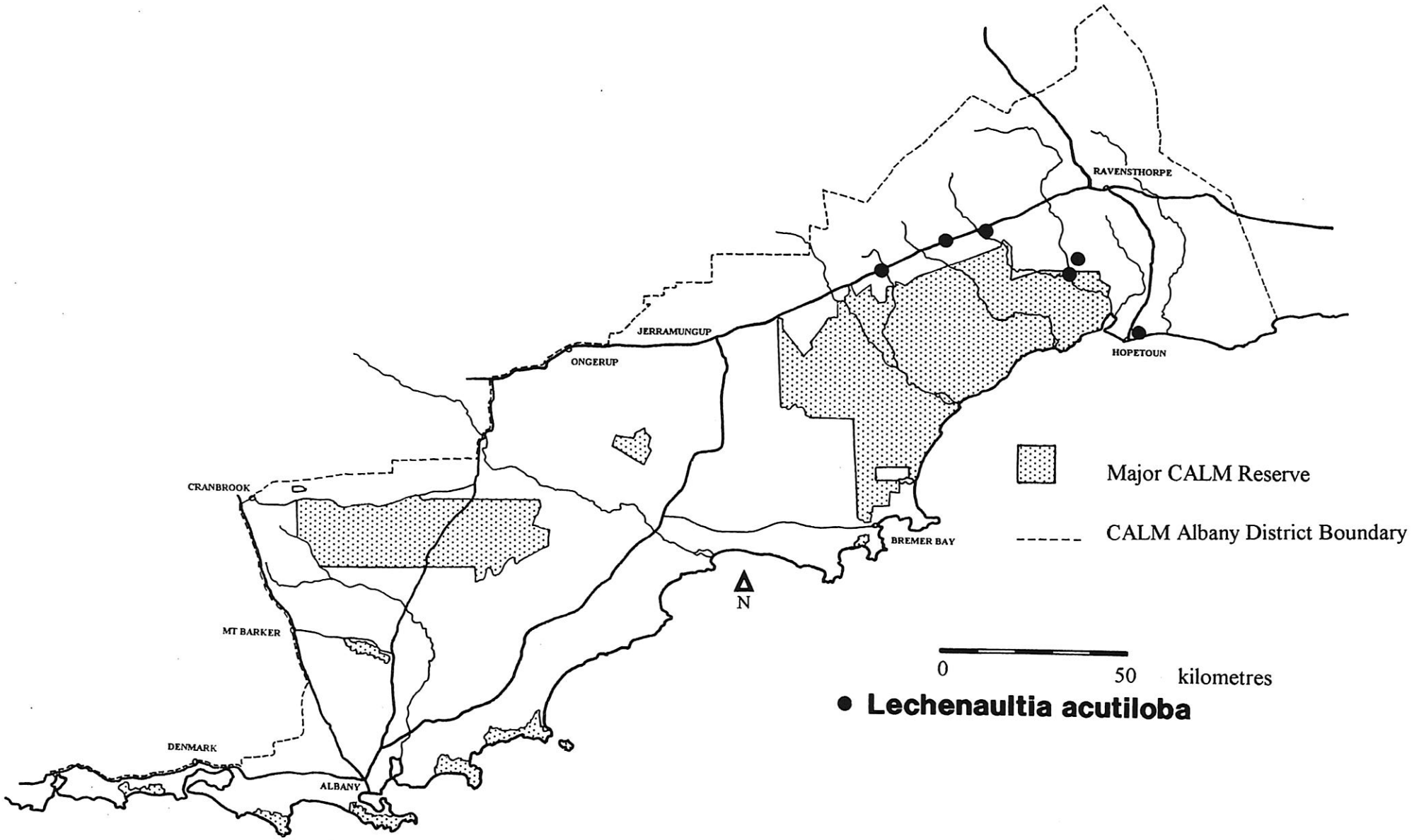
Monitor occasionally

Research Requirements

Survey opportunistically for new populations

References

Bentham(1869), Morrison (1992).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
N
Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Lechenaultia acutiloba

Leptospermum confertum J.Thomps. MYRTACEAE

Leptospermum confertum is an erect, rigid, dense shrub 2-3 m tall with gnarled firm bark. The young branches are loosely pubescent (becoming glabrous) and have a small conspicuous persistent swelling below each leaf base. The leaves are erect and dense, 8-10 mm long and 1-1.5 mm wide, narrowly clavate and almost triquetrous, glabrous and dark green. The upper surface is flattish and the lower tending to be keeled, both tapering to a slender petiole. The flowers are white (pinkish in the bud), 12-15 mm across and are solitary in consecutive axils, on short leafless sideshoots. Minute pale red-brown keeled bracts persist below the flowers. The bracteoles are similar to the bracts but are larger (1 mm) and shed from the bud.

Flowering Period: December-January

Distribution and Habitat

This species was, until January 1994, only known from East Mount Barren (first collection 1926) where it occurs in well drained stony quartzite sand on the exposed wave cut platform, in association with closed heath. It was common in patches (KRN 1964) however the entire location was burnt by wildfire in late 1989 and it has not been relocated. Recently an extensive population was located on the upper slopes of the ocean side of Thumb Peak.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. East Mt Barren	Albany	Rav	NP	13.12.64	common	in flower
2. Thumb Peak	Albany	Rav	NP	24.1.94	+500	in flower

WAHerb: 9 records (all East Mt Barren)

Response to Disturbance

Killed by fire; regenerates from seed

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

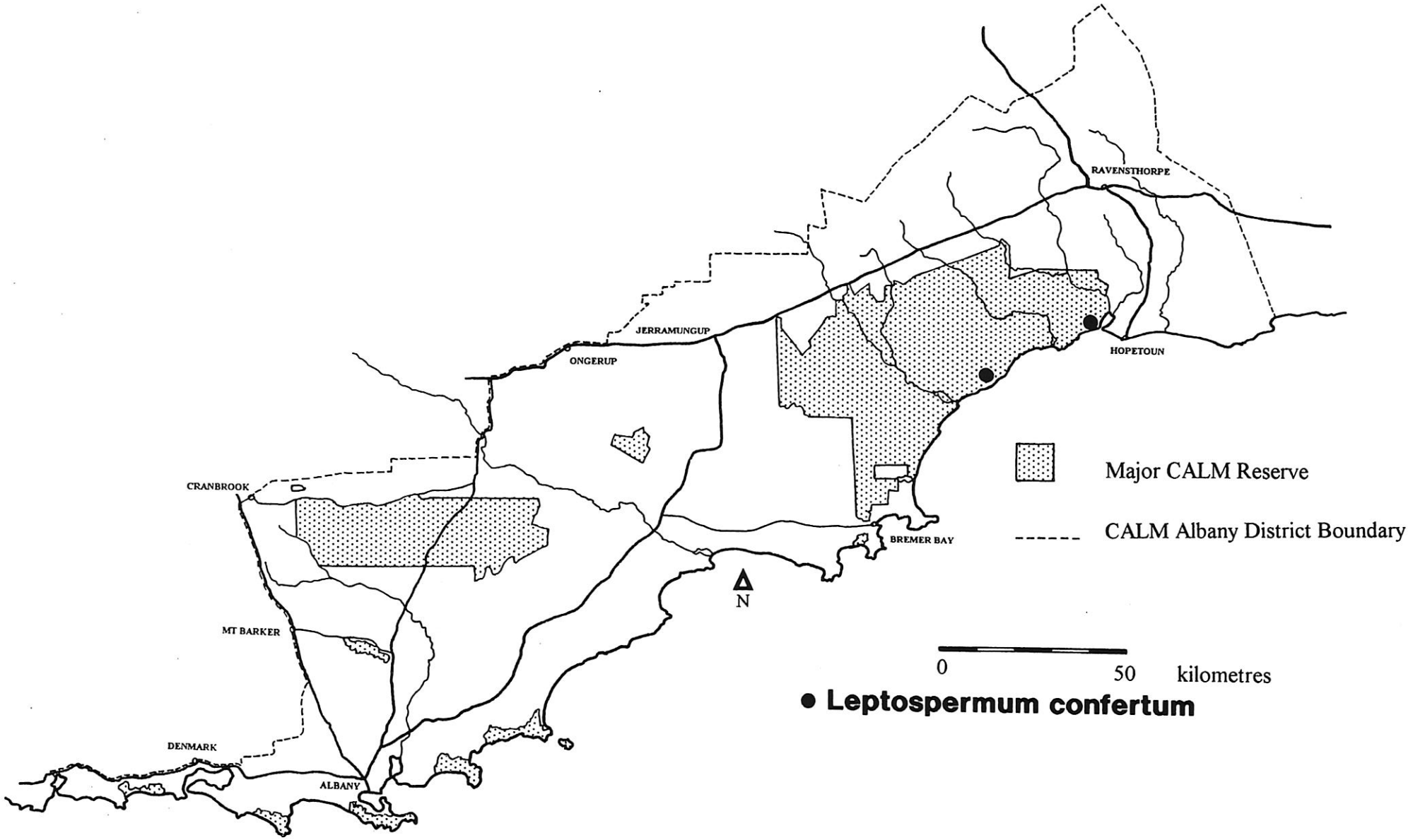
Monitor East Mt Barren to determine regeneration after fire

Research Requirements

Survey opportunistically for new populations

References

Thompson (1989).


RAVENSTHORPE
HOPETOUN
JERRAMUNGUP
ONGERUP
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
N
Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
● Leptospermum confertum

Leucopogon denticulatus W.Fitzg. EPACRIDACEAE

Leucopogon denticulatus is an erect robust shrub to 0.5 m tall, with a woody base. The dull green leaves are opposite, decussate and very crowded (16 pairs per 1 cm). Each leaf, to 2 mm is broadly ovate with short, stiff white marginal hairs and four prominent striae on the underside. The white flowers are in short, few flowered terminal spikes.

Flowering Period: October

Distribution and Habitat

Leucopogon denticulatus has been collected from scattered locations from Ongerup to the western end of FRNP. It occurs in open heath on clayey sand.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Ongerup	Albany	Gno	-	3.8.86	frequent-WH	-
2. Devils Creek Rd	Albany	Jer	-	3.8.86	occasional-WH	-

WAHerb: 5 records.

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible (moderate to high)

Management Requirements

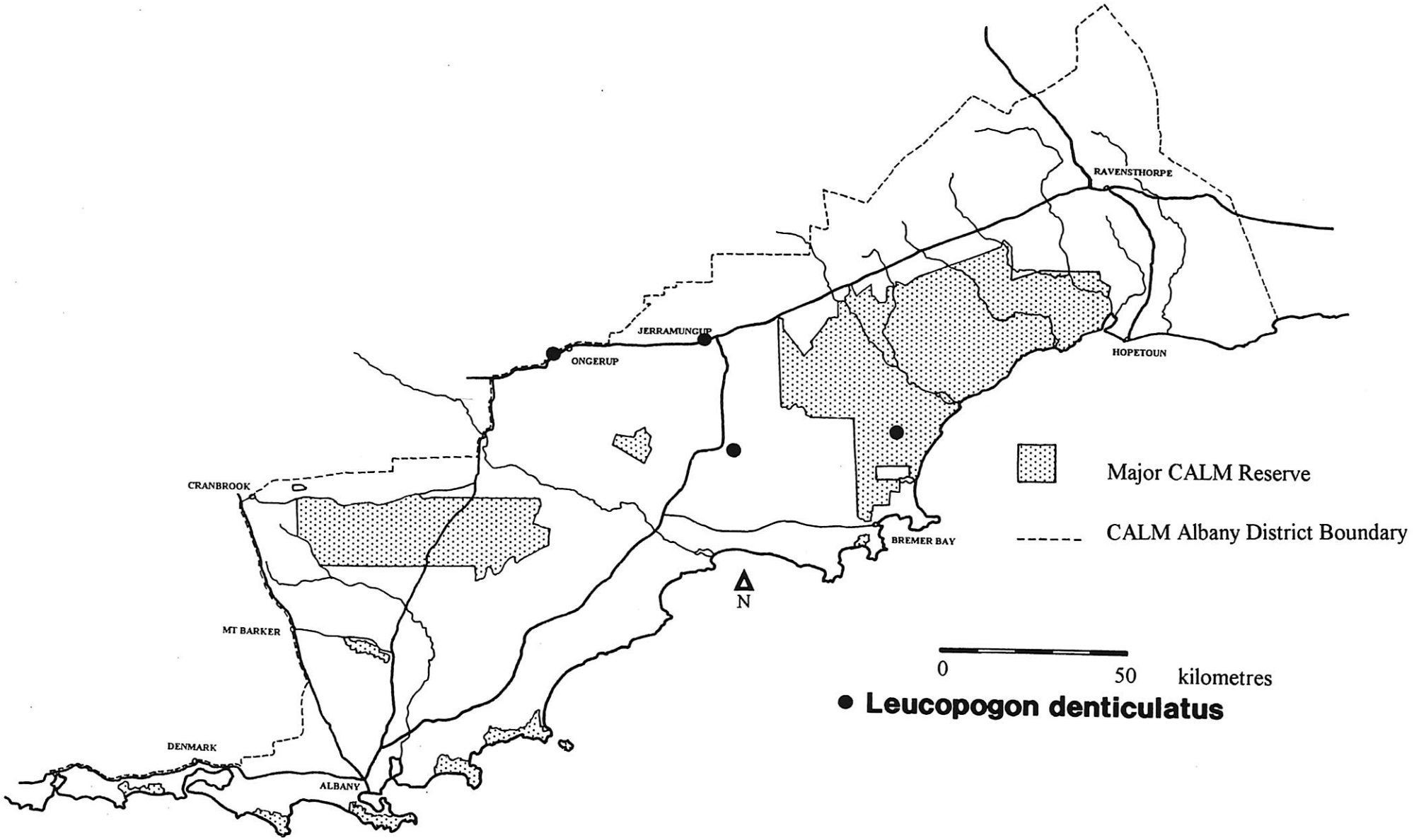
Monitor occasionally

Research Requirements

- relocate and survey WAHerb populations
- survey for new populations

References

Fitzgerald (1905).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Leucopogon denticulatus

Leucopogon glaucifolius W.Fitzg. EPACRIDACEAE

Leucopogon glaucifolius is an erect woody shrub to 30 cm tall. The alternate leaves to 10 mm are erect, pungent pointed, with very revolute margins, striated underneath. The 4 mm pale yellow-white flowers are axillary in pairs in the upper axils. The sepals are imbricate and erect, nearly as long as the shortly exserted corolla tube. The blackened hair like styles remain exserted after the corollas have fallen. The leaves are not noticeably glaucous.

Flowering Period: December

Distribution and Habitat

This species has a wide, possibly disjunct distribution from Cooljarloo to the Stirling Range. It occurs in sandy or loamy soil supporting Banksia woodland and scrub, or low open mallee heath. A WAHerb location at South Stirlings was searched without success.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SRNP Sth	Albany	Pl	NP	8.12.92	+100	healthy

WAHerb: 5 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

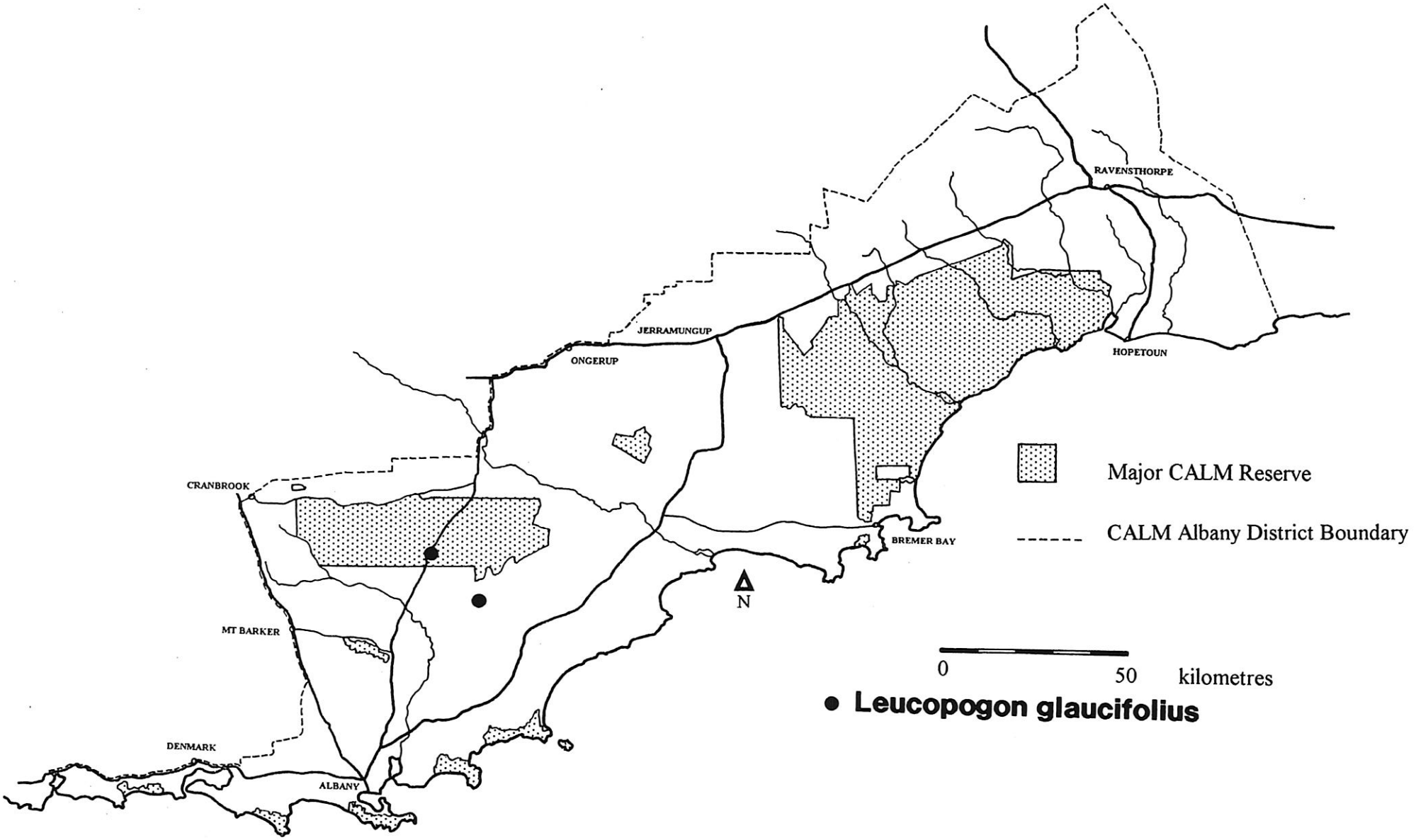
Presumed susceptible (high)

Management Requirements

Monitor occasionally particularly noting any signs of dieback

Research Requirements

Survey for new populations


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Leucopogon glaucifolius

Leucopogon lasiophyllus Stschegl. EPACRIDACEAE

Leucopogon lasiophyllus is an erect, virgate shrub to 30 cm tall, the branches and leaves sparsely pubescent. The narrow linear leaves are opposite or alternate, 4-8 mm long, very shortly petiolate and dilated toward the base. The 3 mm flowers are in pairs, on short, 3 mm axillary peduncles. The sepals are about equal to half the length of the corolla, which is white but pink on the outside in the bud.

Bentham (1869) noted that this species is referred to as a variety of *L. oppositifolius* by Mueller.

Flowering Period: August-December

Distribution and Habitat

This species has been recorded from Mt Barker and the Stirling Range. It occurs in low scrub in sandy gravel. It is considered likely to be more common than WAHerb records currently indicate.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Hamilla Hills	Albany	Cb	NP	24.8.93	+10	good

WAHerb: 5 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Field observation suggests high susceptibility

Management Requirements

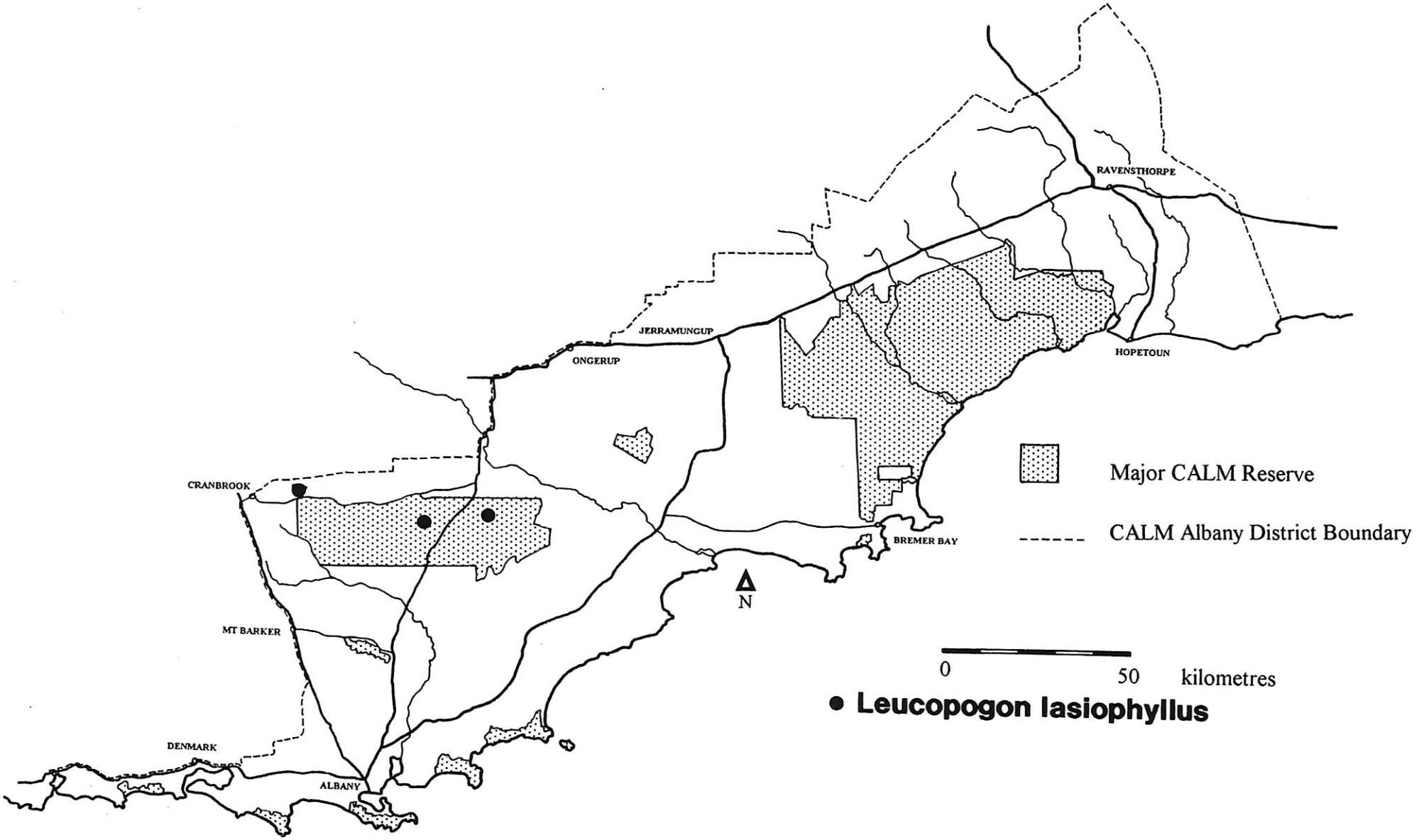
Cannot be determined until further survey

Research Requirements

- relocate WAHerb locations
- survey for new populations

References

Bentham (1869).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Leucopogon lasiophyllus

Leucopogon tamariscinus R.Br. EPACRIDACEAE

Leucopogon tamariscinus is a spindly, erect shrub to 60 cm tall. The alternate leaves are broadly ovate, striated and sessile stem clasping. The leaves tend to be slightly crowded toward the end of the branches, and more scattered below. The inflorescences are many flowered, terminal, cylindrical spikes. The corolla is white and the sepals ciliate.

Flowering Period: August-November

Distribution and Habitat

This species has been widely collected from the Stirling Range, through South Stirlings, to Cape Riche and near Gairdner. It occurs in open scrub or open woodland over heath, growing in sand or gravelly sand. Recent surveys indicate it is common at those WAHerb localities visited, and generally common in many other locations opportunistically surveyed.

Conservation Status

Current: Priority 2 Recommended: Remove from Priority Flora List

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Washpool Rd.	Albany	Pl	verge	4.11.92	24	healthy
2. Gold Holes	Albany	Pl	NP	7.12.92	27	healthy
3. ChesterPass Rd	Albany	Pl	NP	7.12.92	+200	healthy
4. Formby Sth	Albany	Gno	NP	8.12.92	+10	healthy
5. SRNP Sth	Albany	Pl	NP	8.12.92	+100	healthy
6. Chillinup Rd	Albany	Alb	various	1992	+200	healthy
7. Granite Hill	Albany	Alb	UVR	27.8.93	+50	healthy
8. Millbrook	Albany	Alb	NR	27.9.93	+100	in flower

WAHerb: 13 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

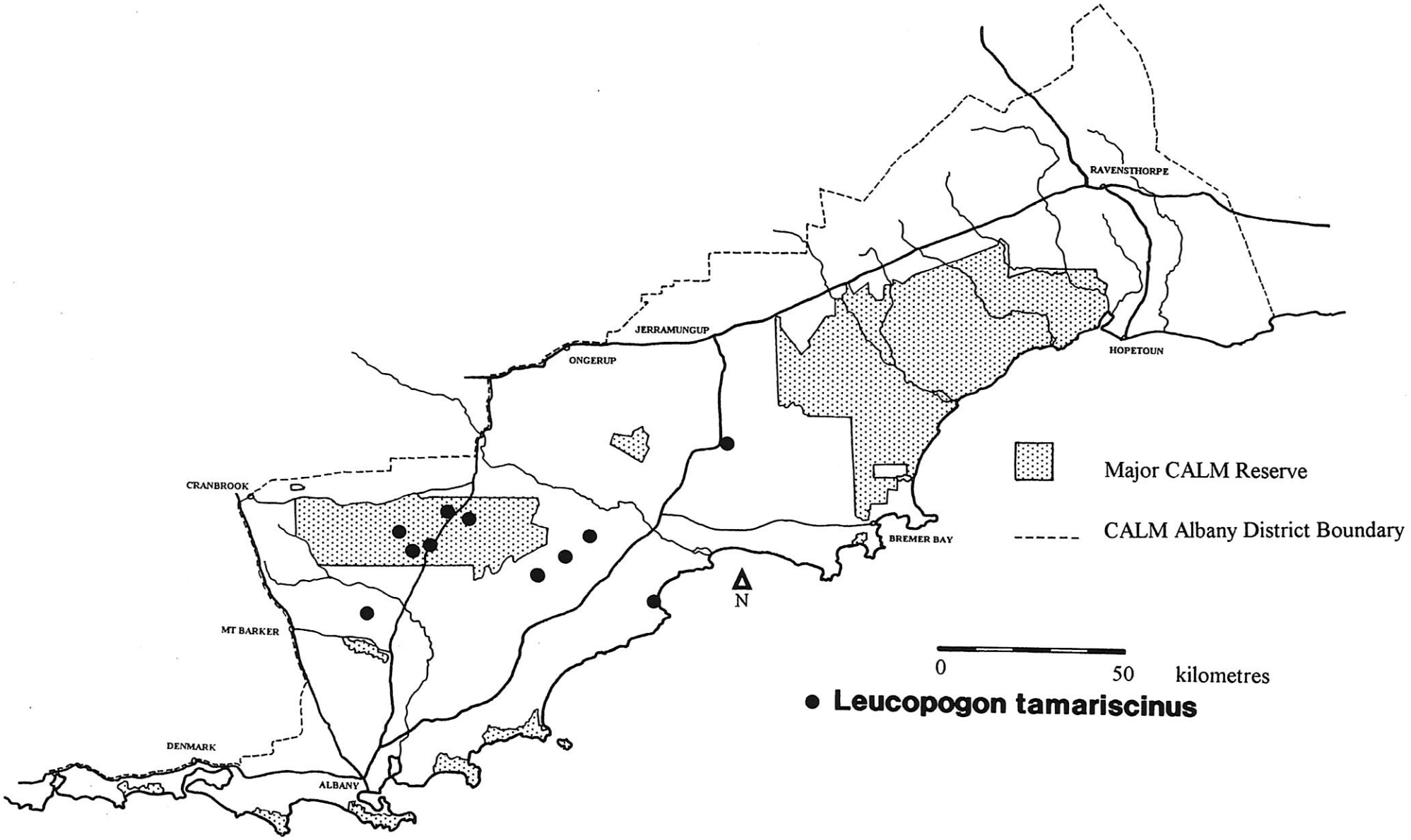
Presumed susceptible (moderate)

Management Requirements

Research Requirements

References

Bentham (1869).


RAVENSTHORPE
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CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Leucopogon tamariscinus

Lysinema lasianthum R.Br. EPACRIDACEAE

Lysinema lasianthum is a very slender, multistemmed erect shrub to 60 cm, which (especially when in flower) is conspicuous waving in the breeze. The linear leaves, to 6 mm are erect and scattered. The creamy white tubular flowers form a one-sided, up to six-flowered, terminal spike, with one flower (10 mm) per axil.

Flowering Period: July-October

Distribution and Habitat

Lysinema lasianthum has been collected from Parry's Beach (west of Denmark) east to Bluff Creek (near Cheyne Beach), and north to the Porongurup. It grows in open heath and sedgeland in peaty black soil which is seasonally damp.

It has been collected from three National Parks and four Nature Reserves and numerous other locations where it is common. Generally, wetland locations where it occurs, have not been well collected in the past.

Conservation Status

Current: Priority 2 Recommended: Priority 4

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Bakers Junction	Albany	Alb	NR	12.10.92	+50	in flower
2. Marbellup	Albany	Alb	NR	2.9.92	+50	in flower
3. Bluff Creek	Albany	Alb	VCL	2.11.92	+300	in flower
4. Parry's Road	Albany	Dnmk	verge	11.11.92	+30	in flower
5. Down Road	Albany	Alb	NR	14.9.93	+50	in flower

WAHerb: 15 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

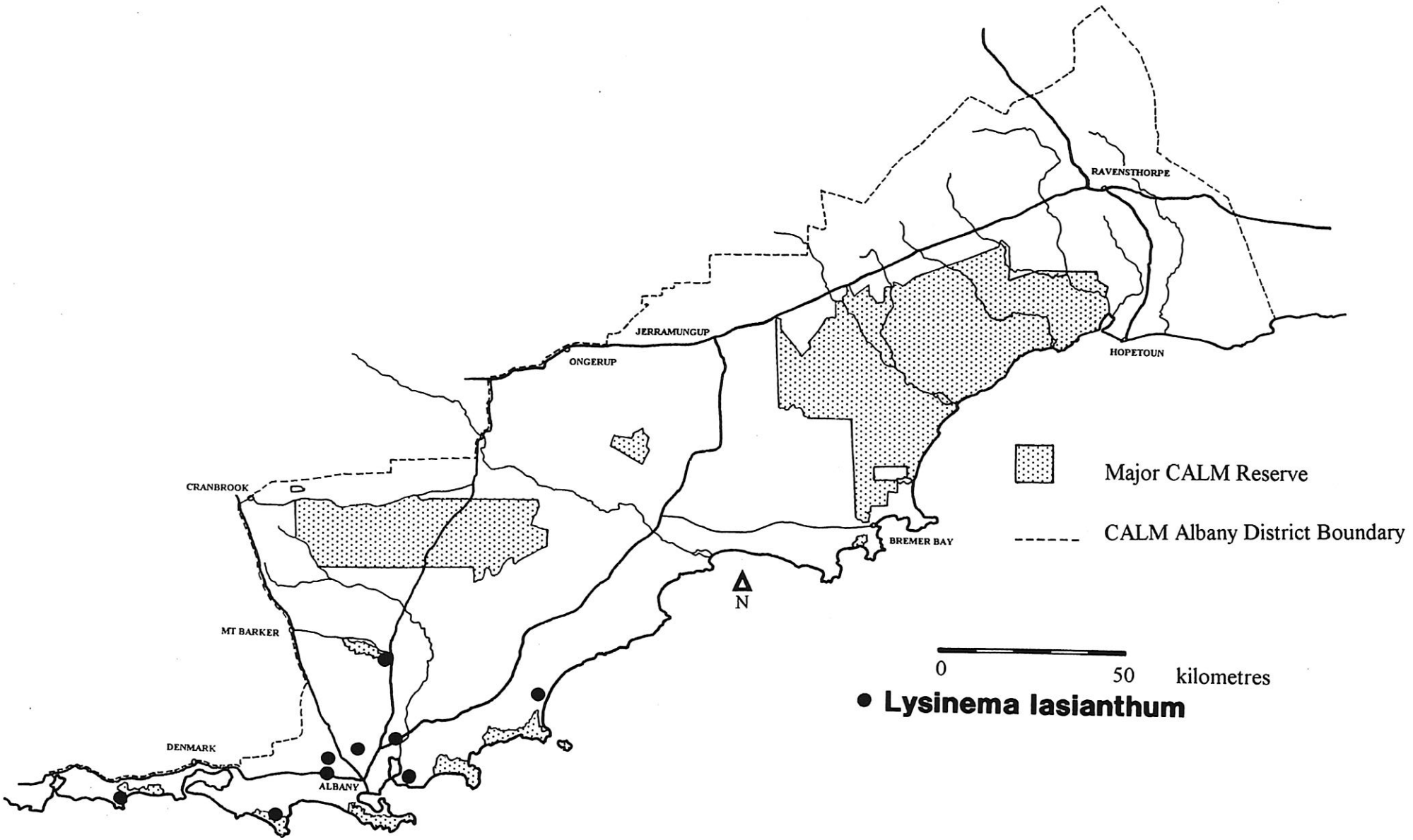
Presumed susceptible (moderate)

Management Requirements

Research Requirements

References

Bentham (1869).


RAVENSTHORPE
JERRAMUNGUP
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CRANBROOK
BREMER BAY
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MT BARKER
DENMARK
ALBANY
Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Lysinema lasianthum

Melaleuca coccinea subsp. *penicula* Cowley MYRTACEAE

This *Melaleuca* is a tall (to 2.7 m) openly branched shrub. The dark green narrowly ovate leaves (10 mm long by over 3 mm wide) are opposite and decussate, tapering to a point. The leaves are erect to spreading. The inflorescence is a dense spike of 20-30 flowers, 85 mm long on a short peduncle 2-5 mm, with the shoot growing out before flowering. Each bud is subtended by a broadly ovate, striate 13 mm acuminate bract which is sometimes persistent. There are sometimes persistent elliptic bracteoles around the barrel-shaped pubescent hypanthium (2-2.3 mm long). The bright red staminal claws are greater than 14 mm long and ca. 1.8 mm wide; stamens are up to 26 mm overall. The style is up to 24 mm long. The globular semi fused fruits remain on the old wood.

The subspecific name *penicula* refers to appearance of the staminal claw and filaments like a painter's brush or little tail. This subspecies is geographically isolated from subspecies *coccinea* and *exima*. Subspecies coccinea occurs east of Kalgoorlie and has shorter and narrower staminal claws than subsp. *penicula*, and subsp. *exima* occurs north east of Esperance and has narrower leaves.

Flowering Period: October-November

Distribution and Habitat

This species is confined to the northern central FRNP and VCL south west of Ravensthorpe. It grows in sandy loams over clay and granite in association with open scrub. *Melaleuca elliptica* which also frequently occurs in FRNP in similar habitat is readily distinguished by having elliptic leaves.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SW Ravensthorpe	Albany	Rav	VCL	12.1.92	+200	in flower
2. Jcp-Fitz	Albany	Jer	NP	1983	occasional-WH	in flower

WAHerb: 4 records

Response to Disturbance

Unknown.

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

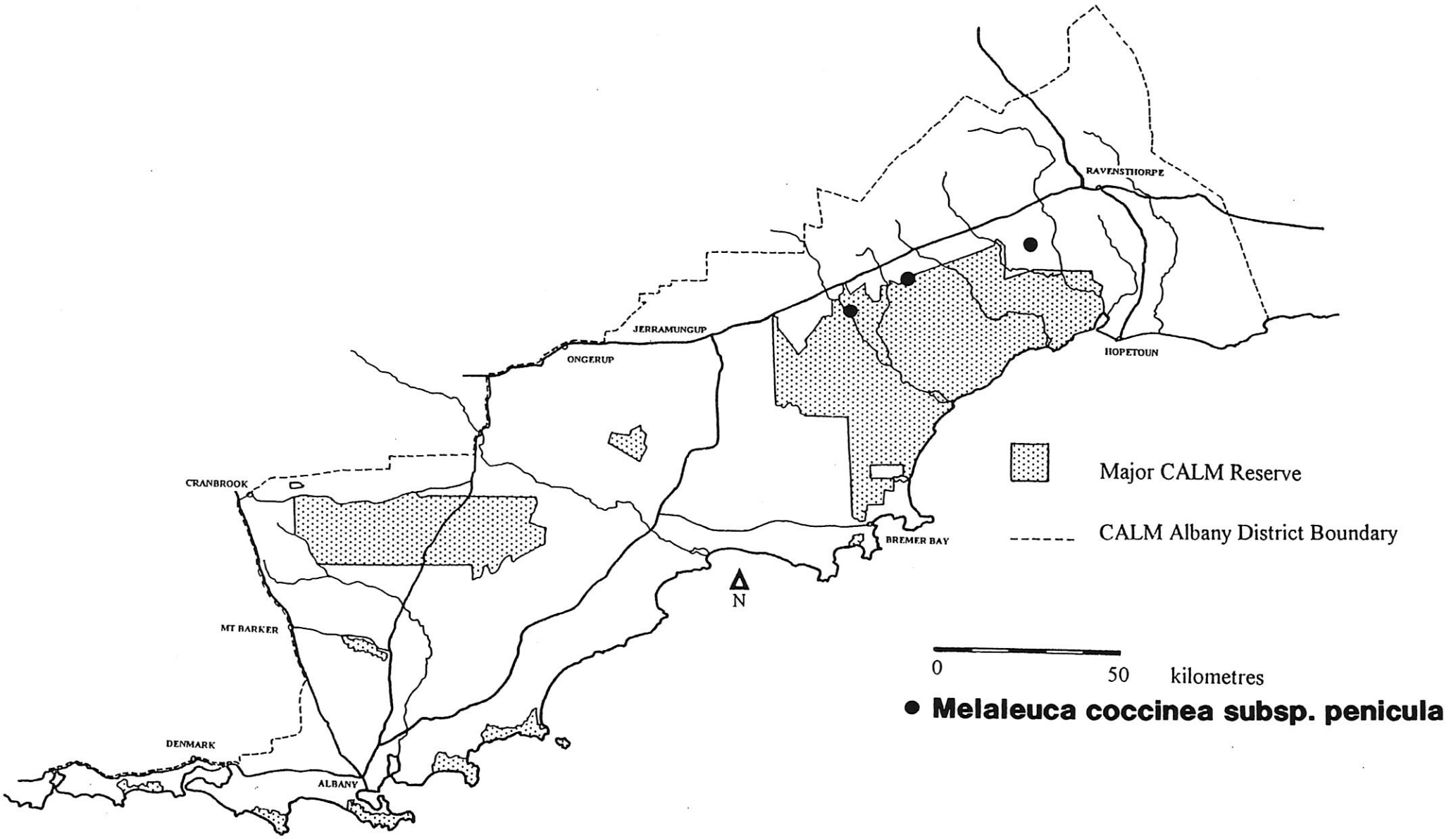
Monitor occasionally

Research Requirements

- relocate and survey WAHerb locations
- survey opportunistically for new populations

References

Cowley (1990).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
Melaleuca coccinea subsp. penicula

Melaleuca micromera Schauer MYRTACEAE

Melaleuca micromera is a tall shrub to 3 m, with numerous short slender branches covered with a close white tomentum. The thick ovate leaves are minute, closely appressed into leaf excavations, almost scale-like in whorls of three. The creamy yellow flowers are in semi-globular terminal heads.

Flowering Period: August-October

Distribution and Habitat

This species has been collected from within the Stirling Range and between Kendenup and Mt Barker. Bentham (1866) sites a record by Preiss from "Warriup hills", which could be from Warriup Hill east of Albany and WAHerb shows a collection from Warriup Hill. It occurs in gravelly clay soils supporting Jarrah forest.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent survey.						

WAHerb: 9 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

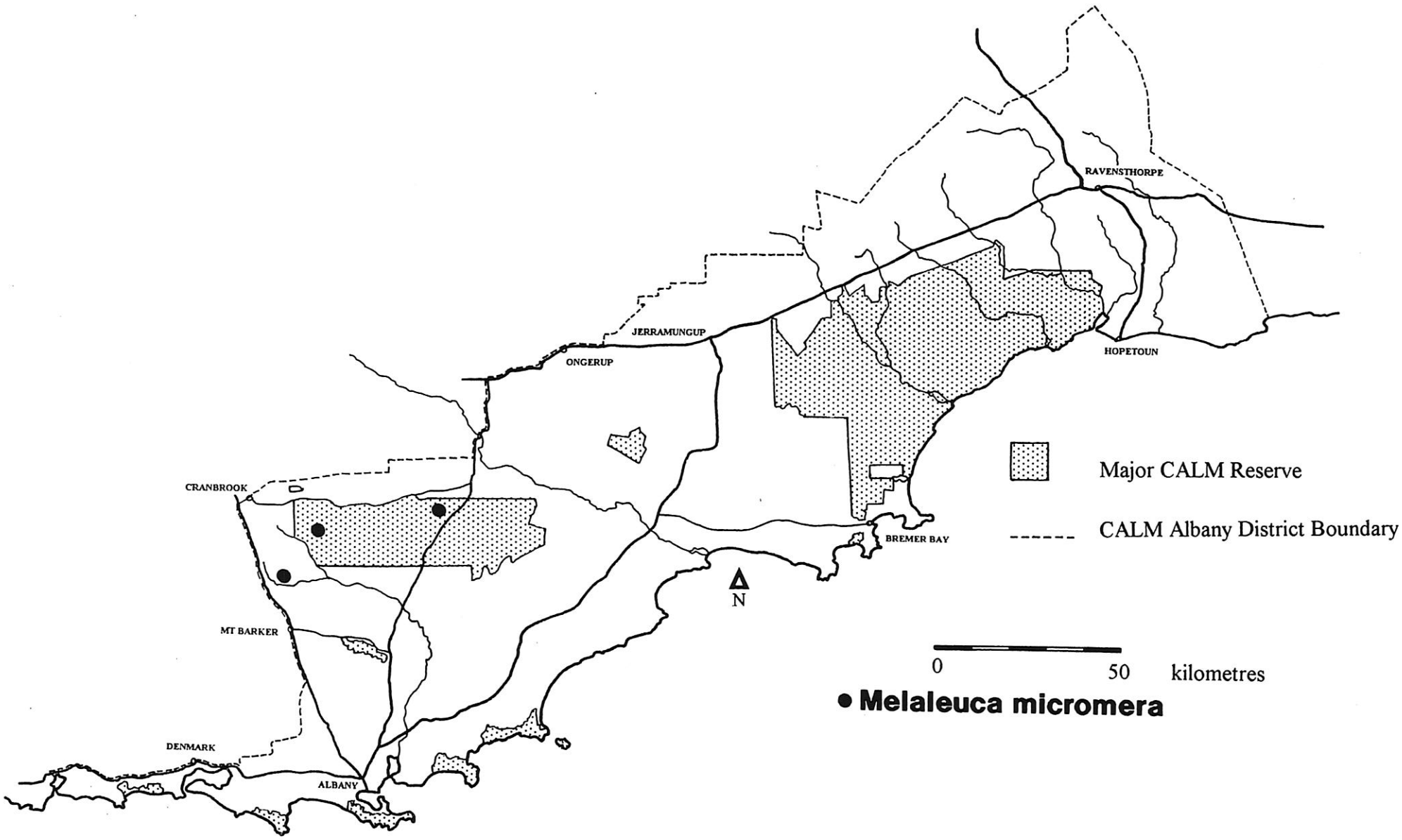
Management Requirements

Research Requirements

- relocate and survey WAHerb locations
- survey for new locations

References

Lehmann (1845).


RAVENSTHORPE
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CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
• Melaleuca micromera

Microcorys virgata R.Br. LAMIACEAE

Microcorys virgata is a slender erect shrub to 1.2 m which adopts a weeping habit as it becomes older. The linear-lanceolate 5 mm leaves are in whorls of three and evenly distributed along the fine branches at internodes spaced at a distance similar to the leaf length. The small pale blue buds and white flowers are in groups of three (one per axil in leaf whorls) toward the branch tips.

Flowering Period: August-January

Distribution and Habitat

This species has been collected over a wide geographic range in a variety of habitats, from near Albany to Cape Arid. Herbarium specimens do exhibit morphological variation. Just north of Albany it occurs in shallow soil over massive outcropping granite supporting other shrubs and Marri. It occurs in disturbed roadside sandy soils north east of Albany, especially along Chillinup Road (*M. barbata* also occurs there). It was also collected by K. Newbey from near Mt Groper (Pallinup Estuary) and although not relocated in a recent search, it is presumed to have occurred in limestone soils over granite common to the area. At Hamilla Hill one plant was seen growing in disturbed pink sand over pink sandstone.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Willyung Hill	Albany	Alb	private	25.8.92	4	healthy
2. Chillinup Rd	Albany	Alb	verge	1.9.92	20	healthy
3. Koj Sprngs Rd	Albany	Alb	Shire res.	9.2.93	11	healthy
4. Hamilla Hill	Albany	Cb	NP	24.8.93	1	in flower

WAHerb: 12 records

Response to Disturbance

Roadside soil disturbance appears to have stimulated germination along Chillinup Road and Kuch Road.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

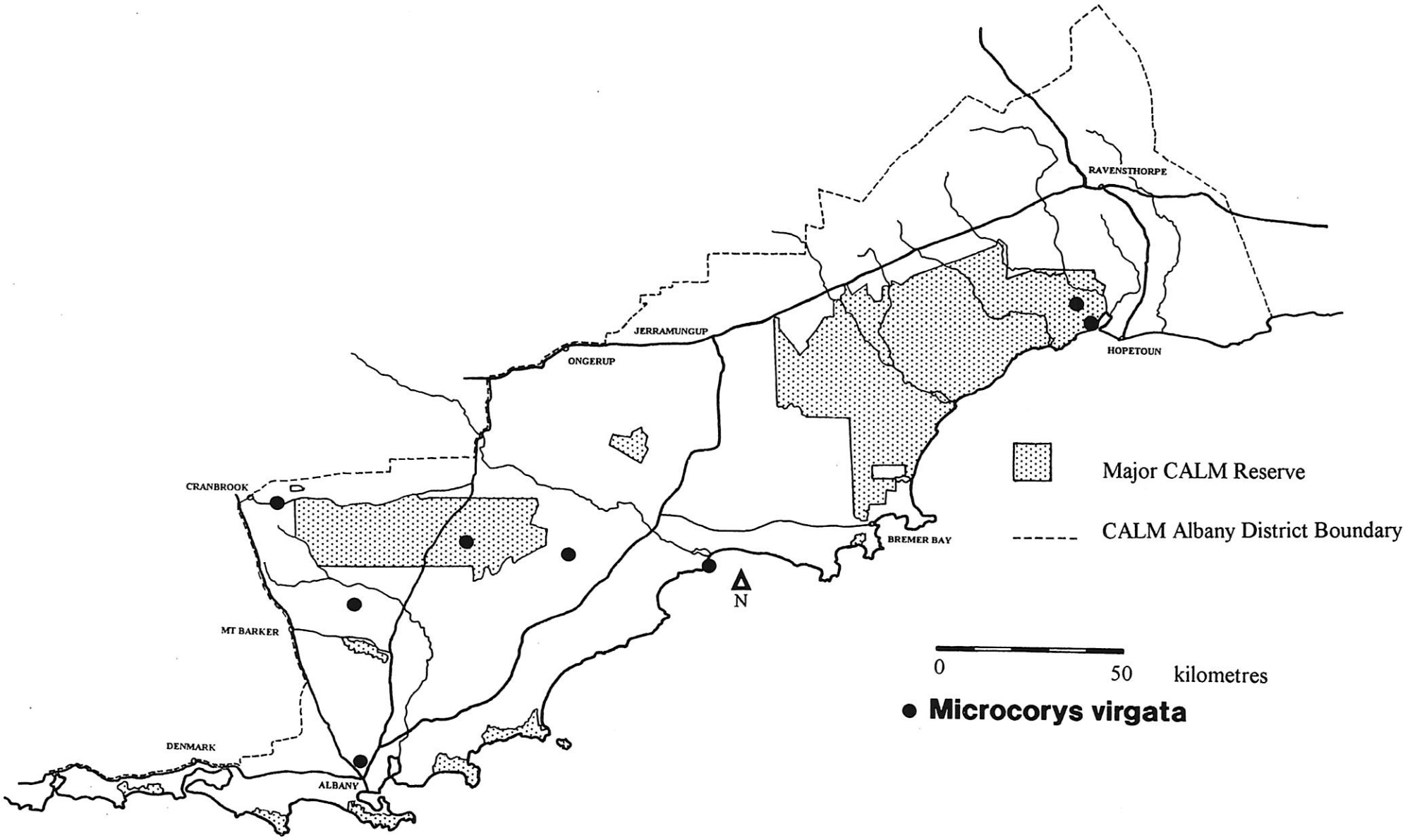
Monitor occasionally

Research Requirements

- survey opportunistically for new populations
- assess morphological variation and taxonomy

References

Bentham (1870).


RAVENSTHORPE
JERRAMUNGUP
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CRANBROOK
BREMER BAY
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ALBANY
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
Microcorys virgata

Muiriantha hassellii (F.Muell.) C.A.Gardner

RUTACEAE

False Mountain Bell.

This species is very similar in general appearance to the true Mountain Bells (*Darwinia*), but has only one flower per inflorescence and flowers much earlier. It is usually a small shrub to 35 cm, softly hirsute with long fine hairs. The simple leaves are small, obovate to elliptical oblong (1.2-1.5 cm long and 2-3 mm broad), flat and becoming narrowed toward the base. The 5-merous flowers are upper axillary or terminal and pendulous on short recurved pedicels. There are small linear to lanceolate bracteoles near the base of the pedicels. The 3-4 mm sepals are unequal, ovate to lanceolate and hairy outside. The petals are large (18-19 mm long), narrowly oblong and are lemon yellow with a dark median stripe and very imbricate. There are ten stamens equal in length to the petals, slender but flattened at the base and with a tuft of hairs on the inner base.

The genus *Muiriantha* is closely related to *Nematolepis*, but differs in having free, imbricate petals.

Flowering Period: Autumn and early Winter

Distribution and Habitat

This species is almost confined to the Stirling Range, the only WAHerb location outside SRNP being "Kendenup-Stirling Range". It has been collected (WAHerb) from ten peaks in the range, and from several other lower locations. It grows in shallow clay soils over schist in association with scrub or mallee scrub.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Tolls Peak	Albany	Gno	NP	22.5.85	common	-
2. Bluff Knoll	Albany	Gno	NP	9.87	2	in flower

WAHerb: 20 records

Response to Disturbance

Killed by fire; regenerating from seed

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

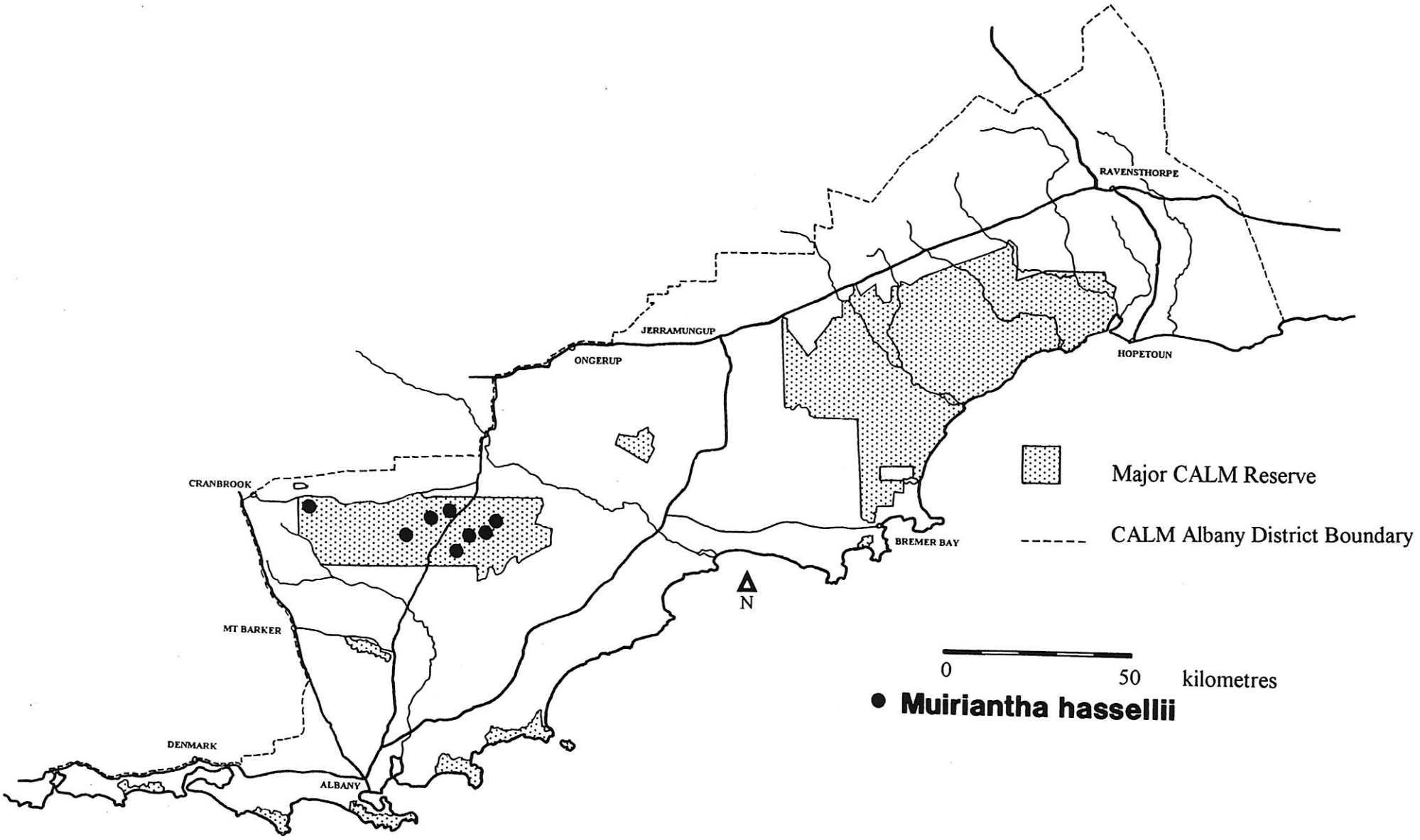
Management Requirements

Monitor occasionally

Research Requirements

References

Gardner (1942).


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ALBANY
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kilometres
Muiriantha hasselii

Opercularia rubioides A.L.Juss

RUBIACEAE

Opercularia rubioides is a stout, erect, glabrous plant which may be woody at the base. The leaves are sessile, ovate-lanceolate, 10-20 mm long with recurved margins and scabrous upper surface. The green flowers are numerous in globular terminal heads, nearly sessile on very short peduncles and subtended by two floral leaves. The flower heads are not spiny or bristly like many others of the genus.

Flowering Period: October

Distribution and Habitat

WAHerb records one location near Jerramungup and another 45 km north of Stokes Inlet. Bentham (1866) cites a Drummond collection from "Toward Cape Riche". No habitat information is available.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No known populations						

WAHerb: 2 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

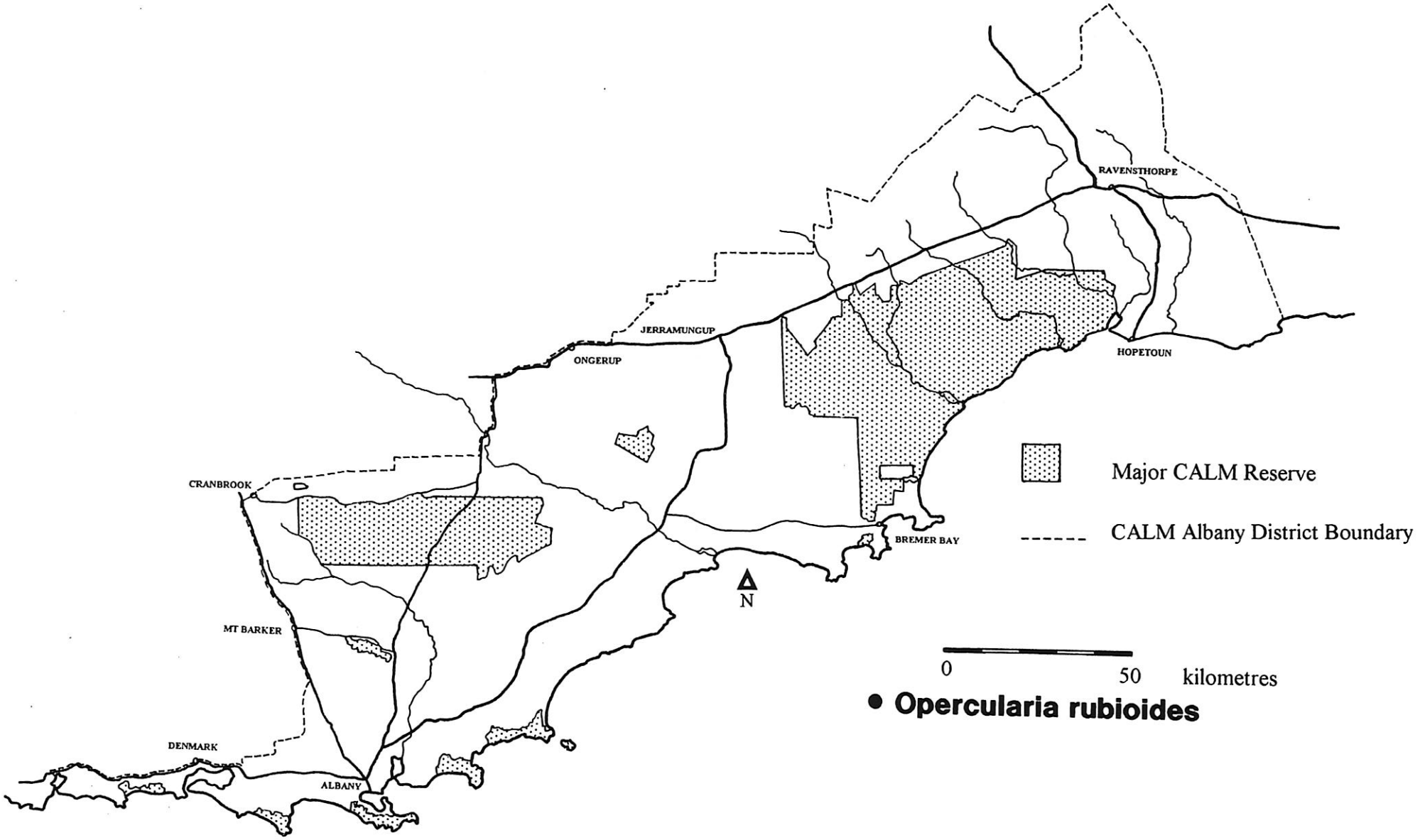
Management Requirements

Research Requirements

- relocate and survey Jerramungup Population
- survey for new populations

References

Bentham (1866).


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kilometres
● Opercularia rubioides

Orthrosanthus muelleri Benth. IRIDACEAE

Orthrosanthus muelleri is a perennial herb, 20-30 cm tall, and a relatively slender member of the genus. The leaves, shorter than the flowering stem are 10-20 cm, 1.5-2.5 mm wide with densely tomentose or pubescent margins. The inflorescence is of 2 or 3 cymose units, the lateral branches (peduncles 1-5 cm long) alternate in opposite directions, subtended by a scape bract. Each cyme or rhipidia is 4-6 flowered, each enclosed by an ovate spathe 10-13 mm long with broad scarious margins and apices. The flowers are each separated by a hyaline bracteole. There is no description of the mature flowers, but would be blue.

Flowering Period: October

Distribution and Habitat

There is no specimen currently housed in the WA Herbarium. Mueller collected the type from the Stirling Range in the 1860's. Drummond had collected it earlier, possibly in the Stirling Range. Keighery has not seen it in SRNP. Flora of Australia (1986) cites a 1962 collection toward Kendenup. A roadside population at this location was relocated in October 1993 which consisted of only four plants (clumps). The roadside was narrow and seriously degraded by invading weeds and dumped plant material; the continued survival of this population is tenuous. Flora of Australia also states that it occurs in the Gnowangerup area, but this is not substantiated.

Conservation Status

Current: Priority 2

Recommended: Priority 2 (with highest priority for further survey and consideration for gazettal as DRF)

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Young River	Albany	Pl	verge	10.93	4	weeds

WAHerb:1 record

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

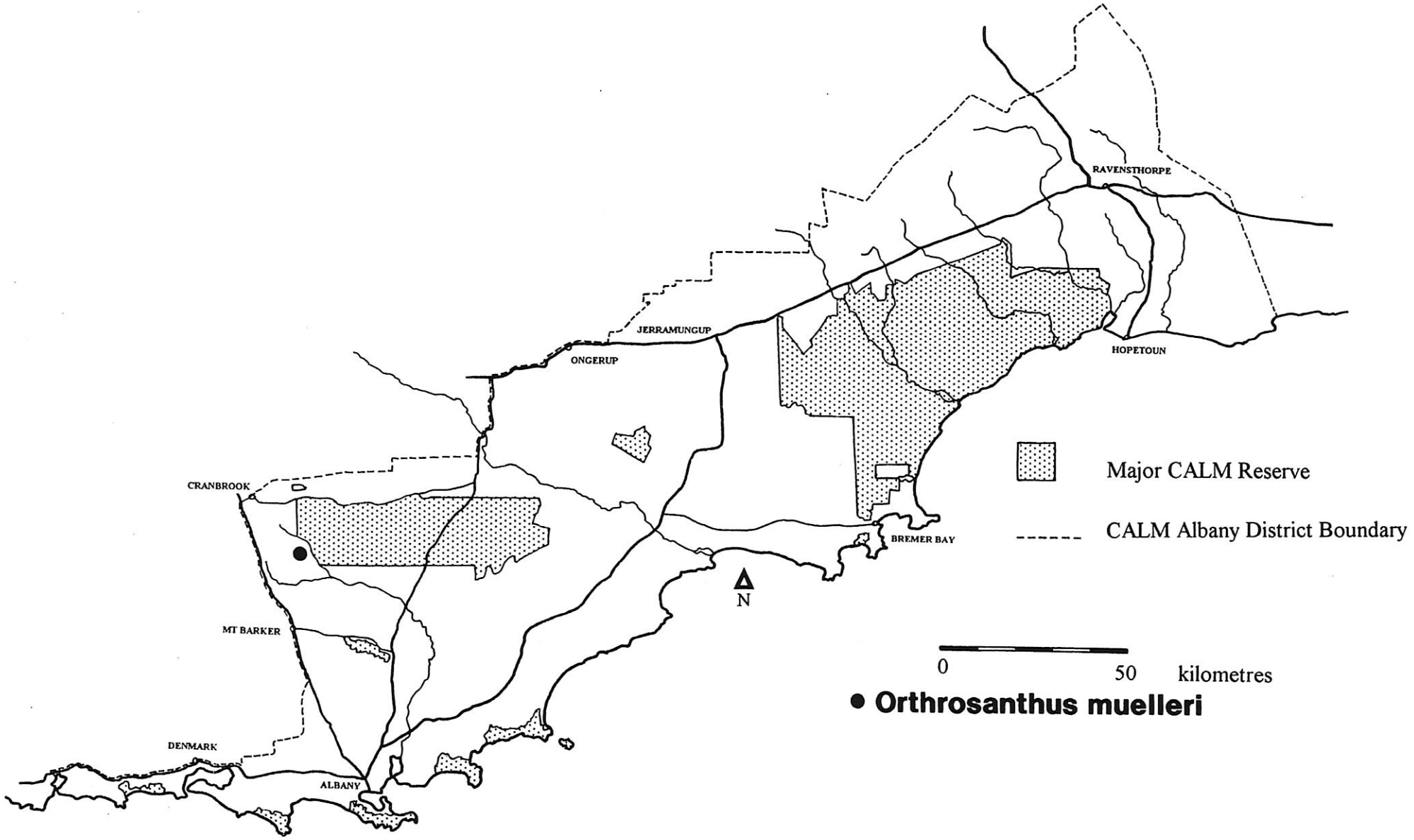
- contact shire and have rare flora markers erected on Red Gum Pass Road
- contact adjacent land holder to advise of rare flora presence

Research Requirements

Survey for new populations and research origin of Gnowangerup location

References

Bentham (1873), Cooke (1986).


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Orthrosanthus muelleri

Persoonia brevirhachis D.Weston ms

PROTEACEAE

This *Persoonia* is an erect, spreading shrub with a single main stem or branching from the base with smooth mottled, grey bark. It is not known whether it is lignotuberous. The branchlets are moderately to densely hairy and sometimes slightly angular when young, becoming terete and glabrous with age. The 2-5 cm alternate leaves are linear-spathulate up to 2.5-5.5 mm wide, suberect to erect with acute or obtuse tips. The leaves are rigid, leathery, and glaucous with revolute margins with midvein evident only on the upper surface. The inflorescence is axillary or subterminal, 1-2 flowered, with a 1 mm rachis subtended by floral bracts (scale leaves). The flowers are regular, held upright to horizontal but occasionally pendulous, on 1.5-5 mm hairy pedicels. The perianth is greenish yellow, moderately hairy outside, glabrous inside with patches of papillae below the point of staminal attachment. The tepals are acute, narrow-elliptic to lanceolate, truncate at the base without lateral wings. The gynoecium is glabrous, 5.5-8 mm long and with the style exserted. The fruit is a smooth, ovoid, drupe

Flowering Period: August-October

Distribution and Habitat

Persoonia brevirhachis ms occurs on yellow sand over laterite in heath or mallee heath between Lake Grace, Newdegate and Ravensthorpe. The nearest collection to Ravensthorpe is 20 miles NW and may in fact be out of the Albany District.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent survey						

WAHerb:

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible

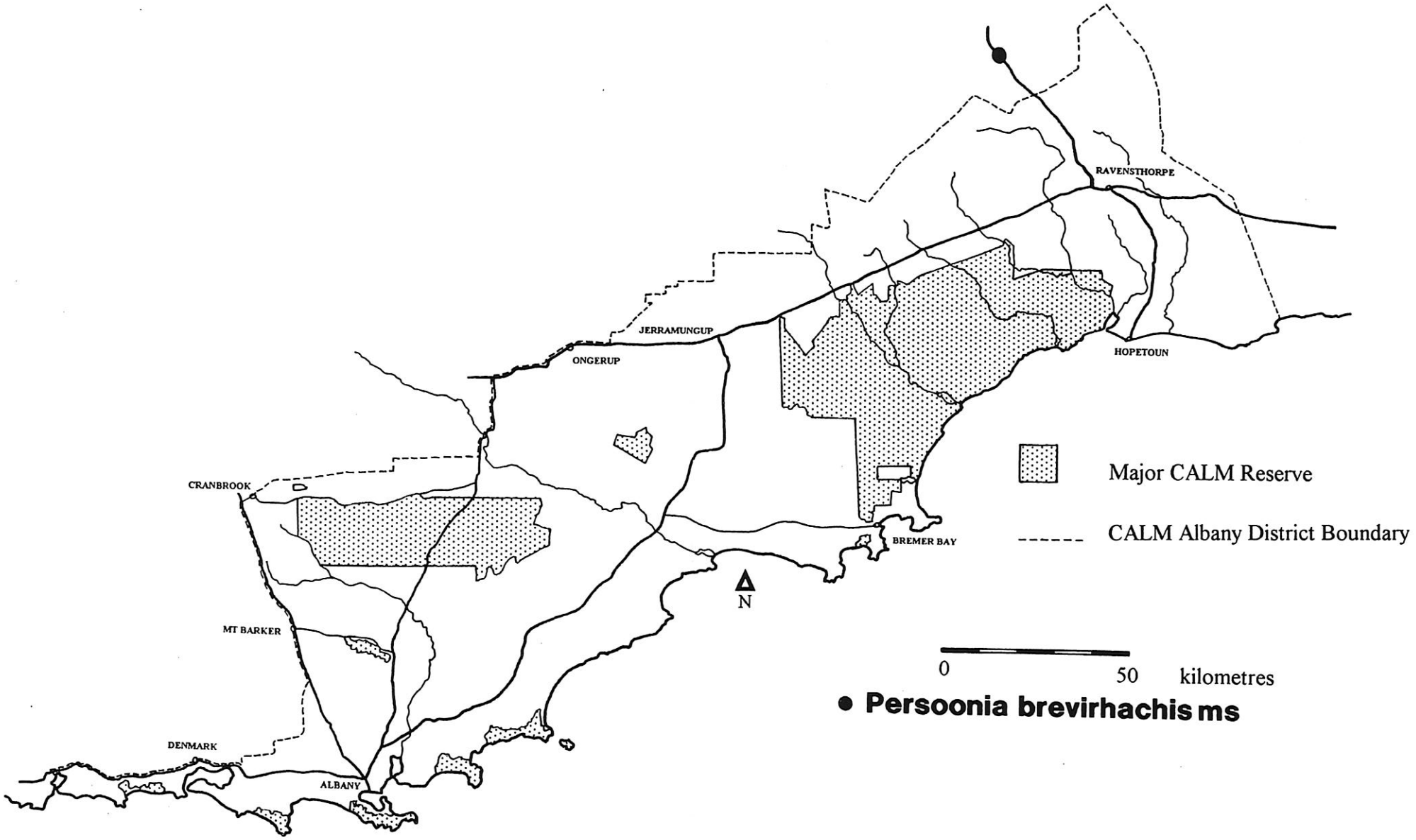
Management Requirements

Research Requirements

Relocate and survey WAHerb populations

References

P. Weston (pers. comm.).


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kilometres
Persoonia brevirhachis ms

Platysace filiformis (Bunge) Norman APIACEAE

Platysace filiformis is a very slender, glabrous trailing perennial with scarcely flattened stems to 40 cm and terminal umbels of minute white flowers. Originally this species was described by Bunge (1844) as *Trachymeme filiformis* and by Bentham (1866) as *Siebera compressa* var *filiformis*. Bentham stated that it has very slender stems, scarcely flattened and with the fruits of *P. compressa*.

At WA Herbarium many specimens included under *P. compressa* are very similar to those under *P. filiformis*. It did appear that there are two distinct forms under *P. compressa*; a very fine form like the *P. filiformis* specimens and a much more robust, erect form with thicker, broader stems.

Flowering Period: April, July

Distribution and Habitat

Specimens given this species name have been sporadically recorded from Northcliffe, west of Denmark and Marbellup. It occurs in grey-white sand over laterite, as an understorey component of Marri-Jarrah-Sheoak woodland.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
(1) Mt Lindesay Rd	Walpole	Dnmk	private	17.8.93	uncommon	

WAHerb: 4 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible

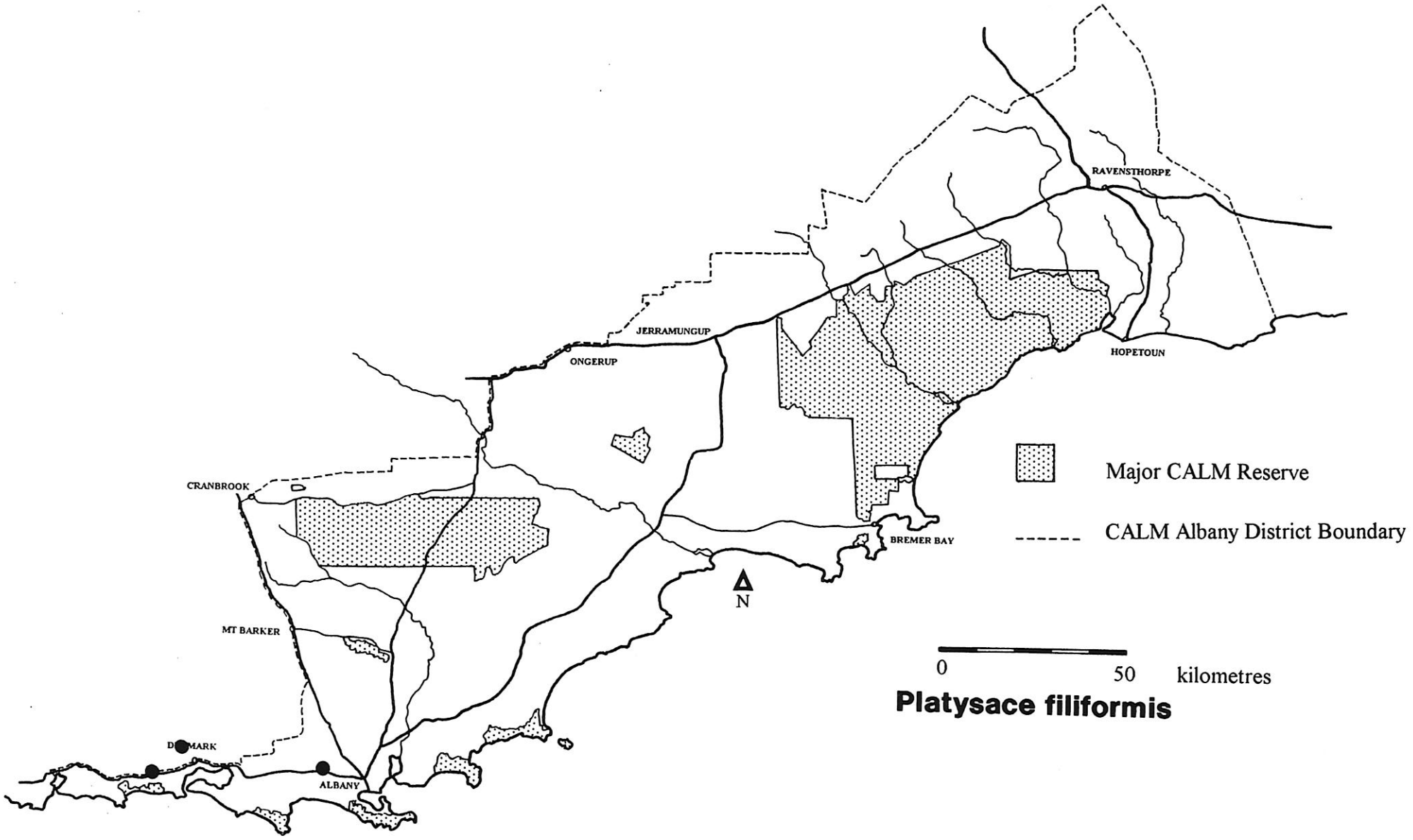
Management Requirements

Research Requirements

- taxonomic study required to confirm the identification of WA Herbarium specimens
- relocate and survey Marbellup and Denmark populations
- survey for new populations

References

Bentham (1866), Bunge (1844).


RAVENSTHORPE
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BREMER BAY
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Major CALM Reserve
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kilometres
Platysace filiformis

Restio ornatus Steud. RESTIONACEAE

Restio ornatus is a rhizomatous, dioecious perennial sedge which may form diffuse patches or dense clumps. The stems (to 30 cm) are relatively very slender, erect with obtuse sheathing scales to 15 mm with white woolly hairs on the margins. Short sterile compound branchlets often arise from the lower sheathing bracts. The lower part of the stem is originally loosely cottony, but may wear off with time. The male spikelets are 1-3 per glume, broadly ovate to 8 mm nearly sessile or pendulous on 7-25 mm filiform pedicels. The female spikelets are narrower and erect. Both arise from within ovate-lanceolate striated glumes with fine rigid points.

Flowering Period: October

Distribution and Habitat

This species has been collected only occasionally since description from around the Stirling Range and near Tambellup. It occurs in white sand or grey sand over clay in open heath or scrub.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Salt River Rd	Albany	Cb	NP	15.10.83	common-WH	in flower
2. Tambellup	Katanning	Ta	verge	10.88	loc.freq-WH	in flower

WAHerb: 7 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

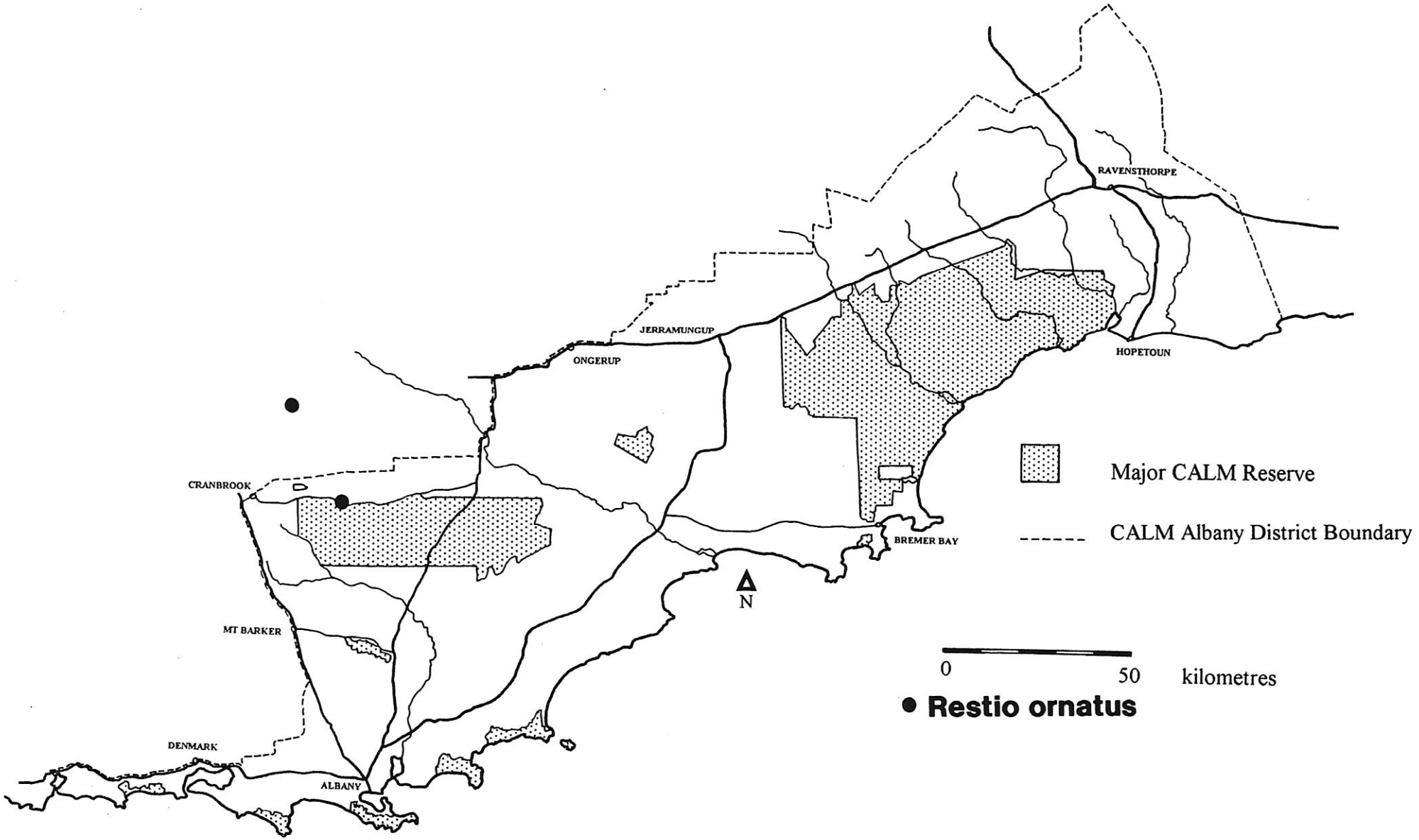
Monitor occasionally

Research Requirements

Relocate and survey WAHerb locations

References

Bentham (1878).


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BREMER BAY
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kilometres
Restio ornatus

Schizaea sp. Lake William (T.A.Halliday 297) SCHIZAEACEAE

Comb Fern

This taxon is thought to be distinct from *S. fistulosa*, which is common around Albany (Chinnock, pers. comm.). It is distinguished by having distinctly flattened lamina, sterile leaves shorter than sporogenous ones, one or two rows of stomata along either side of the midrib and muricate edges to the fronds. The sterile leaves are 50-110 mm long and display circinate vernation. The sporogenous fronds are 150 mm long, with comb-like sporangia, 6-8 mm long.

Sporangia Period: July-August

Distribution and Habitat

This fern forms dense rhizomatous clumps in seasonally damp peaty soil, beneath sedges and low shrubs. It was originally collected at Lake William in Waychinicup NP, but a similar collection in the WA Herbarium was made at Coalmine Beach, near Walpole in 1979. This latter collection has not been seen by Chinnock.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Lake William	Albany	Albany	NP	25.10.93	-	-

WAHerb:1, possibly 2 records

Response to Disturbance

Unknown, but likely to be adversely affected by changes in local drainage

Susceptibility to *Phytophthora* Dieback

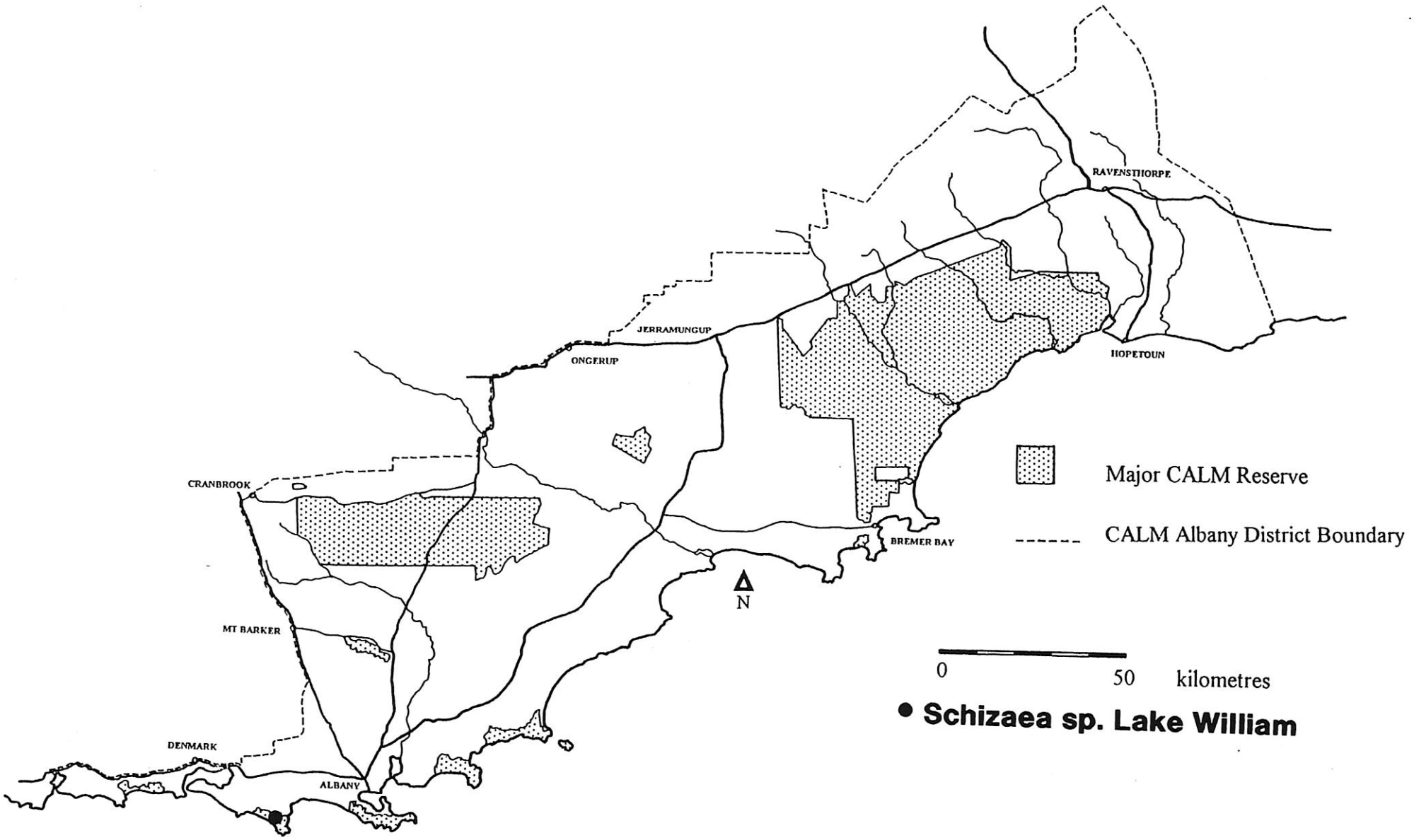
Unknown

Management Requirements

Monitor Lake William population occasionally

Research Requirements

- collect material from Coalmine Beach and other suitable habitats, and send to Bob Chinnock for confirmation of taxonomic status
- survey for new populations


RAVENSTHORPE
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kilometres
Schizaea sp. Lake William

Schoenus acuminatus R.Br. CYPERACEAE

Schoenus acuminatus is a tufted perennial sedge to 50 cm tall. It is more "grassy" in appearance than *S. multiglumis* and *S. rodwayanus* which also commonly occur around Albany. The terete stems (1 mm dia.) are light green and the leaf sheaths are reddish brown with a long ligule, 40-70 mm which may be reflexed or patent. The lower spikelets are sessile or shortly pedicellate in groups of two or three, closely subtended by a short bract. The upper spikelets are shortly pedicellate on the stem, 50-60 mm above the last bract. The glumes are acuminate.

Flowering Period: November

Distribution and Habitat

This sedge occurs in peaty sand supporting winter wet heath and sedgeland and open Jarrah heath. It has been sporadically collected from west of Denmark, east through to Norman's Beach. Potential habitat is very common and widespread, and it is likely that further survey for this species will greatly increase its known occurrence. Sedges have generally been overlooked by collectors in the past.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Gull Rock	Albany	Alb	NP	8.11.82	scattered-WH	healthy
2. Goode Beach	Albany	Alb	NP	4.11.86	common-WH	-
3. Norman's Beach	Albany	Alb	NP	7.8.86	uncommon-WH	-
4. Palmdale Road	Albany	Alb	verge	11.11.86	scattered-WH	-

WAHerb: 11 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

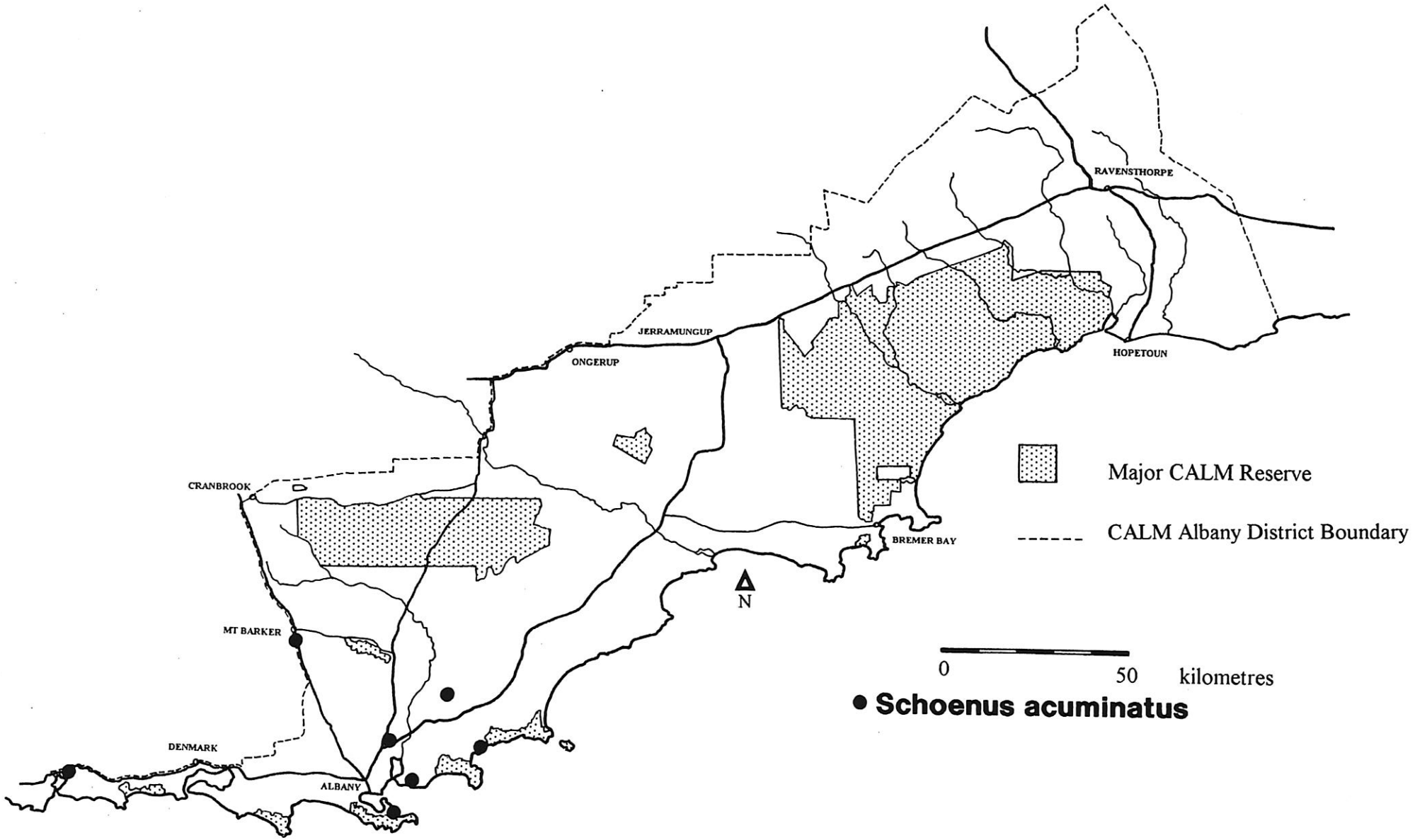
Management Requirements

Research Requirements

Survey in Bakers Junction NR, Torndirrup NP, Manypeaks NR, Waychinicup NP, and other areas of suitable habitat in conservation land.

References

Brown (1810).


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CALM Albany District Boundary
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Schoenus acuminatus

Spyridium villosum (Turcz.) Benth. RHAMNACEAE

This taxon was previously curated at WA Herbarium under *Spyridium westringiifolium*. However the type of that species was found to be a specimen of *Trymalium ledifolium* (Barbara Rye, pers. comm.). The collections under *S. westringiifolium* are actually *S. villosum*, and appear to include true *villosum* from the Stirling Range that match Drummond's type specimen and several collections from nearer to Denmark (Rye pers. comm.) which are atypical. This atypical form has been named by B. Rye as *Spyridium riparium* ms.

S. villosum is a shrub with the young branches hoary or rusty, mixed with short spreading hairs. The leaves are linear or oblong-linear, 12-18 mm long with a short recurved point, with recurved margins. They are glabrous to hoary above and densely silky-tomentose beneath. The flower heads are very dense, shortly pedunculate cymes with one or two floral leaves per head. Each head is subtended by a series of broad papery brown bracts. The 1.8 mm calyx lobes are densely tomentose, and are larger than the minute petals which hood the anthers.

S. riparium ms has glabrous or subglabrous leaves above which are more pointed than *S. villosum* (Rye, pers. comm.)

Flowering Period: August

Distribution and Habitat

S. villosum has been collected infrequently from the Stirling Range and South Stirling where it grows in sand in mallee scrub. The atypical form (now *S. riparium* ms) has been collected from the Mitchell River crossing on the Denmark-Mt Barker Road and from Northumberland Road crossing of the Kent River, growing mid slope above drainage lines.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
S. riparium ms (previously atypical *S. villosum)*						
1. Mitchell River	Walpole	Dnmk	SF	8.93	loc.common	in bud
2. NrthmbldRd	Walpole	Dnmk	SF	8.93	abundant	in bud

No recent surveys of typical *S. villosum*

WAHerb: 7 records (2 atypical)

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

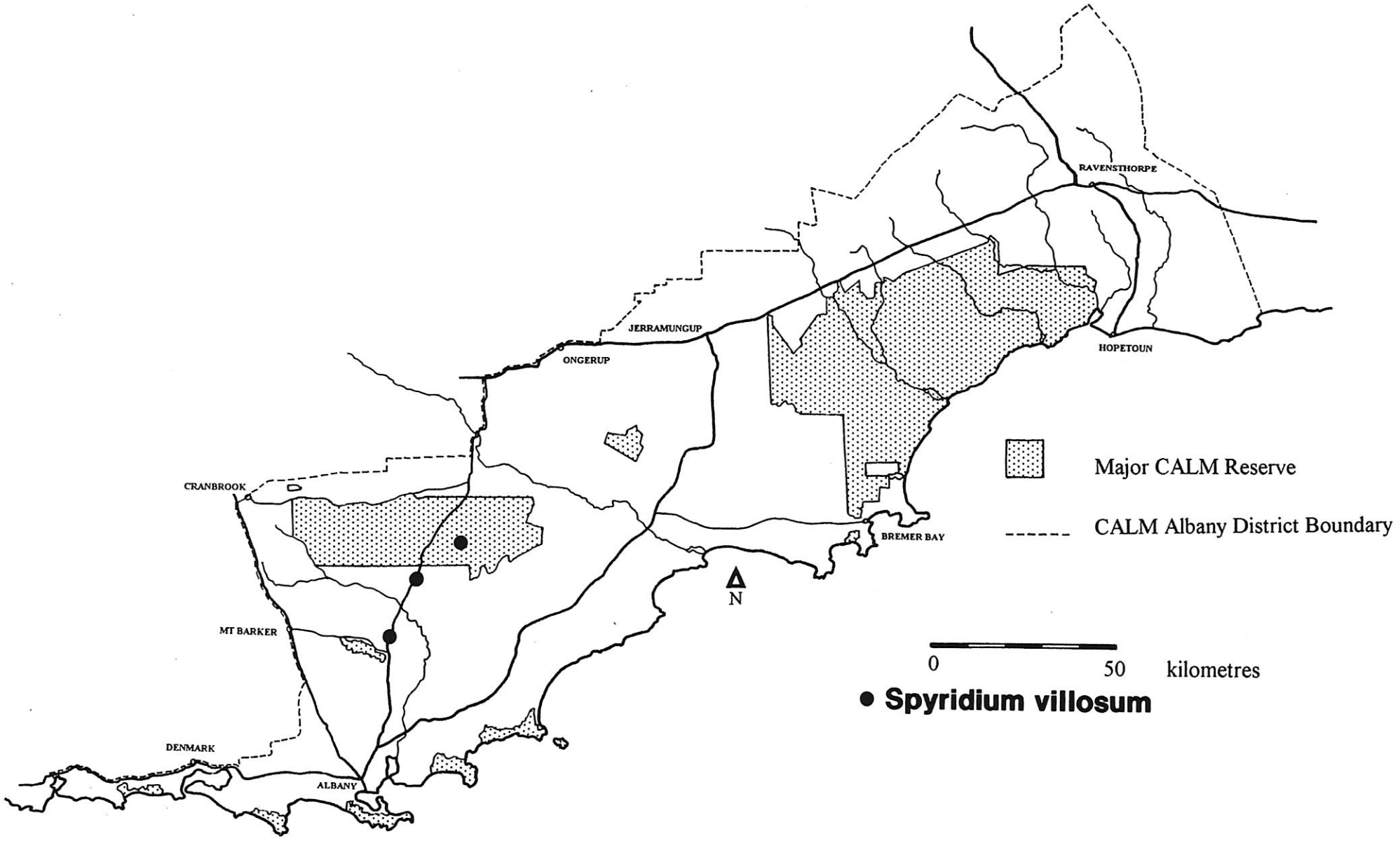
- place atypical form on Priority Flora List as separate taxon (eg. aff. *villosum*)
- monitor occasionally

Research Requirements

- relocate and survey WAHerb Stirlings locations
- both taxa require further taxonomic study
- survey for new populations

References

Bentham (1863), B. Rye (pers. comm.).


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kilometres
• Spyridium villosum

Stenanthemum pumilum (F.Muell.) Diels RHAMNACEAE

Originally, this taxon was described as *Cryptandra pumila* by Mueller and then included by him in *Spyridium* in 1875. Rye (pers. comm..) now recognises the genus *Stenanthemum* Reissek, which is somewhat intermediate between *Cryptandra* and *Spyridium*. The fruit of *Spyridium* separates into 2-3 cocci which shed with their enclosed seed; the fruits of *Stenanthemum* and *Cryptandra* remain within the persistent outer parts of the flower. The inflorescence of *Stenanthemum* is composed of densely clustered heads with each head surrounded by a whorl of bracts whereas the inflorescence of *Cryptandra* has solitary flowers or flowers loosely associated in a head-like arrangement with each flower subtended by a whorl of imbricate bracts.

Stenanthemum pumilum is a very small, compact shrub to 50 mm. The lanceolate 4-5 mm spreading dull green leaves are very silky hairy above, minutely hairy below, with revolute margins. Each leaf is subtended by a deep red-brown, membranous ovate bract which is sparsely hairy. The inflorescence is a compact head of up to 10 flowers with very conspicuous white-grey woolly hairy sepals which are glabrous orange-brown inside. The brown petals are minute, hooding the anthers. The head is surrounded by broad, ovate, brown glabrous bracts with a conspicuous, hairy midvein which elongates into a long acuminate point.

Flowering Period: September, October, November

Distribution and Habitat

Stenanthemum pumilum has been collected several times in the Stirling Range and once from Brookton Highway. Little has been recorded of its habitat in the Stirling Range. The Brookton location was from a granite sheet which is unlike the Stirlings which are mostly shallow sands and slopes of rocky schists. It is possible given the range and different soil types, that it may be more common than current collections indicate.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent survey						

WAHerb: 7 records (most recent in Albany district: ASG 1971)

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

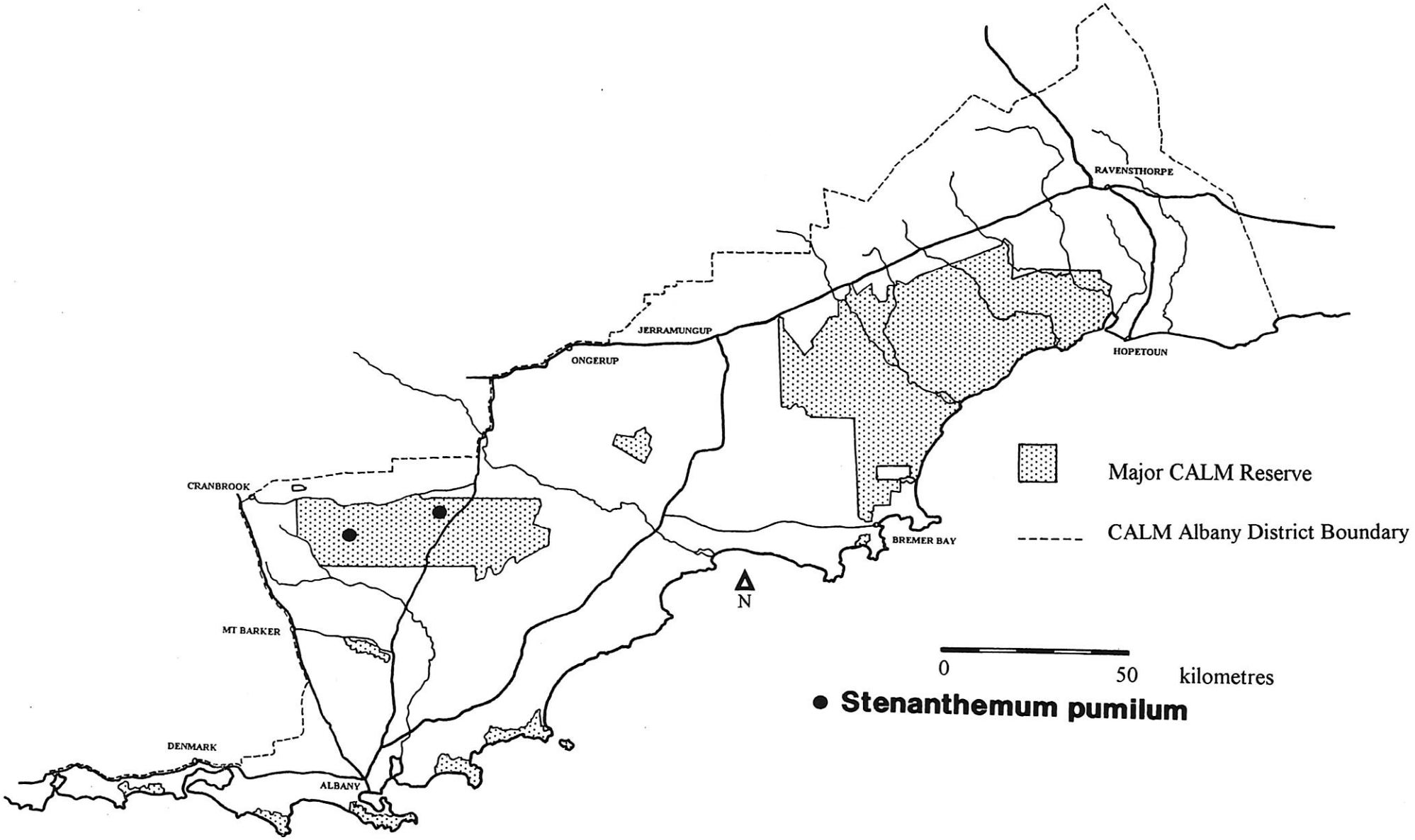
Cannot be determined until relocated

Research Requirements

Relocate Stirling range populations and survey

References

B. Rye (pers. comm.).


RAVENSTHORPE
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
Stenanthemum pumilum

Stylidium articulatum R.Br. STYLIDIACEAE

Stout Trigger Plant

Stylidium articulatum is a perennial herb, comprised of a basal rosette of leaves (to 100 mm long), and a stout flowering scape to 150 mm, bearing one or two whorls of smaller leaves. The radical leaves are oblong-spathulate, obtuse with a short mucrone, dark green above and lighter glaucous below. The scape leaves are up to 10 mm, linear or lanceolate. The stock is often very thick. The large flowers are pale pink, with prominent throat appendages, and form a short, dense glandular-pubescent racemose inflorescence.

Flowering Period: November-December

Distribution and Habitat

WAHerb records only two specific locations, Boulder Hill and Mermaid Point. Bentham cites collections by Brown, Drummond and Baxter which are not represented in the WA Herbarium. It occurs in the shelter of granite boulders and bluffs, in very shallow soil with a pavement of exfoliated rock. They form monospecific colonies in this sheltered situation.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Boulder Hill	Albany	Alb	Shire res.	13.11.92	+500	in bud
2. Mermaid Pt.	Albany	Alb	NP	2.11.86	+1000	in flower

WAHerb: 6 records (one specimen at WA Herb. from Gooseberry Hill appears not to be this taxon)

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

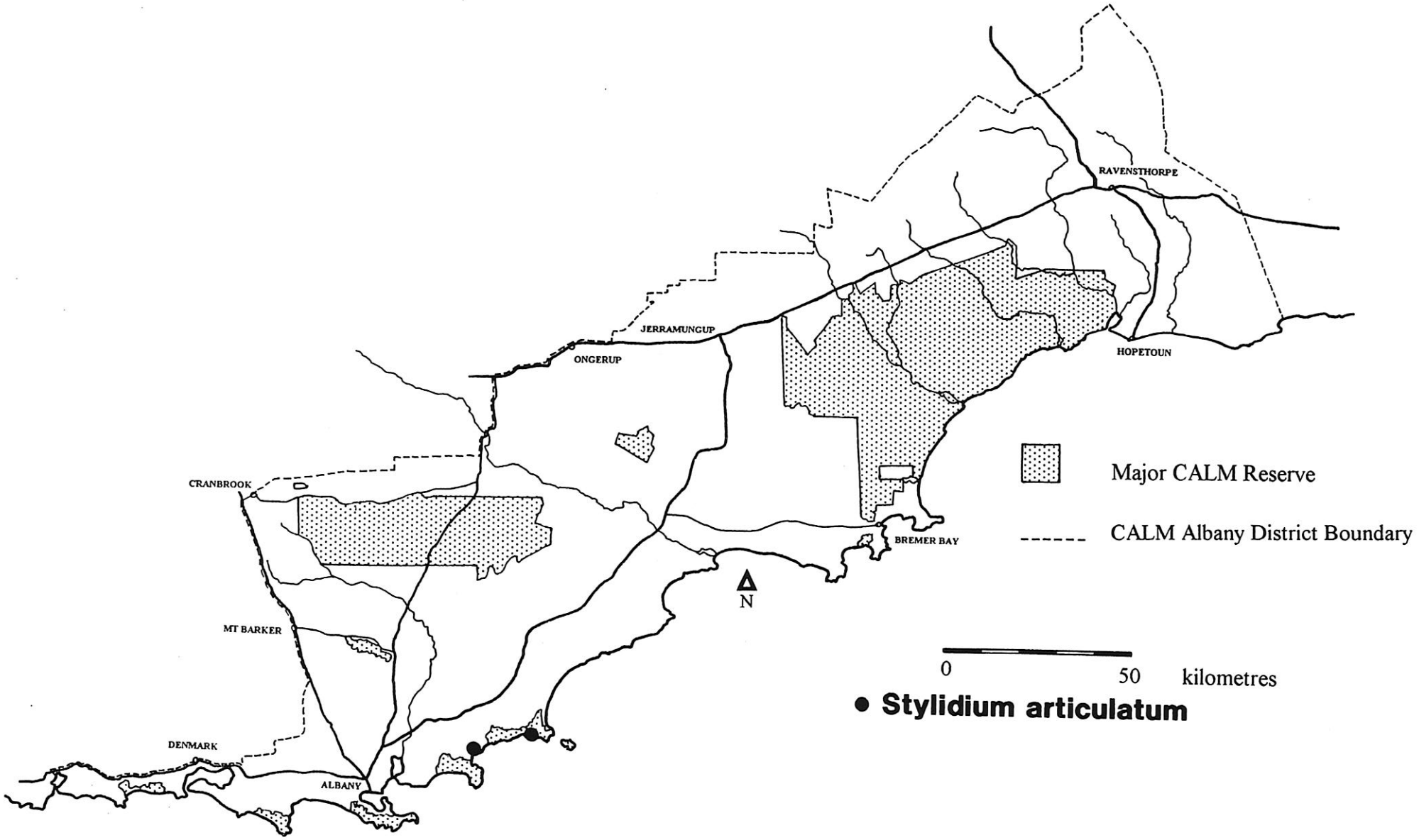
Monitor occasionally

Research Requirements

Survey opportunistically for new populations

References

Brown (1810).


RAVENSTHORPE
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BREMER BAY
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
● Stylidium articulatum

Stylidium keigheryi Lowrie & Carlquist STYLIDIACEAE

Keighery's Trigger Plant

Stylidium keigheryi is a perennial herb with glabrous stems and a very short stock. The sessile deep olive green leaves are verticillate, subcoriaceous, 5 mm long and 1 mm wide, lanceolate and mucronulate. The flowers are arranged in a lax, glabrous cyme, with one flower per slender, bibracteate 3 cm peduncle. The pedicels and calyx are sparsely glandular hairy. The ovary is ovate-turbinate and shorter than the lanceolate, obtuse 2 mm calyx lobes. The corolla is red-purple, lobes obovate-oblong, 3 mm long and 1.7-2.3 mm wide. There are six throat appendages which are capitate, filiform and shortly pubescent. The labellum is elongate and acuminate with very short lateral appendages.

Flowering Period: February-March

Distribution and Habitat

This species has only been collected from just below the summit of Bluff Knoll in the Stirling Range, where it grows in shallow acidic peaty sand over schist, in association with open heath. The only known population is now regenerating from seed, after wildfire on Bluff Knoll in 1991.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Bluff Knoll	Albany	Gno	NP	3.2.93	+1000	seedlings

WAHerb: 2 records

Response to Disturbance

Regenerates from seed after fire

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

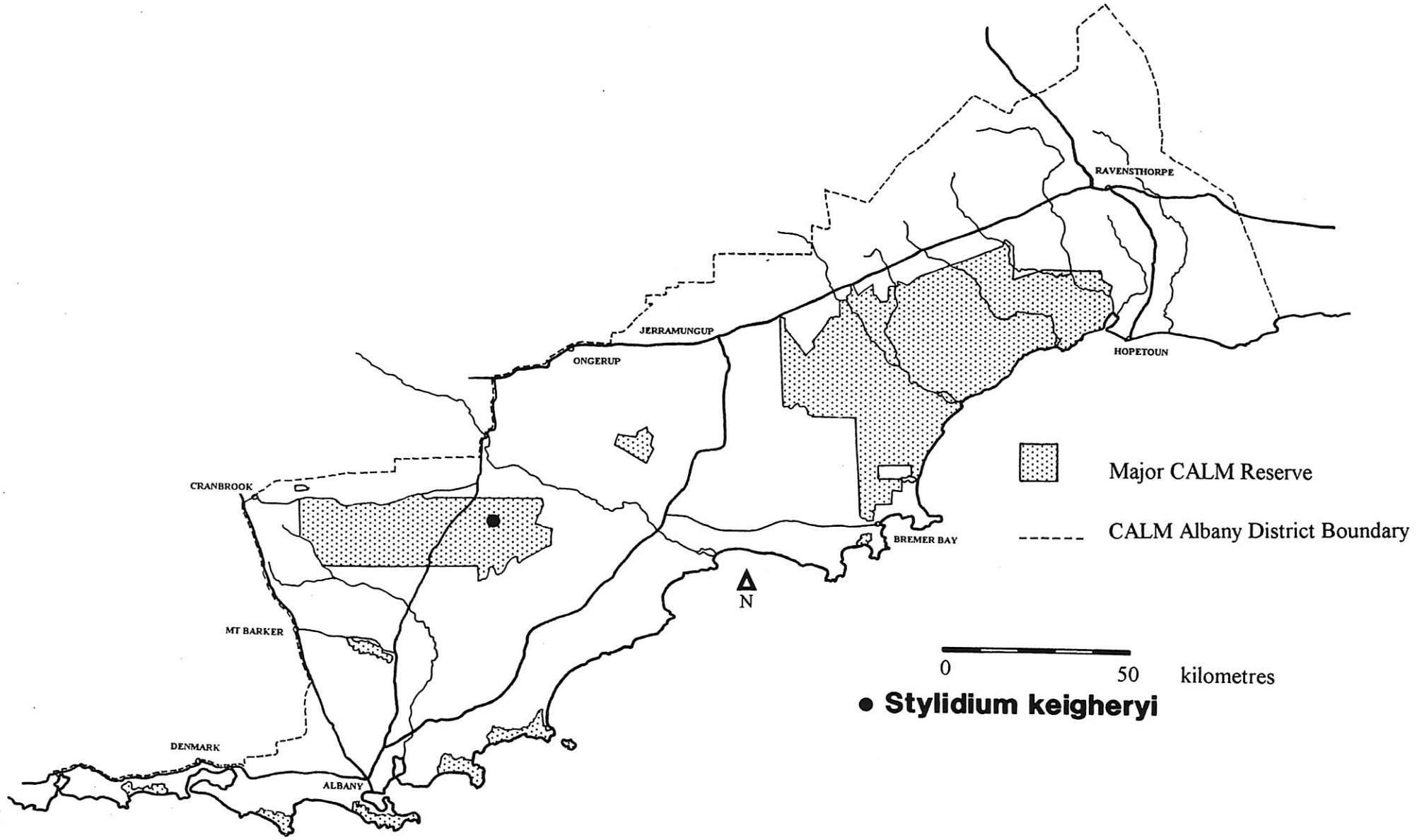
Monitor occasionally

Research Requirements

Survey for new populations

References

Lowrie and Carlquist (1991).


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Major CALM Reserve
CALM Albany District Boundary
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50
kilometres
● Stylidium keigheryi

Thomasia brachystachys Turcz. STERCULIACEAE

Thomasia brachystachys is a tall shrub with very densely stellate hairy branches, which appear rusty in colour. The midribs of the leaves are also rusty tomentose. The leaves are large (8 cm long by 7 cm wide), lobed and somewhat oak-leaf shaped. The upper surface is dark green, the lower pale and both surfaces inconspicuously covered with stellate hairs. The shortly pedicellate purple flowers are borne on simple, densely tomentose-hirsute racemes.

This species is similar to *T. solanacea*, but has larger leaves, a more tomentose calyx which is less deeply divided and has petals present.

Flowering Period: ?Spring

Distribution and Habitat

The type was collected by Drummond from the Stirling Range. It occurs in shallow soil over schist in gullies around the north western face of Bluff Knoll and the south east slope of Toolbrunup. The Bluff Knoll area was burnt by severe wildfire in early 1991 and the plants are now regenerating from seed.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Bluff Knoll	Albany	Gno	NP	3.2.93	+200	seedlings
2. Toolbrunup	Albany	Gno	NP	12.92	+200	healthy

WAHerb: 4 records (records from Mt Hopkins and Fly Brook do not match SRNP collections)

Response to Disturbance

Regenerates from seed after fire

Susceptibility to *Phytophthora* Dieback

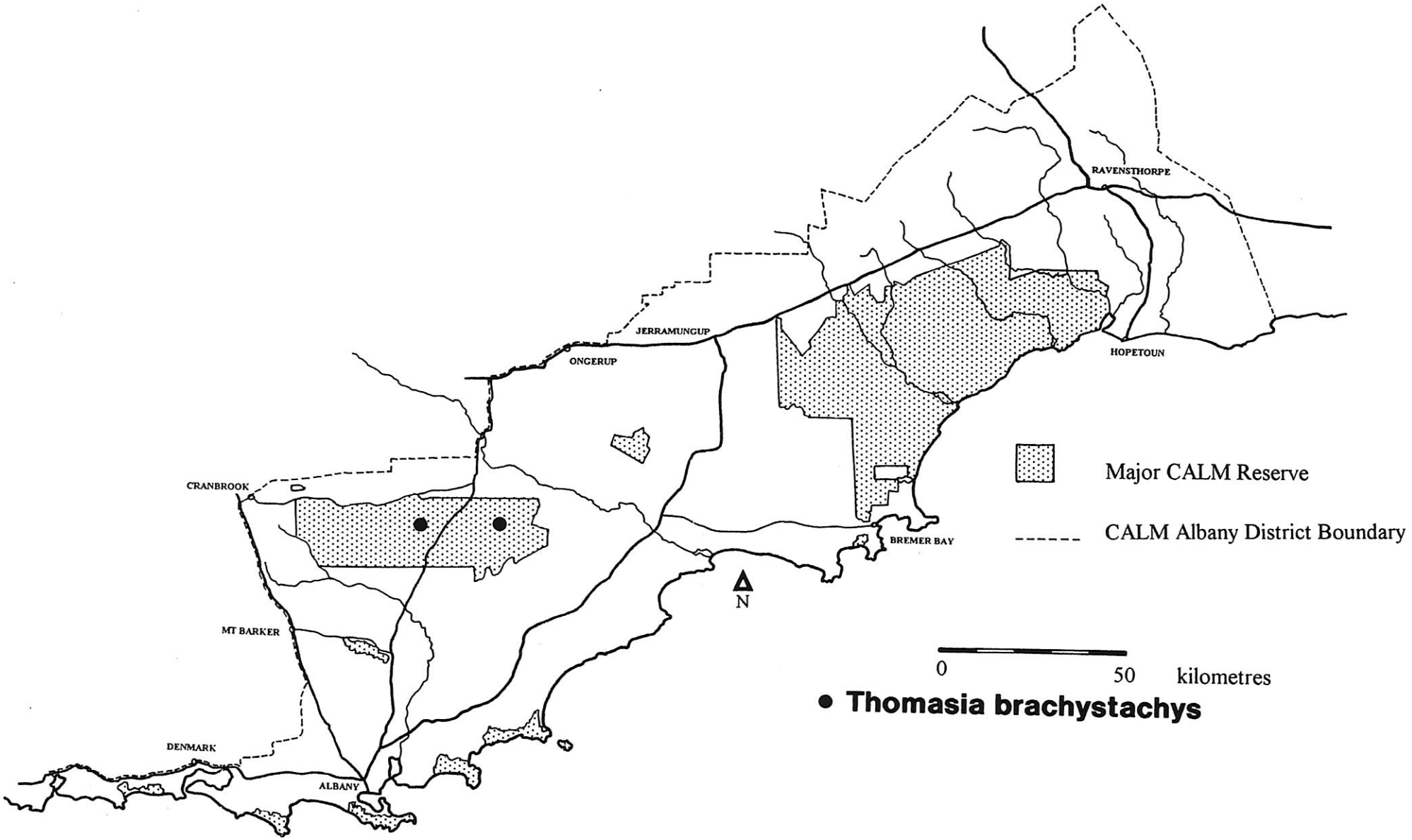
Presumed not susceptible

Management Requirements

Monitor occasionally

Research Requirements

Survey for new populations


RAVENSTHORPE
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Major CALM Reserve
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kilometres
• Thomasia brachystachys

Thysanotus brevifolius Brittan LILIACEAE

Thysanotus brevifolius is a small herb, distinguished by the leaves which are much shorter than the inflorescence. It has a small rootstock with fibrous roots. The 20-25 annual leaves are linear, flat and up to 8 cm long and surrounded by broad membranous bracts with acute apices. The inflorescence is a single umbel of 20-50 mauve flowers on a scape 18-24 cm tall. The perianth segments are 6-7 mm long; the petals elliptic (6-7 mm wide) and fringed with fimbriae to 4 mm and the sepals narrow lanceolate to 2 mm. The three outer anthers are 2.5 mm long, the inner 4 mm.

Flowering Period: November

Distribution and Habitat

This species occurs south and north west of the Stirling range, where it grows in sandy loam supporting open mallee heath. WAHerb records that it has not been collected since 1959. Brittan, in Flora of Australia (Vol. 45, 1987) cited a 1889 collection (Mel.) from the source of the Blackwood, near Pingelly.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent survey						

WAHerb: 5 records (4 Brittan in 1958, 1 George 1959)

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

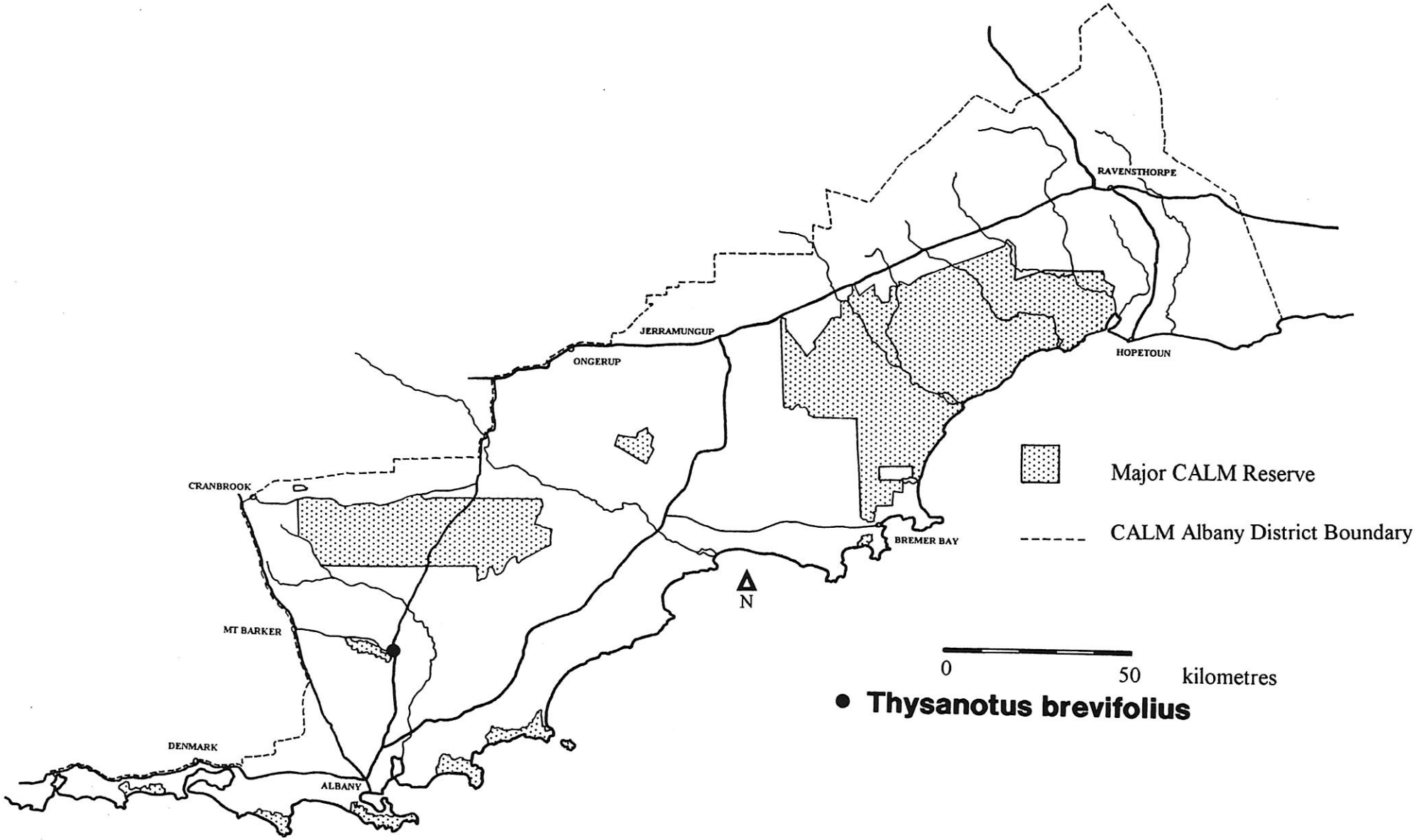
Management Requirements

Research Requirements

- relocate and survey WAHerb populations
- survey opportunistically for new populations

References

Brittan (1960).


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CALM Albany District Boundary
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kilometres
Thysanotus brevifolius

Thysanotus gageoides Diels

LILIACEAE

Thysanotus gageoides is a perennial herb with tuberous roots and a 1-1.5 cm rootstock. The tubers are cylindrical, 2-3 cm long and 3-4 cm from the rootstock. The leaves, only one or two, are linear terete, 10-20 cm long, slightly fleshy and withering from the apex about time of flowering. The inflorescence is a single terminal umbel (occasionally a second umbel below) of 5-20 mauve flowers, on a 10-17 cm scape. The perianth segments are 9-10 mm long; the sepals are ovate lanceolate 2.5 mm wide and the petals circular 5-6 mm in diameter with 3 mm fimbriae. The three outer anthers are 3 mm long, and the inner three anthers 4 mm long.

Flowering Period: October-November

Distribution and Habitat

WAHerb records indicate this species is relatively widespread from Cranbrook, through the Stirling Range to Cape Riche and Corackerup. It grows in gravelly sand supporting open mallee heath.

Conservation Status

Current: Priority 2 Recommended: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Corackerup	Albany	Jer	NR	4.11.92	64	in flower
2. Greaves Hill	Albany	Gno	Shire res.	1.11.86	rare	in flower

WAHerb: 17 records (12 Brittan records).

Response to Disturbance

At Corackerup it occurs on the graded road verge, and may be favoured by the open ground and opportunity afforded by this disturbance.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

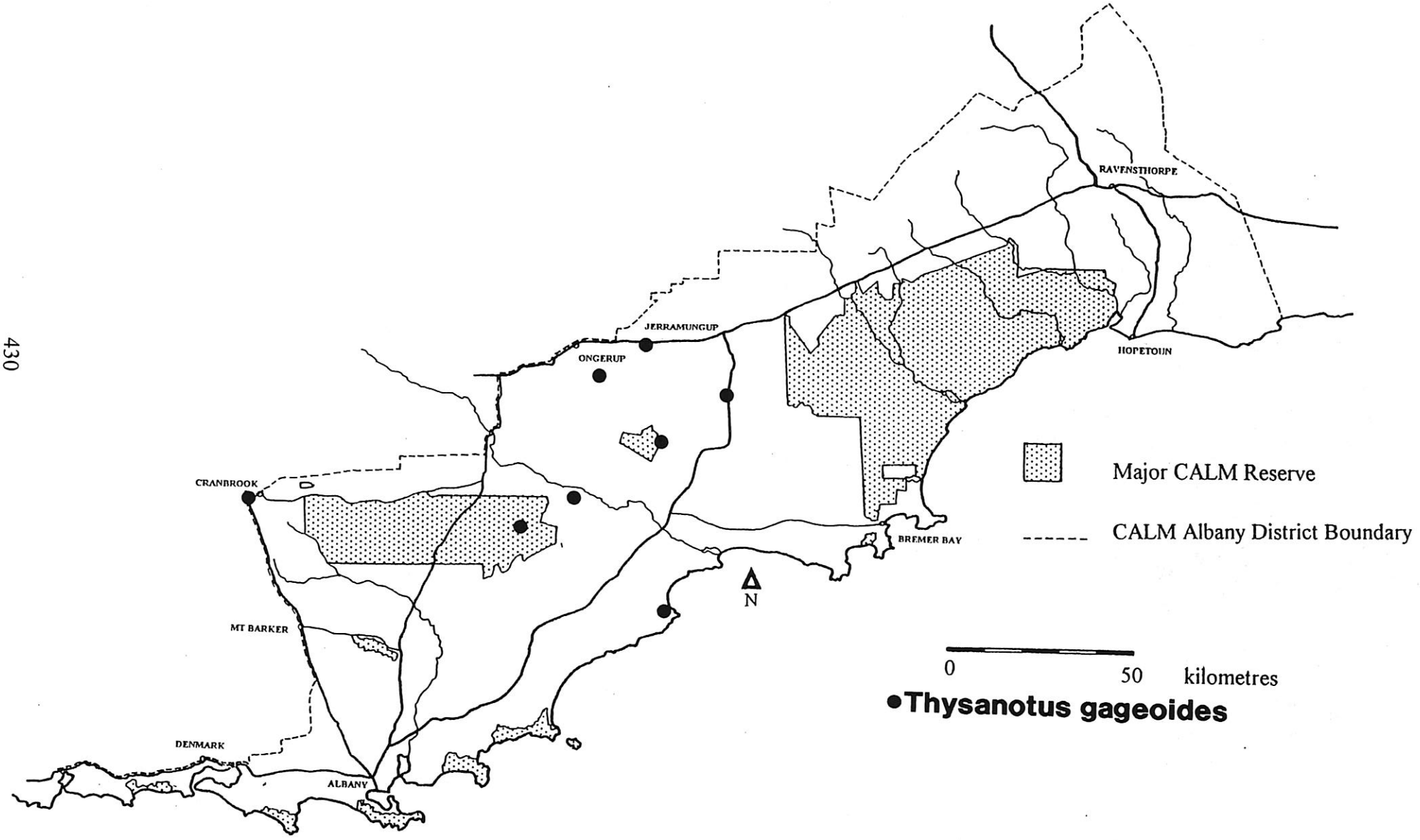
Monitor occasionally

Research Requirements

- survey opportunistically for new populations
- relocate and survey WAHerb locations

References

Diels (1904).


RAVENSTHORPE
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kilometres
●Thysanotus gageoides

Thysanotus parviflorus Brittan LILIACEAE

Thysanotus parviflorus is a perennial herb with fleshy roots and a small rootstock enclosed by bracts and old leaf bases. The one or two annual leaves are narrow linear terete, 10-25 cm long. The inflorescence is a simple to four-branched scape, 14-25 cm with terminal umbels (4-6-flowered). The mauve perianth segments are 7 mm long; the sepals linear, 1.5 mm wide and the petals broadly elliptic to circular, 5-6 mm wide with 2 mm fimbriae.

Flowering Period: October-November

Distribution and Habitat

This species has been sporadically collected from over a very wide range, including the Stirling Range, West Mount Barren and east to Cape Le Grande. It occurs in sandplain mallee heath.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent survey.						

WAHerb: 7 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

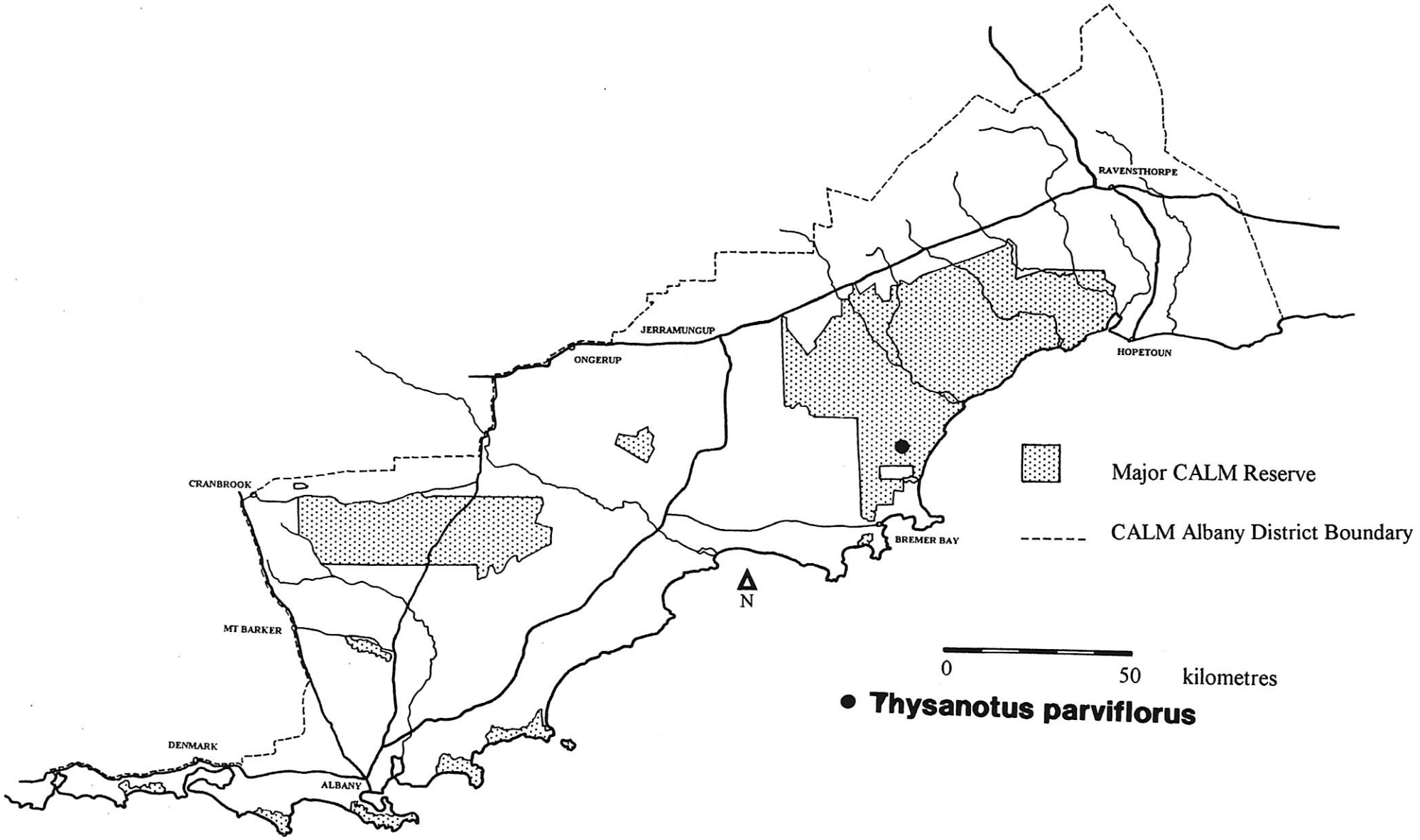
Monitor occasionally

Research Requirements

- relocate and survey WAHerb locations
- survey for new populations

References

Brittan (1972).


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BREMER BAY
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CALM Albany District Boundary
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kilometres
Thysanotus parviflorus

Trachymene croniniana (F.Muell.) T.Durand & B.D.Jacks. APIACEAE

Trachymene croniniana is a small, erect annual herb to 20 cm. The small white flowers are arranged in simple umbels of 3-12 flowers, producing wrinkled, glabrous fruits developed on only one side. The linear leaves are mostly radical, covered with scattered spreading hairs, and frequently simply lobed.

Flowering Period: July, November

Distribution and Habitat

WAHerb records only two collections of this species. One from Coujinup Hill and the other from just north of the Stirling Range. The Coujinup Hill specimen is very tall (40 cm). Both were from recently burnt Eucalypt woodland in alluvial sands near a watercourse or waterbody. Keighery (pers. comm.) reports seeing vast numbers in burnt sandy country near Cape Arid.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Salt River Rd.	Albany	Gno	NP	14.11.82	rare	in flower

WAHerb: 2 records

Response to Disturbance

Germination of soil borne seed is stimulated by fire.

Susceptibility to *Phytophthora* Dieback

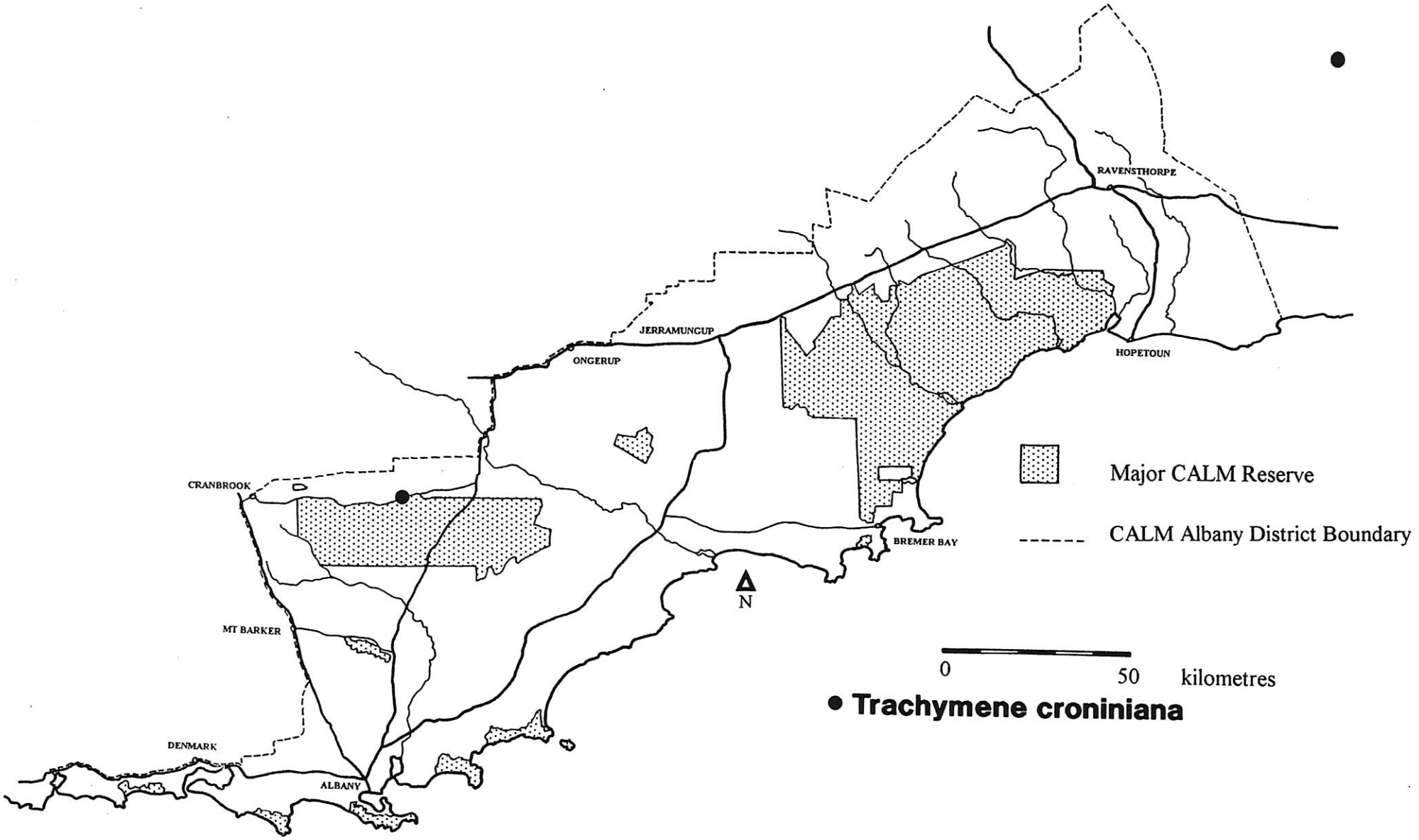
Presumed not susceptible

Management Requirements

Relocate and resurvey Salt River Road population

Research Requirements

Survey for new populations especially in areas of recently burnt *E. occidentalis* woodland


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CALM Albany District Boundary
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kilometres
Trachymene croniniana

Trochocarpa parviflora (Stschegl.) Benth. EPACRIDACEAE

Trochocarpa parviflora is a robust, rounded to spreading woody shrub to 0.5 m. It is very similar in general appearance to plants of the genus *Leucopogon*, but is readily distinguished from that genus by its characteristic fruits. The fruits are a slighlty flattened, globular drupe which is divided into ten cells and appears somewhat like a very small pumpkin. The flowers are small (5-6 mm long), almost sessile, and form clusters of several in the axils of the older leaves. The corolla throat is densely pubescent and the corolla lobes markedly reflexed with spreading hairs radiating from their tips (similar to *Acrotriche*). The leaves are oblong-elliptical to 8 mm, conspicuously striated.

This species is the only member of this genus in Western Australia; Bentham (1869) listed five other species in eastern Australia.

Flowering Period: August-October

Distribution and Habitat

This species appears to be site specific. It occurs on red loamy soils of spongolitic breakaways as an understorey to *Eucalyptus redacta*. Other Eucalypts and scattered shrubs may also be present. It has been collected from this habitat at Kamballup, Cape Riche, Millers Point and near Chillinup Pool and could be expected on other similar breakaways within this range or perhaps further.

Conservation Status

Current: Priority 2 Recommended: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Kamballup	Albany	PL	Shire res.	21.10.92	+30	in flower
2. Cape Riche	Albany	Alb	Shire res.	3.11.92	+50	in fruit
3. MillersPt	Albany	Jer	Shire res.	17.11.92	+50	in fruit
4. Chillinup	Albany	Alb	private	21.19.93	+50	in fruit

WAHerb: 7 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

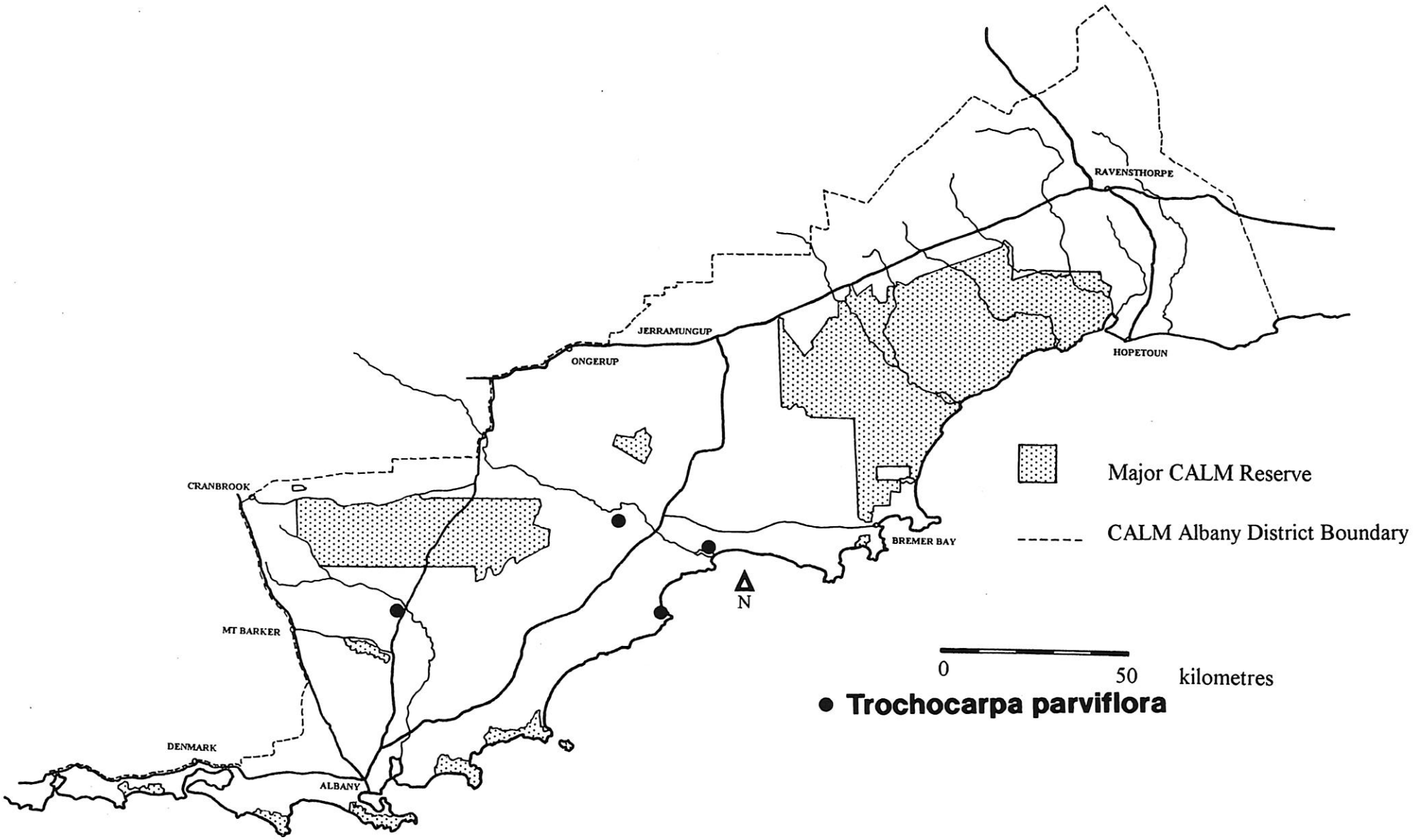
Monitor occasionally

Research Requirements

Survey opportunistically for new populations on spongolitic breakaways

References

Bentham (1869).


RAVENSTHORPE
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CRANBROOK
BREMER BAY
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
Trochocarpa parviflora

Velleia exigua (F.Muell.) Carolin GOODENIACEAE

Velleia exigua is a stoloniferous perennial herb. The 10 mm leaves are clustered in irregular whorls and are terete-spathulate (3 mm wide) with yellowish aristate tips. The yellow flowers are solitary or in few flowered axillary cymes. The corolla is 2 mm with short 0.5 mm wings. The adaxial sepal is deltoid, 1 mm long. The bracteoles are linear, 1-2 mm long.

This species is an unusual *Velleia* in its habit; its flowers being solitary and sessile, the sepals adnate to the ovary in the lower half; the capsule irregularly dehiscent and the seeds being almost wingless. It has previously been included in *Goodenia*, and then *Selliera.*

Flowering Period: September-October

Distribution and Habitat

The type was collected from "Moir Inlet" by Maxwell in 1863; this location is presumed to be the inlet at Cape Riche adjacent to the farming property established by the Moir family last century. This area was surveyed in spring 1993 without success. It was rediscovered in 1982 and 1987 growing in winter wet clay flats around two salt lakes in the eastern section of SRNP (Keighry, pers. comm.)

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. unnamed lake	Albany	Pl	NP	22.10.82	few-WH	good
2. Quarderwardup L.	Albany	Pl	NP	14.9.87	few-WH	good
3. Moir Inlet	Albany	Alb	Shire res.	20.10.93	nil	-

WAHerb: 2 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

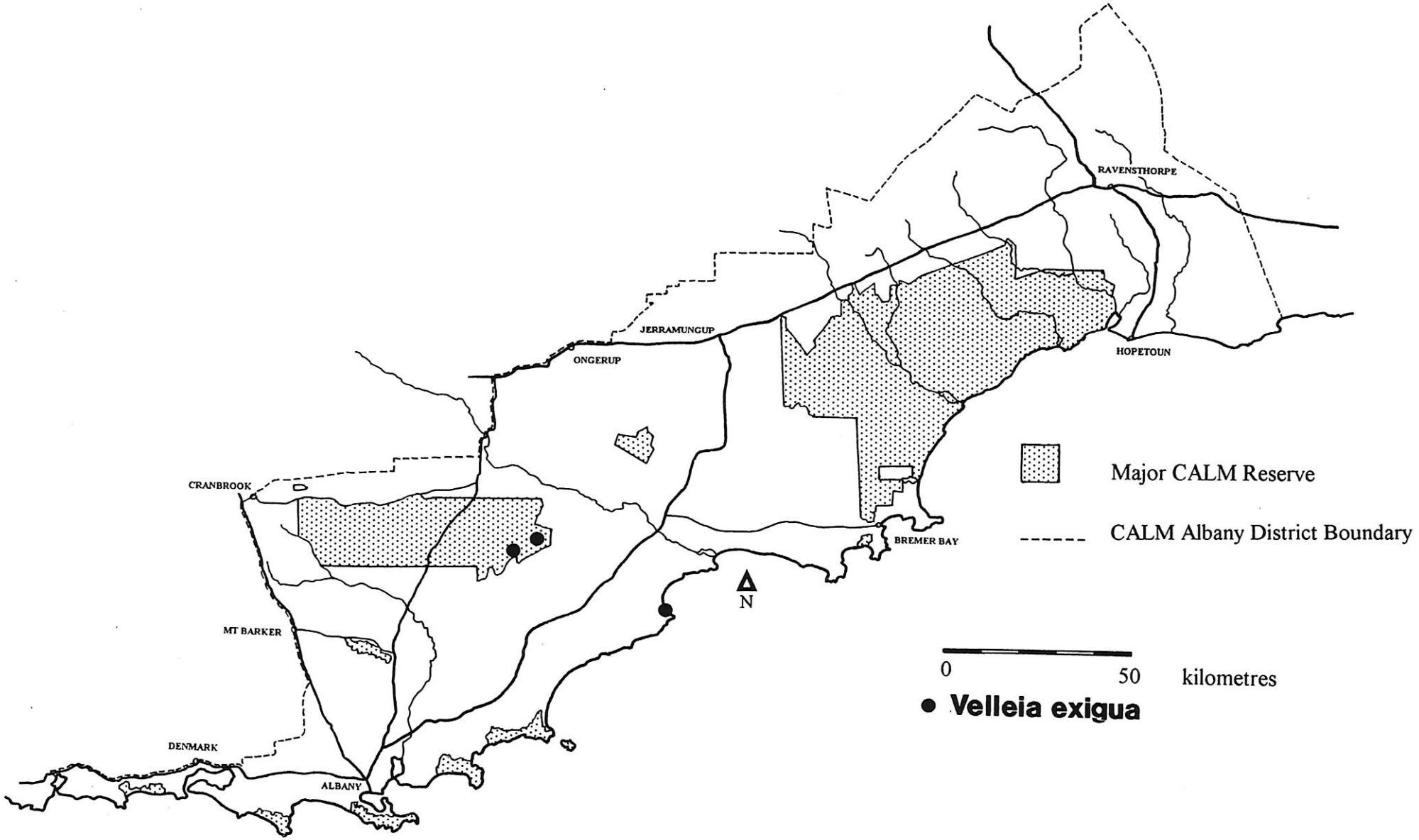
- monitor regularly
- collect seed and cutting material (for Kings Park)

Research Requirements

Survey for new populations around other areas of salty habitat

References

Carolin (1992).


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Major CALM Reserve
CALM Albany District Boundary
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kilometres
Velleia exigua

Verticordia brevifolia subsp. *stirlingensis* A.S.George MYRTACEAE

Verticordia brevifolia subsp. *stirlingensis* is a woody shrub very similar to *V. chrysantha*, from which it differs in having shorter, thicker leaves (3-7 mm), anther locules as long as the appendages, linear-lanceolate entire or slighlty dentate staminodes, and in having a lignotuber. The flowers are bright yellow. Subspecies *stirlingensis* differs from subsp. *brevifolia* in having larger sepals and petals which are 4-5 mm long.

Flowering Period: October

Distribution and Habitat

This subspecies is confined to the Stirling Range, where it occurs in sandy loam or gravel in open woodland or mallee heath. Subspecies *brevifolia* occurs in the Nyabing area.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent survey.						

WAHerb: 3 records

Response to Disturbance

May resprout from lignotuber after fire or physical damage

Susceptibility to *Phytophthora* Dieback

Presumed susceptible

Management Requirements

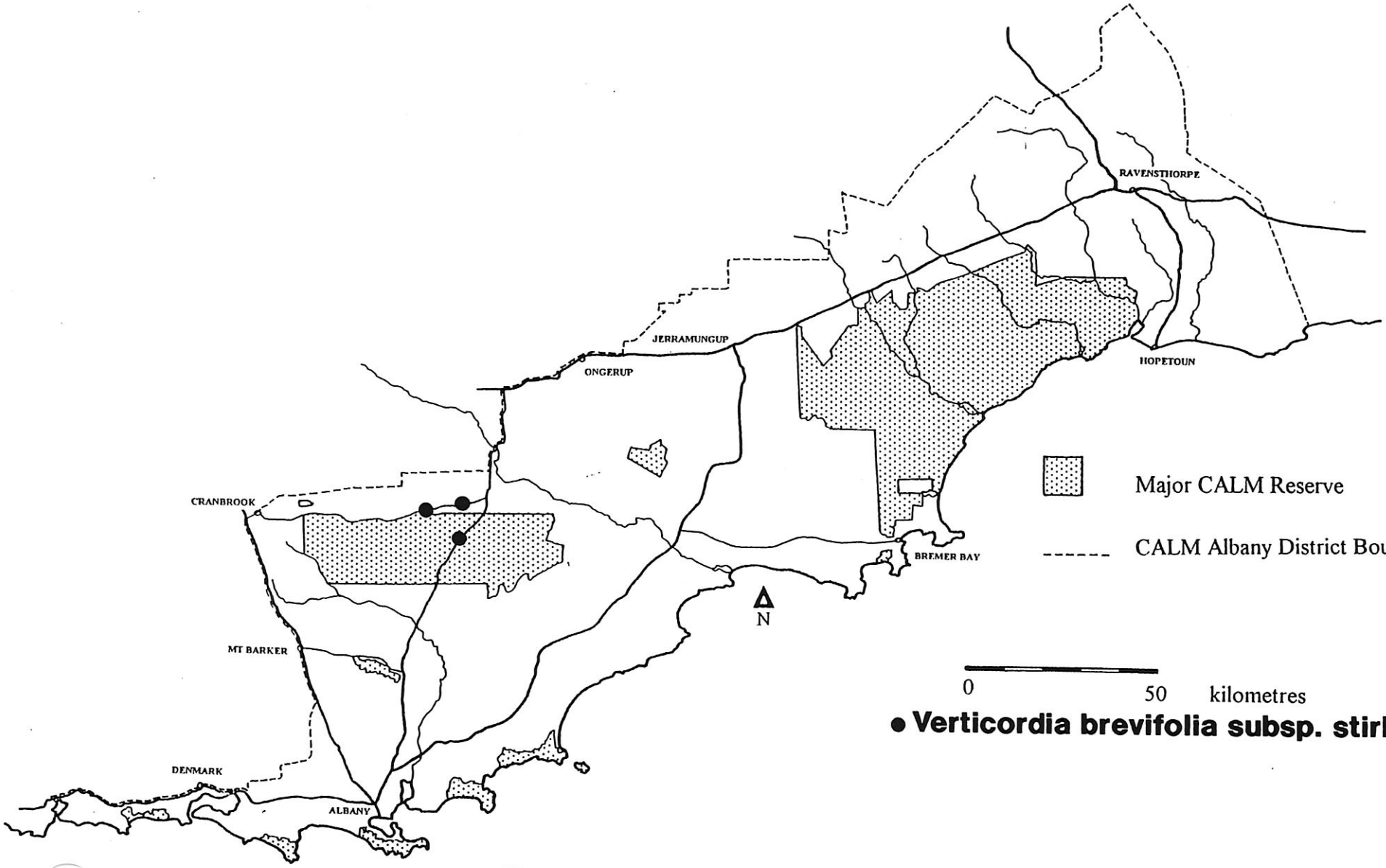
Monitor occasionally once relocated

Research Requirements

- relocate and survey the three ASG 1984 SRNP locations
- survey for new locations

References

George (1991).


RAVENSTHORPE
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
● Verticordia brevifolia subsp. stirlingensis

Verticordia carinata Turcz. MYRTACEAE

Until recently. *Verticordia carinata* was thought to be possibly extinct, only being known from the type collection, made by Drummond in the 1840's. However, it was rediscovered by Allan Rose (SRNP Ranger) in March 1990.

It is an erect, spindly shrub to 30 cm. The 2-4 mm elliptic concave leaves are well spaced on the upper braches, in opposite pairs, thick and erect to slightly recurved. The magenta flowers are arranged in a double sided spike, with one flower per leaf axil (i.e. two per node) toward the branch tips. Peculiar to this species in the genus is that the flower is somewhat zygomorphic and held horizontally. The hypanthium and the sepals are regular, but the petals, anthers and style are irregular in arrangement. The lower petals are erect whilst the upper three are widely spreading, giving an appearance similar to a pea flower. The style is curved downward between the lower petals, with its bearded apex exserted and upturned. This is clearly an adaptation to a particular pollinator, which is as yet unknown.

Flowering Period: March-May

Distribution and Habitat

This species is only known from one population on the North Isongerup Track in SRNP. It grows in sandy soil supporting open low woodland over shrubs and heath. Allan Rose has surveyed 5 km each way from the original population, looking for more *V. carinata* but found none. *Phytophthora* dieback is present in the area.

The 1991 wildfire killed all but about ten plants (located on the track) of the original population. The prefire population was about 2,000 plants.

Conservation Status

Current: Priority 2

Recommended: Priority 2 (with highest priority for further survey and consideration for gazettal as DRF)

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Nth Isongerup	Albany	Gno	NP	1993	+10	healthy

WAHerb: 7 records (all one location except Drummond collection with no location)

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible

Management Requirements

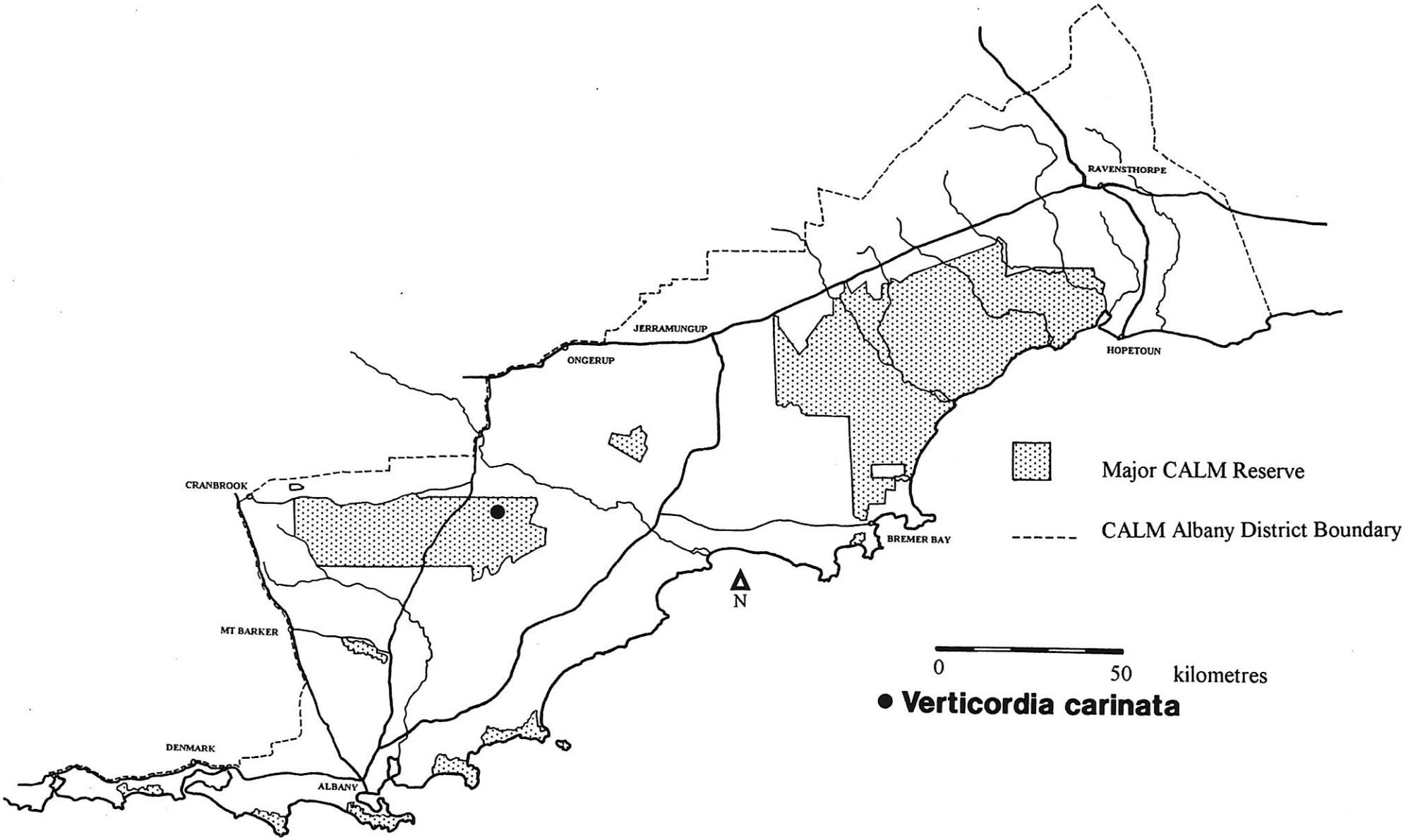
Monitor regularly; determine postfire regeneration

Research Requirements

- Survey vigorously for new populations within SRNP
- collect seed

References

Turczaninow (1849), George (1991).


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Major CALM Reserve
CALM Albany District Boundary
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kilometres
● Verticordia carinata

Verticordia pityrhops A.S.George MYRTACEAE

Verticordia pityrhops is an erect, densley branched, thick stemmed shrub, to 1 m tall with a pine-like habit. The dark green leaves are densely crowded, very narrow linear 7-14 mm long. The flowers are small with 2 mm hypanthium and 2 mm sepals and petals. Flower colour varies from white to pink or purplish brown. When few flowers are present they are almost hidden by the foliage but can be very numerous to cover the entire plant. It is closely related to *V. harveyi*.

Flowering Period: March-June

Distribution and Habitat

This species has only been collected from one location below East Mount Barren; on the wave cut platform growing in shallow soil over quartzite in scrub. This population was burnt in November 1989 and had not been relocated (despite intensive searching) until November 1993. Plants are now 20-30 cm tall, but have not flowered since the fire and this species is known to take up to seven years in cultivation before blooming.

V. tumida subsp. *therogona* which also grows below East Mount Barren has only grown to about 50mm, from seed, in three years since the fire.

Conservation Status

Current: Priority 2

Recommended: Priority 2 (with highest priority for further survey and consideration for gazettal as DRF)

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. East Mt Barren	Albany	Rav	NP	17.11.93	1-200	good

WAHerb: 11 records (one location)

Response to Disturbance

Killed by fire and very slow to regenerate from seed

Susceptibility to *Phytophthora* Dieback

Presumed susceptible

Management Requirements

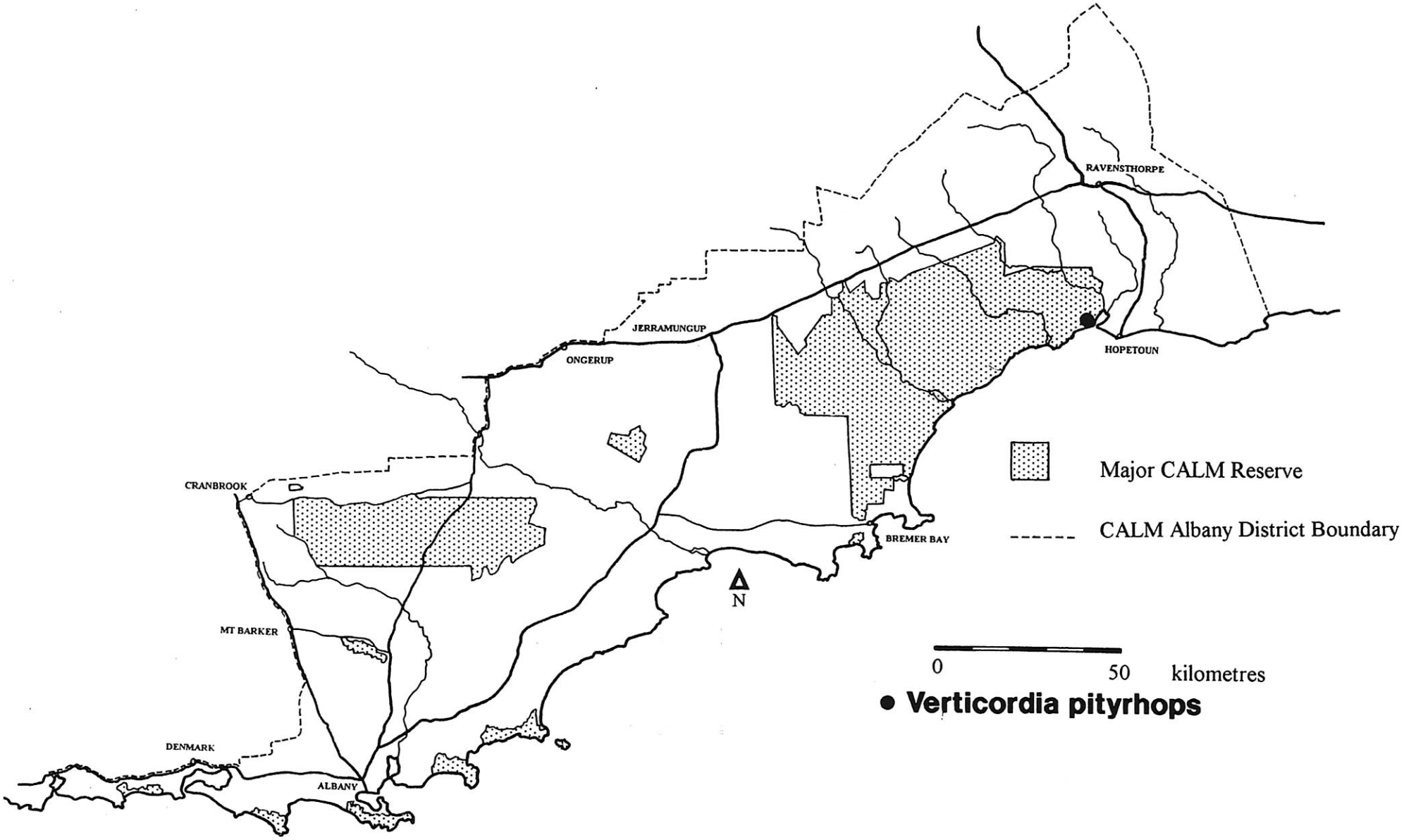
- monitor EMB location closely and note time until flowering
- collect seed
- gazette as DRF

Research Requirements

Once original population has flowered, survey for new populations in similar habitat in FRNP

References

George (1991).


RAVENSTHORPE
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kilometres
• Verticordia pityrhops

Xanthosia singuliflora F.Muell. APIACEAE

Xanthosia singuliflora is an intricate, slender, diffuse, multistemmed perennial herb, glabrous or slightly tomentose. It may grow to 10 cm high and have a woody stem. The 10-20 mm leaves are wedge shaped, acute, entire or three (occasionally five) lobed, tapered to a long petiole. The normally umbellate inflorescence of *Xanthosia* is reduced to a single axillary flower, which is sessile or shortly pedunculate. The small greenish-yellow flowers are surrounded by 3 or 4 narrow bracts. The fruits develop prominent secondary ribs.

Flowering Period: September-October

Distribution and Habitat

The type was collected by Maxwell in the 1850's from "near Cape Paisley", which is east of Esperance. WAHerb records scattered collections from SRNP, King River, Hassell Highway, and near Mt Drummond (FRNP). It occurs in a variety of habitats from Jarrah-Marri woodland on deep white sand, mallee on stony sandy clay to *Banksia baxteri* scrub on sand over clay. Given its range and variety of habitat, it is considered likely that it may be more common than current collections indicate.

Conservation Status

Current: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Hassell Hwy	Albany	Jer	verge	30.10.72	common-WH	in flower
2. Yungermere	Albany	Gno	NP	18.9.80	common-WH	in flower
3. Mt Drummond	Albany	Rav	NP	23.11.85	rare-WH	in flower

WAHerb: 5 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

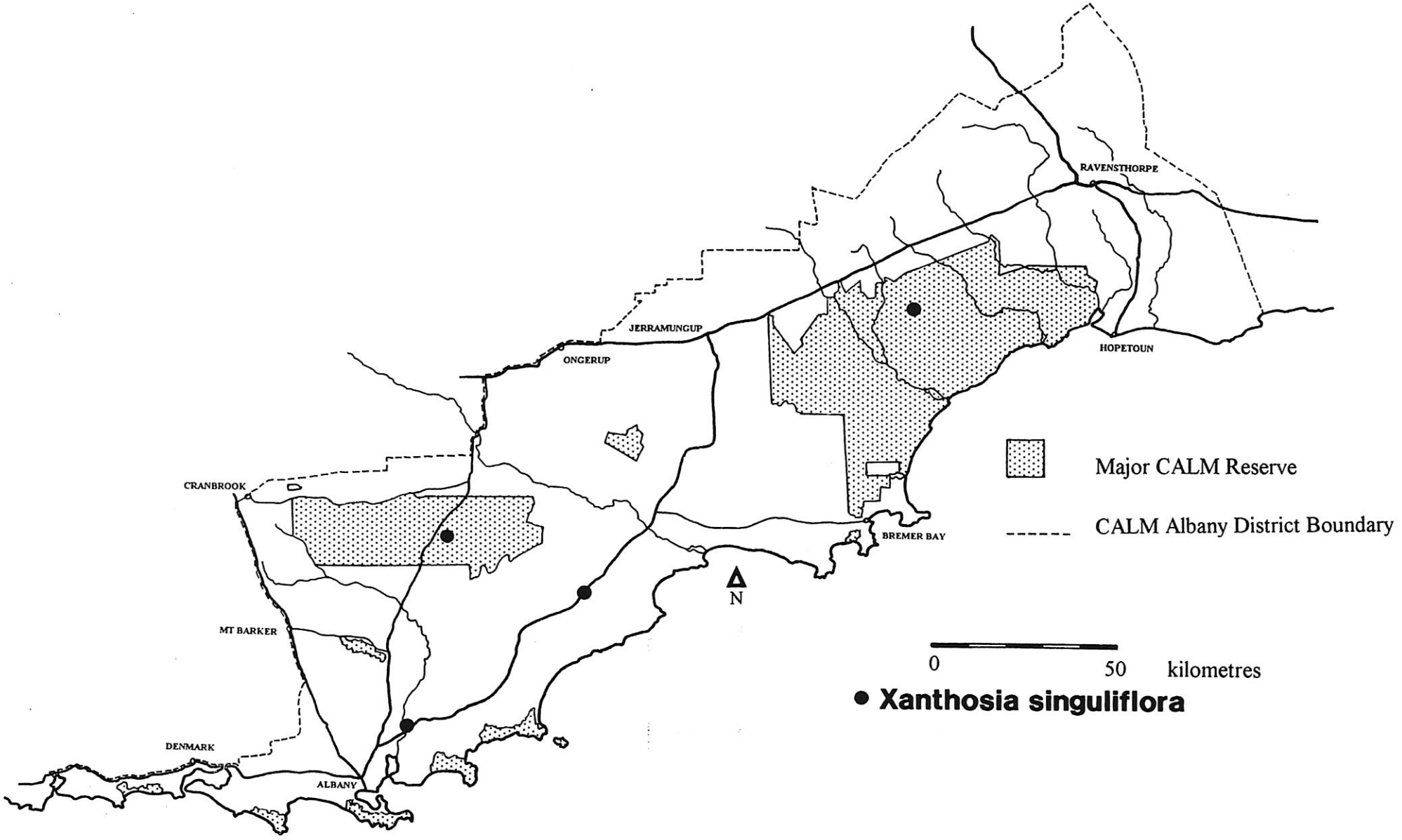
Monitor occasionally once populations have been located

Research Requirements

Survey widely to determine if more common than currently known

References

Mueller (1864).


RAVENSTHORPE
HOPETOUN
JERRAMUNGUP
ONGERUP
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Xanthosia singuliflora

C. Priority Three Taxa

Acacia brachyphylla var. *recurvata* Cowan & Maslin. MIMOSACEAE

This wattle is a low spreading to semi-prostrate shrub, 0.2-0.3 m tall, with pilose to villous-tomentose terete branchlets. The dull green phyllodes are terete to compressed, 8-10 mm long, 6 nerved and with a recurved mucrone and are ascending to erect. The flower heads are globular (3-4 mm dia.), golden on 4-10 mm peduncles, one or two per axil. Each head has 8-12 flowers, notable for their partly united sepals. The legume is linear, undulate, raised over but not constricted between the seeds, glabrous and glaucous. The dull grey bark on the old wood is rough with growth fissures and minor flaking.

Flowering Period: October

Distribution and Habitat

This variety has been collected from around Nyabing, Pingrup, Kukerin and Jerramungup. It occurs in mallee shrubland in loam, gravelly loam or sand or in rocky situations (Calyerup). The range over which it has been collected indicates that it may be relatively common. However many collections may have been from road verges and there are few indications of abundance. Further survey may reveal it not to be rare or under threat.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Calyerup Rocks	Albany	Jer	NP	27.6.74	frequent-WH	-

WAHerb: 10 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

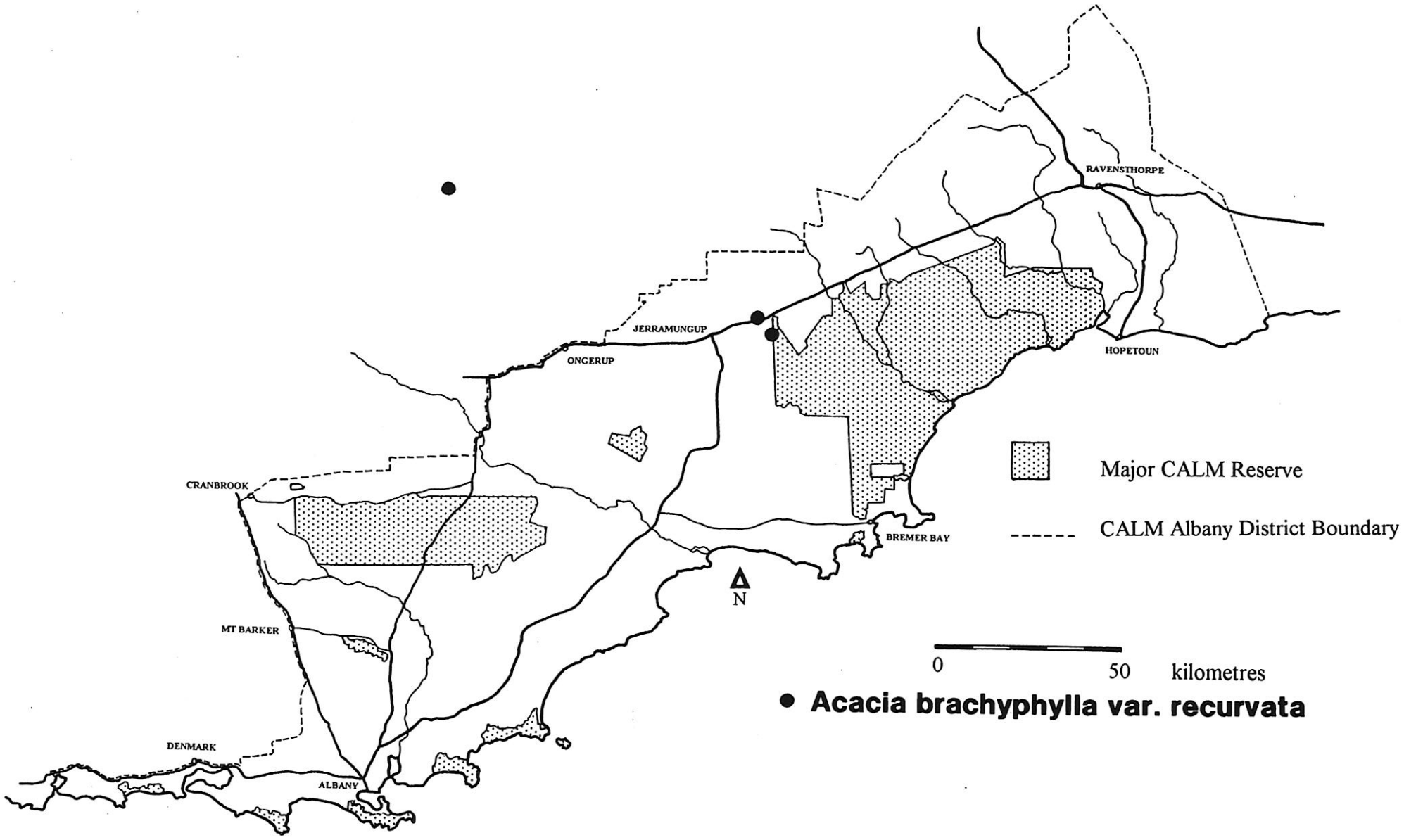
Management Requirements

Research Requirements

Survey widely to determine if this species is adequately conserved on conservation land

References

Cowan and Maslin (1993).


RAVENSTHORPE
JERRAMUNGUP
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CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Acacia brachyphylla var. recurvata

Acacia declinata Cowan & Maslin MIMOSACEAE

Acacia declinata is a prostrate shrub 25-40 cm tall. The branchlets are terete, and puberulous with retrorse hairs, becoming glabrous with age. The patent, spreading dark green phyllodes are subterete tending to compressed with a brown pungent point. The phyllodes are 7-22 mm long and 0.8-1.2 mm in diameter and are sessile or subsessile, straight or shallowly recurved with three raised nerves on each face. Semi persistent 1 mm stipules are very narrow triangular. The globular, golden flower heads are 9-20 flowered, 4-6 mm in diameter and on 4-8.5 mm peduncles, one or two per axil. The pod is linear (3 cm long x 2.5 mm wide), undulate and strongly raised over the seeds.

Flowering Period: September-October

Distribution and Habitat

This species is restricted in distribution from the Stirling Range, through Borden and Manypeaks to Boxwood Hills. It occurs in loamy sand, loam and clay with tall shrubland, woodland or mallee. Its known range over 50 km is mostly cleared and includes few areas of conservation land.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Nth Arrows	Albany	Gno	NP	15.9.86	common	in flower
2. Crkrup/Bxwd	Albany	Jer	NR	12.82	common	in flower

WAHerb: 13 records (several collections from the same locations and two cultivated)

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

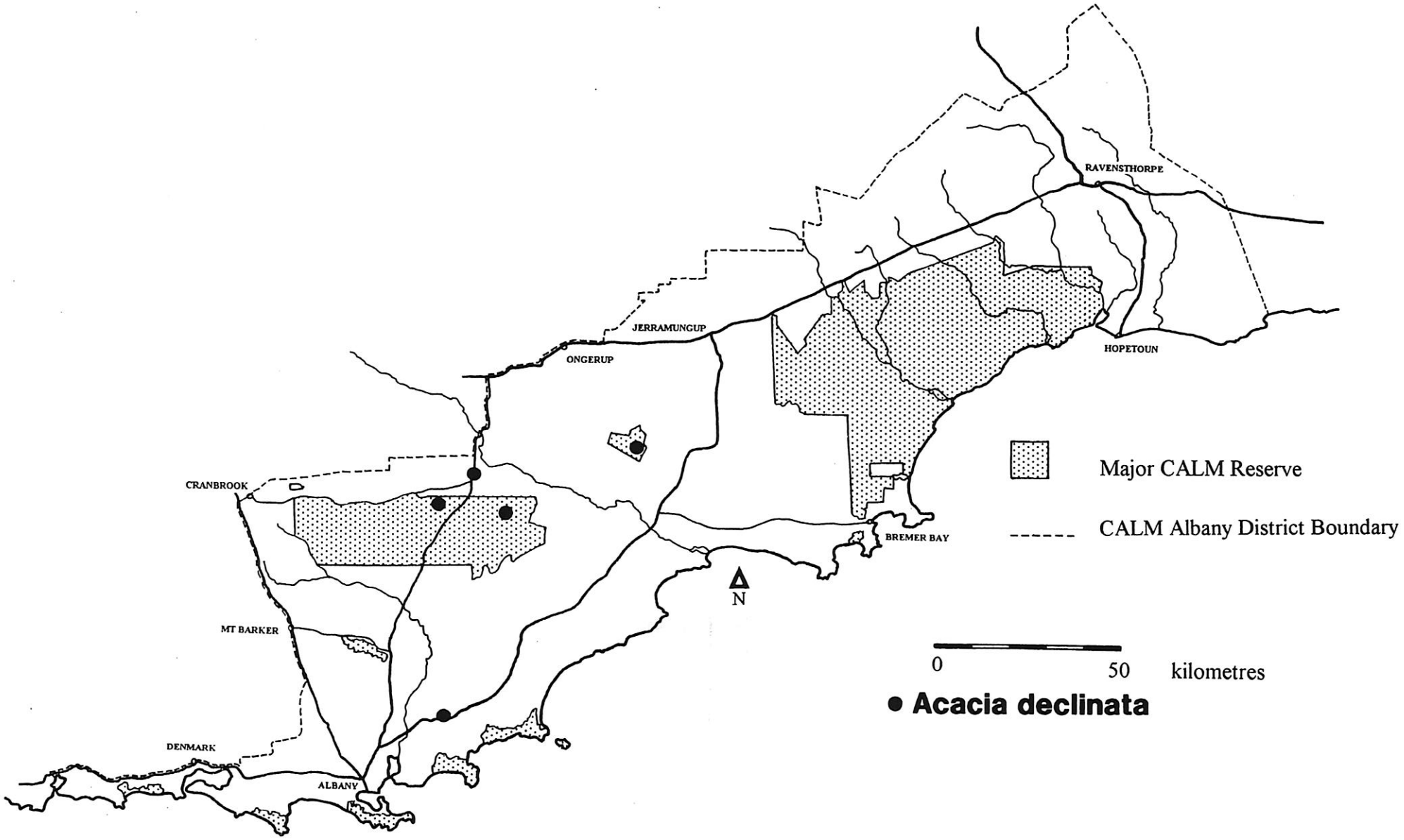
Monitor occasionally

Research Requirements

Requires further survey

References

Cowan and Maslin (1990b).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
● Acacia declinata

Acacia durabilis Maslin ms

MIMOSACEAE

Acacia durabilis ms is an attractive, open, spreading glabrous shrub to 2 m tall. The branchlets are pruinose and prominently striate ribbed. The 1.5-4 cm undulate phyllodes are elliptic, dull green with a prominent, short hooked mucrone to 1 mm. There is one major and one minor yellowish nerve and the margin is thickened. The pair of stipules at the base of each phyllode are persistent and thorny to 10 mm long. The pale yellow-cream flower heads are globular, loosely 6-9 flowered and on 15-25 mm red peduncles, one per axil. The legumes are narrowly oblong, 6 cm long by 6-8 mm wide, twisted with thickened margins.

Flowering Period: September-December

Distribution and Habitat

This species is restricted to the Ravensthorpe Range where it has been collected from 7 km north of Ravensthorpe, Mt Desmond area down to Kundip via the Elverdton and Mt Iron mine sites. It grows on the ridges and hill slopes of the Range, in gravelly lateritic, red sandy or rocky clays, supporting tall, thick mallee scrub. A collection from Marra Bridge (Pallinup River) has been labelled by Maslin as an anomalous location requiring confirmation.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Nth Ravensthorpe	Albany	Rav	VCL	26.10.87	scattered	in flower
2. Mt Desmond	Albany	Rav	VCL	15.12.92	+20	in flower
3. Mt Iron Track	Albany	Rav	VCL	15.12.92	+20	

WAHerb: 17 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

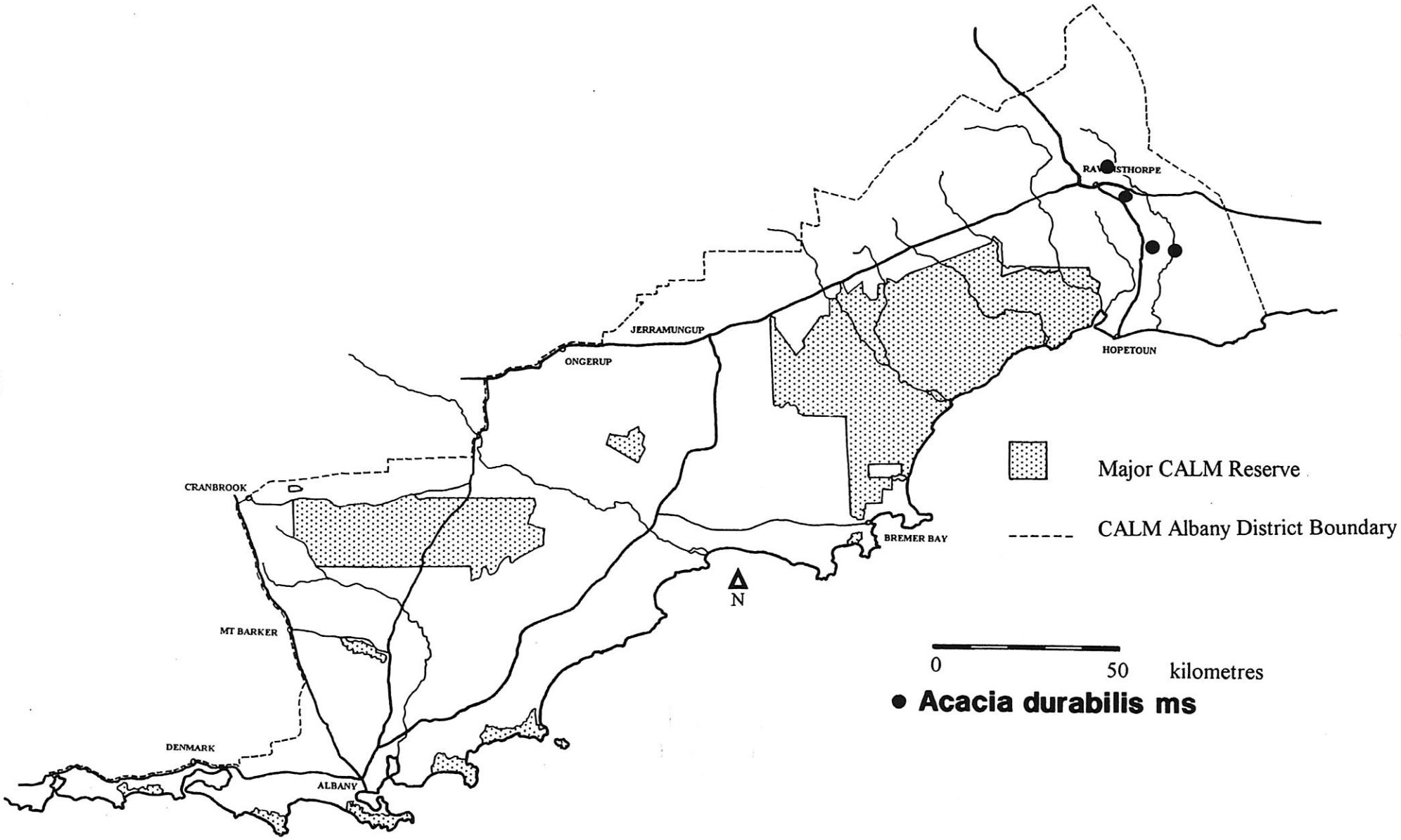
Management Requirements

Monitor occasionally

Research Requirements

References

B.R. Maslin (pers. comm.).


JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
N
Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
● Acacia durabilis ms

Acacia heterochroa Maslin subsp. *heterochroa* ms MIMOSACEAE

This wattle is a glabrous shrub to 1.5 m tall. The new shoots, buds and peduncles are red. The branchlets are terete, slightly pruinose and winged or ribbed below the phyllodes. The 15-20 mm phyllodes are dull grey-green, broadly-ovate with a short, upturned point. They have a prominent pale midvein and thickened margins. The golden flower heads are on 20 mm peduncles, one per axil, supporting 5-12 loose flowers with reddish sepals remaining conspicuous within the stamens. The 60 mm legumes are dark brown-black, curved and twisted with thickened margins. There are often four pods per peduncle.

Flowering Period: August-September

Distribution and Habitat

This sub species is widespread throughout the Ravensthorpe Range, where it may be scattered or frequent in patches, growing on gravelly lateritic soil in mallee scrub. It has also been collected from Coujinup Hill, 40 km north-east of Ravensthorpe.

The Ravensthorpe Range is currently subject to numerous mining leases, although CALM's South Coast Region Management Plan has recommended this area as a Nature Reserve. This species is not considered to be under any immediate threat, and has been frequently collected (WAHerb 40 collections).

Conservation Status

Current: Priority 3 Recommended: Remove from Priority Flora List

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Mt Iron	Albany	Rav	VCL	9.92	3	in flower
2. Floater Rd	Albany	Rav	VCL	21.8.92	+20	in flower
3. Elverdton Rd	Albany	Rav	VCL	21.8.92	+20	in flower
4. Mt IronTrack	Albany	Rav	VCL	15.12.92	+20	in flower
5. Mt Short	Albany	Rav	VCL	16.12.92	+20	in flower

WAHerb: 40 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

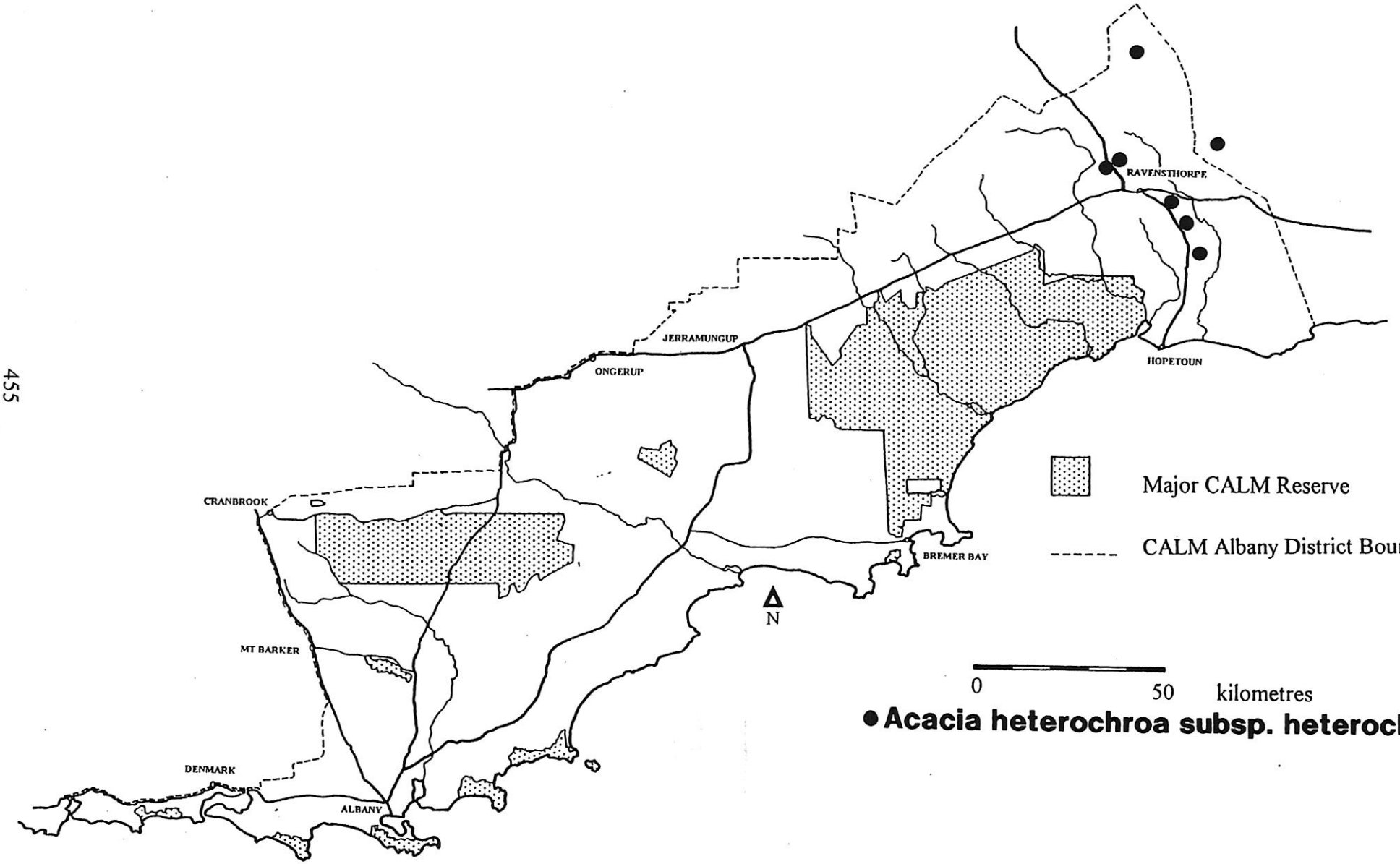
Management Requirements

- change to Priority 4
- monitor occasionally

Research Requirements

References

B.R. Maslin (pers. comm.).


RAVENSTHORPE
HOPETOUN
JERRAMUNGUP
ONGERUP
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
● Acacia heterochroa subsp. heterochroa ms

Acacia luteola Maslin

MIMOSACEAE

Acacia luteola, in the Pulchellae Series, is 0.5-1 m tall, with either a single stem or branched close to the ground into two or three erect branches. The branches are finely nerved and covered with an indumentum of short puberulous hairs. There are no axillary spines. The stipules are narrowly oblong to triangular and the leaves are bipinnate (1-3 pairs of pinnae, each with 2-3 pairs of pinnules), puberulous with a terminal narrowly elliptic seta. The petioles are 1-2 mm, the main rachis 1.5-4 mm, the pinnae rachis 2-3 mm and pinnae length 3-9 mm long. The shortly cylindrical, very pale yellow inflorescences are on 10-20 mm solitary peduncles. The legumes are narrowly oblong to 20 mm, flat but raised over the seeds and densely shortly pilose.

Flowering Period: February-September

Distribution and Habitat

Acacia luteola has been extensively collected over a wide range from Mt Lindesay (just north of Denmark), Marbellup, Mount Barker, through the Porongurup and Stirling Ranges and east to Cheyne Beach, Manypeaks and Beaufort Inlet. It occurs in sandy or loamy soils in low lying swampy areas.

Conservation Status

Current: Priority 3 Recommended: Remove from Priority Flora List

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
Many WAHerb collections record it as common.						

WAHerb: 76 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

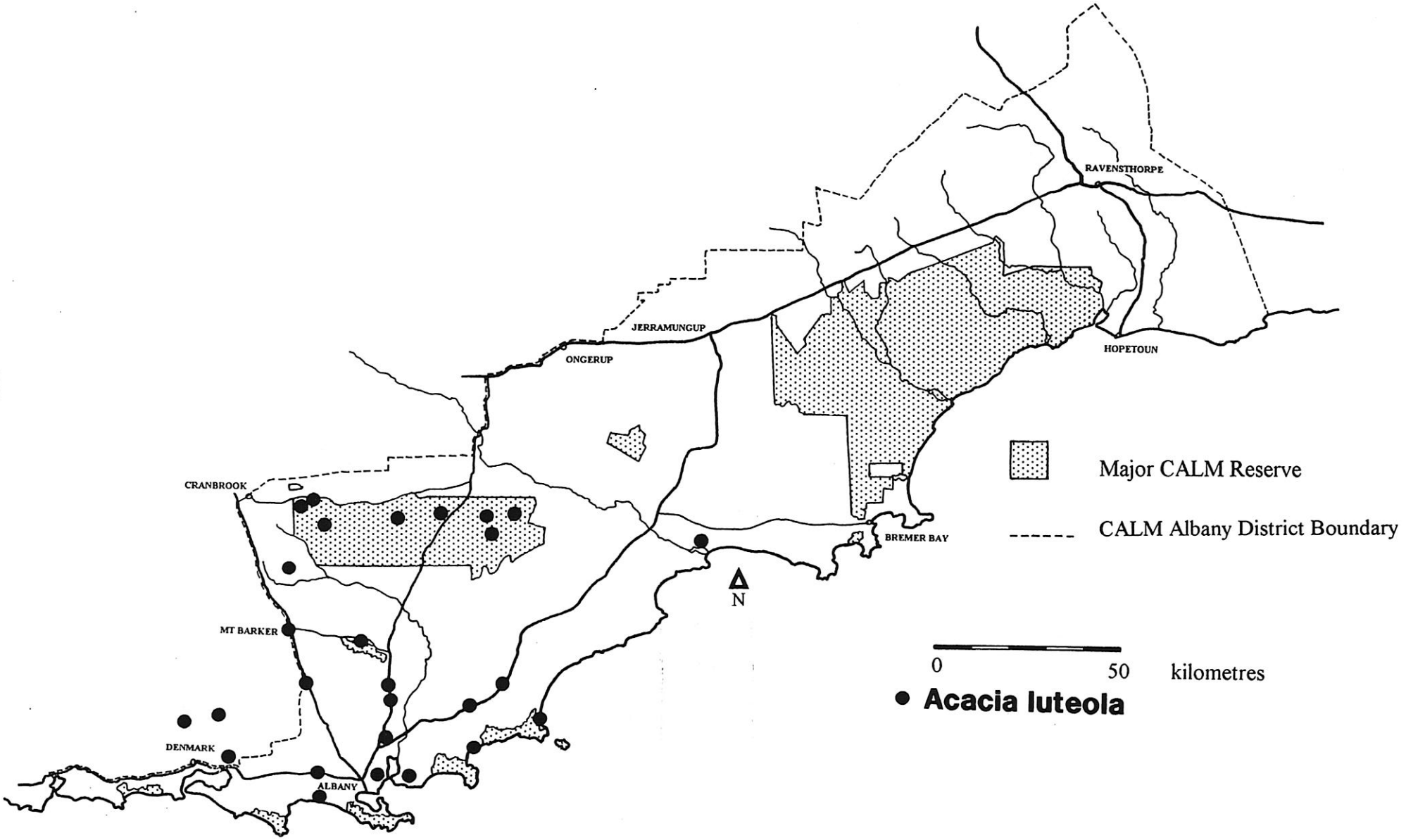
Unknown

Management Requirements

Research Requirements

References

Maslin (1975).


RAVENSTHORPE
JERRAMUNGUP
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HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Acacia luteola

Acacia moirii subsp. *dasycarpa* Maslin MIMOSACEAE

This wattle in the Pulchellae Section is a low, compact densely pilose to villous shrub to 60 cm, possibly closely related to *A. browniana*. The leaves are bipinnate with one pair of pinnae (5-15 mm long), each with 3-4 pairs of narrowly oblong to lanceolate pinnules with a straight terminal seta. The pinnules are densely hairy on both surfaces. The stipules are not spiny. The flower heads are globular, golden, 15-25 flowered on 5-20 mm peduncles. The legume, up to 4 cm long and 5-6 mm wide is also villous.

Flowering Period: April-July

Distribution and Habitat

This taxon is widespread from Hamersley Inlet and West River, up to Ravensthorpe and east toward Munglinup. It has also been collected between Lake King and Newdegate. It grows as an understorey usually in mallee scrub, in a variety of soils from sand, sandy clay to gravel. At East Mount Barren it occurs in heath on quartzite.

This taxon is not perceived to be under any threat, and is well represented in FRNP and proposed reserves/VCL in the Ravensthorpe Range.

Conservation Status

Current: Priority 3 Recommended: Priority 4

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Mt Desmond.	Albany	Rav	VCL	15.12.92	+100	healthy
2. Hamersley Inlet	Albany	Rav	NP	25.5.83	common-WH	-
3. Hamersley Drive	Albany	Rav	NP	12.9.83	occasional-WH	-
4. Jerdacuttup	Albany	Rav	Shire res.	8.9.93	+10	healthy

WAHerb: 17 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

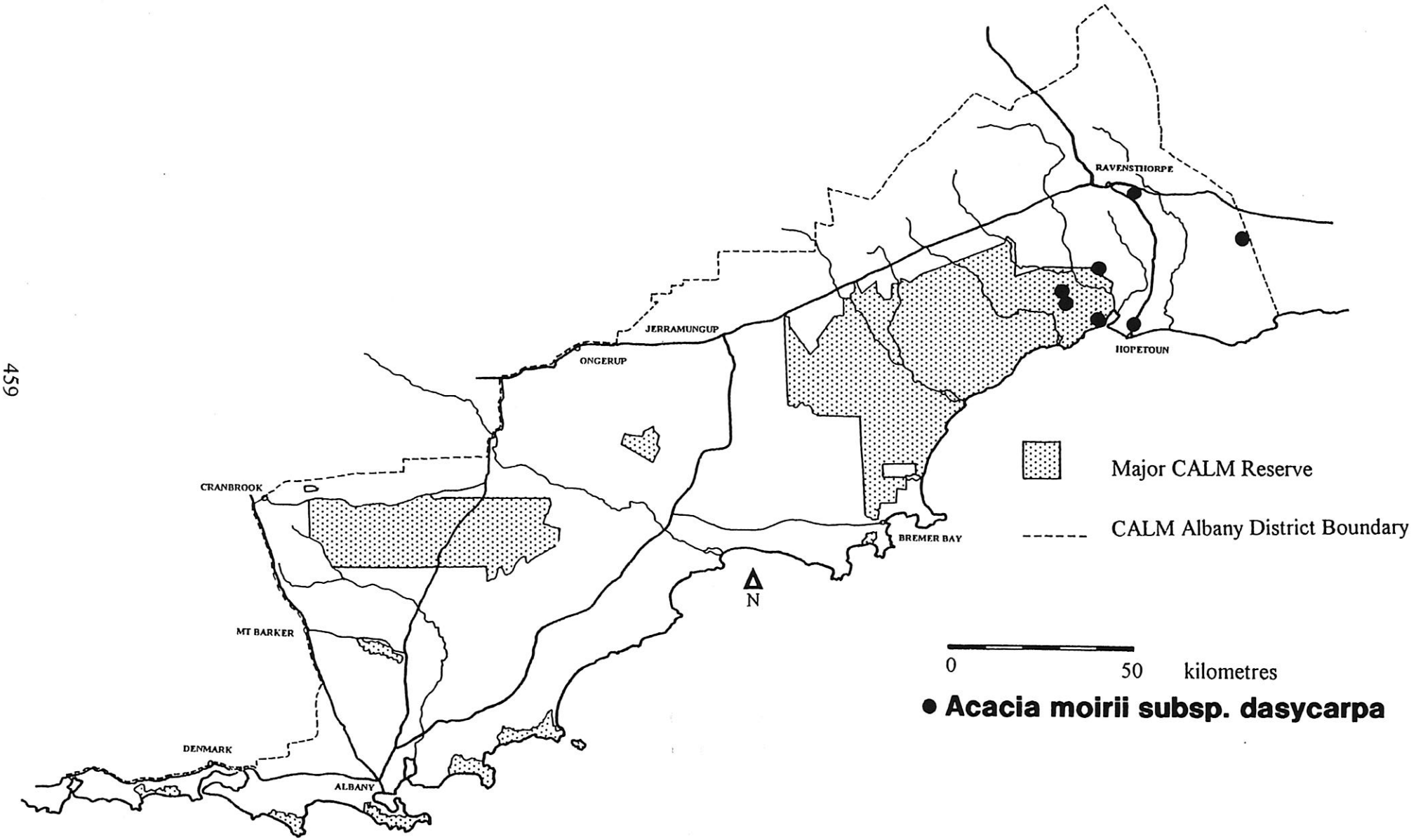
Management Requirements

- change to Priority 4
- monitor occasionally

Research Requirements

References

B.R. Maslin (pers. comm.).


RAVENSTHORPE
HOPETOUN
JERRAMUNGUP
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CRANBROOK
BREMER BAY
MT BARKER
DENMARK
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Acacia moirii subsp. dasycarpa

Acacia newbeyi Maslin

MIMOSACEAE

Newbey's Wattle

Acacia newbeyi is an openly branched shrub 0.5 to 1 m tall, normally dividing near ground level into 2-4 main branches which are obscurely ribbed and strigose to antrorsely puberulous. It is in the Pulchellae Series. The branchlets are spinescent, without axillary spines. The leaves are bipinnate with one pair of pinnae, usually with two pairs of pinnules each. They are glabrous with a minute petiole, 2.5 mm thickened rachis with a caducous triangular terminal seta 0.5 mm. The light yellow globular flower heads are very condensed (3-4 mm dia.), solitary on 4-10 mm peduncles with 10-13 flowers. The light brown legumes are papery, narrowly oblong 20-25 mm long by 3 mm wide, prominently raised over the seeds.

Flowering Period: July-August

Distribution and Habitat

Acacia newbeyi is distributed over a wide range from Nyabing, through Ongerup, Corackerup and Chillinup to Ravensthorpe; but is not considered common (Maslin 1975, p424). It occurs in sand over laterite supporting mallee shrubland.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SE Ongerup	Albany	Gno	?NR	5.9.82	frequent-WH	-
2. Chillinup	Albany	Gno	?private	16.7.74	scattered-WH	

WAHerb: 16 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

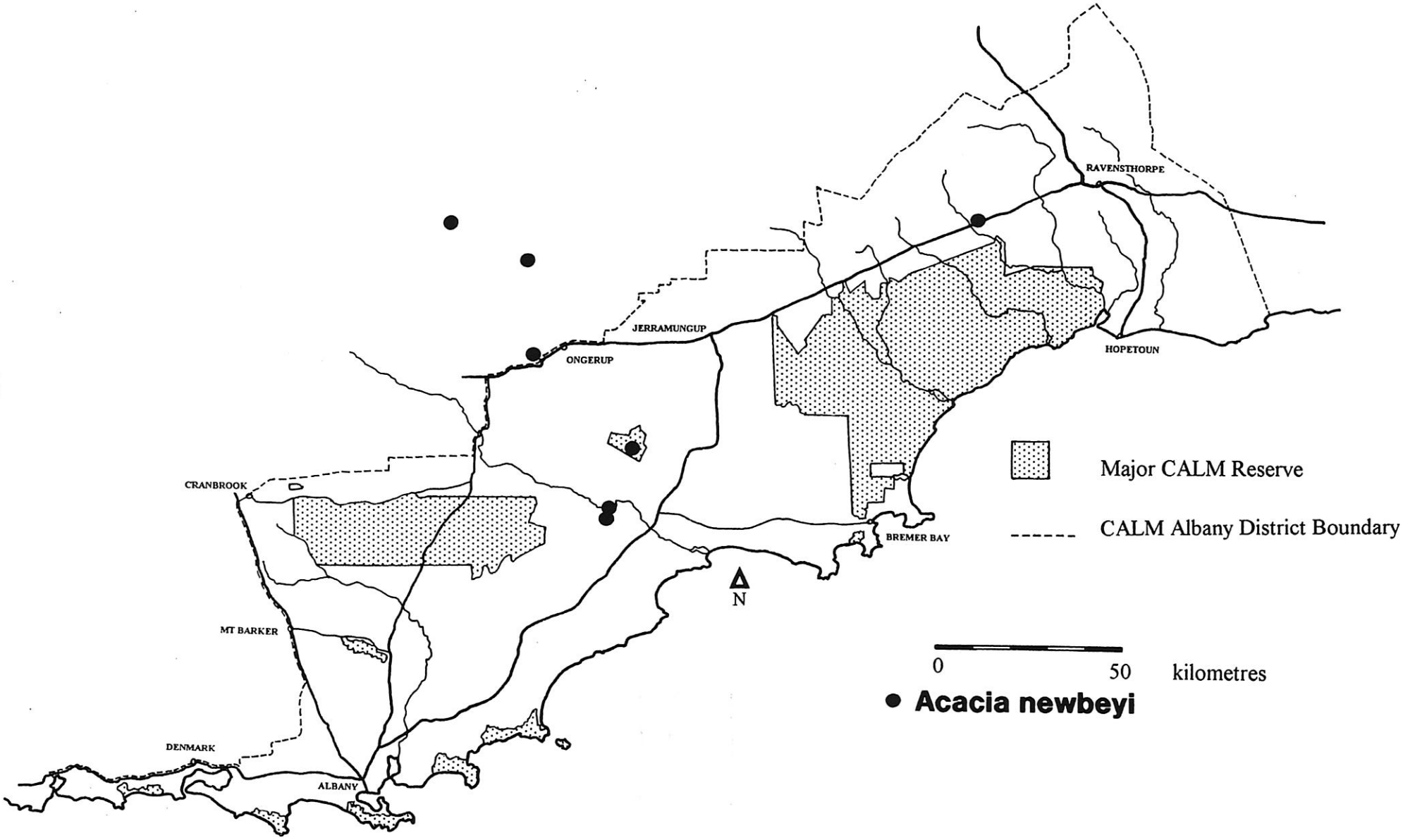
Monitor occasionally

Research Requirements

- relocate and survey WAHerb locations
- survey for new locations

References

Maslin (1975).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
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50
kilometres
Acacia newbeyi

Acacia octonervia Cowan & Maslin MIMOSACEAE

Acacia octonervia is a glabrous spreading shrub to 50 cm (occasionally 1 m) tall, with brownish-red branchlets. The 1.5-2 cm phyllodes are terete (1-1.5 mm dia.), obtuse, mucronulate, straight or weakly curved, dark green with eight distant raised nerves. The persistent stipules are narrowly triangular, 1.5-2 mm long. The light golden flower heads are globular (3-4 mm dia.), 20 flowered on 7-12 mm peduncles (one or two per axil). The shiny coriaceous legume is undulate, narrowly oblong to 2.5 cm long and 3 mm wide.

Flowering Period: October-January

Distribution and Habitat

Acacia octonervia has been collected over a wide range from near Ongerup, through FRNP and Ravensthorpe to the Oldfield River. It occurs in open mallee low heath growing in rocky sand or loam, or sandy clay.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Corackerup	Albany	Jer	NR	12.82	common-WH	in flower

WAHerb: 15 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

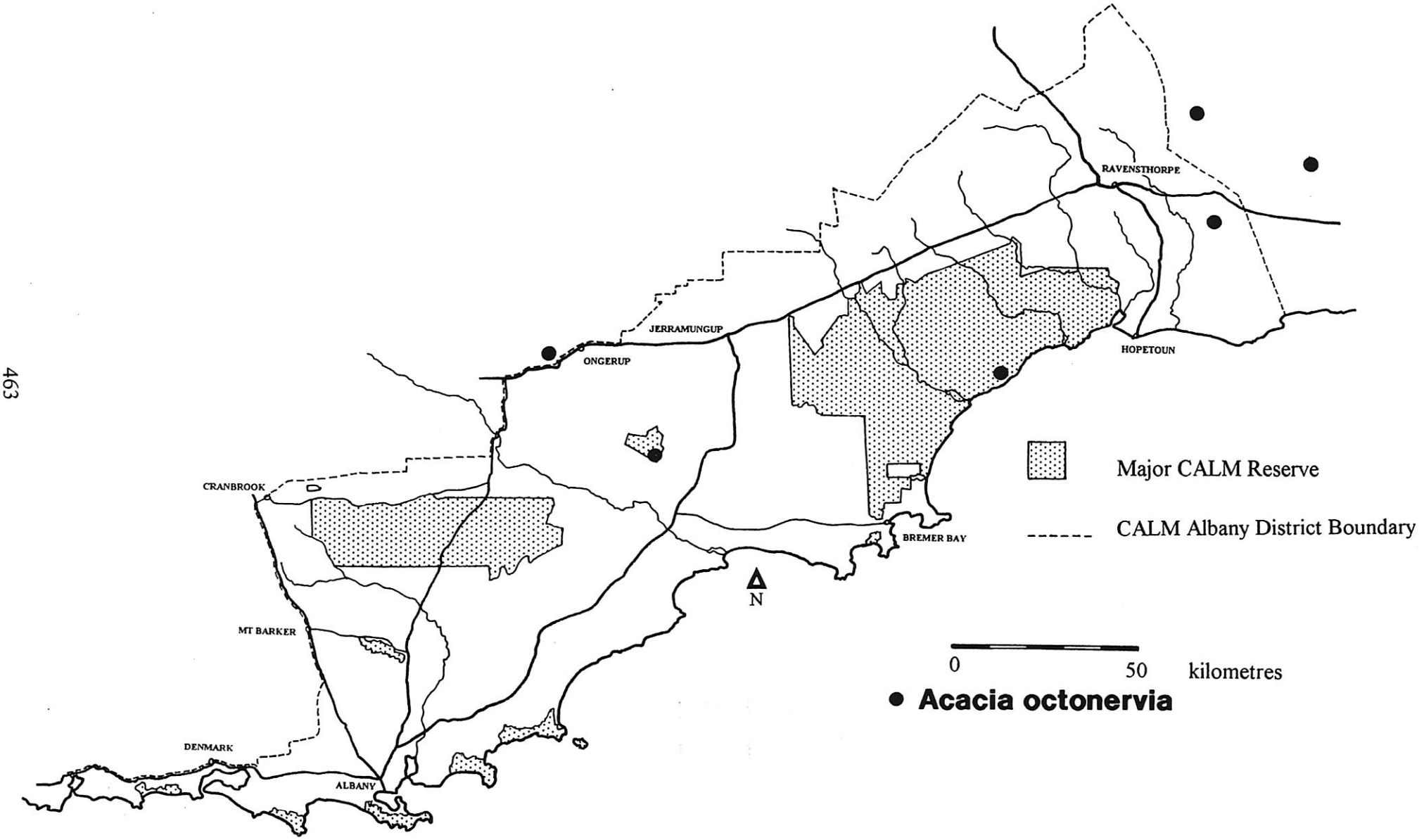
Monitor occasionally

Research Requirements

- relocate and survey WAHerb locations
- survey for new populations

References

R.S. Cowan and B.R. Maslin (pers. comm.).


RAVENSTHORPE
JERRAMUNGUP
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CRANBROOK
BREMER BAY
MT BARKER
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Acacia octonervia

Acacia phlebopetala Maslin var. *phlebopetala* MIMOSACEAE

This wattle may form a spindly, erect open, single or multistemmed shrub with foliage confined to the upper portions of the branches (the typical form) or it may have dense foliage close to ground and branched, spreading to almost prostrate habit (maritime form). The olive to dark green phyllodes are broadly triangular or obliquely obdeltate, 5-10 mm long and 5-11 mm wide. They are patent to slightly ascending with the prominent nerve situated close to the lower edge terminating in a pungent apical mucrone. The two stipules at the base of each phyllode are narrowly triangular to setaceous; the thickened stipule bases are persistent on the old wood. The flower heads (4-6 flowers) are creamy white and globular on 7-12 mm peduncles, one per axil. The legumes are 4-7 cm long, 5 mm wide and glabrous.

Flowering Period: June-July & December-February

Distribution and Habitat

There are two recognised variants of *A. phlebopetala* var. *phlebopetala*. The coastal variant occurs in heath on coastal quartzite cliffs and deep sand dunes from the Pallinup River to the Hamersley River. The other (typical) variant occurs in sand supporting mallee shrubland, inland from East Mount Barren to Munglinup.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. East Mt Barren	Albany	Rav	NP	2.12.80	rare-WH	-
2. Thumb Peak	Albany	Rav	NP	1.11.75	common-WH	in flower
3. Pt Irby	Albany	Rav		30.11.75	scattered-WH	in flower

WAHerb: 25 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

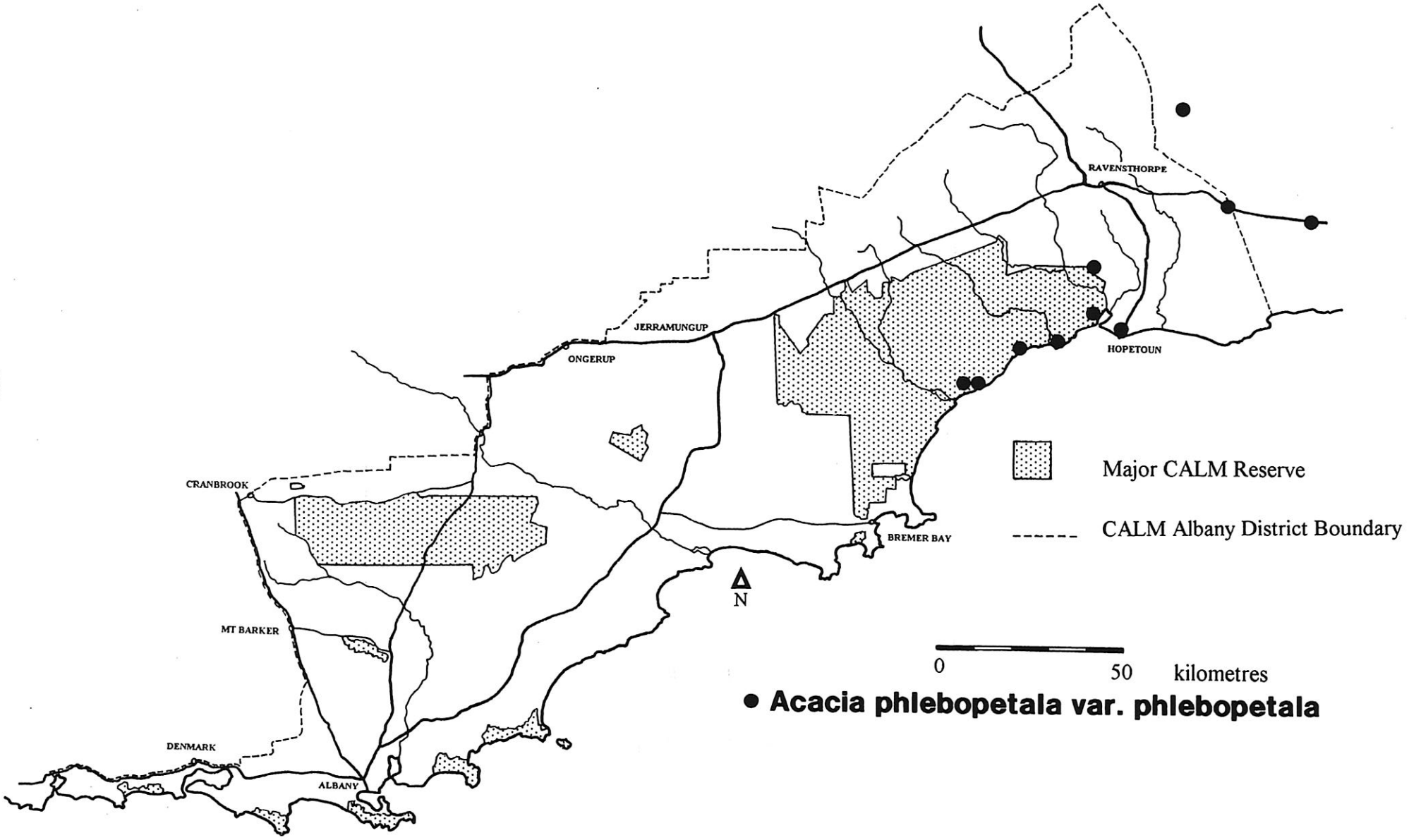
Management Requirements

Monitor occasionally

Research Requirements

References

Maslin (1978).


RAVENSTHORPE
JERRAMUNGUP
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CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
● Acacia phlebopetala var. phlebopetala

Acacia pinguiculosa Cowan & Maslin subsp. *pinguiculosa* ms MIMOSACEAE

This wattle is a densely branching rounded shrub to 80 cm tall. The olive green phyllodes 10-25 mm long by 2.5-7.5 mm are 1-3 nerved, flat, obovate-oblanceolate, rounded obtuse and sometimes obscurely mucronulate. The flower heads are globular, golden (3-6 mm dia.), 10-17 flowered on 5-10 mm peduncles which are one or two per axil. The bark is grey, fissured at the base. The slightly curved legume is linear, flat to 4 cm by 4-5 mm wide and glabrous.

Flowering Period: August-September

Distribution and Habitat

This *Acacia* has been collected from Ravensthorpe east to Jerdacuttup and down to Hopetoun and No Tree Hill. It grows in loam, clay or sand in mallee scrub. At many locations it is common. It is not believed to be under any immediate threat and should be reduced to Priority 4.

Conservation Status

Current: Priority 3 Recommended: Priority 4

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Kundip NW	Albany	Rav	VCL	15.12.92	+5	healthy
2. Hopetoun Rd	Albany	Rav	verge	6.79	common-WH	-
3. No Tree Hill	Albany	Rav	NP	12.84	frequent-WH	-
4. Kundip NE	Albany	Rav	VCL	12.82	common-WH	-
5. Ravensthorpe Sth	Albany	Rav	VCl	9.10.75	not common-WH	-
6. Ravensthorpe NNE	Albany	Rav	?	30.8.80	common-WH	-
7. Ravensthorpe E	Albany	Rav	verge	10.10.75	not common-WH	-

WAHerb: 20 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

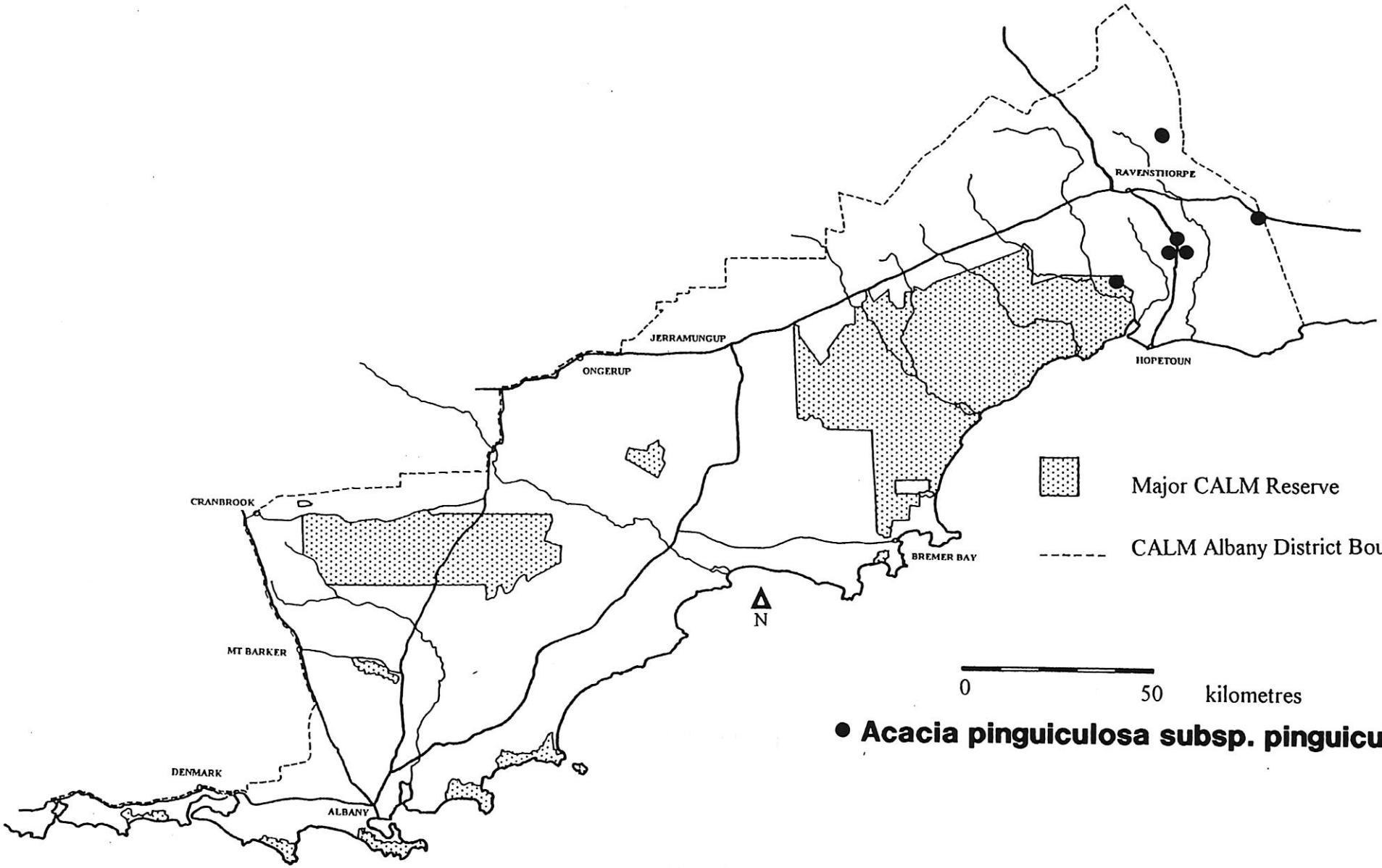
Management Requirements

- reduce to Priority 4
- monitor occasionally

Research Requirements

References

R.S. Cowan and B.R. Maslin (pers. comm.).


RAVENSTHORPE
HOPETOUN
JERRAMUNGUP
ONGERUP
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
N
Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
● Acacia pinguiculosa subsp. pinguiculosa ms

Acacia uliginosa Maslin

MIMOSACEAE

Acacia uliginosa is a low scrambling shrub with 3-6 slender branches (to 1 m long) arising from a short stock. The branchlets are terete, finely nerved with sparse antrorse hairs confined to the nerves. The patent phyllodes are scattered, narrowly (5-9 mm long and 1-1.5 mm wide) triangular with a very pungent apical mucrone. The persistent pair of stipules at the base of each phyllode are distinctly ascending and setaceous. The globular pale yellow flower heads are on short peduncles, one per axil, not exceeding the phyllodes. The heads are 3 mm in diameter and have 8-15 flowers. The red-brown legumes are terete, to 70 mm long and 2 mm wide curved and tapered at both ends.

Flowering Period: August-October

Distribution and Habitat

This species is widely distributed from Karridale via the Scott River, Northcliffe, and Walpole to the Albany area. It grows in seasonally wet sand or loam supporting dense heath and sedges in shallow depressions in Jarrah-Marri woodland. Until recently, this habitat was often ignored by botanical collectors even though it is very common right across the south coast. Further survey is considered likely to show it to be common and may need removal from the Priority Flora List.

A similar species which grows in similar habitat is *A. hastulata* (Albany to Donnelly river) which is distinguished in having more broadly triangular, more crowded phyllodes, and scattered hairs on the stems.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Scott NP	Bsltn	Aug	NP	1990	common-WH	healthy
2. Hunwick Nth	Albany	Alb	?Shire res.	18.8.86	occasional-WH	-
3. Karridale	Bsltn	Alb	?	13.8.80	common-WH	
4. Rest Pt	Walpole	Manj	private	11.8.86	common-WH	in flower
5. Elleker	Albany	Alb	?	15.8.80	common-WH	

WAHerb: 17 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

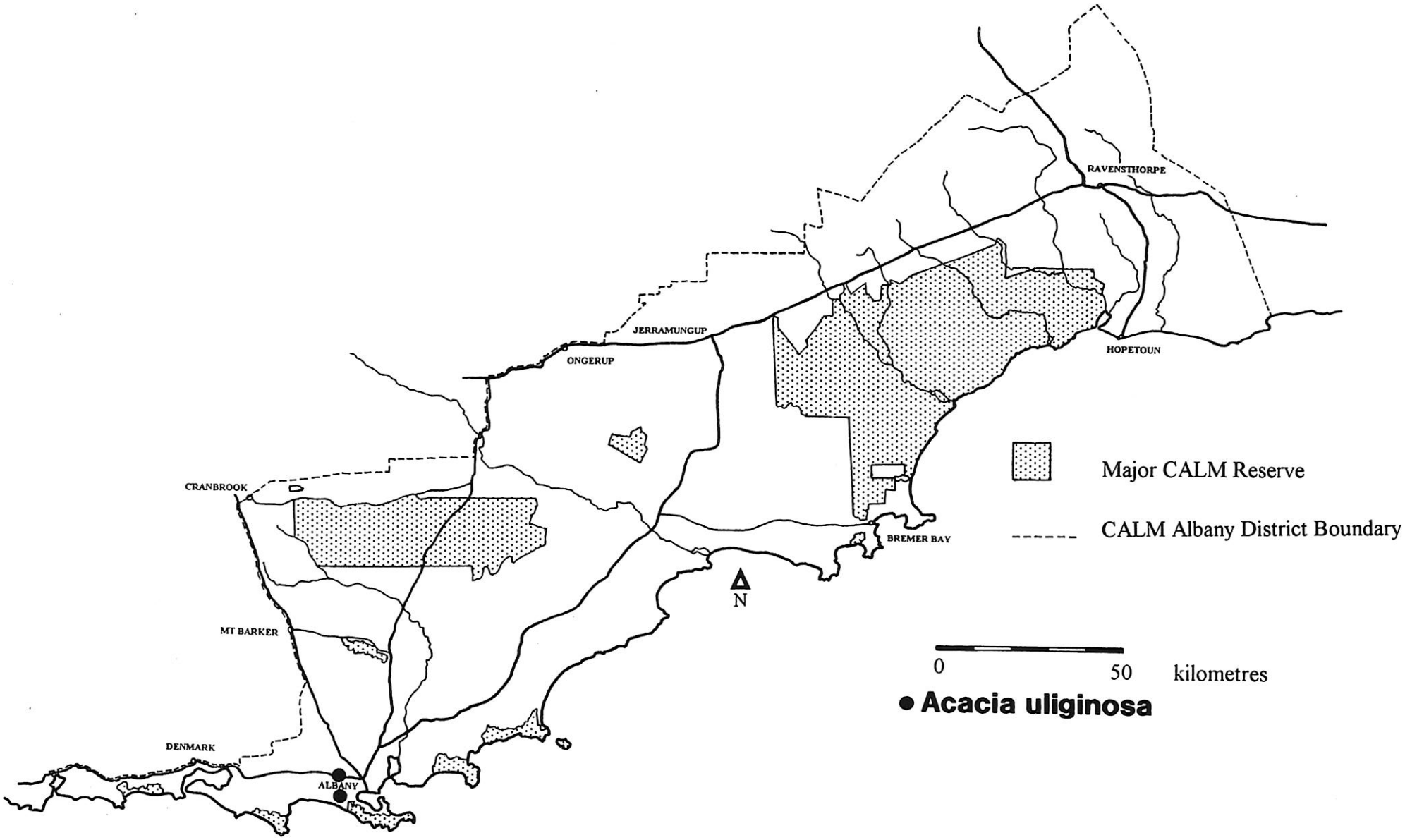
Monitor known populations occasionally

Research Requirements

Survey for new populations with a view to removal from Priority List

References

Maslin (1978).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
N
MT BARKER
DENMARK
ALBANY
Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
● Acacia uliginosa

Adenanthos glabrescens subsp. *exasperatus* Nelson PROTEACEAE

Adenanthos glabrescens subsp. *exasperatus* is an erect lignotuberous shrub with ascending branches to 70 cm. The leaves, concentrated at the tips of the branches, are ovate 5-15 mm long and 3-6 mm wide; at first with a few scattered hairs becoming glabrous or scabrous with age. The 20 mm pink-scarlet to cream flowers are solitary, terminal on short axillary branchlets and a 3 mm peduncle. Imbricate involucral bracts are present.

Subspecies *glabrescens* is very similar, differing in having narrower hairier leaves (2-3 mm wide) less imbricate involucral bracts, and a more diffuse habit.

Flowering Period: November-April

Distribution and Habitat

This subspecies has been collected from Hassell Highway (near Bremer turn off), FRNP and east of Ravensthorpe. It occurs in gravel and on rocky hill slopes in open scrub. Several attempts by Robinson to relocate the Hassell Highway population (see 3 below) have been fruitless.

Subspecies *glabrescens* occurs in flat, sandy clay.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Ravensthorpe E	Albany	Rav	verge	25.9.69	frequent	-
2. Ravensthorpe E	Albany	Rav	VCL	17.11.74	occasional	-
3. Boxwood	Albany	Jer	verge	14.1.79	common	
4. Bandalup	Albany	Rav	VCL	8.9.93	+100	in flower
5. Pabelup	Albany	Jer	NP	9.93	scattered	in flower

WAHerb: 11 records (one in Albany Herbarium)

Response to Disturbance

Likely to resprout after fire from lignotuber

Susceptibility to *Phytophthora* Dieback

Field observation suggests high susceptibility

Management Requirements

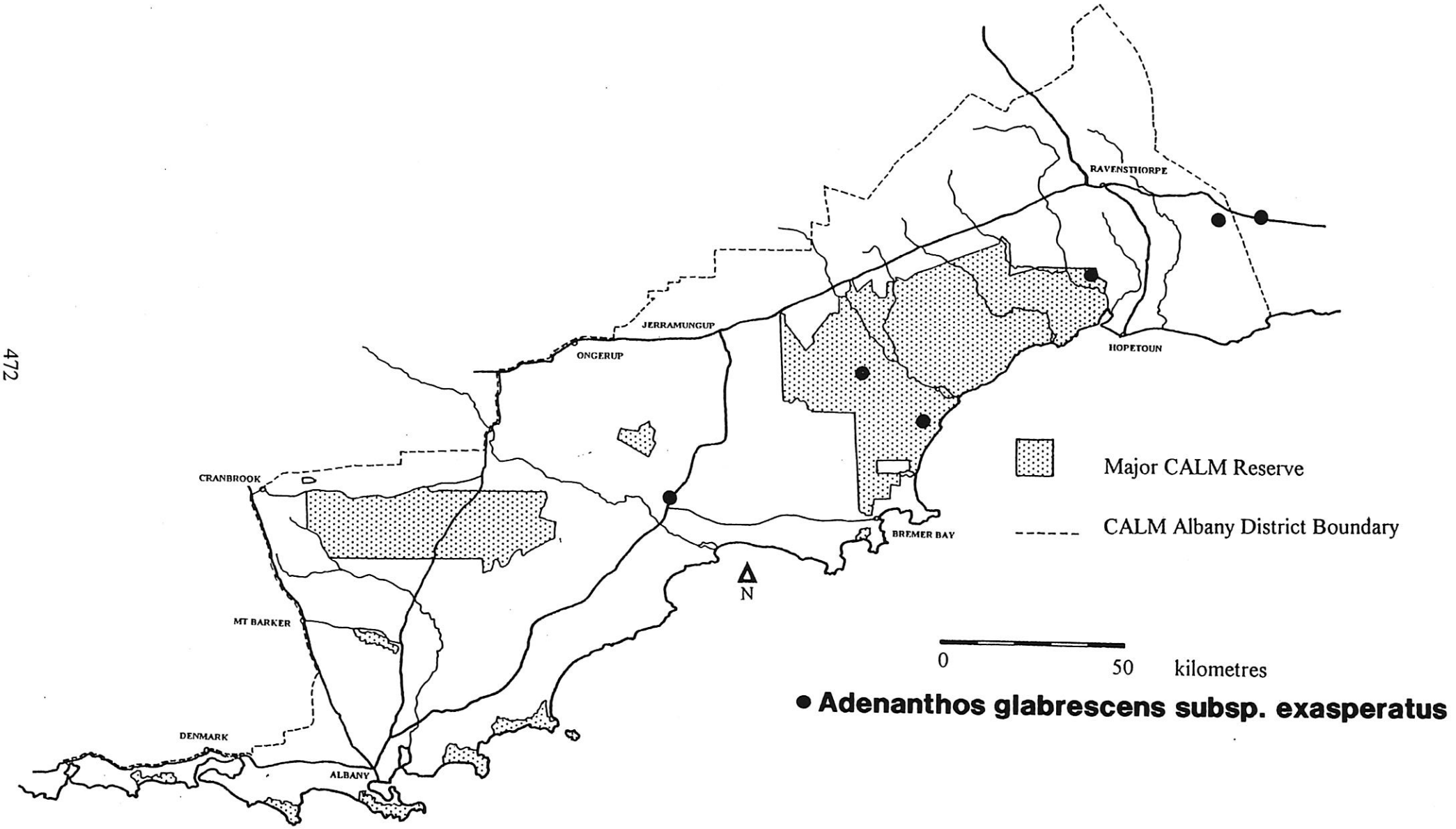
Monitor populations once relocated

Research Requirements

- relocate and survey WAHerb locations
- survey for new populations

References

Nelson (1978).


RAVENSTHORPE
HOPETOUN
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ONGERUP
CRANBROOK
BREMER BAY
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ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
● Adenanthos glabrescens subsp. exasperatus

Andersonia echinocephala (Stschegl.) Druce EPACRIDACEAE

Andersonia echinocephala is an erect robust shrub to 3 m tall. The leaves (up to 3 cm long) are crowded, deltoid and slighlty twisted with acuminate tips. The floral leaves are pale to white and the others dull green. The flowers (about 15) are cream-white, and almost hidden by the floral leaves or bracts. This species is very similar to the more robust *A. axilliflora*, but differs in having anthers about equal to (not much longer than) the filaments and shorter, relatively broader twisted leaves.

Flowering Period: September-November

Distribution and Habitat

This species is widely distributed on slopes and peaks throughout the Stirling Range; WAHerb records 12 separate locations. It has also been collected from Thumb Peak by Alex George in 1965 and McQuoid and Robinson in Jan. 1994 (scattered and not affected by dieback). It grows in shallow sandy/rocky soil in association with dense scrub, and is suffering from dieback disease at many locations in SRNP.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Hill opp. Mt Hassell.	Albany	Gno	NP	19.10.77	common	-
2. Donnelly	Albany	Cb	NP	7.11.77	common	-
3. Talyuberlup	Albany	Pl	NP	18.8.93	+200	diseased
4. Mt Gog	Albany	Pl	NP	19.8.93	+2000	regen gd
5. Mt Hassell	Albany	Gno	NP	26.10.93	+300	diseased

WAHerb: 18 records

Response to Disturbance

Reseeds after fire and soil disturbance

Susceptibility to *Phytophthora* Dieback

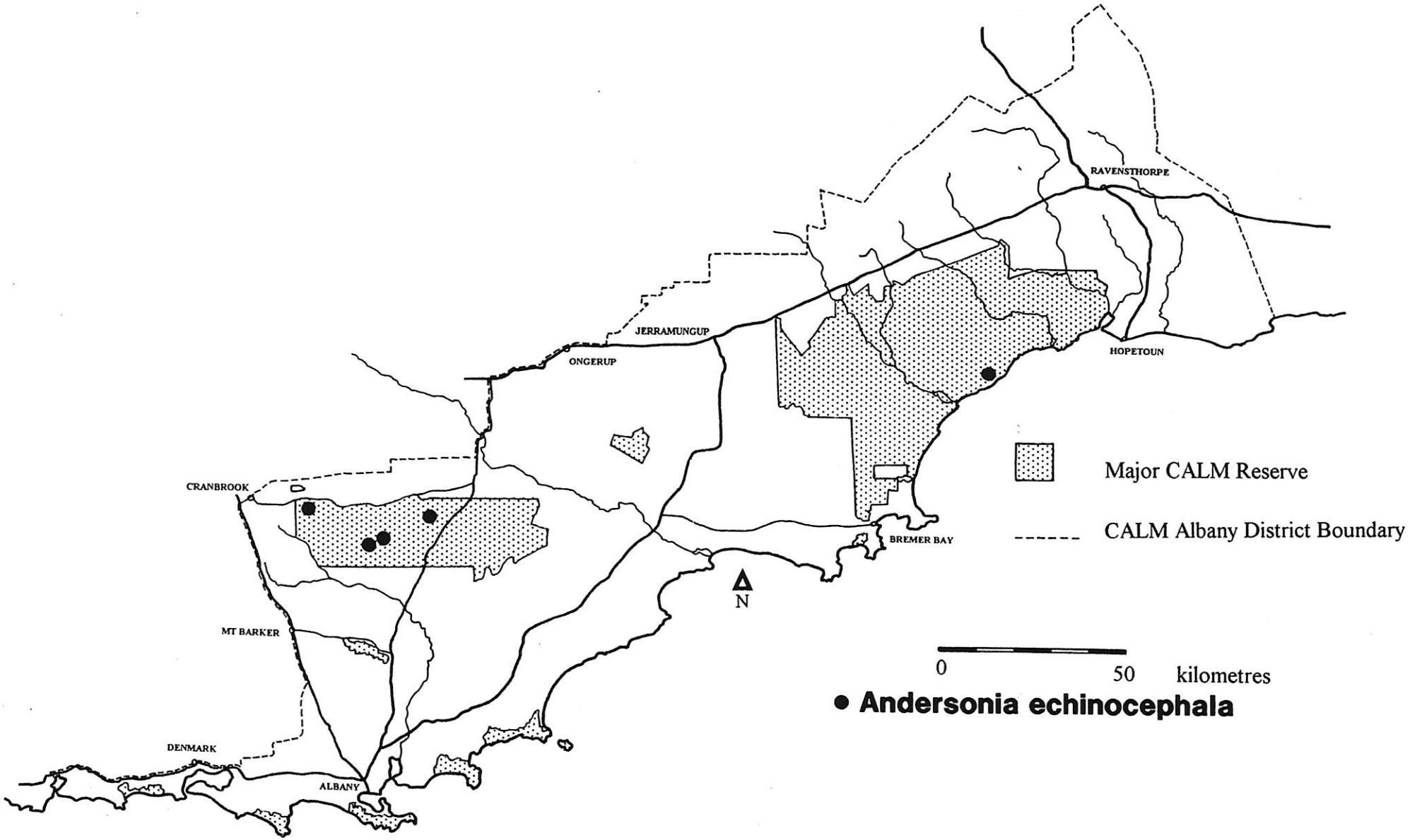
Presumed susceptible (high)

Management Requirements

Monitor regularly especially the effects of dieback

Research Requirements

- relocate and survey SRNP populations
- survey further around Thumb Peak area
- determine effectiveness of phosphonate to protect from dieback


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
● Andersonia echinocephala

Andersonia grandiflora Stschegl. EPACRIDACEAE

Red Andersonia

Andersonia grandiflora is a densely branched low to prostrate, cushion-like shrub with ascending branches to 15 cm tall. The leaves are crowded, twisted and spreading to 15 mm. The deep red flowers are in terminal heads of 2 to 4; each flower is subtended by two bracteoles and the calyx lobes are as long as the corolla.

Flowering Period: September-October

Distribution and Habitat

This species has been collected from several peaks and lower areas within the Stirling Range. It grows in sandy gravel or sandy clay over ironstone in heath or mallee scrub.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Talyuberlup	Albany	Pl	NP	24.7.83	15	-

WAHerb: 11 records

Response to Disturbance

Unknown; likely to be susceptible to *Phytophthora* dieback

Susceptibility to *Phytophthora* Dieback

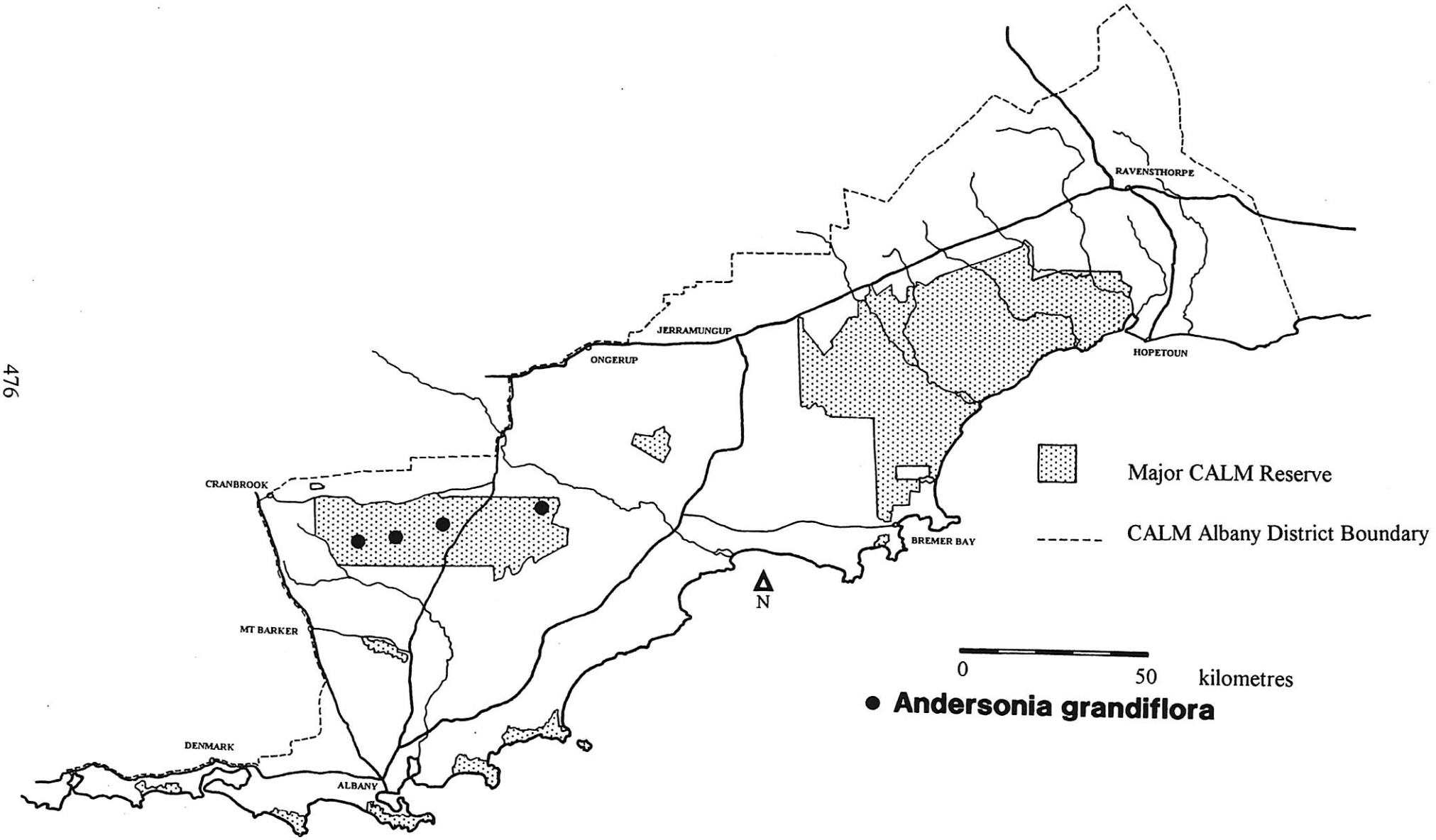
Field observation suggests high susceptibility

Management Requirements

Monitor populations noting impact of dieback; spray phosphonate if necessary

Research Requirements

- assess effectiveness of phosphonate spray in preventing dieback
- relocate and survey WAHerb locations
- survey for new locations


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Andersonia grandiflora

Andersonia setifolia Benth. EPACRIDACEAE

Andersonia setifolia is a prostrate cushion plant or low spreading subshrub to 10 cm high. The densely crowded small leaves are narrow-linear, not markedly twisted, under 2 cm. The red or white flowers are arranged in dense terminal heads with the anthers conspicuously exserted from the mature flowers. Each flower is solitary in the axil of a floral leaf which exceeds the flower. The corolla is slightly exserted from the ciliate sepals

Flowering Period: September-November.

Distribution and Habitat

This species has been collected several times from Boulder Hill to Mount Manypeaks, north of Albany and once from Mount Lindesay. It has also been collected from near Cape Arid. It grows in heath or low woodland over heath in red loamy soils or loam or sandy clay over granite.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Boulder Hill	Albany	Alb	Shire res.	1.8.86	common	in flower
2. Norman's Inlet	Albany	Alb	Shire res.	26.7.86	common	in flower
3. Herring Bay	Albany	Alb	private	13.11.92	+20	in flower
4. Mt Lindesay	Walpole	Dnmk	SF & NP	2.11.90	common	in flower
5. Yungip	Albany	Alb	Shire res.	28.9.93	+200	fair

WAHerb: 10 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible (high)

Management Requirements

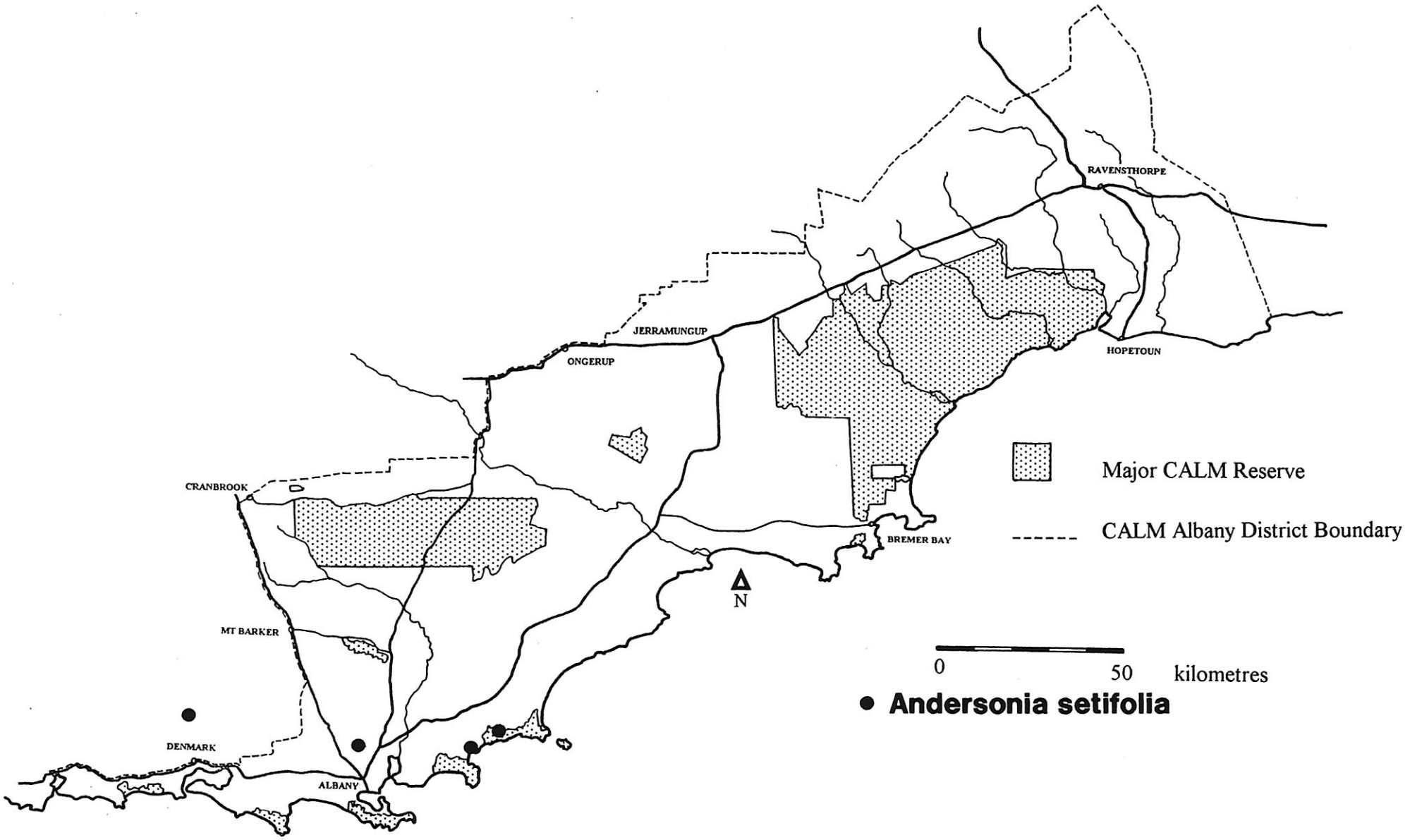
- monitor populations noting any impact of dieback
- spray phosphonate if necessary

Research Requirements

- relocate and survey WAHerb populations
- determine effectiveness and application rates of phosphonate spray in preventing dieback

References

Bentham (1868).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
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MT BARKER
DENMARK
ALBANY
Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Andersonia setifolia

Boronia virgata P.G.Wilson

RUTACEAE

Boronia virgata is a tall erect shrub to 2 m, with long slender minutely puberulous to glabrous branches, usually emergent above the associated vegetation. The leaves are pinnate with 3-7 linear leaflets which are acute up to 10 mm long. The flowers are solitary in the upper axils on a slender glabrous pedicel, 6-14 mm long with two bracts below the middle. The red sepals are very narrowly triangular, 2-3 mm long and glabrous. The four pink petals are ovate, 7 mm long, obtuse to acute. The erect stamens have semiterete, sparsely hairy filaments. This species is very similar to *Boronia stricta* which occurs in similar habitat and overlapping distribution, but has pilose (not glabrous) stems and branchlets.

Flowering Period: September-February

Distribution and Habitat

This species occurs in winter wet peaty sand over laterite supporting an association of dense heath and sedges. It has been collected from near coastal swamps from Denmark to Nornalup. As this habitat is common in the range, further collecting is considered likely to reveal this species to be more common than is currently evident.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Lake William	Albany	Dnmk	NP	16.10.92	+30	in flower
2. Mehniup Hill	Albany	Dnmk	NR	11.92	frequent	in flower
3. Limbrne Rd	Albany	Dnmk	verge	20.9.92	frequent	in flower

WAHerb: 14 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

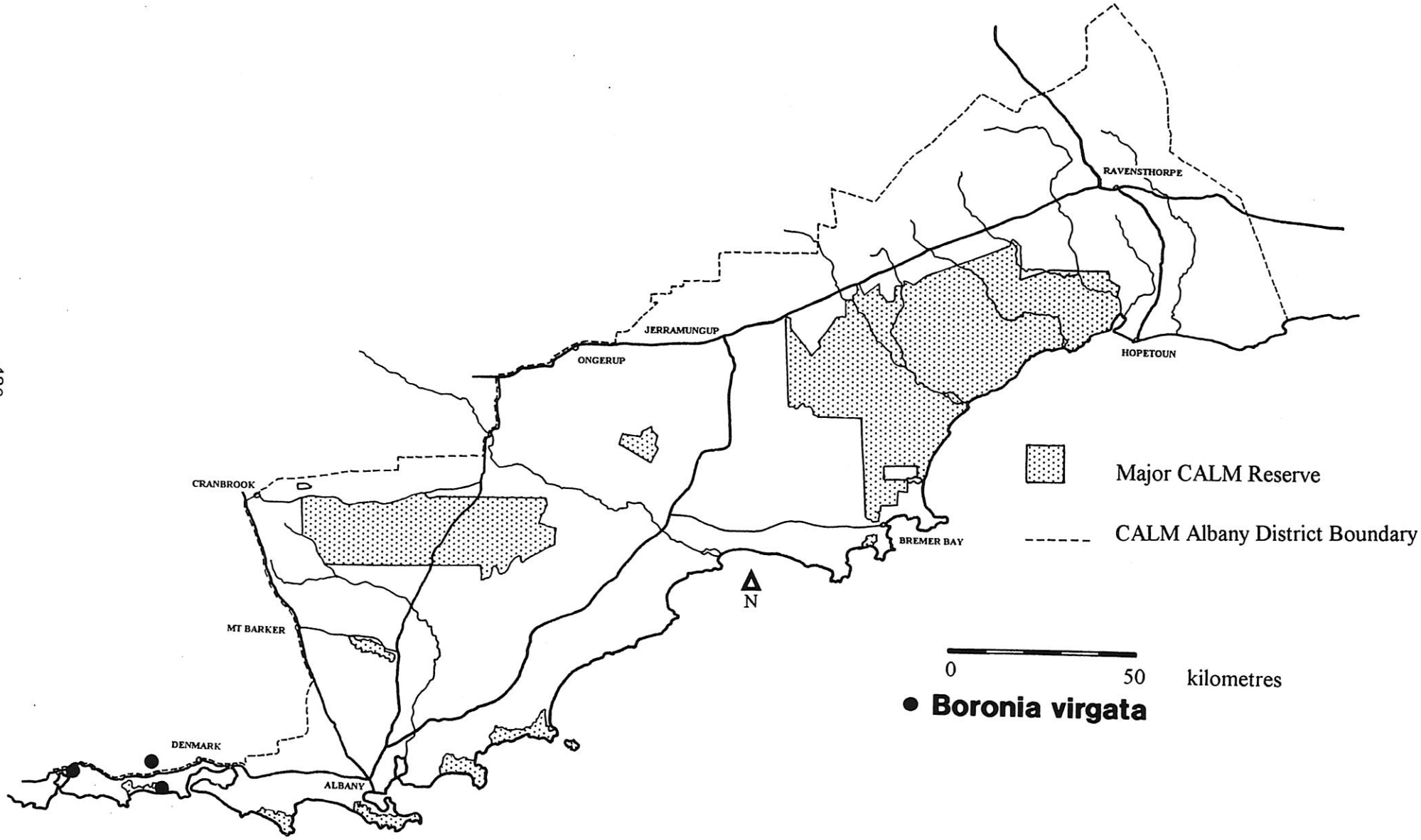
Monitor occasionally

Research Requirements

Survey opportunistically for new populations

References

Wilson (1971).


RAVENSTHORPE
JERRAMUNGUP
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HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Boronia virgata

Bossiaea divaricata Turcz. PAPILIONACEAE

Bossiaea divaricata is an erect distichous, divaricate shrub with hoary branches frequently ending in slightly recurved spines. The 10 mm alternate leaves are lanceolate (to 4 mm wide), slightly broader and rounded toward the base with a very short pointed apex. The leaves are roughly veined above and pubescent below. The flowers have red petals, with the standard twice as long as the calyx; the wings and keel shorter. The calyx lobes are acuminate, longer than the tube with the upper lobes broader than the others. Details of the pod are not known.

Flowering Period: ?August-September

Distribution and Habitat

The majority of collections have been made in the Wheatbelt Region including Dumbleyung, Lake Grace, Nyabing and Lake Magenta. WAHerb records one anonymous undated collection from Gairdner River (Albany District). Bentham (1864) sites a Maxwell collection (1850's) from Gairdner River which is probably the same or a duplicate of the WAHerb record.

It grows in gravel or sandy gravel in association with mallee scrub.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Lake Magenta	Albany	Kent	NR	1992	+300	-
2. Fairclough Rd	Albany	Kent	Tmbr	4.6.92	+50	-
no survey in Albany District						

WAHerb: 7 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

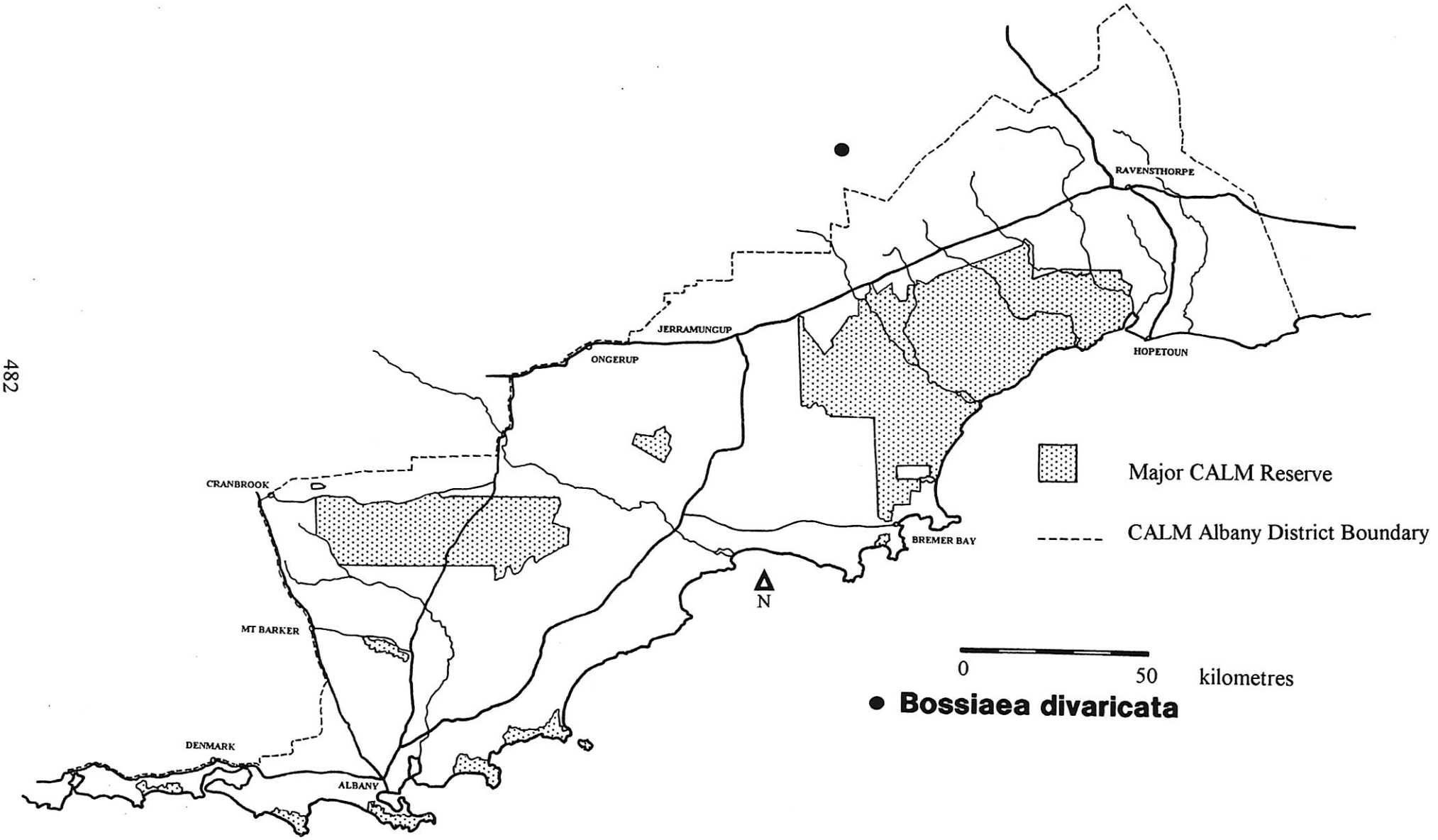
Cannot be determined until populations located

Research Requirements

Survey opportunistically for populations (possibly FRNP)

References

Bentham (1864).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Bossiaea divaricata

Calothamnus affinis Turcz. MYRTACEAE

Calothamnus affinis is a compact or spreading, single or multistemmed shrub to 1.5 m. The leaves are slender, terete, erect and rigid to 8 cm long and 0.7 mm in diameter and shortly mucronate. The leaves are crowded toward the ends of the branches. The inflorescence is a unilateral spike of prominent clusters of 2-4 flowers on younger sections of the stems, amongst the leaves. The four merous flowers are only partly embedded in the rachis; the calyx tube is broadly campanulate 1.5-2 mm with erect deltoid lobes 1 to 1.5 mm long. The orange-brown petals are oblong-elliptical, thin with ciliate margins. The staminal claws are more or less equal, 20-25 mm long, purple-red becoming yellow-green at the base and are 0.5-1.0 mm wide with about seven marginal filaments. The densely crowded fruits are sessile, depressed globular and only partly embedded.

Calothmnus affinis is related to and very similar to *C. crassus* and *C. heugelii*, both of which occur in the Stirling Range. However both these other two species have a swollen rachis.

Flowering Period: August-October

Distribution and Habitat

This species is confined to the eastern and northern Stirling Range where it occurs in gravelly sand or gravelly clay supporting an association of scrub or shrubland.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent survey						

WAHerb: 11 records

Response to Disturbance

Resprouts from lignotuber after fire

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

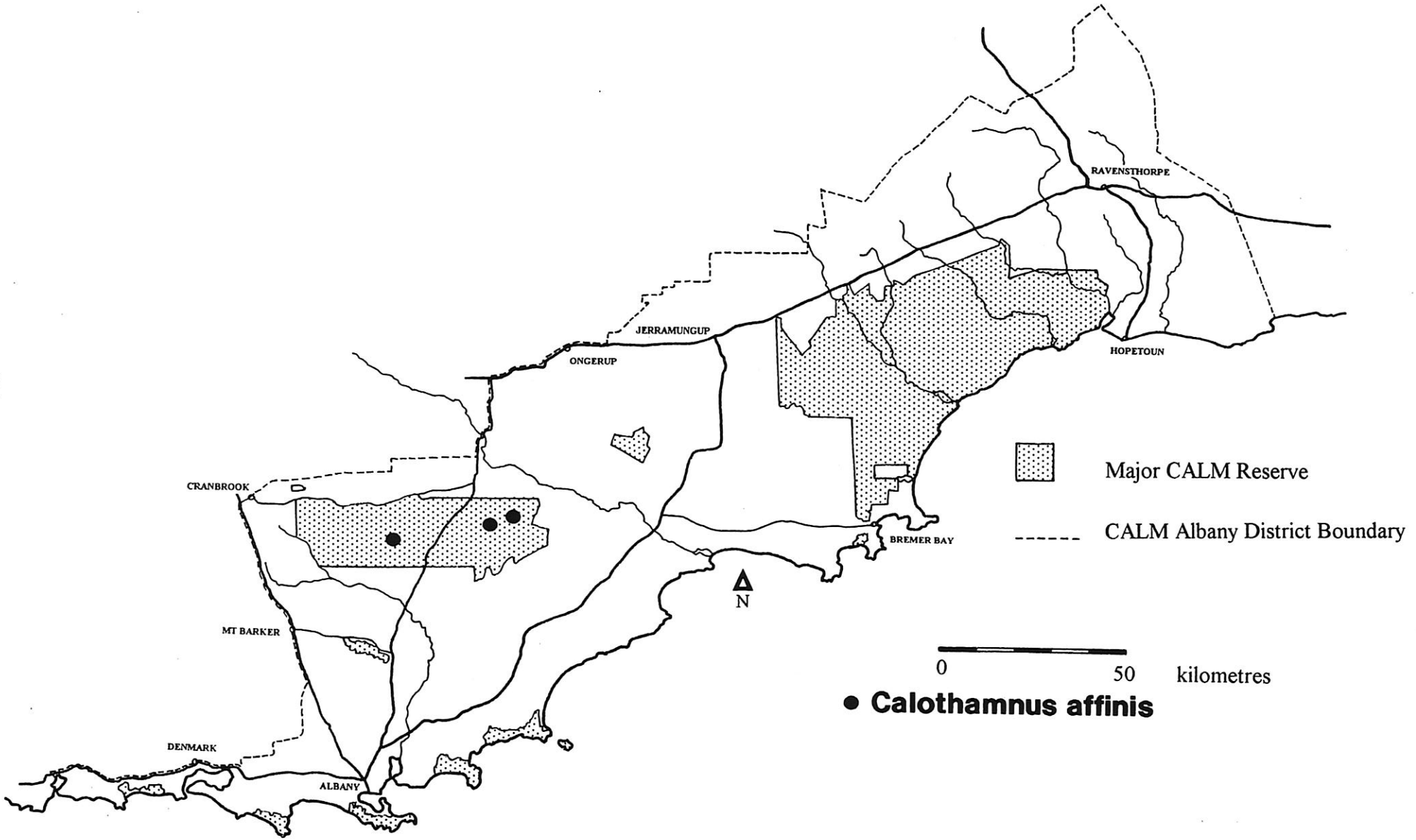
Monitor occasionally

Research Requirements

Survey for new populations

References

Hawkeswood (1987).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
N
Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
● Calothamnus affinis

Calothamnus crassus (Benth.) Hawkeswood MYRTACEAE

Calothamnus crassus is an erect, much branched compact to straggly shrub to 1.5 m tall, often with thick corky branches. The rigid leaves are slender, erect, terete, 7-9 cm long and 0.8-1.2 mm wide. The 4-merous inflorescence is a dense cylindrical spike 3-8 cm long on leafless portions of the older stems. The calyx tube is embedded in the corky rachis and the lobes are erect, deltoid. The 1 mm orange-brown to pale brown petals are narrow elliptical and papery with scarious partly ciliate margins. The dark crimson to purple red staminal claws are equal 25-28 mm long and 0.7-1 mm wide. The fruits are sessile, more or less depressed globular, 3-5 mm long and deeply embedded in the corky rachis.

This species is similar to *C. affinis* which has a unilateral spike, not embedded in the rachis.

Flowering Period: October-November

Distribution and Habitat

This species is confined to the Stirling Range, although several collections made in the Scott River area are very similar and "appear to belong to this species" (Hawkeswood 1987, p.88). The SRNP records are all from Bluff Knoll slopes in shallow stony schist soil in heath or scrub. The Scott River plants are from heath on wet ironstone and Keighery (pers comm) believes the Scott River taxon to be separate and more akin to *C. lateralis*.

Conservation Status

Current: Priority 3 Recommended: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Bluff Knoll	Albany	Gno	NP	3.2.93	+100	resprouting

WAHerb: 2 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

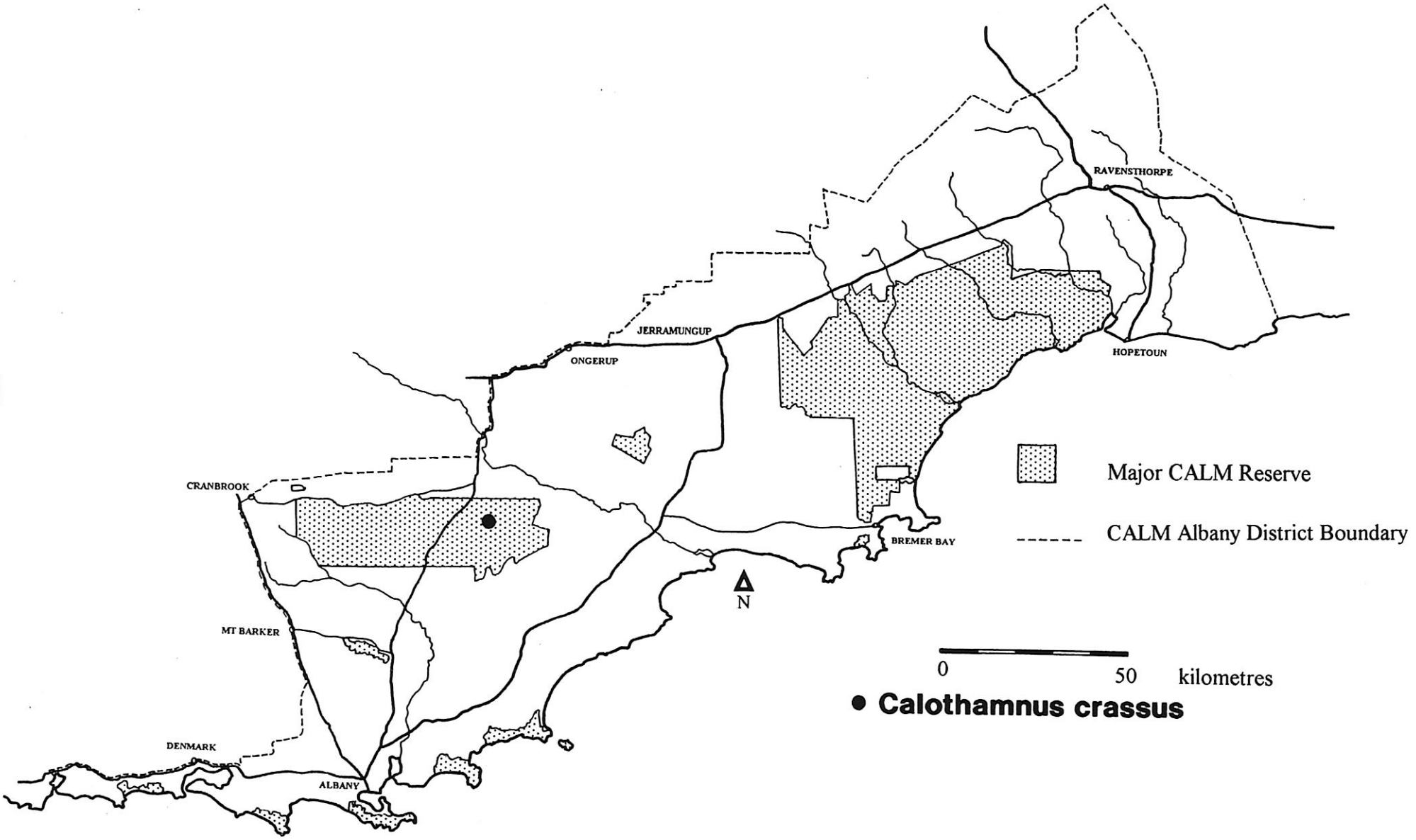
Cannot be determined until populations relocated and surveyed

Research Requirements

Relocate and survey SRNP populations

References

Hawkeswood (1987).


RAVENSTHORPE
JERRAMUNGUP
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HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
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50
kilometres
Calothamnus crassus

Calothamnus microcarpus F.Muell. MYRTACEAE

Calothamnus microcarpus is an erect, compact or spreading multistemmed shrub to 1.5 m, with pilose young shoots becoming glabrous with age. The erect rigid leaves are sessile, linear, flat, 5-9 cm long and 1.5-2.5 mm wide. They are slightly tapered toward the base, shortly mucronate, obtuse with two channels above and below. The 4-merous inflorescence is an interrupted, unilateral spike 4-6 cm long on the younger stem (not embedded) amongst the leaves. The calyx tube is short, broadly campanulate 1.5-2.5 mm long with deltoid lobes 1.5 mm long. The petals are oblong-elliptical, thin, orange-brown with scarious-ciliate margins. The staminal claws are more or less equal, 20-25 mm long. The densely crowded fruits are sessile, depressed globular 3-4 mm long by 4-6 mm wide.

Flowering Period: September-November

Distribution and Habitat

This species occurs around Cranbrook and the Stirling Range in lateritic clay soil supporting scrub or mallee heath. The most recent WAHerb collection is 1968.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent survey						

WAHerb: 14 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

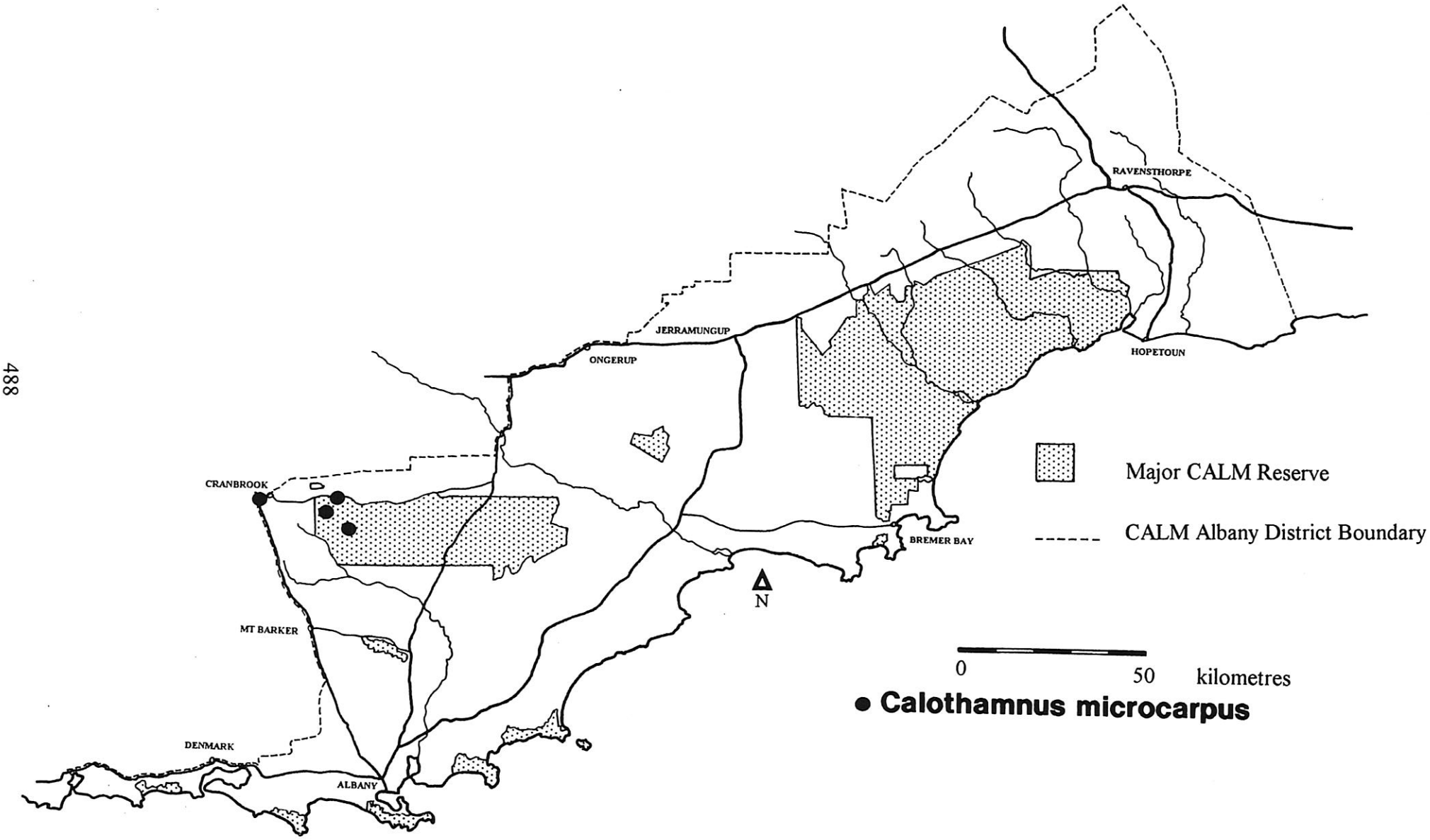
Cannot be determined until relocated

Research Requirements

Relocate and survey WAHerb populations

References

Mueller (1862), Hawkeswood (1987).


RAVENSTHORPE
JERRAMUNGUP
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CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
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kilometres
● Calothamnus microcarpus

Calothamnus robustus Schauer MYRTACEAE

Calothamnus robustus is an erect, multibranched compact shrub to 0.8 m tall. The young shoots are densely pubescent, but the older stems and branches become glabrous. The pale green leaves are patent to erect, rigid, terete to 1.8 cm and 1 mm in diameter, mucronate but not pungent. The 4-merous flowers are in a tight or loose cluster of 2-8 amongst the leaves or on sections of the stem where the leaves have fallen. The calyx tube is shortly campanulate, about 3 mm long, densely pubescent with narrow deltoid pubescent lobes. The orange-brown papery petals are obovate, 4-5 mm long, with scarious margins. The dark crimson staminal claws are more or less equal, free and 25-28 mm long and 1.2-1.5 mm wide. The fruit is sessile, ovoid, 9-11 mm long by 8-10 mm wide, pubescent becoming glabrous with age. The two opposite calyx lobes enlarge in the fruit; the remaining two are smaller and break off with age.

Flowering Period: October-November

Distribution and Habitat

This species is restricted in distribution, but common in coastal locations from Cheyne Beach to just north of Cape Riche. It occurs on hills or slopes in spongolitic loam over spongolite or clay in dense scrub or mallee heath. It is not under any immediate threat.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Bluff Creek Rd	Albany	Alb	verge	2.11.92	+500	healthy
2. Warriup Rd	Albany	Alb	verge	27.2.83	common	-
3. Mt Melville	Albany	Alb	Shire res.	3.11.92	+1000	healthy
4. 31240	Albany	Alb	VCL	16.11.92	+100	healthy
5. Cape Riche	Albany	Alb	?	26.7.83	common	healthy

WAHerb: 11 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

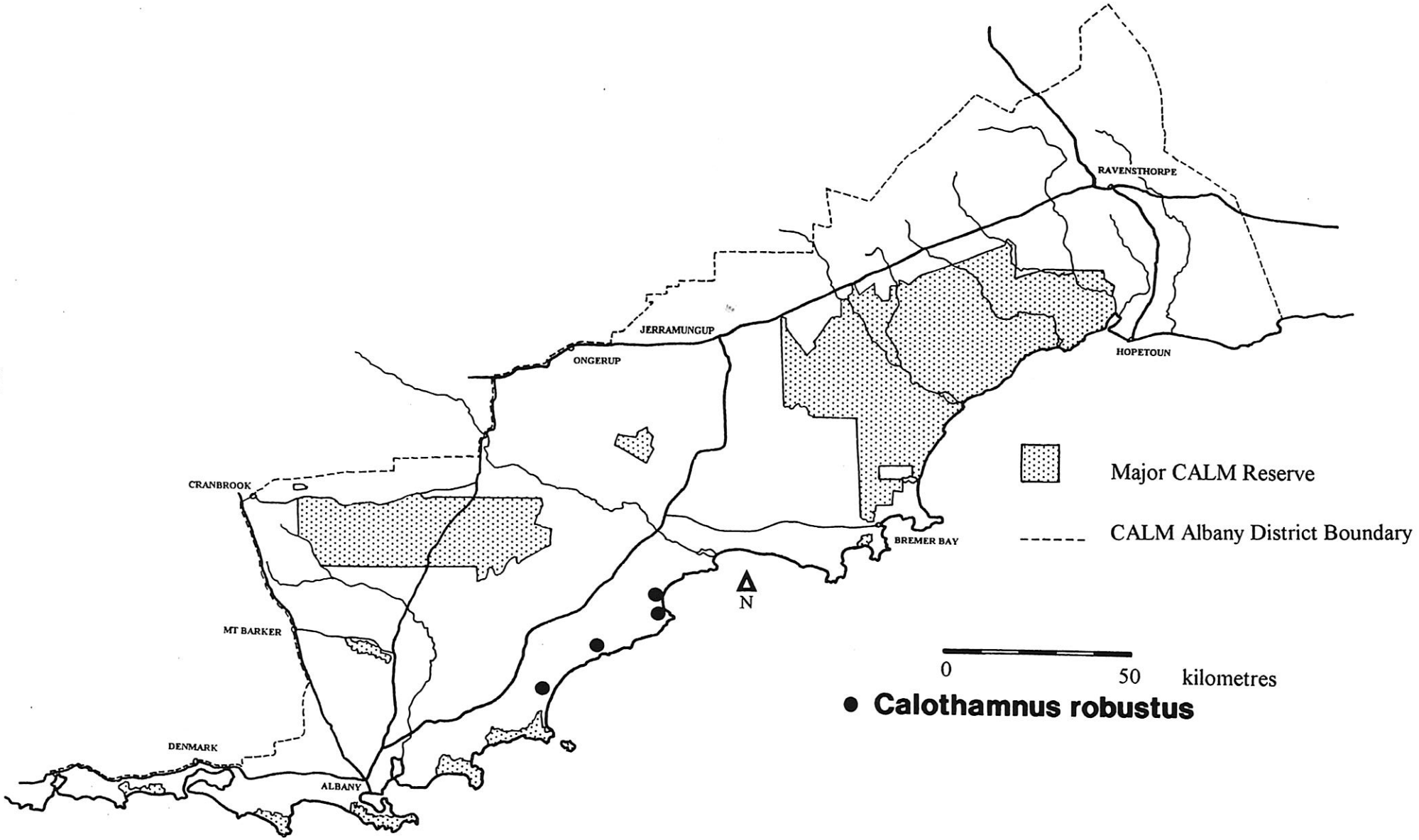
Management Requirements

Monitor occasionally

Research Requirements

References

Hawkeswood (1987).


RAVENSTHORPE
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CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
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50
kilometres
Calothamnus robustus

Calycopeplus marginatus Benth. EUPHORBIACEAE

Calycopeplus marginatus is a virgate, almost leafless subshrub to 0.5 m. The stems are flattened or angular, with very small linear leaves which are soon deciduous. The flower heads are solitary, terminal or axillary on 25 mm peduncles, bearing a pair of bracts. The involucre (of floral bracts) is deeply divided into four broadly ovate lobes, with broad white petal like margins. The clusters of male flowers are very short, not exceeding the involucre. The female flower, on a short pedicel has a perianth divided into four white bordered lobes, similar to the involucre lobes and of similar length to the ovary at the time of flowering. The styles are united into a short slender column. The fruit is a glabrous ovoid capsule.

Flowering Period: July-October

Distribution and Habitat

This species is confined to the Fitzgerald River National Park, where it is widespread in shallow soil in rocky (quartzite) creek beds to mountain slopes.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent survey						

WAHerb: 17 records (1 Albany KRN collection)

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

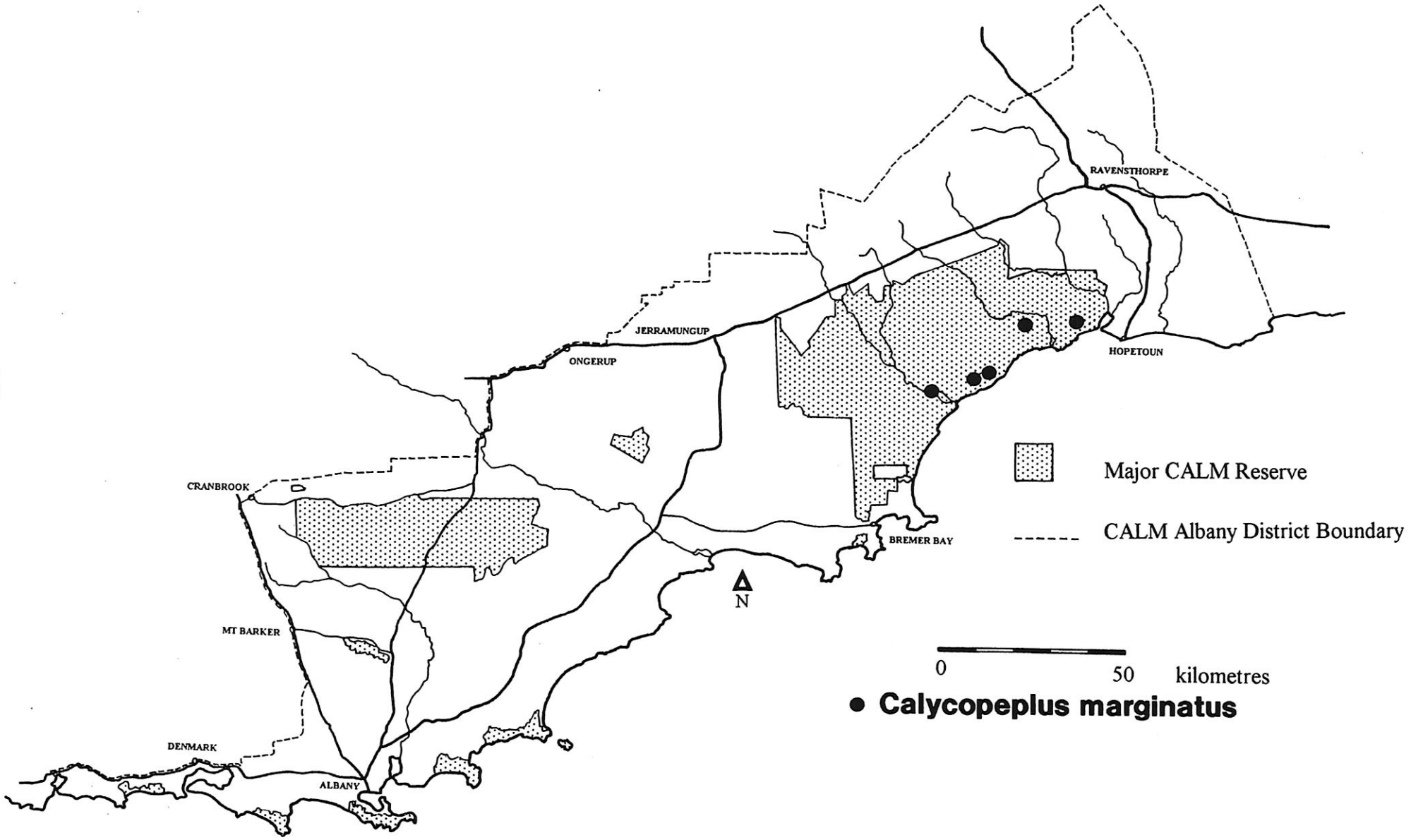
Management Requirements

Research Requirements

Determine whether this species is perennial or short lived and its response to disturbance

References

Bentham (1873).


RAVENSTHORPE
JERRAMUNGUP
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CRANBROOK
BREMER BAY
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CALM Albany District Boundary
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kilometres
Calycopeplus marginatus

Chamelaucium forrestii (F.Muell.) Marchant & Keighery ms MYRTACEAE

Chamelaucium forrestii ms is a glabrous shrub to 2 m tall. The dark green leaves are crowded in four rows (opposite decussate), up to 25 mm long, narrow linear, compressed semi-terete and slightly channelled above. The flowers are solitary, axillary and nodding on reflexed 5 mm pedicels. The buds are covered by deciduous red bracts; the petals are white, 2.5-3.8 mm long. The calyx tube is 5 mm long, obconical-turbinate and shortly lobed. The 4 mm style is glabrous except for a ring of hairs around the stigma. The stamens have short, broad filaments, constricted below the ovate transversely dehiscent anthers.

Flowering Period: September-November

Distribution and Habitat

This species occurs in shallow soil over granite in association with heath and scrub. It has been collected at Granite Peak and Mt Roe (north of Walpole in the proposed Mt Roe National Park) and from near Cape Vancouver and above Waterfall Beach in Two Peoples Bay Nature Reserve.

Conservation Status

Curent: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Cape Vancouver	Albany	Alb	NP	9.92	+1000	healthy
2. above Waterfall Beach	Albany	Alb	NP	29.10.92	+200	healthy

WAHerb: 14 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

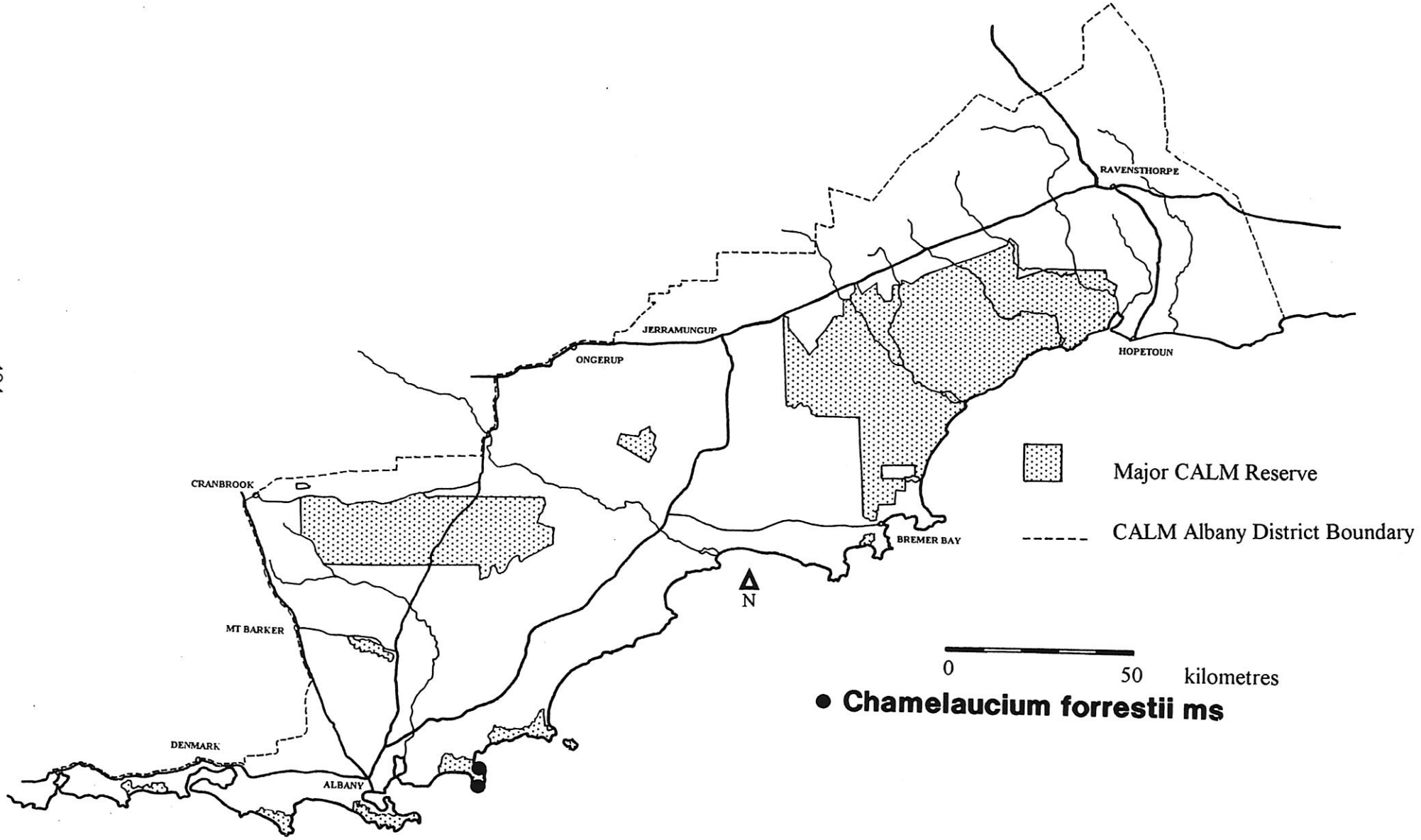
Monitor occasionally

Research Requirements

Survey opportunistically for new populations; especially around granite outcrops between Albany and Walpole

References

Mueller (1878).


RAVENSTHORPE
JERRAMUNGUP
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HOPETOUN
CRANBROOK
BREMER BAY
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ALBANY
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
● Chamelaucium forrestii ms

Chorizandra multiarticulata Nees

CYPERACEAE

Bristle Rush

Chorizandra multiarticulata is a sedge to 45 cm with a thick creeping rhizome. The stems are marked with numerous transverse septa, prominent to faint. The leaves are few, mostly reduced to loose open sheaths. The spikelets are globular and sessile, contained in a partially enclosing bract which is continuous with the stem. The floral glumes are very broad, obtuse to orbicular.

The four specimens at WA Herbarium are on Loan to Karen Wilson.

Flowering Period: ?August

Distribution and Habitat

WAHerb records collections from Tutanning, Bellvue and south of Ravensthorpe (presumed Mt Desmond). The type is from near the Swan River. No information is available on habitat but it is possibly variable. Extensive survey (across the south west) is required.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent survey						

WAHerb: 4 records (specimens on loan to Karen Wilson)

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

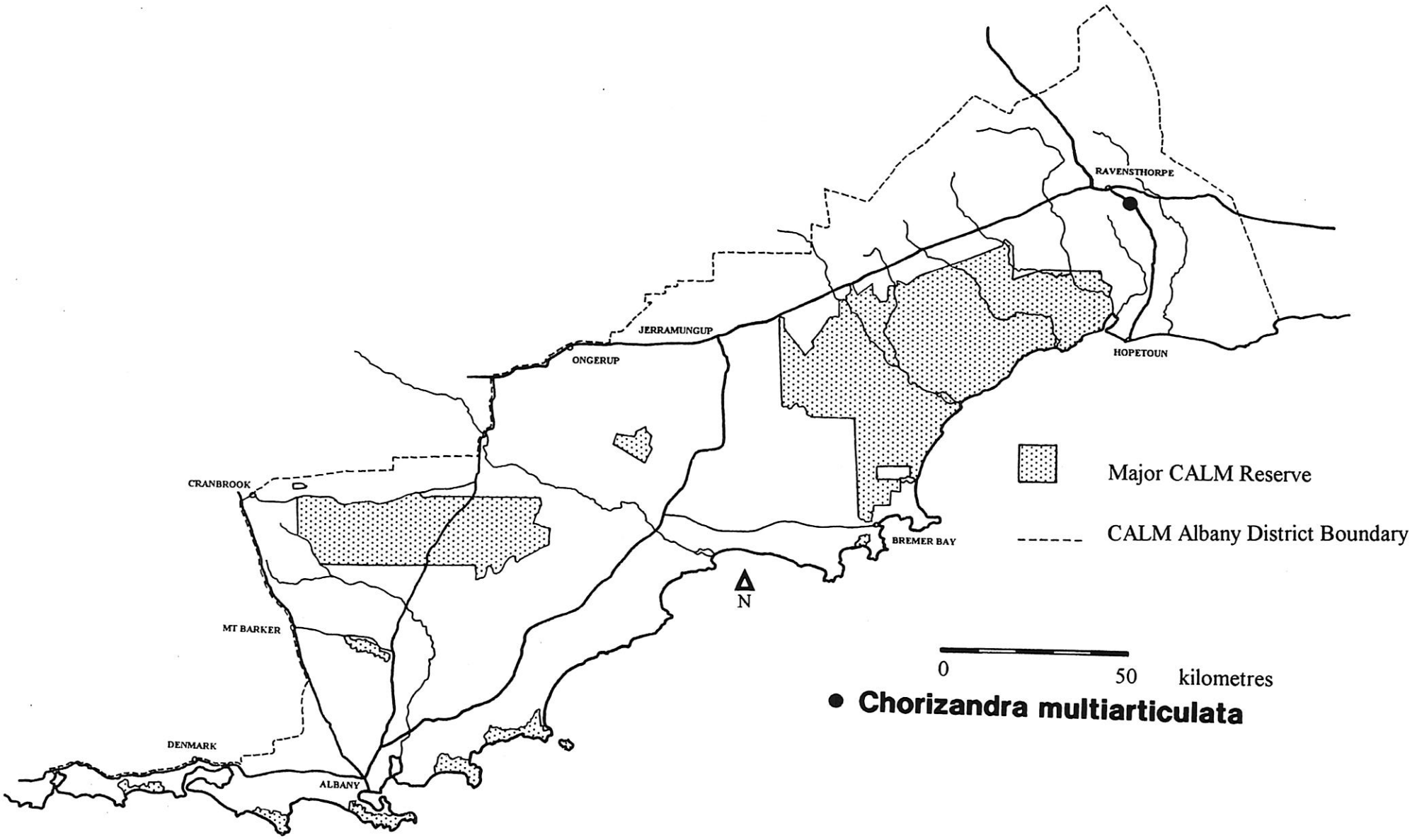
Unknown

Management Requirements

Cannot be determined until further survey is carried out

Research Requirements

Extensive survey (Perth to Ravensthorpe) is essential to establish range and habitat and any possible threats


RAVENSTHORPE
JERRAMUNGUP
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
Chorizandra multiarticulata

Chorizema carinatum (Meisn.) J.M.Taylor & Crisp. PAPILIONACEAE

Chorizema carinatum is an erect or spreading shrub 30-60 cm tall. The branches are slightly striate and glabrous when mature. The alternate leaves are ovate-elliptic to oblong, 7-15 mm long and 2-4 mm wide, very shortly petiolate and with a reflexed mucronate tip. The under surface of the leaf is shortly hairy, the upper minutely scabrous to occasionally glabrous. The stipules are minute and caducous. The inflorescence is an erect terminal raceme of 6-10 yellow, pilose flowers. The pedicels are 2-4 mm long with 4-5 mm bracts and subulate bracteoles; both caducous. The 8-10 mm calyx with almost equal lobes is covered with loosely appressed golden and long pale hairs. The corolla, which scarcely exceeds the calyx has a reniform standard, obovate wings and a saccate, broad ovate keel. The style is gently incurved with short hairs on the adaxial edge. The seed pod is shortly stipitate, ovoid and hirsute and has 8-10 ovules.

Flowering Period: October-November

Distribution and Habitat

This species is wide spread from Cranbrook and Kendenup, through the Stirling and Porongurup Ranges to Cape Riche and Jerramungup. It grows in Eucalypt woodland in sand or sandy clay.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No survey						

WAHerb: 1 record (Taylor & Crisp's revision cites many collections which either have not been returned to Perth or are not data based.)

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

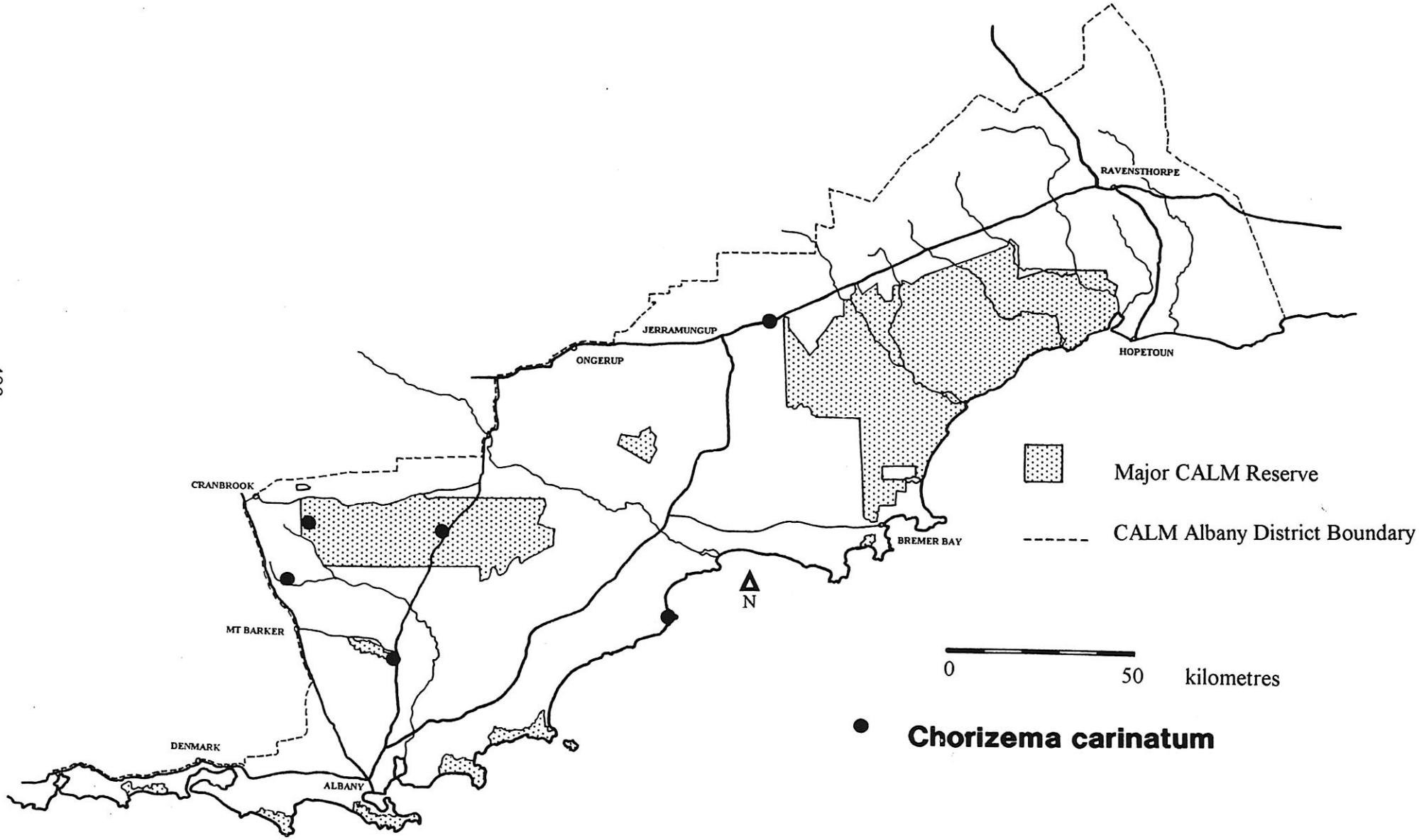
Cannot be determined until surveyed.

Research Requirements

- survey to record location, numbers, land tenure and possible threats
- determine response to dieback

References

Taylor and Crisp (1992).


RAVENSTHORPE
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BREMER BAY
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
Chorizema carinatum

Chorizema trigonum Turcz. PAPILIONACEAE

Chorizema trigonum is an erect shrub, 30-60 mm tall with rigid, angular branches which are usually three-sided and mostly glabrous or with scattered hairs. The alternate leaves are sparse, very narrow ovate to almost linear, 20-60 mm long and 4-25 mm wide, with or without a recurved mucro and with strongly reticulate venation. The petioles are 1.5-3 mm long with setaceous stipules. The inflorescence is a terminal or upper axillary raceme of 5-12 orange-pink/red 15 mm flowers. Pedicels are 3-5 mm long with acute ovate bracts. The standard is very broad-ovate with a large yellow blotch above the claw. The wings are ovate-spathulate and strongly curved and auriculate; the keel is obliquely ovate. The 6 mm calyx is hirsute with scattered, short appressed hairs and has the upper two lobes shortly united. The ovary is silky hairy with a capitate stigma, producing 20-24 seeds.

Flowering Period: September-October

Distribution and Habitat

This species is widely distributed across coastal areas of FRNP and inland along the Old Ongerup Road, and to Kundip and SE of Ravensthorpe. A 1903 Cecil Andrews record is from "east of the Stirling Range, north of Albany". It grows in mallee heath or shrubs on sandy clay. Further survey is considered likely to reveal a wider and more common distribution.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
(1) Old Ongerup Rd	Albany	Rav	Shire res.	9.83	occasional.-WH	-

WAHerb: 5 records (Taylor and Crisp cite 8 selected specimens)

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

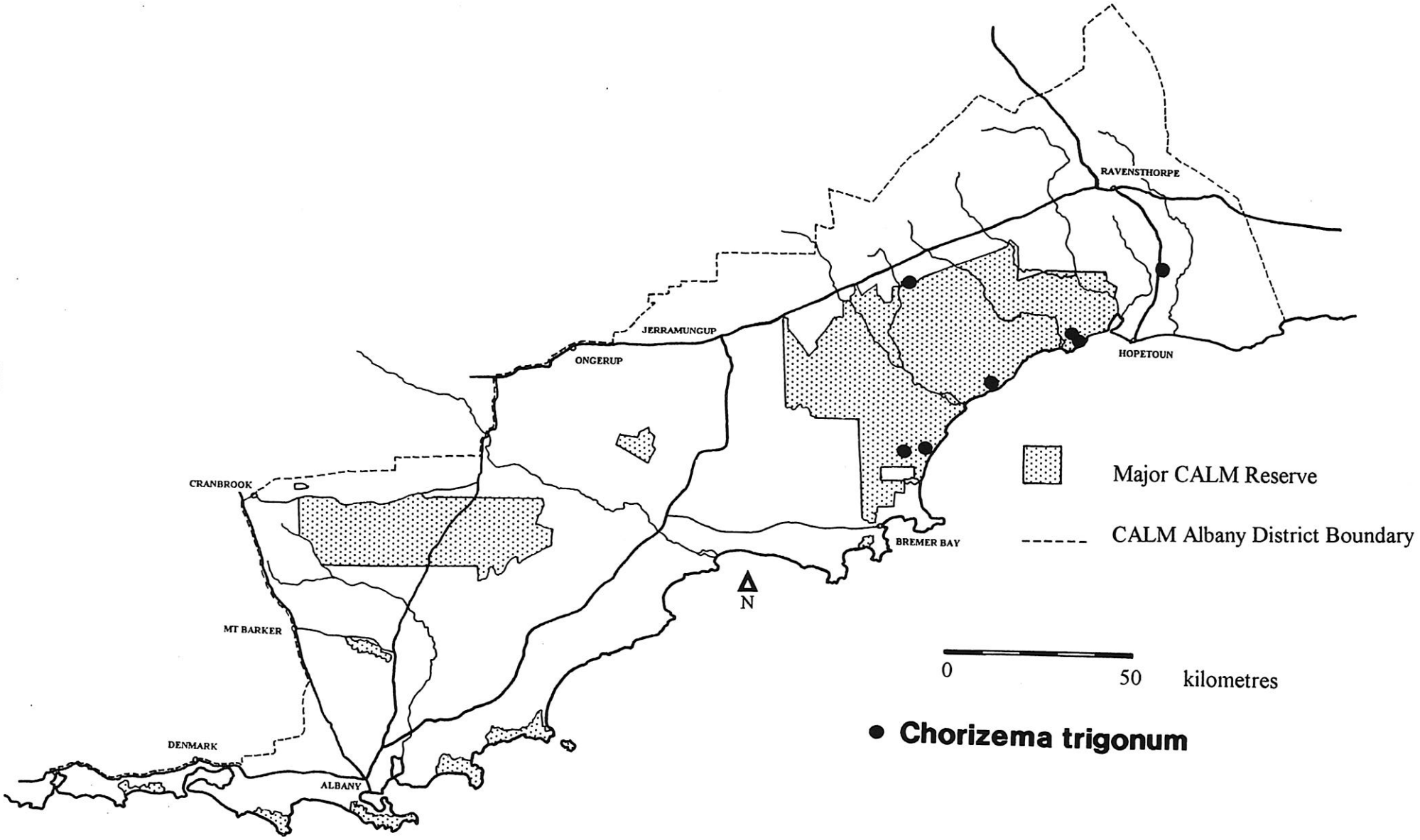
Cannot be determined until further detailed survey.

Research Requirements

- survey WAHerb and Taylor and Crisp locations
- survey for new locations
- determine response to dieback

References

Taylor and Crisp (1992).


RAVENSTHORPE
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CRANBROOK
BREMER BAY
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ALBANY
Major CALM Reserve
CALM Albany District Boundary
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50
kilometres
Chorizema trigonum

Chorizema ulotropis J.M.Taylor & Crisp PAPILIONACEAE

Chorizema ulotropis is a straggling shrub to 45 cm with slender, wiry, glabrous branches. The sparse leaves are alternate or sub-opposite, linear acute, 8-20 mm long and 1 mm wide with revolute margins, an acute mucronate tip and reticulate venation around a prominent midrib. Petioles are less than 1 mm and without stipules. The inflorescence is a terminal raceme 10-15 mm with up to 10 flowers. The 6-8 mm calyx is covered with long spreading grey or white hairs; the lobes are acute tipped with the upper two united. The pedicels are less than 1 mm and have caducous ovate bracts. The 10 mm standard is depressed ovate, orange-yellow with markings and dark red-brown on the reverse. The 10 mm yellow and red brown curved wings are obovate-spathulate. The keel is narrow-ovate and becoming long attenuate and curled up at the apex; it is orange near the claw becoming red-brown to the apex. The ovary is silky hairy, the pod becoming turgid round with 12-14 seeds developing. The stigma is short and capitate.

Flowering Period: August-September

Distribution and Habitat

Most specimens of this species have been collected around Jerramungup with a solitary specimen from the Young River. It grows, often tangled amongst other shrubs in heath on sand, sandy gravel or quartz gravel.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No survey						

WAHerb: 7 records (on loan)

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

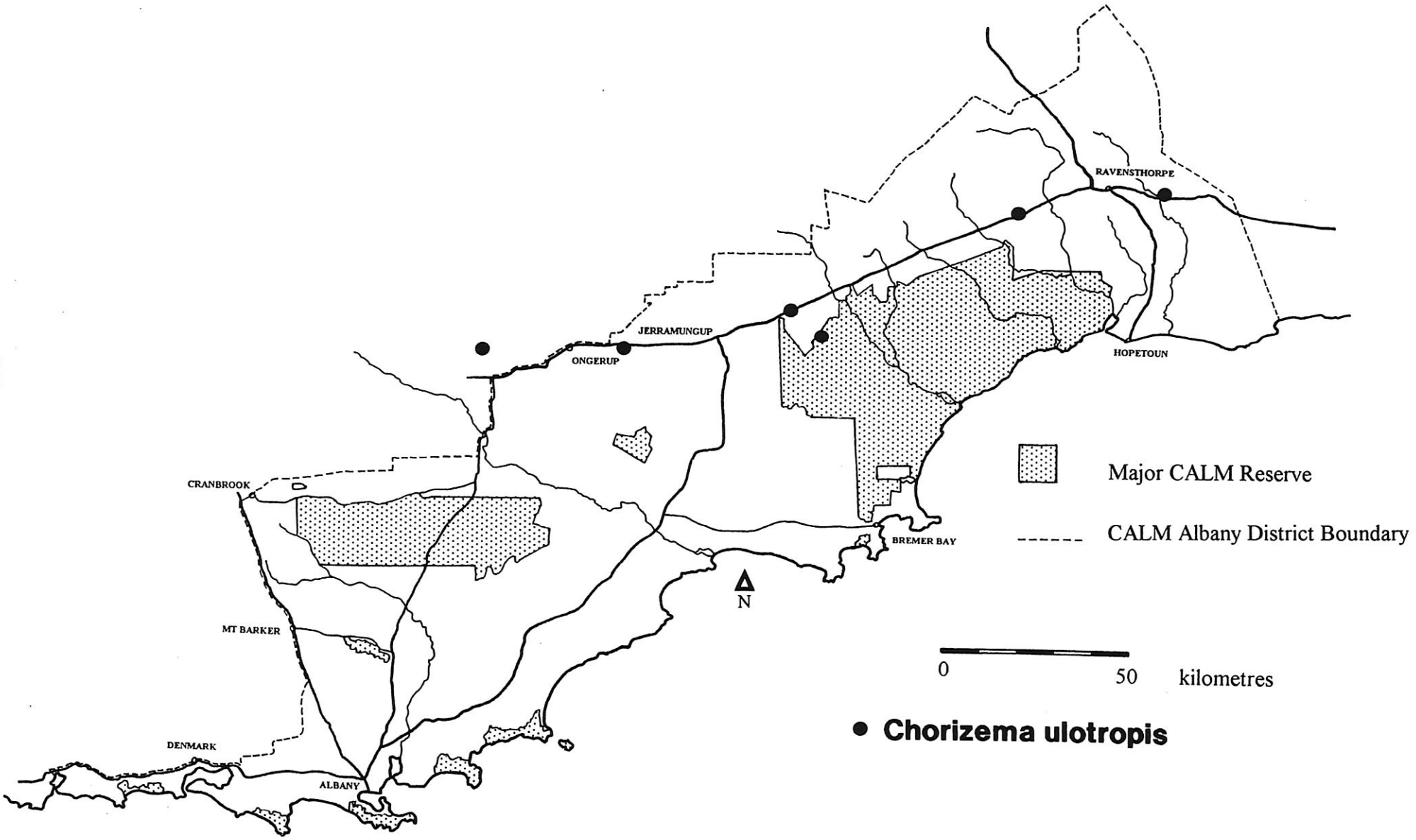
Cannot be determined until survey information is available.

Research Requirements

- resurvey WAHerb and Taylor and Crisp locations
- survey for new locations
- determine response to dieback

References

Taylor and Crisp (1992).


RAVENSTHORPE
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ALBANY
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
Chorizema ulotropis

Cypselocarpus haloragoides (F.Muell. ex Benth.) F.Muell.

Cypselocarpus haloragoides is a dioecious, prostrate, short lived herb with stems up to 45 cm. The 7-27 mm leaves are narrowly lanceolate to linear-terete, acute to obtuse and somewhat succulent with inconspicuous stipules. The male flowers of 8-10 squat stamens (without petals), whorled on a smooth disc are in erect axillary and terminal racemes with leaf like bracts. The male calyx is 1.5 mm and pedicels 1 mm. The female flowers are solitary, axillary on pedicels up to 1 mm long, without petals and composed of the cylindrical 2 mm papillose ovary and the tri-lobed stigma divided into many papillae. The 4-6 mm long fruit is barrel-shaped, basally hollow and broad, constricted above with an oblique apex.

Flowering Period: September-October

Distribution and Habitat

The monotypic genus *Cypselocarpus* is endemic to south western Australia, the type being collected by Maxwell from the Oldfield River (?1850's). It is a widespread species, collected from Israelite Bay, Cape Arid, Cape LeGrande, Esperance, Jerdacuttup, FRNP, Bremer Bay to the Stirling Range. It occurs in mallee heath on sandplain and coastal foredunes, usually following fire or soil disturbance

Given its range, the number of collections made despite the fact that it is short lived, and that there appears to be no immediate threat, this species should be considered for removal from the Priority Flora List.

Conservation Status

Current: Priority 3 Recommended: Remove from Priority Flora List

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent survey						

WAHerb: 22 records

Response to Disturbance

Soil disturbance and fire promotes germination of seed stored in the soil

Susceptibility to *Phytophthora* Dieback

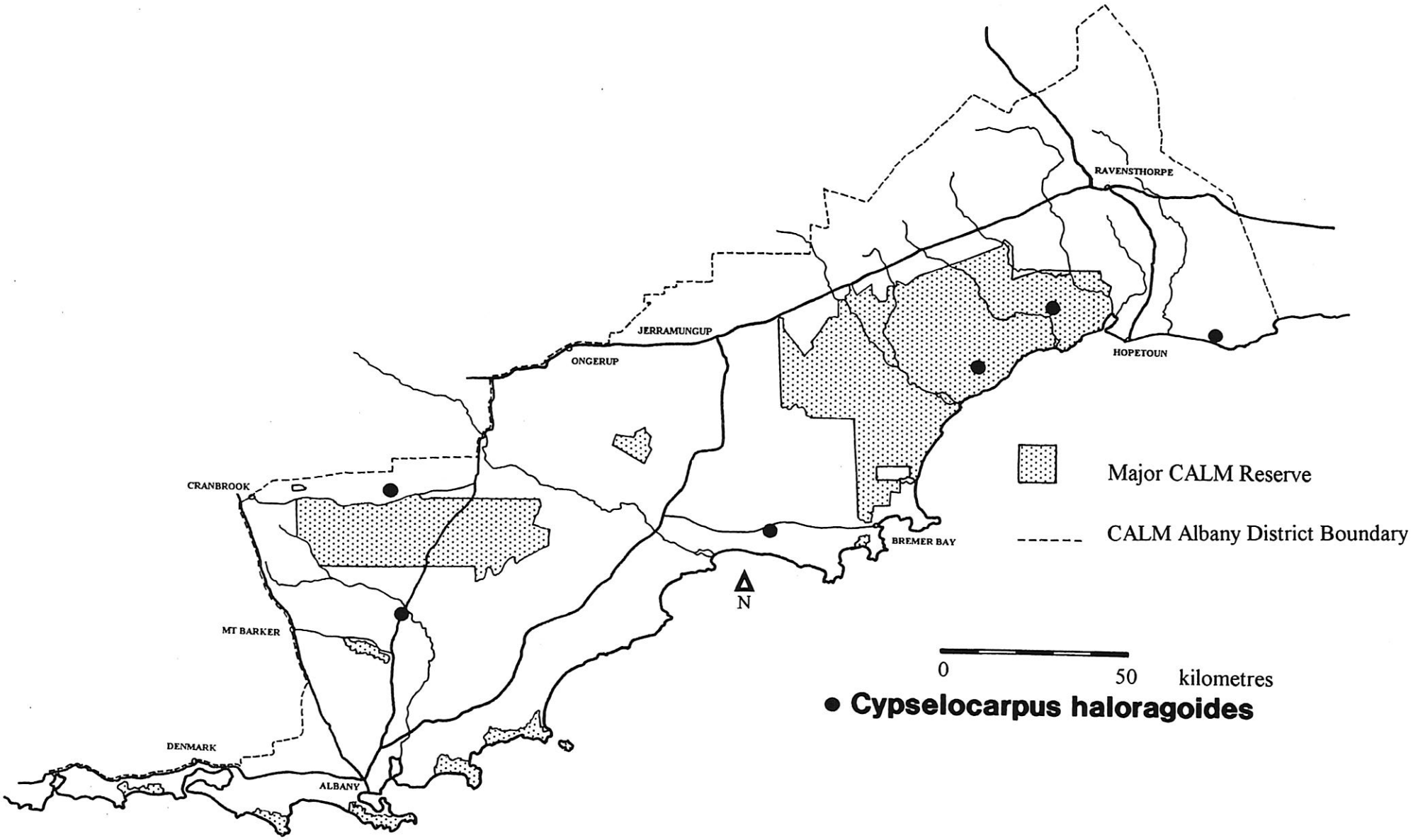
Presumed not susceptible

Management Requirements

Research Requirements

References

George (1982).


RAVENSTHORPE
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CRANBROOK
BREMER BAY
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DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
● Cypselocarpus haloragoides

Dodonaea trifida F.Muell. SAPINDACEAE

Dodonaea trifida is a dioecious, straggly shrub to 1 m. The 7-12 mm long by 4-10 mm wide leaves are sessile, tri-dentate above the middle; entire and revolute below the middle and cuneate at the base. The inflorescence is a 3-5 flowered terminal cyme. Both male and female flowers on 1-2 mm pedicels are inconspicuous without petals. The four to six sepals are 1.6-4.3 mm long and linear lanceolate to elliptic. The male flower has eight stamens; the female a densely pilose ovary. The conspicuous fruit is a three angled subglobose capsule, obovate or broadly angular-obovate in lateral view. It is 7-10 mm long, 7.5-10 mm wide, sparsely pilose with 1-2.5 mm lobe-like appendages above the middle . The capsule is septifragally dehiscent.

Flowering Period: August (fruits November)

Distribution and Habitat

This species has been collected from six locations, from east of Ravensthorpe to Mount Melville at Cape Riche. It occurs in red loam over laterite or spongolite. It forms an understorey to tall mallets (e.g. *E. newbeyi* and *E. redacta* at Beaufort Inlet).

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Cape Riche Tip	Albany	Alb	Shire res.	3.11.92	+50	healthy
2. Millers Point	Albany	Jer	Shire res.	17.11.92	+300	healthy

WAHerb: 10 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

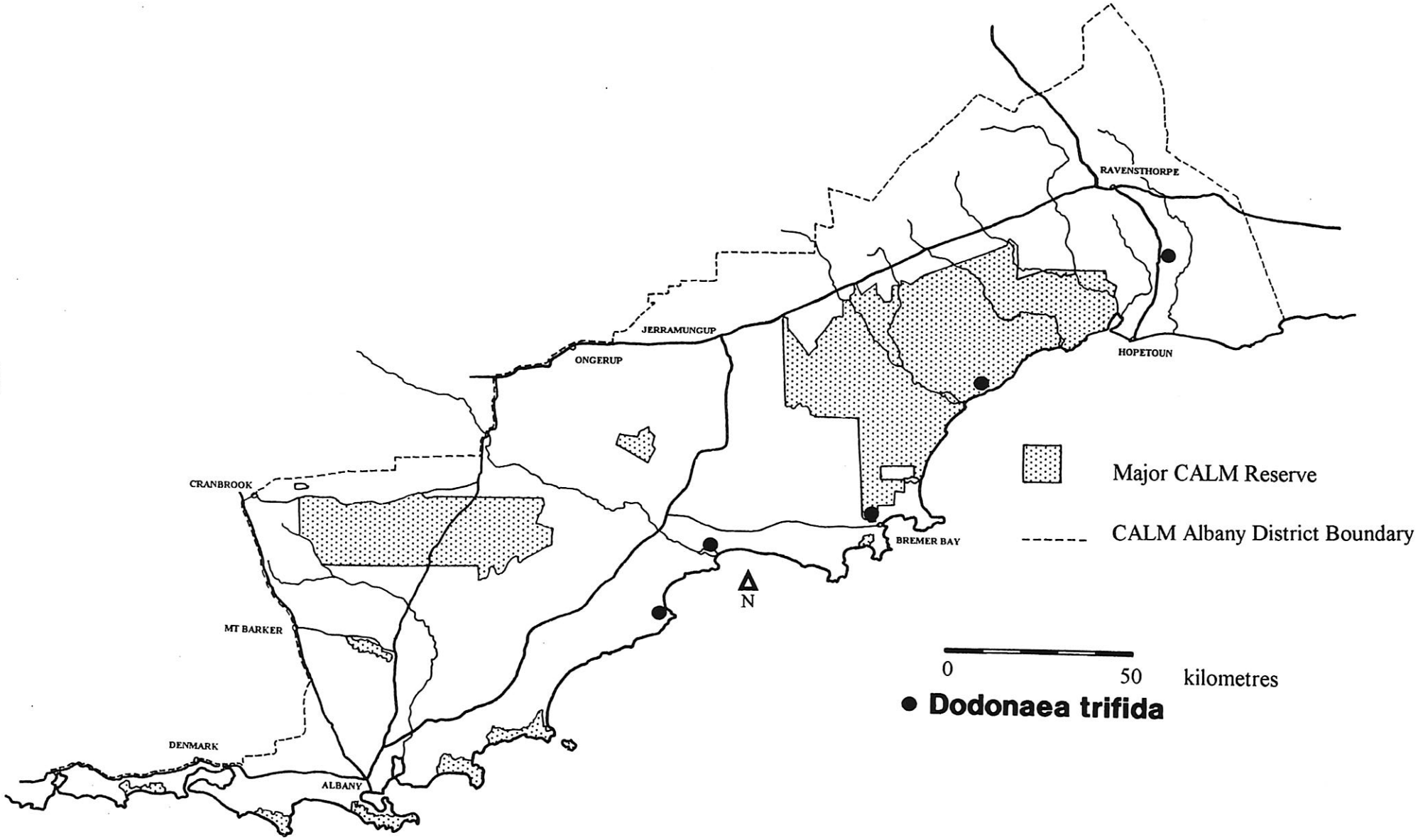
Monitor occasionally

Research Requirements

- relocate and survey Ravensthorpe Range and FRNP populations
- survey opportunistically for new populations

References

West (1985).


RAVENSTHORPE
JERRAMUNGUP
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CRANBROOK
BREMER BAY
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ALBANY
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
Dodonaea trifida

Eucalyptus acies Brooker

MYRTACEAE

Woolbernup Mallee

Eucalyptus acies is a smooth barked, several stemmed mallee shrub to 2.5 m tall. The young branchlets are flattened and quadrangular. The thick, glossy green adult leaves are broad lanceolate, symmetrical to slightly falcate and arranged in mostly opposite pairs, 6-13 cm long and 2-3 cm wide with a 1.5-3 cm peduncle. The juvenile leaves are dull blue-green. The inflorescences are axillary, seven flowered umbels on a very flattened peduncle, 2.5 cm long, often recurved and broader at the top. The pedicellate 11 mm buds are slightly ribbed with very flattened opercula. The opercula turn red at the time of flowering. The fruits are flattened hemispherical with a thick rim and broad disc and several prominent ridges. the three valves are included.

Flowering Period: September-November

Distribution and Habitat

The Woolbernup Mallee has a scattered distribution from Norman's Beach (Manypeaks) to Woolbernup Hill in FRNP. It occurs in loam and sand over granite or quartzite (FRNP) in mallee scrub. It is known from at least nine general locations, some with several populations and none considered to be under immediate threat. It should reduced on the Priority Flora List to Priority 4.

Conservation Status

Current: Priority 3 Recommended: Priority 4

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. South Sister	Albany	Alb	NR	4.3.93	+50	healthy
2. Bluff Creek	Albany	Alb	verge	2.11.92	+200	healthy
3. Cheyne Bch Rd	Albany	Alb	verge	23.9.92	+10	healthy

WAHerb: 34 records

Response to Disturbance

Likely to resprout from lignotuber

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

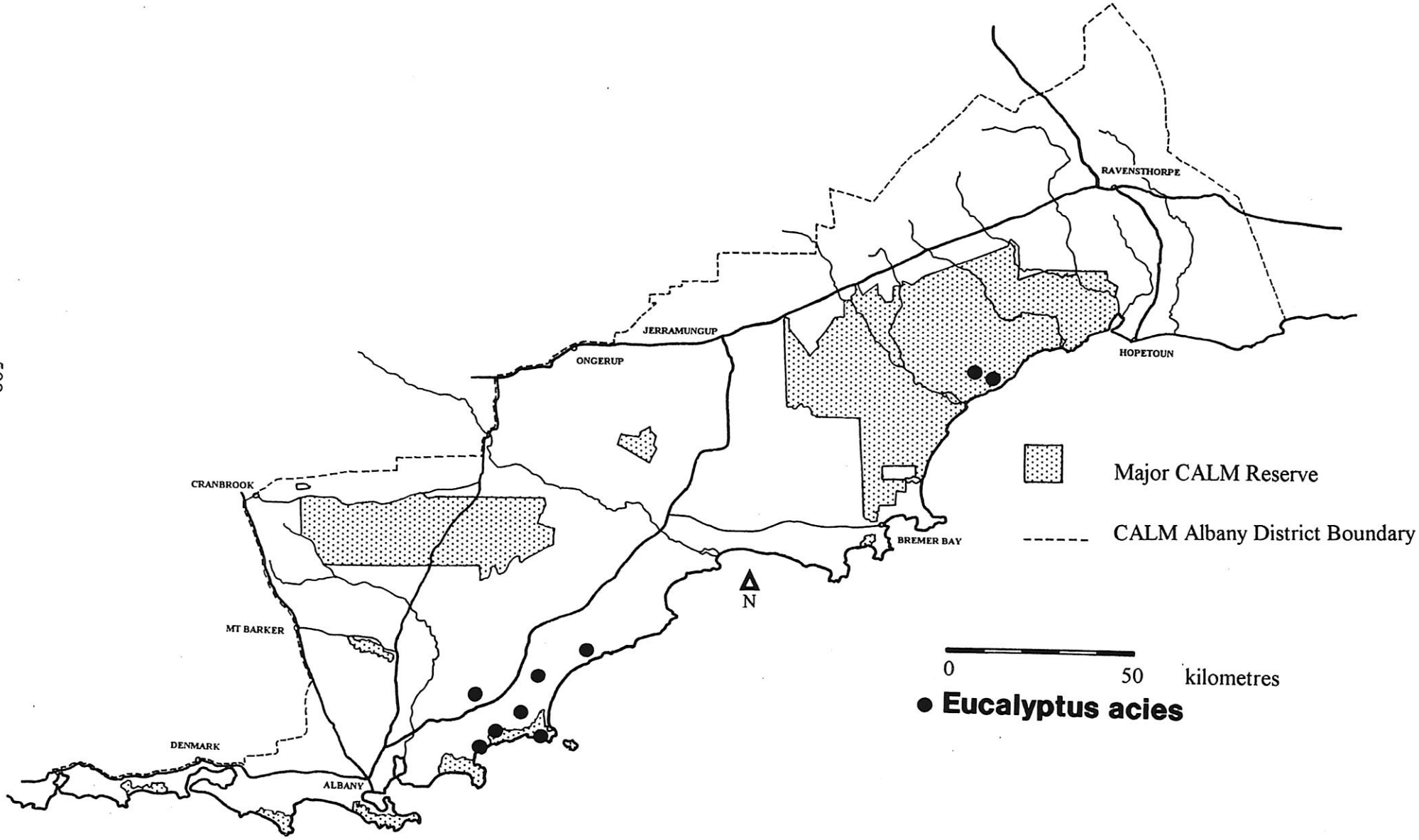
- monitor occasionally
- reduced to Priority 4

Research Requirements

Survey opportunistically

References

Brooker (1972).


RAVENSTHORPE
JERRAMUNGUP
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BREMER BAY
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CALM Albany District Boundary
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kilometres
Eucalyptus acies

Eucalyptus newbeyi D.J.Carr & S.G.M.Carr MYRTACEAE

Beaufort Inlet Mallet

This Eucalypt, in the series Cornutae, is very similar to *E. megacornuta*, *E. bennettiae* and *E. talyuberlup*, but differs from the first two in having a smooth operculum and from *E. talyuberlup* in having fewer, wider (up to 7) buds. All these species are distinguished from *E. lehmannii* by having unfused flowers and fruits. *E. newbeyi* is a tall mallet to 8 m; the single trunk is smooth barked of colour varying from light grey to coppery. The leaves are dark green glossy, 6-7 cm long by 1.5 cm wide. The buds are sessile, with a smooth horn shaped operculum up to 4 cm long. The tri-locular fruits are obconical to campanulate, 2-3 cm across, with a thick rim and broad disc, radially ribbed and with ascending lobes.

Flowering Period: September-February

Distribution and Habitat

E. newbeyi has a disjunct distribution being known from only three locations near Beaufort Inlet and one location 80 km north east along the Suzetta River (FRNP). One plant has been located at Mt Drummond (Natham McQuoid, pers. comm.). It occurs in spongolitic red loam on river or creek slopes (breakaways), usually in association with other mallets or trees of similar stature.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Suzetta River	Albany	Jer	NP	1.88	-	-
2 Beaufort Inlet	Albany	Jer	Shire res.	17.11.92	+300	healthy
3. Boat Harbour	Albany	Alb	UVR	16.11.92	+500	healthy
4. Swan Gully	Albany	Alb	UVR	16.11.92	+1000	healthy

WAHerb: 10 records

Response to Disturbance

May be killed by intense fire

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

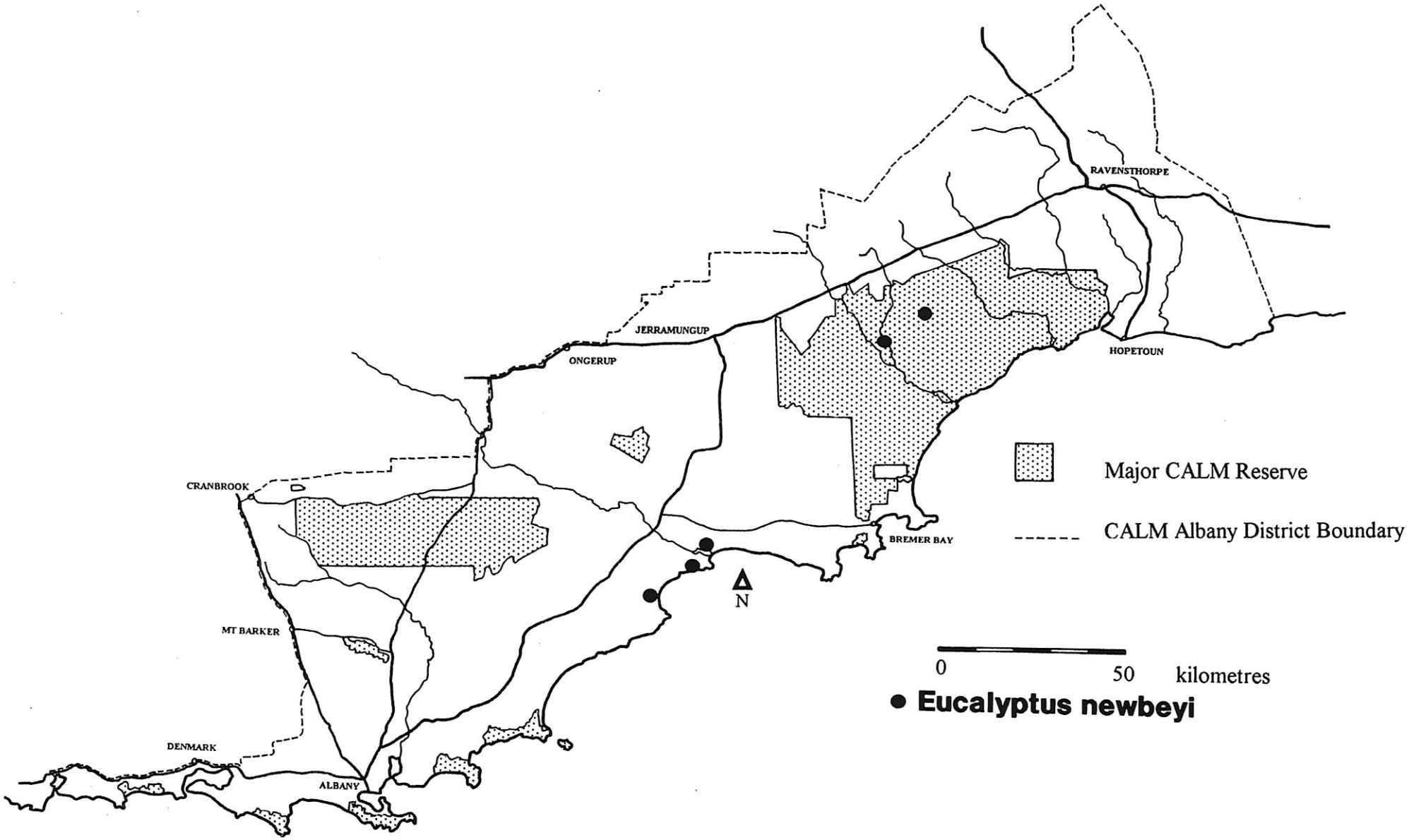
Monitor occasionally

Research Requirements

Survey opportunistically for new populations

References

Carr and Carr (1980).


RAVENSTHORPE
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BREMER BAY
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
Eucalyptus newbeyi

Gastrolobium brownii Meisn. PAPILIONACEAE

Albany Poison

Gastrolobium brownii is a an erect shrub to 2.5 m tall, with softly pubescent or villous leaves. The 20 mm leaves are oblong (6 mm wide), rounded toward the tip and tapered to the base; mucronate with a short point and conspicuously reticulate. The leaves are in whorls of three. The inflorescences, heavily crowded on the upper branches, are axillary racemes (15 mm rachis) of up to six flowers each. The orange standard is 8 mm across, the wings yellow-orange 5 mm enclosing a red keel. The 3 mm calyx is sparsely pubescent; the 3 mm ovary is densely pubescent. This species contains sodium fluoroacetate (poison) which will kill sheep or cattle if ingested.

Flowering Period: September-November

Distribution and Habitat

Gastrolobium brownii occurs on and around granite outcrops in sandy loam as an understorey to Jarrah and Marri. It has been collected at Mt Frankland (National Park), near and on Mehniup Hill (Nature Reserve), Mt Lindesay (proposed National Park), Willyung Hill, and other locations west of Denmark.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Kent River	Albany	Dnmk	verge	8.88	common	-
2. Willyung	Albany	Alb	private	10.11.82	common	in flower
3. Mt Lindesay 3 locs	Walpole	Dnmk	NP	9.92	widesprd	healthy
4. MehniupHill	Albany	Dnmk	NR	20.8.93	+200	healthy

WAHerb: 16 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

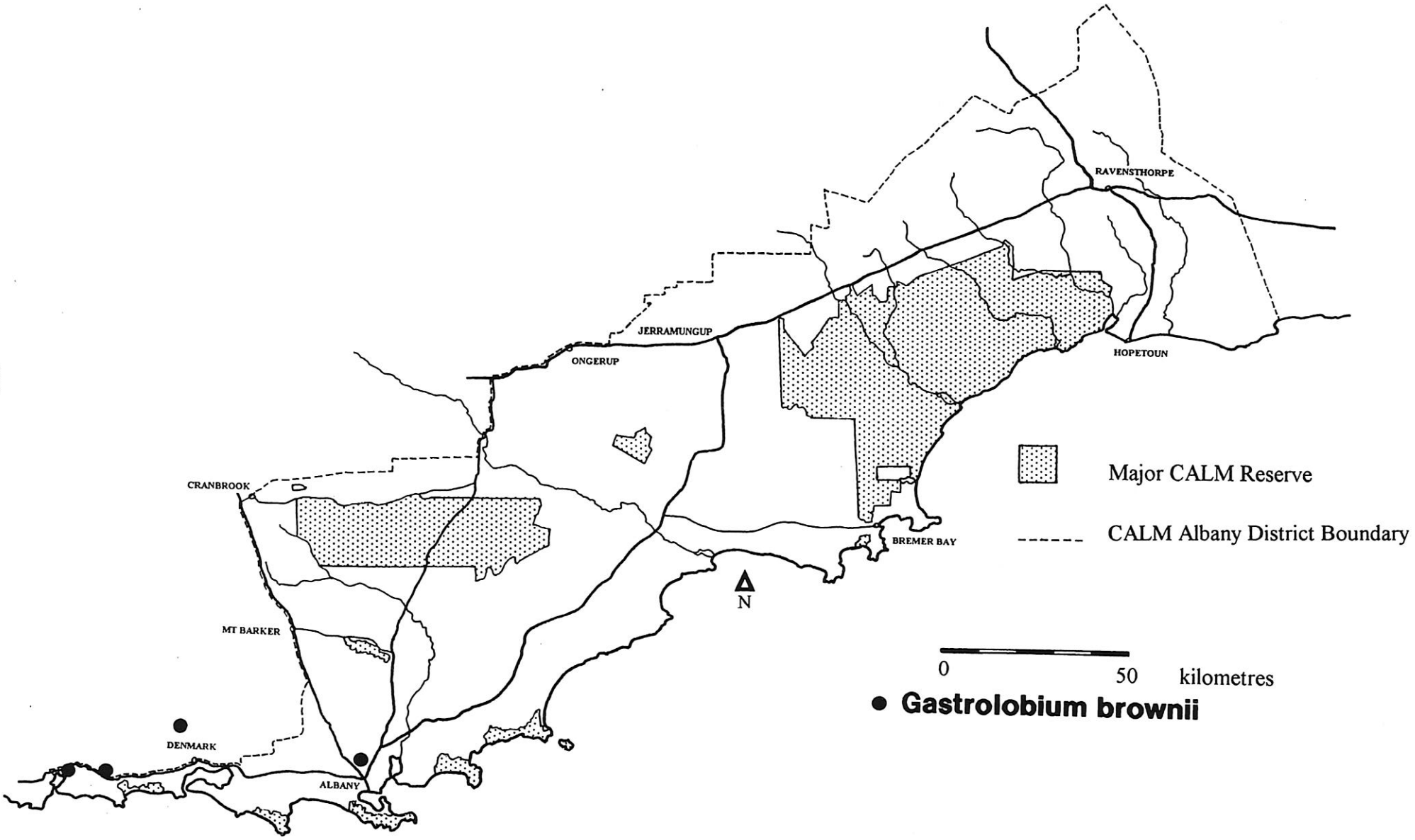
Monitor known populations

Research Requirements

Survey opportunistically for new locations

References

Bentham (1864).


RAVENSTHORPE
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BREMER BAY
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
Gastrolobium brownii

Gastrolobium racemosum (Turcz.) Crisp PAPILIONACEAE

Gastrolobium racemosum is a erect compact to open shrub to 1 m. The olive green leaves are in opposite pairs, shortly petiolate (5 mm), oval-oblong (50 mm long by 14-20 mm wide), markedly reticulate with a very short point. The upper leaf surface is glossy. Small stipules to 1.5 mm are persistent. The inflorescence is a terminal raceme, up to 100 mm long of up to 20 orange and red flowers. The standard is 10 mm across, wings and keel shorter, pedicel 3 mm and calyx glabrous with the upper two lobes shortly united. The fruits are glabrous broadly ovate 10 mm pods with 8-10 ovules developing into fewer seeds.

Flowering Period: October-November

Distribution and Habitat

This species is widespread (44 WAHerb records) in FRNP, Ravensthorpe Range and the area between Ravensthorpe and FRNP. It occurs in mallee heath or scrub on gravelly to stony clay loam soils. One collection was made at Lort River Station.

This species is both common and secure in conservation land, possibly favoured by disturbance, and should be deleted from the Priority Flora List.

Conservation Status

Current: Priority 3 Recommended: Remove from Priority Flora List

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
(1) Kundip	Albany	Rav	VCL	15.12.92	+100	in flower

WAHerb: 44 records

Response to Disturbance

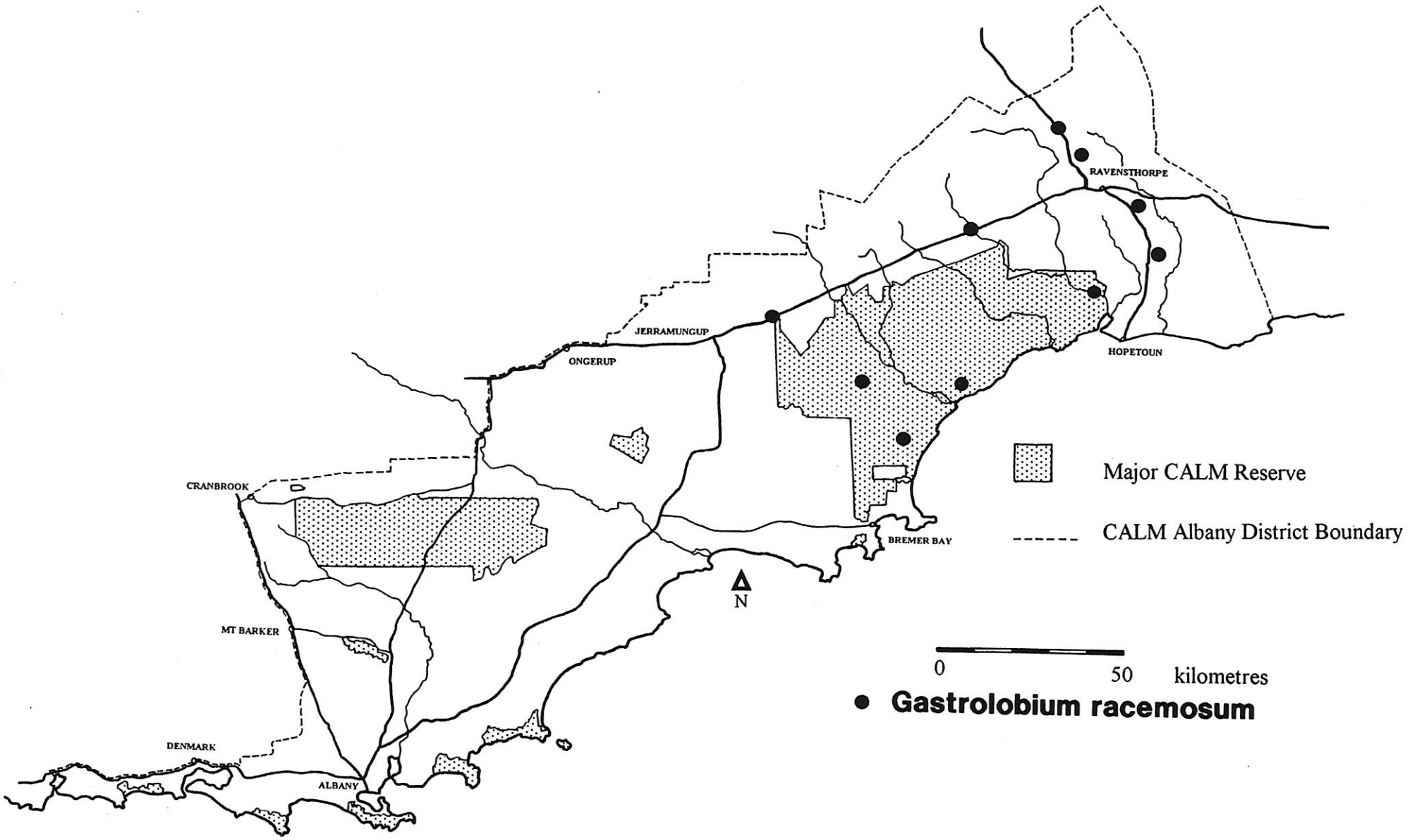
Regenerates from seed after fire (Kundip firebreak; rolled and burnt)

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

Research Requirements


RAVENSTHORPE
HOPETOUN
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BREMER BAY
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
Gastrolobium racemosum

Gastrolobium stenophyllum Turcz. PAPILIONACEAE

Phillips River Poison

Gastrolobium stenophyllum is an erect open shrub to 2.5 m with silky-pubescent branches. The very crowded leaves (25-30 mm long) are alternate or irregularly verticillate, very narrowly linear (3 mm wide), folded inwards or with the margins involute and are obtuse with a minute point. The leaves are dull green and conspicuously reticulate. The inflorescence is a cylindrical terminal raceme, 20 mm long with up to 15 or more shortly pedicellate blooms. The 4 mm calyx is silky pubescent with the lobes as long as the tube. The standard is orange-yellow to 5 mm across, the 4 mm wings yellow and red keel 4 mm.

Flowering Period: September-November

Distribution and Habitat

This species occurs around the Fitzgerald and Phillips River valleys and north of Ravensthorpe. A collection from Bruce Rock (in WAHerb) appears to be a similar but distinctly different taxon. It occurs in coarse sandy soils over spongolite or brown loam over granite, usually in river beds in association with other shrubs. It may be more widespread within FRNP than current WAHerb collections indicate.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Fitzgerald Inlet	Albany	Rav	NP	10.5.92	abundant	-
2. Twertup	Albany	Jer	NP	20.11.77	rare	in flower
3. WNW Ravensthorpe	Albany	Rav	private	10.89	20-50	in flower
4. Twertup Trib	Albany	Jer	NP	9.9.93	+30	in flower

WAHerb: 19 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

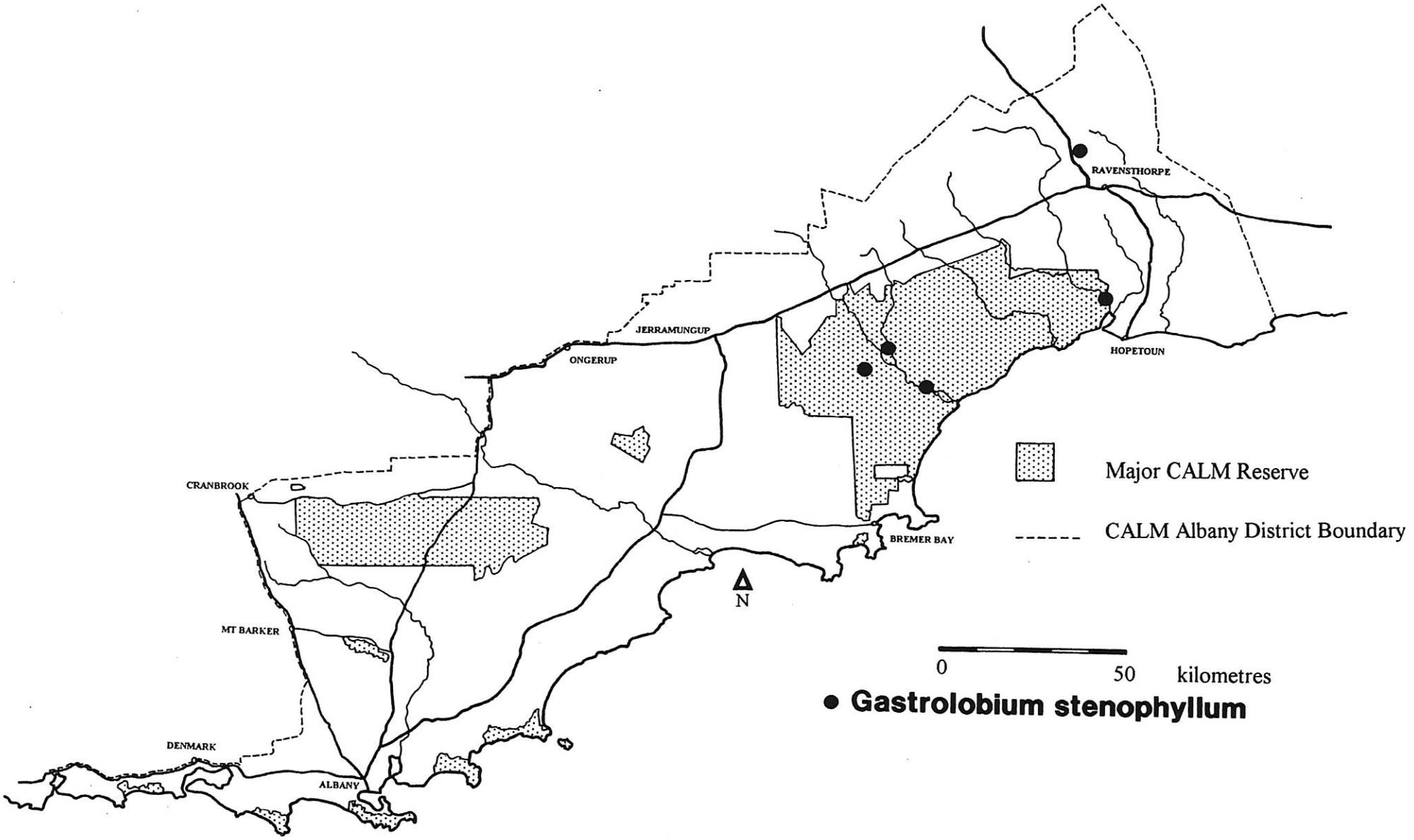
Monitor occasionally

Research Requirements

Survey opportunistically for new populations

References

Bentham (1864).


RAVENSTHORPE
HOPETOUN
JERRAMUNGUP
ONGERUP
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
N
Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Gastrolobium stenophyllum

Grevillea depauperata R.Br. PROTEACEAE

Grevillea depauperata is a low spreading shrub to 1 m high. The subsessile alternate dark green leaves 8-18 mm long (and occasionally much longer), are lanceolate (5 mm wide) with recurved, crinkled margins and silky pubescent below, and are crowded toward the branch ends. The bright red pedicellate (10 mm) flowers are few to several in axillary or terminal, erect umbels, usually on short branchlets. The style and broadly oblique pollen presenter are exserted 6 mm from the 12 mm perianth. The perianth has scattered hairs on the outside.

This species name is synonymous with and takes precedence over *G. brownii*, from which it was previously distinguished by having few flowers (not several) per raceme. This distinction is minor and the two species are regarded as the same by McGillivray (1993). WAHerb has only 13 records of *G. brownii*, many from the same or similar locations as *G. depauperata*.

Flowering Period: July-October

Distribution and Habitat

This species is widespread, having been collected from Cranbrook, Mt Barker, Rocky Gully, Tenterden, Porongurup and Ledge Beach-Mt Martin area. It occurs in gravelly loam, as an understorey to Jarrah-Marri woodland. *G. brownii* has been collected from the Stirling Range, Porongurup, Mt Barker and Ledge Point (Beach).

They are both already widely collected from conservation and other land and are not under any known threat and should be removed from the Priority Flora List.

Conservation Status

Current: Priority 3 Recommended: Remove from Priority Flora List

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Mt Martin	Albany	Alb	Town	9.92	frequent	in flower
2. Mt Barker Lookout	Albany	Pl	Shire res.	20.10.92	+500	in flower
3. Porongurup W	Albany	Pl	-	12.5.79	common	-
4. Porongurup Nth	Albany	Pl	NP	24.7.92	+200	in flower
5. Porongurup Sth	Albany	Pl	NP	24.7.92	+200	in flower

WAHerb: 25 records (plus 13 records of *G. brownii*)

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

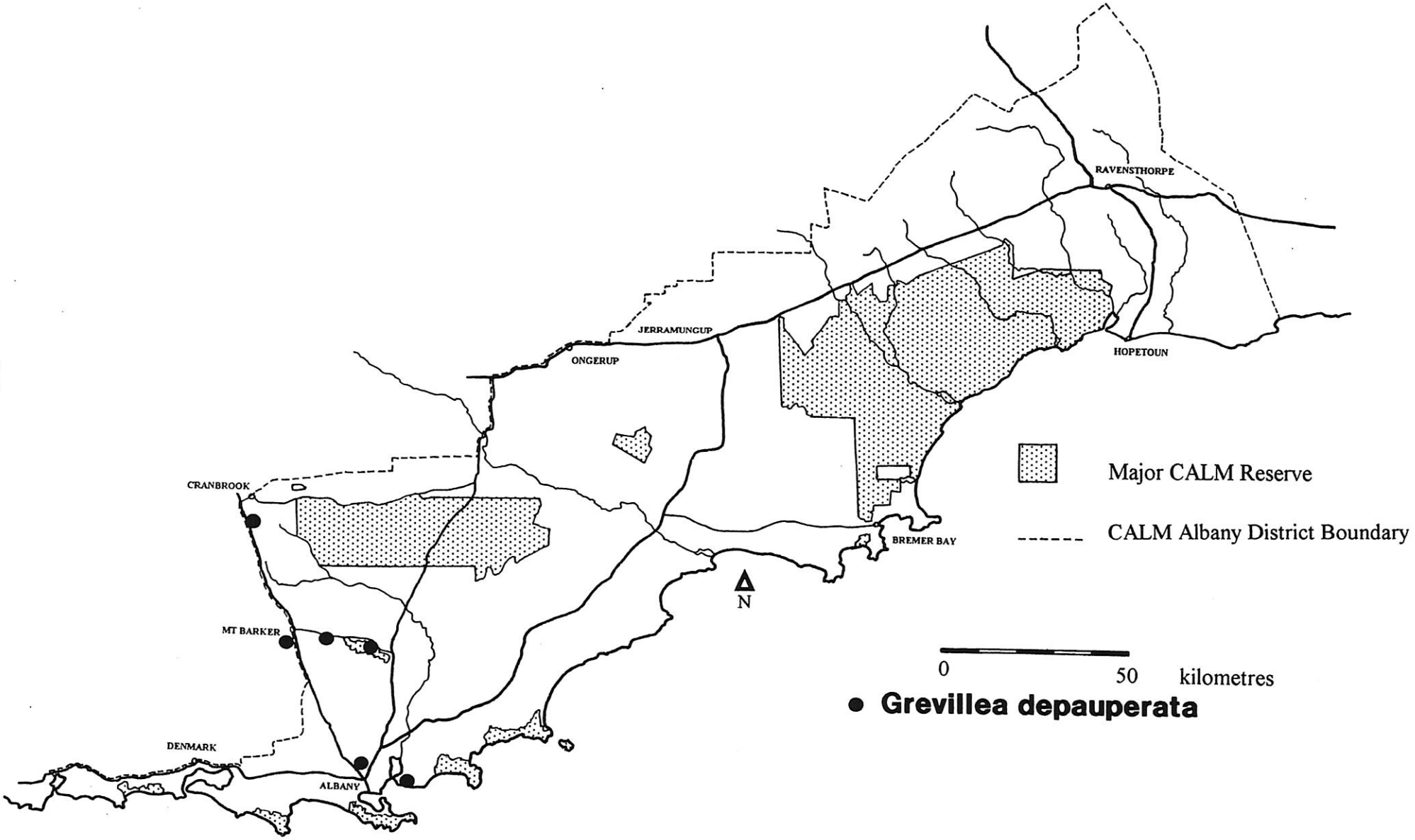
Unknown

Management Requirements

Research Requirements

References

Brown (1830), McGillivray and Makinson (1993).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Grevillea depauperata

Grevillea fulgens C.A.Gardner PROTEACEAE

Grevillea fulgens is a sprawling shrub with a short stem and several erect divaricate branches to 2.5 m. The olive green leaves are very narrow linear (80 mm by 1.5 mm), shortly pointed and with leaf margins markedly revolute to the lower midvein. The leaves are reflexed and confined to short branchlets (60 mm long, 1 mm in diameter) growing from the thicker leafless branches (from 4 mm diameter). The flowers are on few flowered umbel like axillary racemes on the thin branchlets. The pedicels are densely rusty hairy; the bright pink perianth (12 mm tall) is glabrous except for long white hairs on the lobes of the perianth. The ovary is densely pubescent with white hairs at the base and rusty-red hairs up the exserted style (20 mm) to the oblique pollen presenter.

Flowering Period: July-December

Distribution and Habitat

This species is confined to the Ravensthorpe Range with most collections being made around Mt Desmond and The Elverdton Mine and Mt Short. It grows on ridges, hills or slopes in gravel or gravelly loam over laterite or greenstone in association with mallee heath or scrub. Many collections have been made in old regenerating gravel pits. More extensive survey along mining survey grid lines is considered likely to reveal more populations within the range.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Mt Desmond	Albany	Rav	VCL	15.12.92	+100	in flower
2. Mt Iron Track	Albany	Rav	VCL	16.12.92	+12	in flower
3. Elverdton Rd N	Albany	Rav	VCL	15.12.92	10	in flower
4. Mt Short	Albany	Rav	WAWA	6.76	frequent	-
5. Elverdton Rd S	Albany	Rav	VCL	8.9.93	5	old

WAHerb: 19 records

Response to Disturbance

Soil disturbance in gravel pits has favoured this species

Susceptibility to *Phytophthora* Dieback

Unknown; possibly moderate to high (dead/dying plants observed in south Elverdton road gravel pit)

Management Requirements

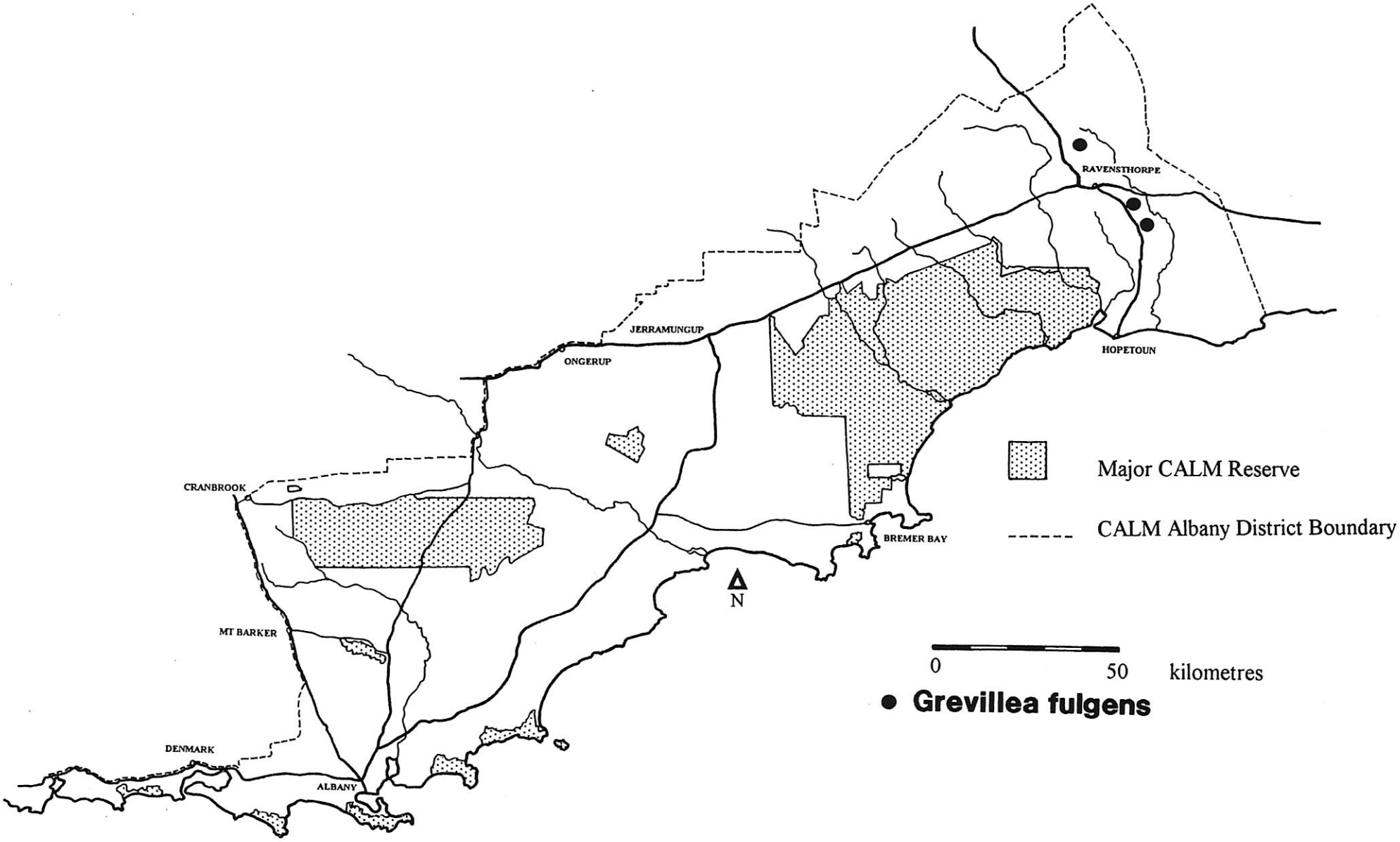
- monitor occasionally
- spray with phosphonate if deaths attributable to *Phytophthora*

Research Requirements

- survey for new locations (within Ravensthorpe Range)
- sample for dieback from recently dead plants

References

Gardner (1964).


RAVENSTHORPE
HOPETOUN
JERRAMUNGUP
ONGERUP
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Grevillea fulgens

Hypocalymma phillipsii Harv.

MYRTACEAE

White Mountain Myrtle

Hypocalymma phillipsii is a compact shrub to 80 cm tall with softly pubescent four-sided angular branches. The opposite dark green glabrous leaves are ovate-cordate, very obtuse, almost sessile, up to 20 mm long and 12 mm wide and very rounded at the base. The flowers are large (12 mm), white with numerous stamens and are solitary or in clusters in the leaf axils. The sepals and bracteoles are reddish-pink to green.

Flowering Period: September-December

Distribution and Habitat

This myrtle is confined to peaks (at least eleven) and upper slopes across the extent of the Stirling Range where it grows in shallow sand over sandstone in mallee thicket or montane heath. Many collections are now quite old and this species possibly requires resurvey. This species is similar to another Stirling Range endemic *Hypocalymma myrtifolium* which differs in having elliptic leaves which are dentate or fringed.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Yungermere	Albany	Gno	NP	19.10.79	common	-
2. Success Saddle	Albany	Gno	NP	22.9.93	+10	in flower
3. Donnelly Park	Albany	Cb	NP	7.11.77	uncommon	-
4. Toolbrunup	Albany	Gno	NP	7.12 92	+1000	in flower

WAHerb: 22 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

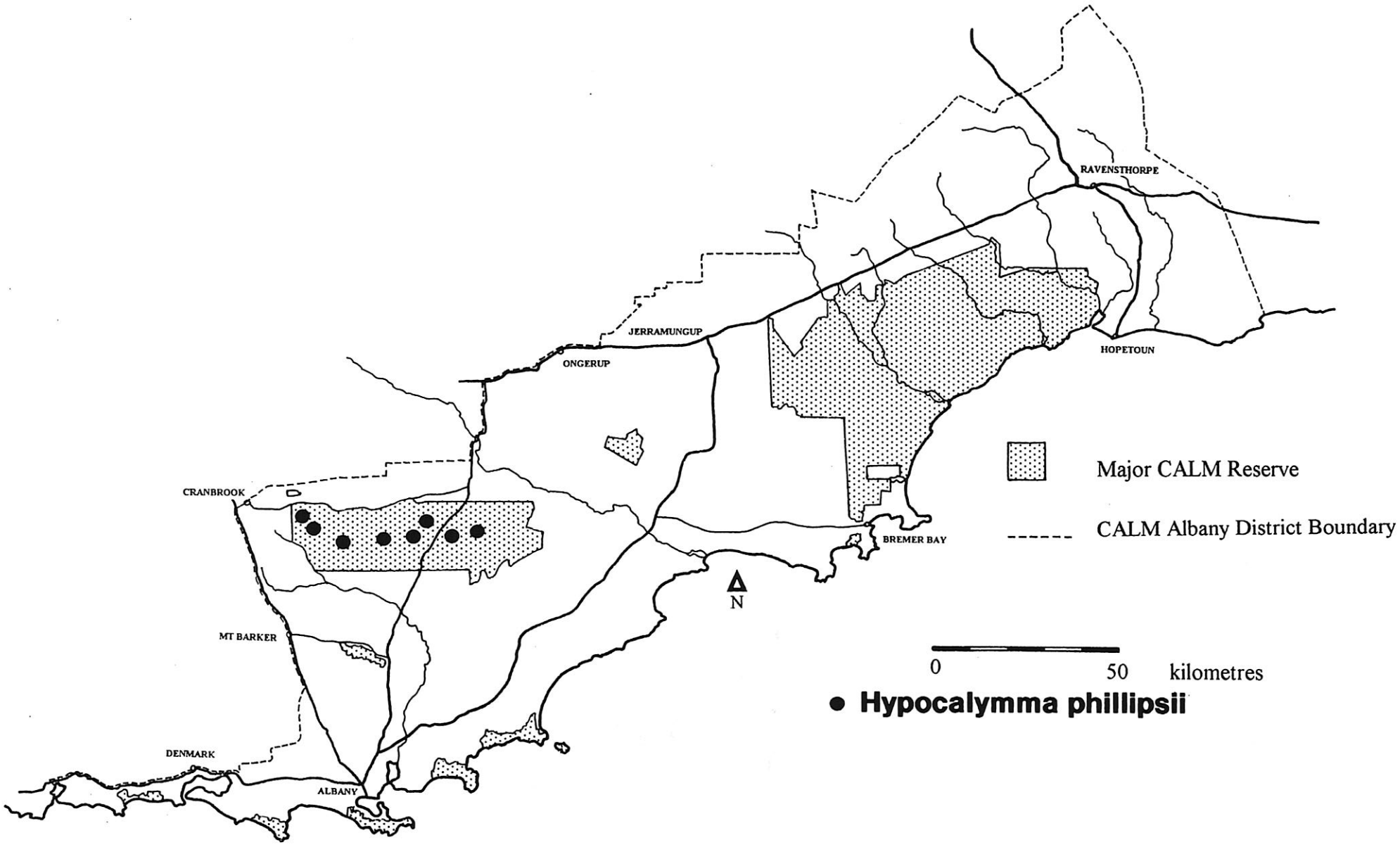
Unknown

Management Requirements

Monitor occasionally

Research Requirements

Resurvey WAHerb locations


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
● Hypocalymma phillipsii

Hibbertia argentea Steud.

DILLENACEAE

Silver Leafed Guinea Flower

This species is allied to *Hibbertia montana* but differs in that the whole plant is silvery due to dense, appressed silky hairs. The leaves are narrow oblong to 20 mm, densely clustered along the branches. The bright yellow flowers are sessile in tufts of floral leaves and are surrounded by broad, short brown bracts which are hairy on the back. The flowers are up to 12 mm across and contain numerous (+40) stamens arranged evenly around the ovary, without staminodes.

Flowering Period: 12 records

Distribution and Habitat

This species is only known from Cape Riche and Toolbrunup in the Stirling range. At Cape Riche it occurs in dense heath on the lower slopes of Mt Melville in rocky red spongolitic soils. It also occurs there in vast numbers along the graded road verge where soil disturbance and lack of competition has favoured germination and growth. At Toolbrunup it occurs in the open scree of the lower slopes.

As this species is only known from two populations, but which are not believed to be under threat, it should be elevated to Priority 2.

Conservation Status

Current: Priority 3 Recommended: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Cape Riche	Albany	Alb	Shire res.	2.11.92	+1000	in flower
2. Toolbrunup	Albany	Gno	NP	7.12.92	+30	healthy

WAHerb: 12 records

Response to Disturbance

Soil disturbance may favour germination

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

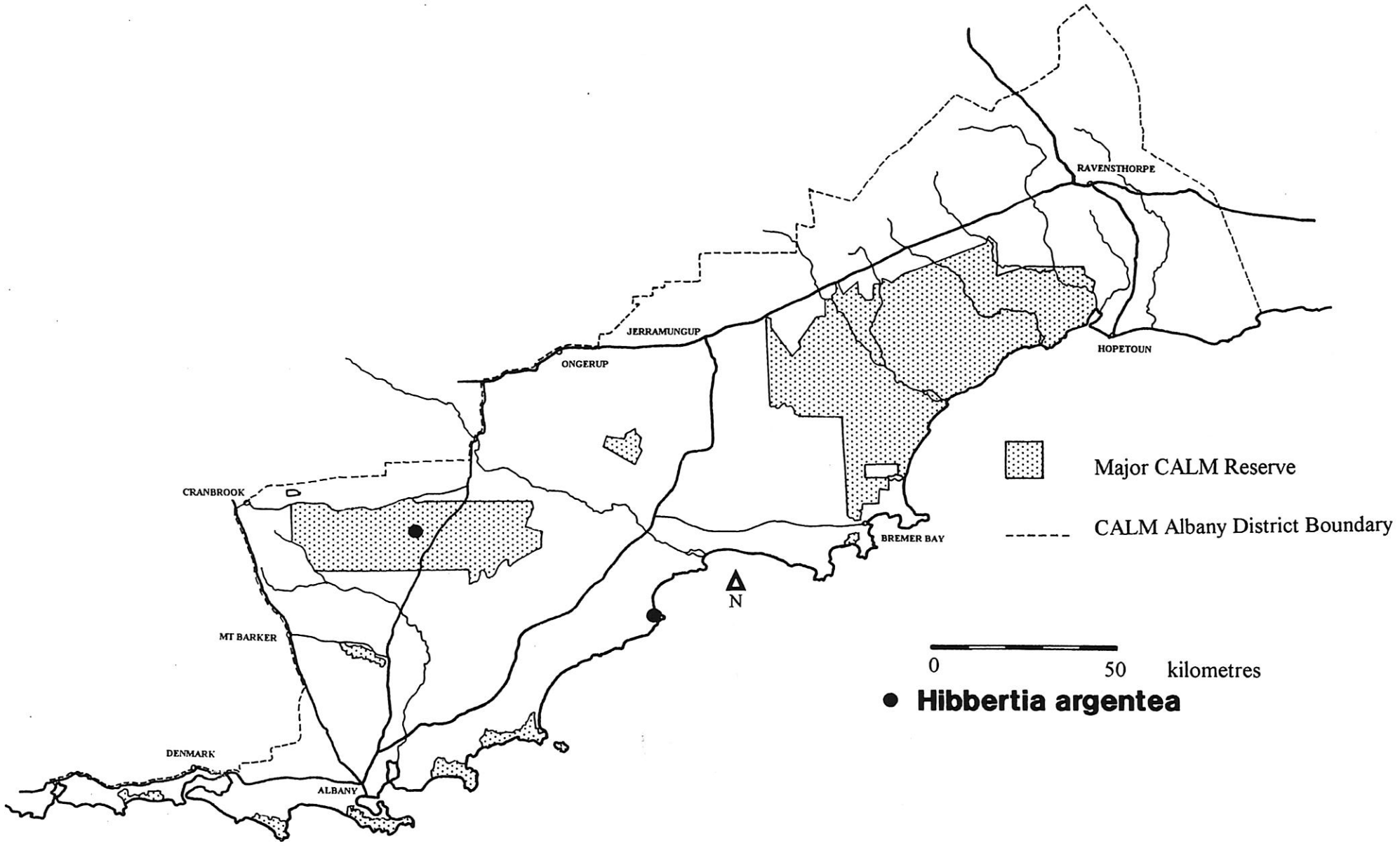
- monitor occasionally
- change on Priority Flora List to Priority 2

Research Requirements

- survey opportunistically for new populations

References

Lehmann (1845).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
N
Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Hibbertia argentea

Lasiopetalum parvuliflorum F.Muell. STERCULIACEAE

Lasiopetalum parvuliflorum is an upright to spreading, mid dense woody shrub to 1 m tall. The dull green leaves are 20 mm long, linear-obtuse, glabrous above and rusty tomentose beneath, in short petioles. The flowers are small, on shortly pedunculate few flowered cymes. The sepals are covered with a fine grey to greenish cream tomentum (almost scaly) outside, glabrous brown inside. The bracteoles are small or absent. The petals are much reduced and the style glabrous.

Flowering Period: September

Distribution and Habitat

This species has been infrequently collected over a wide range (400 km) from Bremer Bay to Pt Malcolm. It grows in locations within 10 km of the coast on grey loamy sand over spongolite or granitic sands, in Eucalypt woodland or mallee heath.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Bremer Bay	Albany	Jer	-	18.9.86	rare-WH	in flower
2. Pt Charles	Albany	Rav	NP	18.9.86	scattered-WH	in flower
3. Lucky Bay	Espernce	Esp	NP	7.90	frequent-WH	-

WAHerb: 7 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

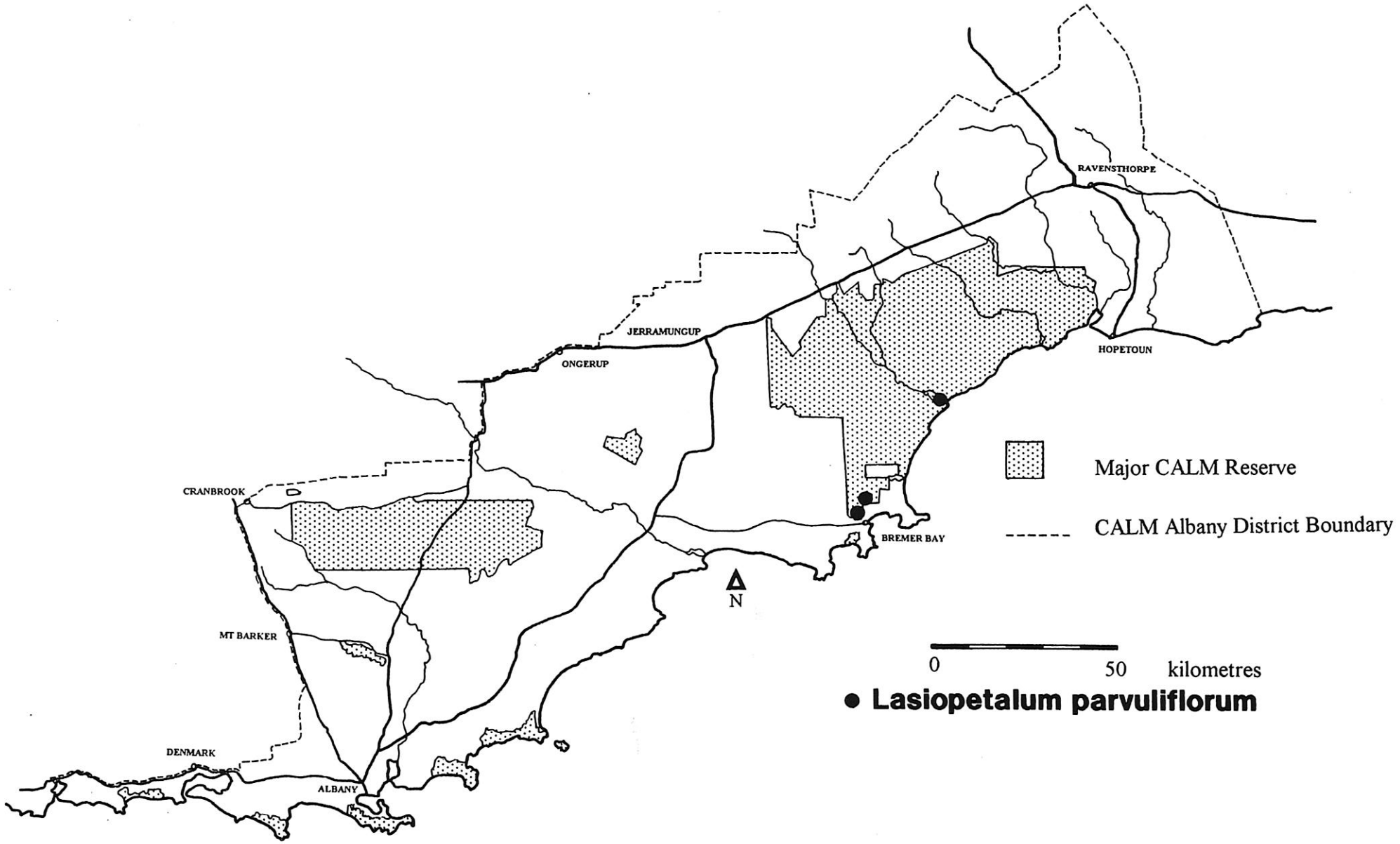
Monitor occasionally

Research Requirements

- relocate and survey WAHerb locations
- survey opportunistically for new populations

References

Mueller (1868).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
● Lasiopetalum parvuliflorum

Melaleuca araucarioides Barlow

MYRTACEAE

Melaleuca araucarioides is a shrub to 1.5 m tall. The leaves are in whorls of three, semi-appressed and crowded in six regular rows. The 1.7-3.5 mm long and 0.7-1.8 mm wide lamina is narrowly elliptic to narrowly obovate, rounded below and slightly channelled above. The leaves on the leafy shoots give the appearance of Norfolk Island Pine leaves; hence the specific epithet.

The inflorescence is a basal or terminal spike of 8-17 crowded cream to yellow 8-10 mm flowers. The 2-4 mm diameter woody fruits are shortly bell-shaped with thickened, rounded and outspread persistent sepals.

Flowering Period: July and October

Distribution and Habitat

This *Melaleuca* has been collected from scattered locations from Cape Riche to Jerramungup. It grows in well drained sand or loams in heath or open Eucalypt woodland. Survey in 1993 by Robinson and Wildlife Officer Anderson at the type location near Cape Riche failed to relocate it. It is therefore considered to be at least uncommon there.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
Cape Riche	Albany	Alb	UVR	10.88	occasional-WH	-
Sth Jerramungup	Albany	Jer	verge	10.88	occasional-WH	-
Sth Boxwood Hill	Albany	Jer	-	19.7.74	very common-WH	-

WAHerb: 7 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

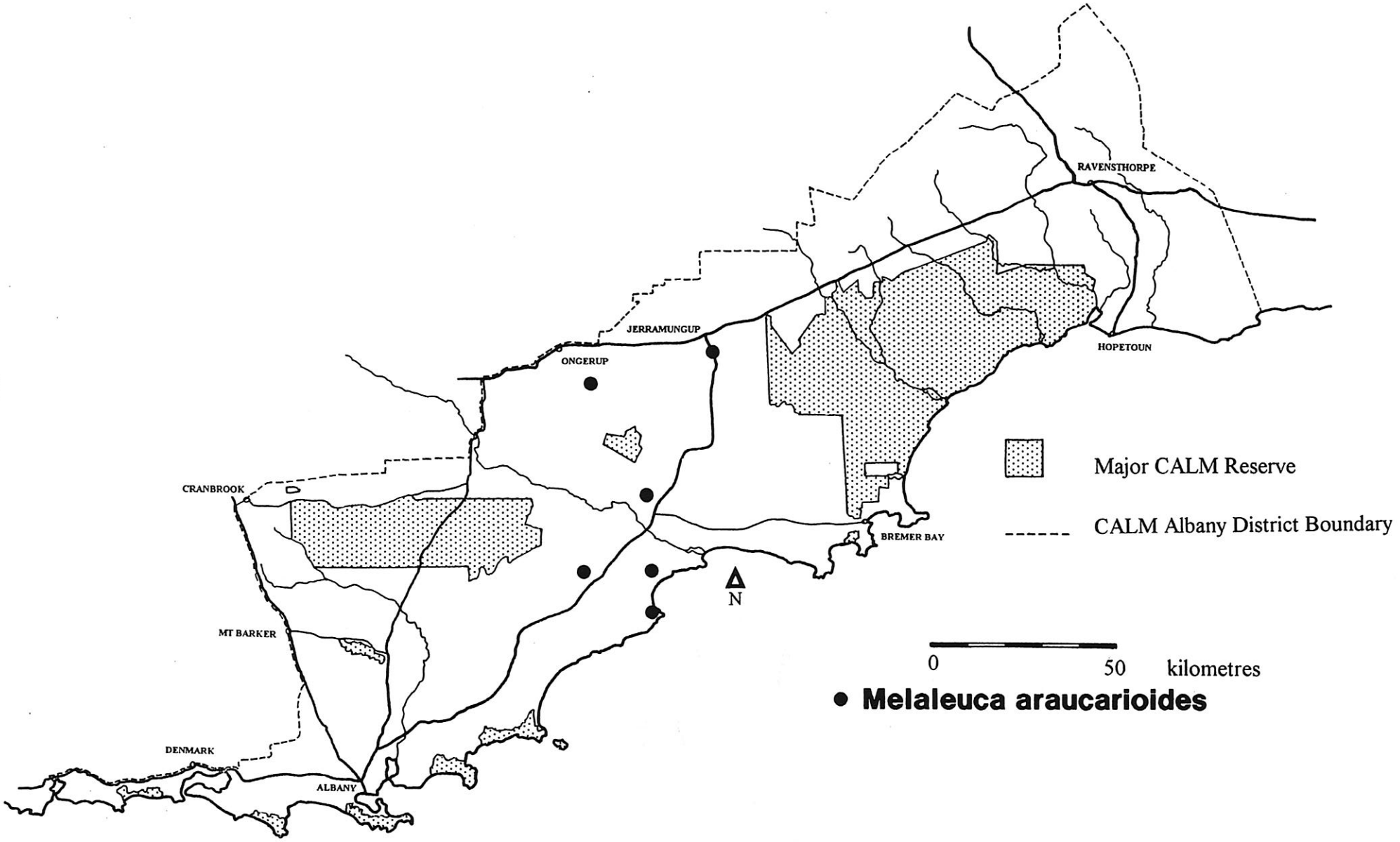
Cannot be determined until further survey

Research Requirements

- relocate WAHerb populations (especially type location)
- survey for new locations
- determine dieback impact

References

Quinn *et al.* (1992).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Melaleuca araucarioides

Melaleuca citrina Turcz. MYRTACEAE

Melaleuca citrina is a compact or erect shrub to 2.5 m. The dark green leaves are flat, narrow linear-lanceolate to 15 mm long by 1 mm wide. The bright lemon yellow flowers are in dense oblong terminal spikes to 25 mm long. The flattened globular 5 mm fruits are tightly clustered on the older stems.

Flowering Period: September-November

Distribution and Habitat

This species occurs very commonly throughout FRNP and west toward Ongerup. It grows in grey or yellow sand over rocky quartzite supporting open mallee heath or scrub. In a recent survey in FRNP it was abundant at Mt Maxwell, East and West Mt Barrens and Quoin head; it had resprouted from lignotuber after fires of late 1989. It is not considered to be rare and is not perceived to be under any threat.

Conservation Status

Current: Priority 3 Recommended: Remove from Priority Flora List

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Ongerup E	Albany	Jer	verge	17.11.85	frqnt	-
2. Mt Maxwell	Albany	Rav	NP	6.9.93	+100	in flower
3. Quoin Head	Albany	Jer	NP	7.9.93	+100	in flower
4. East Mt Barren	Albany	Jer	NP	7.9.93	+200	in flower
5. West Mt Barren	Albany	Rav	NP	9.9.93	+200	in flower

WAHerb: 15 records

Response to Disturbance

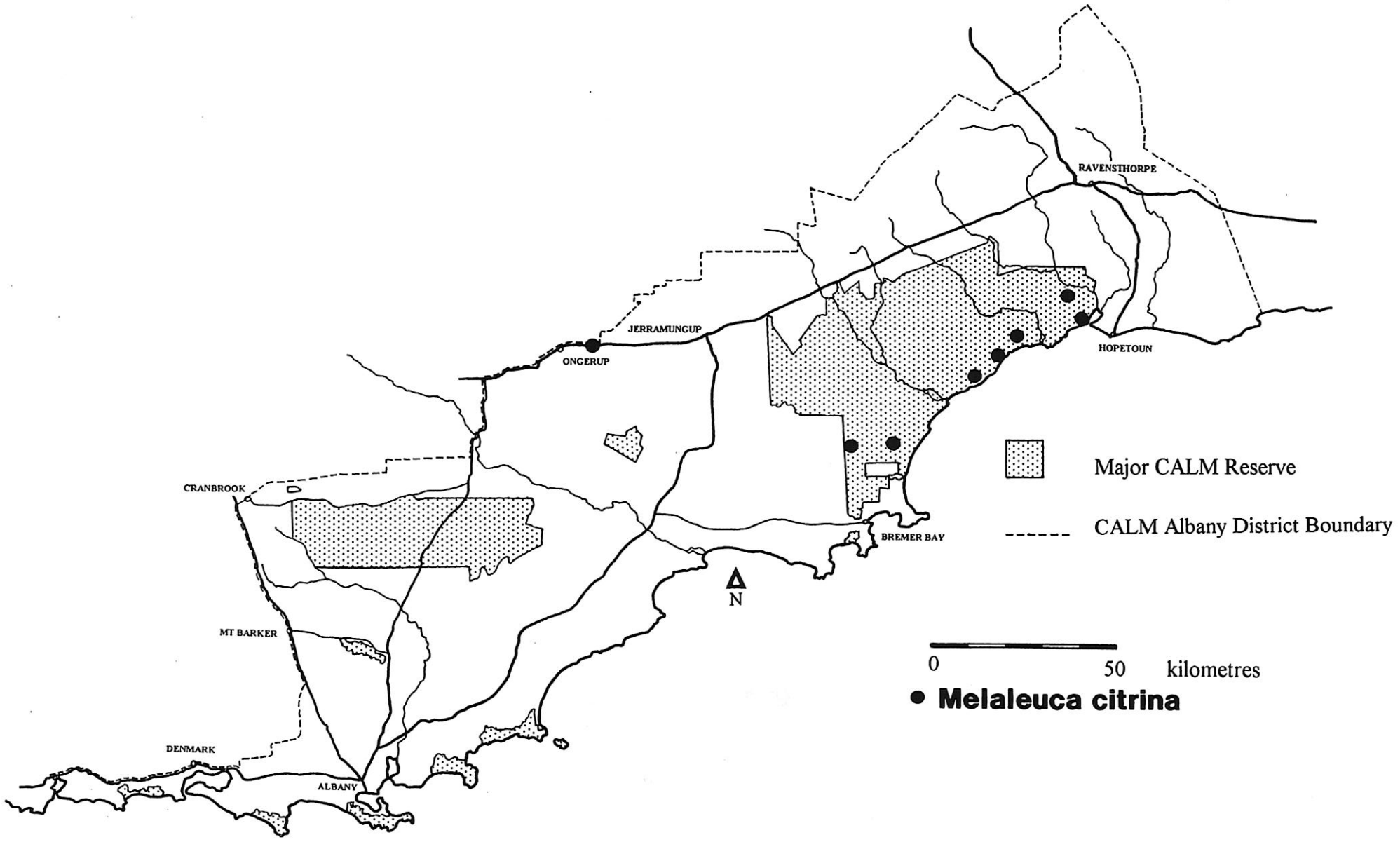
Resprouts from lignotuber after fire

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

Research Requirements


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Melaleuca citrina

Melaleuca diosmifolia Andrews MYRTACEAE

Melaleuca diosmifolia is a compact to tall straggly shrub to 3 m tall. The leaves are dark green, broadly lanceolate to 12 mm long. They are very spreading to patent and densely arranged in a compact series of alternate spirals. The inflorescence is an elongated (+120 mm) cylindrical spike of greenish yellow flowers up to 20 mm long located amongst the older leaves or the bare stems. The fruits are very depressed globular, 8 mm across, tightly clustered in a cylinder on the old wood.

This species is very widely cultivated in gardens in Perth (and elsewhere) where it is used as a dense hedge plant but does not flower.

Flowering Period: September-November

Distribution and Habitat

Melaleuca diosmifolia occurs in tall thickets and low closed woodland in shallow loam over coastal granite on the mainland and islands immediately east of Albany, and west of Broke Inlet in D'Entrecasteau NP. It is scattered but common.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. North Point	Albany	Alb	Shire res.	4.9.92	scattered	in flower
2. Pt Vancouver	Albany	Alb	NR	12.11.92	2	healthy
3. Manypeaks W gully	Albany	Alb	NR	8.7.93	+50	healthy
4. Waychinicup	Albany	Alb	NP	23.8.93	+100	healthy
5. Mt Martin	Albany	Alb	Shire res.	2.9.93	+200	resprouting

WAHerb: 17 records

Response to Disturbance

Resprouts after fire

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

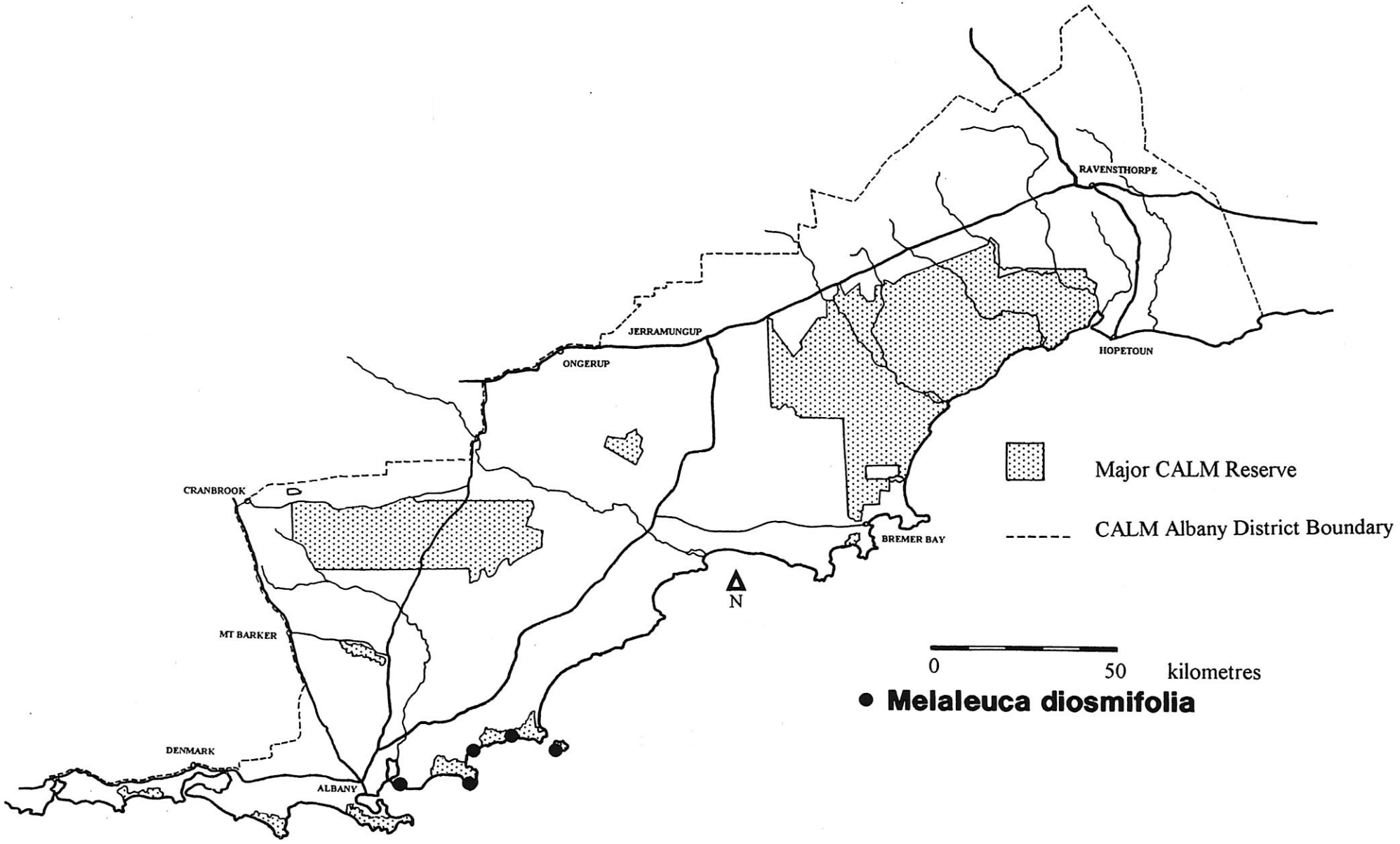
Monitor occasionally

Research Requirements

Relocate and survey WAHerb locations

References

Andrews (1807).


RAVENSTHORPE
JERRAMUNGUP
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CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Melaleuca diosmifolia

Melaleuca polycephala Benth. MYRTACEAE

Melaleuca polycephala is a rigid, divaricately branched shrub to 1m. The scattered leaves are flat, alternate, spreading, ovate-lanceolate to 10 mm with three faint nerves. The mauve-pink flowers are in small, dense, terminal globular heads up to 10 mm. The calyx tube is broadly campanulate with membranous lobes; the small petals have pink centres. The shoots grow out through the heads after flowering. Densely packed globular clusters of fruits develop on the older stems.

Flowering Period: September-October

Distribution and Habitat

This species has been collected from sandy clay or clay soil in mallee shrubland between and around Pingrup, Borden and Ongerup. WAHerb records do not show any collections from conservation land.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Ongerup E	Albany	Gno	verge	9.83	common	in flower

WAHerb: 8 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

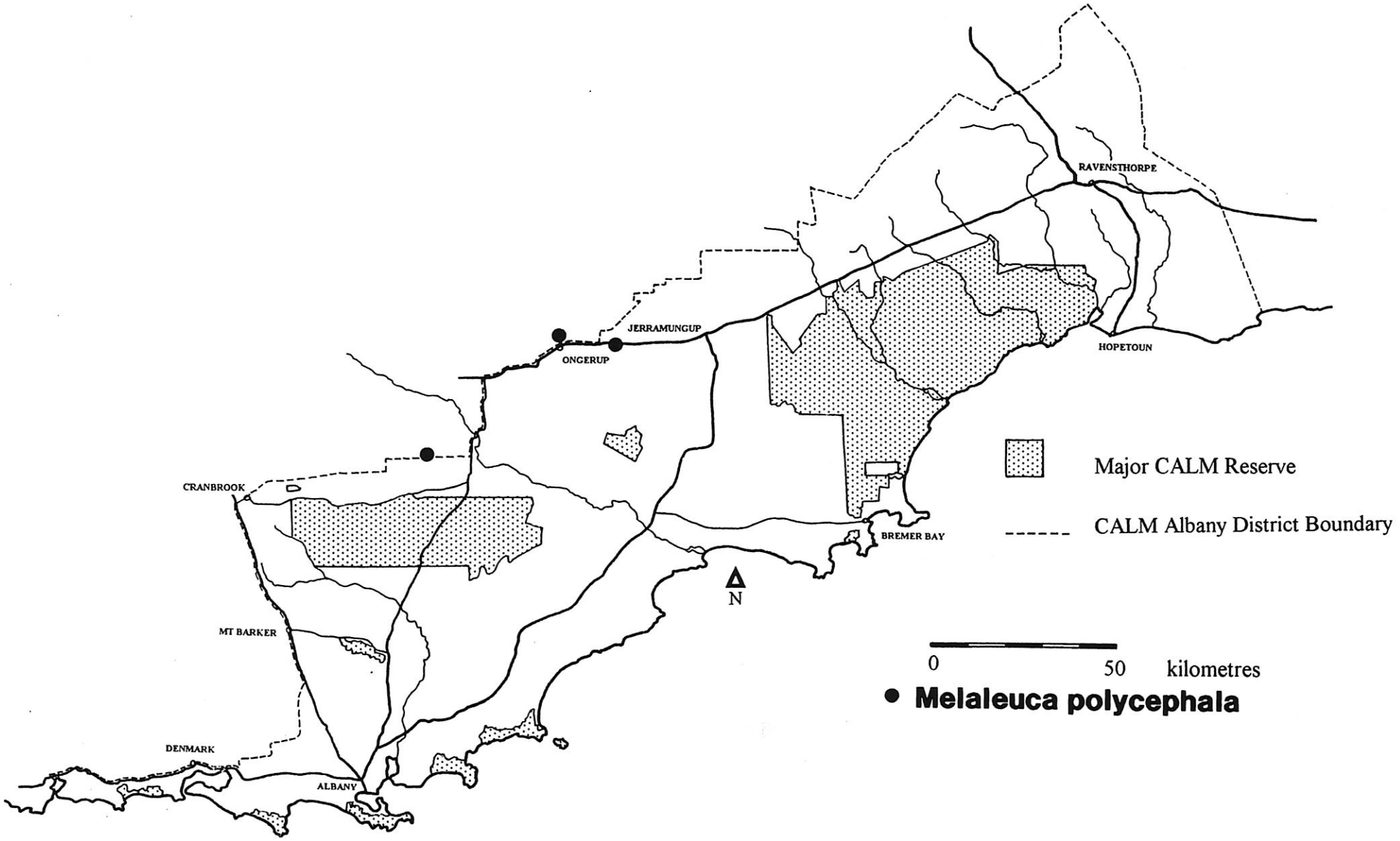
Determine after further survey

Research Requirements

- relocate and survey WAHerb locations
- survey opportunistically for new populations, particularly in conservation land

References

Bentham (1866).


RAVENSTHORPE
HOPETOUN
JERRAMUNGUP
ONGERUP
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
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50
kilometres
Melaleuca polycephala

Melaleuca pomphostoma Barlow MYRTACEAE

Melaleuca pomphostoma is a dense shrub to 1.5 m tall with thick, rough grey bark. The spreading, narrowly elliptic, alternate 5-8 mm long leaves are arranged spirally. The leaves are obtuse at the apex, with obscure venation and covered with conspicuous, white, pustulate stomata (it is from this latter feature that the specific epithet is derived). The inflorescence is a basal or terminal spike of up to ten crowded greenish-yellow 7-11 mm flowers. The bell-shaped fruits have an elongated base and elongated and thickened persisent sepals.

Flowering Period: April, May and August

Distribution and Habitat

This species has been collected sporadically over less than 50 km, from south of Ravensthorpe and from eastern FRNP in the Eyre and Whoogarup Ranges. It grows in moderately drained clay loam in Eucalypt woodland.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
East Mt Barren W	Albany	Rav	NP	2.11.75	very abundant	-

WAHerb: 5 records (1 record from Canberra)

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

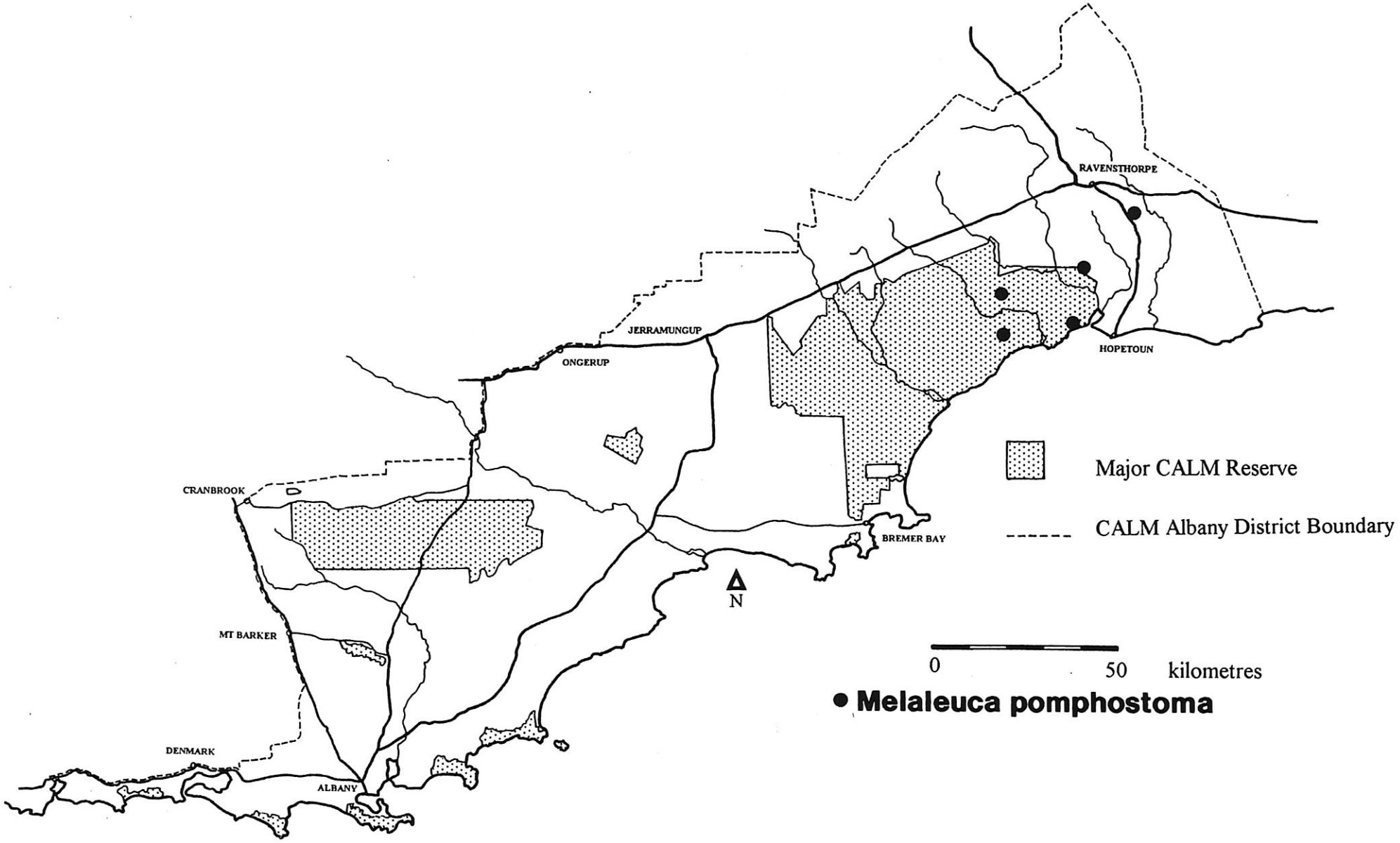
Cannot be determined until further survey

Research Requirements

- relocate WAHerb populations and survey
- survey for new populations
- determine response to dieback

References

Quinn *et al.* (1992).


RAVENSTHORPE
HOPETOUN
JERRAMUNGUP
ONGERUP
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
● Melaleuca pomphostoma

Melaleuca viminea subsp. *appressa* Barlow MYRTACEAE

This *Melaleuca* is a glabrous shrub to 4 mm tall. The l5-9 mm long and 0.6-2 mm wide, narrowly elliptic leaves are arranged spirally, moderately densely and are appressed to the stem. The leaves are obtuse and slightly inflexed at the apex with obscure venation. The inflorescences (up to 50 mm long) are terminal and basal, loose spikes of 10-50 cream flowers. The cylindrical hypanthium is 1-2.5 mm long with 5 mm stamens. the fruits are shortly cylindrical to bell-shaped.

Melaleuca viminea is an extremely variable specis, however Barlow (F.C.Quinn et al 1992) has identified several geographicly defined entities as subspecies. This subspecies differs from the two others in its distinctly appressed leaves with incurved apices and shorter floral parts.

Flowering Period: September-October

Distribution and Habitat

This taxon is known from three disjunct populations; one near Ongerup and two in the Esperance District. It grows in creeks or winter wet clay depressions, possibly over granite.

Conservation Status

Current: Priority 3 Recommended: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
(1) E Ongerup	Albany	Jer	verge	25.11.74	frequent	-

WAHerb: 2 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

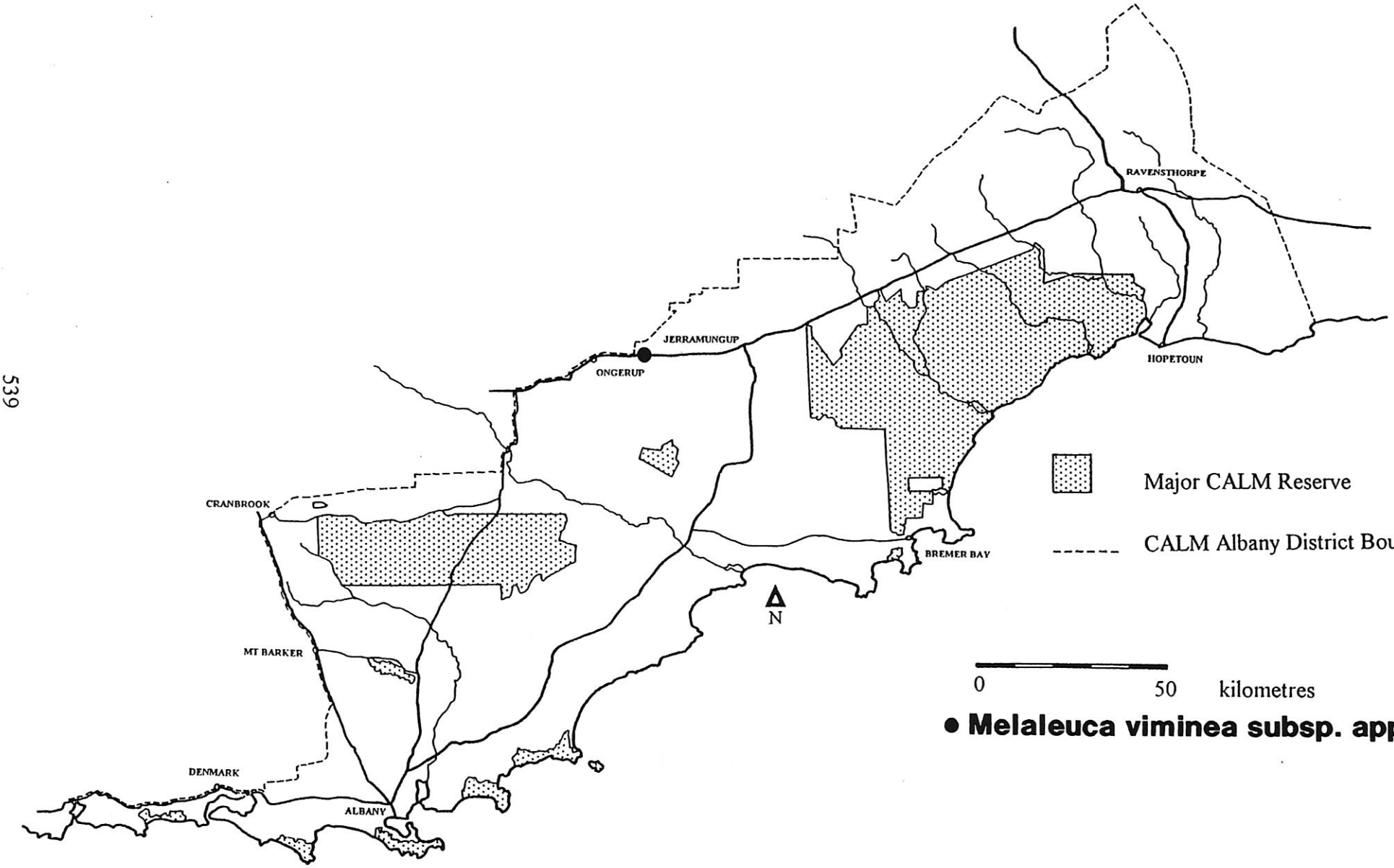
Management Requirements

Research Requirements

- relocate KRN population
- survey for new populations
- determine response to dieback

References

F.C.Quinn et al. (1992).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
N
MT BARKER
DENMARK
ALBANY
Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
• Melaleuca viminea subsp. appressa

Rumicastrum chamaecladum (Diels) Ulbr. PORTULACACEAE

This taxon was originally described as *Atriplex chamaecladum* by Diels (1919). It was reclassified to *Rumicastrum* by Ulbrich (1934), but retained in Chenopodiaceae. Paul Wilson recognised that it belongs in Portulacaceae in his treatment of the *Chenopodiaceae* in Flora of Australia, Vol. 4, 1984. In fact it is possible that all Australian species of *Calandrinia* may be reclassified into the genus *Rumicastrum* (Paul Wilson pers. comm.).

Rumicastrum chamaecladum is a semi-succulent trailing or spreading herb, up to 30 mm tall and 50 mm across. The narrow lanceolate, obtuse radical leaves are up to 15 mm long and 1.5 mm wide. Flowering stems, with short leaves arise from the base and may have two or three branchlets. The flowers are borne on the branchlets in 8-10 flowered spikes. Each flower is subtended by two erect orbicular 3 mm bracts. The five petals do not exceed the bracts. The globose ovary is superior and surrounded by three stamens. (Note: this description is derived from an unscaled, unpublished drawing by Margaret Menadue of ASG 16288 specimen and the 1:1 scale drawing with the original description). ASG 16288 and GJK 7453 have been sent on loan to Judy West.

Flowering Period: October

Distribution and Habitat

The type was collected at the foot of Warrungup (Mt Trio) in the Stirling Range by Diels in 1901. GJK 7453 was collected in burnt open Wandoo woodland, in rocky clay loam on the edges of a winter wet creek below Mondurup Peak. Alex George collected it in October 1983 below Talyuberlup Peak, under burnt mallees. All these locations have been surveyed in 1993; however none has been recently burnt and *R. chamaecladum* was not located.

Including the Alex George specimen, this species has only been collected three times and requires further survey and should at least be Priority 2 (based on current information).

Conservation Status

Current: Priority 3 Recommended: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Mondurup	Albany	Gno	NP	27.10.84	-	-
				26.10.93	0	-
2. Talyuberlup	Albany	Pl	NP	13.10.83	prolific	healthy
				26.10.93	0	-
3. Mt Trio	Albany	Gno	NP	26.10.93	0	-

WAHerb:1 record (GJK 1984)

Response to Disturbance

Germination may be stimulated by fire

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

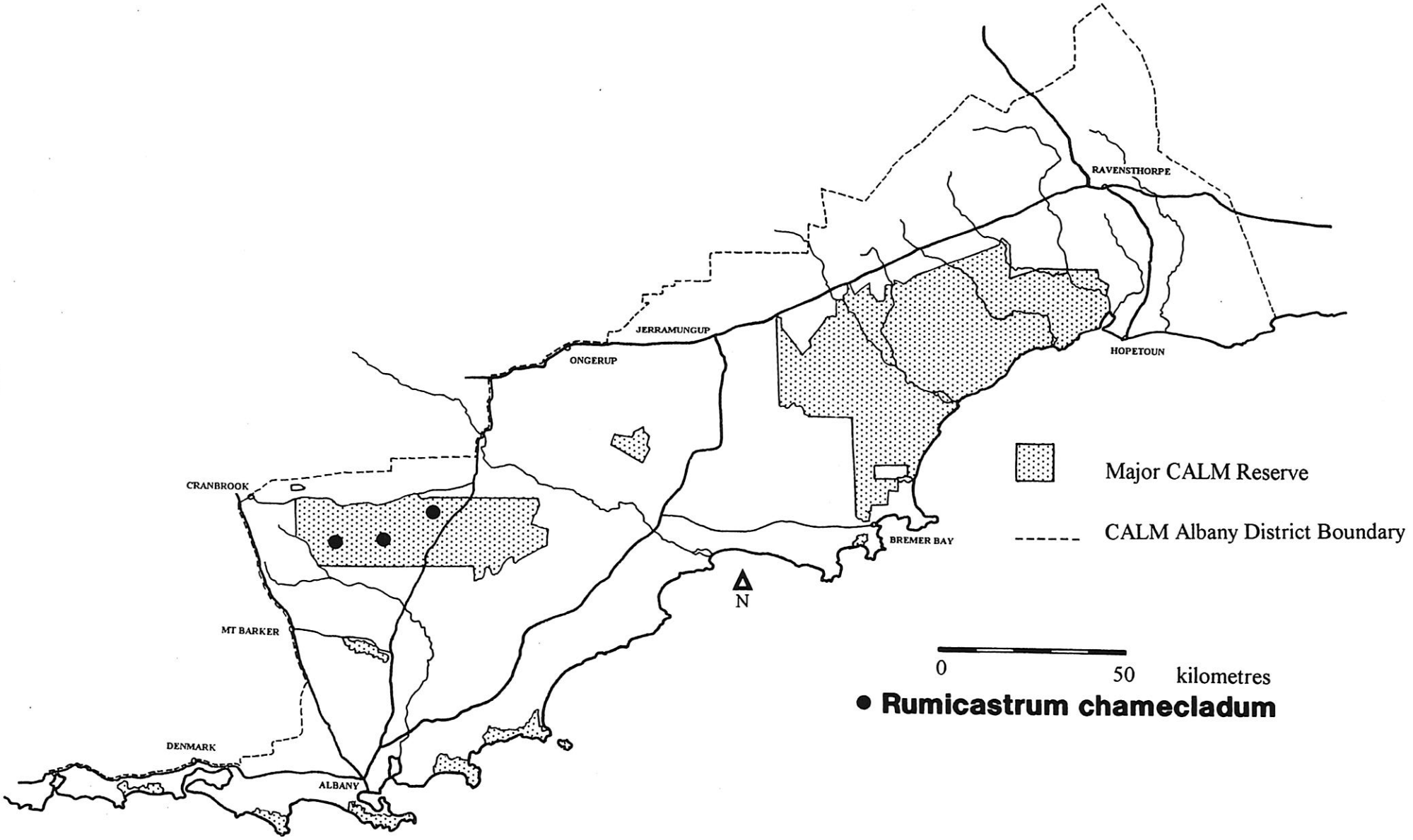
Cannot be determined until populations relocated

Research Requirements

Survey for new locations especially in recently burnt woodland creeklines

References

Engler and Prantl (1934), Wilson (1984).


RAVENSTHORPE
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CRANBROOK
BREMER BAY
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DENMARK
ALBANY
Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
● Rumicastrum chamecladum

Siegfriedia darwinioides C.A.Gardner RHAMNACEAE

Siegfriedia darwinioides is an erect shrub to 1 m, with smooth purplish-brown bark. The leaves are opposite, oblong, obtuse, somewhat cordate at the base with the midrib partly impressed into the upper surface. The lamina is 15 mm long (glabrous dark green above and densely pink tomentose below) with tightly revolute margins and the petiole is up to 8 mm. Small and very deciduous stipules may be present. The inflorescence is an abbreviated cyme of pseudo-heads terminating short lateral branchlets. Each head is a series of 10-12, 8 mm, obtuse-orbicular, imbricate orange-red to pale pink bracts; the 4-6 outer bracts are empty and the inner bracts often subtend 3-4 flowers (infertile) in their axils. A head of 6-10 flowers terminates within the involucre. Each flower has a turbinate 5 mm calyx; the 4-5 shortly triangular lobes being almost as long as the tube. There are no petals. The stamens are exserted from each flower and are clearly visible at the opening of the bracts. The inferior ovary is clearly adnate to the calyx tube.

The specific name refers to the similarity of the inflorescence to that of a *Darwinia*.

Flowering Period: April, August

Distribution and Habitat

This species has been widely collected from Gnowellen Road, Pallinup River, Corackerup and then east to the Eyre and Ravensthorpe Ranges, Coujinup Hill, Starvation Boat Harbour and the "Esperance District". It occurs in stony red loam or kaolinic-lateritic breakaway over in dissected terrain, in association with mallee scrub or woodland.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Mt Short	Albany	Rav	Shire res.	16.12.92	+200	healthy
2. Bandalup	Albany	Rav	VCL	8.9.93	+300	healthy
3. Mt Desmond	Albany	Rav	VCL	8.9.93	+10	healthy

WAHerb: 18 records (1 Albany Herb. record)

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

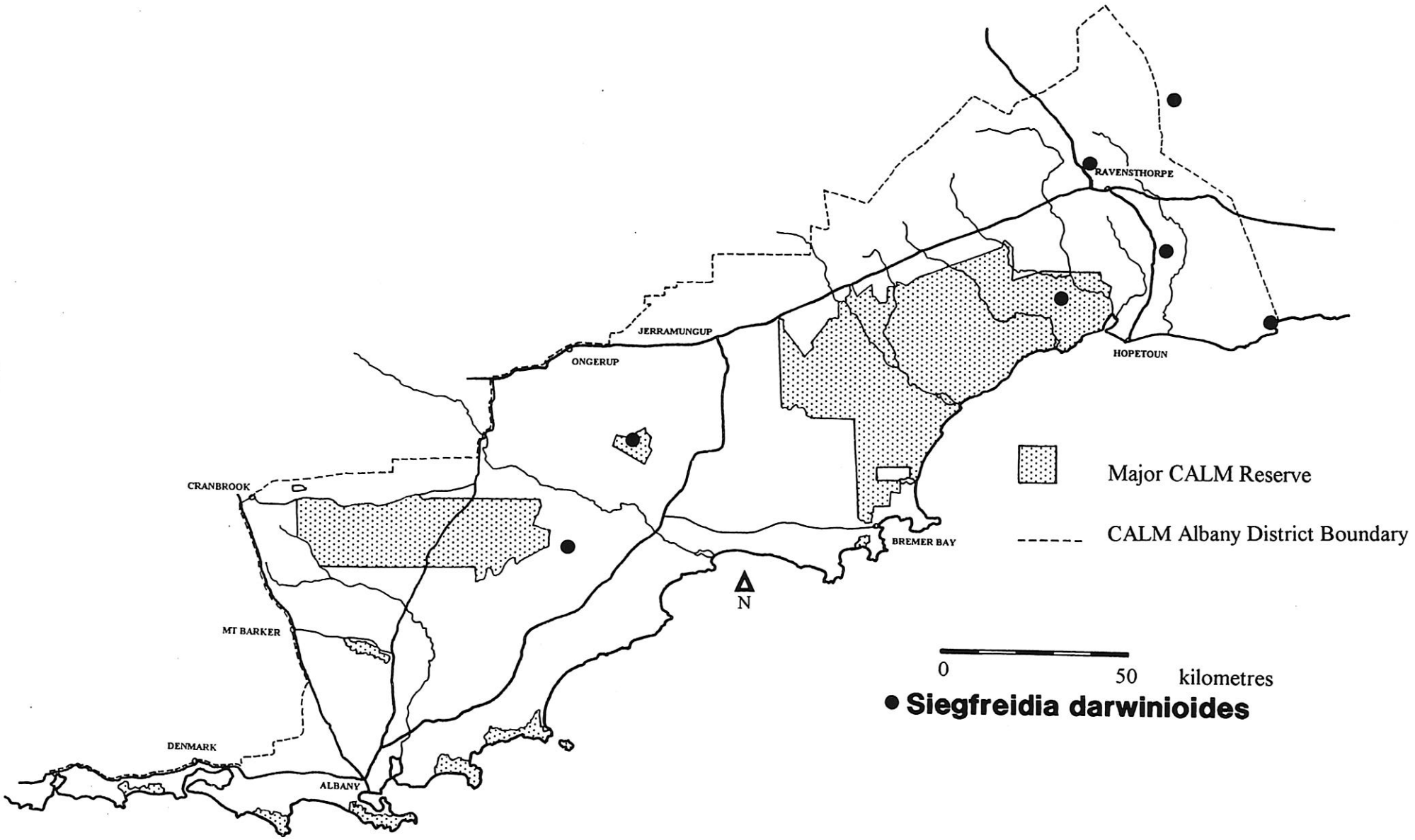
Monitor occasionally

Research Requirements

Survey opportunistically for new populations

References

Gardner (1933).


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Major CALM Reserve
CALM Albany District Boundary
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kilometres
● Siegfreidia darwinioides

Sphenotoma drummondii (Benth.) F.Muell. EPACRIDACEAE

Mountain Paper Heath

Sphenotoma drummondii is an erect, robust shrub 15-30 cm tall. The leaves are densely crowded, erect to spreading (50-70 mm long) in the lower part of the stem, becoming erect to stem clasping (20 mm long) below the inflorescence. The leaves are narrowly lanceolate, tapering gradually from a broad stem clasping ciliate base (5 mm) to a point. The inflorescence is a compact cylindrical spike of up to 40 white flowers; the 5 mm tube is constricted at the throat with 5 mm spreading lobes. Each flower is subtended by a broadly acuminate brown leaf like bract to 12 mm with ciliate margins; within this the flower is further enclosed by two small brown 4 mm bracteoles and imbricate 10 mm brown calyx lobes, spreading at the top.

Flowering Period: October-December

Distribution and Habitat

This species occurs on the summits and slopes of rocky peaks from Mt Frankland to East Mount Barren; including SRNP, FRNP, Two Peoples Bay and Mt Manypeaks Nature Reserves. It grows in shallow soil over granite, quartzite or schist, in either woodland (lower slopes) or montane heath.

This species is considered to be highly susceptible to *Phytophthora* dieback and hence requires close monitoring. Many seedlings germinating postfire on Bluff Knoll are dying, presumably from dieback.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Mt Frankland	Walpole	Dnmk	NP	11.85	frequent	in flower
2. Toolbrunup	Albany	Gno	NP	4.3.73	rare	-
3. Ellen's Peak	Albany	Gno	NP	22.7.83	common	-

WAHerb: 15 records

Response to Disturbance

May colonise open areas after fire and soil disturbance

Susceptibility to *Phytophthora* Dieback

Field observation suggests high susceptibility

Management Requirements

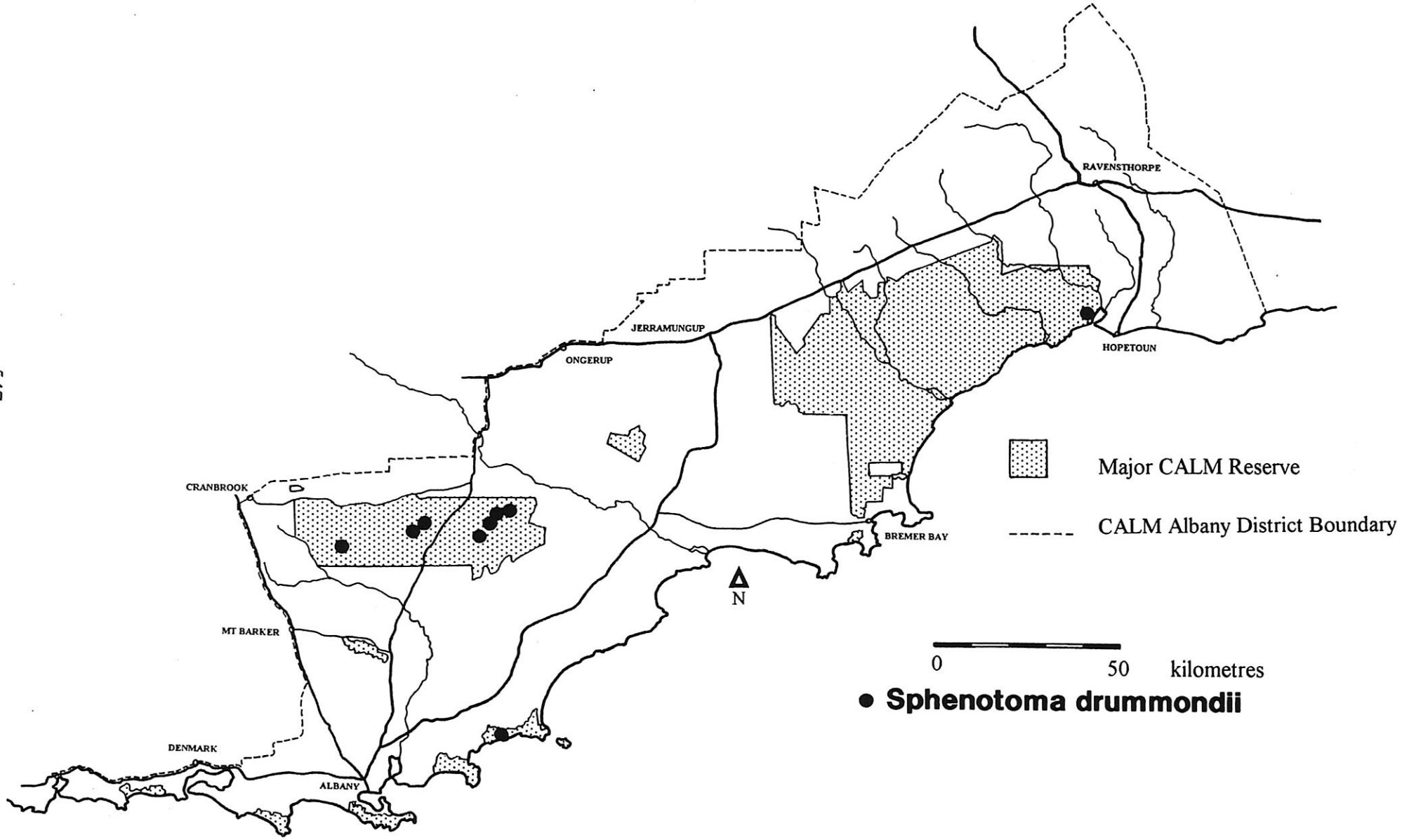
- closely monitor dieback impact of other populations (and spray phosphonate if necessary)
- spray Bluff Knoll seedlings with phosphonate
- relocate and survey WAHerb locations

Research Requirements

Determine spray rates and effectiveness of phosphonate in preventing dieback

References

Bentham (1869).


RAVENSTHORPE
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
● Sphenotoma drummondii

Sphenotoma parviflorum F.Muell. EPACRIDACEAE

Paper Heath

Sphenotoma parviflorum is a slender, erect, single stemmed perennial shrub, 15-30 cm tall. Clustered, spreading leaves to 50 mm are confined to the base of the stem, above which the leaves are shorter and closely appressed. The inflorescence is a dense ovate terminal spike of 5-10 white flowers. The corolla tube (to 5 mm) exceeds the surrounding bracts, and is much longer than the corolla lobes. Other similar *Sphenotoma* species have corolla lobes about equal to the tube.

However, the exact identity of this species is unclear. Gil Craig recently (Nov. 1993) located the only specimen of this species in Kew with Jocelyn Powell, and they believe that most specimens (in WA Herb.) which are given this name are more likely to be *S. gracile*. The location of the Kew specimen is Thomas River, Cape Le Grande. It is not known whether the Kew specimen is the type or duplicate. Further taxonomic research is required to clarify the identity of *S. parviflorum*.

Flowering Period: October

Distribution and Habitat

Sphenotoma parviflorum occurs in seasonally damp, sandy peaty soils supporting an association of heath. The WA Herbarium specimens have been collected from Scott River, Albany, Millbrook to Esperance.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No populations surveyed.						

WAHerb: 8 records

Response to Disturbance

Unknown; but is probably favoured by fire and soil disturbance in the absence of dieback

Susceptibility to *Phytophthora* Dieback

Field observation suggests high susceptibility

Management Requirements

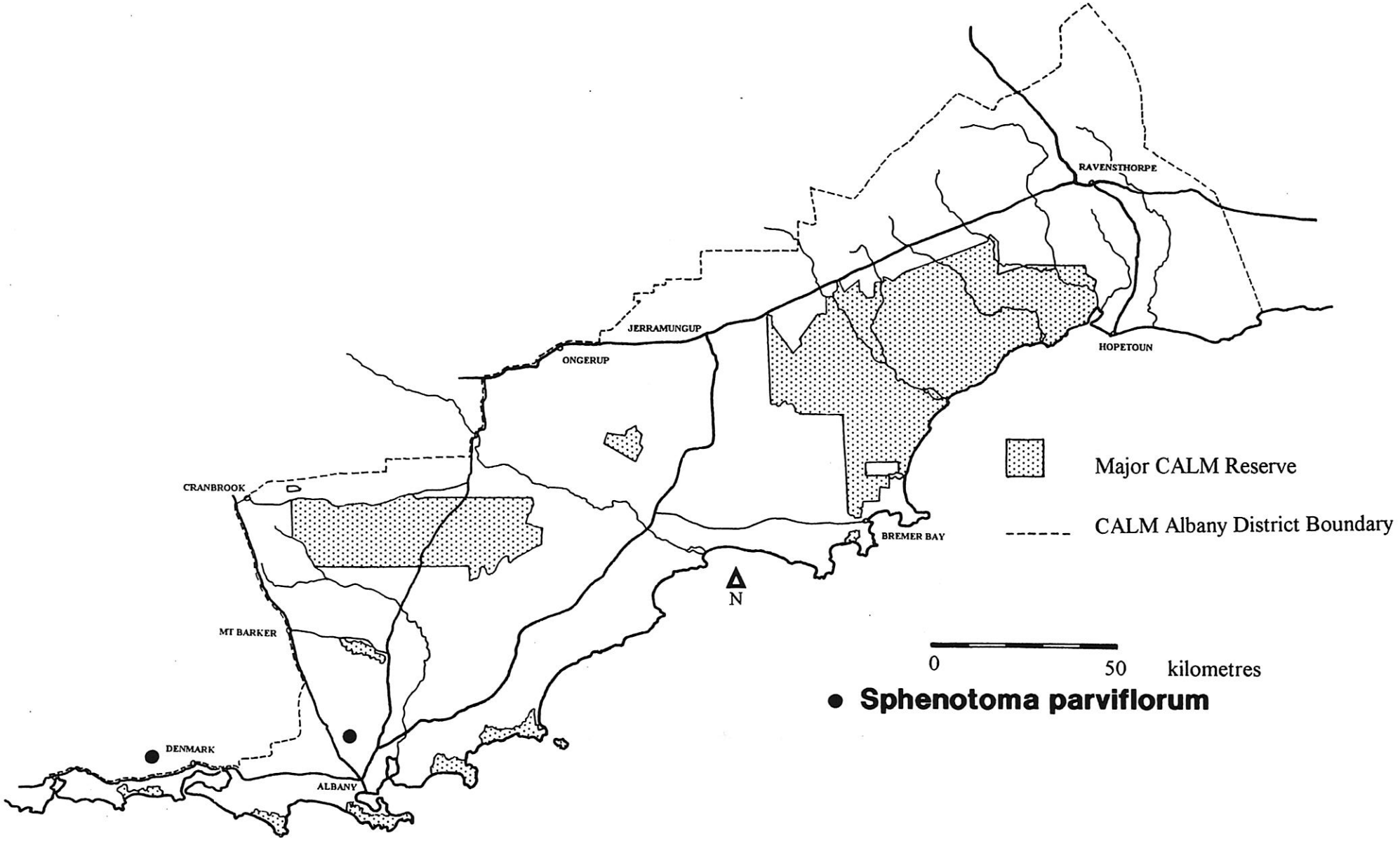
- locate populations from WAHerb details and survey
- monitor populations occasionally

Research Requirements

- survey for new populations
- determine response to disturbance and dieback
- clarify taxonomic status

References

Mueller (1882).


RAVENSTHORPE
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CRANBROOK
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DENMARK
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
Sphenotoma parviflorum

Stylidium lepidum F.Muell. ex Benth. STYLIDIACEAE

Red Caps

Stylidium lepidum is a small perennial herb with a rosette of glabrous, radical pale blue-green leaves to 10 mm, on a short stock. The inflorescence is an open cyme of 3 to 5 flowers on a slender, leafless, reddish brown scape up to 80 mm. Small linear mucronulate bracts subtend the sessile flowers. The slender 6 mm calyx tube is sparsely glandular hairy with narrow lobes. The vertically paired petals are pink or pale orange, with a yellow throat and red spots.

Carlquist noted on a specimen that this is a "distinctive but rarely collected species".

Flowering Period: September-December

Distribution and Habitat

This species occurs in winter wet loamy or clay soil in open heath and sedges, sometimes under open *Eucalyptus occidentalis* woodland. It has been recorded around Kojonup, Wagin, Cranbrook, Tunny, and just north and west of Albany.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Youngs Siding	Albany	Alb	verge	9.92	+100	in bud
2. Kalgan Plains	Albany	Pl	NR	28.10.92	+200	in flower

WAHerb: 11 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

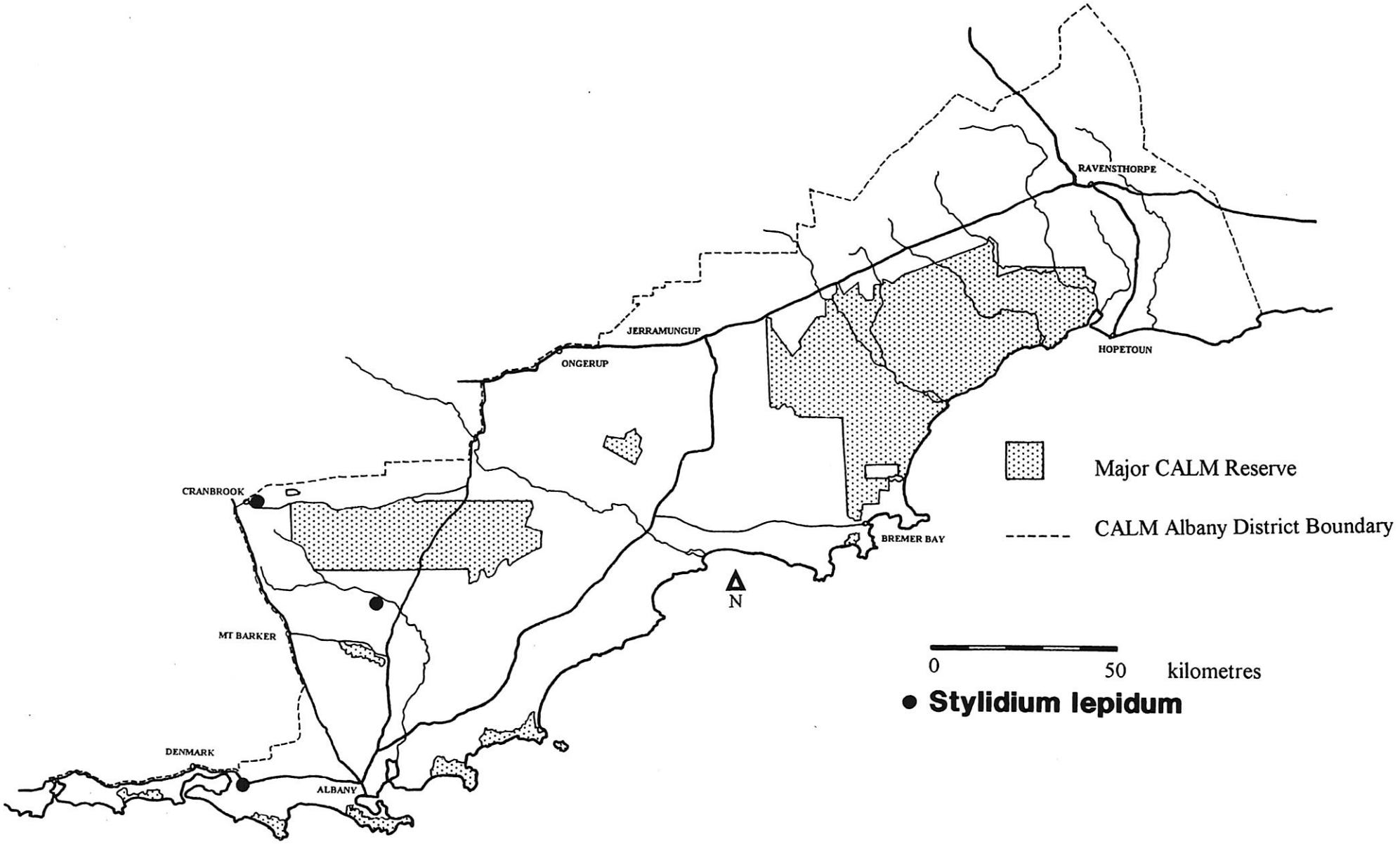
Monitor occasionally

Research Requirements

Survey opportunistically for new populations

References

Bentham (1869).


RAVENSTHORPE
JERRAMUNGUP
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CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
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kilometres
Stylidium lepidum

Stylidium pseudohirsutum Mildbr. STYLIDIACEAE

Stylidium pseudohirsutum is a basally tufted perennial herb in the scale leaved group of triggerplants; similar to but fewer flowered than *S. hirsutum*. The basal leaves are relatively few, narrowly linear (3-10 cm long by 1.5 mm wide), slightly scabrid with sheathing membranous pink scale leaves at the base. The scape, covered in long silky glandless hairs at the base, becoming glandular hairy at the top, is two or three times longer (20-30 cm) than the leaves. The flowers are in a head of 1-4 on very short pedicels, subtended by lanceolate bracts covered with purple glandular hairs and long white glandless hairs. The calyx is similarly hairy and has lobes more or less equal to the tube. The white corolla is up to 10 mm across; the petals are unequal, the upper pair curved-triangular and narrow and lower pair broader oblong. The lower surfaces are yellow with light brown spots. There are four appendages in the throat of the corolla; two large and wing shaped and two small linear.

Flowering Period: November

Distribution and Habitat

This species occurs at Beaufort River, and from south of the Stirling Range, through Needilup and Jerramungup to the western FRNP. It grows in loamy sands or silty clay (possibly winter wet), usually as an understorey to heath or mallee heath.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Gordon Inlet Rd	Albany	Jer	NP	28.11.86	+400	healthy
2. Corackerup	Albany	Jer	NR	12.11.84	rare	in flower
3. Kalgan Plains	Albany	Pl	NR	27.11.86	uncommon	in flower
(4) Kamballup	Albany	Pl	Shire	27.11 86	+1000	in flower

WAHerb: 5 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

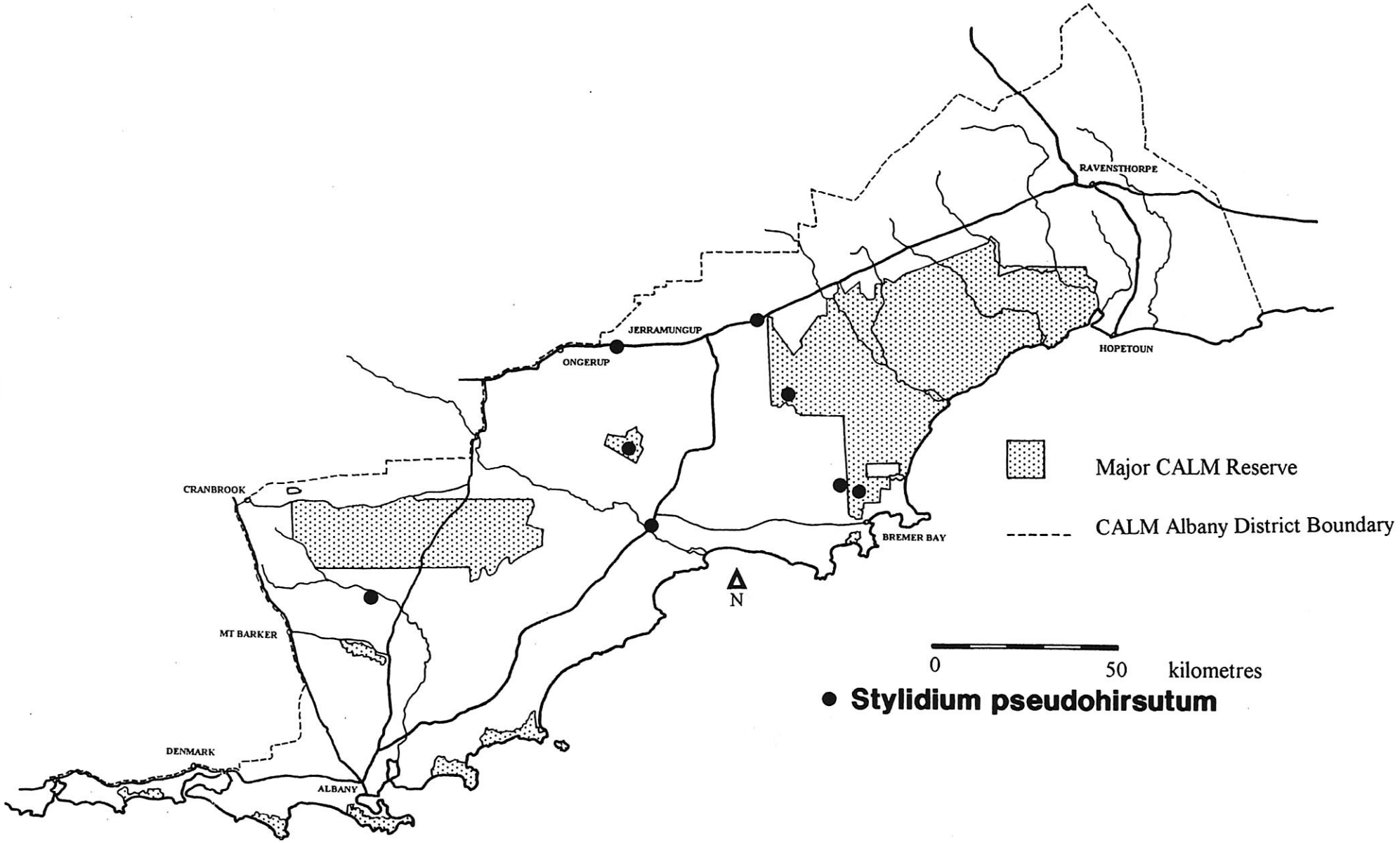
Monitor occasionally

Research Requirements

- relocate and survey WAHerb locations
- survey opportunistically for new populations

References

Erickson (1981).


RAVENSTHORPE
JERRAMUNGUP
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CRANBROOK
BREMER BAY
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DENMARK
ALBANY
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Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Stylidium pseudohirsutum

Stylidium verticillatum F.Muell.

STYLIDIACEAE

Pink Mountain Triggerplant

Stylidium verticillatum is a small perennial plant with trailing to erect stems, which may root from the nodes. The glabrous leaves are arranged in regularly spaced whorls along the slender stems. The leaves are narrow linear to 15 mm, triangular in section and slightly incurved. The stems are red-brown, glabrous and four sided. The inflorescence is a cyme of up to six flowers on very glandular hairy scapes with narrow linear bracts below the slender glandular hairy pedicels. The calyx is also glandular hairy, with a globose tube and narrow spreading lobes, longer than the tube. The corolla is composed of four almost equal pink petals, laterally paired with red spots at the base of the petals. There are six corolla throat appendages.

Flowering Period: October-November

Distribution and Habitat

This species is confined to the Stirling Range, where it occurs on the slopes and summits of peaks throughout the range. It grows in shallow stony peaty sand in mallee Jarrah or scrub heath.

Conservation Status

Current: Priority 3 Recommended: Priority 4

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Mondurup	Albany	Pl	NP	18.10.77	very comn-WH	in flower
2. Mt Mistake	Albany	Cb	NP	18.10.77	common-WH	in flower
3. Mt Barnett	Albany	Cb	NP	8.11.77	common-WH	in flower
4. The Abbey	Albany	Gno	NP	20.10.77	common-WH	in flower
5. Ross Peak	Albany	Cb	NP	7.11.77	common-WH	in flower
6. Donnelly Peak	Albany	Cb	NP	7.11.77	common-WH	in flower
7. Hill Mt Hassell	Albany	Gno	NP	19.10.77	very common-WH	in flower
8. Bluff Knoll	Albany	Gno	NP	28.2.86	scattered-WH	-

WAHerb: 18 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

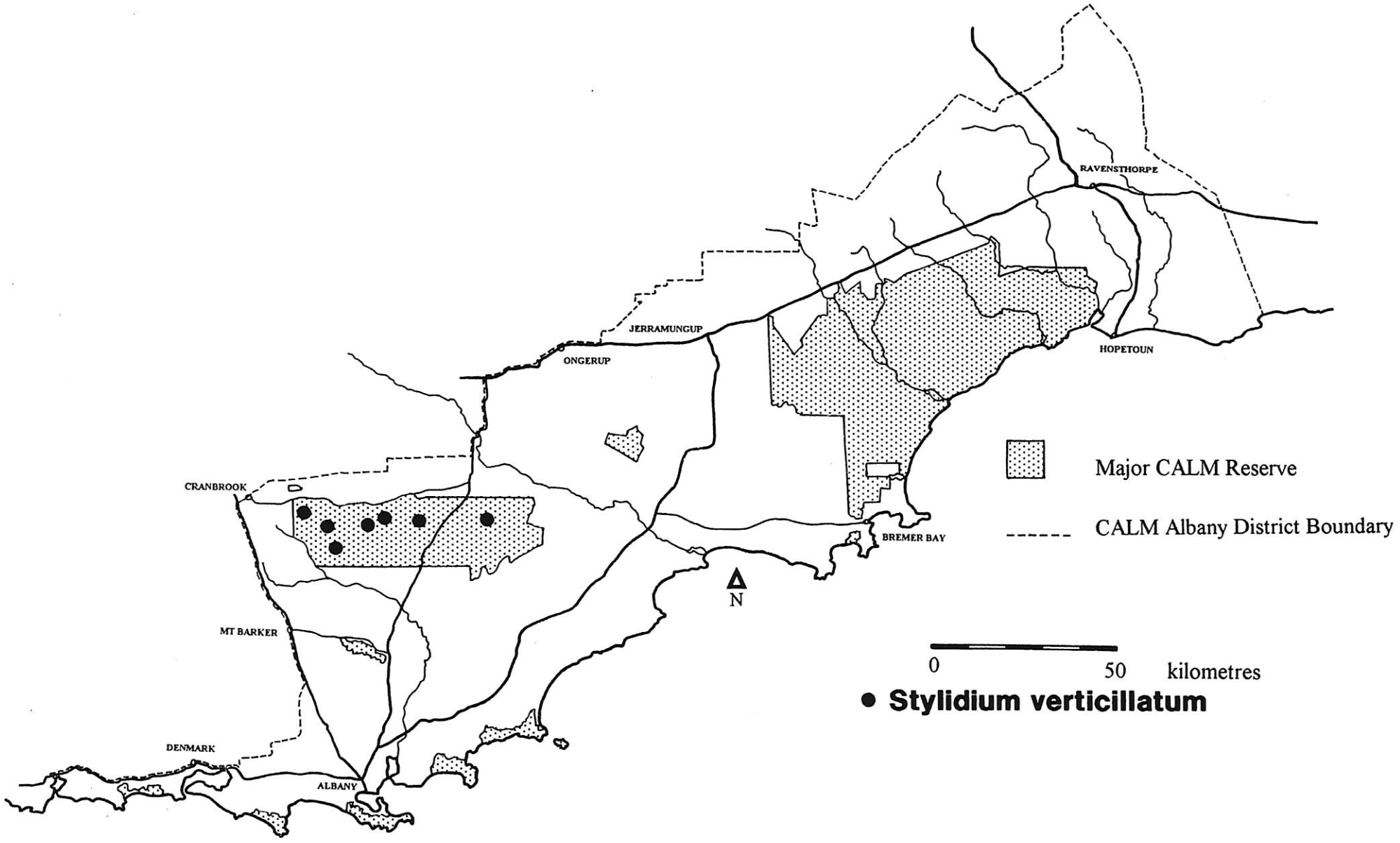
Monitor occasionally

Research Requirements

Determine postfire regeneration on Bluff Knoll

References

Erickson (1981).


RAVENSTHORPE
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CRANBROOK
BREMER BAY
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
• Stylidium verticillatum

Thomasia discolor Steud. STERCULIACEAE

Thomasia discolor is an erect bushy to open shrub to 1.5 m tall, with densely stellate hairy tomentose branches. The leaves are oak-leaf shaped, broadly ovate with sinuately lobed margins to 50 mm and a 20 mm tomentose petiole. The lamina is dark green, nearly glossy glabrous to scabrous above, but conspicuously white and densely rusty tomentose below. A pair of reniform, occasionally petiolate stipules, up to 10 mm across, are present. The inflorescence is cymose with up to six lilac flowers. The coloured calyx spreads up to 15 mm and is subtended by three thick 5 mm linear bracteoles. There are no petals; the globular ovary is densely orange hairy, surrounded by long blackish 2 mm anthers on 2 mm filaments.

Flowering Period: October-December

Distribution and Habitat

Thomasia discolour occurs in dense coastal heath and low woodland in shallow loam soil over granite (around granite outcrops and deep gullies) from Bald Island to Mount Elphinstone (just west of Albany town).

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Boulder Hill	Albany	Alb	Shire res.	13.11.92	+100	in flower
2. North Point	Albany	Alb	Shire res.	4.9.92	+100	in flower
3. Two Peoples Bay	Albany	Alb	NR	12.11.92	+20	in flower
4. Manypeaks W gully	Albany	Alb	NP	8.7.93	+50	healthy
5. Waychinicup	Albany	Alb	NP	23.8.93	+50	healthy

WAHerb: 13 records

Response to Disturbance

Killed by fire

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

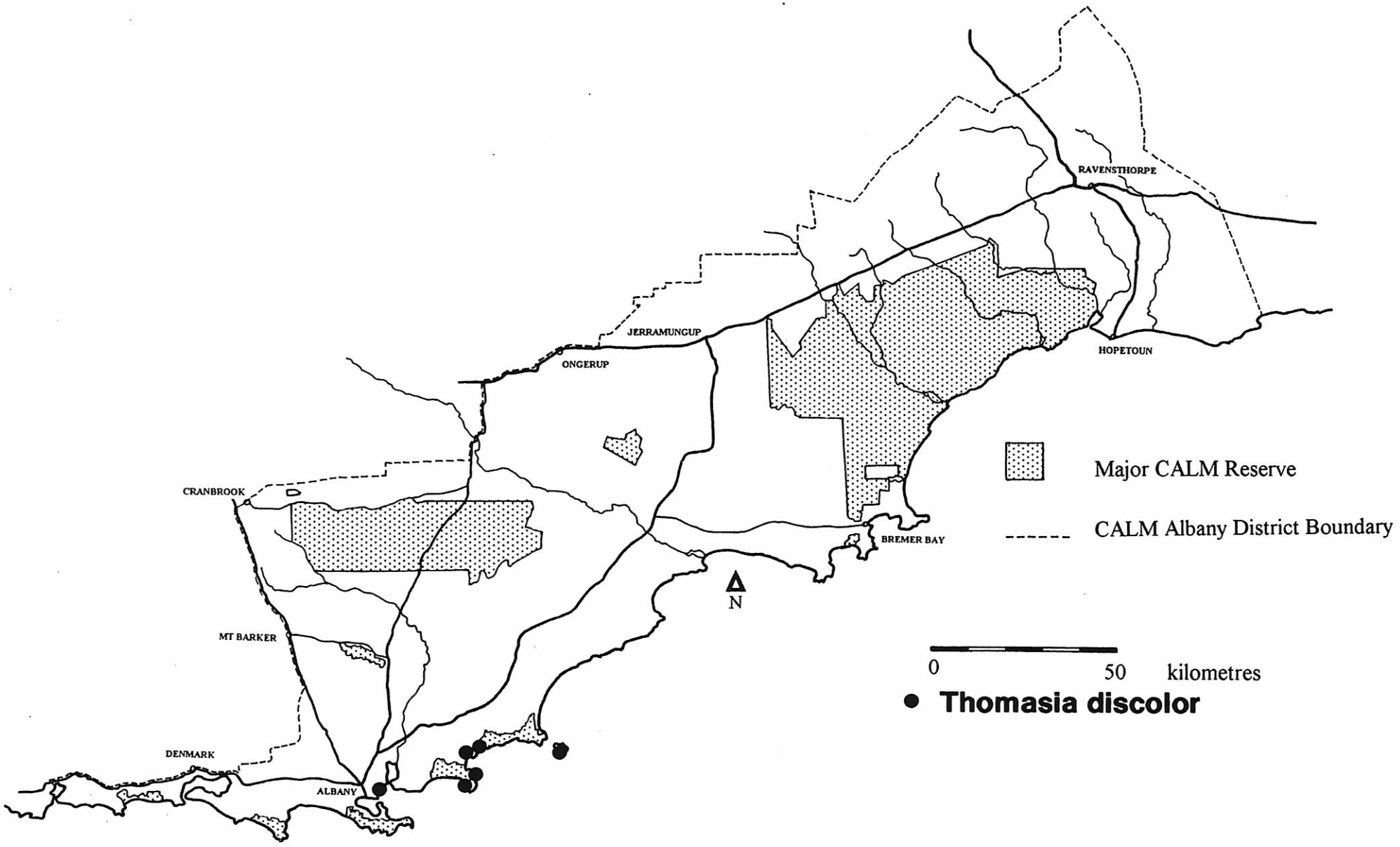
Monitor occasionally

Research Requirements

Survey for old WAHerb locations and new populations

References

Lehmann (1845).


RAVENSTHORPE
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BREMER BAY
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Major CALM Reserve
CALM Albany District Boundary
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kilometres
Thomasia discolor

Thomasia solanacea J.Gay STERCULIACEAE

Thomasia solanacea varies from a low wind pruned shrub in exposed locations to a small tree in sheltered gullies. The leaves (up to 75 mm) of this species are also oak-leaf shaped (deeply sinuately lobed, cordate-ovate) and can be easily confused with *Chorilaena quercifolia*, with which it may grow. The leaves are light green above and below, scabrous hirsute above and more densely tomentose below. The stipules are compressed-ovate tending to reniform, shortly petiolate. The inflorescence is a raceme of up to eight purple flowers on stellate hairy peduncles up to 10 mm. The purple calyx (12 mm across) is tomentose; the cream coloured ovary is shortly scabrid hairy and the anthers are on very short filaments.

Flowering Period: November

Distribution and Habitat

This species occurs in calcareous coastal soil over limestone in exposed wind pruned heath or as an understorey to low woodland (e.g Big Grove Karri), from Cape Riche to Big Grove (Albany).

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Cape Riche W	Albany	Alb	VCL	16.11.92	+100	in flower
2. Betty's Beach	Albany	Alb	Shire res.	13.11.92	+50	in flower
3. Big Grove	Albany	Alb	WAWA	30.11.92	+200	healthy
4. Norman's Beach	Albany	Alb	NP	8.7.93	+50	healthy
5. Waychinicup	Albany	Alb	NP	23.8.93	+100	healthy

WAHerb: 9 records

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

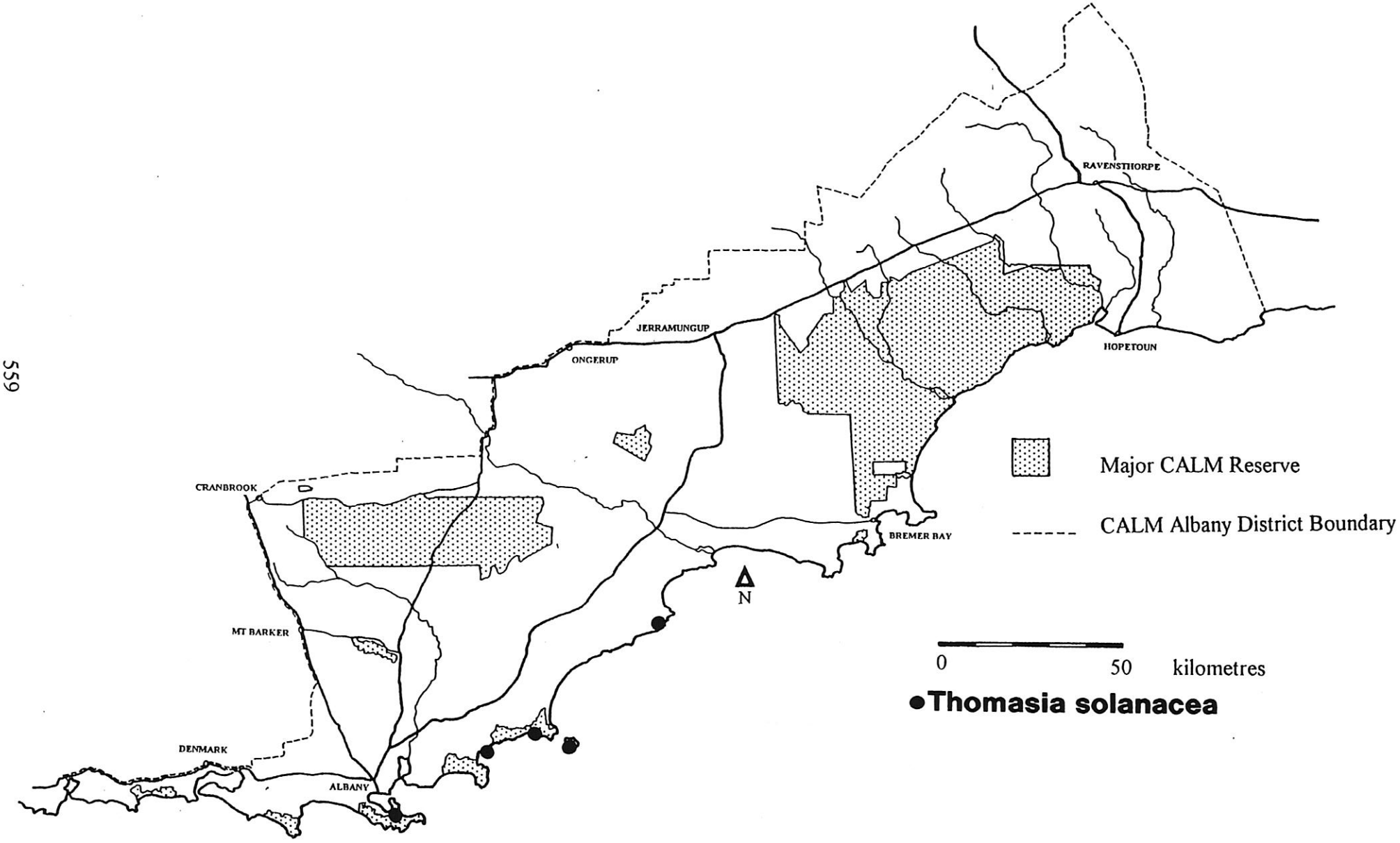
Monitor occasionally

Research Requirements

Survey opportunistically for new populations

References

Gay (1821).


RAVENSTHORPE
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CALM Albany District Boundary
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kilometres
●Thomasia solanacea

Velleia foliosa (Benth.) Krause

GOODENIACEAE

Mountain Velleia

Velleia foliosa is a glabrous perennial herb with erect or spreading stems to 30 cm. The stock is elongated into a short, thick distinct stem; a habit which is only known from one other species in this genus, *V. macrophylla.* The narrowly obovate, crowded leaves are 4-7 cm long and 10-15 mm wide, sessile and broadly stem clasping with dentate margins. The scapes (several) are 20 cm long, with free linear bracteoles to 13 mm subtending the cymose inflorescence of up to five flowers. The orange-yellow corolla is ca. 12 mm long, pubescent outside and inside reddish in the throat. The adaxial lobes of the corolla are winged (2 mm wide) to the base. The indusium enclosing the stigma is obovate with a bunch of hairs on the lower surface. The bracteole axils are densley woolly with white to pale brown hairs.

Flowering Period: October-March

Distribution and Habitat

This species is confined to peaks and slopes within the Stirling Range where it grows in very shallow soil over rocky ledges and outcrops.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Bluff Knoll	Albany	Gno	NP	3.2.93	+20	in flower
2. Success Saddle	Albany	Gno	NP	22.9.93	+20	in flower
3. Ellen's Peak Sth	Albany	Gno	NP	29.9.93	+100	in flower

WAHerb: 14 records

Response to Disturbance

Killed by fire ; regenerates from seed

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

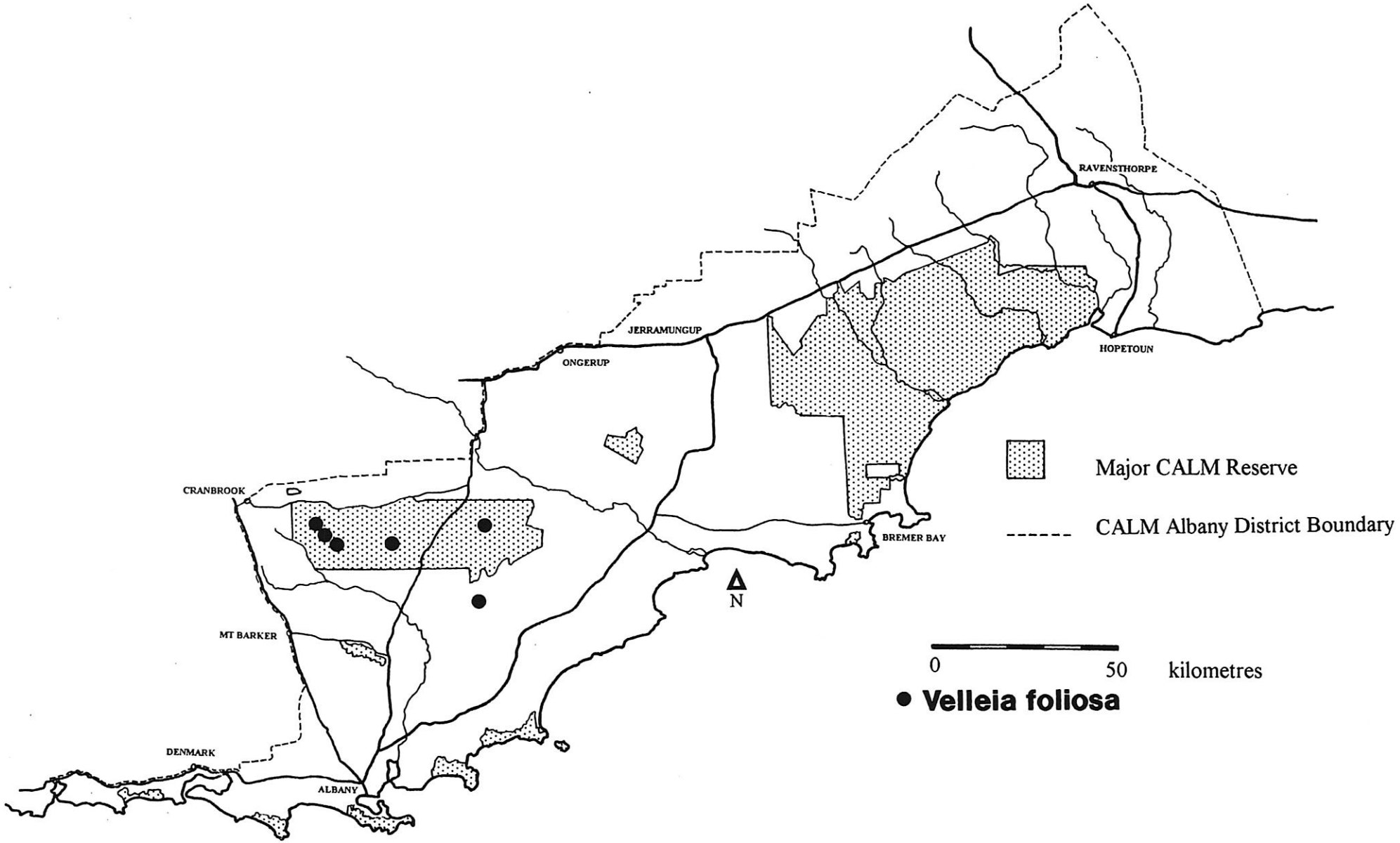
Monitor occasionally

Research Requirements

Survey opportunistically for new populations

References

Bentham (1868), Carolin (1992).


RAVENSTHORPE
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CALM Albany District Boundary
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kilometres
Velleia foliosa

Verticordia coronata A.S.George

MYRTACEAE

Verticordia coronata is an erect lignotuberous shrub to 50 cm. It is similar to *V. chrysantha* (which is non lignotuberous) and characterised by elliptic, oblong, concave and thick floral leaves, a slightly or non verrucose hypanthium, anther locules and appendages of equal length and broad entire staminodes. The specific epithet refers to the broad staminodes which form a crown-like centre to the flowers after anthesis. The flowers are bright yellow and strongly scented.

Flowering Period: October-November

Distribution and Habitat

This species has been widely collected from the Stirling Range, Cranbrook, Borden, Pingrup, Ongerup, Tambellup and Katanning. Many collections, however have been made from road verges and some have been severely disturbed by machines. It grows in sandy loam or gravelly sand over laterite in association with open mallee heath or open woodland (e.g. Wandoo).

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
No recent survey						

WAHerb: 24 records

Response to Disturbance

Resprouts from lignotuber after fire

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

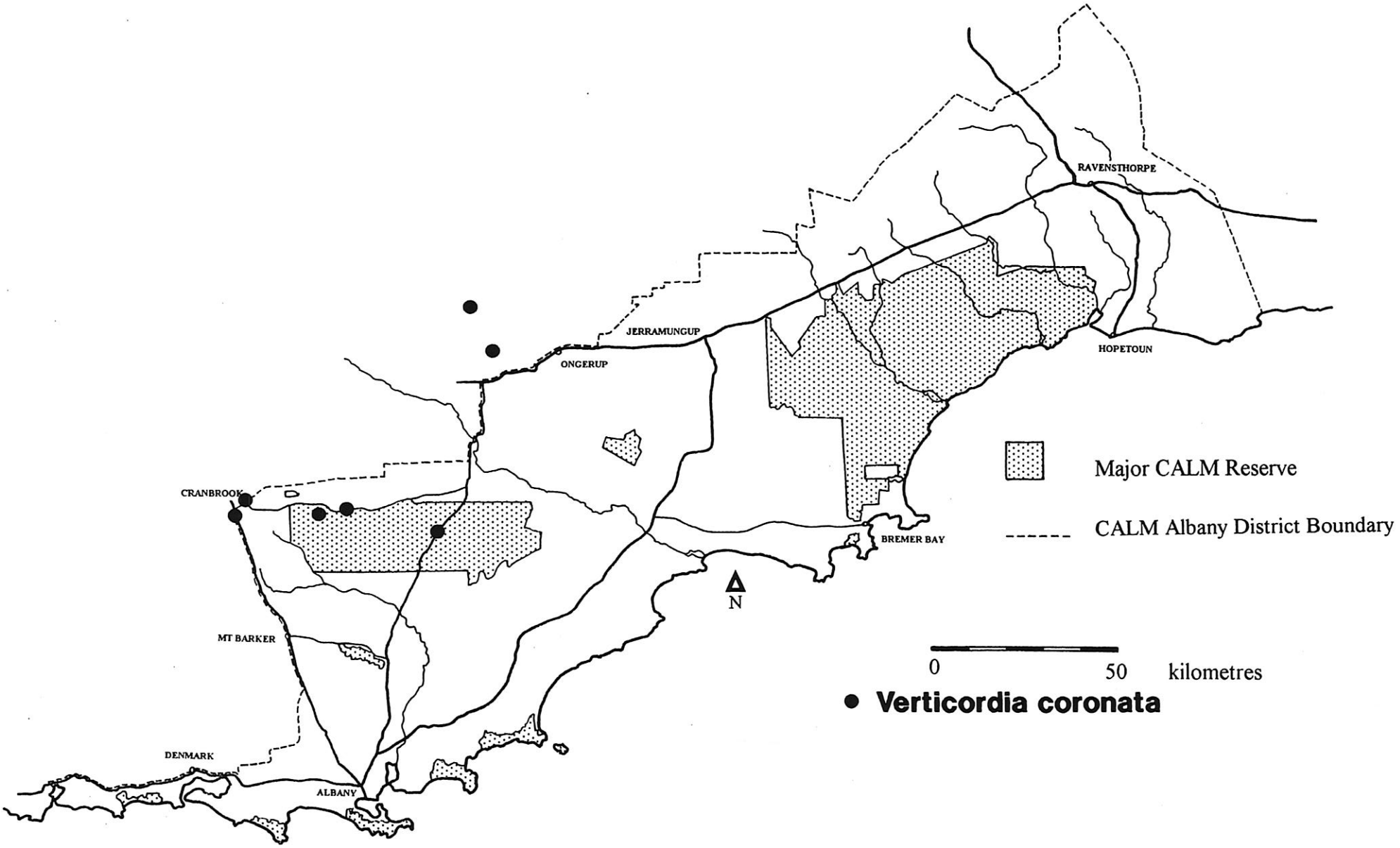
Determine after survey

Research Requirements

Relocate and survey WAHerb locations

References

George (1991).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
N
Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Verticordia coronata

Verticordia lindleyi subsp. *purpurea* A.S.George MYRTACEAE

Verticordia lindleyi subsp. *purpurea* is an erect or spreading non lignotuberous shrub, up to 50 cm tall and 80 cm across. This species is characterised by slightly concave, shortly ciliate leaves to 8 mm, 2-4 mm peduncles and a rounded ribbed hypanthium with short rounded reflexed appendages. Subspecies *purpurea* differs from subsp. *lindleyi* in having purple or deep pink flowers (in a terminal spike), coarsely serrate petals with a broad apex and staminodes longer than the stamens.

Flowering Period: November-December, May

Distribution and Habitat

This taxon is widespread from Brookton to Cranbrook and the Stirling Range with scattered outliers between. The majority of collections have been made on somewhat vulnerable road verges. It grows in slight depressions or flat clay-loamy sand or gravel supporting mallee heath or occasionally Wandoo woodland.

Subspecies *lindleyi* is found north of Perth.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Salt River Rd	Albany	Cb	NP	24.5.82	common	-

WAHerb: 23 records

Response to Disturbance

Killed by fire

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

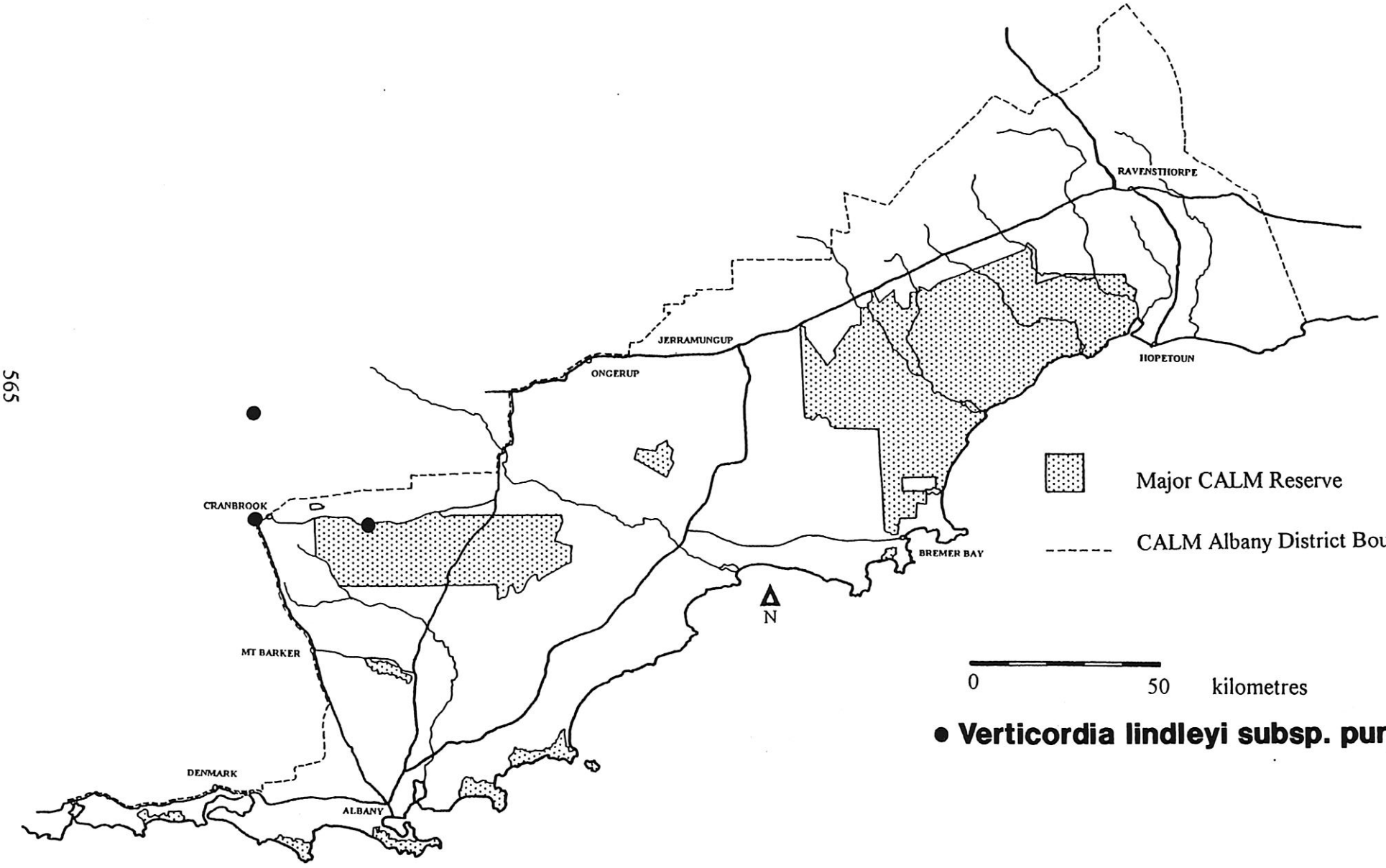
Monitor occasionally

Research Requirements

Survey opportunistically for new populations

References

George (1991).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
N
Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
• Verticordia lindleyi subsp. purpurea

Verticordia longistylis A.S.George MYRTACEAE

Verticordia longistylis is an irregular shrub to 70 cm tall. The glaucous purple leaves are crowded linear, triquetrous to semiterete, obtuse and 4-10 mm long. The yellow flowers are scattered amongst the foliage, on 4-5 mm peduncles with caducous bracteoles. The 5 mm hemispherical hypanthium is verrucose and densely hirsute. The yellow and purple sepals are 6-7 mm long, very divided. The yellow petals are ovate, concave, 2.5-3 mm long, usually glabrous with densely fimbriate margins. The stamens are uniform, 3 mm long and the staminodes 2 mm long, linear and glandular. The straight style is conspicuously exserted, 27-32 mm long with a beard of simple hairs below the apex.

Flowering Period: intermittent, December-June

Distribution and Habitat

This species has only been recorded from the east side of the Fitzgerald River valley east of Roe's Rock and above the Suzetta River near its junction with the Fitzgerald River. Another location south of Roe's Rock on Jacup South Road has been recorded, but was not verified with a specimen. It grows on the rocky spongolite platform above the river valley in an association of *Banksia* and *Hakea* scrub. As this species is known from less than five populations, (which are not believed to be under immediate threat), it should be elevated to Priority 2.

Conservation Status

Current: Priority 3 Recommended: Priority 2

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Fitzgerald River valley	Albany	Rav	NP	16.4.88	14	in flower
2. Jacup Sth Rd	Albany	Rav	NP	6.12.87	300	bud

WAHerb: 5 records

Response to Disturbance

Unknown; probably killed by fire

Susceptibility to *Phytophthora* Dieback

Unknown

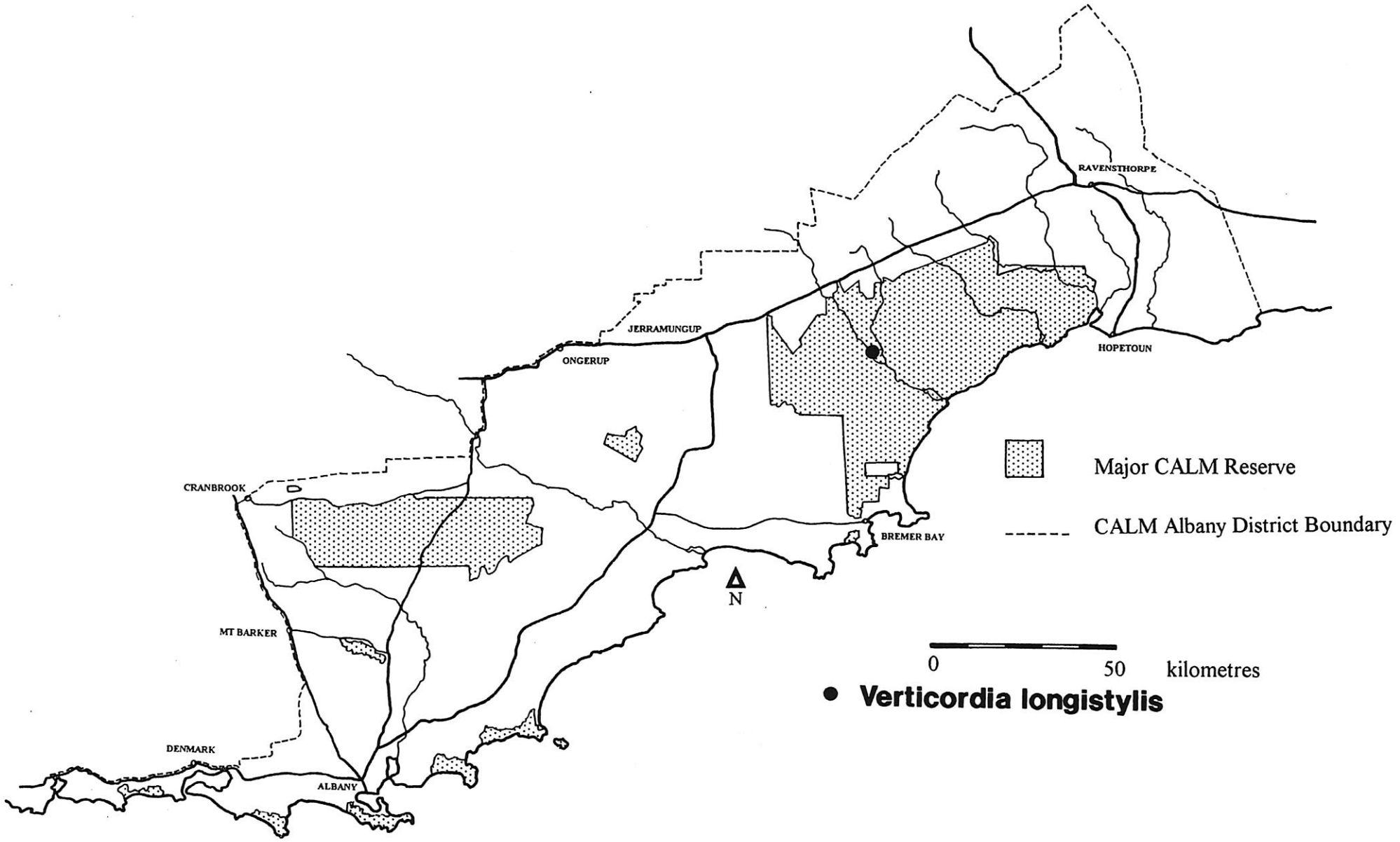
Management Requirements

Research Requirements

- relocate and survey WAHerb and Jacup South Road populations and confirm identification
- survey for new populations

References

George (1991).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
N
Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Verticordia longistylis

Verticordia multiflora Turcz. subsp. *multiflora* MYRTACEAE

Verticordia multiflora is a low divaricately branched shrub to 50 cm with straggly spreading stems. The sessile leaves are crowded, linear, semiterete, obtuse, 2-7 mm long. The flowers are bright yellow. The hypanthium is turbinate, 1.8-2 mm long and densely hairy at the base. The sepals are 4-4.5 mm long and deeply fimbriate and the petals, 2.5-3 mm long, are also fimbriate. The 3.5 mm style has long radiating hairs and a red capitate stigma, 0.5 mm in diameter. The staminodes are subulate.

Flowering Period: October-November

Distribution and Habitat

This subspecies occurs in scattered localities from Darkan to Porongurup. It grows in sandy gravel under open Wandoo woodland. Most collections have been made from road verges as much of this habitat has been cleared for agriculture.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Knights Road	Albany	Pl	verge	10.92	+500	in flower
2. Woogenilup Rd	Albany	Pl	verge	11.92	+300	in flower

WAHerb: 16 records

Response to Disturbance

Killed by fire

Susceptibility to *Phytophthora* Dieback

Unknown

Management Requirements

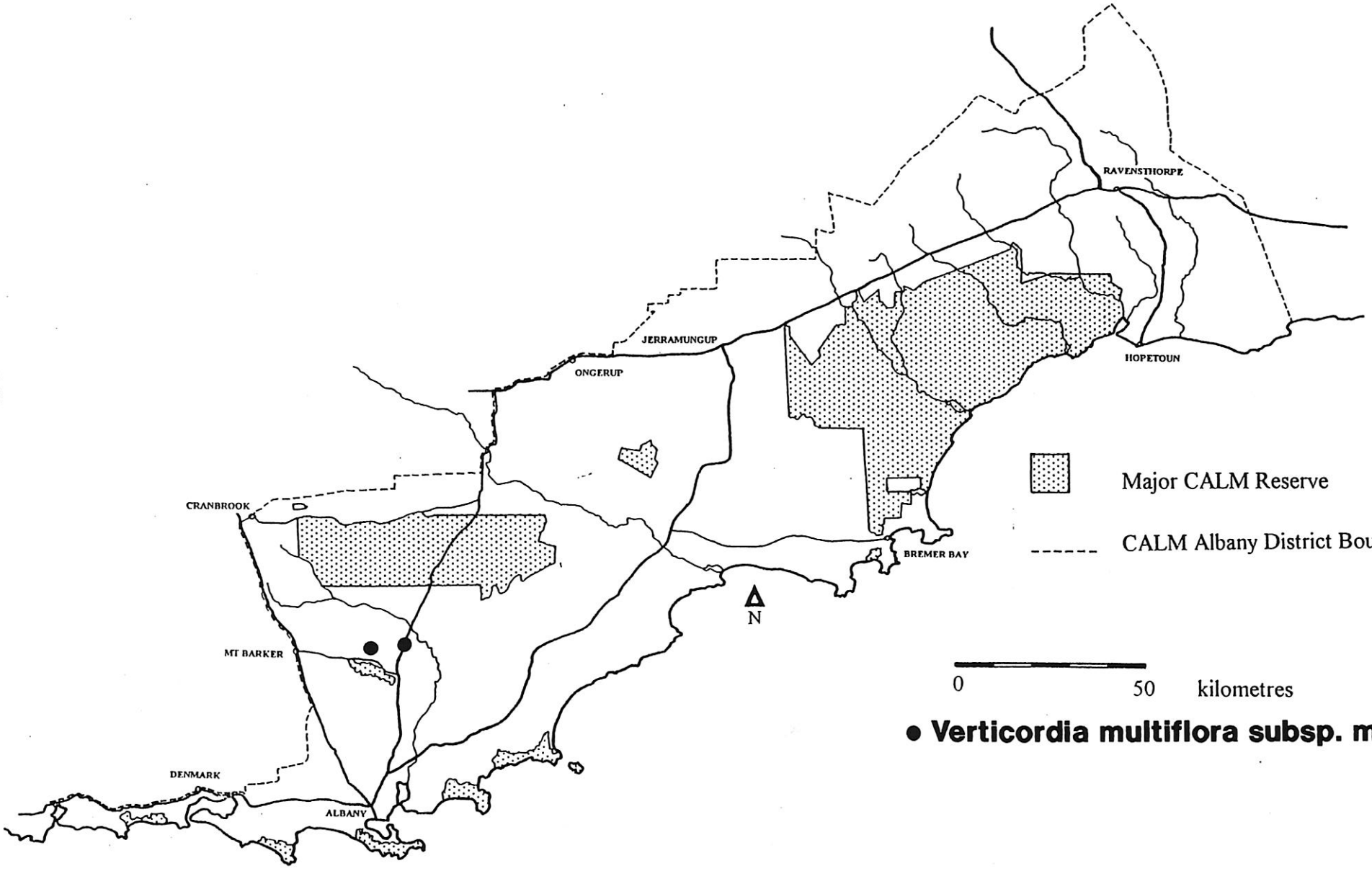
Monitor occasionally

Research Requirements

Survey opportunistically for new populations, particularly on conservation land

References

George (1991).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
N
Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
• Verticordia multiflora subsp. multiflora

Xanthosia peduncularis Benth. APIACEAE

Xanthosia peduncularis is a tufted perennial herb (may appear an annual), glabrous or softly hairy, 15-30 cm high. The leaves are radical from the base of the stem, on long 50 mm petioles. The lamina is divided into two or three linear-cuneately lobed or toothed segments. The leafless peduncles are much longer than the leaves, supporting a compound umbel of 3-4 well developed rays. Each ray has several flowers surrounded by three broad cream coloured ray bracts, subtended by an involucral bract; the three partial involucral bracts are broad and coloured and the lateral one, very oblique. The flowers are small, 2-3 mm long developing into fruits with 4 or 6 prominent ribs.

Flowering Period: September-November

Distribution and Habitat

The only known location for collections of this species is the Bremer Bay vicinity. Only one collection has habitat detail which was tall open shrubland in gently sloped shallow sandy gravel, possibly over spongolite.

Conservation Status

Current: Priority 3

Known Populations

Population	District	Shire	Land Status	Last Survey	No. of Plants	Condition
no recent survey.						
1. Bremer 4.5km Nth	Albany	Jer	?NP	27.10.73	rare	in flower

WAHerb: 4 records

Response to Disturbance

Unknown; presumed killed by fire

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible

Management Requirements

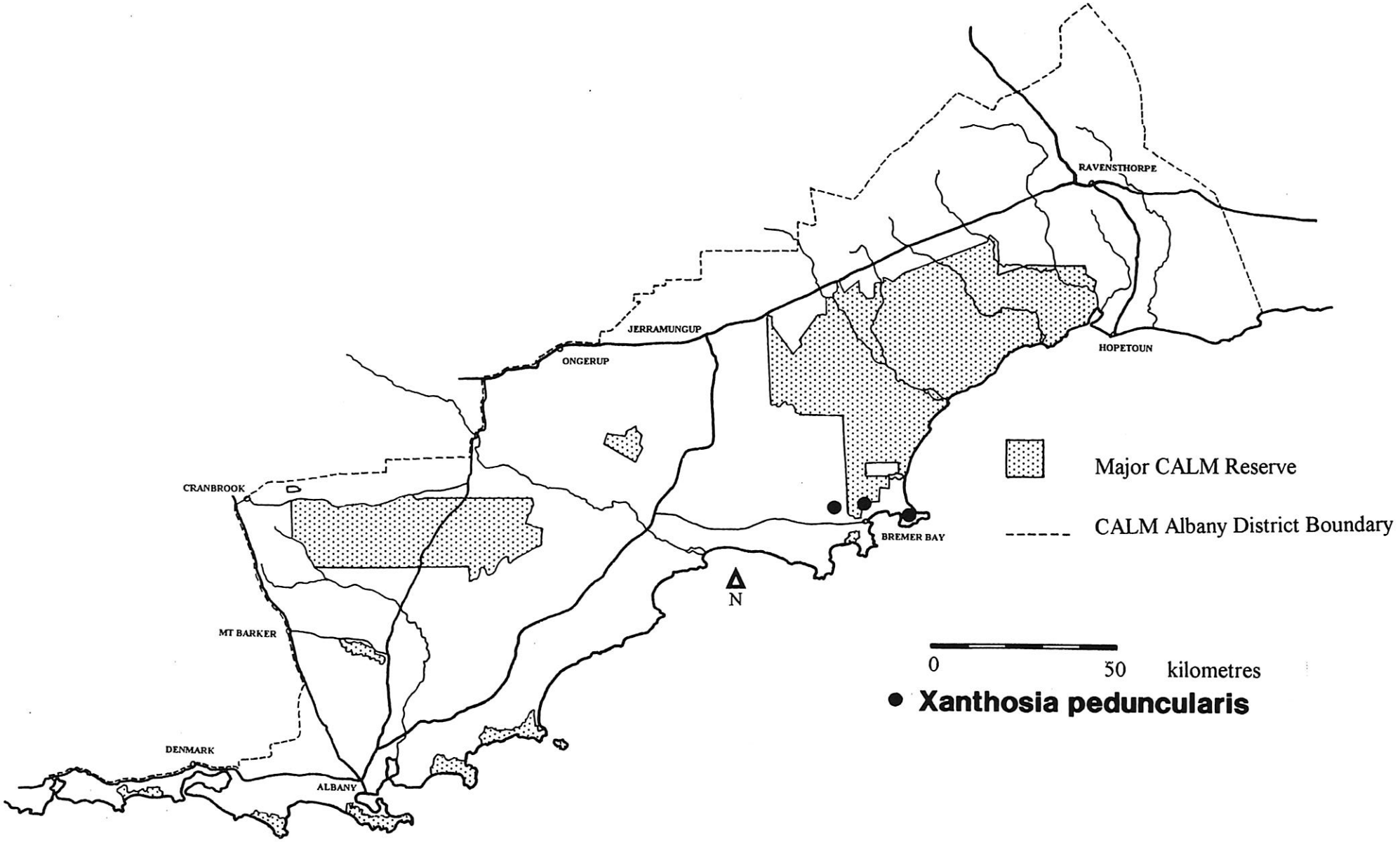
Cannot be determined until further survey

Research Requirements

- relocate and survey WAHerb locations
- survey for new populations to determine range and habitat

References

Bentham (1866).


RAVENSTHORPE
JERRAMUNGUP
ONGERUP
HOPETOUN
CRANBROOK
BREMER BAY
MT BARKER
DENMARK
ALBANY
N
Major CALM Reserve
CALM Albany District Boundary
0
50
kilometres
Xanthosia peduncularis

PART FOUR - THE PLAN FOR MANAGEMENT

The objective of this Wildlife Management Program 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.

1. Determining Priorities

An initial indication of those taxa most in need of attention for a particular management or research requirement can be determined from Table 1. Each taxon of Declared Rare Flora dealt with in Part Two, was ranked on a scale of 0 to 3 under 19 categories identified as potential threats or management and research requirements (Table 1). A high degree of threat or need for action was allocated a score of 3. Those with a lower threat or need for action were scored 2 or 1, and 0 where there was no threat or action required. Taxa where the threat or management/research action was considered irrelevant were marked with a dash. The scores were summed for each of the 62 taxa and for each threat or management/research requirement category. Ranking the categories also provides an initial indication of the most critical threats/management requirements in the District

Table 2 lists the 61 species of Declared Rare Flora in priority order according to the urgency of their requirement for management action. This will enable resources and staff within the Albany District to be allocated where they are most urgently required. 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.

2. Management and Research Actions

Overall rankings of threatened taxa based on the 19 categories of threat, management requirements and research requirements (Table 1) are shown in Table 2. These data suggest that currently seven taxa warrant immediate management and research action. These are:

Dryandra ionthocarpa ms
Isopogon uncinatus
Darwinia oxylepis
Andersonia sp. Two Peoples Bay
Banksia brownii
Darwinia wittwerorum
Dryandra montana ms

Specific management or research actions for all threatened flora in the Albany District are outlined below:

(i) Fungal Disease

Twenty four taxa were perceived as being under threat from fungal pathogens; primarily *Phytophthora* species and in particular *P. cinnamomi*. These fungi represent the single most destructive agent currently threatening native flora in the Albany district. Recent discoveries (Frank Podger *pers comm*) of active *Phytophthora* lesions in two species of *Darwinia* (*D. oxylepsis* and *D. wittwerorum*) have raised concern for this spectacular genus in the Stirling Range.

Selective spraying with phosphonate may be able to sustain populations already infected and limit further plant deaths over at least a two to three year period. Currently, treatment consists of two foliar sprays, applied six weeks apart with monitoring to check for any possible phytotoxic effects. This treatment will probably need to be repeated every three to four years. Due to the remote location of some populations requiring treatment, and the necessity to transport equipment and materials to sites on foot, this management operation can be logistically difficult and costly. Localised aerial application using fixed wing aircraft has proven to be effective in some areas but is

TABLE 1. ALBANY DISTRICT DECLARED RARE FLORA SCORED (1-3) ACCORDING TO THE DEGREE OF THREAT OR URGENCY FOR MANAGEMENT AND RESEARCH ACTION

	Total	Fungal disease	Survey populations	Small/few populations	Roadside	Private land	Land acquisition	Fencing	Mining	Recreation	Drought	Germ plasm collection	Re-establishment	Road/utility maintenance	Liaison	Monitoring	Research	Linear marking	Weeds	Fire exclusion
Acacia argutifolia	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Acacia simulans	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Adenanthos cunninghamii	12	2	1	1	0	0	0	0	0	0	0	2	0	0	0	2	3	0	0	1
Adenanthos dobagii	10	2	1	0	0	0	0	0	0	0	0	2	0	0	0	2	1	0	0	2
Adenanthos ellipticus	15	2	2	1	0	0	0	0	0	0	0	2	0	0	0	3	2	0	0	3
Adenanthos pungens subsp. *pungens*	22	3	3	3	0	0	0	0	0	0	0	3	0	0	2	3	2	0	0	3
Andersonia sp. Two Peoples Bay	29	3	3	3	1	2	2	0	0	0	0	3	0	2	2	3	3	0	0	2
Apium prostratum subsp. *phillipii*	17	0	2	2	0	0	0	0	0	1	0	2	0	0	0	2	3	0	3	2
Asplenium obtusatum	10	-	2	2	0	0	0	0	0	1	1	1	0	0	0	1	2	0	0	0
Baeckea arbuscula	12	2	2	1	0	0	0	0	0	0	0	1	0	0	0	2	2	0	0	2
Banksia brownii	27	3	1	1	3	0	0	0	0	1	0	3	2	2	2	3	3	0	0	3
Banksia goodii	24	1	2	3	2	2	1	0	0	0	0	3	2	0	2	3	1	0	0	2
Banksia verticillata	22	3	2	1	0	0	0	0	0	1	1	3	0	3	0	3	2	0	0	3
Billardiera mollis	16	-	3	2	0	0	2	0	2	0	0	2	0	1	0	2	2	0	0	-
Caladenia bryceana	25	0	2	3	2	2	1	2	0	2	1	0	0	2	2	1	1	0	3	1
Caladenia harringtoniae	11	0	2	3	0	0	0	0	0	1	1	0	0	0	0	1	0	0	2	1
Conostylis misera	24	1	3	2	2	1	0	0	0	0	0	2	0	0	3	3	2	0	3	2
Coopernookia georgei	13	-	3	1	0	0	0	0	0	0	0	2	0	0	0	3	2	0	0	2
Corybas limpidus	15	0	2	0	0	0	0	0	0	1	1	2	0	0	0	2	2	0	2	3

Darwinia collina	21	1	3	1	0	0	0	0	0	3	1	3	0	0	0	3	3	0	0	3
Darwinia macrostegia	21	1	3	1	0	0	0	0	0	3	1	3	0	0	0	3	3	0	0	3
Darwinia meeboldii	22	1	3	3	0	0	0	0	0	2	1	3	0	0	0	3	3	0	0	3
Darwinia oxylepis	31	3	3	2	3	0	0	2	0	2	1	3	0	0	3	3	3	0	0	3
Darwinia squarrosa	21	1	3	2	0	0	0	0	0	2	1	3	0	0	0	3	3	0	0	3
Darwinia wittwerorum	27	3	2	2	3	0	0	0	0	1	1	3	0	0	3	3	3	0	0	3
Darwinia sp. Stirling Range	21	1	2	3	0	0	0	0	0	2	1	3	0	0	0	2	3	0	0	3
Daviesia megacalyx ms	21	1	2	1	1	0	2	0	3	0	0	3	0	0	2	2	3	0	0	1
Daviesia pseudaphylla ms	19	2	3	3	2	0	0	0	0	0	0	2	0	0	0	3	3	0	0	1
Drakaea confluens	12	0	2	2	0	0	0	0	0	0	1	1	0	0	0	2	3	0	-	1
Drosera fimbriata	13	0	2	1	2	0	0	0	0	1	1	2	0	0	0	1	0	0	2	1
Dryandra montana ms	28	3	3	3	0	0	0	0	0	3	3	3	0	2	0	3	2	0	0	3
Dryandra ionthocarpa ms	33	3	1	3	0	0	2	3	2	1	0	3	0	3	3	3	2	0	2	2
Eremophila denticulata	15	0	1	3	0	1	0	0	0	0	0	2	0	0	1	3	3	0	0	1
Eucalyptus bennetiae	13	0	1	3	0	0	0	0	3	1	0	0	0	0	0	1	3	0	0	1
Eucalyptus burdettiana	14	0	1	3	1	0	0	0	0	1	0	2	0	0	0	2	1	0	0	3
Eucalyptus coronata	15	0	3	3	0	0	0	0	0	1	0	2	0	0	0	2	1	0	0	3
Eucalyptus erectifolia	4	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1
Eucalyptus goniantha subsp. *goniantha*	6	0	1	0	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0	1
Grevillea infundibularis	15	2	3	3	0	0	0	0	0	0	0	2	0	0	0	1	3	0	0	1
Hibbertia sp. Porongorup	16	-	3	1	0	0	0	0	0	1	2	2	0	0	0	2	3	0	0	2
Isopogon uncinatus	31	3	3	3	0	0	0	1	0	2	1	3	1	3	2	3	3	0	0	3
Kennedia glabrata	14	0	1	1	0	0	0	0	0	2	0	3	0	0	0	1	3	0	0	3
Lambertia fairallii	23	3	3	3	0	0	0	0	0	2	0	3	0	0	0	3	3	0	0	3
Laxmannia jamesii	6	0	1	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	1
Lechenaultia superba	6	-	1	0	0	1	0	0	0	0	0	1	0	0	0	1	1	0	0	1
Microtis globula	10	0	2	1	0	0	0	0	0	0	0	1	0	0	0	2	2	0	1	1
Myoporum cordifolium	17	0	1	2	2	1	0	0	0	0	0	2	0	0	1	3	3	1	0	1
Pleurophascum occidentale	13	0	2	2	0	0	0	0	0	1	1	-	0	0	0	1	3	0	1	2
Meziella trifida	14	0	3	3	0	0	0	0	0	0	0	3	-	0	0	0	3	0	1	1
Restio abortivus	19	0	3	3	3	0	0	0	0	0	0	2	0	0	0	2	3	0	0	3
Ricinocarpos trichophorus	12	-	2	1	0	0	0	0	0	0	0	2	0	0	0	2	3	0	0	2
Stylidium galioides	13	-	2	2	0	0	0	0	0	1	0	3	0	0	0	1	2	0	0	3
Stylidium plantagineum	2	-	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thelymitra psammophila	13	0	3	1	1	0	0	0	0	0	1	2	0	0	0	2	1	0	1	1
Tribonanthes purpurea	20	0	3	3	0	0	0	0	0	1	2	2	0	0	0	2	3	0	2	2
Verticordia crebra	11	-	2	1	0	0	0	0	0	0	0	2	0	0	0	2	3	0	0	1
Verticordia fimbrilepis	21	-	3	2	0	2	0	0	2	0	0	3	0	0	1	2	3	0	0	3
Verticordia harveyi	23	-	3	2	1	2	0	2	0	0	0	2	0	0	3	3	2	0	0	3
Verticordia helichrysantha	16	-	2	2	0	0	0	0	1	1	0	2	0	1	0	2	2	0	0	3

Villarsia calthifolia	16	0	3	1	0	0	0	0	0	1	2	2	0	0	0	3	3	0	0	1
Xyris sp.Stirling Range	15	0	3	3	0	0	0	0	0	0	1	2	0	0	0	2	2	0	0	2
Total		**54**	**131**	**106**	**32**	**19**	**10**	**10**	**13**	**42**	**27**	**120**	**5**	**19**	**32**	**124**	**130**	**1**	**23**	**117**

not possible in some areas in the Stirling Ranges. Application technologies using helicopters will need to be developed for these less accessible areas. The effectiveness of phosphonate spray in controlling *Phytophthora*, and the overall environmental impact of phosphonate requires continued research and careful monitoring.

Protection of populations not currently infected by the fungus is considered one of the highest priorities for rare and threatened flora management in the Albany District.

Those species currently considered at greatest risk from *Phytophthora* are:-

Adenanthos pungens ssp. *pungens*
Andersonia sp. Two Peoples Bay
Banksia brownii
Banksia verticillata
Darwinia oxylepis
Darwinia wittwerorum
Dryandra montana ms
Dryandra ionthocarpa ms
Isopogon uncinatus
Lambertia fairallii

(ii) Survey

Survey to relocate and census populations which have not been revisited within the last ten years is urgently required for many taxa. This is critical for those taxa where few populations are known and current knowledge of each population is insufficient to accurately assess their conservation status. Survey for new populations in areas containing suitable habitat is also high priority for a number of taxa.

Further survey is urgently required for the following taxa:

Adenanthos dobagii
Adenanthos pungens ssp. *pungens*
Andersonia sp. Two Peoples Bay
Billardiera mollis
Conostylis misera
Coopernookia georgei
Darwinia collina
Darwinia macrostegia
Darwinia meeboldii
Darwinia oxylepis
Darwinia squarrosa
Daviesia pseudaphylla
Dryandra montana ms
Eucalyptus coronata
Hibbertia sp Porongurups
Isopogon uncinatus
Lambertia fairallii
Meziella trifida
Restio arbortivus
Thelymitra psammophila
Tribonanthes purpurea
Verticordia fimbrilepis
Verticordia harveyi
Villarsia calthifolia
Xyris sp. Stirling Range

(iii) Population Size and Few Populations

Species which are known from few populations, or where known populations are composed of small numbers of individuals are considered to be at risk. Many threatened taxa, except those proposed for deletion from the list of Declared Rare Flora, are likely to be at risk from low numbers and few populations. The following taxa are those currently considered to be at greatest risk from low numbers in the Albany District.

Adenanthos pungens ssp. *pungens*
Andersonia sp.Two Peoples Bay
Banksia goodii
Caladenia bryceana ssp. *bryceana*
Caladenia harringtoniae
Darwinia meeboldii
Darwinia sp. Stirling Range
Daviesia pseudaphylla ms
Dryandra montana ms
Dryandra ionthocarpa ms
Eucalyptus burdettiana
Eucalyptus coronata
Grevillea infundibularis
Isopogon uncinatus
Lambertia fairallii
Meziella trifida
Restio arbortivus
Tribonanthes purpurea
Xyris sp. Stirling Range

TABLE 2. Albany District Declared Rare Flora ranked in priority order for management and research action. Rank totals are derived from the 19 categories of threats, management and research requirements given in Table 1.

Taxon	Rank
Dryandra ionthocarpa ms	33
Isopogon uncinatus	31
Darwinia oxylepis	31
Andersonia sp. Two Peoples Bay	29
Dryandra montana ms	28
Banksia brownii	27
Darwinia wittwerorum	27
Caladenia bryceana	25
Banksia goodii	24
Conostylis misera	24
Lambertia fairallii	23
Verticordia harveyi	23
Adenanthos pungens subsp. *pungens*	22
Banksia verticillata	22
Darwinia meeboldii	22
Darwinia squarrosa	21
Darwinia collina	21
Darwinia macrostegia	21
Darwinia sp.Stirling Range	21
Daviesia megacalyx ms	21
Verticordia fimbrilepis	21
Tribonanthes purpurea	20
Restio abortivus	19
Daviesia pseudaphylla ms	19
Myoporum cordifolium	17
Apium prostratum subsp. *phillipii* ms	17
Billardiera mollis	16
Hibbertia bracteosa	16
Verticordia helichrysantha	16
Villarsia calthifolia	16
Adenanthos ellipticus	15
Corybas limpidus	15
Eucalyptus coronata	15
Eremophila denticulata	15
Grevillea infundibularis	15
Xyris sp. Stirling Range	15
Eucalyptus burdettiana	14
Kennedia glabrata	14
Meziella trifida	14
Coopernookia georgei	13
Drosera fimbriata	13
Eucalyptus bennettiae	13

Pleurophascum occidentale	13
Stylidium galioides	13
Thelymitra psammophila	13
Adenanthos cunninghamii	12
Baeckea arbuscula	12
Drakaea confluens	12
Ricinocarpos velutinus	12
Caladenia harringtoniae	11
Verticordia crebra	11
Adenanthos dobagii	10
Asplenium obtusatum	10
Microtis globula	10
Eucalyptus goniantha subsp. *goniantha*	6
Laxmannia jamesii	6
Lechenaultia superba	6
Eucalyptus erectifolia	4
Acacia simulans	2
Acacia argutifolia	2
Stylidium plantagineum	2

(iv) Roadside

Roadside populations are at risk from many factors such as bulldozing or grading, weed invasion, flooding, herbicide overspray, nutrient enriched runoff, picking, fungal disease and fire. Fortunately, in the Albany District, most populations of threatened taxa are on conservation land. However, two species of *Darwinia oxylepis* and *D. wittwerorum* in the Stirling Range National Park are subjected to tourist visitation on a scenic drive. Careful management is required to minimise or eliminate any adverse effects from this attention.

Small road verge populations are typical of some taxa particularly along minor roads and are likely to be at risk from roadworks and invasive weeds. *Restio arbortivus,* known from only a single roadverge population, is considered to be most at risk in this category. Taxa with populations considered to be at risk because of there proximity to roads are:

Banksia brownii
Banksia goodii
Conostylis misera
Darwinia oxylepis
Darwinia wittwerorum
Restio abortivus

(v) Private Land Negotiations

Where Declared Rare Flora occurs on private land, liaison is required with the landholder. Fencing of populations should be undertaken to exclude vehicles and stock. Twelve species have populations occurring on private land in the Albany District, but most are already fenced and not considered to be endangered by the landholder's activity.

Verticordia fimbrilepis ssp. *australis* however, is only known in the Albany District from one small population on private land, adjacent to an active granite quarry. Constant liaison and monitoring is needed to ensure that the disposal of overburden does not damage or affect these plants.

(vi) Land Acquisition

As the Albany district has a number of significantly large National Parks and Nature Reserves in which a large proportion of Declared Rare Flora occur (and where most botanical survey has been carried out), the need for land acquisition is relatively low. Six species were identified for action in land acquisition which would largely be satisfied by conversion of VCL or Shire Reserve to CALM estate.

No taxa currently require urgent land acquisition, however, it would be desirable in the case of:

Andersonia sp Two Peoples Bay
Billardiera mollis
Daviesia megacalyx ms
Dryandra ionthocarpa

(vii) Fencing

Fencing is required in situations where movement of people, stock or vehicles have the potential to destroy populations.

Restricted access, through partial fencing may need to be considered for populations of *Darwinia oxylepis* and *Caladenia bryceana* ssp. *bryceana* in the Stirling Range National Park to protect them from tourists and wildflower enthusiasts. Fencing is required adjacent to a spongolite mine in the Shire reserve at Kamballup to protect *Dryandra ionthocarpa* ms from vehicles and/or mine operations. A population of *Isopogon uncinatus* near Mutton Bird Island will also need to be fenced to protect it from 4WD activity.

(viii) Mining

Verticordia fimbrilepis ssp. *australis,* which occurs as a few plants on private land, is under extreme threat from an adjacent granite quarry. Other species which occur in unvested reserves which are covered by mining or exploration leases, and are potentially at risk are:

Billardiera mollis
Daviesia megacalyx
Dryandra ionthocarpa ms
Eucalyptus bennetiae
Verticordia helichrysantha

(ix) Recreation

Twenty nine species were perceived to be at some degree of risk from recreational activities, primarily from walkers or campers in National Parks. This risk may be from trampling, picking or through the spread of disease. Those species which are confined to or concentrated on upper slopes and mountain tops are under greatest threat as these parts of the landscape attract activity. These species are:

Darwinia collina
Darwinia macrostegia
Darwinia meeboldii
Darwinia squarrosa
Darwinia sp. GJK 5732
Dryandra montana ms

Species occurring lower in the landscape and at risk from recreational activities are:

Caladenia bryceana ssp. *bryceana*
Darwinia oxylepis
Darwinia wittwerorum
Isopogon uncinatus
Kennedia glabrata

(x) Drought or Changing Weather Patterns

Twenty three species were considered to be at risk if drought conditions persist or long term weather patterns change, leading to drier conditions. These species are mainly from wetter mountain tops, such as the Darwinias in the Stirling Range National Park. Species at greatest risk are considered to be those growing in very shallow soil in cracks of granite outcrops and are:

Hibbertia sp. Porongorups
Tribonanthes purpurea
Villarsia calthifolia

Current predictions in terms of long term change in weather patterns are speculative although the above species are likely to be susceptible to any long term reduction in rainfall.

(xi) *Ex situ* Germ Plasm Collections

Ideally, *ex situ* germ plasm collections should be maintained for all DRF. The highest priority is placed on those species which are susceptible to *Phytophthora* and currently under immediate threat from that disease. They are:

Adenanthos pungens ssp. *pungens*
Andersonia sp. Two Peoples Bay
Banksia brownii
Darwinia oxylepis
Darwinia wittwerorum
Banksia verticillata
Isopogon uncinatus
Dryandra montana ms
Dryandra ionthocarpa ms

(xii) Re-introduction

Banksia brownii, Banksia goodii and *Isopogon uncinatus* are species which may be considered for re-establishment in the wild on conservation land. However, any introduction or re-introduction of these or any other taxa must be carried out under approved Wildlife Management Programs or Interim Management Guidelines as outlined in CALM Policy Statement No. 29.

(xiii) Road or Track Closure

The closure or diversion of vehicle or walking tracks requires action or consideration for nine species. Trampling, erosion, crushing or introduction of disease are the main concerns. The most urgent cases are:

- A walking track in the Stirling Range National Park should be diverted away from a stand of *Banksia brownii*
- Recreation 4WD tracks near *Banksia verticillata* and *Isopogon uncinatus* populations should be closed or diverted
- An access track through a Shire Reserve at Kamballup has placed *Dryandra ionthocarpa* ms at risk and should be modified.
- A population of *Caladenia bryceana* in the Stirling Range National Park is at risk from visitors using an information bay.

(xiv) Liaison

Liaison is required in the management of 16 species. This need arises when plants occur on or adjacent to private, Shire or other land not managed by CALM. Activities of groups such as tourist operators may need to be modified through liaison.. Those species where liaison is most critical are:

Conostylis misera
Darwinia oxylepis
Darwinia wittwerorum
Dryandra ionthocarpa ms
Verticordia harveyi

(xv) Monitoring

Monitoring on an annual basis (if possible) of all populations of Declared Rare Flora is a requirement under CALM's Policy Statement No. 9. Monitoring should be followed by appropriate management action where detrimental population changes are detected. Species which require the closest monitoring are those affected by fungal disease, drought and perturbations such as fire where population recruitment patterns are poorly understood. They are:

Adenanthos dobagii
Adenanthos ellipticus
Andersonia sp. Two Peoples Bay
Banksia brownii
Banksia goodii
Banksia verticillata
Conostylis misera
Coopernookia georgei
Darwinia collina
Darwinia macrostegia
Darwinia meeboldii
Darwinia oxylepis
Darwinia squarrosa
Darwinia wittwerorum
Daviesia pseudaphylla ms
Dryandra montana ms
Dryandra ionthocarpa ms
Eremophila denticulata
Isopogon uncinatus
Lambertia fairallii
Myoporum cordifolium
Verticordia harveyi
Villarsia calthifolia

(xvi) Research

Research into at least some aspect of the taxonomy, breeding systems, population dynamics, plant disease, response to fire and disturbance is required for most species of Declared Rare Flora in the Albany District. Taxa currently being researched in some detail include *Banksia brownii, Banksia verticillata,* and *Lambertia fairallii.* Major research requirements for other taxa are:

Taxonomic
Adenanthos dobagii
Adenanthos cunninghamii
Eucalyptus bennettiae

Plant Diseases
Adenanthos species
Andersonia sp. Two Peoples Bay
Banksia species
Dryandra species
Darwinia species
Isopogon uncinatus
Lambertia fairallii
Daviesia megacalyx
Daviesia pseudaphylla ms

Climatic Change
Hibbertia sp. Porongorups
Villarsia calthifolia

Population Biology and Breeding Systems
Daviesia pseudaphylla ms
Dryandra species
Eremophila denticulata
Grevillea infundibularis
Isopogon uncinatus
Kennedia glabrata
Meziella trifida
Myoporum cordifolium
Restio arbortivus
Verticordia crebra

Specimen Collection
Pleurophascum occidentale

(xvii) Linear Marking

As the majority of populations of rare flora are located on conservation land, the need for linear marking is minimal. Upgrading marking of one population of *Myoporum cordifolium* is required.

(xviii) Environmental Weeds

Control of environmental weeds is required for the protection of 14 species. Those species under greatest threat are:

Apium prostratum ssp. *phillipii* ms
Caladenia cryceana ssp. *bryceana*
Conostylis misera

(xix) Fire Regimes

Sixty one species require fire regimes where fire frequency needs to be carefully controlled and monitored, and where some degree of fire exclusion may be required. Those taxa which are obligate seeders (such as the *Darwinia* species) should not be burnt on a frequency which is less than the time it takes for plants to produce adequate postfire seed for successful recruitment events and sustainable regeneration of the population. Even species which are lignotuberous and resprout after fire may have limited capacity to repeat this procedure after frequent fire. Those species considered to be at greatest risk, if subjected to frequent fire are:

Adenanthos ellipticus
Adenanthos pungens ssp. *pungens*
Banksia brownii
Banksia verticillata
Corybas limpidus
Darwinia species
Dryandra montana ms
Eucalyptus burdettiana
Eucalyptus coronata
Isopogon uncinatus
Kennedia glabrata
Lambertia fairallii
Restio arbortivus
Stylidium galioides
Verticordia fimbrilipis ssp. *australis*
Verticordia harveyi
Verticordia helichrysantha

3. Priority Flora in the Albany District

The conservation status of the priority flora (poorly known but thought to be rare) in the Albany District is assessed in Part Three. Recommended status, based on recent surveys, is listed in Table 3. For priority taxa the most urgent requirement is further survey to enable an accurate assessment of their conservation status. Usually Priority One and Priority Two taxa are in most need of survey because of low numbers of populations and small population sizes. However, the threat from *Phytophthora* will require that in some cases more common (Priority Three) but highly susceptible taxa are targeted for immediate survey.

4. Implementation and Term of the Management Program

A recovery team will be appointed which will oversee and report annually to CALM's Corporate Executive on the implementation of this Management Program.

This program shall 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 auratiflora ms	-
Acacia microneura	-
Acacia mutabilis subsp. *incurva* ms	-
Acacia pusilla ms	-
Acacia rhamphophylla ms	-
Acacia trulliformis	-
Bossiaea strigillosa	-
Coleanthera coelophylla	-
Conospermum coerulescens subsp. *coerulescens* ms	-
Diuris heberlei	-
Dryandra sp. 36 (A.S. George 16721) [aff. *ferruginea*]	-
Eremophila sp. Lake Magenta (M.S. Graham s.n. 7.3.90) [aff. *serpens*]	-
Eucalyptus praetermissa	Delete
Gonocarpus hispidus	-
Grevillea maxwellii	P1*
Guichenotia apetala	-
Hydatella australis	-
Kunzea pauciflora	P1*
Lepidium aschersonii	P1*
Leptomeria ericoides	-
Leucopogon florulentus	-
Leucopogon pogonocalyx	-
Melaleuca ordinifolia	-
Melaleuca pritzelii	-
Melaleuca sculponeata	-
Microcorys pimelioides	-
Microcorys wilsoniana	-
Monotoca sp. Mt. Maxwell (K.R. Newbey 4727)	-
Persoonia micranthera ms	P1*
Picris wagenitzii	-
Pterostylis turfosa	-
Restio leucoblephara	-
Rinzia longifolia	-
Rumex drummondii	-
Schoenus multiglumis	-
Sollya drummondii	-
Stachystemon sp. Mt. Baring (K.R. Newbey 9773)	-
Stackhousia sp. Stirling Range (W.R. Barker 2399)	-
Thomasia dielsii	-

* With highest priority for further survey and consideration for gazettal as DRF

Thomasia multiflora	-
Thomasia quercifolia	-
Thysanotus isantherus	-
Verticordia huegelii var. *tridens*	-

Priority Two Species

Acacia awestoniana	P2*
Acacia dictyoneura	-
Acacia disticha ms	-
Acacia heteroclita subsp. *valida* ms	-
Acacia ophiolithica ms	P3
Acacia papulosa ms	-
Acacia phlebopetala var. *pubscens*	-
Acacia veronica	P3
Actinotis rhomboideus	-
Adenanthos cacomorphus	-
Andersonia axilliflora	-
Anthocercis fasciculata	P4
Astroloma sp. Fitzgerald (G.J. Keighery 8376)	-
Astroloma microphyllum	-
Banksia occidentalis subsp. *formosa*	-
Billardiera granulata	-
Boronia clavata	P1
Boronia crassipes	P1
Boronia oxyantha	P3
Caladenia granitora ms	-
Calochilas sp. Hopetoun (H. Taylor s.n.) [aff. *campestris*]	-
Calothamnus macrocarpus	-
Chamelaucium juniperinum ms	-
Chorizema reticulatum	Delete
Comesperma lanceolatum	-
Conosperma spectabilis ms	-
Cymbonotus preissianus	-
Dampiera deltoidea	-
Dillwynia acerosa	-
Dryandra foliosissima	-
Dryandra seneciifolia	-
Dryandra serra	-
Dryandra sp. *anatoma* ms	P2*
Dryandra sp. 49 (K. Alcock 472) [aff. *ferruginea*]	-
Eriostemon cymbiformis	-
Eucalyptus chrysantha	-
Eucalyptus petila ms	-
Gastrolobium heterophyllum	Delete
Gonocarpus rudis	-
Gonocarpus trichostachyus	-
Grevillea fistulosa	-

* With highest priority for further survey and consideration for gazettal as DRF

Grevillea wittweri	Delete
Hakea hookeriana	-
Haloragis aculeolata	-
Hemigenia glabrescens	-
Lasiopetalum dielsii	-
Lechenaultia acutiloba	-
Leptospermum confertum	-
Leucopogon denticulatus	-
Leucopogon glaucifolius	-
Leucopogon lasiophyllus	-
Leucopogon tamariscinus	Delete
Lysinema lasianthum	P4
Melaleuca coccinea subsp. *penicula*	-
Melaleuca micromera	-
Microcorys virgata	-
Muiriantha hassellii	-
Opercularia rubioides	-
Orthrosanthus muelleri	P2*
Persoonia brevirhachis ms	-
Platysace filiformis	-
Restio ornatus	-
Schizaea sp. Lake William (T.A. Halliday 297)	-
Schoenus acuminatus	-
Spyridium villosum	-
Stenanthemum pumilum	-
Stylidium articulatum	-
Stylidium keigheryi	-
Thomasia brachystachys	-
Thysanotus brevifolius	-
Thysanotus gageoides	P3
Thysanotus parviflorus	-
Trachymene croniniana	-
Trochocarpa parviflora	P3
Velleia exigua	-
Verticordia brevifolia subsp. *stirlingensis*	-
Verticordia carinata	P2*
Verticordia pityrhops	P2*
Xanthosia singuliflora	-

Priority Three Species

Acacia brachyphylla var. *recurvata*	-
Acacia declinata	-
Acacia durabilis ms	-
Acacia heterochroa subsp. *heterochroa* ms	P4
Acacia luteola	Delete
Acacia moirii subsp. *dasycarpa*	P4

* With highest priority for further survey and consideration for gazettal as DRF

Acacia newbeyi	-
Acacia octonervia	-
Acacia phlebopetala var. phlebopetala	-
Acacia pinguiculosa subsp. *pinguiculosa* ms	P4
Acacia uliginosa	-
Adenanthos glabrescens subsp. *exasperatus*	-
Andersonia echinocephala	-
Andersonia grandiflora	-
Andersonia setifolia	-
Boronia virgata	-
Bossiaea divaricata	-
Calothamnus affinis	-
Calothamnus crassus	-
Calothmnus microcarpus	-
Calothamnus robustus	-
Calycopeplus marginatus	-
Chamelaucium forrestii ms	-
Chorizandra multiarticulata	Delete
Chorizema carinatum	-
Chorizema trigonum	-
Chorizema ulotropis	-
Cypselocarpus haloragoides	Delete
Dodonaea trifida	-
Eucalyptus acies	P4
Eucalyptus newbeyi	-
Gastrolobium brownii	-
Gastrolobium racemosum	Delete
Gastrolobium stenophyllum	-
Grevillea depauperata	Delete
Grevillea fulgens	-
Hypocalymma phillipsii	-
Hibbertia argentea	P2
Lasiopetalum parvuliflorum	-
Melaleuca araucarioides	-
Melaleuca citrina	Delete
Melaleuca diosmifolia	-
Melaleuca polycephala	-
Melaleuca pomphostoma	-
Melaleuca viminea subsp. *appressa*	-
Rumicastrum chamaecladum	P2
Siegfriedia darwinioides	-
Sphenotoma drummondii	-
Sphenotoma parviflorum	-
Stylidium lepidum	-
Stylidium pseudohirsutum	-
Stylidium verticillatum	-
Thomasia discolor	-
Thomasia solanacea	-
Velleia foliosa	-

Verticordia coronata	-
Verticordia lindleyi subsp. *purpurea*	-
Verticordia longistylis	P2
Verticordia multiflora subsp. *multiflora*	-
Xanthosia peduncularis	-

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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, eg 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, eg 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, eg of the leaves or bark of some trees

decumbent — spreading horizontally but then growing upwards

decurrent — extending downwards beyond the point of insertion, eg 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)

adaphic 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, eg 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 Cyperaceeae and Asteraceae)

follicle a dry, dehiscent fruit formed from one carpel and dehiscing along the line os 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. Fig. 25

incised cut deeply, sharply and often irregularly (an intermediate condition between toothed and lobed). Fig 24

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 planel) 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, ie asymmetrical. Fig. 23

oblong having the length greater than the width but no many times greater, and the sides parallel. Fig. 23

obovate similar in shape to **ovate** but attached at the narrower end. Fig. 23

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. Fig. 23

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, eg 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, eg 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 produced 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. Fig. 24

sessile without a stalk (when applied to a stigma, indicates that the style is absent, the stigma being `sessile' on the ovary)

seta a bristile or stiff hair

shrub a woody plant less than 5 metres 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, eg 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, ie not lfat. 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

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. 94) of 3 July 1992]

WILDLIFE CONSERVATION ACT 1950

WILDLIFE CONSERVATION (RARE FLORA) NOTICE 1992

MADE by the Minister under section 23F(2).

Citation

1. This notice may be cited as the *Wildlife Conservation (Rare Flora) Notice 1992.*

Interpretation

2. In this notice—

"extant" means still existing in its original state;

"protected flora" means any flora belonging to 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 17 May 1991 at pp. 2468-73 is revoked.

SCHEDULE (Clause 3)

Protected Flora Declared As Rare Flora

ITEM 1—TAXA KNOWN TO BE EXTANT

Acacia anomala
Acacia aphylla
Acacia argutifolia
Acacia denticulosa
Acacia depressa
Acacia forrestiana
Acacia lanuginophylla ms
Acacia leptalea ms
Acacia lobulata
Acacia merrickiae
Acacia pharangites
Acacia pygmaea ms
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
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. *terrasspectans*
Anthocercis gracilis
Apium prostratum subsp. *phillipii* ms
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
Caladenia busselliana ms
Caladenia caesarea subsp. *maritima* ms
Caladenia christineae ms
Caladenia cristata
Caladenia dorrienii
Caladenia elegans ms

Caladenia excelsa ms
Caladenia exstans ms
Caladenia harringtoniae ms
Caladenia hoffmanii ms
Caladenia huegelii
Caladenia integra
Caladenia viridescens ms
Caladenia voigtii ms
Caladenia wanosa
Calectasia arnoldii ms
Calytrix breviseta subsp. *breviseta*
Chamelaucium erythrochlora ms
Chamelaucium griffinii ms
Chamelaucium roycei ms
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
Darwinia acerosa
Darwinia apiculata
Darwinia carnea
Darwinia collina
Darwinia ferricola ms
Darwinia macrostegia
Darwinia masonii
Darwinia meeboldii
Darwinia oxylepis
Darwinia squarrosa
Darwinia wittwerorum
Darwinia sp. Stirling Range (G.J. Keighery 5732)
Daviesia bursarioides ms
Daviesia euphorbioides
Daviesia megacalyx ms
Daviesia microcarpa ms
Daviesia oxylobium ms
Daviesia pseudaphylla ms
Daviesia purpurascens
Daviesia speciosa ms
Daviesia spiralis
Diuris drummondii
Diuris micrantha
Diuris purdiei
Diuris recurva
Drakaea concolor ms
Drakaea confluens ms
Drakaea elastica
Drakaea micrantha ms
Drakonorchis barbarella ms
Drakonorchis drakeoides ms
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* ms
Eremophila caerulea subsp. *merrallii* ms
Eremophila denticulata
Eremophila inflata
Eremophila microtheca
Eremophila nivea
Eremophila racemosa
Eremophila resinosa
Eremophila subteretifolia ms
Eremophila ternifolia
Eremophila veneta ms
Eremophila verticillata
Eremophila virens
Eremophila viscida
Eriostemon wonganensis
Eucalyptus absita
Eucalyptus argutifolia
Eucalyptus articulata ms
Eucalyptus balanites
Eucalyptus beardiana
Eucalyptus bennettiae
Eucalyptus blaxellii
Eucalyptus brevipes
Eucalyptus burdettiana
Eucalyptus ceracea
Eucalyptus cerasiformis
Eucalyptus coronata
Eucalyptus crispata ms
Eucalyptus crucis subsp. *crucis*
Eucalyptus crucis subsp. *praecipua* ms
Eucalyptus cuprea ms
Eucalyptus dolorosa ms
Eucalyptus erectifolia
Eucalyptus goniantha subsp. *goniantha*
Eucalyptus graniticola ms
Eucalyptus impensa ms
Eucalyptus insularis
Eucalyptus johnsoniana
Eucalyptus lateritica
Eucalyptus leprophloia ms
Eucalyptus merrickiae
Eucalyptus mooreana
Eucalyptus olivacea ms
Eucalyptus phylacis
Eucalyptus pruiniramis
Eucalyptus rameliana
Eucalyptus rhodantha
Eucalyptus steedmanii
Eucalyptus suberea
Eucalyptus synandra
Eucalyptus sp. Norseman (S.D. Hopper 2736)
Gastrolobium appressum
Gastrolobium callistachys
Gastrolobium glaucum
Gastrolobium graniticum
Gastrolobium hamulosum
Gastrolobium tomentosum
Gonocarpus intricatus
Grevillea batrachioides
Grevillea calliantha
Grevillea cirsiifolia
Grevillea dryandroides
Grevillea flexuosa
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
Hypocalymma longifolium
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
Meziella trifida
Microcorys eremophiloides
Microtis globula
Myoporum turbinatum
Myoporum cordifolium
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 ms
Thelymitra dedmaniae
Thelymitra psammophila
Thelymitra stellata
Thomasia montana
Thomasia sp. York (A.S. George 8075)
Thryptomene wittweri
Tribonanthes purpurea
Verreauxia verreauxii
Verticordia crebra
Verticordia fimbrilepis
Verticordia harveyi
Verticordia helichrysantha
Verticordia hughanii
Verticordia plumosa var. *ananeotes*
Verticordia staminosa
Villarsia calthifolia
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
Deyeuxia drummondii
Dicrastylis morrisonii
Eriostemon falcatus
Frankenia conferta
Frankenia decurrens
Frankenia parvula
Glyceria drummondii
Gyrostemon reticulatus
Haloragis platycarpa
Hemigenia exilis
Hemigenia obtusa
Hydatella leptogyne
Lasiopetalum rotundifolium
Lepidium drummondii
Leptomeria dielsiana
Leptomeria laxa
Leucopogon cryptanthus
Leucopogon marginatus
Menkea draboides
Nemcia lehmannii
Opercularia acolytantha
Phlegmatospermum drummondii
Platysace dissecta
Plectrachne bromoides
Pseudanthus nematophorus
Ptilotus fasciculatus
Ptilotus pyramidatus
Scaevola attenuata
Scaevola macrophylla
Schoenus natans
Stylidium merrallii
Stylidium neglectum
Taraxacum cygnorum
Tetraria australiensis
Tetratheca elliptica
Tetratheca fasciculata
Thomasia gardneri

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).

iv) In the case of hybrids, or suspected hybrids, the following criteria must also be satisfied:

(a) they must be a distinct entity, that is, the progeny are consistent within the agreed taxonomic limits for that taxon group;

(b) they must be self perpetuating, that is, not reliant on the parent stock for replacement; and

(c) they are the product of a natural event, that is, both parents are naturally occurring and cross fertilisation was by natural means.

(Plants which occur on land reserved for nature conservation may be considered less in need of special protection than 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:

4.1 Identify, locate and seek to conserve threatened flora.

4.2 Undertake research into the taxonomy, population biology, ecology, protection and propagation of threatened flora.

4.3 Implement management practices to conserve threatened flora and its habitat.

4.4 Publicise the need for conservation of threatened flora, and encourage involvement in conservation from all sectors of the community.

4.5 Liaise with other land management and research agencies and private landowners to enhance the study and conservation of threatened flora.

4.6 Develop and manage a geographic database for threatened flora at its headquarters and at regional and district offices.

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 programs 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 IV

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	#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 os 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.