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Declared Rare and Poorly Known Flora in the Geraldton District

by Susan J Patrick

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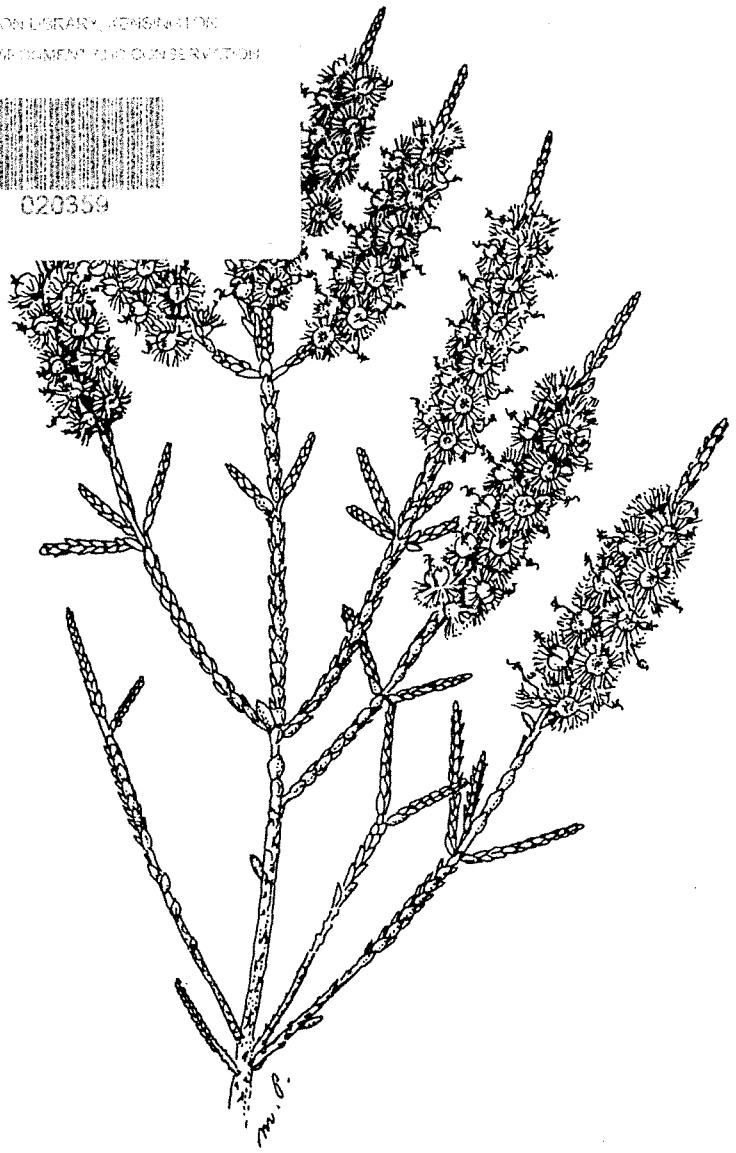

2001

Wildlife Management Program No 26

DEPARTMENT OF
Conservation
AND LAND MANAGEMENT
Conserving the nature of WA

WESTERN AUSTRALIAN WILDLIFE MANAGEMENT PROGRAM NO. 26

Declared Rare and Poorly Known Flora in the Geraldton District

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Susan J. Patrick

2001

Department of Conservation and Land Management
Locked Bag 104, Bentley Delivery Centre WA 6983

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Verticordia spicata subsp. *squamosa*
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 Geraldton 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 their conservation status.

This Program has been approved by the Executive Director, Department of Conservation and Land Management, the Conservation Commission and the Minister for the Environment.

Approved programs are subject to modification as dictated by new findings, changes in species' status and completion of recovery actions.

Information in the Plan was accurate at August 1998.

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ABBREVIATIONS

Co	Coorow Shire
CV	Chapman Valley Shire
C	Cue Shire
est.	Estimated number of plants
G	Greenough Shire
I	Irwin Shire
MRWA	Main Roads W.A.
Mi	Mingenew Shire
MM	Mount Magnet Shire
Mo	Morowa Shire
Mu	Mullewa Shire
Mur	Murchison Shire
N	Northampton
P	Perenjori Shire
S	Sandstone Shire
VCL	Vacant Crown Land
WATSCU	Western Australian Threatened Species and Communities Unit
*	WAHERB record only, population not seen more recently
Y	Yalgoo Shire

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 12 306 current taxa (species, subspecies, varieties and phrase-names) (January 1997), with the total likely to exceed 13 000 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 isolation and climatic and geological stability (Hopper 1979). According to Briggs and Leigh (1996) the State has 45.9 percent of the Australian total of threatened, rare or poorly known plant species, with 79 percent restricted to the south-west. Nearly 2 000 Western Australian taxa are currently listed as threatened or have been placed on the Department of Conservation and Land Management's (CALM) Priority Flora List because they are rare or poorly known (K. Atkins, personal communication).

Although some plants are rare because of their requirement for a specific restricted habitat, the majority have become rare or threatened because of the activities of humans. 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, plant diseases (particularly due to *Phytophthora* species), exotic weeds and pests, road works, urbanisation, grazing by domestic stock and increasing 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. CALM is responsible for the administration of the Wildlife Conservation Act, and hence, is responsible for the protection and conservation of flora and fauna on all lands and waters throughout the State. Section 23F of the Act gives the Minister responsible for the Act statutory responsibility for the protection of those plant taxa declared to be rare (i.e. threatened taxa).

This Wildlife Management Program collates the available biological and management information on the Declared Rare Flora, and Priority One, Two and Three (poorly known) taxa of CALM's Geraldton District, as at 21 October 1996. In 1996, 302 extant taxa were classified as Declared Rare Flora and a further 27 species were listed on the Schedule as Presumed Extinct. In addition to those that were declared rare, 1 639 taxa were listed on CALM's Priority Flora List as at October 1996. The majority of these taxa require further detailed survey to accurately assess their conservation status while others are rare, but not currently threatened, and require ongoing monitoring. Brown *et al.* (1998) provide illustrations of Declared Rare Flora as at 1998, discuss the conservation of Western Australia's threatened species and review the relevant legislation, and the policy, research and management activities of CALM.

The Geraldton District covers some 137 338 km^2 of which some has been cleared for agriculture on the south-western side. Figure 1 shows the location of the Geraldton District in relation to the CALM Management Regions of the State.

2. Objective of the Program

The objective of this program for the Geraldton District is:

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

It aims to achieve this by:

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

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

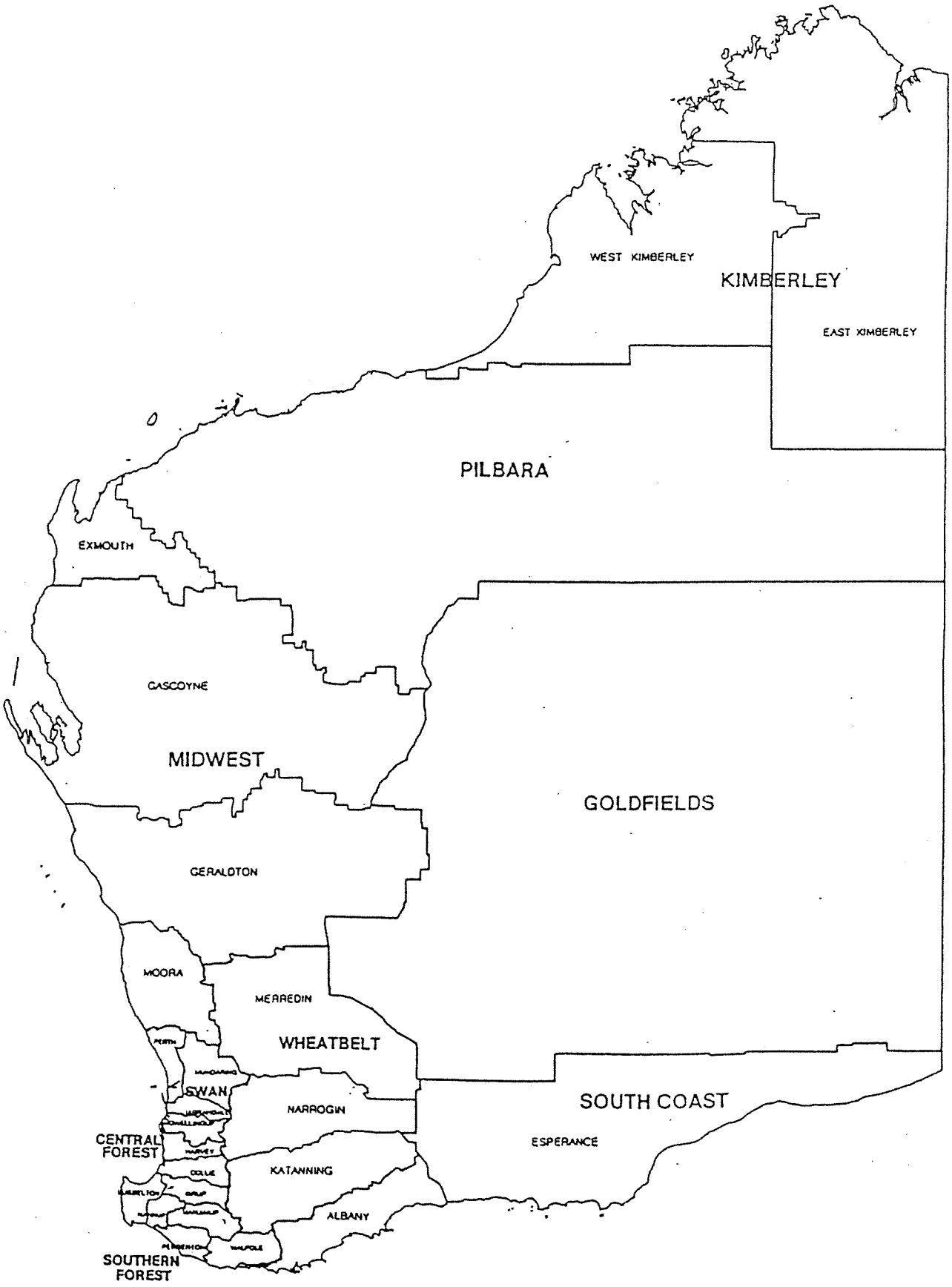


Figure 1.
Location of the Geraldton District in relation to other CALM Management Regions of the State

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

- 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 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 flora to be 'rare flora' by notice published in the Government Gazette. CALM's Policy Statement No. 9 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 on any category of land throughout the State without the written consent of the Minister. A person breaching the Act is liable to a penalty of up to $10,000. The legislation refers only to wild populations and applies equally to Government officers and private citizens on Crown and private land.

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

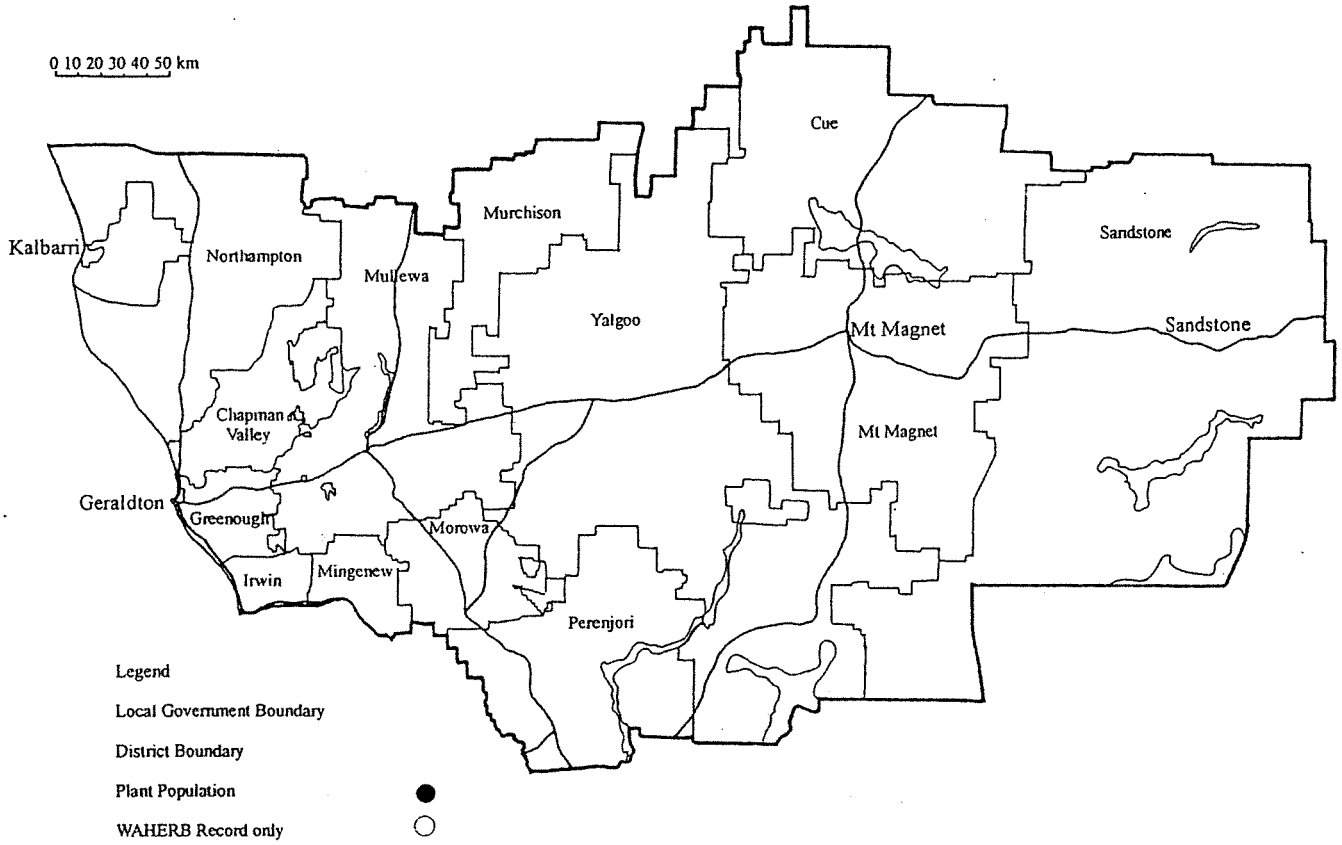


Figure 2.
The Geraldton District covered by this Program

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

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

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

- the searches have established that the plant in the wild is either rare, endangered or otherwise and in need of special protection.

Plants may be deleted from the Declared 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 1 866 (at October 1996) 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 or presumed extinct on the basis of thorough survey can be included on the Declared Rare Flora 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, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.

Priority Two - Poorly Known Taxa

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

Priority Three - Poorly Known Taxa

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

Priority Four - Rare Taxa

Taxa which are considered to have been adequately surveyed and which, whilst 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 Bioconservation Group (CALMScience) staff, Wildlife Branch and the Western Australian Threatened Species and Communities Unit (WATSCU) (Nature Conservation Division) and Regional Services Division 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 staff of Bioconservation Group (CALMScience), Regional Ecologists (Regional Services Division), Wildlife Branch and WATSCU staff;
- Coordination of Recovery Plans and Interim Recovery Plans for threatened taxa is the responsibility of WATSCU;
- Management, protection and regular inspection of Declared Rare Flora populations is the responsibility of staff of the Geraldton District;
- Enforcement matters relating to the provisions of the Wildlife Conservation Act are the responsibility of Wildlife Officers in the Midwest Region;
- Implementation and revision of the Management Program is the responsibility of the Geraldton District Threatened Flora Recovery Team.

6. The Geraldton District

The CALM Geraldton District is part of the Midwest Region and extends inland from Geraldton for ca. 540 km to its most easterly boundary east of Sandstone near Depot Springs. On the western side it runs north from Dongara to the northern boundary of the Kalbarri National Park. The northern boundary extends roughly eastwards from that point along the northern boundaries of the Northampton and Mullewa Shires, crossing the Murchison River ca. 100 km inland. It then extends north-east across the Murchison Shire, reaching its most northerly point on the northern boundary of the Cue Shire, crossing the Great Northern Highway about 60 km north-east of Cue. It includes the Sandstone Shire and the southern boundary runs from there westwards along the southern boundaries of the Yalgoo, Perenjori and Morowa Shires and along the Midlands Highway from the Mingenew Shire boundary to Dongara. Its widest point from north to south runs just west of Mt Magnet and Paynes Find and is ca. 330 km long.

The south-western part of the District is bounded by CALM's Moora District, which is also part of the Midwest Region. The Merredin District, part of the Wheatbelt Region, borders the central part of the southern boundary and the eastern section (the Sandstone Shire) is adjacent to the Goldfields Region. Its northern boundary is adjacent to the Gascoyne District of the Midwest Region. The District includes the Shires of Sandstone, Cue, Mt Magnet, Yalgoo, Perenjori, Morowa, Mullewa, Greenough, Chapman Valley and Northampton, and part of the Shires of Murchison, Irwin and Mingenew.

The District covers an area of 137 338 km^2, with one national park (Kalbarri National Park) of 183 004 hectares, one conservation park (Coalseam) of 753 hectares, two timber reserves (26 338 hectares), a pastoral lease of 59 908 hectares and 55 nature reserves (85 284 hectares of conservation reserves) managed by CALM. The area of the District cleared for farming is relatively small, running from south of the Kalbarri National Park down the western side of the District, extending inland for about 100 km to east of Morowa, Mullewa and Yuna. Most of the conservation reserves are concentrated in this area, with very few further eastward in the pastoral area which covers a major part of the District. However, Burnerbinmah Station, south-west of Paynes Find, is leasehold in the name of the Executive Director of CALM.

The large pastoral proportion of the District is reflected in the fact that most of the Declared Rare Flora are found on its western side, with few on the eastern side, which is also less well known and less surveyed botanically. The proportion of Declared Rare Flora populations in the District which occur on road and rail reserves is less (a quarter of the total number of populations, compared to a half in the Moora District), than in other Districts further south, which also reflects the difference in land use between this District and those which are mainly within the South-West Botanical Province. Even in the north-west of the District most of the Declared Rare Flora populations occur on pastoral leases, the national park or other Crown land.

The impact of fungal disease in the District is low. Most of the area has rainfall levels which are too low to support infections of *Phytophthora* species. The south-west corner of the District, where rainfall levels are higher, has large areas of sandplain over limestone, which are well drained and therefore unlikely to provide suitable conditions for the spread of dieback. An area in the north-west of the District reported to have an infection of a species of *Phytophthora* in the mid 1980s has been monitored since but the disease has not been reconfirmed there.

6.1 Climate

The climate of the Geraldton District varies considerably from the coastal belt inland to the eastern limit of the District. Rainfall decreases from an annual average of ca. 500 mm in the south-west of the District near the coast to ca. 200 mm in the north-east in the dry inland areas. Near the coast in the Geraldton area the climate is defined as dry warm Mediterranean, with cool, wet winters and hot, dry summers, the rainfall sufficient for four winter months for crops to be grown, whilst the remaining eight months of the year are generally dry. Further inland in the Yalgoo area, the semi-desert climate still has a winter maximum rainfall and is also Mediterranean, with fairly reliable winter rain and some additional summer rain from thunderstorms. Further inland, for example, as at Cue, the climate is desert, with both winter and summer rainfall peaks. Here the summer rain is received from tropical cyclones moving in a southerly or south-easterly direction. Winter rainfall from southern depressions is dependable only along the coastal belt as only the strongest depressions penetrate far enough inland to bring any effective winter rain, and in this inland area neither summer or winter rainfall is reliable and in some years, no rain falls.

Temperatures in the District vary from a mean February maximum of 32.2° C and a mean July maximum of 19.4° C at Geraldton, to a mean January maximum of 37.7° C and a mean July maximum of 18.4° C at Yalgoo, and at Cue, a mean January maximum of 37.8° C and a mean July maximum of 18.2° C. Mean minimum temperatures range from 8.8° C in September at Geraldton to 6.1° C in July at Yalgoo and 6.9° C in July at Cue.

6.2 Geology, Landforms and Soils

Much of the eastern part of the District is part of the Archaean Yilgarn Block, which is composed mainly of gneisses and granites, with minor infolded belts of metamorphic sedimentary and igneous rocks. The metamorphic rocks consist of a wide variety of volcanic and sedimentary assemblages, including basalts, lavas and tuffs, banded ironstone, jaspalite and chert, and shale, siltstone, sandstone, greywacke and conglomerate. The mafic (basalt) rocks are known as greenstones and the sediments as whitestones. The rocks of the

metamorphic belts are harder and more resistant than gneiss and granite, so they form ranges of hills, the granites and gneiss underlying sandplains and other plain areas. The metamorphic rocks are also of economic importance as a result of their mineralisation, and are mined for gold, nickel, copper and iron ore.

The western boundary of the Yilgarn Block is mainly formed by the Darling Fault which runs northwards through the District from east of Arrino in the south, to just west of Mullewa and north to the Greenough River near Barraweelbarra Hill and thence to the northern boundary of the District just east of the Murchison River at Mulla Mulla Flat. In the District, it does not form a feature visible on the ground as it does nearer Perth.

West of the Fault, the edge of the continent has subsided into the Perth Basin, which was submerged and became filled with sediments. Since the end of the Cretaceous period, the area has been above sea level and has become weathered and denuded. Part of the Geraldton area did not become submerged with the Perth Basin. This is the Northampton Block, which formed an island of Proterozoic rocks until Mesozoic time when it was covered with a thin sequence of flat Jurassic and Cretaceous rocks. The rocks of this Block have been metamorphosed and are mainly of granulites and quartzites, with large intrusions of granite. The rocks deposited in the Perth Basin are sandstones and shales. Some of the Permian rock contains coal seams and the youngest Cretaceous rocks consist of radiolarite and chert.

A second fault, the Urella Fault, runs parallel to the Darling Fault and lies about 20 km west of the latter in the Dongara area. The Irwin Sub-basin lies between the two faults and has a narrow belt of Precambrian metamorphic rocks to the east of the Urella Fault, which is overlapped by sandstones and siltstones, and a Permian sequence of tillite, sandstones, shales and coal measures, mainly to the north and south of the Precambrian rocks in the Sub-basin.

North of the Perth Basin lies the Carnarvon Basin, separated from it by the Hardabut Fault which crosses the Murchison River near Hardabut Pool, north-west of Ajana. The Tumblagooda Sandstone is the oldest of the sedimentary rocks in this Basin. It is exposed in the gorge of the lower Murchison and underlies the Kalbarri sandplain south of the river. Further north it is overlain by shales and sandstones which are exposed on the north side of the valley below Mt Curious. The white cliffs bounding the valley are formed by the younger Toolonga Calcilulite which has a greenish shale in its upper layers. It also caps Meanarra Hill in the Kalbarri National Park, but hills further south in the Park are capped by Windalia radiolarite.

At the end of the Cretaceous period, uplift of the continental shield and the basins took place and a gently undulating plain formed on all areas. This is seen as the Victoria Plateau on the sedimentary rocks and as the Darling Plateau on the Yilgarn Block. Before the plain formed, a period of deep weathering produced deep layers of leached sand over massive laterite, particularly in the more south-western part of the Victoria Plateau. After this uplift the Murchison and Greenough Rivers cut deeper into their beds and younger streams were created, such as the Hutt, Bowes, Chapman and Irwin Rivers, which eroded the plateau surface, leaving its remnants as flat-topped mesas.

The Greenough Flats were created by marine erosion, their inner edge being the former shoreline, with three rows of dunes which have been deposited since, the oldest on the inner edge of the flats, the second dividing the flats and the most recent on the seaward side. These have formed limestone ridges. The Hutt Lagoon has been formed by a similar, more recent process.

On the Darling Plateau which lies on the Yilgarn Block, drainage is active due to summer flood run-off along the lower Murchison, but is less so in its upper reaches and along rivers further south, being arranged into chains of saltpans along the upper Sanford River and the Lake Monger system. Drainage is westward in these systems, but east of this drainage is eastwards, from Lake Mason and Lake Barlee in the south-east corner of the District.

The Plateau has an undulating landscape, the higher ground covered with extensive sandplains which have eroded edges exposing massive laterite as low scarps or breakaways, which usually face south. Valleys are filled with sand, alluvium and evaporites such as gypsum and calcium carbonate. There are numerous hills and granite tors.

West of the Darling Plateau, the plateau surface of the sedimentary basins is divided into the Victoria Plateau south of the Murchison and the Toolonga Plateau to the north of the Murchison. Much of the Toolonga Plateau

is intact, except where it has been eroded by the Murchison Gorge. It slopes gradually downwards towards the north, reaching sea level north of the District at Shark Bay.

The Victoria Plateau has been cut back on the western edge, producing undulating landscapes around Northampton and the Chapman Valley. Remnants of the original duricrust surface survive as mesas, such as the flat-topped hills of the Moresby Range north of Geraldton. Pleistocene variations in sea level produced a plain of marine denudation south of Geraldton, which is up to 30 km wide and was formed when the sea level was 100 m higher than today. Subsequently, beach sand deposits thrown up on this plain have produced the coastal limestones which now have mobile dunes deposited on their seaward side. North of Geraldton the limestone was deposited on a rocky coast and cliffs have formed which reach their maximum height of ca. 200 m at the Zuytdorp Cliffs in the north-west corner of the District.

The major soil type of the Darling Plateau is a shallow earthy loam overlying red-brown siliceous hardpan, which usually lies between 20 and 100 cm down but may be exposed on the surface. This soil is characteristically associated with mulga, *Acacia aneura.* Other soil types of the area include shallow stony loams on hills and ranges, red earthy sands on the upland sandplains, with red sands on dunes. Acid or neutral red earths, with loams and surface gravels, occur on flat and gently sloping plains, and saline soils are associated with salt lakes. Further to the west and south, the upland earthy sands become more yellow in colour and ironstone gravel is more common. The siliceous hardpan becomes calcareous. On the part of the Darling Plateau that is within the South-West Botanical Province, as in the Perenjori area, a simple soil sequence occurs. Sandplains of leached, acid sandy soils and gravel occur on the remnants of duricrust. Red loams with red clayey subsoils are found in the valleys, and there are saline, alkaline soils along drainage lines.

On the Toolonga and Victoria Plateaux, inland from the 300 mm isohyet, the soil is red and alkaline or neutral and earthy sand. Further west it becomes acid yellow sand. These sands become whiter near the coast where they are subject to higher rainfall. Loamy soils occur in depressions. Dissected country of the Ajana, Northampton and Mingenew areas has loamy soils, which may be acid to alkaline. The coastal limestone is covered by shallow siliceous sand that is red in the north of the District, becoming yellow in the south.

6.3 Vegetation

The western side of the Geraldton District falls within the South-West Botanical Province, including parts of the Irwin and Avon Botanical Districts, whilst the eastern part of the District comes within the Austin Botanical District of the Eremaean Botanical Province.

The Austin Botanical District lies on the Yilgarn Block. Its western boundary coincides with that of the Yilgarn Block but its southerly boundary is determined by the rainfall patterns. The vegetation is characterised by mulga, *Acacia aneura,* which grows in several forms. As a tree with a single erect trunk, on favourable soils it forms low woodland, on plains with red loam soils overlying hard pan. It forms a shrub in less favourable situations where it extends onto hills or downslope and it is less common or absent on sandplain or on heavy alkaline or saline soils. Mulga woodland has an open tree layer 3 m or more tall, with a sparse layer of low shrubs 1-2 m tall and a ground layer of ephemeral herbs which varies in density according to the favourabilty of the season. Mallees such as *Eucalyptus kingsmillii* may also be present. Species of *Cassia* are common in the shrub layer, with *Eremophila* species. Perennial grasses occur on low banks of sandy soil, where *A. linophylla* occurs with *A. aneura.*

Granite and gneiss hills also have mulga in shrub form, associated with *A. quadrimarginea* and *A. grasbyi.* This association is also found on the edging laterite breakaways or scarps of sandplains, sometimes with *Callitris* and *Eucalyptus* species. On the open areas of white clay at the base of these breakaways, *Frankenia* species and other halophytes occur.

On slopes lower in the landscape from the plains with mulga woodland, the woodland opens out and patches of scrub with *A. sclerosperma, A. tetragonophylla* and *Hakea preissii* become more common. Lower still, *Maireana* species are present, with *Melaleuca uncinata* and *Eremophila* species. These are replaced by samphires as salinity increases.

Where calcrete has been deposited in drainage lines, a characteristic scrub of *A. sclerosperma, Pittosporum phylliraeoides* and *Grevillea nematophylla* occurs. Near rivers with active drainage, *Eucalyptus camaldulensis*

and *Casuarina obesa* may become frequent enough to form woodland. On salt flats, *Atriplex, Maireana* and *Frankenia* species form low colonies.

Sandplains in the eastern part of the District, such as in the Sandstone area, have hummock grasses, *Triodia* and *Plectrachne* species, with scattered trees, particularly *Eucalyptus gongylocarpa,* on deeper sand. Mallee eucalypts, such as *E. kingsmillii, E. oldfieldii* and *E. leptopoda* may occur.

On the south-west side of the Austin Botanical District, the Yalgoo Sub-region is the transitional zone between the Eremaean and Southwestern Provinces. The rainfall increases towards the south-west and although the vegetation is basically Eremaean, this change towards the South-west Botanical Province is marked by the decrease in frequency of mulga and its replacement by other species of *Acacia.* Outliers of mulga woodland occur to the north and east of Yalgoo. As mulga decreases in frequency, it is replaced by scrub of *A. ramulosa* and *A. acuminata* on hills, mixed *Acacia* scrub on plains, *A. ramulosa* and *A. murrayana* on sandplains and *A. sclerosperma* and *A. eremaea* with *Atriplex* and *Maireana* species on low lying flats. Further south, midslope vegetation is of thickets of *Acacia ramulosa, A. acuminata* and *Melaleuca uncinata,* scrub of *A. ramulosa, Callitris* and *Eucalyptus* in the valleys.

In this sub-region, an extensive chain of salt flats and lakes runs from Lake Monger westward to Lake Nullewa. These are surrounded by samphire, teatree and *Acacia-Eremophila* scrub.

Hills and ranges in the area may be of banded ironstone, with sparse shrubs of *Acacia, Eremophila, Thryptomene* and *Ptilotus obovatus.* Greenstone hills are less harsh and better vegetated.

To the east of the Yalgoo Sub-region lies the Barlee Sub-region, east of Lake Moore and the Great Northern Highway, running north to Mt Magnet and Youanmi. This an area of gently undulating country with extensive sandplains, straddling a watershed, draining north to Lake Austin, south-west to Lake Monger and Lake Moore and east to Lake Barlee and the Youanmi salt flats. The vegetation is basically of *Acacia* scrub on hills, sandplains, mulga low woodland on plains and halophytic communities in low-lying saline areas. Rainfall rises towards the south where the boundary with the Southwestern Interzone lies. Mixed with the mulga are native pines, sheoaks and eucalypts and outliers of eucalypt woodland on the southern boundary. Mulga is dominant on hills in the north, giving way to *Acacia acuminata, A. ramulosa* and *A. quadrimarginea* in the south. Sandplains support bowgada, heath and spinifex.

On the north-west side of the Yalgoo Sub-region, the Carnarvon Botanical District extends south into the Geraldton District as the southern part of the Toolonga Plateau. This is a flat sandplain bisected in the District by the Murchison River. The red sands support Bowgada shrubland with scattered pines and eucalypts.

The Southwestern Botanical Province occupies the western side of the District. Its higher winter rainfall supports more varied plant communities than the Eremaean Province. To the north of Kalbarri along the coast, the Zuytdorp system supports wattle scrub and heath on the slopes of the high limestone cliffs facing the sea. Coastal heath or *Melaleuca* thicket grows on hills, and on deeper soils, thicket of *Acacia rostellifera,* sometimes with patches of scrub heath. To the east of this, north of the Murchison River, the Eurardy System has undulating sandplains with belts of yellow sand ridges on the western side and red flatter sand to the east. Scrub heath with *Actinostrobus arenarius, Banksia sceptrum* and *Xylomelum angustifolium* grow on the sand ridges. Mixed scrub heath grows on the sandplain. The red sandplain to the east has *Acacia-Allocasuarina* thicket. On this side of the System, the North West Coastal Highway runs through an area of mallee with thicket towards the northern boundary of the District.

Along the Murchison River, the gorges and valleys are cut into the Tumblagooda Sandstone. *Acacia acuminata* and *Jacksonia cupulifera* scrub occurs on the rocky areas, with *Eucalyptus camaldulensis* and *Casuarina obesa* along the river.

Along the coast south of Kalbarri, the Greenough System is associated with coastal limestone south to Dongara. The limestone belt varies in width and there are alluvial flats and lagoons. There are thickets of *Acacia rostellifera* and *Melaleuca cardiophylla* on rocky ridges, *Acacia-Banksia* scrub on sand over limestone and low forest of *A. rostellifera* on alluvial flats.

Much of the Kalbarri System lies within the Kalbarri National Park. It is a gently undulating sandplain of deep yellow sand and bleached sand over laterite, supporting scrub heath. Outcropping Windalia radiolarite forms low rocky hills with *Acacia-Melaleuca* thicket and the heavier soils support mallees. East of this, the less resistant rocks of the Ajana System have allowed more extensive erosion by the Murchison River to produce shallow rocky soil. This supports *Acacia acuminata* scrub with scattered York gum.

The northern part of the Yuna System lies to the east of this, running south almost to the southern boundary of the District. Mainly an undulating sandplain, the sand on the western side is yellow and loose, supporting scrub heath, and to the east with lower rainfall becoming red and more earthy, with *Acacia-Allocasuarina* thicket. The change in soil type is patchy, producing a vegetation mosaic. On deep soils east of Yuna, there is York gum woodland, and this is present with salmon gum to the west of Mullewa. Where the Greenough River crosses the system, there is *Acacia acuminata* scrub with scattered York gum in its valley.

The Hutt System is made up of the lower drainage basin of the Hutt River, south of the Kalbarri System. Drainage channels have cut into the plateau, exposing Tumblagooda Sandstone with thicket and scrub heath and Kockatea Shale with *Melaleuca-Hakea* thicket. The remaining sandplain supports scrub heath. *Eucalyptus camaldulensis, Casuarina obesa* and *Melaleuca rhaphiophylla* grow along the Hutt River.

To the east of the Greenough System and south of the Hutt System lies the Northampton System. Here much of the plateau surface has been removed, with the remnants forming the flat-topped mesas of the Moresby Range and undulating country between. Scrub heath occurs on the mesa tops, *Melaleuca-Hakea* thicket on the steep scarp slopes and *Acacia acuminata* scrub on the lower country, with *Hakea* and scattered *Eucalyptus loxophleba. E. camaldulensis* is scattered in drainage lines.

On coastal limestone around Dongara lies the northernmost section of the Ilyarrie System, which takes its name from *Eucalyptus erythrocorys,* which characteristically grows in small groves on exposed limestone. To the east of this lies the northern part of the Tathra System. Low heath covers the laterite of ridges and breakaways. Scrub heath with small patches of *Melaleuca* thicket and woodland cover the sandplain between the ridges.

The south-eastern section of the South Western Botanical Province in the District lies to the south-east of the Yuna System. The Mullewa System has sandplains similar to those further west, with *Acacia-Allocasuarina-Melaleuca* thickets. The residual sandplain of the Pindar System, around the headwaters of the Irwin, has been stripped on much of the high ground, the shallow red loams over granite supporting *Acacia ramulosa* shrubland on hills, *A. acuminata* thicket on red sand and eucalypt woodland on red loam in the valleys.

North of the Arrino latitude, the Nanekine System is much dissected with numerous small valleys, divided by stony ridges. Only the valleys have been cleared so that more natural vegetation remains on the ridges, heath on shallow soil over granite, *Acacia* thicket on sand over gravel, thicket on laterite, *A. acuminata* scrub on red loam of lower slopes with scattered *Eucalyptus loxophleba,* thicket and mallee.

The Mingenew System, also in the headwaters of the Irwin River, is situated on dissected, gently undulating country. Between the edging scarps, the country has been eroded to an undulating plain with many creeks and with loam soils, although there are some low hills north of Yandanooka. The vegetation is similar to that in the Northampton System.

South-west of Morowa, the Billeranga Hills lie on the District boundary. Much of these are of quartzitic rocks with yellow soil, supporting dense thicket of *Allocasuarina campestris* and other shrubs, whilst on the south-east side, shales and lavas produce a red soil and are covered with scrub of *Dodonaea inaequifolia, Eremophila clarkei, Grevillea* and *Acacia* species.

The south-east part of this Province in the Geraldton District is comprised of the Perenjori and Jibberding Systems, which are similar, but the latter being further east has lower rainfall, so that *Acacia* species dominate in sandplain thickets rather than *Allocasuarina.* Yellow sandy soils over laterite occur on high ground, with *Allocasuarina* or *Acacia* thickets. Red loams on lower ground support *Eucalyptus* woodland, and saline grey soils along drainage lines have salt tolerant vegetation. North-east of Morowa, the Moonagin and Milhun Ranges of rounded hills have red soil and are covered with *Acacia* scrub. A little further to the south-east, the Koolanooka Hills with banded ironstones form steep, linear ridges with open woodland of *Allocasuarina huegeliana, Eucalyptus ebbanoensis, Acacia acuminata* and *Dodonaea inaequifolia.* There are also thickets of

Allocasuarina campestris, Acacia acuminata, Grevillea stenostachya, and *Melaleuca* species. Woodland of *Eucalyptus loxophleba* grows on the lower slopes.

7. Botanical History of the Geraldton District

The north-western part of the District was visited by the botanist Leschenault as early as 1803, when Gantheaume Bay, at the mouth of the Murchison River, was named by the French expedition of which he was a member, under Captain Baudin. The bay was also visited by the botanist Alan Cunningham in 1821 when he accompanied Captain King there. In the 1850s and 1860s, Augustus Oldfield collected in the neighbourhood of the Murchison River. His collections were contributed to the Kew Museum for work on Bentham's *Flora Australiensis* (1863-1878).

In November 1877, Baron von Mueller travelled overland from Geraldton to Shark Bay. He passed through Northampton, Lynton and Murchison House Station on the way and made collections along his route (Taunton 1903). Until quite recently, this part of the District has been difficult to access owing to the sandy terrain, dense bush and sparse settlement. It was included in an account of the vegetation of the Irwin Botanical District by Speck in 1958 and the vegetation was mapped by J.S. Beard between 1973 and 1975 (Beard 1976b). It is believed that neither Drummond, Preiss nor Morrison travelled so far north.

Further south, in the area between Geraldton and Dongara, James Drummond was the first to begin botanical exploration. The town of Geraldton was established in 1851 and in that year Drummond visited the district of Champion Bay, where he stayed with his son, John, who had been appointed policeman at the settlement. James accompanied his son on many patrols so that he could collect plants. Ludwig Preiss, the German botanist, also worked in the area a little earlier, making many collections that he distributed to European herbaria on his return to Germany in 1842. Later Mueller collected plants on his journey northwards from Geraldton to Shark Bay in 1877.

A railway was constructed from Geraldton to Northampton in 1879 and extended to Ajana in 1913, making access easier to some areas, as did the construction of a telegraph line in 1894 from Geraldton to Hamelin Pool, which provided a bridle path and stock route whilst it was maintained. In 1901, the German botanists L. Diels and E. Pritzel visited the area and travelled inland by train to Cue (Diels 1906).

N. Speck included the area in his account of the vegetation of the Irwin Botanical District for his thesis in 1958, and J.S. Beard (1976a) mapped the vegetation in 1973 and 1974.

There was little botanical exploration of the more inland areas until much later than that of the coastal areas, owing to its remoteness and inaccessibility. The first exploration of the inland area was made in 1894 by R. Austin, the assistant surveyor, who travelled to Shark Bay by way of Mt Magnet. The railway from Geraldton to Mullewa was completed in 1894 and was extended to Cue by 1898. Later extension was made to Meekatharra and Wiluna, with a branch from Mt Magnet to Sandstone. The Government Railway was opened in 1913 through Wubin, Perenjori and Morowa. Diels gave the first general account of the vegetation as far east as Cue. This was followed by the work of Charles Gardner (1942b) who was appointed as Government Botanist in 1929 and who travelled widely, making botanical collections from the 1920s onward, sometimes with W.E. Blackall. He visited Geraldton, Paynes Find, Mt Magnet, Sandstone and Mt Barloweerie in 1931, Geraldton and Morowa in 1940, the Chapman River in 1947, Mt Gibson and Mt Singleton in 1952, the Murchison River in 1959, Howatharra and Hutt River in 1961, and the Paynes Find-Sandstone area in 1966.

Other earlier collectors in the eastern part of the District around the Sandstone area include N. Kniep in 1937, F.M. Bennett in 1941, A.M. Baird in 1947, N.H. Speck in 1957.

Melville (1947) made a local study of part of Boolardy Station, north of Yalgoo and just outside the District boundary, in 1947 and another local study was made of Lakeside Station south-west of Cue by Kenneally (1968, 1971).

J. Beard traversed the area many times from 1963 onwards and mapped the vegetation for the account of the Murchison area for the 1:1 000 000 series which extends from Shark Bay to Eneabba in the west, eastward to the Carnarvon Range and Menzies. This includes the whole of the Geraldton District (Beard 1976c).

PART TWO: DECLARED RARE FLORA IN THE GERALDTON DISTRICT

In 1996, 35 taxa of Declared Rare Flora were known to be extant within the boundaries of the Geraldton District. Two species listed as presumed extinct on the Declared Rare Flora Schedule are also included. While they have been collected from the Geraldton 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 and records in the Western Australian Herbarium. Emphasis was placed on the particular habitat characteristics of locations in the Geraldton 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 Geraldton District only and populations that occur outside the District are not listed but referred to in the description of the species' distribution. Not only populations that have been surveyed are included, but also those represented only by a Herbarium specimen if they are from a different locality. These are denoted by an asterisk and are included because they indicate the former wider range of the species, where it may still occur in as yet undiscovered populations, although some are known to have been destroyed since the time of collection.

Precise locality details are contained on Departmental files and a computerised database.

Of the 35 extant taxa included in the program, 18 are endemic to the Geraldton District. During the course of the program, several species listed as presumed extinct on the Declared Rare Flora Schedule have been found to be extant within the District. These are *Beyeria lepidopetala, Glyceria drummondii, Menkea draboides* and *Phlegmatospermum drummondii.* Survey work has also resulted in the discovery of 19 new populations of Declared Rare Flora.

A. Extant Taxa

Beyeria lepidopetala F.Muell. EUPHORBIACEAE

Short-petalled Beyeria

Until its rediscovery in 1994, this species was known only from the type collection made from near the Murchison River, where it was collected by Oldfield before 1859.

Beyeria lepidopetala is an erect, open shrub to c. 25 cm tall, with stellate hairs on the branches. The leaves are narrow, oblong in shape, with the margins rolled under and with a short petiole. They are glabrous above, with white hairs on the underside, and are up to 1.5 cm long. The flowers are green in colour, both male and female flowers are solitary and are on separate plants at the known population, but on the same plant on the type specimens. They are on slender pedicels to c. 12 mm long, and the pedicel of the female flower thickens upward after flowering. The five male calyx segments are almost circular in outline, c. 2 mm in diameter, overlapping. Those of the female flower are narrower and more rigid. The petals are broad and rather large. They are hairy on the inside, fringed and shorter than the calyx lobes. There are numerous stamens, each anther cell with a small, terminal appendage. The stigma is three-lobed and the fruit is a three-celled, ovoid globular capsule which is equally three-seeded and about 6 mm long.

Flowering Period: August

Distribution and Habitat in the Geraldton District

Known from one locality south of Kalbarri.

Grows on yellow sandy clay in a gully in low heath which is regenerating after fire beneath open mallee woodland. It also occurs in low regenerating heath on a limestone ridge above the gully.

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. S of Kalbarri	N	National Park	17.8.1994	"Frequent". Not refound more recently despite several searches.	Regenerating after fire

Response to Disturbance

Regenerates after fire.

Management Requirements

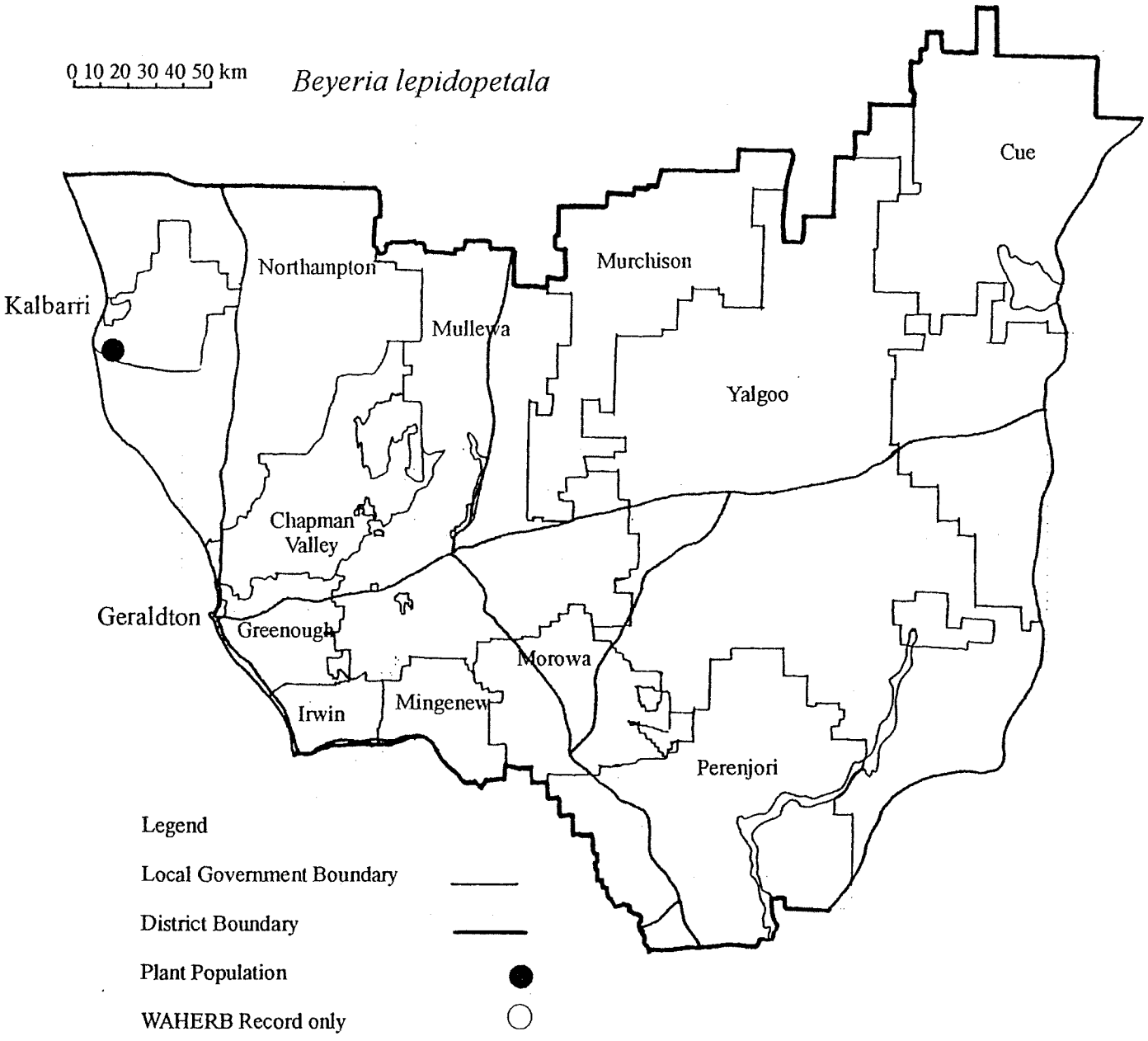
- Collect seed for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.
- Protect, where possible, from fire until the fire response of the species is known.
- Monitor population regularly.
- Ensure that the population is marked to avoid damage during firebreak maintenance.

Research Requirements

- Further survey is required during the flowering season to determine the full extent of population 1 and to search for further populations, particularly in the Kalbarri National Park.
- Research is required into the population biology of this species, particularly in relation to fire.

References

Bentham (1873), Leigh, Boden & Briggs (1984), Mueller (1859).



Caladenia bryceana R.S.Rogers subsp. *cracens* Hopper & A.P.Brown ms

ORCHIDACEAE

[*Caladenia bryceana* R.S.Rogers subsp. *uncinata* ms]

Northern Dwarf Spider Orchid

This subspecies was first discovered in 1967 near Northampton. The plant grows from 3 to 8 cm in height, with a leaf which is broad and may be as long as the flowering stem. The stem and leaf are hairy. The flower is c. 14 mm wide, greenish in colour, with a dark red tip to the labellum and dark red calli. The labellum is hinged at the base and has at the base a large bilobed, clubbed projection formed by fusion of the basal calli.

Caladenia bryceana subsp. *cracens* ms differs from the typical subspecies in its paler flowers, curled petals and sepals and less globular calli, which are often absent from the centre of the labellum. It occurs in a much more northerly area.

Flowering Period: August-early September

Distribution and Habitat in the Geraldton District

Occurs between Northampton and north of Kalbarri. In the southern part of this range, it grows scattered in low heath in shallow soil on coastal limestone. Further north, it forms colonies on winter-wet flats or in swales beneath thickets of *Melaleuca uncinata,* over open herbs in pale red-brown sandy loam or brown sandy clay. Other associated species include *Leptosema aphylla.*

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SW of Nerren Nerren	N	Pastoral Lease	23.8.1994	20 on 30.8.84 2 on 23.8.94	Undisturbed
2. S of Kalbarri	N	Private	18.8.1987	100+	Healthy
3. E of Horrocks	N	Private	31.8.1998	34	Healthy
4. S of Weerinoogudda Soak	N	Pastoral Lease	24.8.1994	3 30+ in 1988	Healthy, area burnt by wildfire 1992
5. NW of Eurardy	N	Pastoral Lease	12.8.1994	-	-

Response to Disturbance

Unknown

Management Requirements

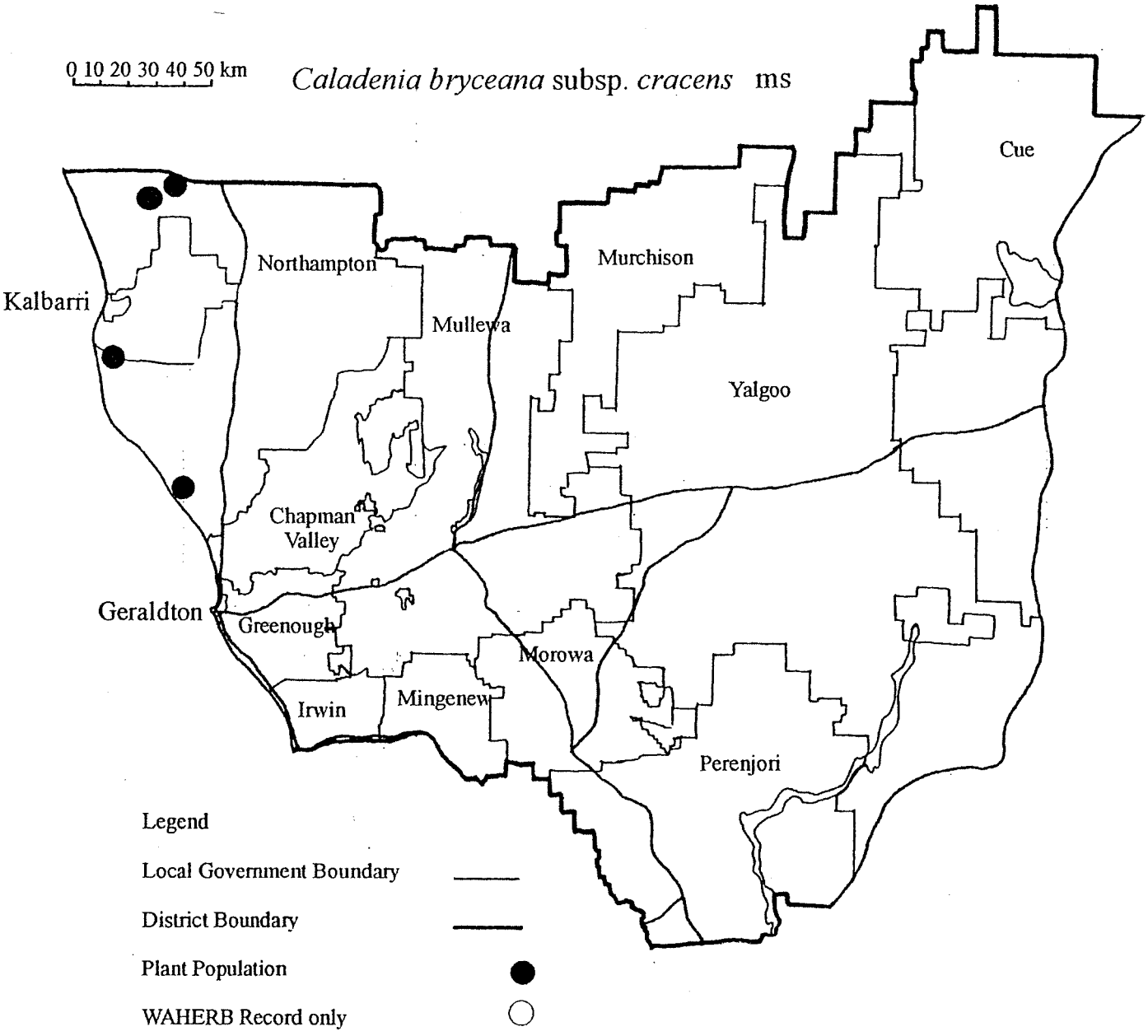
- Monitor population 4 in relation to grazing by feral goats. Fence if necessary.
- Monitor populations regularly.
- Maintain liaison with the private landowners and pastoralists.
- Collect germ-plasm material for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.
- Protect from fire, where possible, during vegetative/flowering phase.

Research Requirements

- Resurvey population 2.
- Research is required on the population biology and fire response of the species.

References

Erickson (1978), Hoffman & Brown (1992), Leigh, Boden & Briggs (1984), Patrick & Hopper (1982).



Caladenia elegans Hopper & A.P.Brown ms ORCHIDACEAE

Elegant Spider Orchid

A clump-forming species growing to about 30 cm tall, with narrow leaves 6-12 cm long and 3-5 mm wide. The flowers are bright lemon-yellow in colour, becoming dark maroon on the slender apical filaments of the petals and sepals and with dark red stripes on the pale yellow labellum. The labellum edge is irregularly toothed and the calli are in two rows. The flowers are 10-20 cm long.

This species often occurs near *Caladenia varians* subsp. *varians* which has white flowers.

An Interim Recovery Plan has been written for this species and is currently being implemented. A monitoring quadrat has been set up at population 1.

Flowering Period: Late July-August

Distribution and Habitat in the Geraldton District

Occurs over a geographic range of about 60 km around Northampton. Grows on clay loam over laterite on winter-wet flats, gradual slopes or in swamps. It occurs in open areas amongst dense shrubs and annuals, associated with scrub of *Melaleuca uncinata, Grevillea pinaster, Acacia* and *Melaleuca* species, with low shrubs of *Thryptomene saxicola, Cryptandra nudiflora, Acacia* and *Hypocalymma* species.

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. W of Swamp Road	N	Shire Road Reserve	13.8.1996	971	Healthy, water erosion and feral pigs threaten the site
2. Rob Road	N	Shire Road Reserve, Private	15.8.1996	378	Moderate
3. Yerina Springs Road	N	Shire Road Reserve, Private	14.8.1996	200+	Healthy to moderate, some feral pig activity
4. S of Swamp Road	N	Shire Reserve	13.8.1996	1 000+	Healthy
5. Nolba	N	VCL	15.8.1996	300+	Healthy to moderate, some water erosion and feral pig activity
6. Port Gregory Road	N	Shire Road Reserve, Private	14.8.1996	500+	Healthy to moderate, some water erosion and feral pig activity

Response to Disturbance

Thought to benefit from fire over an interval of about ten years, in that it reduces competition from associated shrubs and provides a source of nutrients to the fungal mycorrhiza on which the seedlings depend for establishment and growth. The adult plants are most vulnerable to fire during the vegetative stage from April to July when the parent tuber is being replaced.

Management Requirements

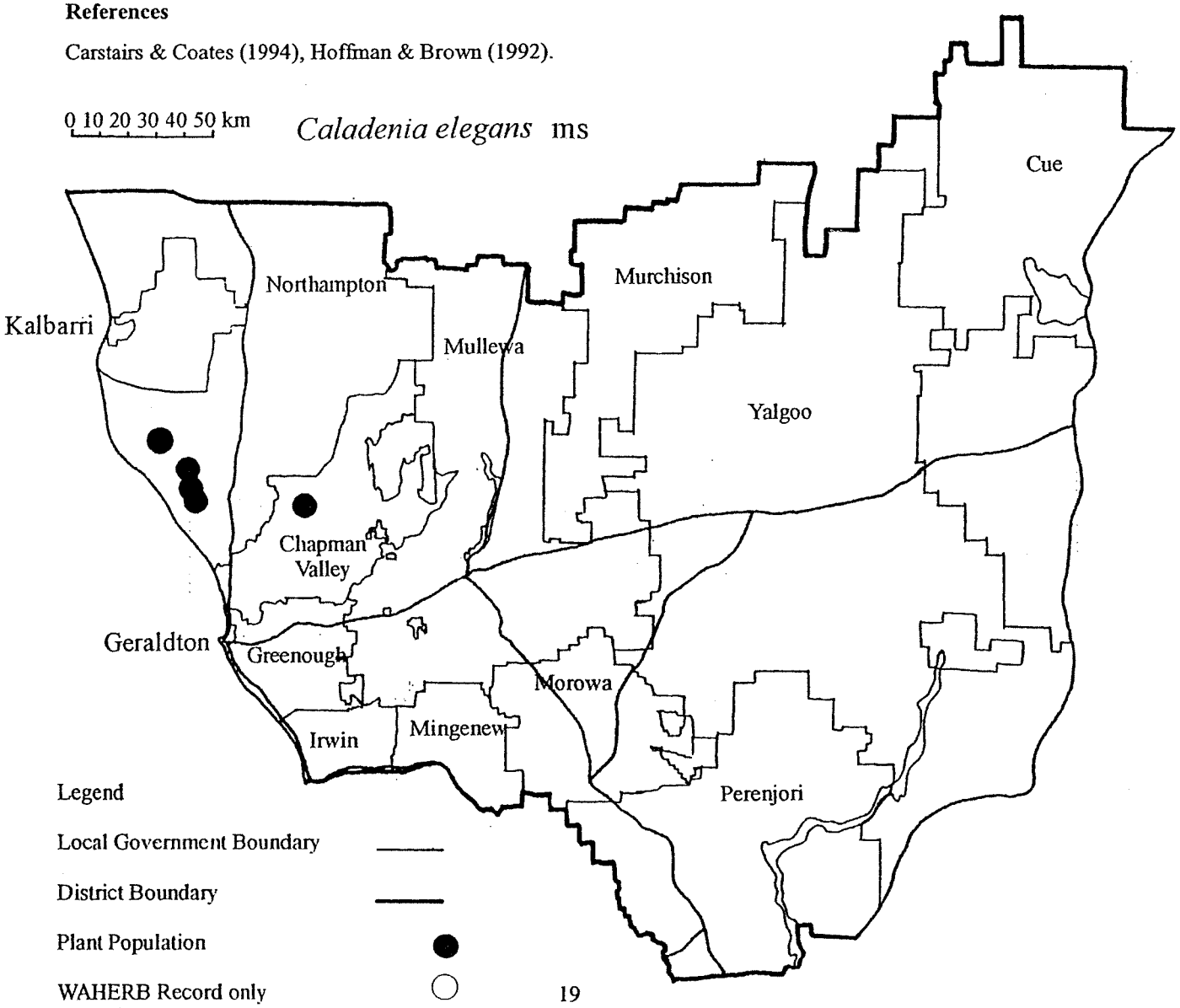
- Maintain liaison with the Shire and private landowners.
- Collect germ-plasm material for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.
- Monitor populations annually, particularly in relation to presence of feral pigs and rabbits.
- Investigate the possibility of vesting the reserve on which population 4 occurs, as a nature reserve.
- Weed infestation needs to be monitored at all populations.
- Ensure that populations 3 and 5 are fenced.
- Ensure that markers are in place at population 5.
- Protect from fire, where possible, during vegetative/flowering phase.

Research Requirements

- Further survey is required on remnant vegetation in the area.
- Research is required on the population biology and fire response of the species.

References

Carstairs & Coates (1994), Hoffman & Brown (1992).



Caladenia hoffmanii Hopper & A.P.Brown ms ORCHIDACEAE

Hoffman's Spider Orchid

A distinctive species which grows to 30 cm tall, with a leaf 8-15 cm long and 5-10 mm wide. The tapering labellum has a deep red tip and is curled only at the tip. It has a long red fringe and dark red calli. The petals and sepals are shorter than those of flowers in the *Caladenia longiclavata* complex, to which this species is related.

Flowering Period: August-October

Distribution and Habitat in the Geraldton District

Occurs between Geraldton and the Murchison River where it grows in clay, sandy clay or clay loam with laterite on rocky hillsides, ridges or swamps. The plants are found beneath tall shrubs with low heath. Associated species include *Acacia acuminata, Melaleuca megacephala, Grevillea pinaster* and *Thryptomene* species.

There is also a disjunct occurrence of the species some 600 km to the south-east where it occurs in the Pingaring area, growing around large granite outcrops under tall shrubs and in woodland.

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Howatharra Hill	CV	Nature Reserve	23.8.1986	500+	Healthy
2. Howatharra Hill	CV	Nature Reserve, Shire Road Reserve	7.8.1994	20+	Healthy
3. WNW of Northampton	N	Shire Road Reserve	18.8.1987	10+	Healthy
4. N of Oakabella	N	Nature Reserve	13.8.1996	2+ (12-15 in 1988)	Healthy
5. Oakajee	CV	Nature Reserve	15.8.1996	1	Healthy
6. Oakajee	CV	Nature Reserve	15.8.1996	13	Healthy

Response to Disturbance

Unknown

Management Requirements

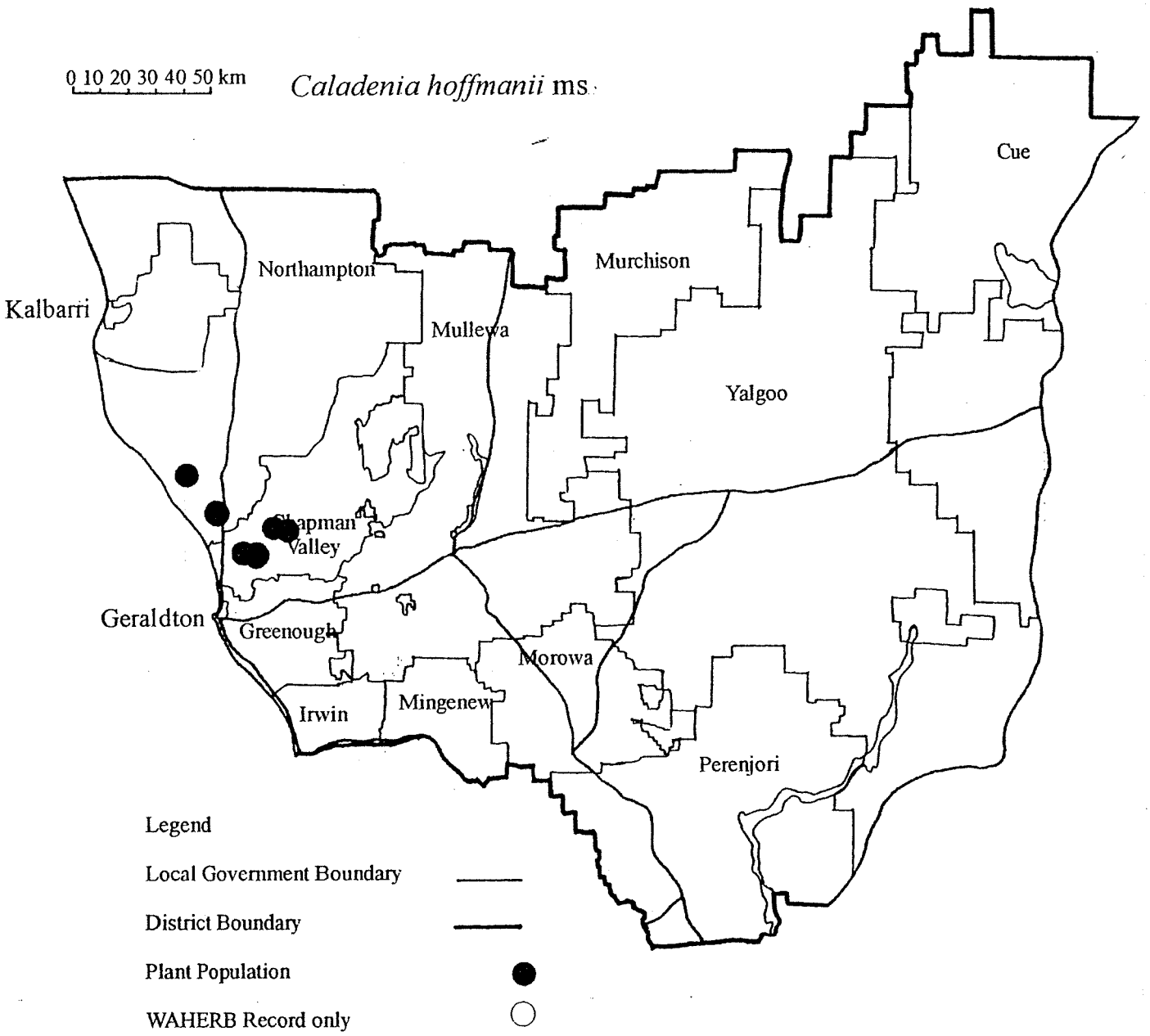
- Populations 1, 3 and 5 require checking during flowering time. Population 5 was last visited in 1996 but the plants were in bud and therefore not easily found.
- Monitor populations regularly.
- Maintain liaison with the Shires.
- Collect germ-plasm material for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.
- Protect from fire, where possible, during vegetative/flowering phase.

Research Requirements

Further survey is required, particularly in the Kalbarri National Park, where the species was reported to occur in 1992.

References

Hoffman & Brown (1992).


0 10 20 30 40 50 km
Caladenia hoffmanii ms
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Caladenia wanosa A.S.George — ORCHIDACEAE

Kalbarri Spider Orchid

The specific name of *Caladenia wanosa* is taken from the initials of the Western Australian Native Orchid Study and Conservation Group.

This species is a small orchid which usually occurs as scattered individuals. The plants are up to 20 cm tall, with an erect linear leaf which is 3-6 cm long and about 3 mm wide, with hairs mainly on the lower surface. The flower has an erect dorsal sepal and clubbed lateral sepals, which are cream with deep maroon markings. The labellum is broad with bold red stripes and has entire margins and recurved tip. The dark red calli are in two rows.

This species is related to *C. radialis*, which differs in its drooping upper sepal, tapering lateral sepal tips and crowded band of calli on the labellum.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

Occurs near Kalbarri and further to the south-east near Mullewa.

Near Kalbarri, *C. wanosa* grows in sandy soil under tall shrubs amongst sandstone outcrops, often along the edges of gorges. Near Mullewa, it occurs in deep, yellow loamy sand beneath tall shrubs of *Acacia acuminata* and *Hakea* species with emergent mallees.

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. S of Ardingley	Mu	Shire Road Reserve	8.1986	600+	Healthy
			21.8.1987	20	-
			6.8.1994	Nil	Evidence of rabbits in area
2. S of Ardingley	Mu	Shire Road Reserve	8.1986	3	Plants probably eaten by rabbits
			21.8.1987	Nil	
			6.8.1994	Nil	
3. Hawkshead	N	National Park	19.8.1987	50+	Mainly undisturbed, some damage by goats and pigs
4. S of Z Bend	N	National Park	20.8.1987	150+	Undisturbed except for feral pig and goat activity
5. Z Bend	N	National Park	19.8.1987	30+	Undisturbed
			9.8.1994		

Populations Known in the Geraldton District (Cont'd)

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
6. NW of Eurardy	N	Pastoral Lease	20.8.1987 1.9.1988	20+ 5+	Undisturbed, but some grazing evident
7. NW of Eurardy	N	Pastoral Lease	1.9.1988 6.9.1991 12.8.1994	20+ 6	Evidence of some grazing. Site has been fenced
8. N of Z Bend	N	National Park	20.8.1986	20	Undisturbed but evidence of feral pigs in area
9. S of Z Bend	N	National Park	22.8.1986	20	Undisturbed but evidence of feral pigs in area
10. S of Z Bend	N	National Park	22.8.1986	10	Undisturbed
11. W of Deep Well	N	Pastoral Lease	1.9.1988	10+	Area recently burnt
12. NE of Hawkeshead	N	National Park	24.8.1991	50+, 20+ seedlings	Undisturbed but some evidence of pig activity

Response to Disturbance

Unknown

Management Requirements

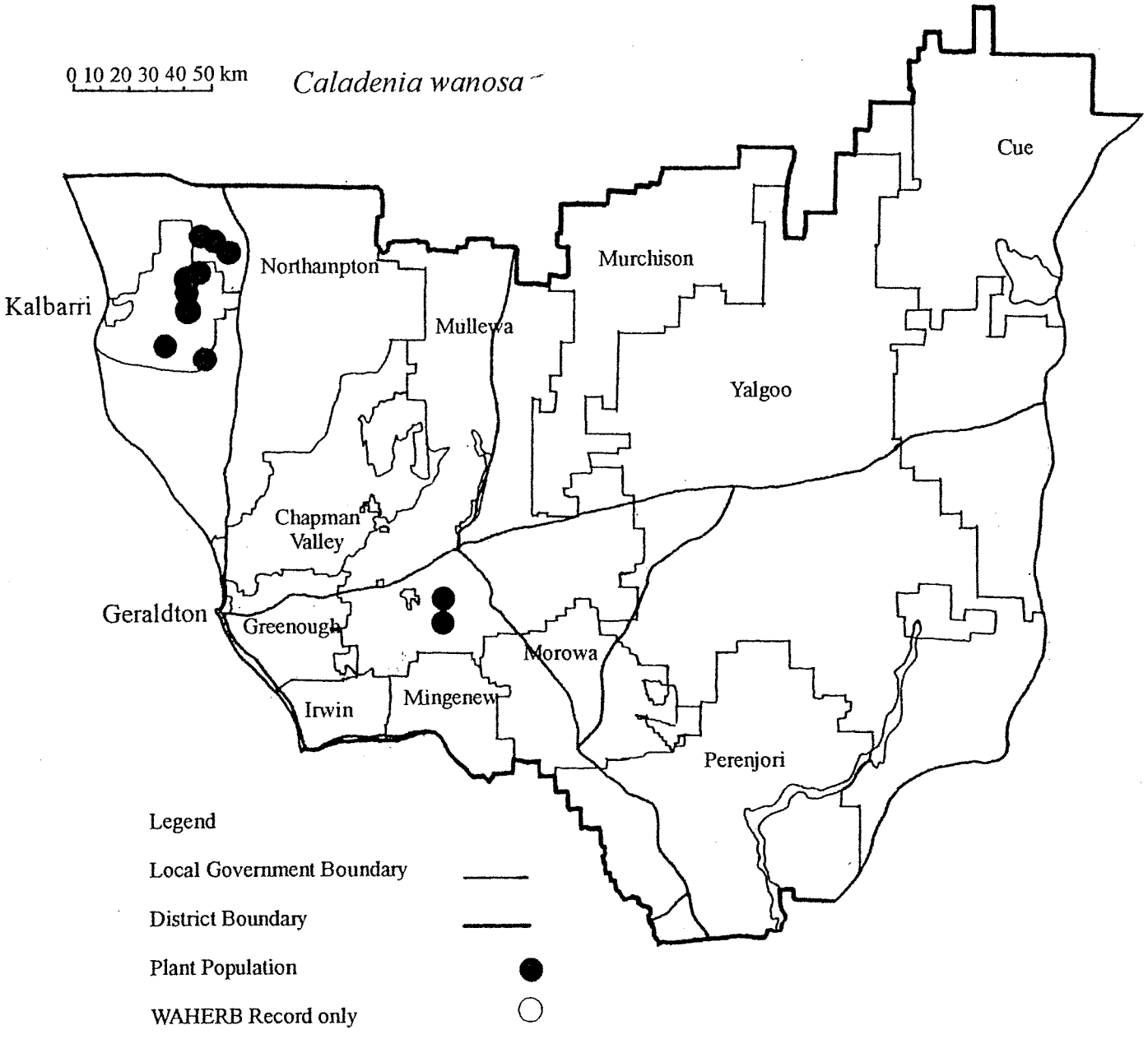
- Monitor populations regularly, particularly populations 3, 4, 6 and 8-11 which have not been visited recently.
- Control of rabbits is required at populations 1 and 2.
- Maintain liaison with Shire, pastoralists and private landowners.
- Collect germ-plasm material for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.
- Protect from fire, where possible, during vegetative/flowering phase.

Research Requirements

- Further survey is required, particularly in the Mullewa area on nature reserves north-west of populations 1 and 2.

References

George (1984a), Hoffman & Brown (1992).


0 10 20 30 40 50 km
Caladenia wanosa
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Chorizema humile Turcz. FABACEAE

Chorizema humile is a small, prostrate subshrub to c. 60 cm diameter. The leaves are alternate, obovate and mucronate at the apex, 4-16 x 2.5-5 mm, tapering at the base into a short petiole, which has a pair of persistent stipules c. 1 mm long. There are terminal racemes to 18 cm long, with up to 30 flowers on pedicels to 2.5 mm long. The calyx is lobed, the two upper lobes joined to form a lip with free tips. It is tapered at the base and has hairs of uniform length and colour. The petals are yellow with red-brown markings. The standard petal is up to 9 mm long, the wing petals are gently curved, to 8 mm long, and the keel is acuminate, almost as long as the wings. The style is gently incurved.

This species is similar to *C. parviflorum* which has narrow to linear leaves, and to C. *racemosum* which has spinescent branchlets and linear leaves with revolute margins.

C. genistoides differs in its erect or spreading spinescent branches, fewer leaves, minute stipules, rounded calyx base and flowers which have a short keel and an abruptly incurved style.

An Interim Recovery Plan is in process of preparation for this species.

Flowering Period: July-September

Distribution and Habitat in the Geraldton District

This species has been recorded from east of Dongara on the southern boundary of the District in 1970, and from east of Geraldton in 1967. There is also a specimen collected from Cue by W.E. Blackall in 1931 which represents a considerable range extension northwards for the species. It has not been found at any of these localities more recently. This species is known at present from three populations within the Moora District in the Carnamah-Coorow area, and east of Moora, where it is known from a total of c. 20 plants. It has also been recorded from Dowerin in the Merredin District.

In the Moora District, it has been recorded growing in red loam, brown sandy clay with granite or clay soils, on plains in scrub or open tree mallee. Associated species include *Allocasuarina campestris, Dodoaea inaequifolia, Hypocalymma angustifolium, Melaleuca radula* and species of *Acacia, Borya, Drosera* and *Calytrix.* Composites are also recorded at one population.

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* Strawberry	I/Mi	-	12.7.1970	-	-
2.* Kojarena	G	-	8.1967	-	-
3.* Cue	C	-	13.7.1931	-	-

Response to Disturbance

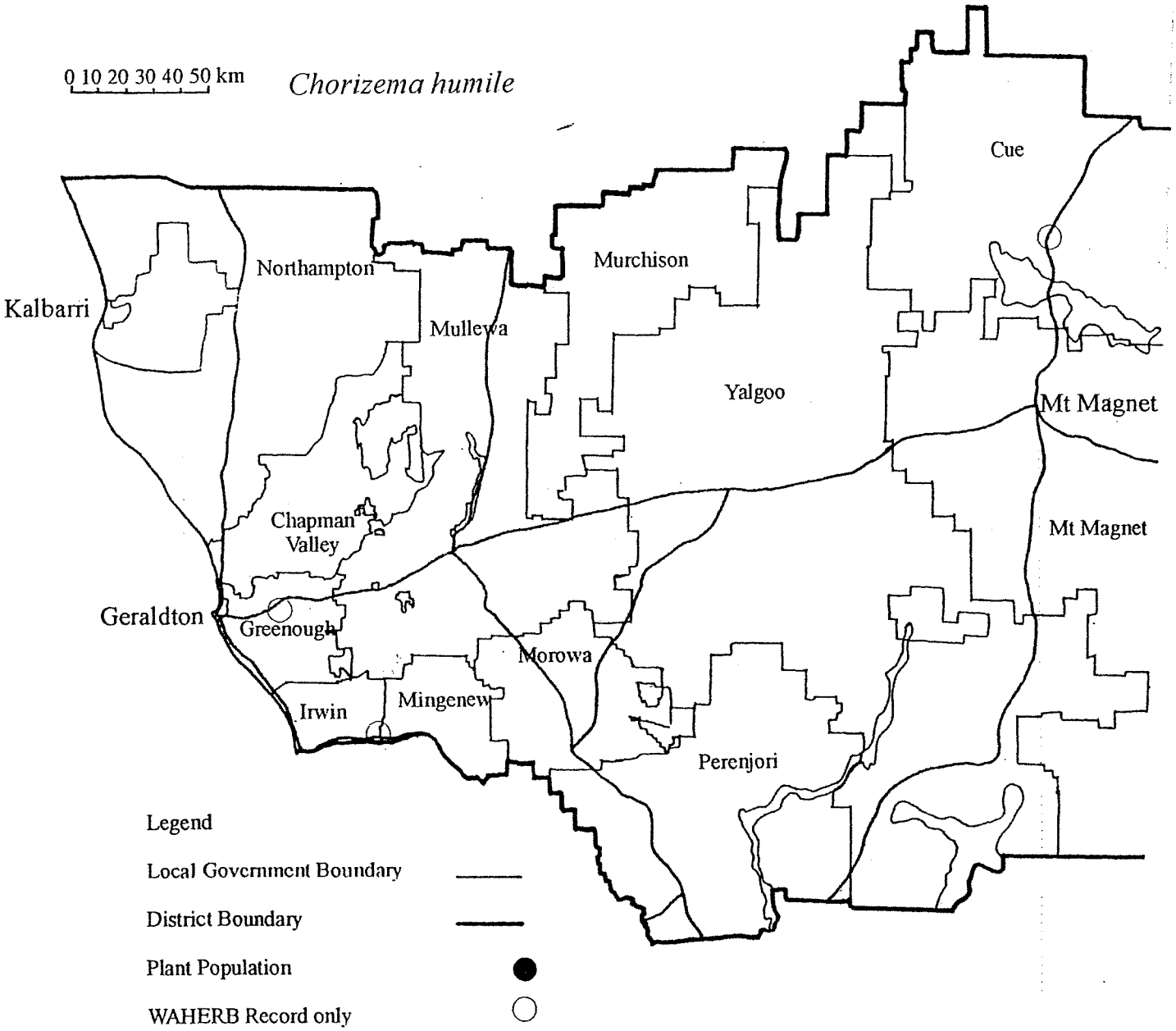
Unknown

Research Requirements

– Further survey is required.

References

Taylor & Crisp (1992).


0 10 20 30 40 50 km
Chorizema humile
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Mt Magnet
Chapman Valley
Mt Magnet
Geraldton
Greenough
Morowa
Mingenew
Irwin
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Conostylis dielsii W.Fitzg. subsp. *teres* Hopper HAEMODORACEAE

This subspecies is a tufted perennial herb to c. 20 cm tall, with terete leaves, 13-33 cm long and less than 1 mm wide. The leaf bases are densely tomentose, the upper part of the leaf less hairy. The flowering stem is 4-10 cm long with a dense many-flowered inflorescence. The flower stalks are short. Each flower has the perianth joined for one-third to half the length, the tube tapering below the lobes, and is divided above into six lobes. It is cream in colour, 7.5-10 mm long, with a short densely matted covering of hairs. The persistent petal lobes on the fruit become claw-like, touching at the apex with gaps at the bases. The stamens are erect, in one row, shorter than the filaments, the connective dorsally decurrent from the base upwards, without appendages. The placenta has several reflexed ovules.

Differs from *Conostylis dielsii* in the terete, not flat leaves, which are also slightly longer. Also similar to *C. teretiuscula,* which has silvery, villous hairs on the leaves and numerous ovules on the sides and lower part of the placenta.

An Interim Recovery Plan is in course of preparation for this subspecies.

Flowering Period: July-August

Distribution and Habitat in the Geraldton District

Known from a restricted area formerly in the Moora District to the north-east of Dongara, from two populations on road verges and also known from one small population on a nature reserve c. 30 km further north.

Grows in white, pale yellow or grey sand with lateritic gravel, in heath, open scrub, low open heath and low open woodland, in upland areas. Associated species include *Hibbertia hypericoides, Hakea trifurcata, Eremaea beaufortioides* and *Allocasuarina humilis.*

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. N of Irwin	I	Shire Road Reserve	7.8.1996 16.9.1976	10 <10 000	Moderate to poor, evidence of rabbits and weed infestation
2. N of Irwin	I	Shire Road Reserve	13.8.1996	340+	Healthy but evidence of rabbits
3. E of Walkaway	G	Nature Reserve	16.8.1996	11	Healthy
4.* NW of Strawberry	I	-	5.8.1975	<1 000	-
5.* NW of Strawberry	I	-	5.8.1976	-	-
6.* The Casuarinas	Mu	-	c. 1975	<10	-

Response to Disturbance

Population 1, when found in 1976, had been recently burnt and was estimated then at <10 000 plants. There are now few plants and few have been found since it was first re-inspected in 1992.

This species is thought to regenerate after fire, like other members of the genus, from subterranean regenerative buds emerging from horizontal rhizomes (Gill 1981).

Management Requirements

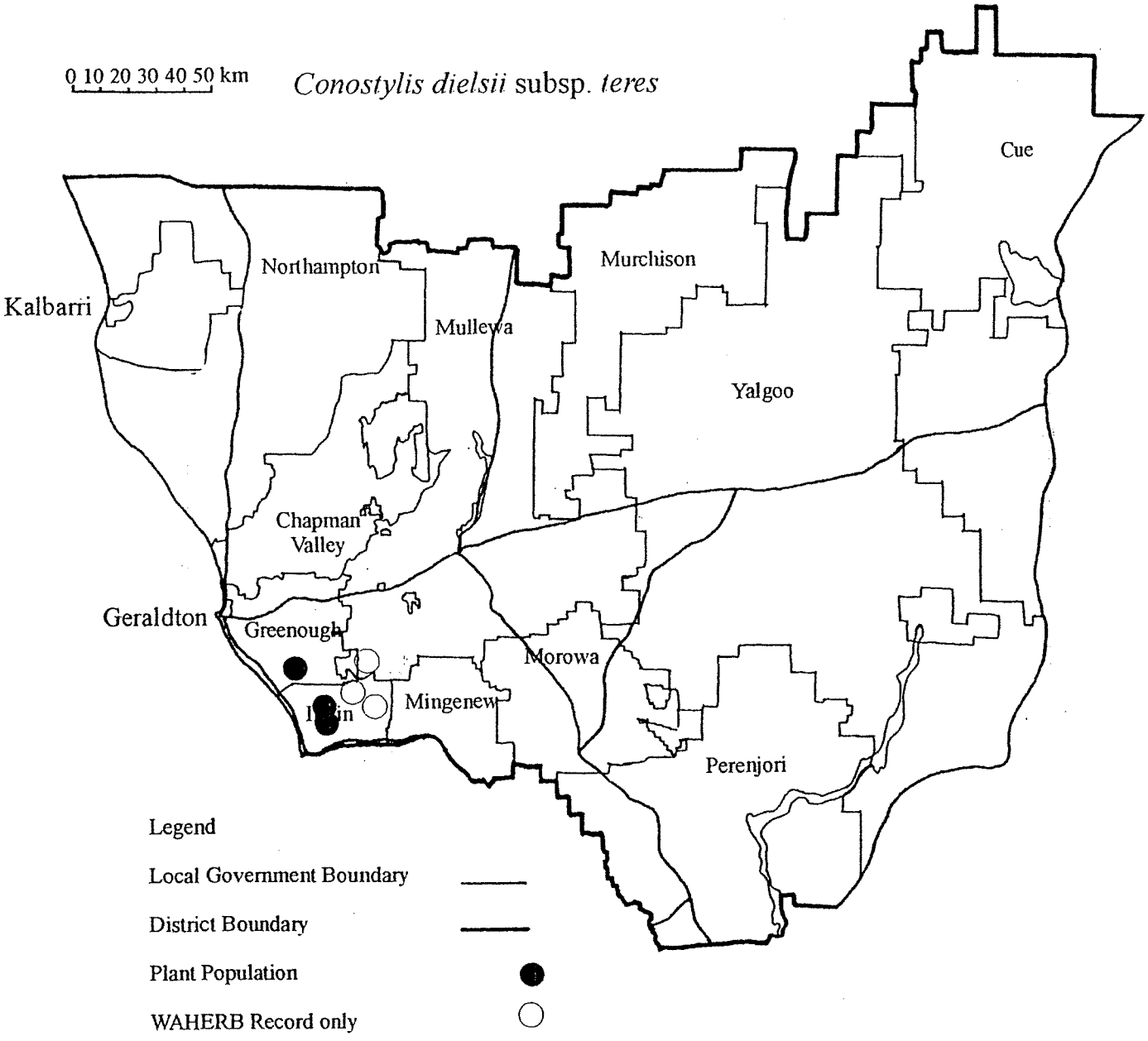
- Monitor all populations regularly.
- Control of rabbits is required at populations 1 and 2.
- Weed control is required at population 1.
- Ensure that population 3 is marked to avoid damage during firebreak maintenance.
- Maintain liaison with the Shire and private landowners adjacent to the populations.
- Collect seed for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.
- Protect, where possible, from fire until the fire response of the species is known.

Research Requirements

- Further survey is required. Populations 4 and 5 have not been refound despite recent searches.
- Further survey is also required on the nature reserve where population 3 occurs.
- Research is required into the fire response of the species.

References

Gill (1981), Hopper (1987).



Conostylis micrantha Hopper — HAEMODORACEAE

Small-flowered Conostylis

A perennial herb, forming tufts up to 30 cm in diameter. The leaves are terete, 31-24 cm long, with a few simple, spreading, white hairs 3-9 mm long on the lower margins. The flowers are in bifurcate, flattened heads on stems 5-13 cm long, with a hairy, papery bract 3-8 mm long half way up the stem. The perianth is 5-7.5 mm long, tubular in the lower half, dividing into six spreading lobes which are cream inside, golden yellow towards the base. The flowers are pale yellowish-cream, ageing to brick red. The stamens are joined to the perianth at one level, the anthers are 1-1.7 mm long, slightly longer than the filaments. The style is 3-4 mm long.

This species is related to *Conostylis teretifolia* but has longer leaf hairs which are confined to the base of the leaf. It flowers earlier and has smaller flowers which are arranged in a bifurcate, flattened, many-flowered head, not in a few-flowered simple head.

An Interim Recovery Plan has been written for this species and is currently being implemented.

Flowering Period: July-August

Distribution and Habitat in the Geraldton District

This species occurs in the southern part of the Geraldton District, where it has been found over a range of c. 30 km in an area north-east of Dongara, extending south to the boundary of the Geraldton and Moora Districts, where one population is known on a railway reserve.

C. micrantha grows in white or grey sand, usually high in the landscape in heath or low heath. Associated species include *Allocasuarina humilis*, *Eremaea* sp., *Hakea trifurcata, Hibbertia hypericoides* and *Dryandra frazeri.*

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. N of Irwin	I	Shire Road Reserve	13.8.1996	550+	Healthy
2. N of Irwin	I	Shire Road Reserve	13.8.1996	12	Moderate
3. N of Irwin	I	Shire Road Reserve	13.8.1996	7	Healthy
4. NW of Strawberry	I	Shire Road Reserve	13.8.1996	-	Recent disturbance, no plants seen at this site since 1976
5. Allanooka Springs Road	I	Shire Road Reserve	13.8.1996	27	Healthy
6. N of Burma Road	G	Nature Reserve	16.8.1996	9	Site recently burnt

Response to Disturbance

This species is thought to regenerate from fire, like other members of the genus, from subterranean regenerative buds emerging from horizontal rhizomes (Gill 1981).

Management Requirements

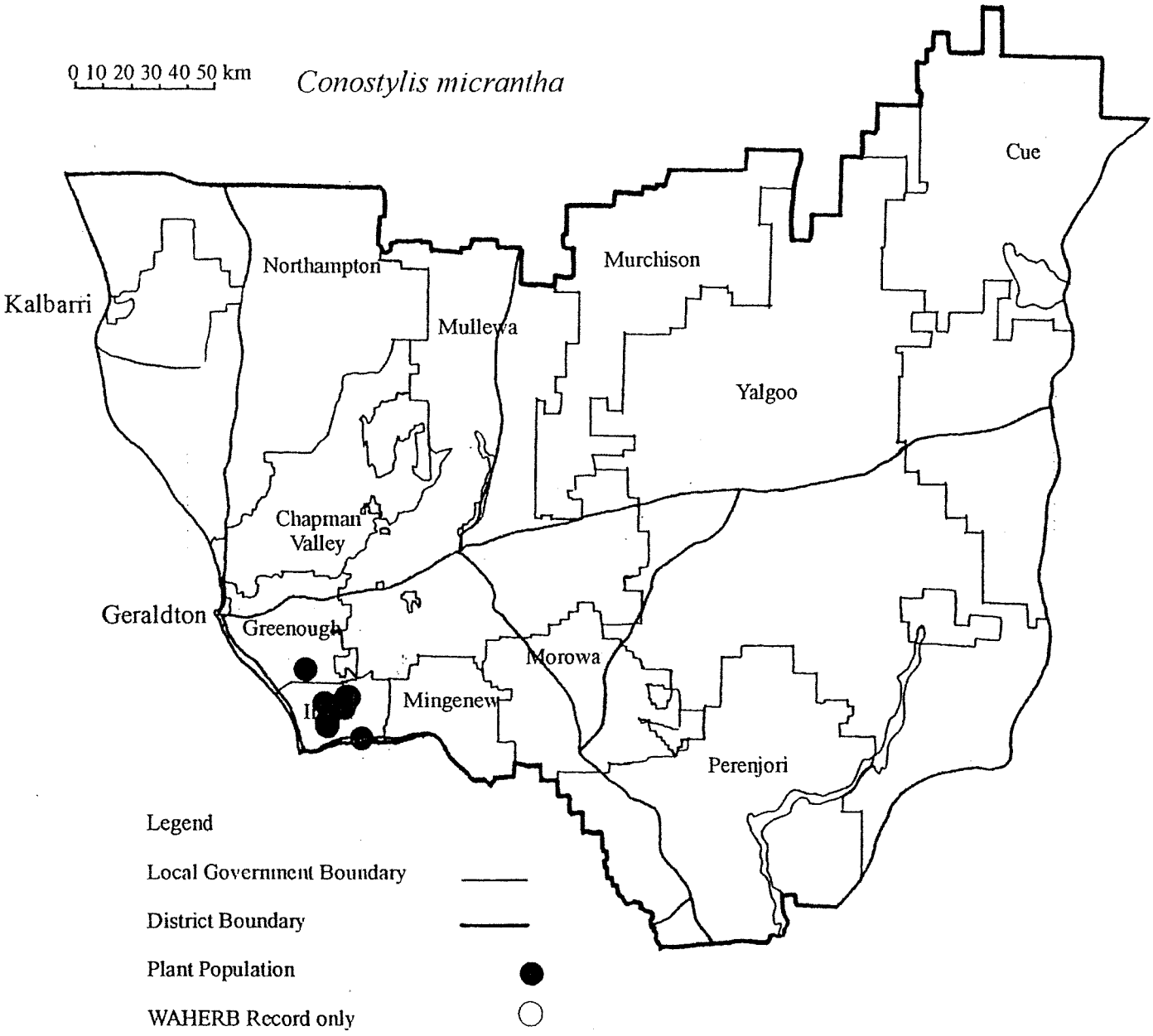
- Monitor populations annually, particularly in relation to grazing by rabbits.
- Some weed control is required.
- Maintain liaison with the Shire and private landowners adjacent to the populations.
- Ensure that dieback hygiene procedures are carried out at all populations.
- Collect seed for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.
- Ensure that markers are in place at populations 1, 3, 5 and 6.
- Protect, where possible, from fire until the fire response of the species is known.

Research Requirements

- Further survey is required, particularly on the large nature reserve on which population 6 occurs.
- Establish monitoring quadrat at population 6 to monitor the fire response of the species.

References

Gill (1981), Hopper (1987), Hopper *et al.* (1990).



Darwinia masonii C.A.Gardner MYRTACEAE

Mason's Darwinia

This species was described in 1964 by Charles Gardner from specimens collected by D. Mason of Whitewells Station in about 1960.

Darwinia masonii is an erect shrub 1.5-2.5 m tall, with leaves which are narrow and almost triangular in cross-section, about 1 cm long. They are densely crowded towards the ends of the branchlets. The flower heads terminate short branchlets and are drooping. They are c. 3 cm across, surrounded by numerous spreading bracts which are reddish in colour, broad at the base, narrowing to a pointed apex and with a distinct midrib. They are c. 2 cm long and 0.5 cm wide. The numerous flowers are not hidden by the bracts as in some of the other species of *Darwinia*. Each tubular flower is c. 0.5 cm long, with minute sepal lobes. The styles are hairy below the stigma and are c. 1.5 cm long.

This species is closely related to *D. leiostyla*, which occurs in the Stirling Ranges, but this species has leaves which are narrower and triangular in cross-section and the flower heads are smaller. It also resembles *D. acerosa*, which occurs in the Mogumber area. The latter species has shorter styles, less than 0.5 cm long, and green involucral bracts with purplish-red margins.

Flowering Period: April, May, July-November

Distribution and Habitat in the Geraldton District

This species is known from a ridge of hills south-west of Paynes Find, where it occurs over a range of about 6 km. It has been reported that the species has been found on a range of hills further to the north of the known populations but no herbarium specimens are known from that area and the plant has not been found there recently.

Grows on the summits of a ridge of banded ironstone formation, where it occurs in tall shrubland of *Allocasuarina acutivalvis*, with a lower shrub layer of *Grevillea paradoxa* and *Phebalium tuberculatum*, and with *Acacia* and *Eucalyptus* species. The plants grow on the south-western sides of the ridges in yellow-brown clay loams in pockets amongst banded ironstone.

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SW of Paynes Find	Y	Pastoral Lease (Mining Lease)	28.10.1994	1 200+	Healthy
2. SW of Paynes Find	Y	Pastoral Lease (Mining Lease)	5.1995	?1 000+	-
3. SW of Paynes Find	Y	Pastoral Lease (Mining Lease)	15.7.1996	180	Area disturbed by mining exploration

Response to Disturbance

Thought to regenerate from seed after fire. Plants have also been found in areas of disturbed soil and on bulldozed tracks and are thought to regenerate from a woody rootstock.

Management Requirements

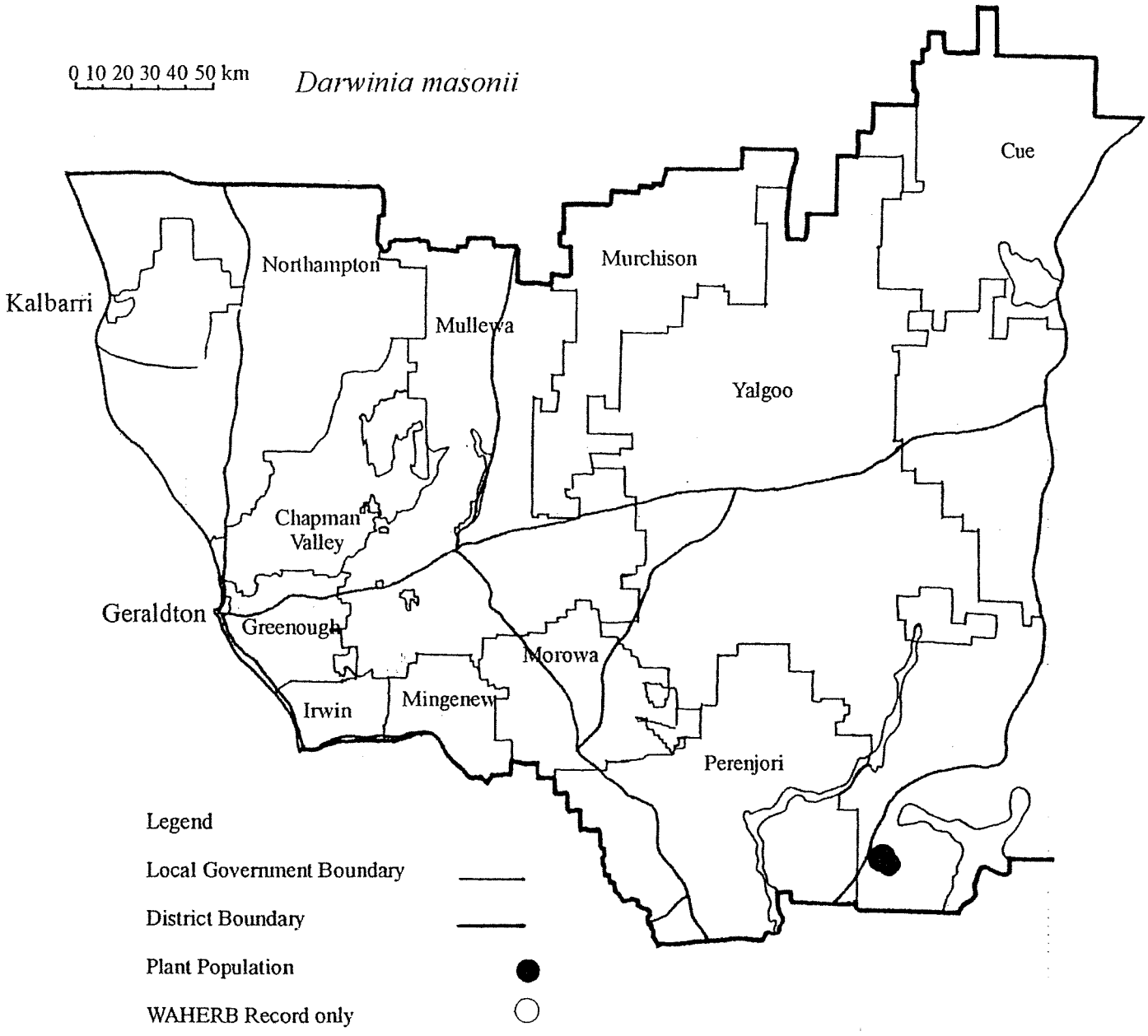
- Collect seed for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.
- Monitor the populations regularly, particularly in relation to mining operations.
- Maintain liaison with pastoralist and mining operators.
- Protect, where possible, from frequent fire.

Research Requirements

- Further survey is required on suitable habitat, particularly further north from the area in which the population has been reported.
- Research is required into the fire response of the species.

References

Blake (1981), Gardner (1964), Leigh, Boden & Briggs (1984), Rye & Hopper (1981).



Daviesia speciosa Crisp — FABACEAE

Beautiful Daviesia

Daviesia speciosa was first collected by C.A. Gardner in 1958 from a single population near Mingenew (since cleared for agriculture). A further population was found in the Moora District by C. Chapman prior to 1969 who, after 20 years of study, noted that it flowered every year but did not produce seed. Further populations have been found north-east of Eneabba on the boundary between the Moora and Geraldton Districts south of Mingenew.

D. speciosa is a glaucous, blue leafless shrub to 1 metre high by 2 metres wide with stiff, erect stems. It has a thick, spreading rootstock from which new plants are produced. The phyllodes are erect, continuous with the branchlets and with small scale leaves at the base. The flowers are red and typically pea-shaped. They are large, to 2.5 cm long on a long stalk, growing in one- or two-flowered clusters on the stems. They are nodding. Pods have not been seen on the populations in the Moora District after observation over about 20 years and apparently are not set, nor have they been observed on the northern populations. Hand pollination trials indicated that pollen infertility is the most likely cause of ovule abortion. The species is thought to be bird pollinated, but no birds were observed pollinating flowers during work on this species, so that lack of suitable pollinators is also a possible reason for lack of sexual reproduction (Schwarten 1995).

This species is quite distinct in the genus, although *D. epiphylla* has similar flowers but differs in its flattened stems.

Flowering Period: March-June

Distribution and Habitat in the Geraldton District

D. speciosa is currently known from five populations over a range of c. 40 km, three of which are in the Moora District, the other two on the boundary between the Moora and Geraldton Districts.

Occurs in dense low shrubland of species such as *Acacia, Grevillea, Eremaea, Hakea trifurcata, Hibbertia, Calothamnus longissimus* and *Allocasuarina* in lateritic loams, usually high in the landscape.

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Scott Road N of Yandanooka Road	Mi	Private	13.3.1996	50+	Healthy, possible threat from gravel extraction
2. Yandanooka Road W of Scott Road	Mi	Shire Road Reserve	13.3.1996	50+	Healthy

Response to Disturbance

A disturbance opportunist occurring on road verges and gravel pits. Plants are thought to be short-lived. They are known to resprout from rhizomes after mechanical disturbance and the species can increase its numbers by producing new plants from root suckers. At a population in the Moora District, many plants were observed to have died in undisturbed vegetation, whereas those in a gravel scrape were all healthy.

Management Requirements

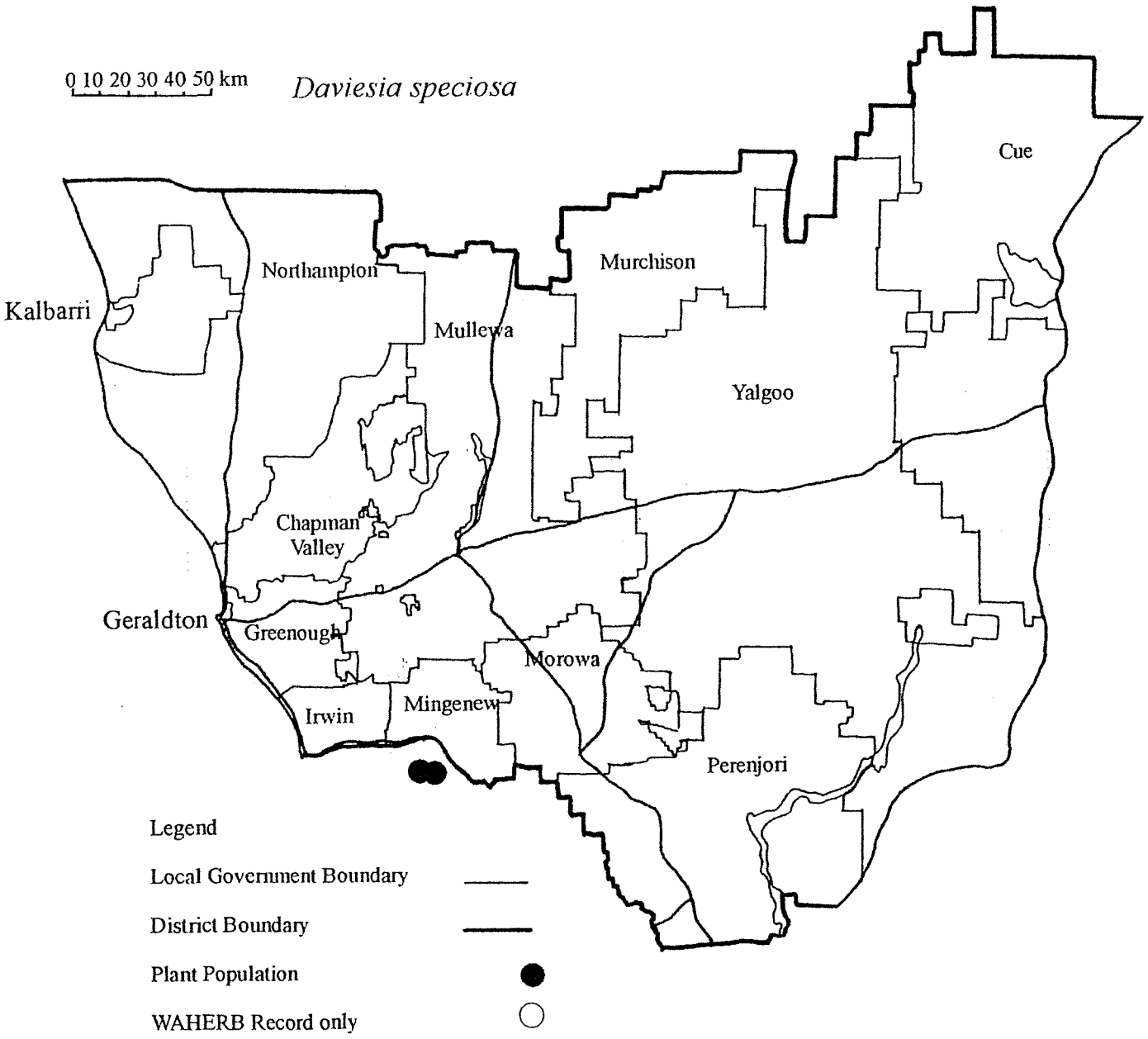
- Ensure that dieback hygiene procedures are carried out at all populations.
- Continue close liaison with private landowners and the Shire.
- Monitor populations regularly.
- Exclude areas from road works and gravel extraction where plants are known to occur.
- Ensure that population 2 is marked.
- Protect, where possible, from frequent fire.

Research Requirements

- Research on the biology and ecology of this species has been carried out as part of a Masters degree project through the University of Western Australia.
- Further surveys should be carried out in areas of suitable habitat.
- Continue research on pollination biology and population ecology, particularly genetic research to determine the reasons for clonal growth and lack of seed production.

References

Crisp (1985, 1995), Hopper *et al.* (1990), Schwarten (1995).



Drakaea concolor Hopper & A.P.Brown ms ORCHIDACEAE

Kneeling Hammer Orchid

An erect, tuberous herb to 30 cm tall. The solitary leaf is small, heart-shaped, 2 to 3 cm across and is dull, hairless and dark green in colour. The plants are usually single-flowered, each flower is 3-4 cm long.

This species is related to *Drakaea elastica* which has a light green, shiny leaf.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

This species is known from four populations over a geographic range of about 20 km. It occurs in an area east of Kalbarri.

Grows in sandy soil over sandstone amongst thick scrub of *Acacia, Calothamnus* and *Melaleuca* species or in open areas amongst low dense heath with species of *Melaleuca, Isopogon, Verticordia, Hakea, Calothamnus* and *Callitris.* It has also been recorded from a damp depression, growing amongst sedges.

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Z Bend	N	National Park	9.8.1994	30+	Healthy
2. Road to Z Bend	N	National Park	8.8.1990	35	-
3. Ross Graham Lookout	N	National Park	24.8.1991	200 mature, 2 000 seedlings	Recently burnt, evidence of pig and goat activity, some weeds
4. Lockwood Springs	N	National Park	24.8.1991	20+ mature, 200+ seedlings	Some evidence of pig activity
5. SW of Z Bend	N	National Park	15.9.1998	27	Healthy

Response to Disturbance

Unknown

Management Requirements

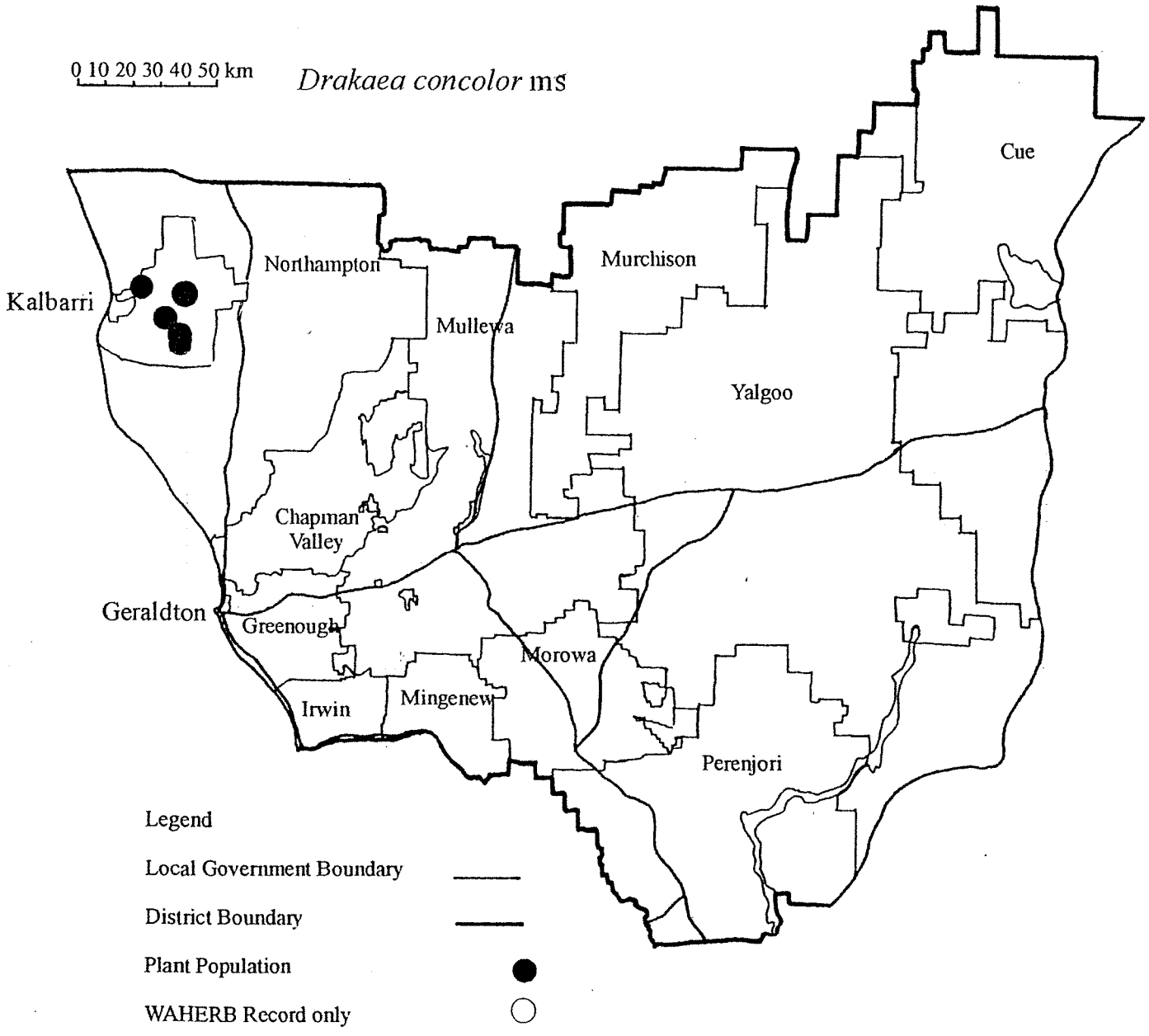
- Monitor populations regularly.
- Collect germ-plasm material for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.
- Protect from fire, where possible, during vegetative/flowering phase.

Research Requirements

- Further survey is required.

References

Hoffman & Brown (1992).


0 10 20 30 40 50 km
Drakaea concolor ms
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Drakonorchis barbarella Hopper & A.P.Brown ms ORCHIDACEAE

[*Caladenia* sp. Murchison (S.D.Hopper 3270)]

Small Dragon Orchid

This orchid was first discovered in 1978 by Noel Hoffman in the Kalbarri National Park.

Drakonorchis barbarella ms is a small plant which often grows in clumps of two or three plants. It is 8-25 cm in height, with a single narrow leaf 3-6 mm wide and 3-8 cm long, which lies fairly close to the ground. There is one flower on each flowering stalk and the flower is c. 2 cm long and broad. The green labellum has shining purple calli at its base and is covered with long purple hairs which attract the pollinators, male wasps. These attempt to mate with the labellum which resembles a female wasp, and in doing so, effect pollination of the flower.

This species has smaller flowers than other species in the genus and has a shorter, stiffly-hinged labellum.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

This species is known from seven populations, five of which are on pastoral leases and one on a national park in the Geraldton District. The other (population 3) occurs on a nature reserve, a little further north outside the Geraldton District in the Midwest Region.

Grows in sandy loam or clay loam, in shallow, wet depressions or alongside seasonal creeklines. Occurs in dense heath or tall scrub of *Melaleuca uncinata* or *Acacia* species. Associated species include *Brachysema aphylla, Eucalyptus loxophleba, Hakea preissii* and *Calothamnus* sp.

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. NNW of Mt Curious	N	Pastoral Lease	18.8.1996	10 50+ in 1993 100 in 1983	Healthy. Area burnt 1992, regenerating well
2. NNW of Mt Curious	N	Pastoral Lease	19.8.1987	20+	Healthy
4. NW of Eurardy Station	N	Pastoral Lease	18.4.1996	c. 15 100 in 1986	Healthy, population fenced
5. NW of Eurardy Station	N	Pastoral Lease	6.9.1991	0 20+ in 1988	Wildfire summer 1991
6. NW of Eurardy Station	N	Pastoral Lease	1.9.1983	20+	Burnt summer 87/88
7. E of Kalbarri	N	National Park	10.8.1994	10	Healthy, but becoming somewhat weed infested

Response to Disturbance

Unknown

Management Requirements

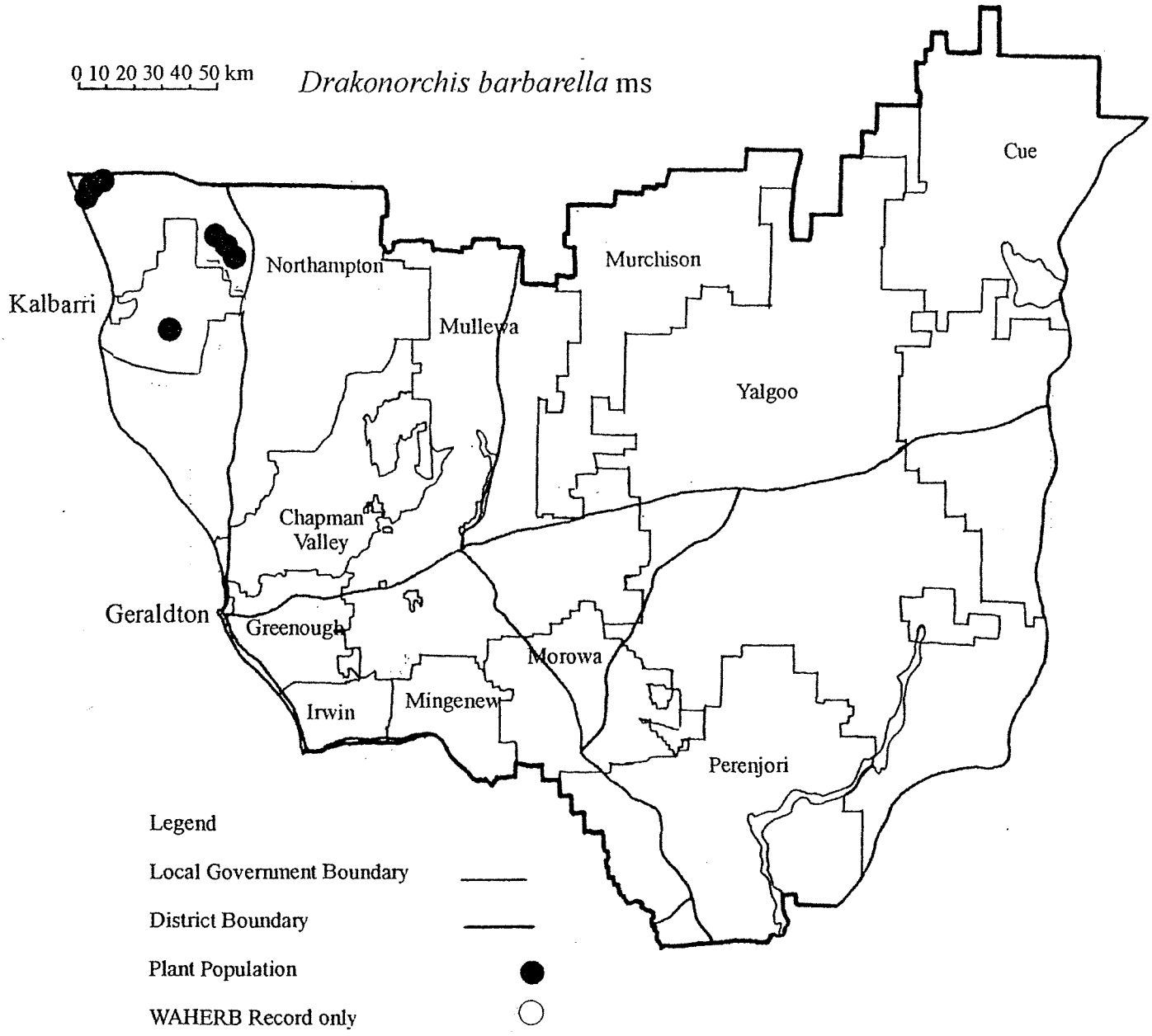
- Monitor populations regularly, particularly populations 2 and 6 which have not been visited recently.
- Monitor grazing pressure on populations 1, 2, 5 and 6.
- Monitor weed infestation at population 7.
- Collect germ-plasm material for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.
- Put markers in place at population 1 to avoid damage during track maintenance.
- Maintain liaison with the pastoralists.
- Protect from fire, where possible, during vegetative/flowering phase.

Research Requirements

- Further survey is required.

References

Hoffman & Brown (1992).



Drummondita ericoides Harv. RUTACEAE

Moresby Range Drummondita

This species was first collected by James Drummond and described by Harvey in 1855. It was recollected by Charles Gardner in 1926, but was then thought to be extinct until its rediscovery in 1980.

Drummondita ericoides is a low, erect, heath-like shrub growing to about a metre tall. The leaves are small, simple and hairless, crowded on the branches, and are c. 8 mm long and narrow, scattered with glandular dots. The flowers are solitary, each with five short, hairless sepals and five concave, erect petals which are yellowish in colour, greenish at the tips. The ten stamen filaments are united to form a narrow hairy tube, white to violet in colour, which projects beyond the petals. The five longer filaments have no anthers and have long hairs. The five shorter filaments have anthers which are hairy on the back. The style is crimson and projects beyond the stamens. There are five free carpels, which split when ripe to release the kidney-shaped seeds.

Flowering Period: August-October

Distribution and Habitat in the Geraldton District

Known from a restricted area in the Moresby Range north of Geraldton where it occurs over c. 1 km.

Grows amongst low heath on slopes, ridges and gullies, in brown loam, and sandy loam and clay amongst sandstone and laterite. Associated species include *Melaleuca megacephala, M. cardiophylla, Acacia blakelyi, Hakea pycnoneura* and *Gastrolobium spinosum.*

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. N of Geraldton	CV	Nature Reserve	7.7.1993 15.8.1996 (partial survey)	90+ (307 in 1987) 15+	Good, but the terrain is unstable and plants have been lost in landslides

Response to Disturbance

Unknown

Management Requirements

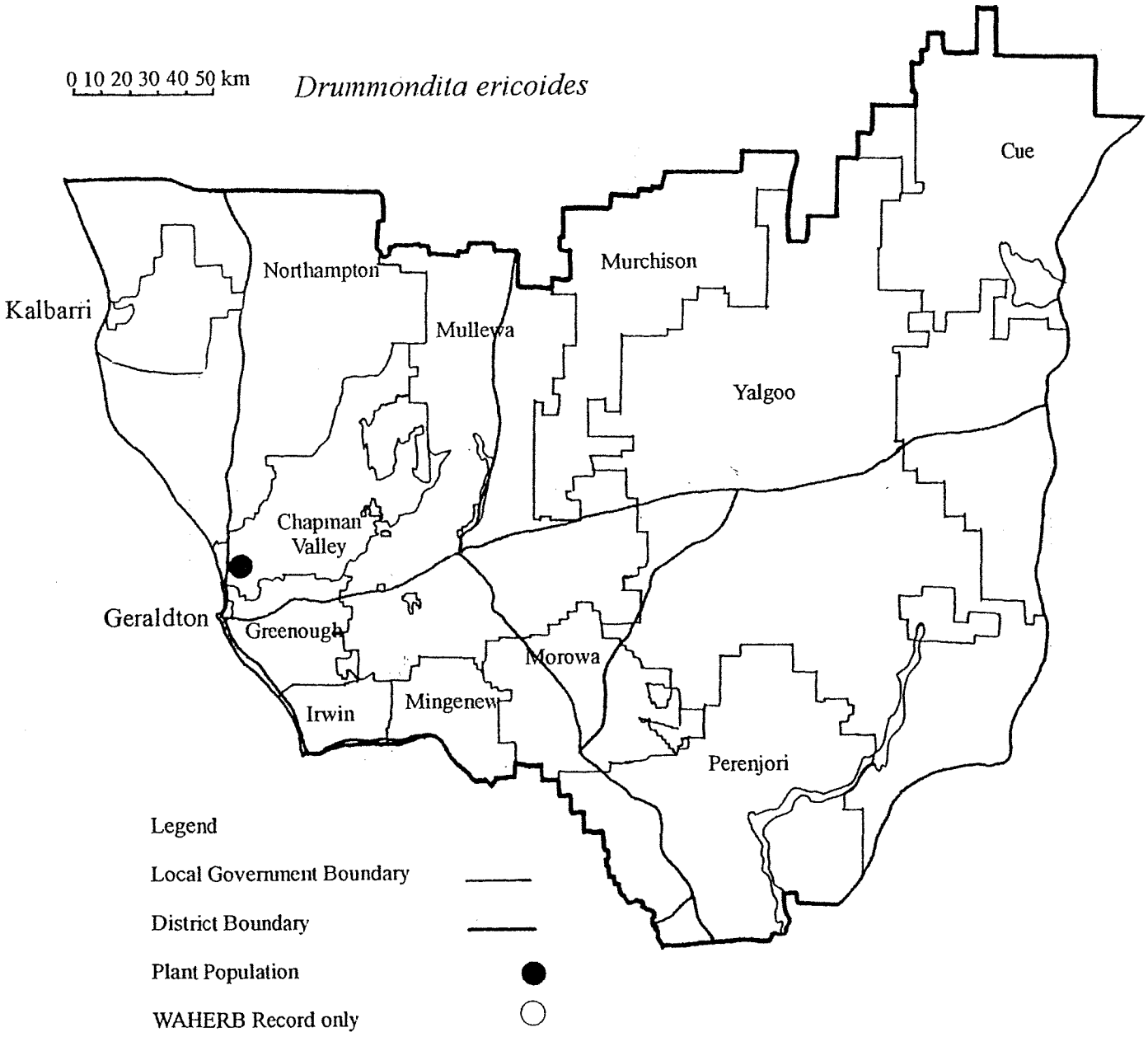
- Monitor the population regularly, particularly in relation to damage by water erosion and landslides.
- Maintain liaison with adjacent private landowners.
- Protect, where possible, from frequent fire.
- Collect seed for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.

Research Requirements

- Further survey is required in suitable habitat for this species, particularly in remnant vegetation in the Moresby Range.
- Research is required on the population biology and fire response of the species.

References

Bentham (1863), Leigh, Boden & Briggs (1984), Patrick & Hopper (1982), Wilson (1971).



Eremophila microtheca (F.Muell. ex Benth.) F.Muell. MYOPORACEAE

Heath-like Eremophila

This species was first collected and described last century from specimens collected by Oldfield at Port Gregory and Murchison River in the Geraldton District.

Eremophila microtheca is an erect, heath-like shrub to c. 1 m high, with finely hairy stems and leaves, giving the plant a hoary appearance. The leaves become glabrous with age. The plant has a strong pungent scent. The leaves are crowded and linear, c. 1 cm long. The flower has short, dense, stellate hairs on the calyx and minute scales on the corolla, which is lilac in colour, tubular with five lobes. The populations in the Kalbarri area differ from those in the Moora District, which have longer terete leaves.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

This species is known in the Geraldton District from near Kalbarri, where two populations occur 17 km apart to the east of Kalbarri, and was originally collected further south at Port Gregory, where it has not recently been rediscovered. It also occurs in the Moora District from an area south-west of Eneabba, where it grows for c. 2 km along a drainage line.

It grows on sandy clay and gravel soils along drainage lines, in open low mallee woodland with tall *Melaleuca* shrubland. Associated species include *Eucalyptus obtusiflora, Dodonaea larreoides, Acacia saxatilis* and *Trymalium ledifolium.*

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. ESE of Kalbarri	N	National Park	23.7.1994	900+	Healthy, partly burnt 1990, with many seedlings in the burnt area
2. NE of Kalbarri	N	National Park	1.6.1994	10 000+	Healthy, plants appear to have regenerated from seedlings after fire several years ago

Response to Disturbance

Both populations in the Geraldton District have regenerated after fire, with many seedlings produced.

Plants at a population in the Moora District were surviving as the only representative of native vegetation in grazed pasture. The plants were partly grazed but some were in flower. Grazing is possibly inhibited to some extent by the strong smell and presumably, the taste of the plant.

Management Requirements

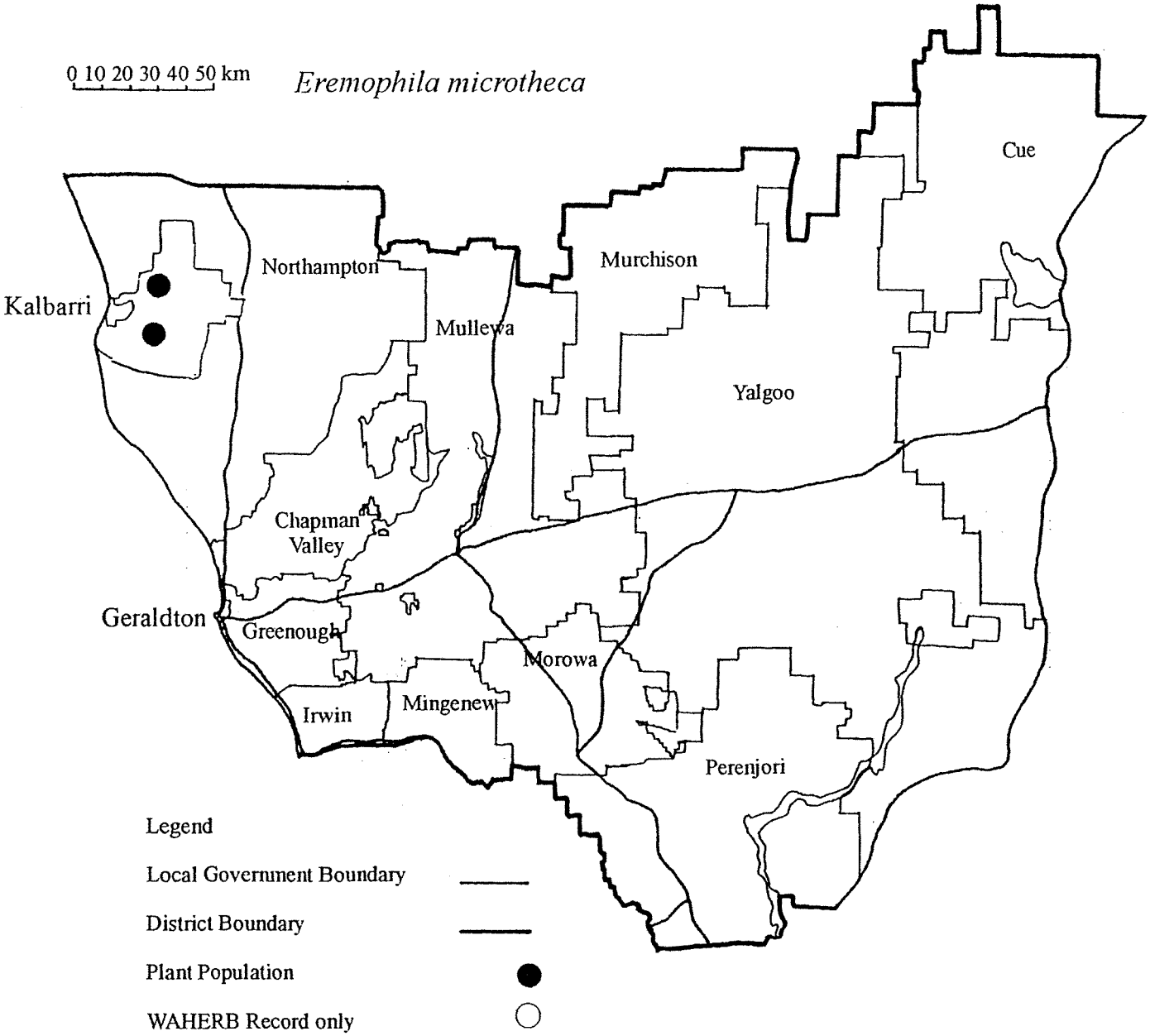
- Monitor the populations regularly.
- Collect seed for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.
- Protect, where possible, from inappropriate fire regime.

Research Requirements

- Further taxonomic research may be required to clarify differences between the northern and southern populations.
- Further survey is required to find new populations, particularly in other areas of suitable habitat within the Kalbarri National Park and in the coastal areas south to the Port Gregory area.

References

Bentham (1870), R. Chinnock (personal communication), Patrick & Hopper (1982).



Eremophila nivea Chinnock

MYOPORACEAE

Silky Eremophila

An erect, compact shrub to 2 m tall, with branches, leaves, pedicels and sepals clothed in a dense covering of whitish woolly hairs. The leaves are sessile, alternate and linear, to 18 x 3.5 mm, acute, with slightly turned back margins. The flowers are borne 1-2 in the axils of the leaves, on pedicels 2-5.5 mm long. The sepals are acute, to 11 x 2.5 mm. The petal tube is about 23 mm long, tubular, two-lipped, hairless on the outside and lilac in colour. It is whitish inside on the lower lip, with lilac to brown spots. There are four stamens which are held within the flower tube. The fruit is ovoid in shape, beaked, with a papery, buff-coloured coat, splitting at the apex. This species is similar to *Eremophila eriocalyx*, but differs in the more dense tomentum, the hairless corolla, open corolla throat, shorter pedicels and sepals. *E. nivea* has been cultivated mainly by enthusiasts under the name *E. margarethae.*

This species is one of several endangered *Eremophila* species for which the population dynamics and seed biology have been studied as part of a Ph.D. thesis at Curtin University. An Interim Recovery Plan has been written and is currently being implemented.

Flowering Period: August-October

Distribution and Habitat in the Geraldton District

This species was described in 1986 from a road verge population south-west of Morowa which was in the Geraldton District just north of the boundary with the Moora District. This population is now extinct. An earlier collection made in 1964 was from north-east of Morowa and the species was recollected from south-east of Morowa in 1995. There are six other populations known from the Moora District which occur over a range of less than 5 km to the north of Three Springs.

E. nivea grows in red-brown sandy loam and lateritic gravel, or in clayey loam, usually near the edge of seasonal creeks, in open York gum woodland and open scrub. Associated species include *Acacia acuminata, E. glabra, Enchylaena tomentosa, Maireana brevifolia, Melaleuca* and *Ptilotus* species.

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SE of Morowa	Mo	Shire Road Verge, Private	21.2.1997	54	Possible threat of salt encroachment
2.* SE of Morowa	Mo	MRWA Road Verge	30.9.1979	<200	Now extinct

Response to Disturbance

The species has been reported to be a disturbance opportunist and the seed is thought to germinate in disturbed sites, possibly following fire. An experimental burn has been conducted at one population which indicated that it appears to be partially fire tolerant as the foliage is not highly flammable. Further monitoring is being undertaken to determine whether suckering or reseeding has taken place. Assessment of starch grains within the roots suggest that it is partially fire tolerant (Richmond & Coates 1996). All populations in the Moora District have some weed infestation and those on road reserves are surviving with some recruitment. Thought to be short-lived, surviving in low numbers once associated vegetation has reached maturity.

Management Requirements

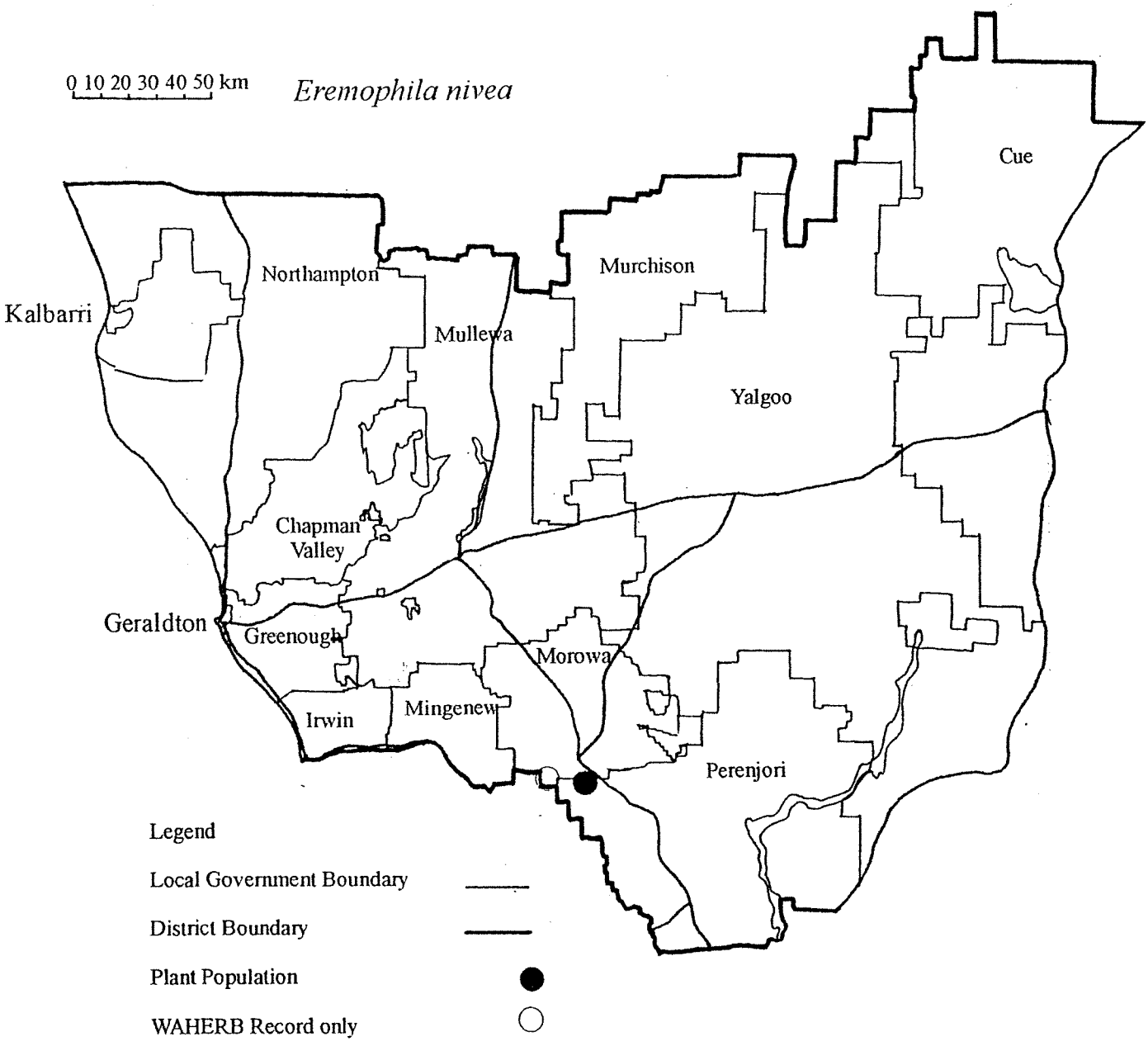
- Collect seed for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.
- Monitor the population annually.
- Fence population 1 if required.
- Ensure that population 1 is marked.
- Liaise with private landowner.
- Protect, where possible, from inappropriate fire regime.

Research Requirements

- Further survey is required during the flowering period, particularly in suitable habitat in the Morowa area.
- Population 1 requires further survey.
- Establish monitoring quadrat at population 1 to monitor effect of salinisation.

References

Chinnock (1985), Elliot & Jones (1984), Papenfus *et al.* (1996), Richmond & Coates (1996).



Eremophila viscida Endl. MYOPORACEAE

Varnish Bush

An erect shrub from 2 to 6 m tall with glabrous branches. The leaves are glabrous to finely glandular hairy with a distinctly shiny, sticky surface. They are alternate, scattered or clustered, lanceolate in shape, gradually tapering to the base and 5-10 cm long. The flowers are axillary and usually solitary or sometimes two together. Each flower is borne on a stalk 1 cm long, which is enlarged beneath the flower. The calyx segments are obovate and obtuse, membranous and strongly veined. They enlarge after flowering to c. 1 cm long. The corolla is white to pale yellow, with purple spots. It is just over 1 cm long, with glandular hairs and with the lobes obtuse. The stamens project beyond the tube. The ovary is hairy.

This species is similar to *Eremophila platycalyx,* which differs in its stamens being included within the corolla.

Flowering Period: September-October

Distribution and Habitat in the Geraldton District

This species is known at present in the District from one small population near Pindar. It has been collected in that area several times in the past and also further south in the District from the Perenjori area. Its geographic range has extended in the past over 290 km from Pindar south-eastwards into the Merredin District, where it is known at present from six populations in the Muckinbudin area. Its most easterly known location was west of Norseman, where it was recorded in 1979.

Grows in sandy soils or at the known population, in red-brown clay loam, in open low woodland of *Acacia acuminata* and an open shrub layer with other species of *Eremophila, Ricinocarpus velutinus, Scaevola spinescens* and *Melaleuca* species.

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. NW of Pindar	Mu	Private	25.9.1997	2 (more when population originally found)	Moderate
2.* East of Pindar	Mu	-	10.1975	-	-
3.* NE of Carnamah	P	-	20.9.1971	-	-
4.* Between Tardun & Wilroy	Mu	-	9.1969	-	-
5.* S of Pindar	Mu	Private	2.10.1963	-	-
6.* N of Latham	P	-	9.1963	-	-

Response to Disturbance

Unknown

Management Requirements

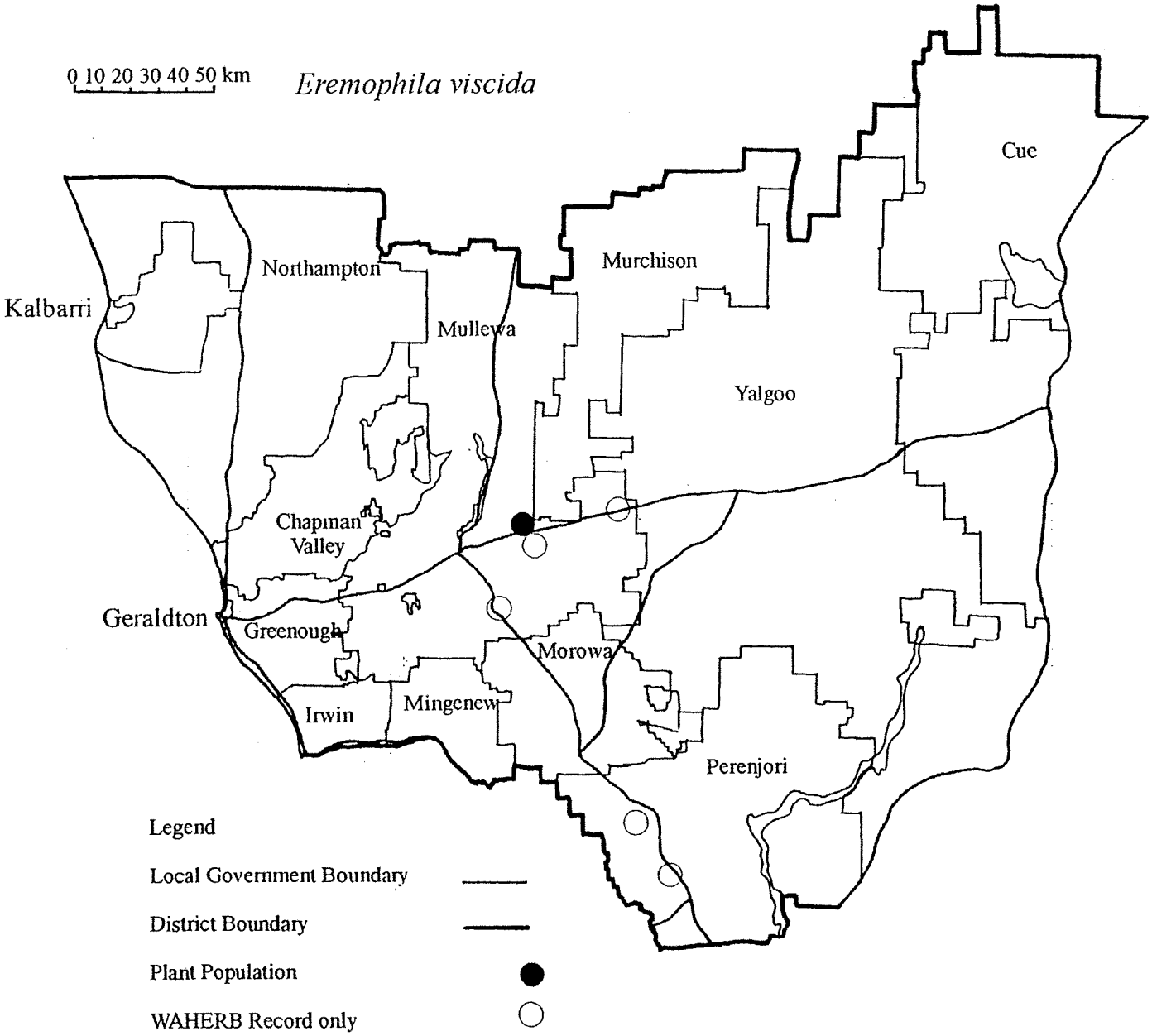
- Collect seed for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.

Research Requirements

- Further survey is required in the area of occurrence and areas in which it has been recorded in the past, particularly on conservation reserves.

References

Bentham (1870), Hopper *et al.* (1990), Patrick & Hopper (1982).



Eucalyptus beardiana Brooker & Blaxell MYRTACEAE

Beard's Mallee

A tall, spreading mallee to 5 m tall, with smooth, pinkish-grey to cream bark. The leaves are narrow-lanceolate, to 12.5 cm long and up to 1.5 cm wide, light grey-green in colour. The inflorescences are on down-curved stalks and have up to 11 flowers in each group. The buds are pendulous, with a cup-shaped hypanthium and a beaked operculum. They are up to 2.1 cm long and 0.6 cm wide. The flowers are creamy white in colour, with the filaments of the stamens united in the lower half. The fruits are pendulous, urn-shaped, with a thick rim and the disc level to descending. There are four or five valves which are exserted.

This species is closely related to *Eucalyptus leptopoda,* which also has joined filaments, but has narrower leaves, smaller buds, 7-9 in each inflorescence and smaller fruit with a level to raised disc. It is also related to *E. synandra,* which has smaller buds, up to 7 in each inflorescence, and fruits with a steeply ascending disc.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

This species is known from four populations in the Geraldton District and five further north in the Midwest Region.

Grows on red sand dunes and on yellow sand ridges in tree-heath or tall open shrubland with species of *Eucalyptus,* including *E. jucunda, E. eudesmoides* and *E. gittinsii,* with *Banksia sceptrum, B. ashbyi, Melaleuca uncinata* and species of *Acacia, Grevillea* and *Persoonia.*

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. W of Eurardy Station	N	Pastoral Lease, National Park	4.5.1995	7+12	Undisturbed
2. E side of North West Coastal Highway, S of Vermin Proof Fence	N	Crown Land	8.10.1991	16+	Healthy
3. E side of North West Coastal Highway, S of Vermin Proof Fence	N	Crown Land	11. 8.1994	18	Healthy
4. NW of Mullewa	Mu	Private	8.2.1999	10+	Healthy

Response to Disturbance

A population north of the District regenerated after fire. The plants in September 1993 had regenerated to 2 m tall after a fire in summer 1987.

Management Requirements

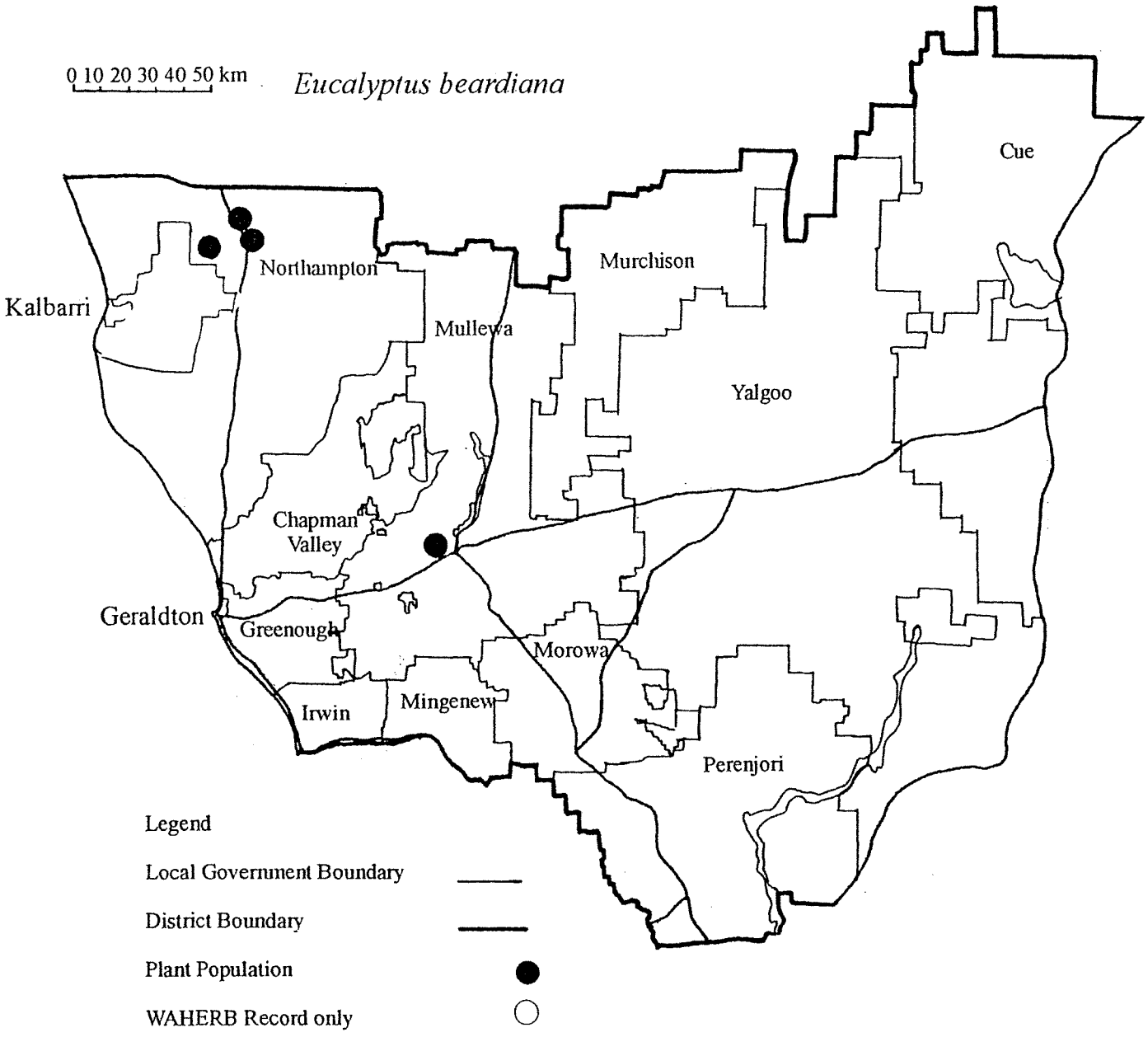
- Collect seed for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.
- Monitor populations regularly, particularly population 2.
- Maintain liaison with pastoralist.
- Protect, where possible, from inappropriate fire regime.

Research Requirements

– Further survey is required, particularly to survey fully population 4.

References

Brooker & Blaxell (1978), Brooker & Kleinig (1990), Kelly, Napier & Hopper (1995), Napier, Taylor & Hopper (1988).



Eucalyptus blaxellii L.A.S.Johnson & K.D.Hill MYRTACEAE

Howatharra Mallee

A mallee to 3 m with smooth bark, pinkish-brown or grey over coppery. The juvenile leaves are lanceolate to broad-lanceolate. The adult leaves are narrow-lanceolate, glossy green in colour, with irregular lateral veins at an angle of 20-40 to the midrib. The buds are small, grouped in simple axillary inflorescences, with up to 7 buds in each. They are up to 0.6 x 0.3 cm with a hemispherical cap. The fruits are cup-shaped with a thin rim, descending disc and three enclosed valves.

This species is related to *Eucalyptus loxophleba* group of taxa which have ovate to orbicular, dull bluish juvenile leaves and strongly irregular venation in the adult leaves, with the inflorescences often clustered at the leafless ends of small branches.

Flowering Period: May-November

Distribution and Habitat in the Geraldton District

Occurs in the Moresby Ranges north-east of Geraldton, where it grows in scattered populations as an emergent mallee over heath on sandstone hills or creek flats. It grows in sand over laterite, or brown clayey sand. Associated species include *E. loxophleba, E. stowardii, E. diminuta* and *E. ebbanoensis, Allocasuarina campestris, Melaleuca megacephala, Gastrolobium spinosum* and *Acacia* species.

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. S of Northampton	N	Nature Reserve, Private	18.6.1996	32	Healthy
2. NW of Northampton	N	Private	4.7.1995	10 clumps	Healthy, some water erosion near the population
3. NE of Geraldton	CV	Private	3.7.1995	2 clumps	Healthy
4. NE of Geraldton	CV	Shire Road Verge, Private	26.9.1995	8 clumps	Healthy, but most associated vegetation cleared
5.* N of Geraldton	CV	Private	22.8.1983	Frequent, 10-20 plants	-
6. NE of Oakajee	CV	Nature Reserve	12.3.1986	1	-
7. NE of Oakajee	CV	Private	17.2.1997	5 clumps	Healthy
8.* W of Morowa	Mo	Private	3.2.1988	-	-

Response to Disturbance

Unknown

Management Requirements

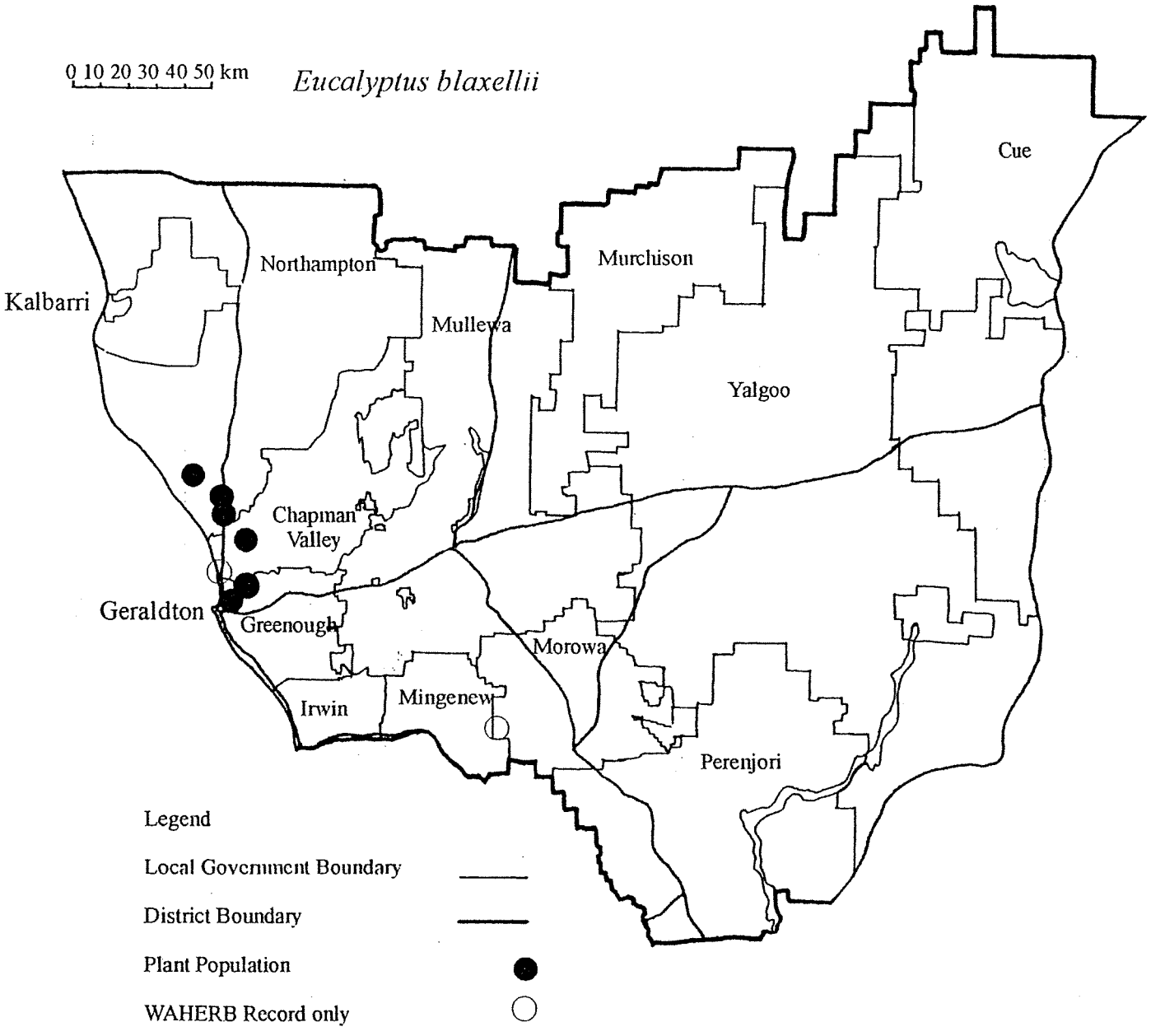
- Monitor populations regularly.
- Maintain liaison with the Shire and private landowners.
- Protect, where possible, from inappropriate fire regime.
- Collect seed for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.

Research Requirements

- Further survey is required to refind and survey the population recorded from west of Morowa, population 8.
- Populations 5 and 6 need to be resurveyed.

References

Hill & Johnson (1992), Brooker & Kleinig (1990), Kelly, Napier & Hopper (1995), Napier, Taylor & Hopper (1988).



Eucalyptus crucis Maiden subsp. *praecipua* Brooker & Hopper MYRTACEAE

Paynes Find Mallee

This subspecies of *Eucalyptus crucis* was described in 1993. The subspecific name is from the Latin, meaning special, alluding to its distinct morphology and isozyme constituents. A study on isozymes by Sampson *et al.* (1988) showed that the maximum genetic difference between subsp. *lanceolata* and subsp. *praecipua*, which are morphologically similar, was much greater than the distance of subsp. *lanceolata* from subsp. *crucis* which is morphologically dissimilar.

A mallee to 10 m tall, the stems with thick, amorphous basal bark, minniritchi above. The leaves are petiolate, up to 15 cm long, 2.5 cm wide, blue-green to light green in colour and lanceolate in shape. The axillary inflorescences have up to 7 buds in each. These are not constricted and the bud cap is obtusely conical, longer than the hypanthium. Each bud is up to 1.5 cm long, 1 cm wide, and glaucous. The fruits are up to 1.3 cm long and 2 cm wide, stalked, hemispherical in shape, with a thick rim and a broad disc which is level to slightly ascending.

E. crucis subsp. *praecipua* differs from subspecies *lanceolata* in its larger adult leaves, buds and fruits.

Flowering Period: December-March

Distribution and Habitat in the Geraldton District

This subspecies is known only from the type locality which is south-west of Paynes Find, where it occurs in five groups which are just under 2 km apart. Four groups occur over less than 1 km apart, the fifth is just over 1 km north of these. It grows in brown sandy loam in gullies on and around granite hills, occurring in open low woodland and open low scrub with *Acacia lasiocalyx, Allocasuarina eriochlamys* and *Calycopleplus ephedroides.*

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SW of Paynes Find	Y	Pastoral Lease	23.11.1993	5 clumps, 30-44 plants estimated	Relatively undisturbed, some grazing

Response to Disturbance

Thought to resprout after fire.

Management Requirements

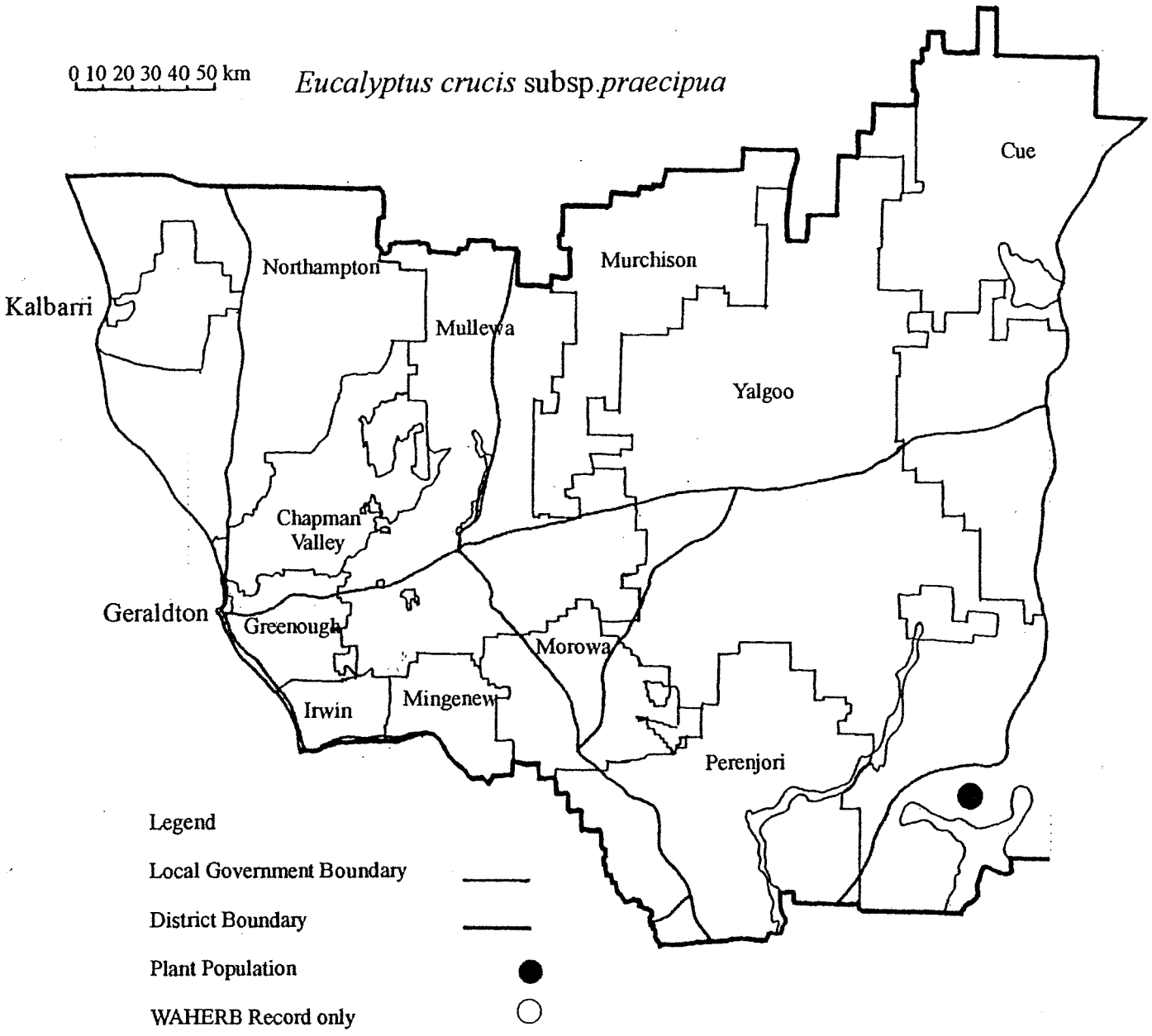
- Monitor the populations regularly, particularly in relation to grazing pressure and seedling recruitment.
- Ensure that the current pastoralist is aware of the populations.
- Maintain liaison with pastoralist.
- Protect, where possible, from inappropriate fire regime.
- Collect seed for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.

Research Requirements

Further survey of granite rocks in the area is required.

References

Brooker & Hopper (1993), Brooker & Kleinig (1990), Kelly, Napier & Hopper (1995), Sampson, Hopper & James (1988).



Eucalyptus cuprea Brooker & Hopper MYRTACEAE

Mallee Box

An erect mallee to 5 m tall, with a stocking of thin, grey bark which is flaky and fibrous. The bark above the stocking is smooth and coppery or grey in colour. The juvenile leaves are light green and ovate in shape. The adult leaves are lanceolate in shape, to 11 cm long and 2.3 cm wide. They are dark green and glossy. The buds are club-shaped, with inflexed stamens, the outer ones without anthers. They are 0.6 x 0.4 cm and are arranged in inflorescences which are apparently terminal. The fruits are stalked and cup-shaped, to 0.5 x 0.4 cm, with the valves below rim level. The seed is grey-brown in colour.

Eucalyptus cuprea is related to *E. absita* from which it differs in its light green ovate juvenile leaves and less prominent disc. It is also related to *E. petraea* which has larger buds and fruits and fruits which split open by a 5-sided disc which often remains attached at the side of the opening.

Flowering Period: October

Distribution and Habitat in the Geraldton District

This species is known from four populations, which occur from north of Galena to south of Northampton over a range of about 80 km. A fifth population of one tree, which occurred formerly within this range, has since been cleared. Two collections, made in 1952 and 1959, indicate that it occurred further west in an area on a clay flat near the Hutt River south-east of Lynton, but it has not been refound there more recently.

Grows on rises in brown sandy loam with sandstone or sometimes with granite, and in red-brown clayey loam with laterite and has been recorded from a clay flat. It grows emergent above low heath with other emergents, including *Nuytsia floribunda*, and heath species, including *Melaleuca megacephala* and *M. scabra,* or in tall shrubland with *Eucalyptus loxophleba, Acacia acuminata, Dodonaea inaequifolia* and *Allocasuarina* sp.

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. N of Murchison River Bridge	N	MRWA Road Verge, Private	21.9.1994	36+	Healthy, some damage by grading.
2. W of Ogilvie	N	Private	13.12.1994	30+	Healthy
3. N of Northampton	N	Private	1991	Population destroyed pre 1991 during land clearance (1 plant)	-
4. W of Nanson	CV	Private	18.6.1996	3 clumps	Healthy, population is fenced
5. W of Ogilvie	N	Private	9.6.1995	12 (1 large clump)	Healthy, but the clump survives in ploughed paddock
6.* Hutt River	N	-	9.1959	-	-

Response to Disturbance

Unknown

Management Requirements

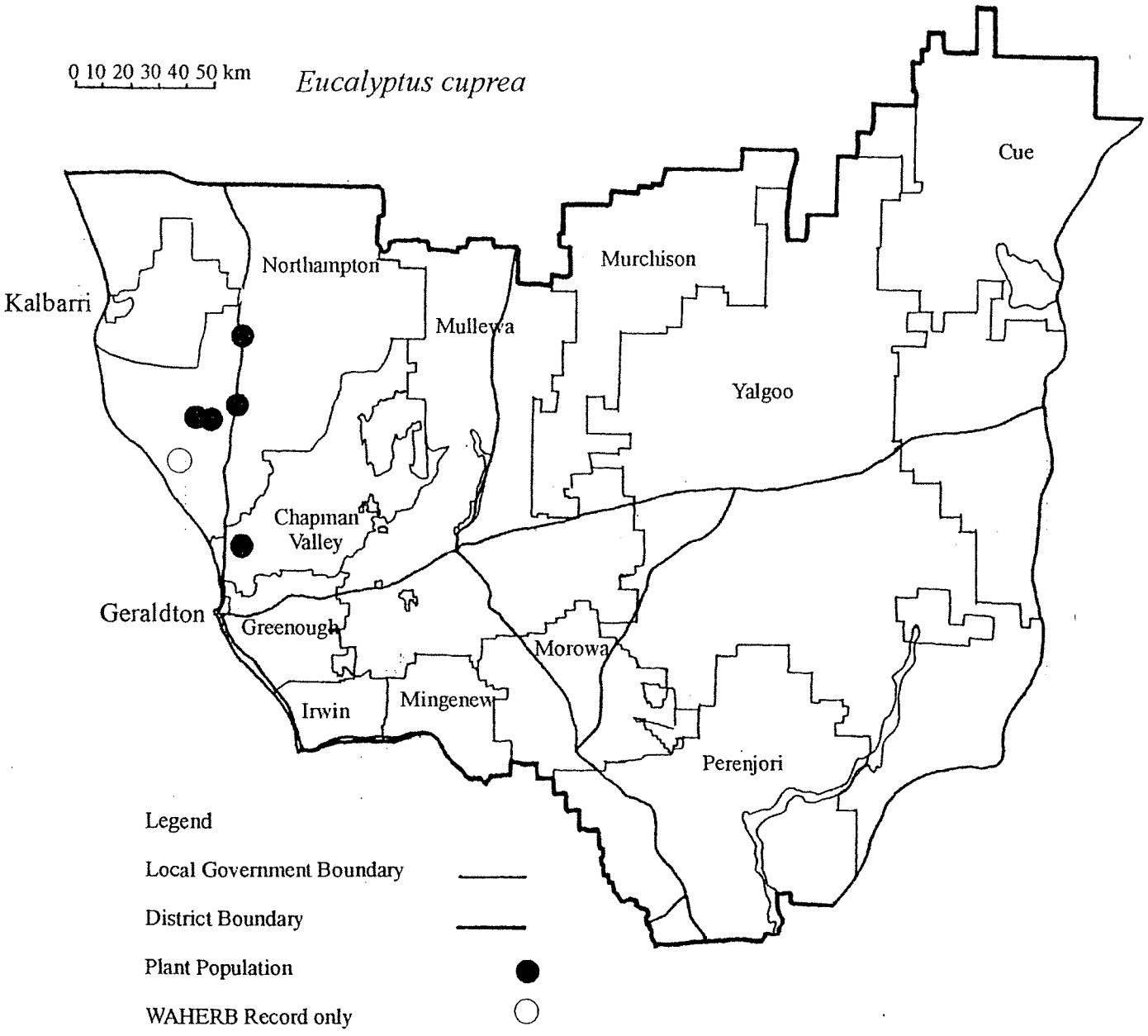
- Populations 2 and 4 require fencing.
- Monitor all populations regularly.
- Maintain liaison with Main Roads W.A. and private landowners.
- Protect, where possible, from inappropriate fire regime.

Research Requirements

- Further survey is required, particularly in the Lynton area.

References

Brooker & Hopper (1993), Brooker & Kleinig (1990), Kelly, Napier & Hopper (1995), Napier, Taylor & Hopper (1988).



Eucalyptus synandra Crisp MYRTACEAE

Jingymia Mallee

A straggly mallee to 5 m tall, with smooth, powdery white bark over pink and brown, shedding in ribbons. The branches are often pendulous and the crown is thin with pendulous leaves, which are dull, grey-green, linear to narrow-lanceolate, to 18 cm long and 15 mm wide. The inflorescences are simple and axillary and seven-flowered. The buds are stalked, with a hemispherical hypanthium and a conical to beaked cap. The stamens have the filaments united in the lower half into a tube. The flowers are creamy in colour, maturing to pink. The fruits are stalked, hemispherical, with a thick rim, a steeply ascending disc and four or five exserted valves. They are 6-9 mm long.

This species is related to *Eucalyptus leptopoda,* which does not have united stamens and which has more upright branches and a more dense canopy. It is also closely related to *E. beardiana,* which has partially joined filaments, but has an elongate, cup-shaped hypanthium and longer fruits to 11 mm long. Another closely related species, which until recently was included under *E. synandra,* now described as *E. rosacea,* has erect, non-glaucous branches and grows on sand, occurring much further east.

Flowering Period: December-March

Distribution and Habitat in the Geraldton District

E. synandra grows in scattered populations throughout the northern wheatbelt from north of Morowa in the Geraldton District to the Koorda area in the Merredin District. Within the Geraldton District, there are nine populations which occur from Morowa northwards and another south of Paynes Find which has not been refound recently.

Grows on laterite or ironstone ridges, or on sand or sandy loam over laterite, on undulating or flat country, occurring as an emergent over heath and scrub. Associated species include *Acacia ramulosa, Allocasuarina campestris, A. acutivalvis, Eucalyptus leptopoda* and *Grevillea* and *Hakea* species.

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Morowa	Mo	Townsite Reserve	26.2.1996	1	-
2. N of Morowa	Mo	Shire Road Reserve, Private	21.6.1996	30	Healthy
3. NE of Morowa	Mo	Shire Road Reserve, Private	21.6.1996	107	Healthy
4. NE of Morowa	Mo	Shire Road Reserve	21.6.1996	68	Healthy
5. NE of Morowa	Mo	Shire Road Reserve	21.6.1996	13	Healthy
6. NE of Morowa	Mo	Shire Road Reserve, Private	21.6.1996	c. 55	Healthy
7. NE of Morowa	Mo	Shire Road Reserve, Private	21.6.1996	5	Moderate
8. NNE of Morowa	Mo	Shire Road Verge, Private	21.6.1996	2	Moderate
9. NE of Gutha	Mo	Water Reserve, Shire Road Verges	15.2.1995	100+	Healthy, some weeds and rubbish
10.*SW of Paynes Find	Y	Pastoral Lease (Mining Lease)	28.11.1988	10-12	-

Response to Disturbance

It has been reported that this species may be killed by fire or may resprout.

Management Requirements

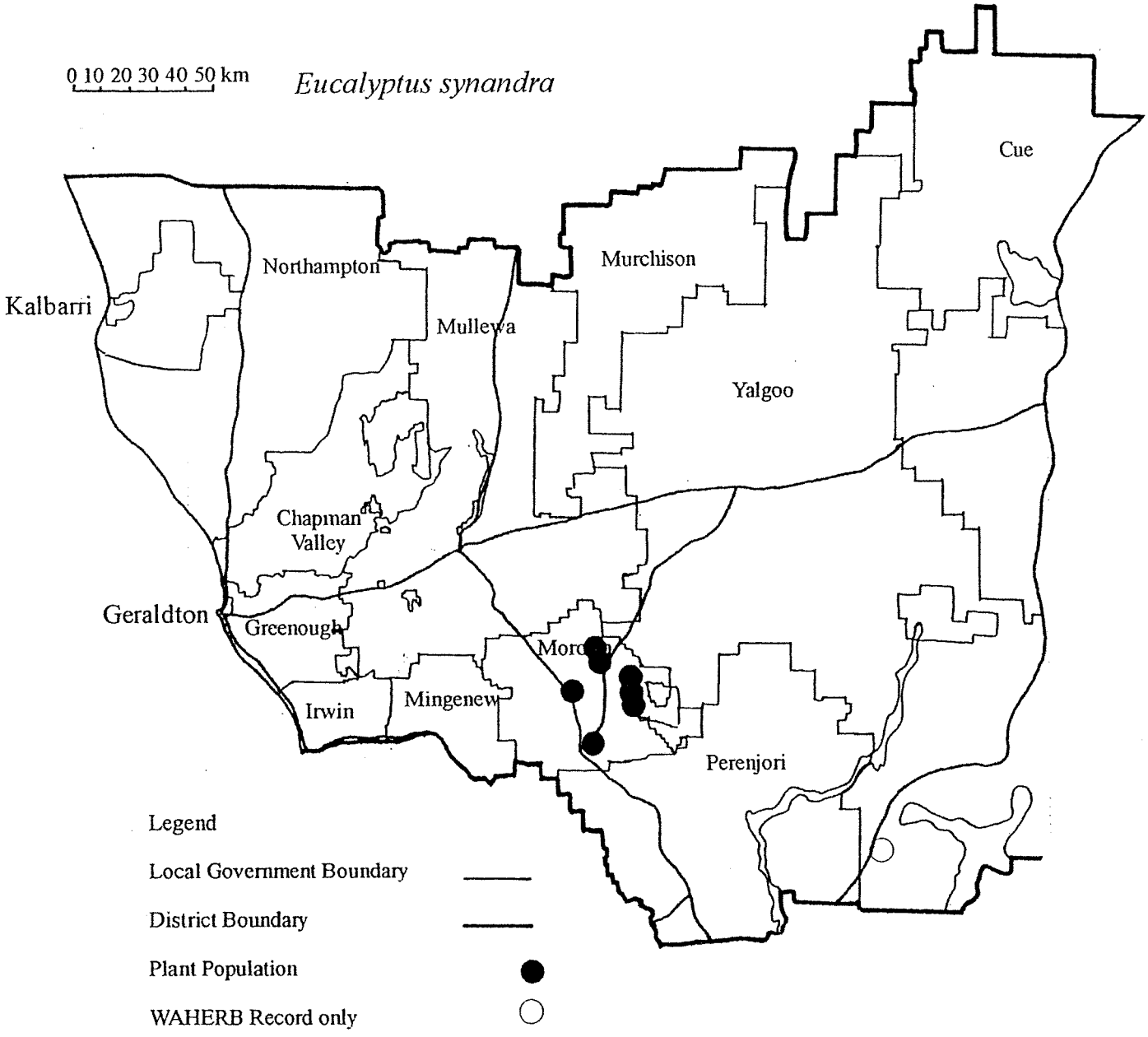
- Monitor populations regularly.
- Part of population 9 requires fencing.
- Ensure that all road verge populations are marked.
- Maintain liaison with the Shire, private landowners, pastoralist and mining operators.
- Protect, where possible, from inappropriate fire regime.

Research Requirements

- Further survey is required, particularly to refind and survey population 10.

References

Brooker & Kleinig (1990), Crisp (1982), Hill & Johnson (1992), Kelly, Napier & Hopper (1995).



Glyceria drummondii (Steud.) C.E.Hubb. POACEAE

Nangetty Grass

This species was first collected by James Drummond before 1854 and one further collection was made before 1934 when the species was published. It was presumed extinct until its rediscovery by A. Mitchell in 1995 from north of Mingenew.

An erect, hairless grass, possibly an annual, with creeping stems which root at the nodes. The leaves are flat, rough on the upper surface with an oblong ligule. The flowers are in a narrow, loose panicle, with stiff branches, each bearing 1-4 spikelets. The internodes between the flowering glumes are up to 4 mm long. The lower glume is 0.5-1 mm long, the upper glume is 1.5-2.5 mm long. The lemmas taper upwards and the paleas have scabrous keels and are 8-9 mm long, conspicuously longer than the lemmas.

This species is similar to *Glyceria fluitans* and Bentham included it as *Porroteranthe drummondii* as a variety or small leafy state of *G. fluitans.* It differs from *G. fluitans* in the longer internodes between the spikelets and in its smaller glumes, tapering lemmas and scabrous paleas which are longer than the lemmas.

Flowering Period: September-October

Distribution and Habitat in the Geraldton District

This species is known only from an area north of Mingenew, where it grows in seasonally flooded, localised hollows of clay pans on clay plains. It grows on brown clay in maireana shrubland, with *Maireana pyramidata, Atriplex bunburyana* and *Marsilea* sp.

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. N of Mingenew	Mi	Private	4.10.1995	Several hundred	Healthy, no grazing evident on plants

Response to Disturbance

Although the population was found in a paddock with livestock, the plants had not been grazed.

Management Requirements

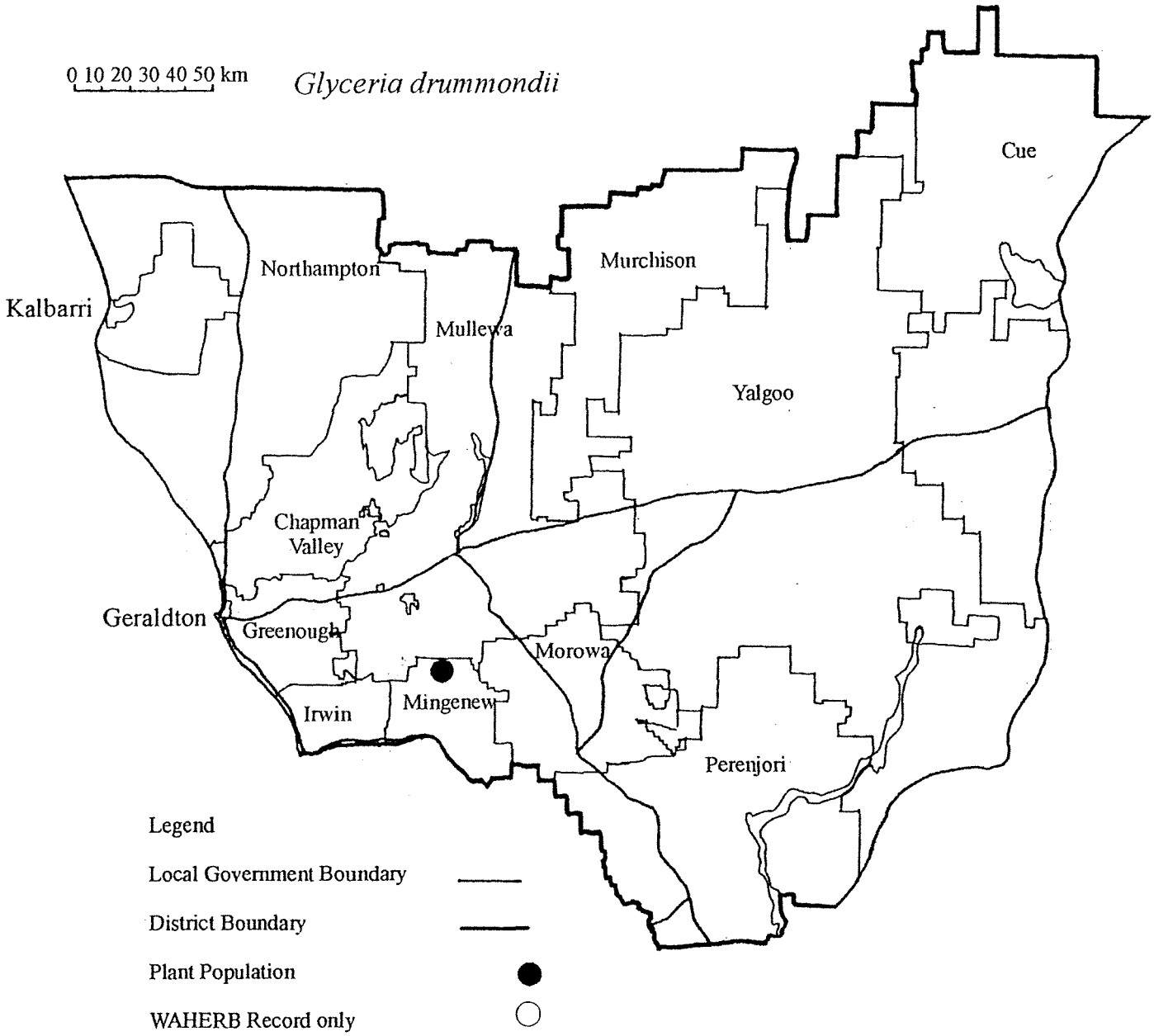
- Collect seed for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.
- Monitor the population regularly.
- Investigate necessity for fencing the population.
- Maintain liaison with the private landowner.
- Protect, where possible, from inappropriate fire regime.

Research Requirements

- Further survey is required.

References

Bentham (1854), Gardner (1952), Hopper *et al.* (1990), Hubbard (1934).


0 10 20 30 40 50 km
Glyceria drummondii
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Mingenew
Irwin
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Grevillea christineae McGill. PROTEACEAE

Christine's Grevillea

A rounded shrub to 1 m tall, with flexuose, wiry branches, and narrow-obovate to linear leaves which are up to 6 cm x 0.6 cm, with margins loosely rolled back and with a pointed tip. The flowers are in short clusters, either terminal or in the axils of the leaves and c. 1.5 cm long. The flowers are creamy-white in colour, the perianth hairy on the outside, c. 3 mm long. The style is reddish, c. 0.7 cm long, hairless except for the apex where it is strongly curved. The ovary is hairless. The fruit is oblong, c. 1.5 cm long, with faint longitudinal ribs.

This species is similar to *Grevillea costata*, which has strongly ribbed fruit, leaves hairy on the lower surface and larger white flowers. Research on the population biology of this species is being undertaken as part of the work for a Ph.D. thesis.

Flowering Period: July-early September

Distribution and Habitat in the Geraldton District

This species has been found recently in the Geraldton District where it is known from one population east of Northampton. It is also known from six populations c. 250 km south in the Moora District in the Watheroo area over a range of c. 12 km. The species also occurs in the Merredin District where it is known from one population (population 1) c. 140 km further to the south-west, near Goomalling. It grows in open low woodland of *Eucalyptus loxophleba* and *E. wandoo* over open tall shrubs, including *Allocasuarina campestris, Melaleuca radula* and *Acacia acuminata*, and with species of *Drosera* and *Tribonanthes* in grey or red-brown sandy clay loams with granite or laterite, usually in moist areas, near drainage lines or outcropping granite.

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
2. NE of Northampton	N	Shire Road Verge, Private	25.9.1997	120+	Healthy

Response to Disturbance

Plants at some populations in the Moora District have survived on narrow, weed infested road verges and are almost the only surviving representatives of natural vegetation.

Management Requirements

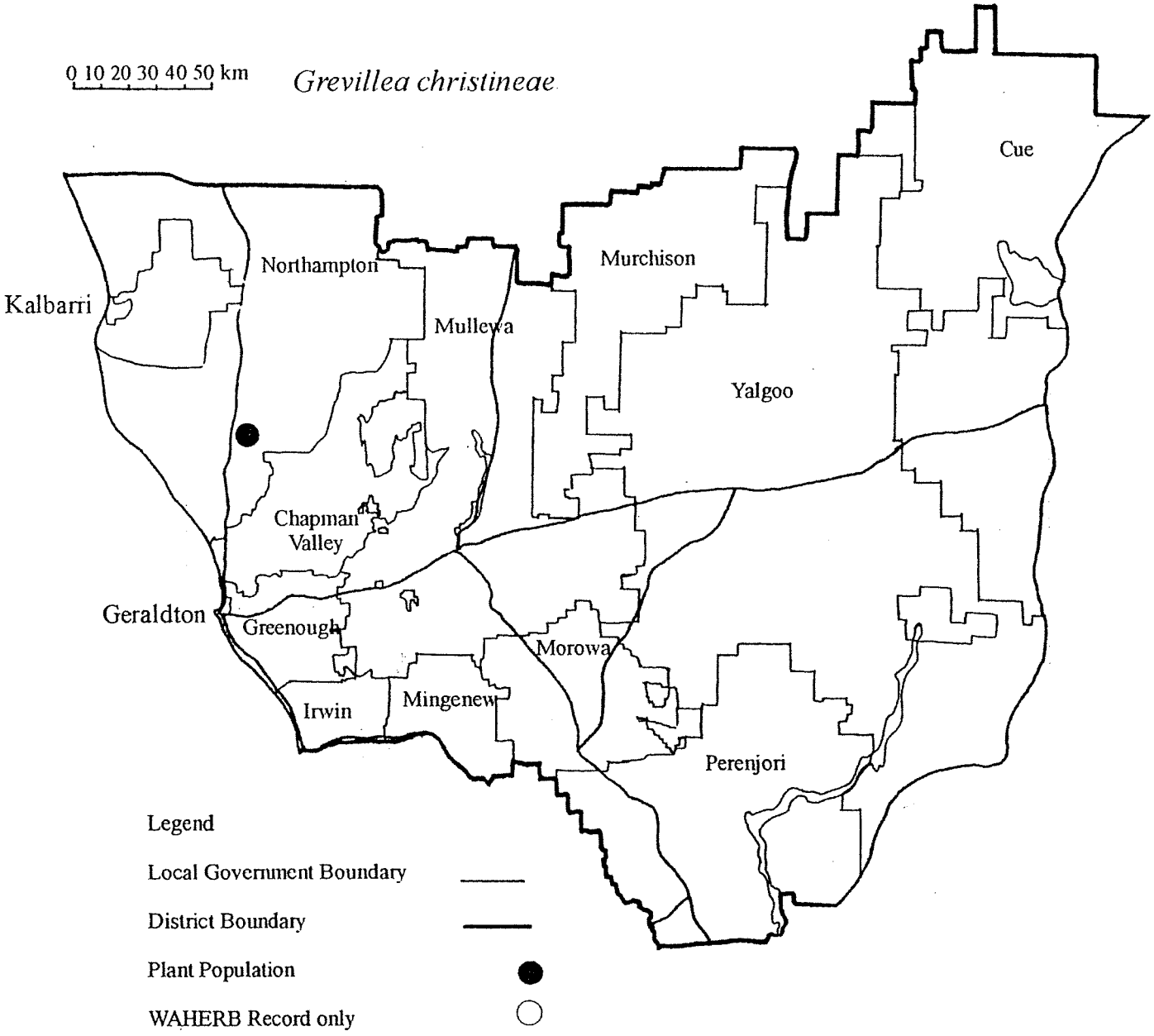
- Monitor populations regularly, particularly those on road verges.
- Maintain liaison with landowners and managers.
- Protect from frequent fire, where possible, until fire response has been investigated.
- Collect seed for storage according to the protocols of the Threatened Fora Seed Centre at the Western Australian Herbarium.

Research Requirements

- Further survey is required, particularly on reserves with suitable habitat throughout the known range of the species, and in remnant vegetation in the northern part of the range.
- Investigate the fire response of the species.

References

McGillivray & Makinson (1993), Olde & Marriott (1994-5).



Grevillea inconspicua Diels

PROTEACEAE

Cue Grevillea

This species was described and named by Diels in 1904 from specimens collected near Cue and was also described as *Grevillea brachyclada* by W.V. Fitzgerald in 1905 from material from the Greenough River.

G. inconspicua is a much-branched, fairly open and rounded shrub to 2 m tall and up to 2 m across, with wiry branches. The leaves hang downwards from the stems and are grey-green in colour, linear in shape and up to 4 cm long, with a twisted base. The midvein is sometimes evident on the upper surface. The flowers are small, grouped in small clusters of 6-8 flowers in the axils of the leaves. They are whitish in colour with a pale pink style. Each flower is about 1 cm long. The fruits are beaked, faintly ribbed and up to 1 cm long.

This species is similar to *G. costata*, which differs in its conspicuously ribbed fruits and in its leaves which do not have the midrib evident and which are held upwards on the plant, not drooping.

Flowering Period: July

Distribution and Habitat in the Geraldton District

Occurs around Mt Magnet, Cue, Sandstone and the Weld Range in the Geraldton District, further north in the Meekatharra area in the Gascoyne District and further east in the Goldfields Region near Leinster and Yakabindie.

Grows on gravelly clay loam soils derived from basic rocks such as basalts (greenstone formations), and on drainage lines and slopes below outcropping rocks. It is found in open *Acacia* woodland and low shrubland. Associated species include *A. aneura, A. linophylla, Ptilotus obovatus, Solanum lasiophyllum* and *Eremophila fraseri.*

Conservation Status

Current: Declared Rare Flora[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Cue	C	Shire Reserve	20.7.1994	c. 100	Moderate, some plants drought stressed
2. NE of Sandstone	S	Pastoral Lease	16.12.1990	75	Disturbed, moderate to heavy grazing
3. ENE of Sandstone	S	Pastoral Lease	30.10.1994	5	Moderate, recovering from grazing
4. SSE of Booylgoo Homestead	S	Pastoral Lease	16.12.1990	2	Healthy, slight grazing
5. NNE of Sandstone	S	Pastoral Lease	23.6.1995	145	Part of population fenced 6.12.92. Healthy, with new growth
6. N of Sandstone	S	Pastoral Lease	29.10.1994	200+	Healthy

[#] now Priority 4 (updated at December 1999)

Populations Known in the Geraldton District (Cont'd)

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
7. NW of Cue	C	Pastoral Lease	3.8.1995	40	Healthy
8. SW of Cue	C	Shire Reserve	23.12.1990	500	Disturbed, with rubbish dumping and offroad vehicle use
9. NNE of Sandstone	S	Pastoral Lease (Mining Lease)	29.10.1994	100+	Some plants with drought stress
10. ESE of Mt Magnet	S	Pastoral Lease	9.1.1992	100+	Disturbed, grazing
11. NNE of Sandstone	S	Pastoral Lease (Mining Lease)	29.10.1994	20+	Plants showing drought stress
12. NNE of Sandstone	S	Pastoral Lease (Mining Lease)	29.10.1994	44+	Plants showing drought stress
13. Mt Magnet	MM	-	0.10.1994	57	Severely grazed

Response to Disturbance

Even when heavily grazed by sheep, the plant is able to produce some flowers within the shelter of the intricate outer branches.

Management Requirements

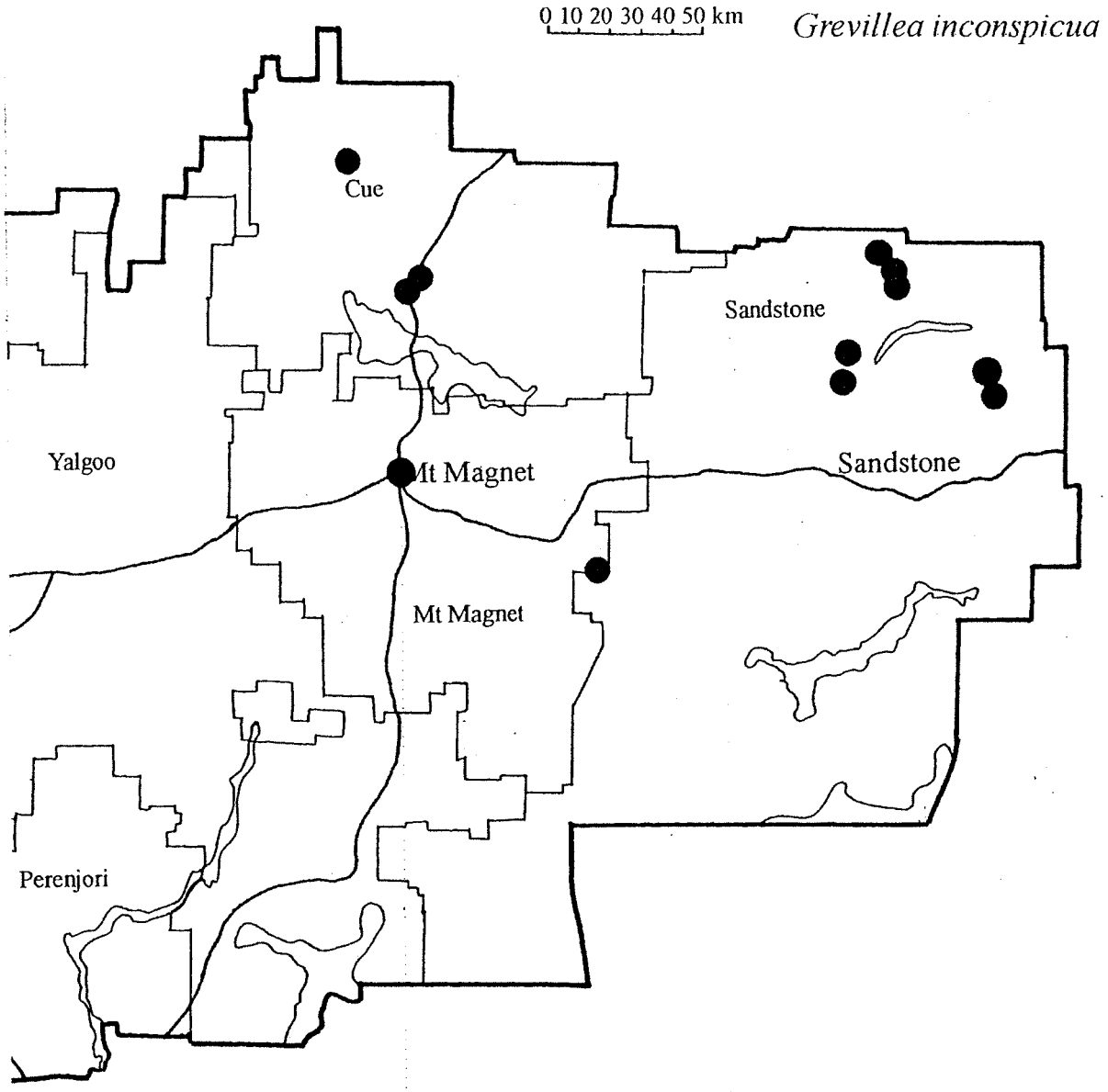
- Collect seed for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.
- Monitor the populations regularly.
- Establish land status for population 13.
- Maintain liaison with land managers.

Research Requirements

- Further survey is required to refind the population from the Greenough River, described by Fitzgerald as *G. brachyclada.* The headwaters of the Greenough River arise in an area north of Yalgoo where there are some areas of basaltic rocks which this species favours.
- Further survey is required to resurvey populations 2, 4, 8 and 10 and to collect flowering voucher specimens for these populations.
- Further survey is required to survey fully population 13 which represents a south-westerly range extension.

References

Diels & Pritzel (1904-5), McGillivray & Makinson (1993), Mitchell & Wilcox (1994), Olde & Marriott (1994-5), Rye & Hopper (1981).



Legend

Local Government Boundary

District Boundary

Plant Population

WAHERB Record only

Halosarcia bulbosa Paul G.Wilson CHENOPODIACEAE

Large-articled Samphire

A low, sprawling shrub to 1 m tall and 2-3 m in diameter, with spreading branches. The vegetative articles are barrel-shaped, c. 15 mm long and 12 mm wide, glaucous to pale blue or pink in colour. The margins of the articles and bracts are entire. The flowering spikes are sessile and lateral, 15-20 mm long, with opposite bracts which are united and undulate and shrivelled at the fruiting stage The flowers are in groups of three and are hermaphrodite. The perianth is united and has succulent side walls but is otherwise thin, hard and brittle. It is dorsiventrally flattened at the apex and divided into two lateral lobes. The solitary anther is c. 1.7 mm long. The fruiting spike is persistent and dark brown, with cup-shaped leathery bracts enclosing the fruitlets, which have areas of spines on the outside and eventually become free from one another and from the bracts. The seeds are smooth and pale brown and are released only after the decay of the bracts and perianth.

This species is most closely related to *Halosarcia pruinosa* and *H. undulata,* which have similar fruits, but it is easily recognised by the large pruinose articles. It has been suggested that these may be a response to the particular soil type at the known location, as the species developed narrower articles when transplanted to non-saline sandy loam. However, the other species of *Halosarcia* growing there were of normal size.

Flowering Period: April

Distribution and Habitat in the Geraldton District

Known from only one population which occurs to the east of Morowa.

Grows on the saline flats of a drainage line on yellow-brown sandy clay in low open heath with very open *Acacia* and *Melaleuca* scrub. Grows with *H. halocnemoides* subsp. *halocnemoides*, *H. pergranulata* subsp. *pergranulata, H. pruinosa* and *Atriplex* species.

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. E of Morowa	Mo	Shire Road Reserve, Private	20.6.1995	1 000+	Healthy, but private land grazed by sheep

Response to Disturbance

Unknown

Management Requirements

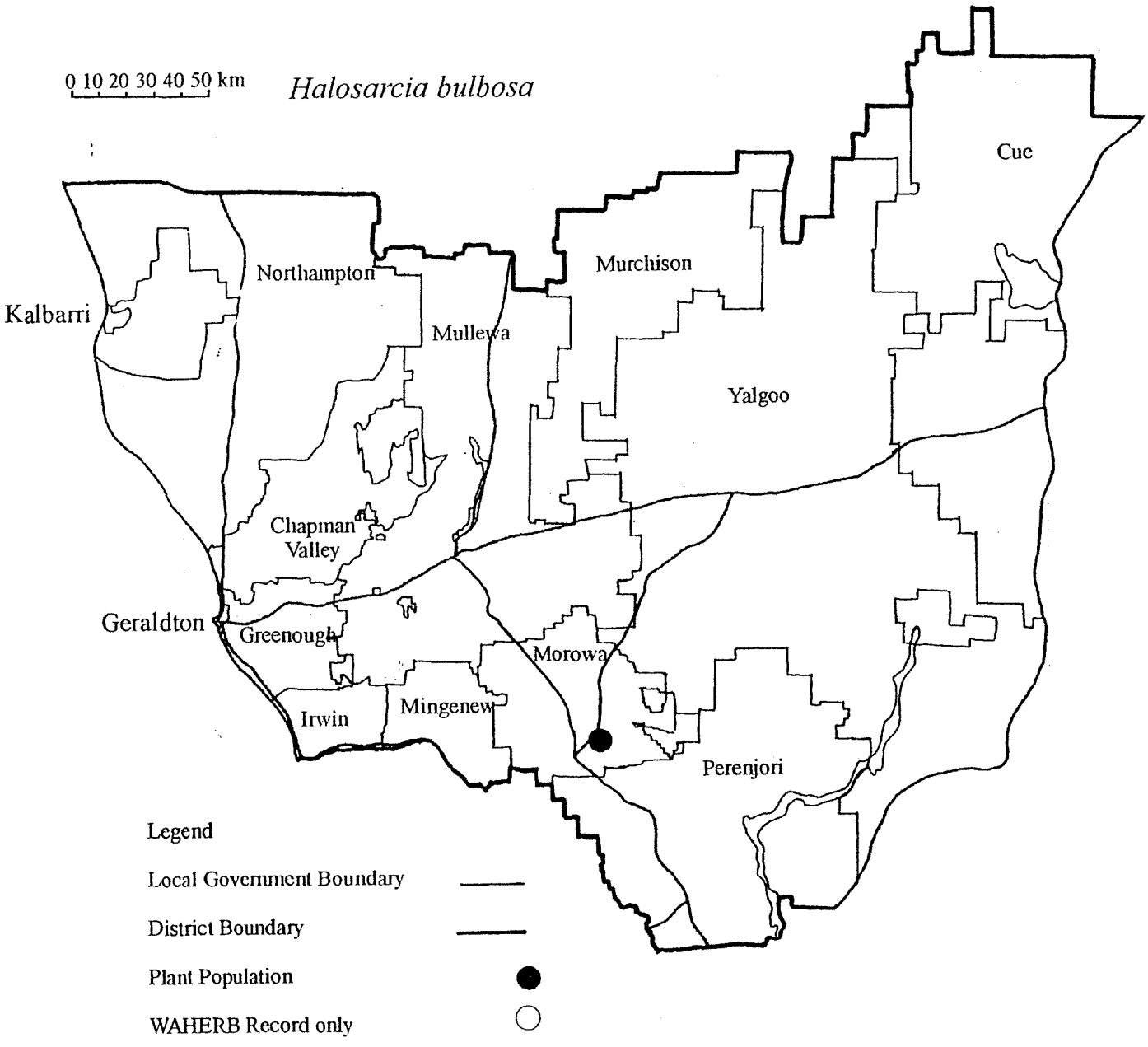
- The population requires fencing to eliminate grazing by sheep.
- Ensure that Rare Flora markers are in place to indicate the extent of the population along the road verges.
- Collect seed for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.
- Monitor the population regularly.
- Maintain liaison with private landowner and the Shire.

Research Requirements

– Further survey is required in suitable habitat in the area.

References

Patrick & Hopper (1982), Wilson (1980, 1984).



Hypocalymma longifolium F.Muell. MYRTACEAE

Hypocalymma longifolium was described by Ferdinand von Mueller in 1860 from a collection made by Oldfield from the Murchison River.

A low, glabrous shrub to 20 cm tall, with rigid, erect branches, it has opposite leaves which are between 4 cm and 6 cm long, linear and triangular in cross-section, tapering to a slightly recurved point. The flowers are in pairs, sessile on a short thick peduncle. There are five petals, which are white in colour. The ovary is two-celled with ovules in each cell. The capsule is very convex, the style continuous with the prominent ridges.

This species is related to *H. angustifolium.* A pink-flowered long-leaved *Hypocalymma* which has been cultivated for many years as *H. longifolium*, has been found to be related to H. *strictum,* which has terete or grooved leaves less than 2 cm long.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

Near the Murchison River, it occurs in open low scrub, on white sand with sandstone on damp areas of west-facing slopes of breakaways, with *Melaleuca uncinata, M. filifolia, Lechenaultia chlorantha* and *Acacia* species. Further south, the species occurs in a permanently damp spring area and surrounding swamp, with low heath and sedges.

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. N of Kalbarri	N	Pastoral Lease	27.9.1993	60+	Healthy
2. NE of Port Gregory	N	Private, Shire Road Reserve	16.2.1995	10 000+	Healthy

Response to Disturbance

Population 2 had been burnt less than five years previously. Population 1 had been burnt in summer 1987.

Management Requirements

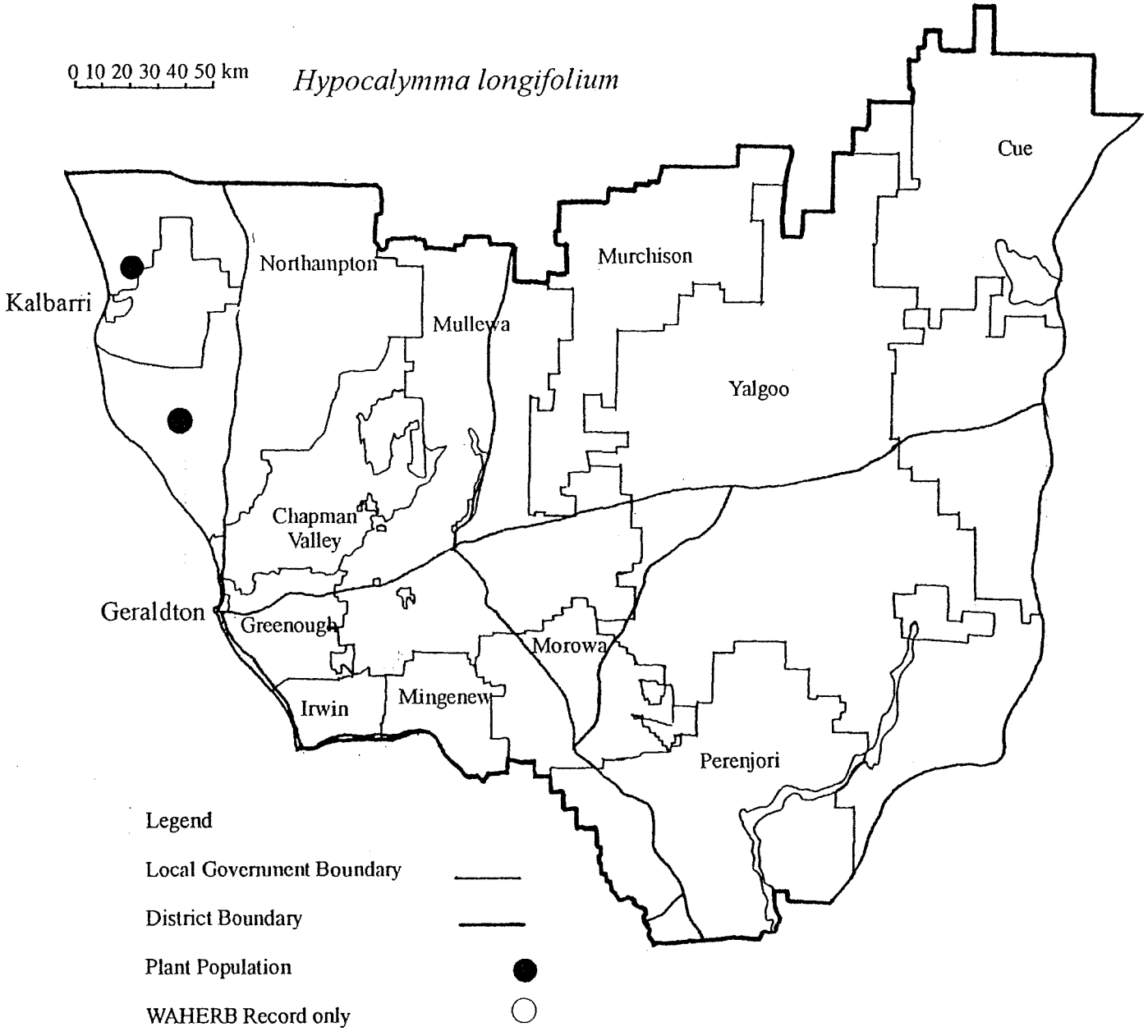
- Collect seed for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.
- Monitor the populations regularly.
- Maintain liaison with private landowner, the pastoralist and Shire.
- Protect from frequent fire.

Research Requirements

- Further survey is required, particularly in the Murchison River area.

References

Bentham (1866), Blackall & Grieve (1980), Mueller (1860).


0 10 20 30 40 50 km
Hypocalymma longifolium
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Lechenaultia chlorantha F.Muell. GOODENIACEAE

Kalbarri Leschenaultia

This species was described from a collection thought to have been collected by Oldfield, from "rocky gully, Murchison River".

A low, much-branched, diffuse shrub to 30 cm tall, sometimes suckering. The stems have rough bark, except on the new growth. The leaves are soft, fleshy and fine, crowded on the stems, 6.5-13.5 mm long. The flowers are solitary and terminal, the sepals 7.5-9 mm long. The corolla is 21-25 mm long, pale bluish-green in colour, the tube hairy on the inside and the five winged lobes are almost equal, the two upper converging lobes enclose the indusium and are more or less recurved. The wings on the joining margins are absent. The other lobes are spreading and reflexed.

Closely related to *Lechenaultia formosa* and *L. linarioides,* from which it is distinguished by the green corolla. Bentham was unsure about the taxonomic status of this species and it was later reduced by Krause to a variety of *L. formosa,* which is a variable species. However, it differs in a number of ways apart from the flower colour. The leaves are longer and thinner, with a more wrinkled surface. The bracts and bracteoles are also longer and thinner and the flowers are usually larger. The style appears to be glabrous and the stamen filaments are thinner and longer.

Flowering Period: July-September

Distribution and Habitat in the Geraldton District

A restricted species occurring in a few populations near Kalbarri.

Occurs in rocky gullies, ridges, breakaways and ledges of red sandstone. Grows in pockets of shallow yellow-brown sand either in rock crevices or amongst open low scrub. Grows with *Melaleuca cardiophylla, M. radula, M. megacephala, Conostylis prolifera, Grevillea dielsiana* and *Darwinia oldfieldii.*

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. S of Kalbarri	N	National Park	20.8.1985	17	Undisturbed
			3.7.1992	8	
2. E of Kalbarri	N	National Park	16.7.1988	100+	Undisturbed
3. NE of Kalbarri	N	Pastoral Lease	27.9.1993	80+	Healthy
4. ENE of Kalbarri	N	National Park	9.8.1994	20+	Undisturbed
5. SSW of Kalbarri	N	Private	?1987	1	Not refound more recently

Response to Disturbance

Population 3 had been burnt several years before its discovery in 1992. The species often grows in rock crevices on open areas and is therefore little affected by fire. The species has a woody rootstock which is thought to sucker.

Management Requirements

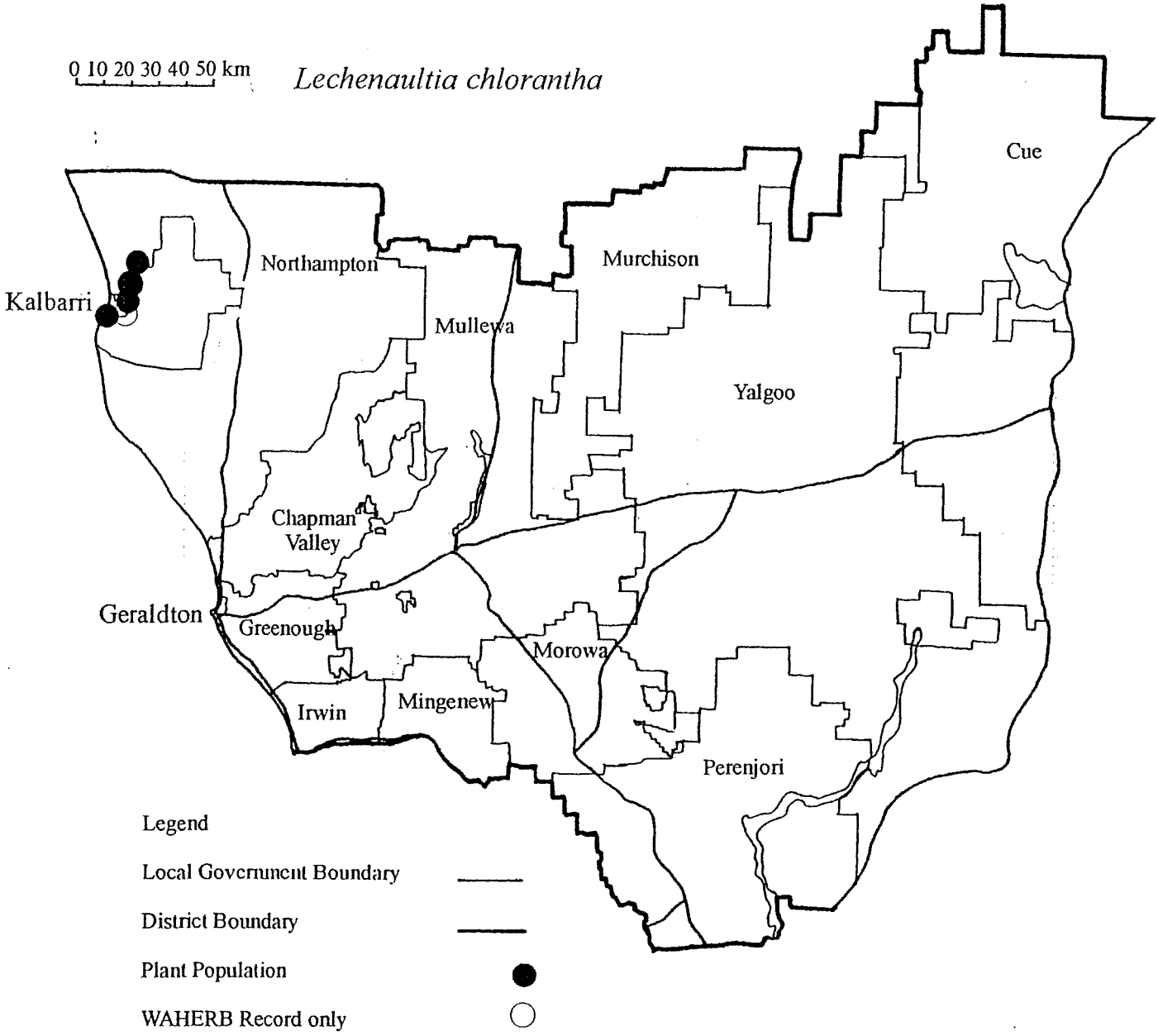
- Monitor the populations regularly.
- Collect seed for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.

Research Requirements

- Further survey is required on red sandstone outcrops throughout the area of occurrence.

References

Bentham (1868), Morrison (1987, 1992), Mueller (1860).



Leucopogon marginatus W.Fitzg. EPACRIDACEAE

Leucopogon marginatus was originally collected from sandplains at Arrino in the Moora District in September 1903 by W.V. Fitzgerald. It is an erect shrub, 45-60 cm tall, with alternate leaves which are erect, the margins often curled round the stem, ovate to ovate-lanceolate in shape, with crisped membranous margins and with a pungent point. The leaves are concave and striate in the lower half, 4-6 mm long and almost sessile, with a very short stalk. The flowers are in groups of one to three in the axils of the upper leaves. Each flower has bracteoles at the base as third as long as the sepals, rounded with membranous margins. The five sepals are broadly lanceolate. The flower is white, joined at the base to form a tube just longer than the calyx. The five free lobes are bearded on the inside, but with acute, hairless tips. The anthers are oblong, attached near the top of the tube, and are without sterile tips. The style is barely longer than the petal tube.

Allied to *L. obtectus* and *L. crassiflorus*, differing from the former in the foliage, which does not have a mucronate tip, and from the latter in the inflorescence, in which the peduncles are 1-2 flowered. It is also similar to *L. amplectans,* which has sterile tips to the anthers.

Flowering Period: July-September

Distribution and Habitat in the Geraldton District

This species has been collected twice recently from the Geraldton District, in an area east of Geraldton c. 90 km north-west of the type locality at Arrino, where it has not been collected since it was found there in 1903. The species has not been found elsewhere in the Moora District and searches east of Geraldton in September 1997 failed to refind those populations. Specimens called *L. marginatus* from the Merredin District have more recently been recognised as a related but undescribed species.

It was recorded growing on sandplain at Arrino. There are no details of habitat for the specimens collected east of Geraldton but they are recorded from areas of sandplain with heath.

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* Burma Road	G	-	29.7.1985	-	-
2.* Sandsprings Road	G	-	12.8.1986	-	-

Response to Disturbance

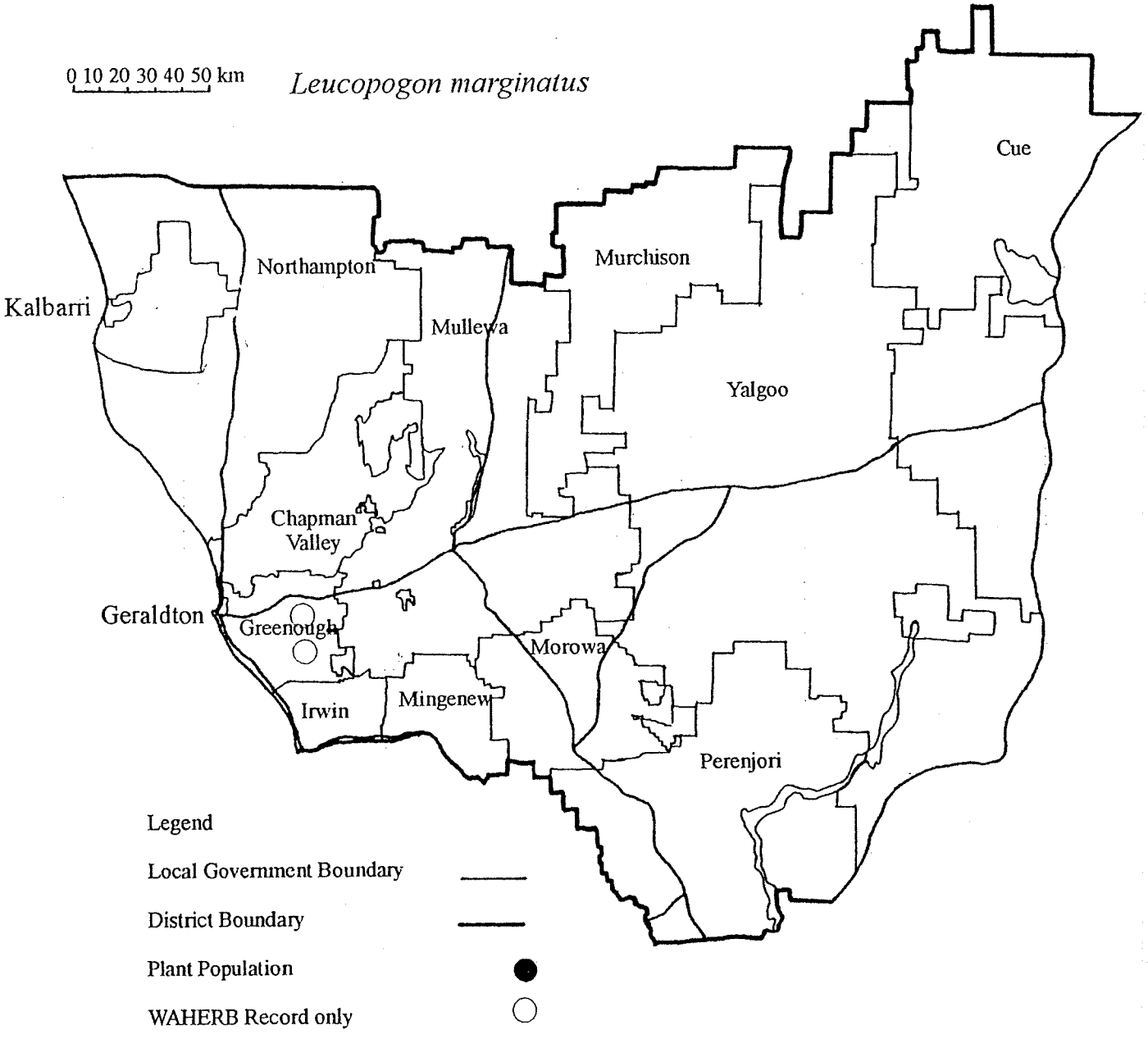
Unknown

Research Requirements

- Further survey is required.

References

Blackall & Grieve (1981), Fitzgerald (1904), Mollemans *et al.* (1993).


0 10 20 30 40 50 km
Leucopogon marginatus
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Menkea draboides (Hook.f.) Hook.f. ex Benth. BRASSICAEAE

This species was collected by James Drummond in 1843 and was then collected only three times and was presumed extinct until 1995 when six more recent collections came to light at the Western Australian Herbarium. It was originally described and illustrated by Hooker as *Stenopetalum draboides*.

Menkea draboides is a prostrate, spreading, herbaceous annual plant, with hairless stems to 60 cm long. The basal leaves are bright green, obovate, entire or with a few lobes or teeth. They are c. 3 cm long and c. 10 mm wide, the blade narrowing to a slender stalk almost as long as the blade. The stem leaves become smaller, higher up the stems. The flowers are white, borne in dense few-flowered inflorescences. There are four sepals and petals. The latter are c. 3 mm long, with a broad blade narrowing to a linear claw, white to cream in colour. There are six stamens, a papillose ovary and short style. The seed pod is flattened and dry, splitting down two sides, leaving a central partition. It is often twisted and the valves are papillose. The seeds are dark red-brown in colour.

Differs from other species of *Menkea* in the twisted papillose seed pod.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

This species has been collected from the Geraldton District twice in 1980 from two localities 3 km apart, north of Paynes Find. The collections are two of six which were brought to light during recent taxonomic study on the genus. Other collections have been made from north of Meekatharra in 1986, and in 1980 from Woodline and north-east of Norseman. It has also been collected twice in the Moora District, from the Watheroo area in 1905 and was also found in 1889 at Yilgarn near Southern Cross in the Merredin District. The collection made by Drummond is without location information.

It grows in clay or red loam over granite or in granitic loamy sand, in wet places including drainage lines and at Woodline, with samphire on the margin of a salt lake.

Conservation Status

Current: Declared Rare Flora[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* N of Paynes Find	Y	-	28.8.1980	-	-
2.* N of Paynes Find	Y	-	10.9.1980	-	-

Response to Disturbance

Unknown

Management Requirements

- Collect seed for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.

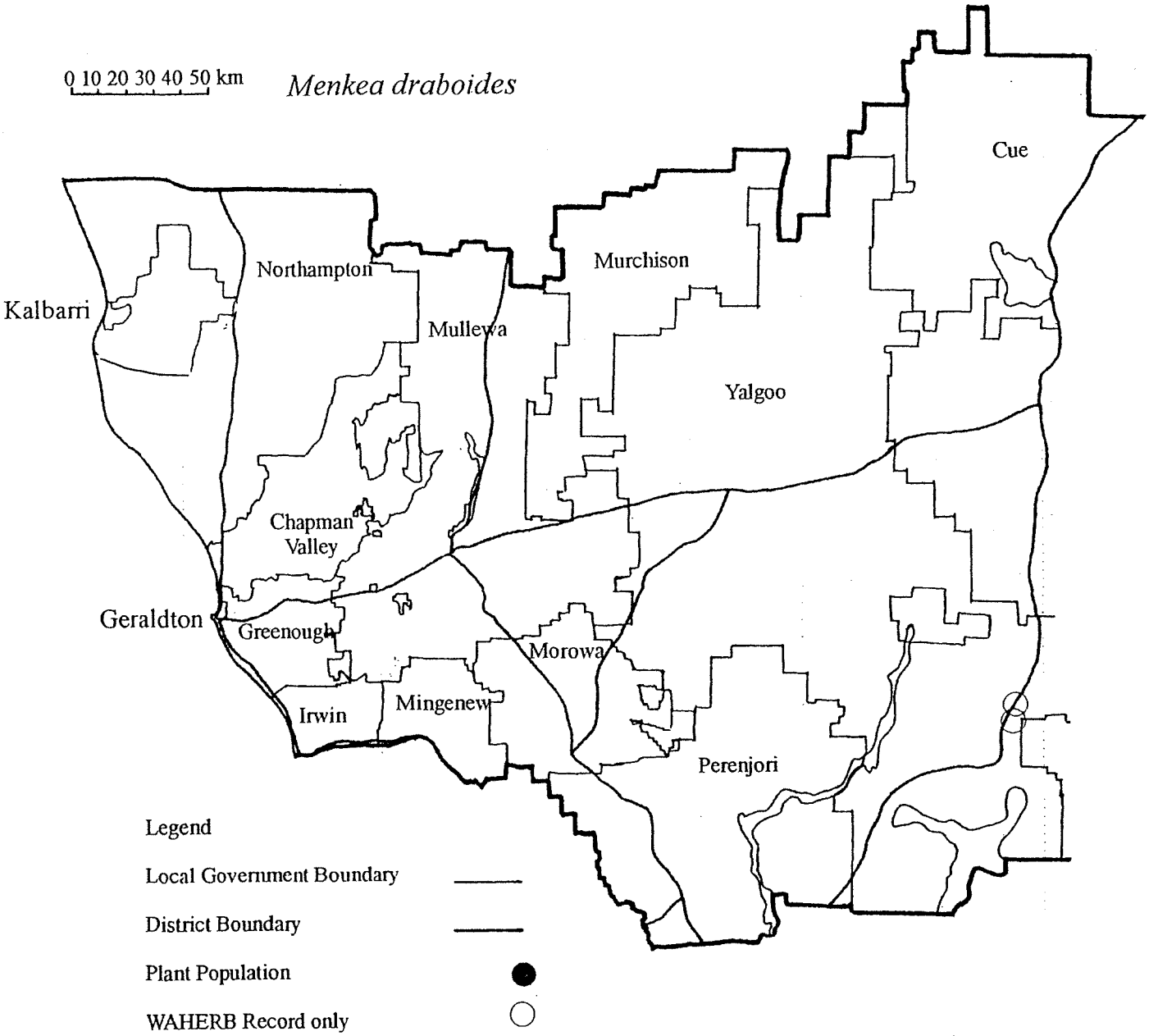
[#] now Priority 3 (updated at December 1999)

Research Requirements

- Further survey for the species is required, particularly to refind and survey areas where recent collections have been made.

References

Bentham (1863), Hewson (1982b), Hooker (1844), Leigh *et al.* (1984), Mueller (1861), Shaw (1970).



Phlegmatospermum drummondii (Benth.) O.E.Schulz BRASSICACEAE

Drummond's Phlegmatospermum

An annual, erect or creeping, rosetted herb to 30 cm tall with stalked hairs, which are divided into up to four ascending (not appressed) branches. The basal leaves are up to 3.5 cm long, pinnately divided or with a deeply wavy margin. The flowers are cream or yellow in colour and are borne in a raceme. Each flower has four spreading sepals and there are four clawed petals 2-3 mm long. There are six stamens and a short style. The fruit is a silicula (length less than three times the width), obovate in shape, 6.5-8 mm long, slightly winged at the apex and with 3-6 ovules per locule.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

In the Geraldton District, it has been collected from north-east of Eurardy where it was growing in red loamy sand over limestone in an interdunal depression in open shrubland with *Melaleuca cardiophylla, Hakea stenophylla, Acacia rostellifera, Grevillea brachystachya, Stylobasium spathulatum* and *Rhagodia preissii.* It is also known in the District from north-west of Paynes Find where it was growing on red sand on a sand dune in open low mallee woodland with *Callitris glaucophylla*, and open shrubland with *Acacia ramulosa* and *A. ligulata* over spinifex. This locality is close to the headwaters of Lake Monger where it was collected c. 1904, recorded from "forests", presumably eucalypt woodland. It has also been recorded from the Wongan Hills in the Merredin District where it grows in red clay soil under *Acacia acuminata* and with *Eucalyptus longicornis, E. gracilis* and *Melaleuca* sp. There is an earlier record from the Cowcowing area made in 1904 and there are also early records from Southern Cross and the Parker Range, all in the Merredin District.

Conservation Status

Current: Declared Rare Flora[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. NE of Eurardy	N	Pastoral Lease	17.8.1995	"common"	-
2. NW of Paynes Find	Y	Pastoral Lease CALM	18.10.1998	500+	Healthy
3.* Lake Monger	Y	-	c. 1904	-	-

Response to Disturbance

Thought to be reasonably resilient to grazing unless pressure extreme.

Management Requirements

- Collect seed for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.
- Monitor the population regularly.
- Maintain liaison with pastoralists.

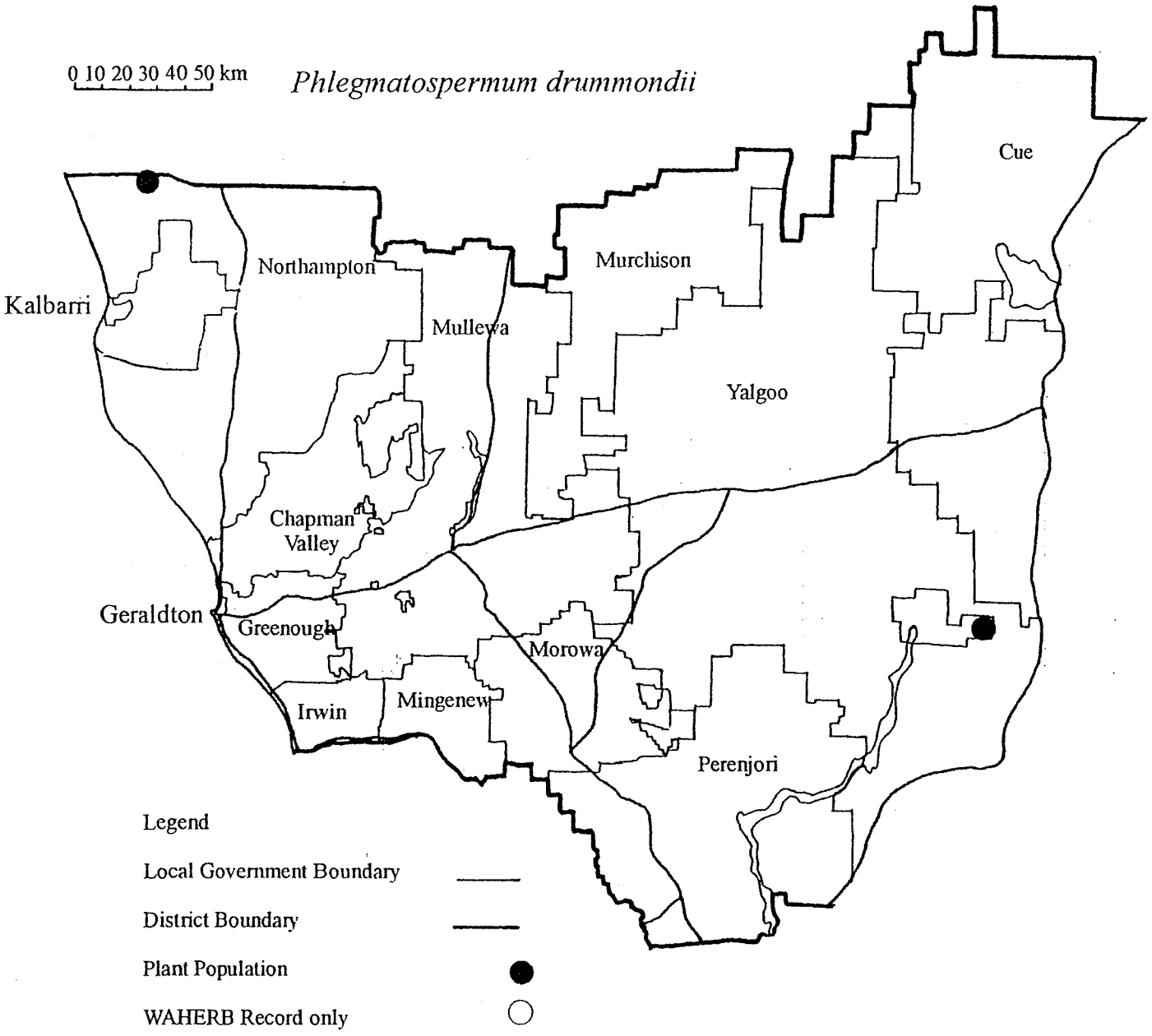
[#] now Priority 3 (updated at December 1999)

Research Requirements

- Resurvey populations 1 and 2 to determine size and extent of population, and conduct further survey in similar habitat throughout the area.
- Further survey is required in suitable habitat, particularly in the Eurardy and Lake Monger areas of the District.

References

Hewson (1982b), Leigh *et al.* (1984), Schulz (1933), Shaw (1974).



Plectrachne bromoides (F.Muell.) C.E.Hubb. POACEAE

(now *Triodia bromoides*)

This species was described from specimens collected by Oldfield at Geographe Bay in the south-west, now thought to be a mistake for Murchison River, and was also known from Oldfield's collections from Murchison River and a Drummond collection without locality. It was presumed extinct until December 1993 when specimens collected in 1989 from Shark Bay were identified as *Plectrachne bromoides* as a result of a revision of the genus.

A tall perennial plant, forming tussocks, the plants up to 1.3 m tall, with simple sterile shoots. The stems and nodes are glabrous. The leaves are erect, with glabrous, rather broad sheaths, bearded at the orifice. The blades of the leaves are narrow, rigid and pungent pointed, 30-60 cm long. The flowers are arranged in loose but narrow panicles c. 30 cm long. The flowers have long erect pedicels and the spikelets are 5-7 flowered, only the lower one fertile. The glumes have long awns and are 20-28 mm long, including the awns. The awns of the lemmas are up to 3.5 cm long. The palea is glabrous, ciliolate on the keel. The lemmas are three-awned and the lowest fertile lemma is 6 mm long, without a transverse line at the base of the lobes, pubescent on the back, with the hairs somewhat in rows and ciliate on the margins. The lobes taper from a broad base to slender straight awns, the middle one up to 2 or 3.5 cm long, the lateral awns much shorter.

Flowering Period: July to October, mainly September in the Geraldton District

Distribution and Habitat in the Geraldton District

Within the Geraldton District, this species has been found from north-west of Eurardy Station to the Kalbarri area, with an earlier record made in 1947 from between Geraldton and Northampton. It is also known from four localities in the Shark Bay area, one where the population is of 10 000 plants, and two other populations further south, one with more than 100 plants, which are both north of the Geraldton District.

Grows on sandplain or on sand dunes on red or grey sand, in heathland, dwarf scrub, shrubland or low woodland. Associated species include *Acacia rostellifera, A. oldfieldii, Melaleuca cardiophylla, Hakea stenophylla, Olearia axillaris, Thryptomene strongylophylla* and *Olearia axillaris.*

Conservation Status

Current: Declared Rare Flora[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. E of Kalbarri	N	Private	8.4.1995	50+	Healthy
2. E of Kalbarri	N	National Park	8.4.1995	100+	Healthy
3. NW of Eurardy	N	Pastoral Lease	28.9.1989	100+	-
4.* Beween Geraldton & Northampton	-	-	2.9.1947	-	-

Response to Disturbance

Species of spinifex resprout after fire from buds, roots or rhizomes (Griffin 1992).

[#] now Priority 4 (updated at December 1999)

Management Requirements

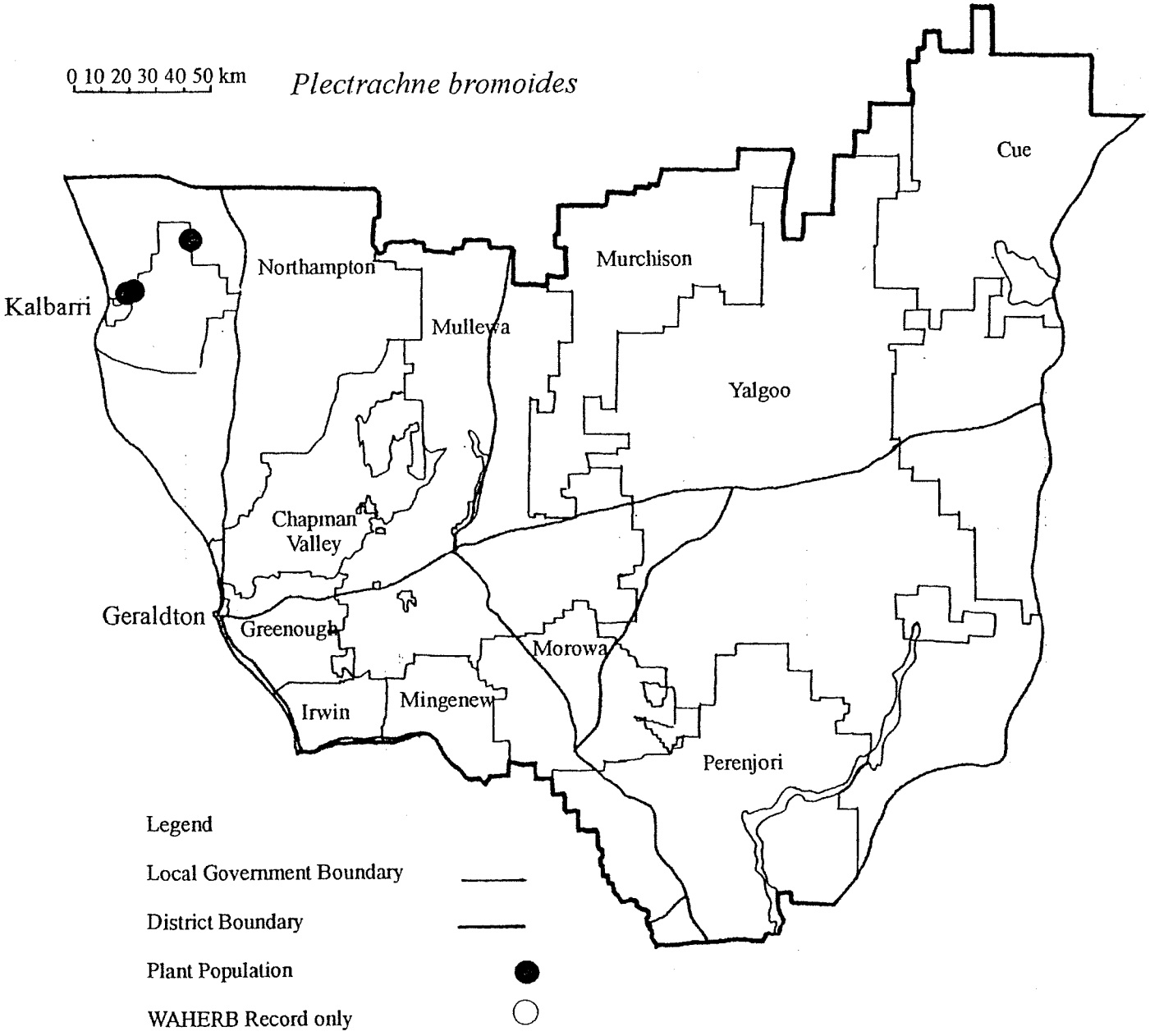
- Collect seed for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.
- Monitor the populations regularly.
- Maintain liaison with pastoralist and private landowners.
- Protect, where possible, from inappropriate fire regime.

Research Requirements

- Further survey is required, particularly in the Kalbarri National Park and further north in the District.

References

Bentham, (1866), Gardner (1952), Griffin (1992), Hubbard (1939), Mueller (1873).



Pterostylis sp. Northampton (S.D.Hopper 3349) ORCHIDACEAE

Northampton Midget Greenhood, Western Swan Greenhood

This species was discovered in 1978 and was declared as Rare Flora in 1989.

A small tuberous herb 5-10 cm tall, with a basal rosette of light green leaves. The leaves are broad elliptic in shape, with wavy edges and are 1-2 cm long and 5-10 mm broad. There are from 2-20 small flowers on the flowering spike, each flower is c. 5 mm long and c. 5 mm wide. The labellum appendage in the flower projects forward.

This species is related to *Pterostylis mutica,* which has darker coloured flowers, a labellum appendage which bends backwards into the flower and leaves which are darker green in colour, with smooth edges. It is also related to *P. cycnocephala,* a species occurring in the Eastern States.

An Interim Recovery Plan has been written for this species and is currently being implemented.

Flowering Period: August

Distribution and Habitat in the Geraldton District

This species is known from four populations in an area north-west of Northampton.

It grows in swamps and damp areas in brown clay loam over laterite in open low scrub over low heath. Occurs with *Melaleuca uncinata, Hakea recurva, Caladenia elegans, Diuris recurva* and *Cryptandra nudiflora* but grows on bare soil in open areas.

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Yerina Springs Road	N	Shire Road Reserve, Private	4.7.1995	60+	Healthy
2. Port Gregory Road	N	Shire Road Reserve	14.8.1996	100+	Some evidence of feral pig activity
3. W of Rob Road	N	Private	8.8.1994	1	Poor, on narrow strip of remnant vegetation
4. S of Swamp Road	N	Shire Reserve	14.8.1996	29	Undisturbed, some weed encroachment

Response to Disturbance

Unknown

Management Requirements

- Collect germ-plasm material for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.
- Monitor populations annually, particularly in relation to presence of feral pigs and rabbits.
- Investigate the possibility of vesting the reserve on which population 4 occurs, as a nature reserve.

Management Requirements (Cont'd)

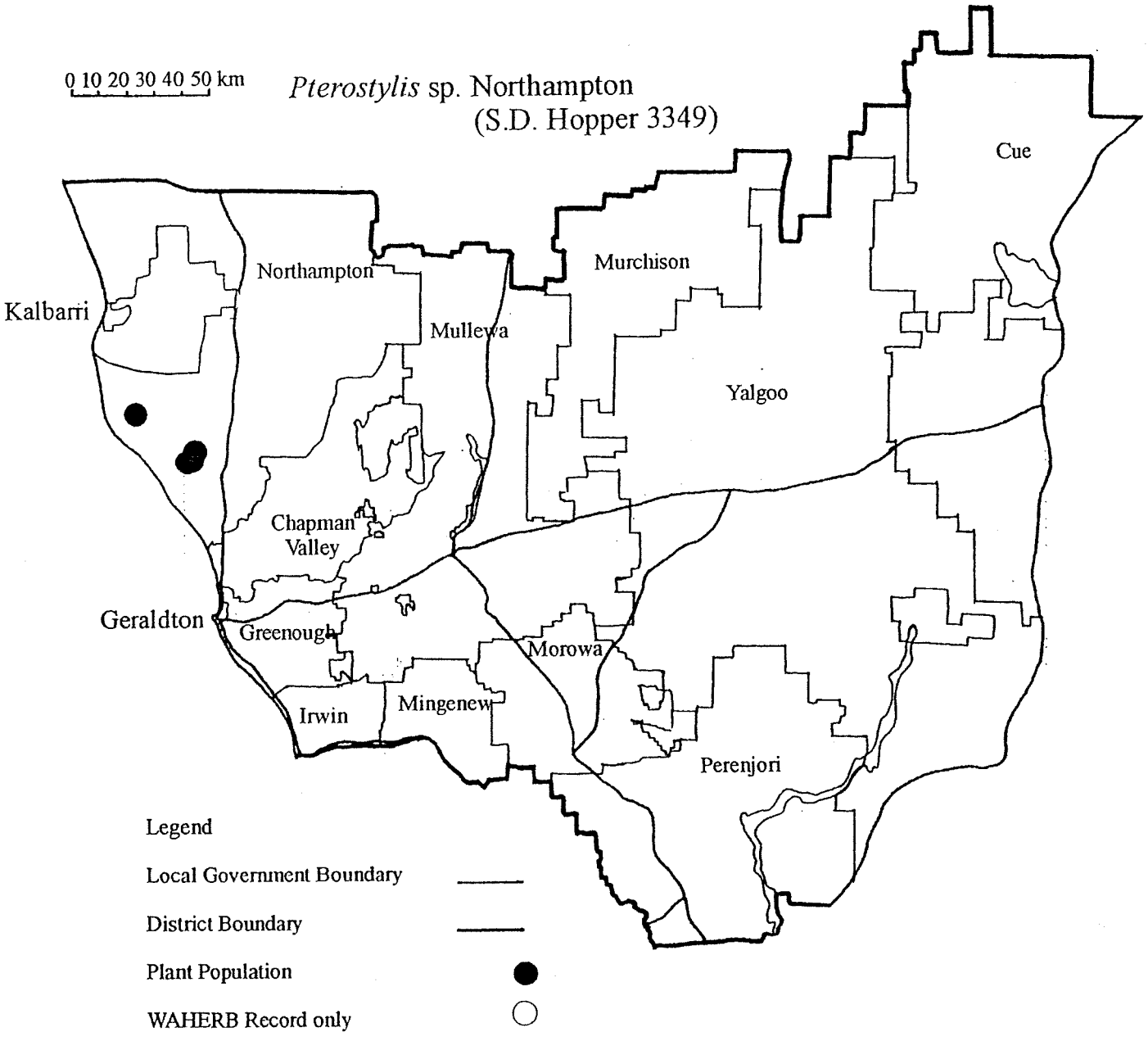
- Weed control is required at all populations.
- Ensure that population 1 is fenced.
- Maintain liaison with the Shire and private landowners.
- Protect from fire, where possible, during vegetative/flowering phase.

Research Requirements

- Further survey is required on remnant vegetation in the area.
- Research is required on the population biology and fire response of the species.

References

Hoffman & Brown (1992).



Stylidium coroniforme R.Erickson & J.H.Willis STYLIDIACEAE

Wongan Triggerplant

This species was described in 1966 from collections made from a single population discovered in 1963 in the Wongan Hills, Merredin District. In 1980 that population had declined to one plant and the species was gazetted as Declared Rare Flora. Further populations have been found in that area since then and in 1989 two populations were discovered in the Geraldton District. The specific name refers to the crown-like arrangement of the flowering spikes around the cluster of rosettes.

Stylidium coroniforme is a perennial plant with a dense, basal cluster of leaf rosettes. The leaves are numerous, grey-green in colour, with conspicuous white margins and a white rib down the underside. They are up to 3 cm long, narrow at the base and widening to c. 5 mm wide towards the apex, ending in a long narrow point. There is one flowering stem arising from each rosette. The flowering stems are 10-15 cm tall, dark-coloured with glandular hairs. Each stem has many short-stalked flowers in a pyramidal raceme up to 12 cm long, each flower with three small bracts at the base. The flowers are c. 1 cm across, yellow at first, becoming creamy white, with four oval petals which are all similar in size, with red spots at the throat and dark red lines on the outer surface. There are two narrow hair-like throat appendages and finger-like projections on the end of the trigger. The ovary is c. 1.5 cm long, the fruit to 2 cm long.

This species is distinctive in its very long ovary, racemose flowering spike and conspicuously margined leaves. *S. limbatum* has similar leaves but a short ovary. *S. dichotomum* has a similar flower but the throat in that species has no appendages and the end of the trigger is cushion-like.

Research into the genetic structure of all populations of *S. coroniforme* has shown a level of divergence between the two groups of populations at Wongan Hills and Maya that indicates that they may be different species, although there appear to be few morphological differences (Coates 1992).

A Recovery Plan has been written for this species and has been implemented.

Flowering Period: September-November

Distribution and Habitat in the Geraldton District

This species is known from three populations over a range of c. 8 km in the Wongan Hills and from two populations in the Geraldton District which are about 140 km north of the Wongan Hills. These are near Maya and occur on ridges c. 2 km apart.

Grows on shallow yellow sand over laterite on open areas in low scrub and heath. Associated species include *Allocasuarina acutivalvis, Petrophile shuttleworthiana, Grevillea petrophiloides, G. paradoxa* and *Isopogon divergens.*

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. N of Maya	P	MRWA Road Reserve, Rail Reserve	15.11.1995	85 (105 in 1994)	Healthy to moderate. 8 of the plants were new seedlings
2. N of Maya	P	MRWA Road Reserve, Rail Reserve	13.11.1996	14 (18 in 1994)	Healthy to moderate

Response to Disturbance

Thought to be a disturbance opportunist, the plants being relatively short-lived so that the populations decline after several years, persisting at low densities for many years in the absence of suitable disturbance, with sporadic recruitment as seed dormancy is broken by ageing and weathering.

Management Requirements

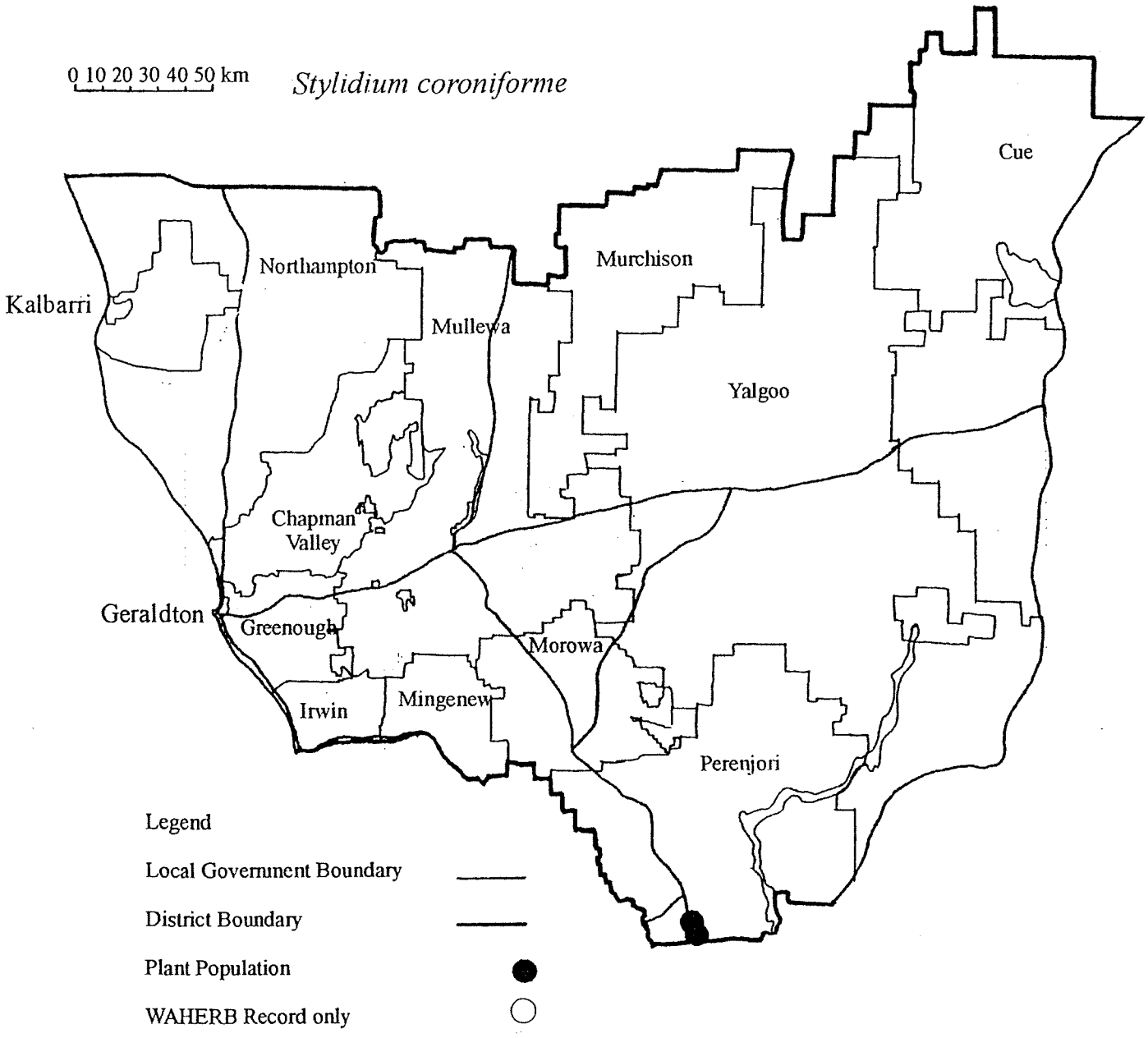
- Monitor the populations regularly, particularly to monitor survival of new seedlings at population 1.
- Maintain liaison with land managers.

Research Requirements

- Further survey is required in the Geraldton District.

References

Coates (1992), Erickson & Willis (1966), Leigh *et al.* (1984), Rye & Hopper (1981), Stace & Coates (1995).



Verticordia spicata F.Muell. subsp. *squamosa* A.S.George MYRTACEAE

Scaly Spiked Featherflower

The subspecific name means scaly, referring to the small overlapping leaves.

Verticordia spicata subsp. *squamosa* is a shrub to 80 cm tall and 1 m wide. The leaves are 1.5-2 mm long, rounded to elliptic, with prominent oil glands. Their margins are irregularly toothed or fringed with hairs less than 0.5 mm long. They are pressed to the stem and closely overlapping. The flowers are closely packed, forming dense spikes on the ends of the branches. They are mauve pink in colour, fading to white and are stalkless or with short stalks. The hypanthium is honeycombed with obscure ribs and has five green reflexed appendages nearly as long as the tube.

The sepals are 3-4 mm long, fringed and with small basal auricles. The petals are 3 mm long, fringed with fine segments more than 1 mm long. The stamens and staminodes are hairless and the staminodes are linear. The style is 4 mm long and bearded below the apex.

Differs from *V. spicata* subsp. *spicata* in the smaller leaves and flowers. At the type locality in the Moora District, *V. spicata* subsp. *squamosa* grows with *V. comosa* and appears to hybridise with it. The presumed hybrid has spreading leaves 2-3 mm long, a hypanthium with shorter appendages, sepals with prominent auricles and a style 5 mm long with a more dense beard than that of *V. spicata* subsp. *squamosa*. Another presumed hybrid has "offwhite" flowers with larger sepal auricles and a style beard with longer hairs.

An Interim Recovery Plan has been written for this subspecies and is currently being implemented.

Flowering Period: October-December

Distribution and Habitat in the Geraldton District

Occurs between Three Springs and Morawa where it is known from two small populations which occur just within the Geraldton District, and in the Moora District, from three other populations, all within a range of 17 km.

Grows in tall shrubland over low scrub, sometimes with mallees, in deep yellow sand. Associated species include *Eucalyptus jucunda, Actinostrobus arenarius, Melaleuca cordata, Thryptomene saxicola, Jacksonia* sp., *V. comosa, V. monadelpha, V. densiflora* var. *stelluligera, V. eriocephala, Grevillea biformis* and *G. eriostachya.*

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Colgate Road	Mi	Shire Road Verge	3.12.1995	1	Moderate, on very narrow road verge
2. Colgate Road	Mi	Private	3.12.1995	10	Healthy
3.* 19 miles from Three Springs towards Morawa	-	-	10.1951	-	-

Response to Disturbance

Thought to be killed by fire, regenerating from seed.

Management Requirements

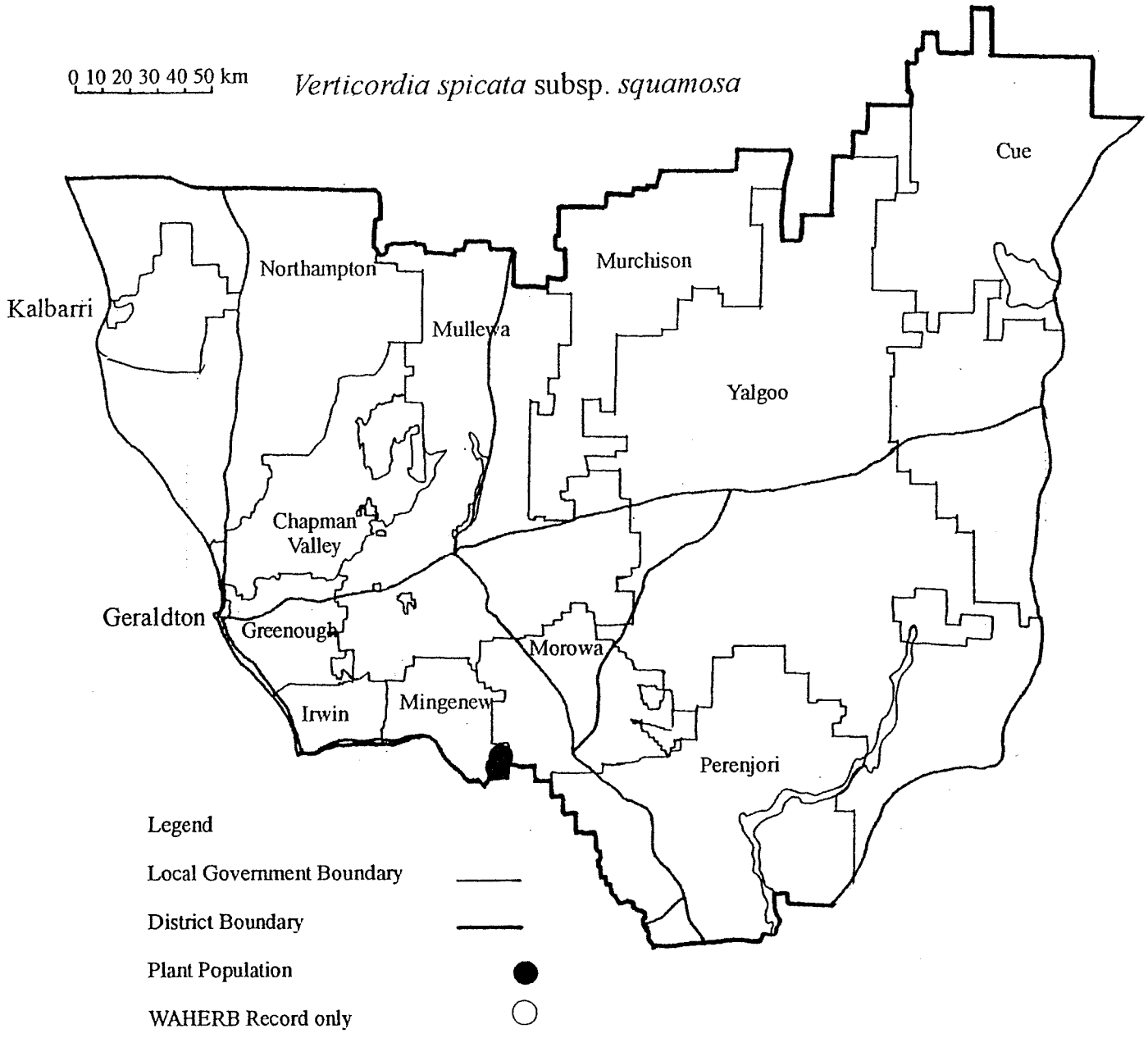
- Ensure that dieback hygiene procedures are carried out at all populations.
- Maintain liaison with the Shire and private landowners.
- Population 2 requires fencing.
- Monitor the populations annually, particularly in relation to weed encroachment.
- Protect from frequent fire.

Research Requirements

- Further survey is required.
- Research is required on the population biology and fire response of the species.

References

Bentham (1866), George (1991), E. George (personal communication), Mueller (1859).



Wurmbea tubulosa Benth. COLCHICACEAE

Long-flowered Nancy

This species was described in 1878 by George Bentham from material collected at Champion Bay, which is now part of the town of Geraldton.

Wurmbea tubulosa is a small plant 1-3 cm tall, with an ellipsoid corm to 2.5 cm long. There are three leaves, the lower two are basal and similar in length and width, without a distinct section of stem between their bases. They are very broad, 3-22 mm wide, lanceolate in shape, held flat to the ground. The upper leaf is smaller and erect, emerging from the two lower leaves or attached to the stem just above them. The flowers are either male or female, borne on separate plants. There are 1-16 flowers in the inflorescence. The male flowers are in an open inflorescence which is taller than the uppermost leaf, whereas the female flowers are in a dense inflorescence which is almost concealed between the two basal leaves at ground level. The perianth is 6-7 mm long in male flowers, 9-12 mm in female flowers, white to pale pink in colour and joined at the base into a long tubular section for about half the perianth length. The upper section of the perianth is divided into six equal lobes, each having a single nectary, which is a narrow, curved, mauve-pink band situated a third to a half the distance from the base of the lobe and slightly raised. There are six stamens in the male flowers and a superior ovary with three styles in the female flowers. The fruit is a capsule with spherical, smooth brown seeds.

This species differs from all other Western Australian species in that the perianth is tubular for up to half its length. *W. drummondii* is a related species but differs in that the perianth is united into a tube for up to a quarter of its length. It also differs in the smaller flowers, which are fewer in each flower head.

Flowering Period: June-July

Distribution and Habitat in the Geraldton District

This species is known from six populations in the Geraldton District and two on the border between the Geraldton and Moora Districts, one east of Dongara, the other at Yandanooka. The plants in the latter population, like those of another in the Moora District north of Three Springs, appear smaller than is typical for the species, but this is thought to be a result of poor growth in a dry season. They appear to be almost intermediate with *W. drummondii.* The geographic range for the species is c. 100 km but the type location at Champion Bay is c. 35 km further north. *W. tubulosa* grows in clay and sandy clay, clay loam or brown loam under shrubs on riverbanks, along drainage lines and in seasonally wet places in woodland of *Eucalyptus loxophleba* with an open shrub layer including *Acacia* and *Hakea* species beneath. This species appears to be variable in the number of plants that are seen at a particular population from one year to another, possibly depending on good rainfall.

Conservation Status

Current: Declared Rare Flora

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. S of Geraldton	G	Private	18.6.1996	2 000	Healthy, but weed infestation poses a threat
2. NW of Mingenew	Mi	Shire Reserve	20.6.1996	30+	Undisturbed, at edge of carpark
3. Mingenew	Mi	Nature Reserve	19.6.1996	c. 300	Healthy
4. E of Mingenew	Mi	Shire Reserve, Shire Road Verge	20.6.1996	10 000+	Healthy but heavy weed infestation

Populations Known in the Geraldton District (Cont'd)

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
5. NE of Mingenew	Mi	?Private	20.6.1996	300+	Undisturbed
6. E of Dongara	I	MRWA Road Verge, Rail Reserve	19.6.1996	500+	Healthy, but heavy infestation of grasses
7. Yandanooka	Mi	Townsite Reserve	11.6.1991	1 000+	Undisturbed
8. E of Geraldton	G	Private	27.6.1996	800+	Healthy

Response to Disturbance

Unknown. Plants at population 6 were growing on a well-used compacted track with little other vegetation. There were few plants in the areas adjacent to the track which were heavily weed infested. Population 4 had been grazed for many years until shortly before its discovery.

Management Requirements

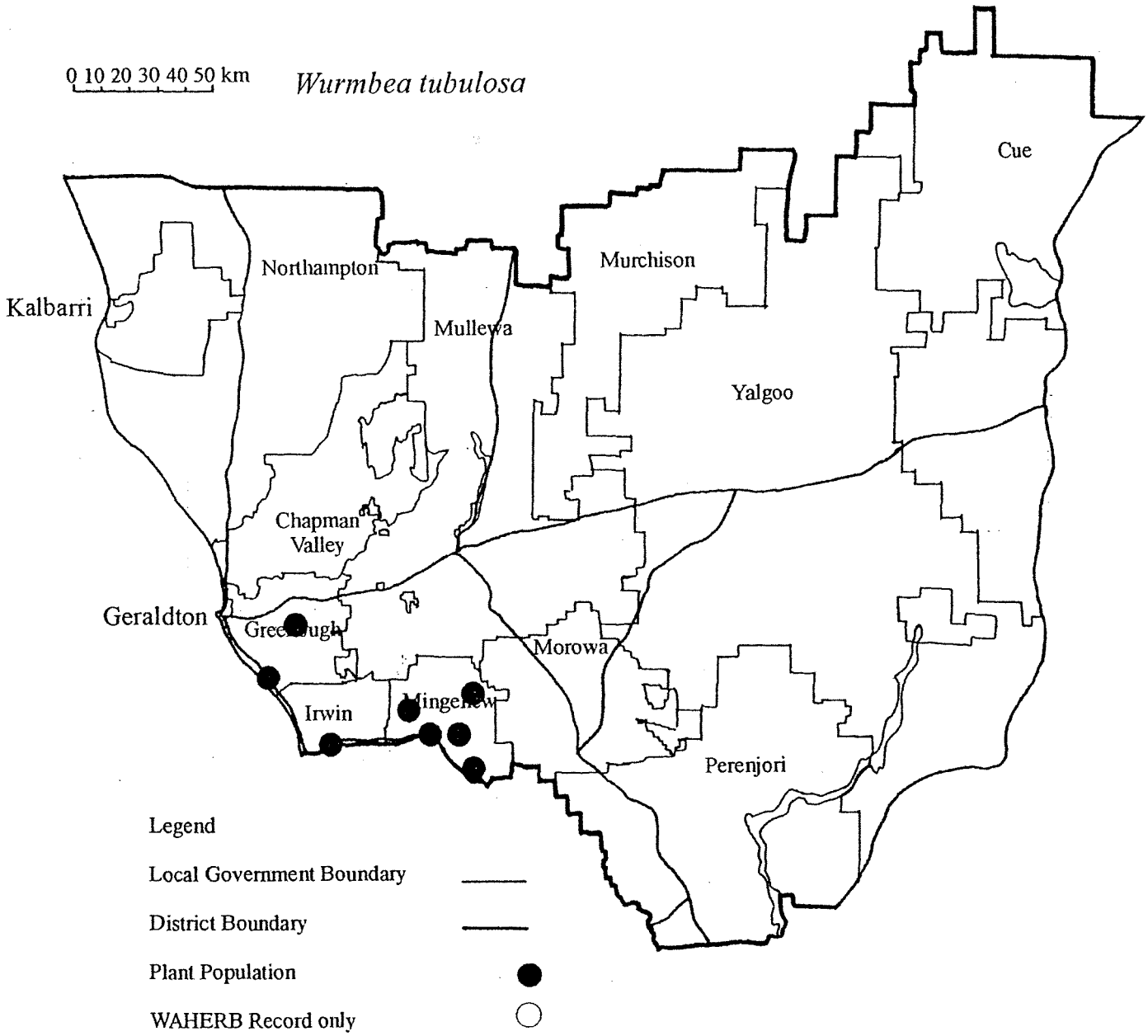
- Monitor the populations regularly.
- Consider weed control at populations 1, 3 and 6.
- Maintain liaison with managers of land on which the populations occur.
- Efforts should be made to acquire the reserves on which populations 4 and 7 occur, as conservation reserves.
- Ensure that population 4 is marked.
- Collect seed for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.
- Fencing is required at population 1.

Research Requirements

- Further survey is required for this small and inconspicuous species.

References

Bentham (1878), Macfarlane (1980, 1987), Patrick & Hopper (1982).


0 10 20 30 40 50 km
Wurmbea tubulosa
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Morowa
Irwin
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

B. Presumed Extinct Taxa

Hydatella leptogyne Diels — HYDATELLACEAE

This species is known only from the type collection made by Diels in 1901 from the Hutt River.

A tufted aquatic annual plant, it has male and female flowers on the same plant. The leaves are thread-like, terete, up to 5 cm long. The flowers grow on scapes which are shorter than the leaves. Male and female heads are each enclosed in two loosely sheathing bracts less than 5 mm long. The male flower has one oblong purple anther and the female flowers are loosely grouped, each with a narrowly pyriform ovary and several unequal stigmatic hairs.

This species is closely related to *Hydatella australis*, which differs in the ovoid shape of the ovary. It is possibly the northern extreme of a single variable species, as *H. australis* is also poorly collected, being known from Perth and the Hamersley River in the south-west.

Flowering Period: November

Distribution and Habitat in the Geraldton District

Known only from the type collection made from the Hutt River, where it was recorded growing in a waterhole on a granite platform.

Conservation Status

Current: Declared Rare Flora, Presumed Extinct[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* Hutt River	N	-	28.11.1901	-	-

Response to Disturbance

Unknown

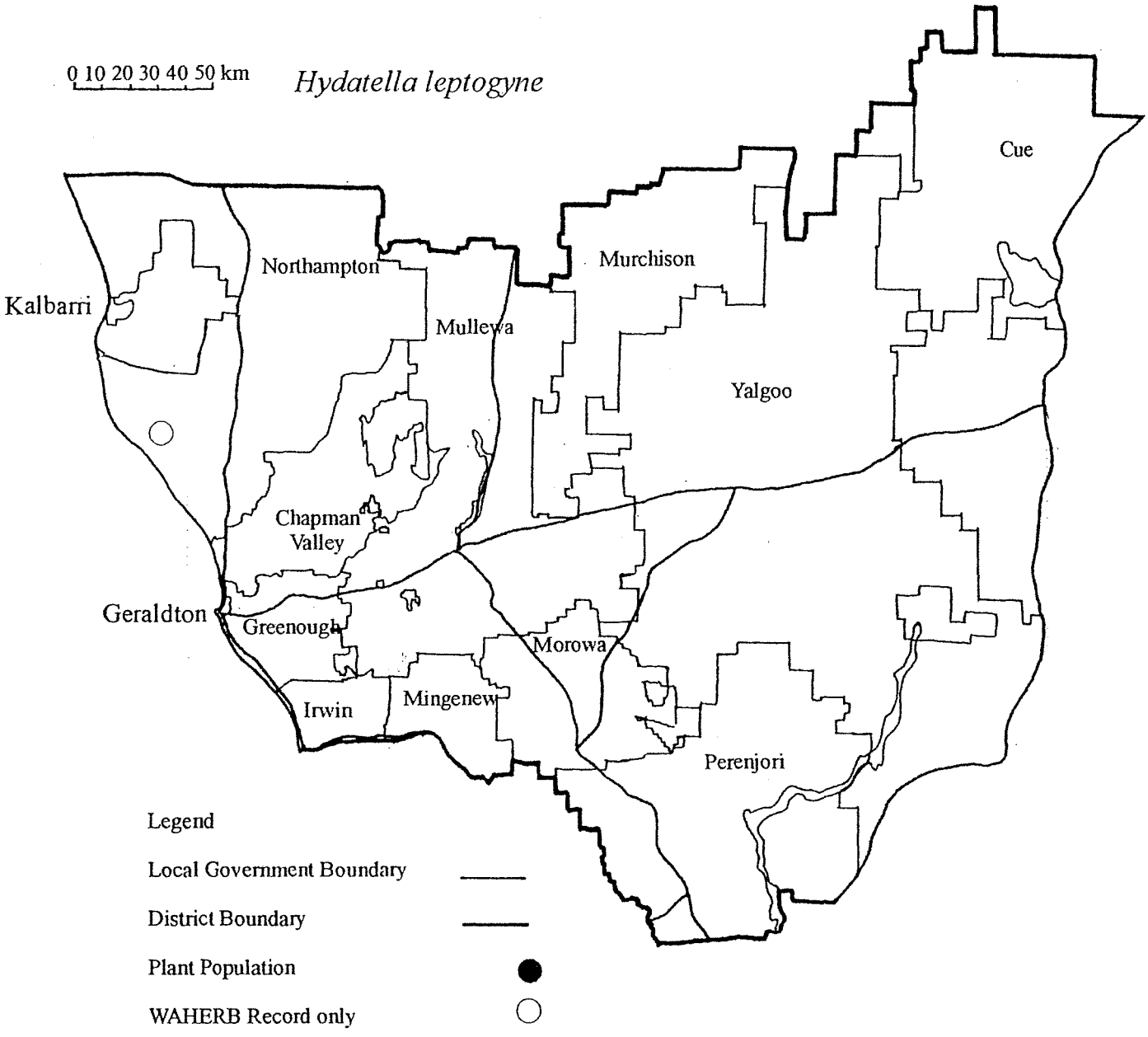
Research Requirements

- Conduct further survey for this species and *H. australis* along rivers and temporarily inundated stream margins in the Geraldton District, making further collections of both species.
- Further taxonomic work is required to elucidate the relationship of this species with *H. australis*.

References

Blackall & Grieve (1974), Cooke (1987), Diels & Pritzel (1904-5), Leigh *et al.*(1984).

[#] now extant Declared Rare Flora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Hydatella leptogyne
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Pseudanthus nematophorus F.Muell. EUPHORBIACEAE

Three-flowered Pseudanthus

This species is known from two collections, one made by Drummond from Moore-Murchison Rivers in 1859 and another by Oldfield from the Murchison River before 1873.

Pseudanthus nematophorus is a shrub 0.3-0.6 m tall, glabrous and upright, slender and erect in habit. The leaves are opposite or alternate, linear in shape, to 1.2 cm long. The flowers are very small, without stalks, clustered in the upper leaf axils or at the ends of branches. They are male or female, with 3-7 male flowers in a cluster and with one female flower at the centre or with none. The male flower has three broadly ovate outer perianth segments c. 1 mm long, and two smaller inner segments, the third reduced to a red filament 4-6 mm long. There are 15-20 stamens, little longer than the perianth, with short, thick filaments and a rudimentary 2- or 3-lobed ovary in the centre.

The female flower usually has four narrow acute perianth segments and a 2-lobed ovary. The fruit is an oblong capsule c. 4 mm long, 4-valved and rather acute.

This species differs from *P. virgatus* in its stalkless male flowers and glabrous leaves. Within the family, this genus is distinguished by the combination of distinct flowers, both sexes with a perianth, free stamens which are more than nine in number, with two-celled anthers opening by slits and the styles divided into two or three lobes.

The specific name refers to the thread-like third inner perianth segment of the male flower.

Flowering Period: Unknown

Distribution and Habitat in the Geraldton District

The species is recorded as having been found in rocky and sandy locations by the Murchison River.

Conservation Status

Current: Declared Rare Flora, Presumed Extinct

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* Murchison River	-	-	1859	-	-

Response to Disturbance

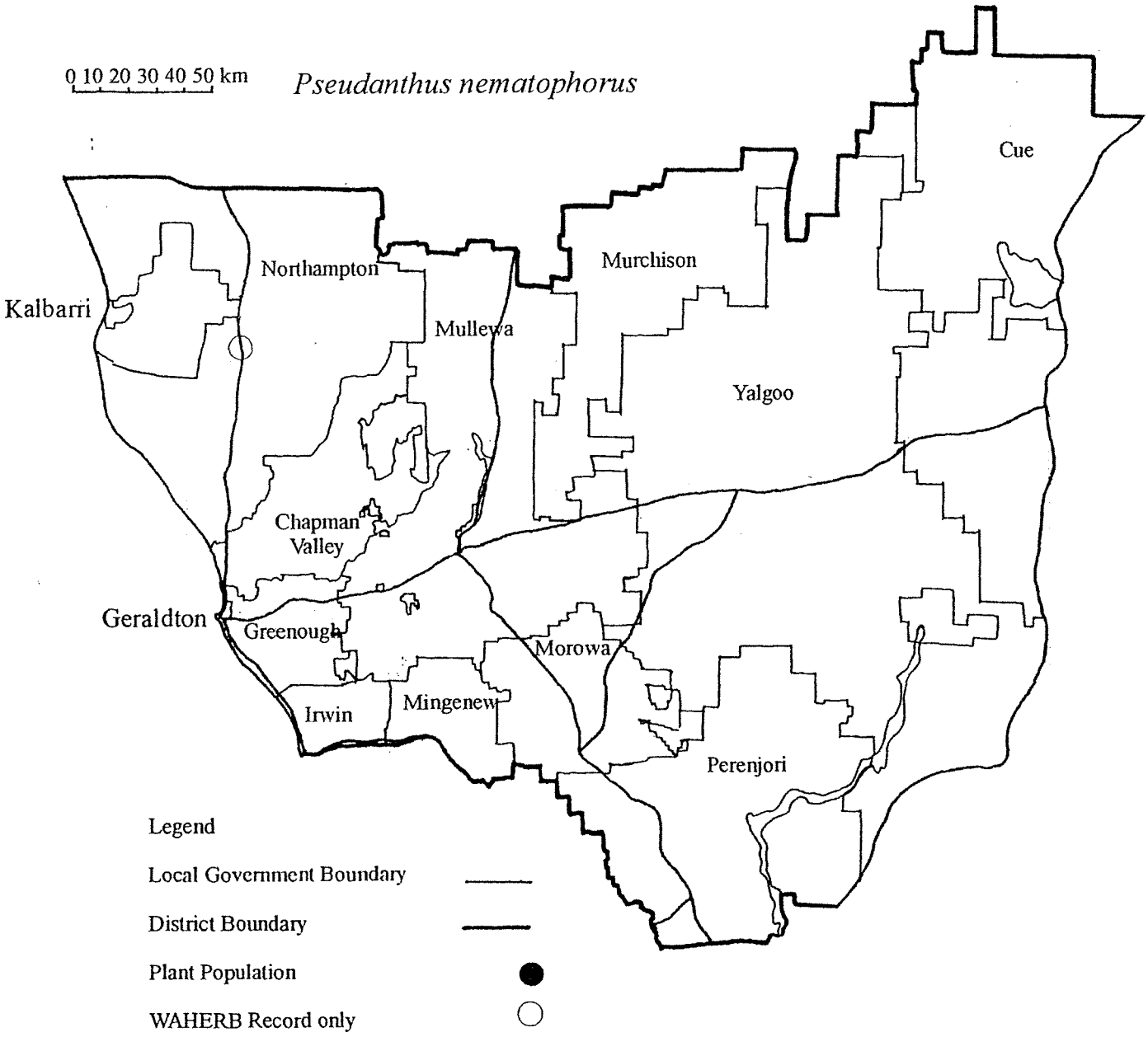
Unknown

Research Requirements

– Further survey is required in order to refind this species.

References

Bentham (1873), Leigh *et al.* (1984), Mueller (1860).


0 10 20 30 40 50 km
Pseudanthus nematophorus
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

PART THREE: PRIORITY FLORA IN THE GERALDTON DISTRICT

The taxa treated in this section are those listed on CALM's Priority Flora List (October 1996) for the Geraldton District. The priority categories are outlined in Part 1.4. The treatments follow the format in Part 2.

Priority One, Two and Three taxa require further survey to determine their conservation status as they do not meet the requirements for gazettal as Rare Flora. They may be added to the Declared Rare Flora Schedule if they prove to be truly rare, endangered or in need of special protection. Populations of these taxa, particularly those listed as Priority One and Two, should be protected from accidental damage or destruction.

There are 119 Priority One, 80 Priority Two and 65 Priority Three Taxa which have been found to occur in the District, and survey priority was given to those in the Priority One and Two categories. 308 new populations were recorded for 84 taxa and some were found to be more abundant than was previously thought. Table 3 lists the current and recommended status for all priority taxa in the Geraldton District.

A. Priority One Taxa

Acacia ampliata R.S.Cowan & Maslin MIMOSACEAE

A shrub or small tree 2-5 m tall, with grey bark which has fine longitudinal fissures. The phyllodes are held upright, sometimes incurved, and are flat, linear to linear-elliptic, 8-19 cm long, 3-6 mm wide. The nerves are numerous and closely parallel, the midrib conspicuously raised. The flower heads are golden, elongate, 9-12 mm long, 7-8 mm in diameter. They grow singly or in pairs at each node on stalks to 9 mm long. The pods are up to 11 cm long, 5-6 mm wide, slightly curved and constricted between the seeds, which are shiny, dark brown to black with a large, much-folded golden aril.

This species is related to *Acacia jamesiana*, which has narrower four-sided phyllodes, 1-1.5 mm wide. *A. ampliata* occurs further west than *A. jamesiana,* which has a widely scattered distribution in the arid zone.

Flowering Period: Flowering has been recorded in April, June, August, October and December, with mature fruits collected in mid-December.

Distribution and Habitat in the Geraldton District

This species occurs in the Mullewa area where it has been found over a range of c. 20 km, but it has also been collected in 1972 from south of Coolcalalaya, which is about 100 km north-north-west of Mullewa in the north-west corner of the Geraldton District.

Grows in red or orange sand, sandy loam and light brown loam, in mallee scrub.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* E of Mullewa	Mu	-	22.7.1982	Common	-
2. S of Mullewa	Mu	Shire Road Reserve	4.12.1991	Common	-
3.* S of Mullewa	Mu	-	2.8.1974	-	-
4.* S of Coolcalalaya	N	-	22.10.1974	-	-

Response to Disturbance

Unknown

Management Requirements

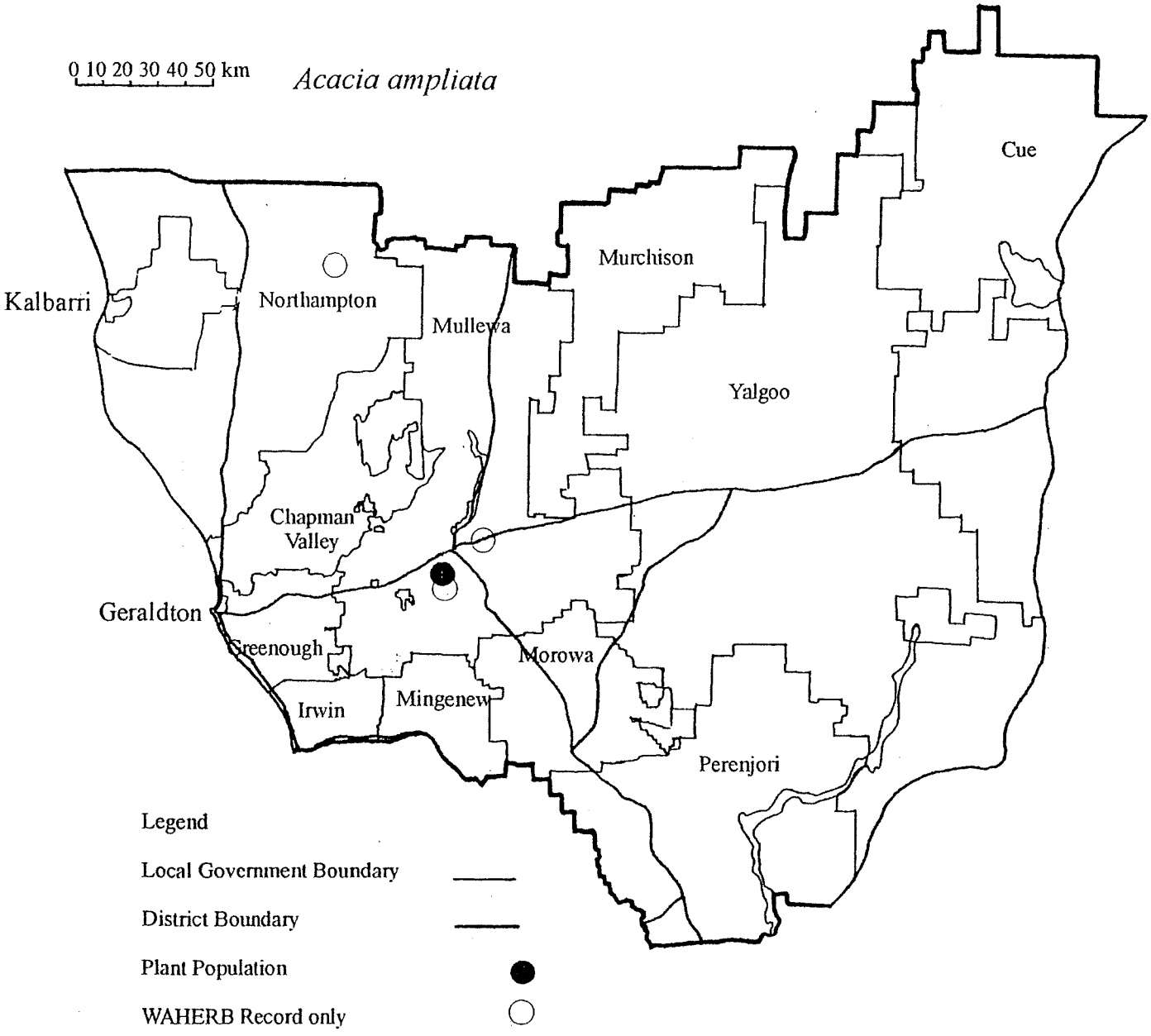
- Ensure that the known road verge population is marked.
- Resurvey population 2 to determine number of plants, area covered and condition of the population.

Research Requirements

- Further survey is required, particularly to refind all previously recorded populations, and to find further populations on conservation reserves in the area.

References

Cowan & Maslin (1995a).


0 10 20 30 40 50 km
Acacia ampliata
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Acacia cerastes Maslin MIMOSACEAE

Acacia cerastes is a restricted species known from only five collections.

It is an erect, much-branched shrub to 1.5 m tall, single-stemmed at the base but much-branched from about 1.5 m above the base. The branches are terete, finely ribbed, green in colour and tortuous, forming a tangled mass. They have rudimentary phyllodes 1 mm long which form minute horn-like projections. The flower heads are golden, globular in shape, grouped in very reduced racemes on peduncles 3-4 mm long. The pods are linear, to 4.5 cm long, 3-4 mm wide, somewhat constricted between the seeds. Seeds have not been seen.

This species is most closely related to *A. davesioides,* which has more glaucous, non-tortuous branches and longer phyllodes, 2-10 mm long. It may also be confused with *A. restiacea,* which is superficially similar but has straight branches, no phyllodes and long racemes of flower heads.

The name *'cerastes'* is derived from the Greek, meaning a horned serpent, referring to the serpentinous branches with reduced horn-like phyllodes.

Flowering Period: July-August and November

Distribution and Habitat in the Geraldton District

Known from a restricted area on Mt Gibson Station and further north on Ninghan Station over a range of c. 40 km.

One population occurs in skeletal soil pockets on the upper slopes of ironstone hills, whilst the two other populations grow in brown sandy loam in crevices on large granite rocks. One of these populations grows in open low mallee woodland with shrubs, including *Allocasuarina* sp and *Melaleuca radula,* the other in scrub including *Calycopeplus ephedroides, Gastrolobium laytonii, Dodonaea inaequifolia* and *Anthocercis* sp.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Mt Gibson	Y	Pastoral Lease	1.10.1990	"common"	
2. Ninghan	Y	Pastoral Lease	2.8.1992	5+	Undisturbed
3. E of Mt Gibson	Y	Pastoral Lease	16.7.1996	1	Healthy

Response to Disturbance

Unknown

Management Requirements

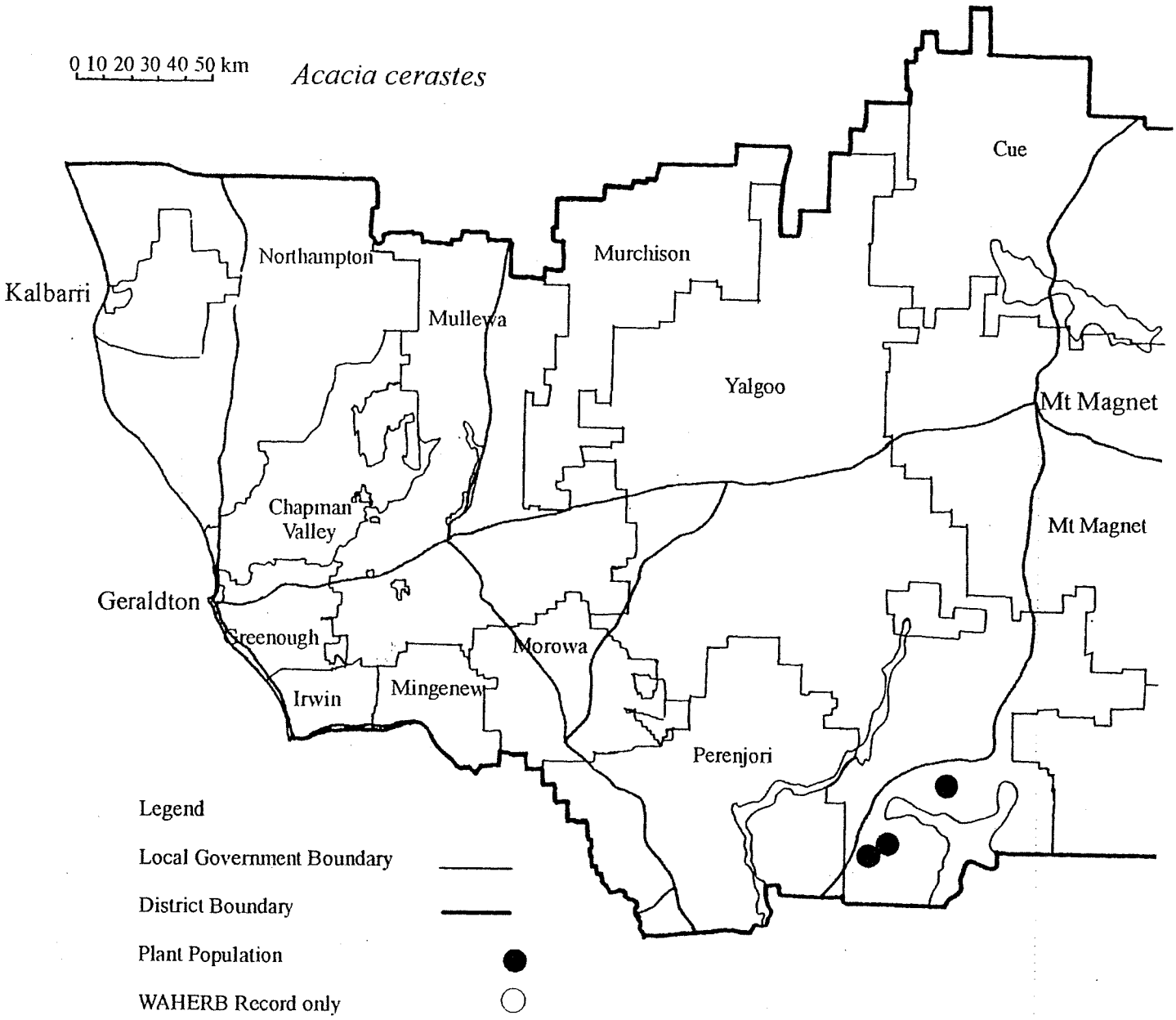
- All populations should be monitored regularly, particularly with regard to damage from grazing and mining.

Research Requirements

- Further survey is required to resurvey all populations and establish their size and extent, and to find further populations.

References

Maslin (1995a).


0 10 20 30 40 50 km
Acacia cerastes
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Mt Magnet
Chapman Valley
Mt Magnet
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Acacia congesta Benth. subsp. *cliftoniana* (W.Fitzg.) Maslin MIMOSACEAE

This taxon was originally described in 1904 by W.V. Fitzgerald as *Acacia cliftoniana* but is now included as a subspecies of *A. congesta.* It was first collected in 1903 from Arrino by Fitzgerald.

A. congesta subsp. *cliftoniana* is a low shrub 0.5-1 m tall, with hirsute branchlets and phyllodes. The phyllodes are 5-10 mm long, 1.2-2.5 mm wide, the abaxial margin more or less straight, the adaxial margin convex. The flower heads are globular to shortly oblongoid, 30-40 flowered. There are 1-3 flower heads in each axil. The legumes are constricted between the seeds and are 4-5 mm wide.

This subspecies differs from *A. congesta* subsp. *congesta* in its shorter, hairy phyllodes. *A. congesta* subsp. *wonganensis* has glabrous phyllodes and flower heads arranged in racemes, with 50-70 flowers in each head.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

Has been collected in the past from Yandanooka, which is just within the southern boundary of the Geraldton District, to the Three Springs area, a geographic range of c. 25 km. This population has not been refound recently and the taxon is at present known only from four road verge populations and two larger ones on private land in the Moora District near Arrino.

There is no record of the habitat of the population recorded at Yandanooka. In the Moora District, this taxon grows on lateritic gravel and brown loam in open scrub beneath open low woodland communities. Associated species include *Eucalyptus wandoo* and *A. flabellifolia.*

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* Yandanooka	Mi	-	19.9.1904	-	-

Response to Disturbance

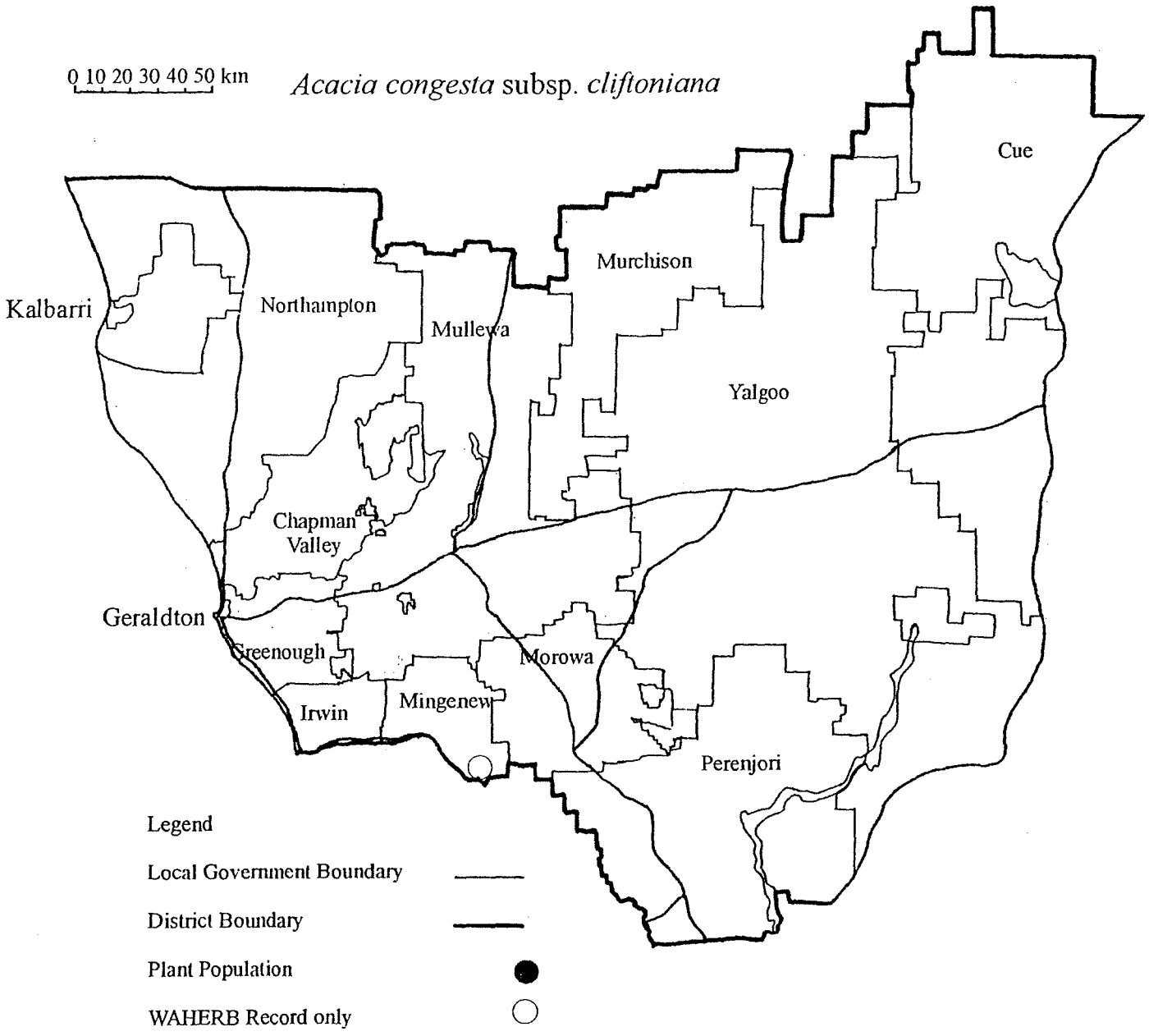
Unknown

Research Requirements

– Further survey is required, particularly in suitable habit on conservation reserves in the Yandanooka area.

References

Fitzgerald (1904), Maslin (1999).


0 10 20 30 40 50 km
Acacia congesta subsp. cliftoniana
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Acacia flabellifolia W.Fitzg. MIMOSACEAE

This species was first collected by W.V. Fitzgerald in 1903 from Arrino in the Moora District and was described by him in 1904.

A spreading shrub to 1 m tall, *Acacia flabellifolia* has rigid undulate phyllodes which end in a long pungent point. The upper margin is rounded and the principal nerve runs close to the lower margin. The flower heads are globular and solitary and the legumes are tightly coiled.

A. dilatata is a species with similarly shaped phyllodes and it occurs within the range of *A. flabellifolia* but is not closely related.

Flowering Period: August

Distribution and Habitat in the Geraldton District

Has been recorded as occurring between Yandanooka and Watheroo, a geographic range of just over 100 km, and it is at present known from four populations occurring between Arrino and Watheroo. The population recorded at Yandanooka (which is on the border of the Geraldton District) in 1904 has not been found more recently and no record of the habitat was made.

In the Moora District, it grows in rocky or lateritic loam on low hills in open eucalypt woodland. Associated species include *Eucalyptus wandoo* and *E. loxophleba.*

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* Yandanooka	Mi	-	14.9.1904	-	-

Response to Disturbance

Unknown

Management Requirements

– Further survey is required.

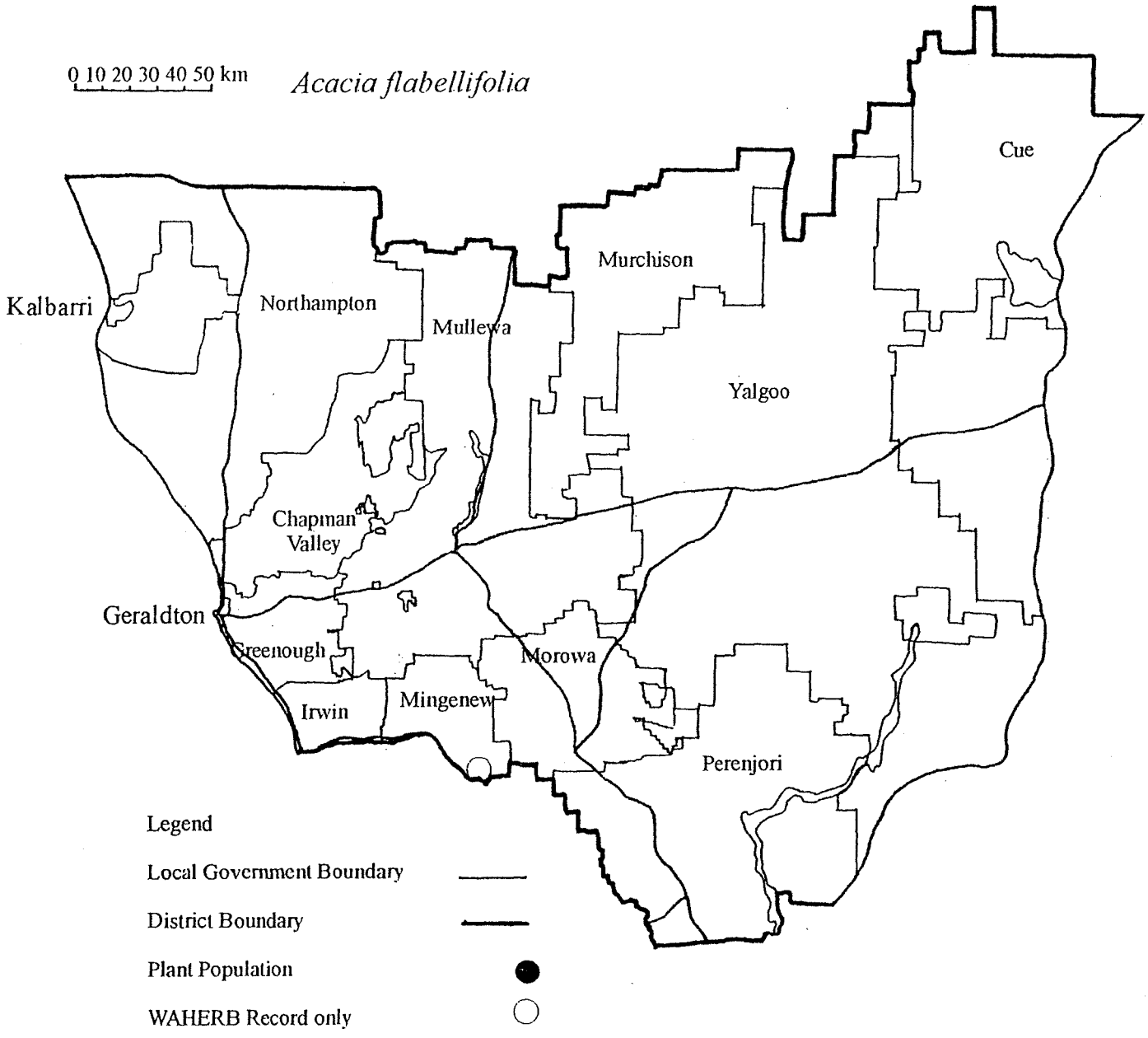
Research Requirements

– Further survey required, particularly on the Yandanooka townsite and in suitable habitat in the area.

References

Fitzgerald (1904), B. Maslin (personal communication).

[#] now Priority 2 (updated at December 1999)


0 10 20 30 40 50 km
Acacia flabellifolia
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Acacia imitans Maslin MIMOSACEAE

This species was first collected by Ken Newbey in 1965.

A low shrub 0.3-1 m tall, *Acacia imitans* is intricately branched and semi-prostrate, forming low-domed plants to 3 m across. The branches are spinescent, dividing into numerous short, rigid branchlets. The phyllodes are 3.5-7 mm long, 1.5-2.5 mm wide, thin and hairless. They are asymmetrical in shape, with a mucronate tip, the upper margin straight or slightly concave, the lower margin convex. They are often bent backwards on the branches but are not grouped in clusters. There is one inflorescence at each node, on a stalk 3-4 mm long. The flower head is 6-8 mm long, 4-5 mm wide, thought to be golden in colour. The pods are tightly coiled, to 7 mm long (when coiled), and 3 mm wide.

This species has been confused with *A. kochii* which occurs in the same area. However, *A. kochii* has phyllodes 1-2 cm long which are grouped in bundles of 2-8, with a modified branchlet forming a spine associated with each bundle. The stalks of the flower heads are 1-2 cm long and the flower heads are 7-13 mm long. The pods are up to 9 cm long and are not tightly coiled. A. *erinacea* also occurs in the same area and has a similar habit, small phyllodes and spinescent branches. It can be distinguished from *A. imitans* by its globular flower heads and pods which are short, straight and oblong, c. 8 mm wide.

This species has been confused with *A. kochii* which has phyllodes 10-20 mm long, grouped in clusters of 2-8, with a thorn associated with each cluster. The flower heads and their stalks are longer and the pods are not tightly coiled.

A. erinacea, which occurs near the type locality, resembles *A. imitans* in its habit, spinescent branchlets and small phyllodes, but has globular flower heads, and short, straight, oblong pods.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

Known only from the slopes of a range of hills south-west of Paynes Find, where it is known over a range of c. 18 km.

Grows on the summit and slopes of hills in rocky red loam and dolerite. It grows in open areas amongst tall shrubland with species of *Allocasuarina, Acacia,* and *Grevillea* and with *Dodonaea inaequifolia.*

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Mt Singleton	Y	Pastoral Lease	6.10.1993	100+	Healthy
2. SE of Mt Singleton	Y	Pastoral Lease	15.7.1994	10+	Healthy

Response to Disturbance

Unknown

Management Requirements

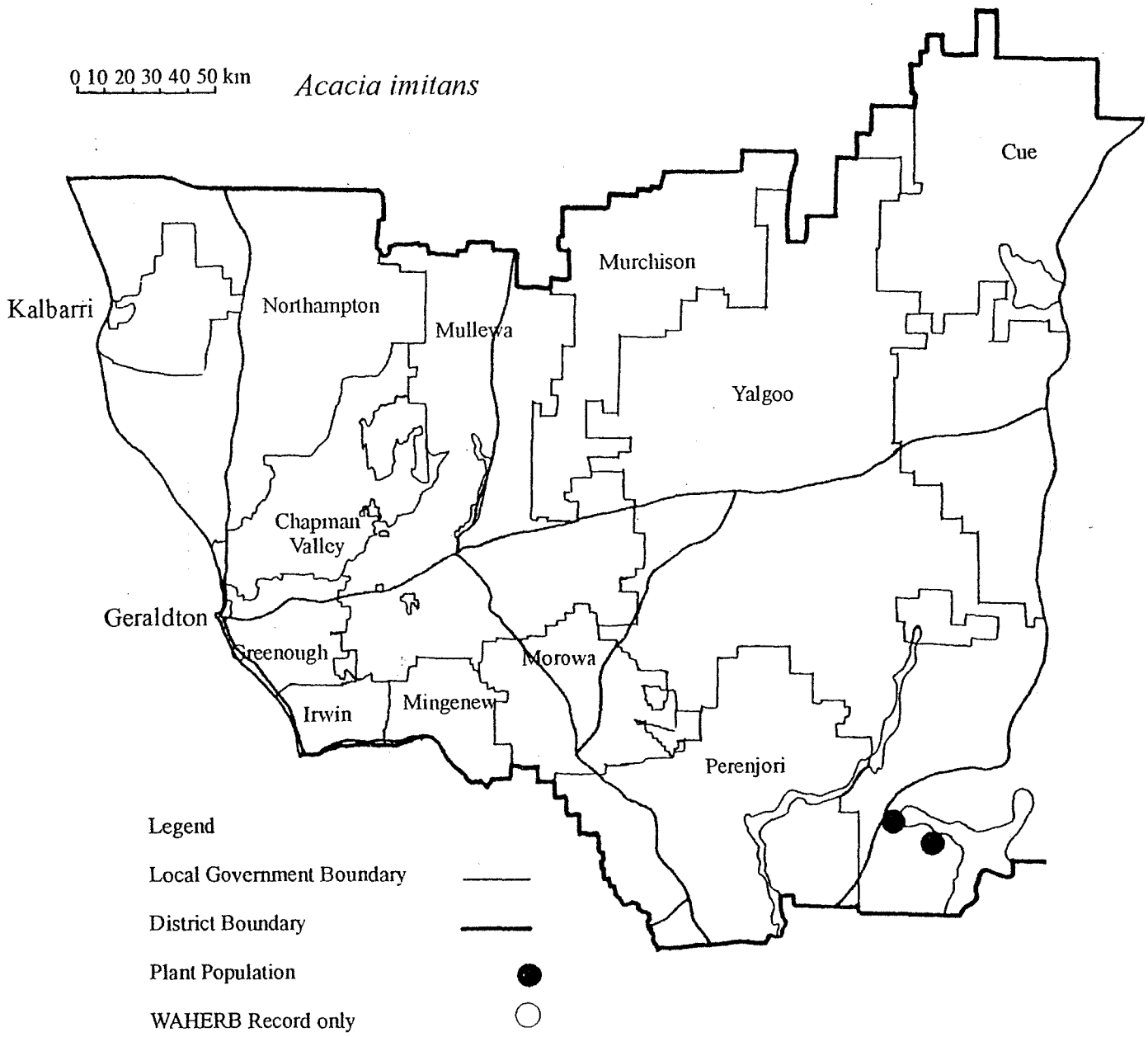
- Maintain liaison with land managers in the area of the known populations.

Research Requirements

- Further survey is required throughout the range of the species and in similar habitat elsewhere, to find further populations.

References

Maslin (1999).



Acacia inceana Domin subsp. *conformis* R.S.Cowan & Maslin MIMOSACEAE

This taxon is placed in the "*Acacia enervia*" group, in which the phyllodes are terete to flat with an acute apex drawn out to a delicate curving tip, and with numerous closely parallel nerves. The flower heads are rather small, on fine stalks, the flowers having 4 or 5 parts, and the perianth parts are free or nearly so. The pods are flat or linear.

A. inceana subsp. *conformis* is a spreading to rounded shrub 1-3 m tall. It has phyllodes which are sub-terete to flat, 4-7 cm long, 1-2 mm wide, at first with appressed hairs, becoming glabrous except for the pulvinus. The tip is curved. The peduncles are 5-6 mm long, the flower heads with 10-15 flowers in each. The flowers are 4-merous, the sepals more or less spathulate. The pods are pale dull brown in colour, 4-7 cm long, 3-4 mm wide.

This taxon has a similar appearance to *A. enervia* subsp. *explicata*, which differs in having flowers with five parts.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

In the Geraldton District, this taxon has been recorded from south of Morowa, east of Mt Magnet and south-west of Paynes Find, extending to just outside the District boundary north-east of Wubin. It extends south-east to Hines Hill near Merredin and east to c. 90 km west of Coolgardie.

Grows on red-brown clay-sand or brown sandy clay at the margins of salt pans or lakes. A highly salt-tolerant species. Occurs in *Acacia* shrubland. Associated species include *Alyxia buxifolia.*

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Mt Gibson	Y	-	27.8.1993	-	-
2. E of Mt Magnet	MM	Pastoral Lease	24.9.1993	-	-
3.* S of Morowa	Mo	-	31.8.1982	-	-

Response to Disturbance

Unknown

Management Requirements

- Maintain liaison with land managers.

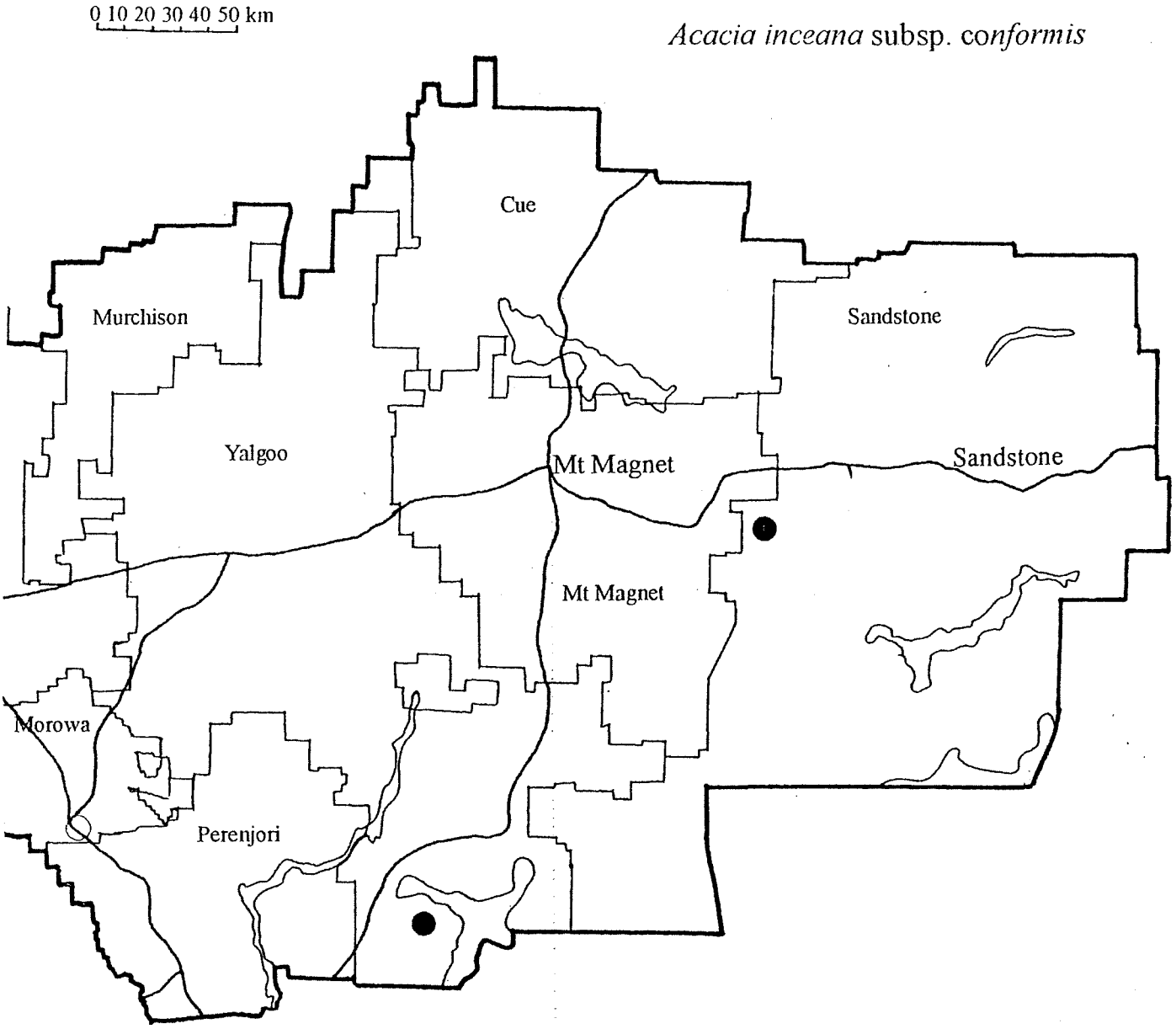
Research Requirements

- Further survey is required to refind and survey the three populations recorded in the District and to find further populations.

[#] species has been taken off the Priority Flora list (updated at December 1999)

References

Cowan & Maslin (1995b).



Acacia lanceolata Maslin MIMOSACEAE

This species was first collected by Blackall in 1940 from Three Springs in the Moora District.

Acacia lanceolata is a much-branched shrub to 1.5 m tall. The branchlets are spinose, with short soft hairs and a waxy bloom when young. The phyllodes are lanceolate, 7-13 mm long and 1.5-4 mm wide, each with a pungent point. They have a central midrib, with two or three minor nerves parallel to it and the gland 4-7 mm above the pulvinus, with the margin slightly angled at the gland. The flower heads are globular to shortly oblongoid and the legumes are tightly coiled.

This species is related to *A. amblygona,* which has non-spinose branchlets without a bloom, the mid-rib of the phyllode near the lower margin and the pods curved or openly coiled.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

This species occurs in a hilly area east of Mingenew in the Geraldton District over a range of 11 km and has also been recorded from several populations c. 40 km further south in the Moora District, north-west and west of Three Springs. Two of the latter are on nature reserves.

Grows on low hills, usually on laterite or sandstone, in eucalypt woodland with *Eucalyptus drummondii* or tall shrubland of *Allocasuarina* and *Dryandra* species.

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. E of Mingenew	Mi	Private	17.9.1987	1	-
2.* E of Mingenew	Mo	-	1973	-	-
3. E of Mingenew	Mo	-	17.9.1987	Fairly common	-
4. E of Mingenew	Mo	Shire Road Verge	4.8.1994	5+	Healthy
5. NE of Mingenew	Mo	Shire Road Verge, Private	8.7.1995	20+	Healthy

Response to Disturbance

It was noted that a population in the Moora District was common on the road verge but not in adjacent undisturbed vegetation.

Management Requirements

- Ensure that road verge populations are marked.
- Maintain liaison with private landowners and land managers.

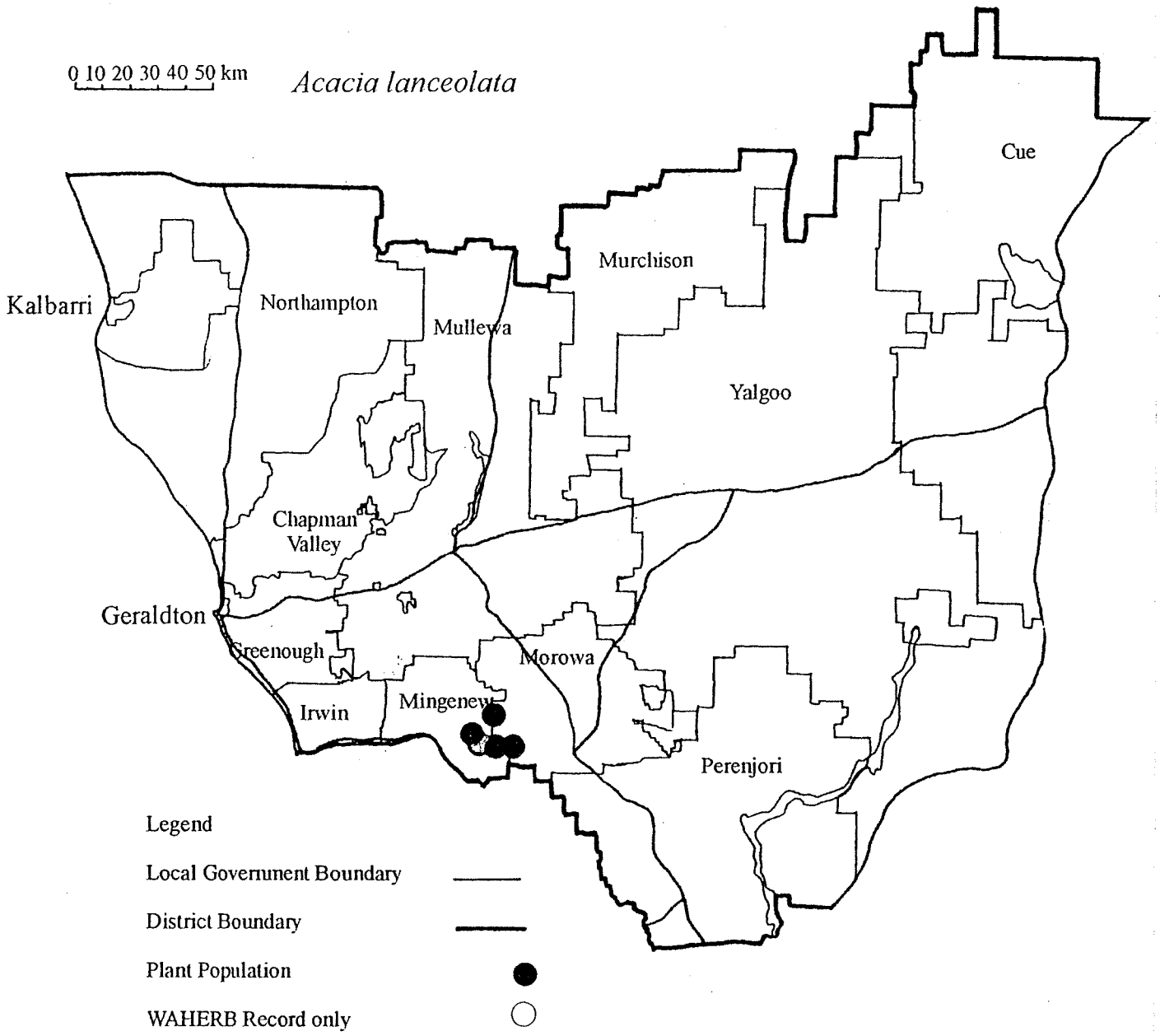
Research Requirements

- Further survey is required, particularly to refind and survey populations 1, 2 and 3 recorded in the District in the past, and also to establish the full extent of population 5 and find further populations.

[#] now Priority 2 (updated at December 1999)

References

Maslin (1999).



Acacia lineolata Benth. subsp. ***multilineata*** (W.Fitzg.) R.S.Cowan & Maslin

MIMOSACEAE

This taxon is placed in the *"Acacia enervia"* group, in which the phyllodes are terete to flat with an acute apex drawn out to a delicate curving tip, and with numerous closely parallel nerves. The flower heads are rather small, on fine stalks, the flowers having four or five parts and the perianth parts are free or nearly so. The pods are flat or linear.

A dense shrub to 1.7 m tall, with a bushy crown to 3 m in diameter. The stipules are persistent, triangular and less than 1 mm long. The phyllodes are held upright or spreading. They are oblong-oblanceolate to oblong-elliptic in shape, acute to short-acuminate, 3-6.5 cm long, 3-5 mm wide. They are 10-13 times longer than wide, rigid-coriaceous, straight to incurved, the apical point straight and pungent. The nerves of the phyllodes are distinct and slightly raised. There are 1-3 inconspicuous glands along the upper margin, the lowermost one 5-21 mm above the pulvinus. The peduncles are 5-11 mm long. There are one or two flower heads in each axil. They are globular or slightly elongate, 4-6 mm in diameter, golden in colour. The flowers have their parts in fives and the sepals are always free. The pods are linear, to 10 cm long and 2-3 mm wide. The seeds are glossy and brown in colour, with a yellow aril.

Subspecies *multilineata* differs from the typical subspecies in its broader, pungent phyllodes, sepals which are never united and in its habitat. It is also superficially similar to *A. patagiata* which has different phyllode nervature, and to *A. unguicula* which has spinose stipules.

Flowering Period: June-August

Distribution and Habitat in the Geraldton District

Occurs in the Mullewa area of the Geraldton District but was originally collected from Arrino, some 100 km further south in the Moora District, where it still occurs. A collection made near Latham has not yet been confirmed as this taxon.

Unlike the typical subspecies which often grows in saline conditions on sandy or stony loam, this taxon is found on sandplains or on rocky clay. Grows in mallee woodland with associated species, including *Eucalyptus loxophleba* and *Melaleuca nesophylla.*

Conservation Status

Current: Priority 1

Populations known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. E of Mullewa	Mu	Shire Road Verge	7.7.1995	10+	Healthy
2.* W of Mullewa	Mu	-	19.7.1972	-	-
3.* Yuna	CV	-	25.6.1972	-	-

Response to Disturbance

A population in the Moora District was recorded from an open disturbed site in gravel on the edge of a gravel pit as well as in adjacent mallee woodland.

Management Requirements

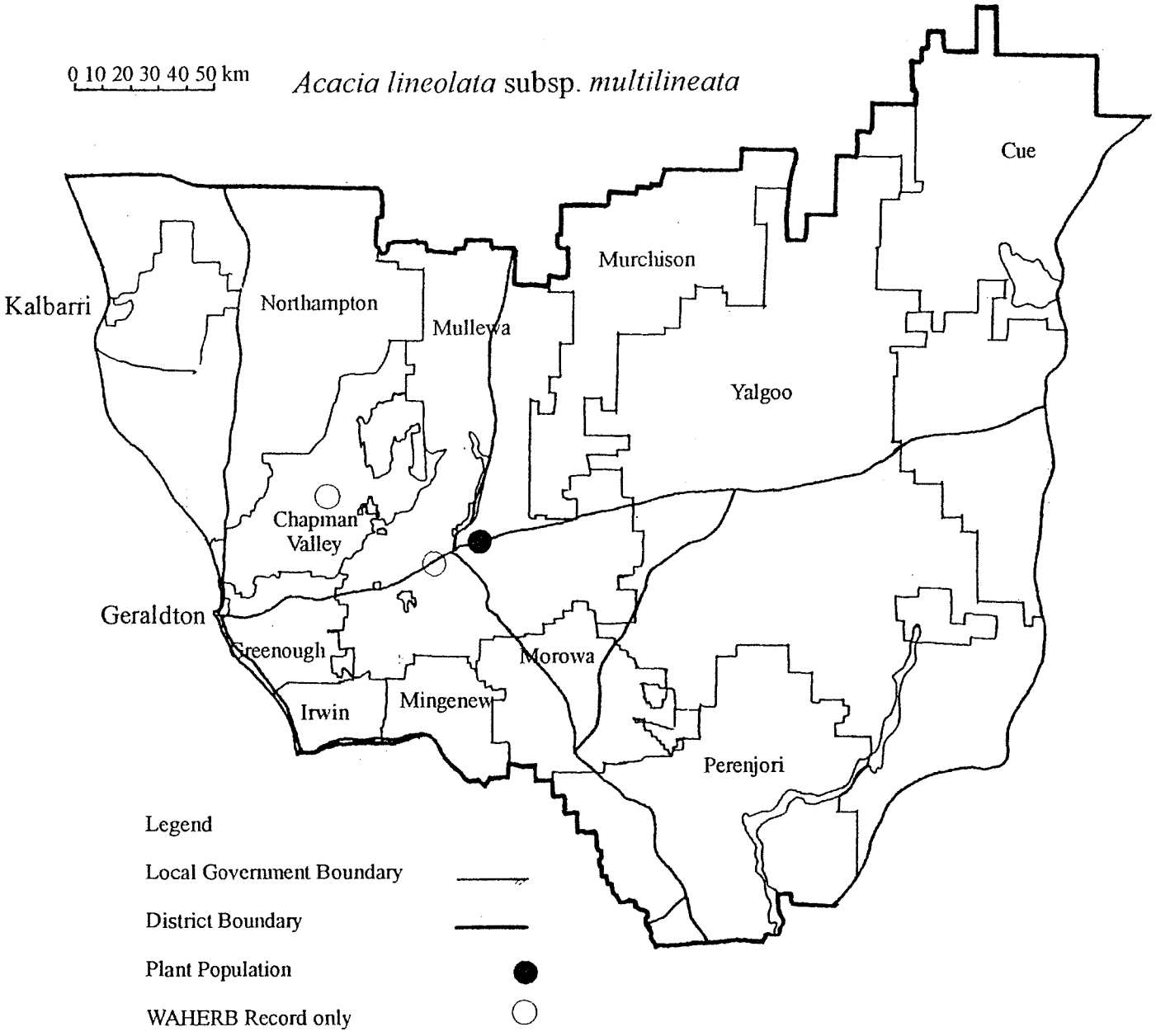
- Ensure that the road verge population is marked.
- Maintain liaison with the Shire on whose road verge population 1 occurs.

Research Requirements

- Further survey is required to refind and survey populations 2 and 3 and to survey in suitable habitat, particularly on conservation reserves, for further populations.

References

Cowan & Maslin (1995b).



Acacia megacephala Maslin MIMOSACEAE

An erect, single or multistemmed shrub 1-2 m tall, with pilose branchlets which are often pendulous. There are axillary spines, 5-15 mm long, which are usually solitary. The stipules are narrowly triangular, 2-4 mm long. The leaves are bipinnate, with one pair of pinnae and a very short petiole. There are 4-6 pairs of pinnules which are narrowly obovate, 4-6 mm long, 2-3 mm broad. They are flat and dull green. The peduncles are 15-25 mm long, supporting large globular flower heads 8-10 mm in diameter, with 80-90 narrowly top-shaped flowers. The pods are linear or narrowly oblong, 25-50 mm long, 4 mm wide, dark brown and hairless, with oblong brown seeds.

This species is related to *Acacia lasiocarpa* and *A. pulchella,* but differs in its very long peduncles and large flower heads with 80-90 narrowly top-shaped flowers. It is distinguished from *A. pulchella* by the presence of one spine, not two, at each node, by its longer, narrower stipules and terminal setae, and by the larger pinnules. *A. lasiocarpa* has pinnules with recurved margins and shorter glands.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

Has been recorded in the past from about 16 km east of Geraldton eastwards to the Greenough River over c. 30 km, but has recently been found only between Kojarena and Northern Gully over c. 6 km. Also occurs 30 km further south in the Burma Road area.

Grows in white, pale yellow or brown sand in tall open scrub of *Banksia menziesii, Nuytsia floribunda, Xanthorrhoea* sp. and *Xylomelum angustifolium,* with heath of *Hibbertia, Grevillea, Melaleuca* and *Conospermum* species.

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Kojarena	G	Railway Reserve	6.7.1995	4	Moderate
2. Kojarena	G	MRWA Road Verge, Private	6.7.1995	20+	Moderate, weed infestation and rubbish
3. Burma Road	G	Nature Reserve	16.8.1996	150+	Healthy
4. E of Northern Gully	G	MRWA Road Verge, Railway Reserve	6.7.1995	5	Moderate
5. Burma Road	G	Shire Road Verge	5.8.1994	100+	Healthy
6.* E of Geraldton	G	-	23.4.1970	-	-
7.* E of Geraldton	G	-	12.8.1956	-	-
8.* Northern Gully	G	-	2.12.1971	-	-
9.* E of Northern Gully	G	-	5.10.1972	-	-
10.*Burma Road	G	-	9.7.1972	-	-
11.*Eradu	G	-	4.10.1963	-	-

[#] now Priority 2 (updated at December 1999)

Response to Disturbance

Unknown

Management Requirements

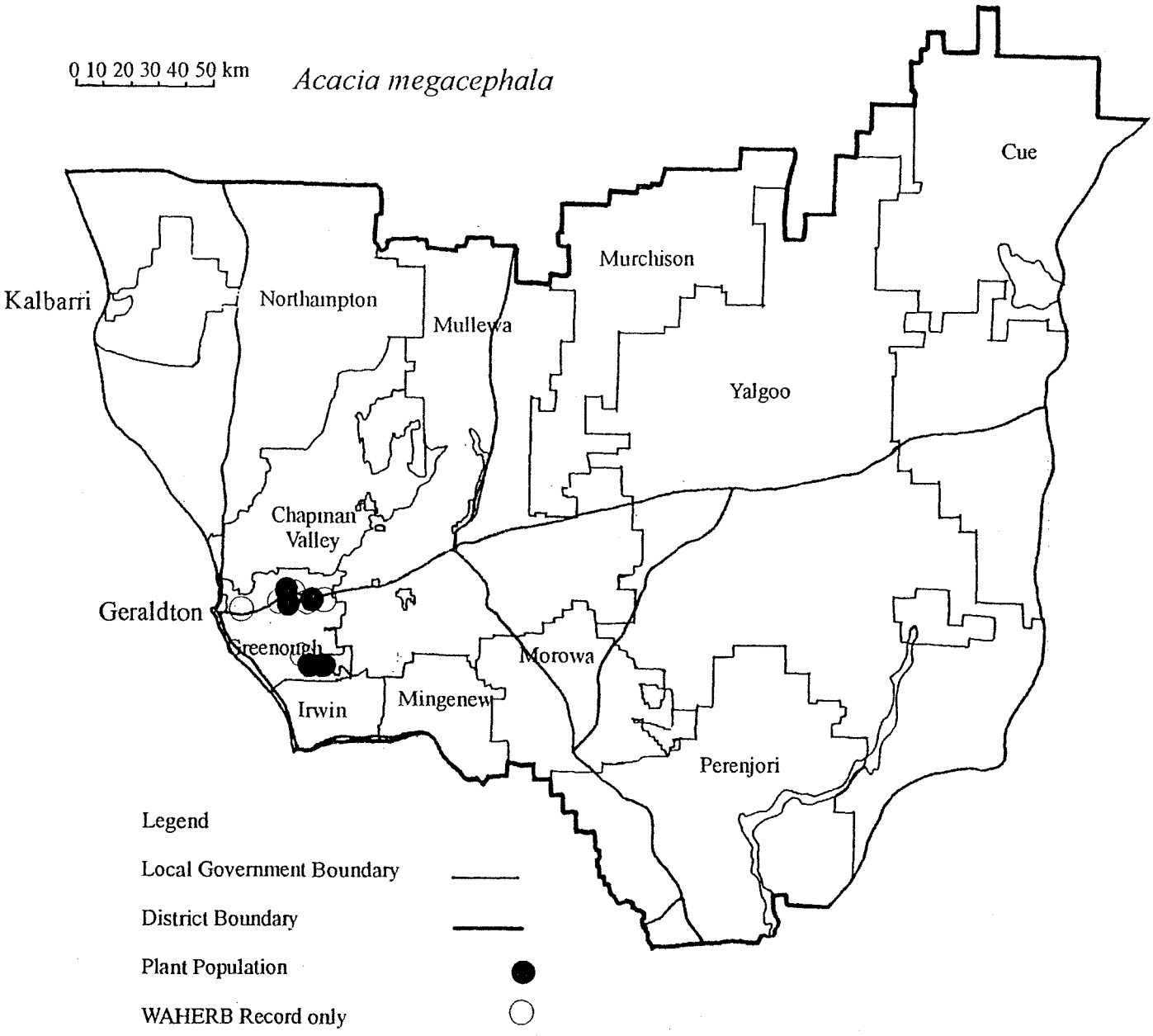
- Ensure that road verge and rail reserve populations are marked.
- Maintain liaison with land managers.

Research Requirements

- Further survey is required to refind populations 6-11 and to find further populations, particularly in suitable habitat on conservation reserves over the range east of Geraldton in which it has been recorded in the past, and in the Burma Road area south-east of Geraldton.

References

Maslin (1972, 1975).



Acacia nigripilosa Maiden subsp. *latifolia* Maslin MIMOSACEAE

An erect or spreading shrub, rounded in shape, growing to 2 m tall and 2-3 m in diameter. The bark is smooth and light grey. The phyllodes are glaucous, dull and flat, with one central nerve. They are c. 2 cm long and 5-8 mm wide, slightly asymmetric, narrowly oblong-elliptic to oblanceolate, narrowing abruptly at the apex to straight, fairly pungent points.

The inflorescences are one- or two-headed racemes, enclosed when young in brown papery bracts. The flower heads are slightly elongate, golden in colour, on stalks 4-10 mm long. The flowers have five petals which have brown to black appressed hairs. The pods are 4-9 cm long, 4-7 mm wide, with shiny dark brown seeds.

Acacia nigripilosa can be distinguished from all other species of *Acacia* by the presence of dark appressed hairs on the petals. Subspecies *latifolia* differs from the typical subspecies in its wider phyllodes which are dull and glaucous. The typical subspecies has phyllodes which are 1-5 mm long, green and somewhat shiny.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

Occurs between Caron and Maya over a range of c. 30 km, with a disjunct occurrence north-east of Geraldton. Grows on yellow or light brown sandplain, or on hills with stony yellow sand or loam, in tall dense scrub with *Allocasuarina* and *Acacia* species.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* Mullewa	Mu	-	26.8.1964	-	-
2.* Bunjil	P	-	28.8.1964	-	-
3.* N of Caron	P	-	24.8.1973	-	-
4.* N of Latham	P	-	16.12.1981	"common"	-
5.* N of Latham	P	-	23.8.1973	-	-
6.* Near Maya	-	-	23.8.1963	-	-

Response to Disturbance

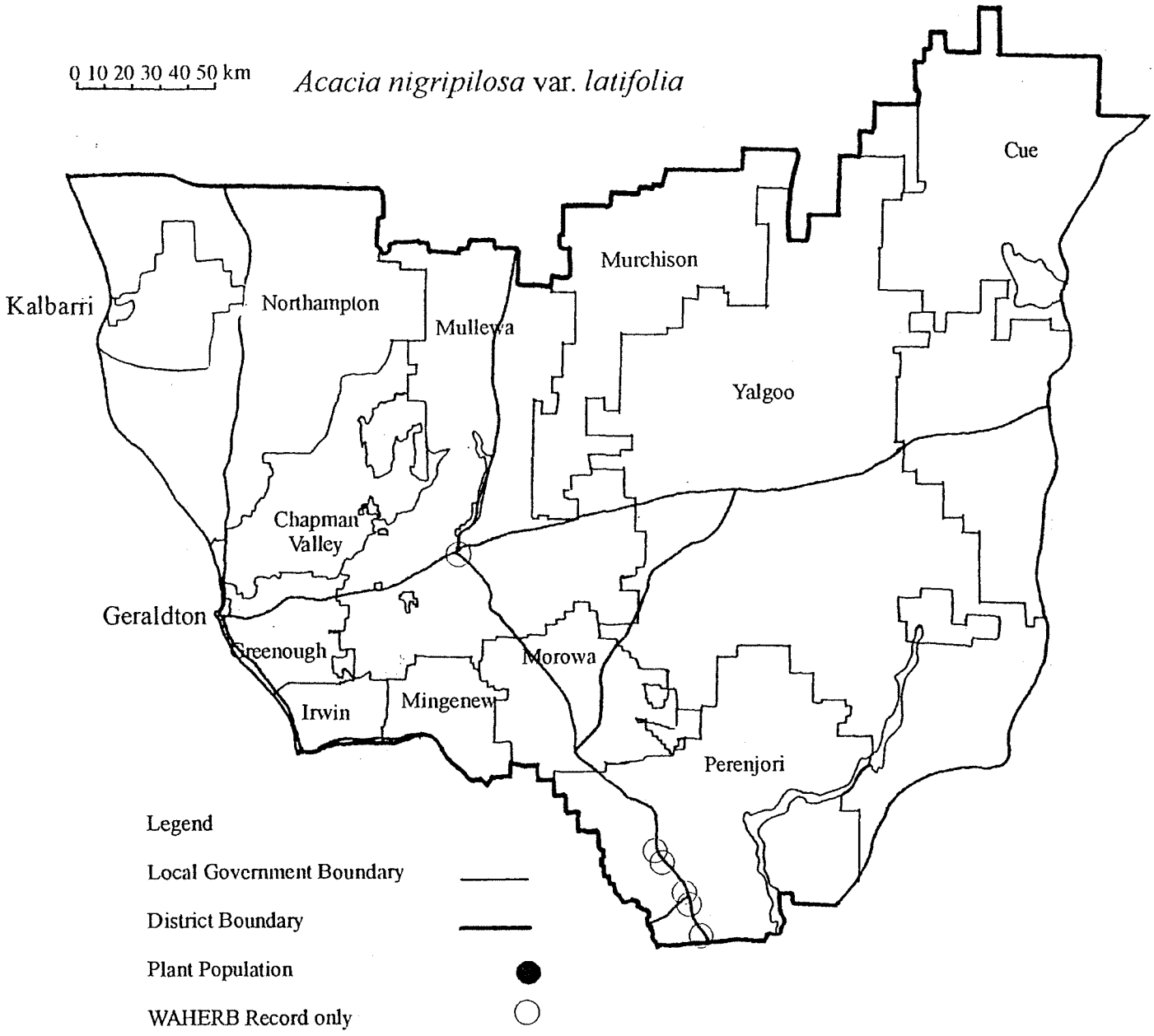
Unknown

Research Requirements

- Further survey is required to refind and resurvey the populations previously recorded and to find further populations, particularly on conservation reserves.

References

Maslin (1999).


0 10 20 30 40 50 km
Acacia nigripilosa var. latifolia
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Acacia nodiflora Benth. MIMOSACEAE

This species was first collected by James Drummond from "Swan River" and later described from these collections by Bentham in 1855. The next collection of the species was made by W.E. Blackall in 1940 and only four collections were made subsequently until it was surveyed in 1991 for the Moora District Endangered Flora Program.

Acacia nodiflora is a diffuse shrub to 2 m tall. The phyllodes are grouped in bundles, with up to seven phyllodes in each. They are linear to narrowly oblong, 7-13 mm long, 0.5-1.5 mm wide. There is a pair of spiny stipules at each cluster of phyllodes. The flower heads are globular to widely ellipsoid, golden in colour and 5-7 mm in diameter. They are borne on peduncles 1-2 cm long and are grouped 1-3 per node. The legumes are up to 6.5 cm long, 7-8 mm wide.

This species is related to *A. dentifera,* which has larger phyllodes which are not grouped into bundles and have non-spiny stipules. The populations in the Geraldton District have plants that are more hairy than those found further south.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

This species is known from south-west of Morawa in the Geraldton District to east of Carnamah further south in the Moora District, over a range of c. 40 km. It is known in the Moora District from about 15 populations on private land and road verges.

Grows amongst laterite, chert or granite rocks on low hills, in brown loam or clay soils. Occurs in open low scrub and associated species include species of *Melaleuca, Acacia* and *Allocasuarina.*

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SW of Morowa	Mo	Crown Reserve	25.9.1990	24	Partly disturbed

Response to Disturbance

Unknown

Management Requirements

- Ensure that land managers are aware of the population.

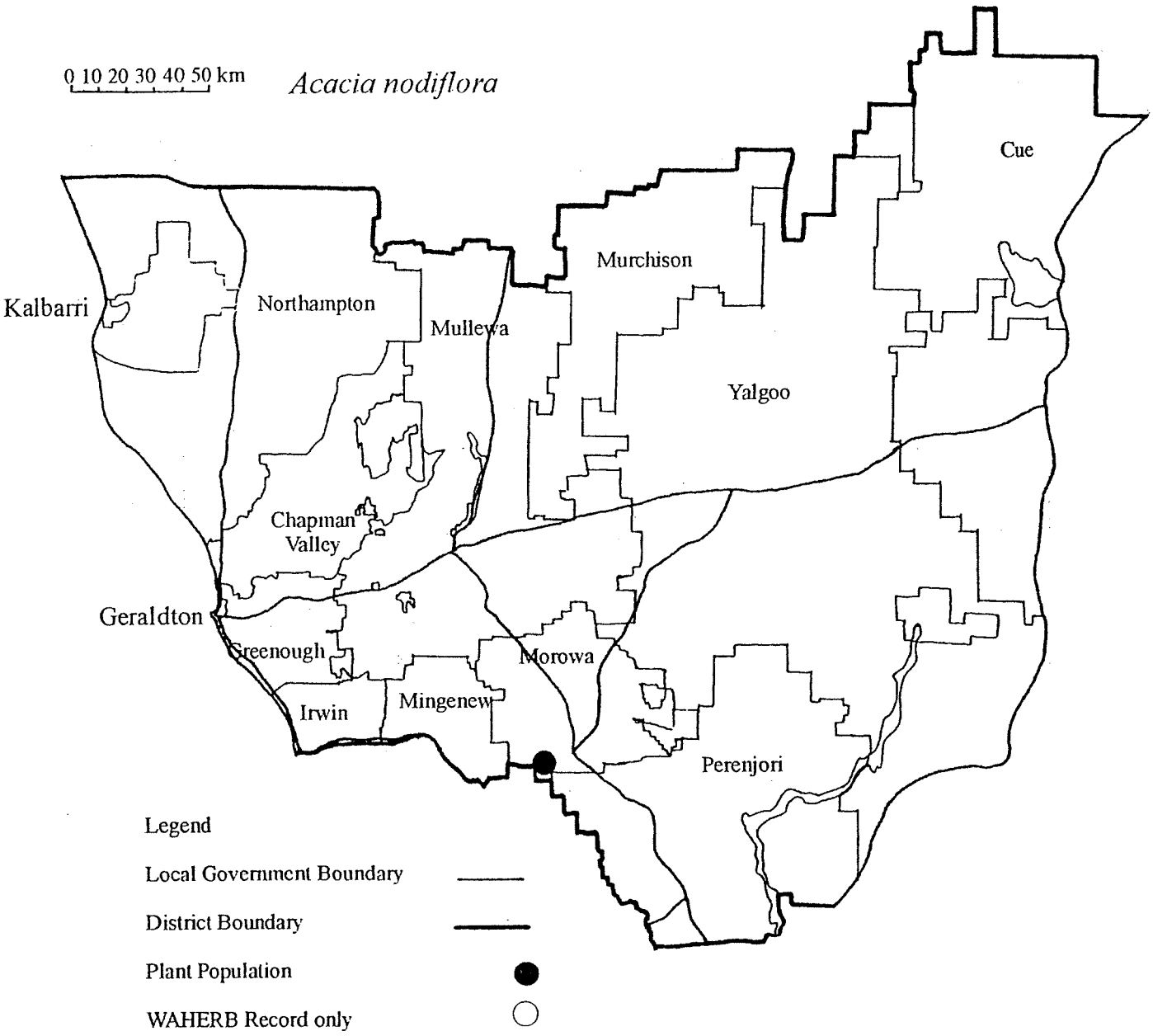
Research Requirements

- Further survey is required.

[#] now Priority 3 (updated at December 1999)

References

Bentham (1855), B. Maslin (personal communication).



Acacia pelophila R.S.Cowan & Maslin MIMOSACEAE

A dense, rounded shrub 1-2 m tall. The stipules are persistent, narrowly triangular, to 0.8 mm long. The phyllodes are linear-oblanceolate, widest near the apex, 37-75 mm long, 3-5 mm wide. They are straight to gently curved, with three or four nerves per face, and are held upright. There are two flower heads at each node, with stalks to 9.5 mm long. The heads are slightly elongated, 5.5-6 mm long, 4.5 mm in diameter. They have 33-45 flowers which have their parts in fives. The pods are linear, to 5 cm long, 1.5 mm wide, slightly curved, with appressed hairs. The seeds are semi-glossy, black, with a white aril.

Acacia pelophylla is most closely related to *A. sclerophylla,* but has larger phyllodes, sub-globular heads and straighter, narrower pods. It superficially resembles *A. lanei,* which has white silky hairs on the resinous branchlets, globular heads in reduced racemes and glabrous pods 2-3 mm wide.

The specific name of *A. pelophylla* means clay-loving, referring to the habitat in which it grows.

Flowering Period: July-August, October

Distribution and Habitat in the Geraldton District

Known from a few collections made in the Northampton to Lynton area, most recently in 1989. It has been collected over a range of about 18 km. Although this species is represented by eight collections in the Western Australian Herbarium, the locality information for four of these is not precise.

Grows along saline creek lines in white to grey-brown clay, sometimes overlain with red or brown silt. Grows in low woodland with *A. brumalis* and *Eucalyptus arachnea.* The area of occurrence is heavily cleared.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* Near Lynton	N	-	1.9.1940	-	-
2.* Yerina Spring Road	N	-	6.10.1972	-	-
3.* NW of Northampton	N	Private	30.7.1987	Occasional	-
4.* E of Port Gregory Road	N	-	-	-	-

Response to Disturbance

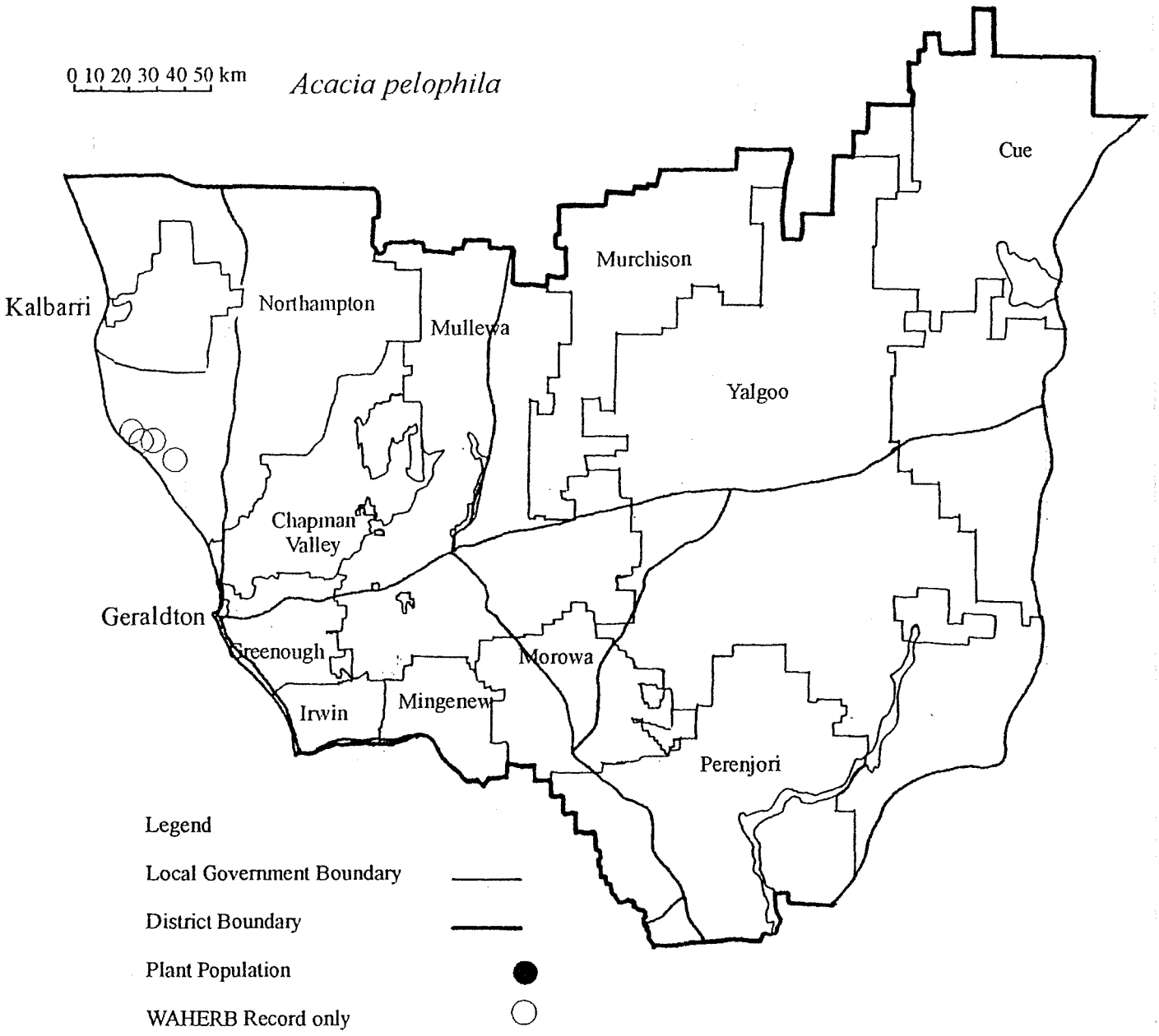
Unknown

Research Requirements

- Further survey is urgently required.

References

Cowan & Maslin (1999a).


0 10 20 30 40 50 km
Acacia pelophila
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Acacia pterocaulon Maslin MIMOSACEAE

An intricately branched, tangled shrub to 1.3 or 2 m tall, either erect or sprawling. The phyllodes are continuous with the branchlets, decurrent in two vertical rows, forming two opposite wings on the stems. Each wing is 2-6 mm wide, with prominent yellow or light brown marginal nerves. The free portion of the phyllode is 1-5.5 cm long, lanceolate to narrowly triangular, with a prominent central nerve. There are about five flower heads in each raceme, which is 1-8 cm long, with 1-2 in each axil. Each flower head is globular, 10-15 mm in diameter, golden in colour, on a stalk 10-15 mm long. The pods are linear, to 12 cm long, 4-5 mm wide, straight or slightly curved. The seeds are oblong, to 5 mm long, dark brown to black, with a white aril.

This species vegetatively resembles *Acacia glaucoptera* and *A. willdenowiana,* species which occur further south, but it is distinguished by its long, linear, almost straight pods. *A. glaucoptera* is similar in habit but has much smaller flower heads, shorter racemes and has dense hairs in the axils of the phyllodes. *A. willdenowiana* has a rush-like growth form, twinned peduncles and pale flower heads with fewer flowers.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

Occurs in a range of hills west of Morowa where it has been recorded over a narrow range of c. 5 km and where it is reported that several hundred plants exist. There are also unconfirmed reports of this species from a range of hills east-north-east of Morowa, 40 km from the known populations.

Grows on rocky hill slopes in clay loam, clayey sand or reddish sandy loam with chert. Occurs in mallee *Eucalyptus* woodland or dense scrub of *Allocasuarina campestris* with associated species, including *Melaleuca cardiophylla, Ricinocarpus velutinus, Calycopeplus ephedroides* and *Baeckea* sp.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Neates Road	Mo	Shire Road Verge, Private	13.11.1996	5+	Healthy
2. Mt Campbell	Mo	Crown Reserve, Trig Station	25.9.1990	15+	Undisturbed
3. Manners Valley	Mo	-	29.9.1990	-	-
4.* W of Morowa	Mo	-	29.8.1973	-	-

Response to Disturbance

Unknown

Management Requirements

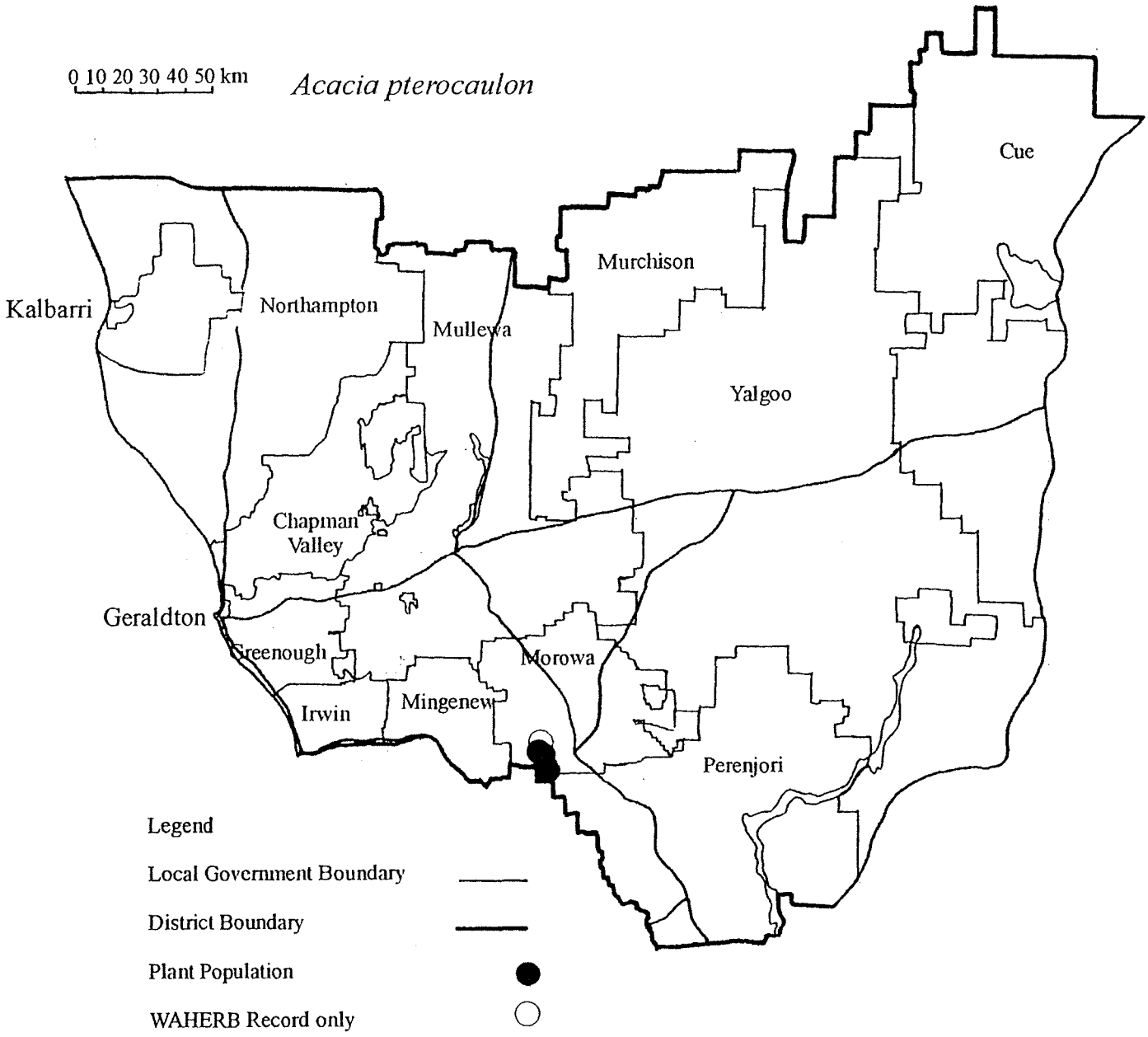
- Ensure that the road verge population is marked.
- Establish and maintain liaison with landowners and managers.

Research Requirements

- Further survey is required, particularly within the known area of occurrence to establish the full extent of populations 1-3, and to find further populations to the west and north-east of Morowa.

References

Maslin (1995a).


0 10 20 30 40 50 km
Acacia pterocaulon
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Acacia unguicula R.S.Cowan & Maslin MIMOSACEAE

An erect, open shrub 1-2 m tall, with smooth grey bark. The stipules are persistent, spinescent, somewhat recurved, 0.7-1.2 mm long. The phyllodes are rigid, erect, narrowly oblong to oblanceolate, pungent, to 40 mm long and 4 mm wide, with 14-16 prominent nerves. They are olive-green and clustered towards the ends of the branches, with the persistent stipules remaining on the bare branchlets. The flower heads are deep golden, globular, 5-6 mm in diameter, on stalks 7-11 mm long. The pods are linear, becoming coiled, to 60 mm long, 2 mm wide.

This species is related to *Acacia multilineata,* differing in its persistent recurved spiny stipules, longer peduncles and prominent nerves.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

Known only from Mt Singleton between Wubin and Paynes Find.

Grows on the upper slopes and mountain summit amongst open scrub, in rocky clay, brown clayey sand or brown loam with dolerite. Associated species include *Allocasuarina tesselata, A. campestris, Micromyrtus racemosa* and *Brachysema aphylla.*

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Mt Singleton	Y	Pastoral Lease	6.10.1993	50+	Healthy, but some grazing by goats

Response to Disturbance

Unknown

Management Requirements

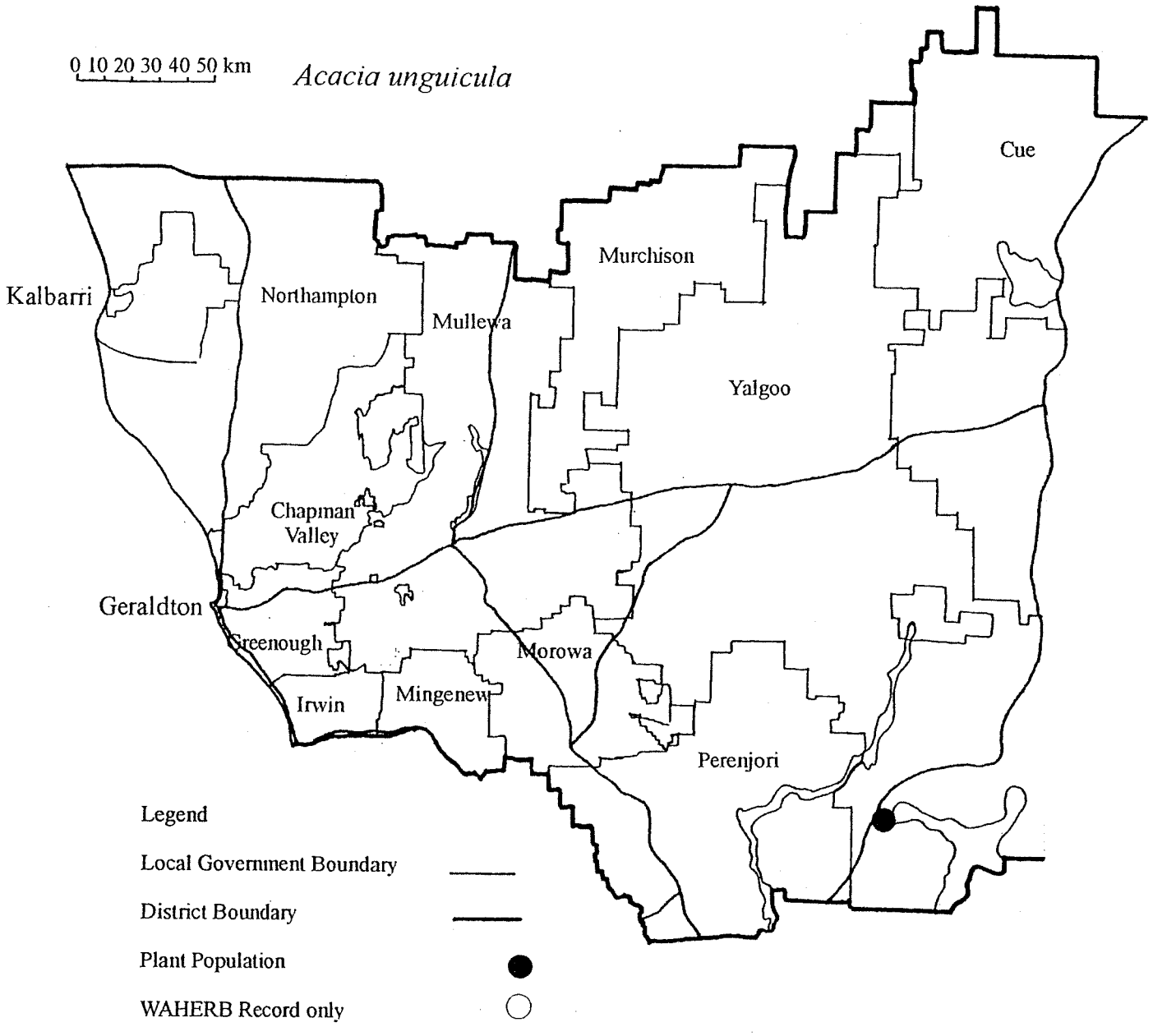
- Maintain liaison with land managers.

Research Requirements

- Further survey is required to establish the full extent of the population and to find others in similar habitat elsewhere.

References

Cowan & Maslin (1990).


0 10 20 30 40 50 km
Acacia unguicula
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Allocasuarina tessellata (C.A.Gardner) L.A.S.Johnson CASUARINACEAE

An upright shrub or tree 3-5 m high, with erect branches. The branchlets are glaucous green towards the ends, becoming woody lower down. There are 8-10 teeth in each whorl on the branchlets. The teeth are erect or appressed, not spreading. The branchlets are circular in cross-section, deeply striate, and the distance between their joints is 7-14 mm. The male spikes are terminal and dense, 4-4 cm long, with seven or eight whorls per centimetre. The erect, cylindrical cones are tessellated, the surface of the bracteoles being divided into 5-7 small sections. The cones often have a sterile apex to 5 mm long, forming a beak, and the stalk is 7-13 mm long, the cone 26-55 mm long, 14-18 mm in diameter. The winged seed is 5-7.5 mm long, the nut dark brown and the wing translucent.

This species is similar to *Allocasuarina campestris* but is more tree-like in habit, with cones on longer stalks and with the characteristic tessellated surface. Gardner considered it closely related to *A. helmsii,* differing in the grooved branchlets and stalked cones with thick, prominent bracts.

Flowering Period: April, August-September

Distribution and Habitat in the Geraldton District

Known from one range of hills south-east of Paynes Find, where it has been recorded over a range of 28 km.

Grows in brown loam with dolerite on hill slopes in tall shrubland and low woodland. Associated species include *A. dielsiana, Santalum acuminatum, S. spicatum, Brachychiton gregorii, Thryptomene mucronata, Melaleuca uncinata* and *Acacia* species, including *A. jibberdingensis.*

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Mt Singleton	Y	Pastoral Lease	6.10.1993	500+	Some grazing
2. Wylacoopin Hill	Y	Pastoral Lease	19.4.1992	500+	Some grazing
3. NE of Mt Gibson Homestead	Y	Pastoral Lease	15.7.1994	30+	Healthy

Response to Disturbance

Unknown

Management Requirements

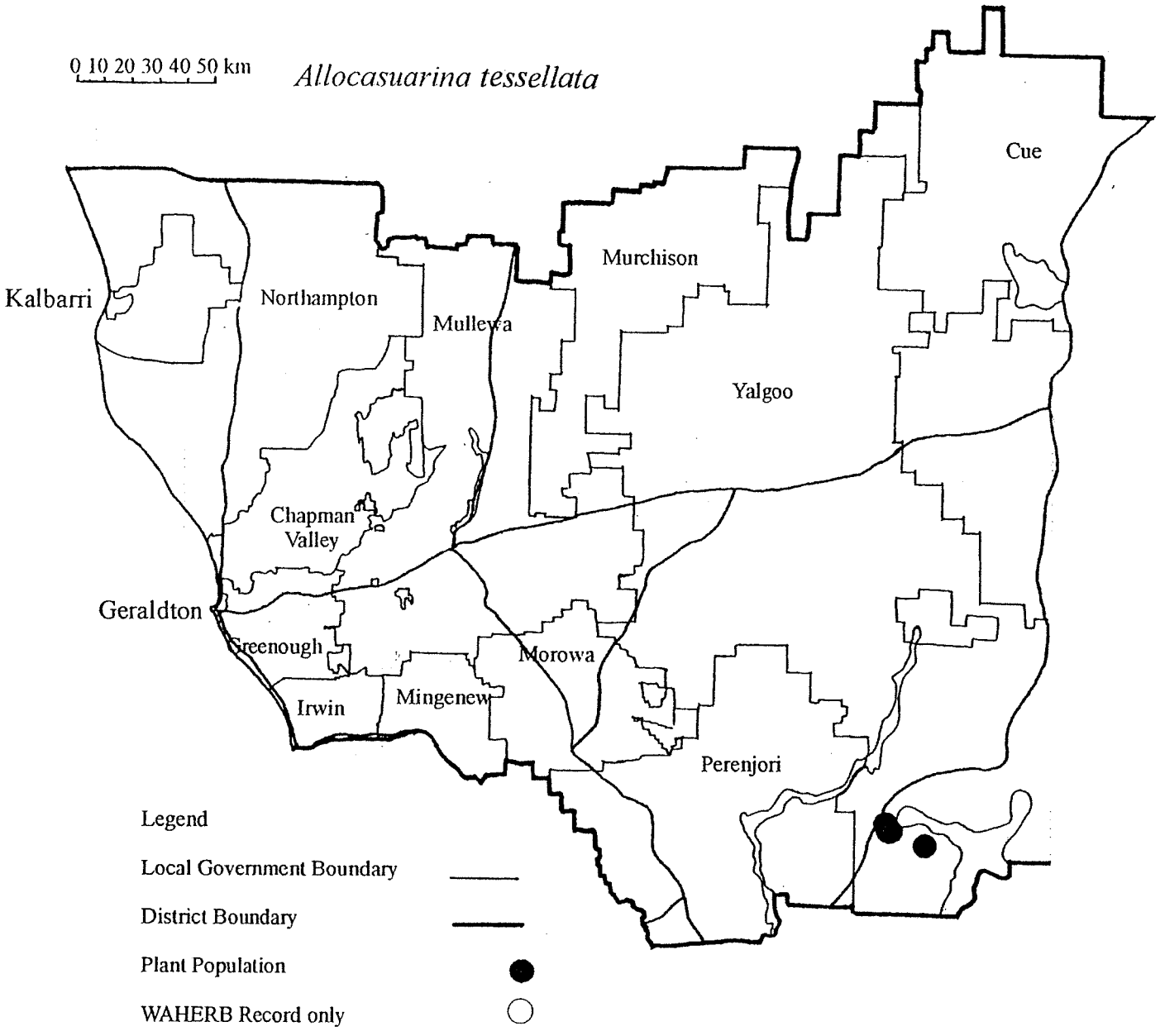
- Maintain liaison with land managers.
- Monitor grazing pressure of goats in the area of occurrence.

Research Requirements

- Further survey is required to establish the full extent of this species on the range of hills where it is known to occur, and on similar habitat elsewhere.

References

Bennett (1982), Gardner (1936), Johnson (1982), Wilson & Johnson (1989).


0 10 20 30 40 50 km
Allocasuarina tessellata
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Alyxia tetanifolia Cranfield APOCYNACEAE

A newly described species, first collected in 1992, *Alyxia tetanifolia* is an upright shrub to 2 m high and up to 2.5 m across, the branches somewhat spreading. The leaves are opposite and decussate, with a short stalk and an acute spiny tip. They are linear, 9-15 mm long, 1.2-1.7 mm broad, with revolute margins. The inflorescences are terminal, with one or two sweet-smelling flowers. Each flower has a short stalk and is 6-6.5 mm long. The white perianth is tubular, expanding to five triangular lobes 1.5 mm long. The fruit is a red ellipsoid drupe 7 mm long.

This species is related to *A. buxifolia,* which has obtuse, longer leaves, and to *A. spicata,* which has flowers in axillary racemes.

Flowering Period: February, May-June

Distribution and Habitat in the Geraldton District

This species is known from one locality in the Geraldton District north of Mt Magnet, where it has been found at two locations about 2 km apart. It has also been found near Kalgoorlie and at Diemals, a total geographic range of c. 450 km.

Grows in red-brown loam, loamy sand, sandy clay or sand over hard pan, adjacent to ephemeral creeks or lakes. North of Mt Magnet, it grows in a rocky area with laterite,quartz and ironstone fragments amongst open scrub of *Acacia, Eremophila* and *Senna* species at the edge of ephemeral creeks. At a site near Kalgoorlie, it grows in chenopod shrubland between a lake edge and a belt of eucalypts.

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. N of Mt Magnet	MM	Pastoral Lease	21.6.1995	9	Healthy
2. N of Mt Magnet	MM	VCL	2.2.1995	Common in area	-

Response to Disturbance

Plants at population 2 had recovered well from severe grazing.

Management Requirements

- Maintain liaison with land managers.

Research Requirements

- Further survey is required to find more populations of this species which has a wide geographical range and may well be more common.

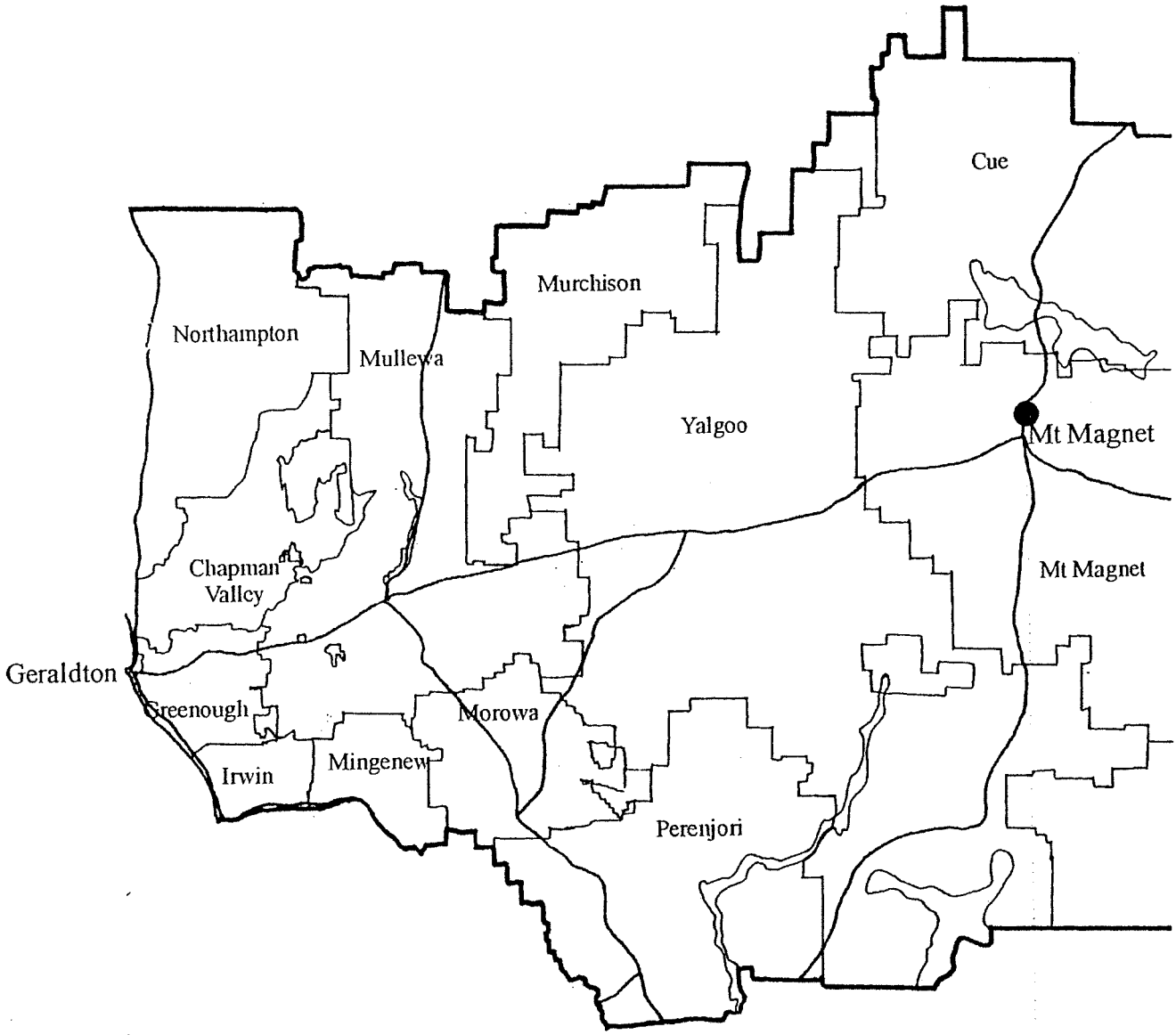
References

Cranfield (1995).

[#] now Priority 3 (updated at December 1999)

0 10 20 30 40 50 km

Alyxia tetanifolia



Legend

Local Government Boundary

District Boundary

Plant Population

WAHERB Record only

Angianthus uniflorus P.S.Short ASTERACEAE

An annual herb to 7 cm tall, with several ascending to erect stems which have cottony hairs. The leaves are alternate, linear, to 1.05 cm long, with a cottony appearance. The flowers are in compound terminal heads which are ovoid or ellipsoid, 0.6-1 cm long, 0.5-0.7 cm in diameter. The bracts are leaf-like but with hyaline apices. They form a conspicuous involucre around the head to one-third its length. There are 30-60 small flower heads within each compound head, each with only one flower. These have a five-lobed corolla and a pappus (modified calyx) which forms a jagged cup.

This species is similar to *Angianthus microcephalus,* which also has a single flower in each flower head, but in this species the pappus consists of two or three scales, each terminating in a barbed bristle.

Flowering Period: September

Distribution and Habitat in the Geraldton District

This species is known only from one population which was found south of Cue in 1986, where it was growing on the lower margin of a calcrete rise near a gypseous salt lake. This area has been searched twice since then but so far the species has not been refound.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* S of Cue	C	-	28.9.1986	-	-

Response to Disturbance

Unknown

Research Requirements

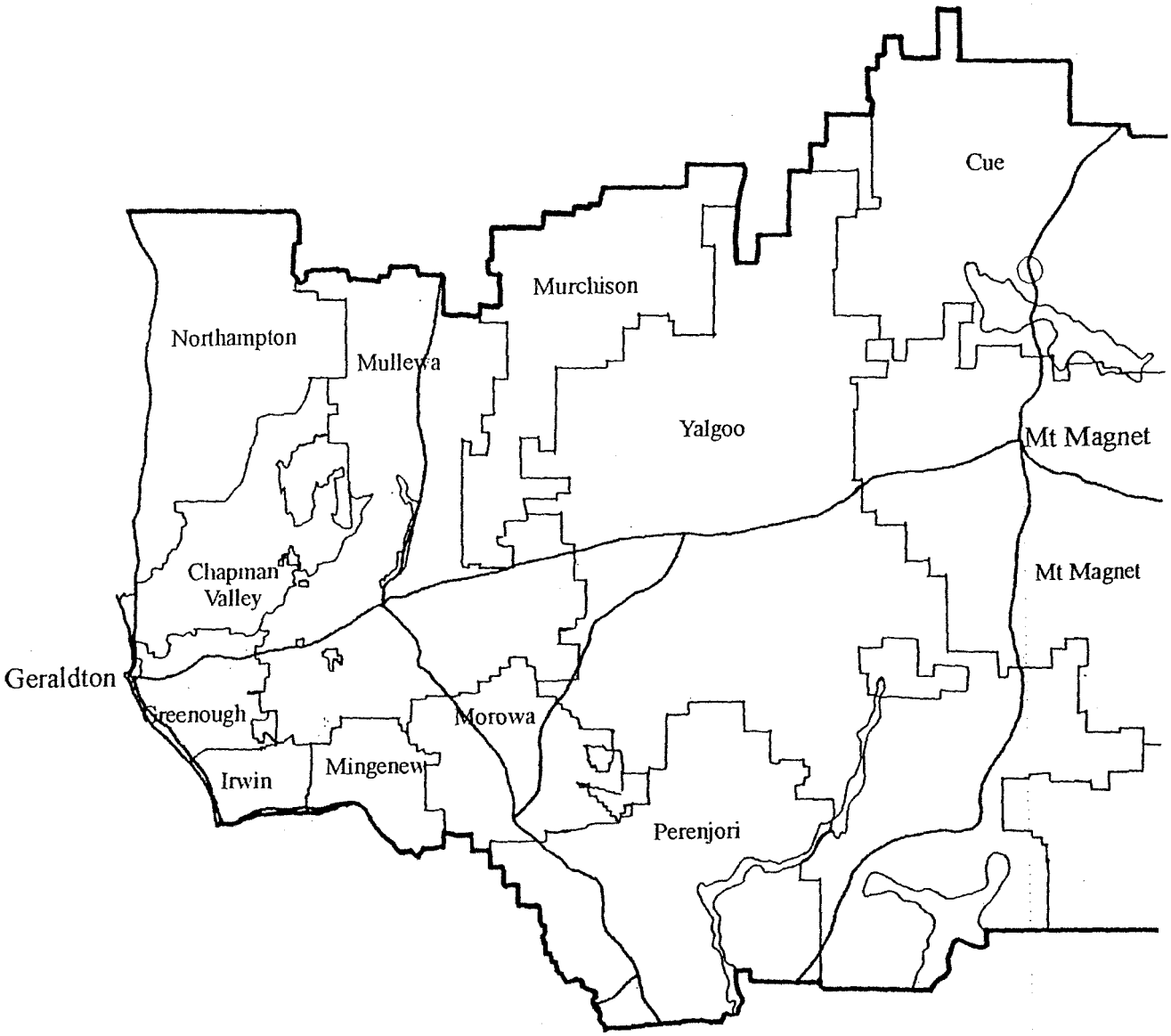
– Further survey is required to refind this species, survey the full extent of the population and find others.

References

Short (1990).

0 10 20 30 40 50 km

Angianthus uniflorus



Legend

Local Government Boundary

District Boundary

Plant Population

WAHERB Record only

Atriplex muelleri Benth. CHENOPODIACEAE

Mueller's Saltbush, Annual Saltbush

An erect or spreading, mealy white annual herb, branching from the base, to 30 cm tall. The leaves are thin, narrow to broadly rhomboid in shape, with a petiole half the length of the blade, altogether 15-30 mm long. The male flowers are clustered in terminal leaf axils and the female flowers are in scattered axillary clusters. The fruiting bracteoles are almost sessile, bluntly deltoid to circular, hard, smooth and swollen, c. 3 mm long, joined except at the rounded apex.

Flowering Period: September, October

Distribution and Habitat in the Geraldton District

This species is known from Queensland, eastern Northern Territory, northern New South Wales and north-eastern New South Wales, where it grows in low lying areas.

In the Geraldton District, it has been found north of Mingenew, where it was growing on a roadside in undulating clay plain with small drainage foci formed from shale. It occurred in shrubland of *Maireana pyramidata* with grasses.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. N of Mingenew	Mi	MRWA Road Verge	4.10.1995	-	-

Response to Disturbance

Unknown

Management Requirements

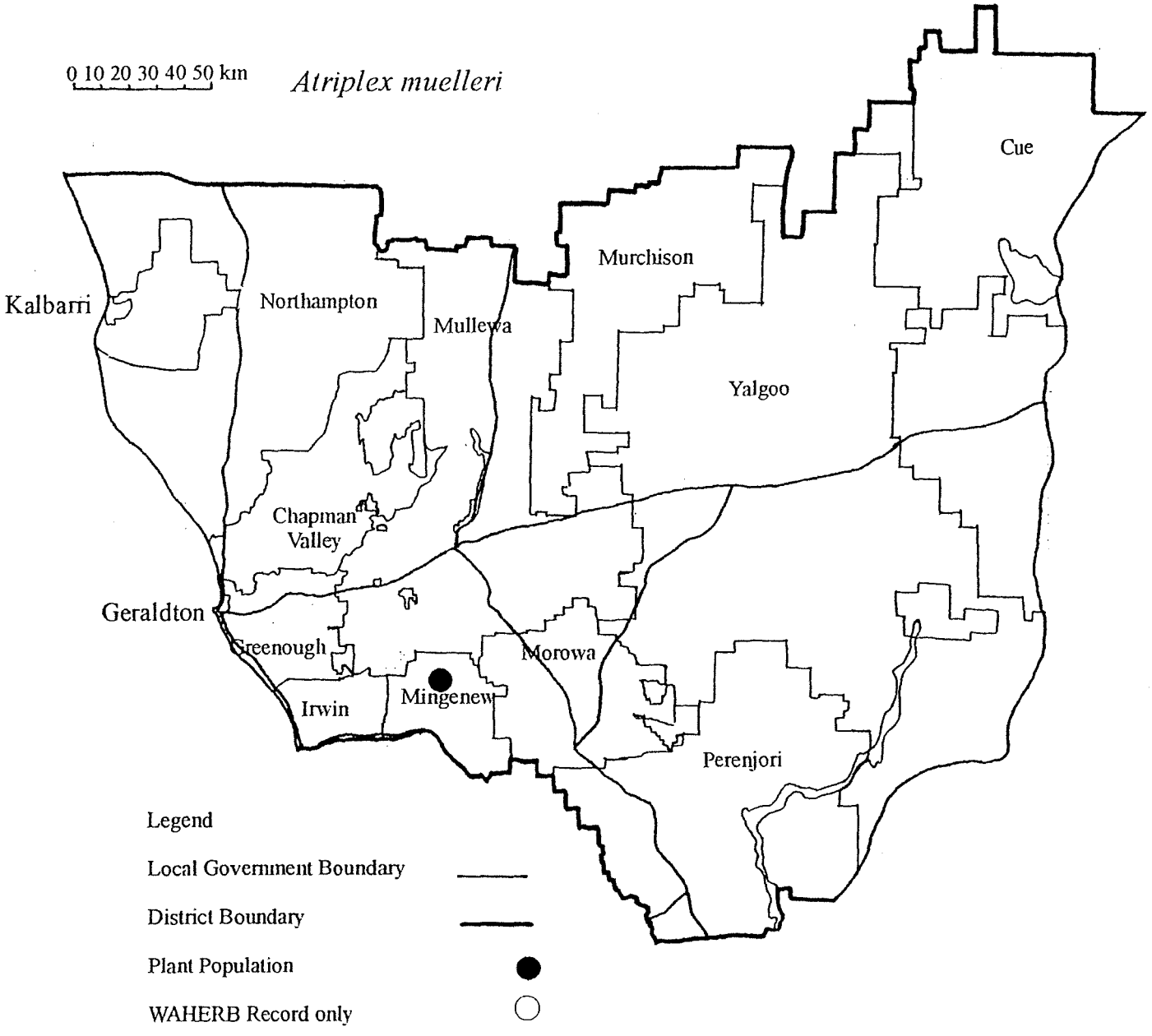
- Ensure that the population is marked.

Research Requirements

- Further survey is required.

References

Bentham (1870), Wilson (1984).


0 10 20 30 40 50 km
Atriplex muelleri
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Baeckea sp. Billeranga Hills (M.E.Trudgen 2206) MYRTACEAE

An erect, open shrub to 3 m tall, with few branches. The leaves are opposite, flat, elliptic, c. 1.5 mm long and 1 mm broad. They have a short stalk and are warty on the lower surface. The buds are pink in colour, the flowers are white. They are arranged in the axils of the upper leaves. They are c. 7 mm broad, with a slightly ridged floral tube. The five petals are rounded, c. 3 mm long. There are 10 stamens with flattened filaments. The style is c. 1.5 mm long.

Flowering Period: September

Distribution and Habitat in the Geraldton District

This taxon is known only from a range of hills south-west of Morawa, close to the southern boundary of the District. It has also been recorded from c. 6 km south-west of these hills in the Moora District.

It grows on the summit and upper slopes of the hills in yellow sand or red-brown clayey sand over granite or on chert. It grows in thickets, scrub or shrubland with *Melaleuca radula, Dodonaea lobulata, Hemigenia macphersonii* and species of *Thomasia, Eucalyptus* and *Casuarina.*

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

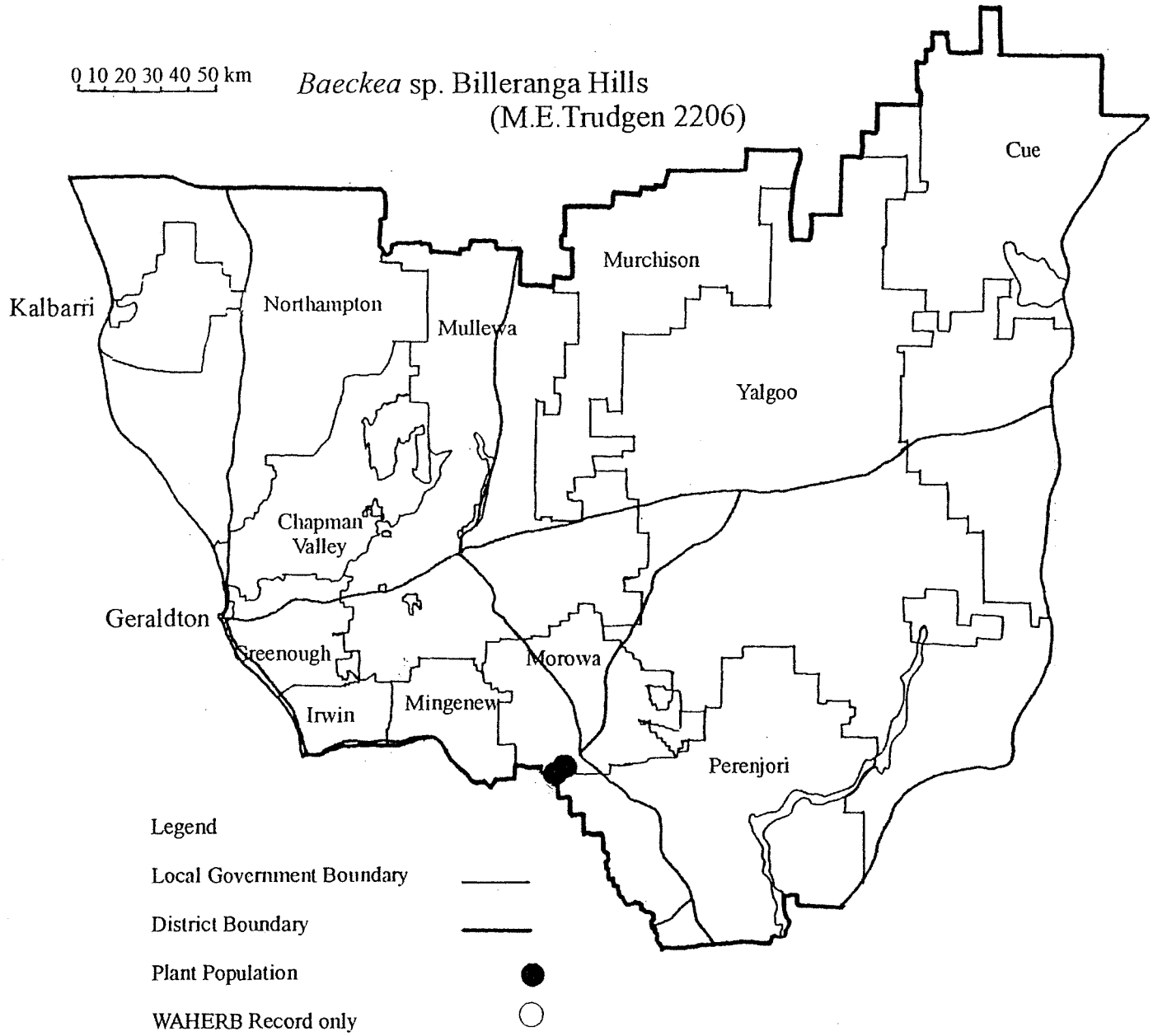
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. NE of Arrino	Mo	Crown Reserve	25.9.1990	20 estimated	Some disturbance
2. W of Billeranga Homestead gate	Mo	-	10.9.1978	-	-

Response to Disturbance

Unknown

Research Requirements

- Further survey is required to refind population 1.
- Taxonomic work is required.


0 10 20 30 40 50 km
Baeckea sp. Billeranga Hills
(M.E.Trudgen 2206)
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Baeckea sp. Bunjil (B.R.Maslin 5067) MYRTACEAE

A compact subshrub 0.4 m tall or a shrub 0.5-1.5 m tall, with arching branches, divergent, warty branchlets and small elliptic leaves which are opposite, thick and obtuse, c. 1 mm long. The flowers are arranged in the upper leaf axils and have stalks c. 3 mm long. They are c. 7 mm in diameter. The floral tube is short and broad, tuberculate but unridged. There are five broad pale pink petals, c. 2.5 mm long. There are 20 stamens with flattened filaments and a slender style c. 2 mm long.

Flowering Period: November-December

Distribution and Habitat in the Geraldton District

This taxon has been collected from only two localities, from south of Bunjil in the Geraldton District and from between Carnamah and Perenjori, with no precise location.

Grows on rocky ground in heavy soil near Bunjil at the edge of scrub and is recorded on sandplain at the second locality.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

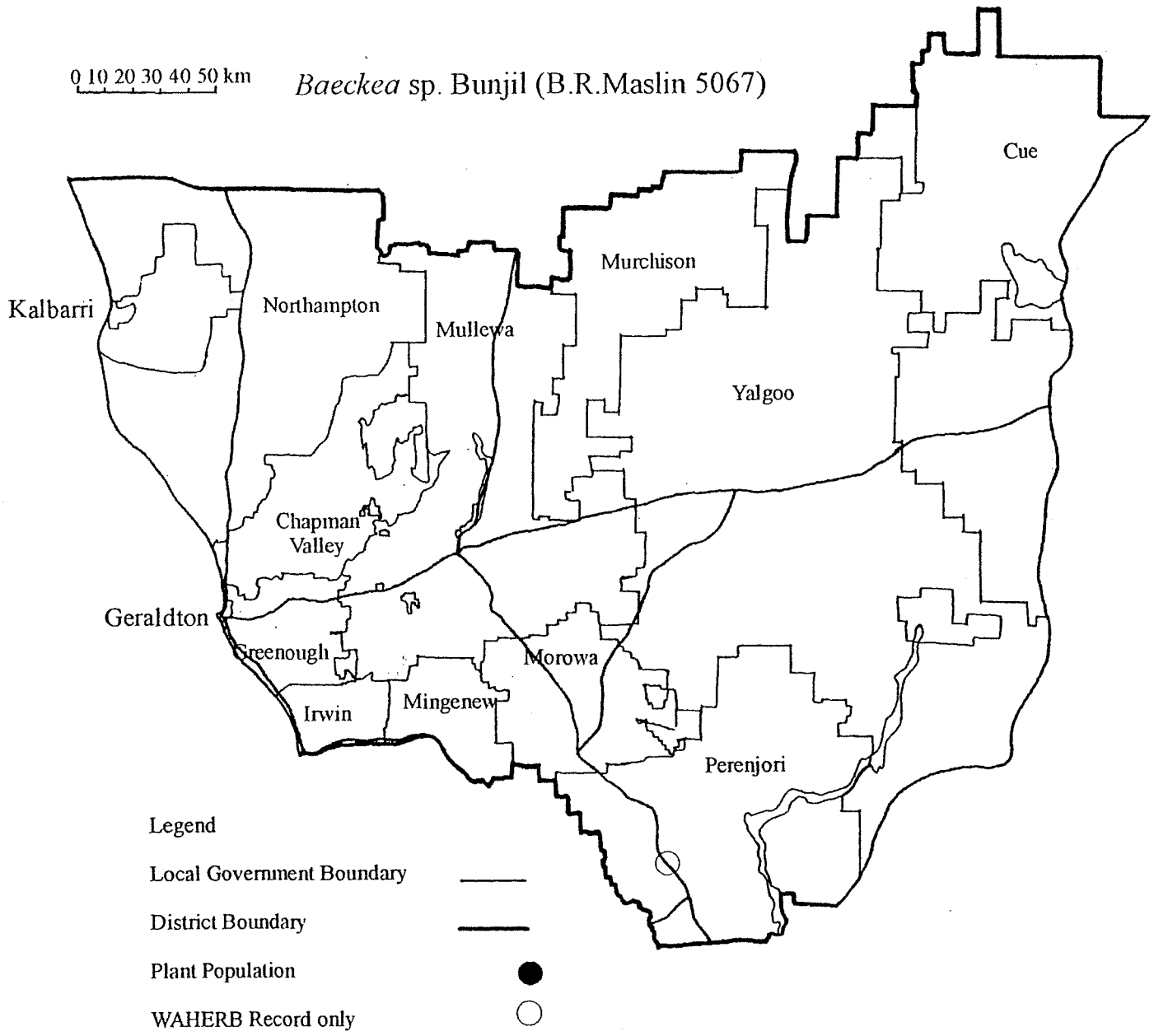
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* Near Bunjil	P	-	16.12.1981	-	-

Response to Disturbance

Unknown

Research Requirements

- Further survey is required.
- Taxonomic work is required.


0 10 20 30 40 50 km
Baeckea sp. Bunjil (B.R.Maslin 5067)
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Baeckea sp. East Yuna (R.Spjut & C.Edson 7077) MYRTACEAE

This taxon has been recorded only once, as a shrub 1 m tall. The leaves are elliptic, warty on the lower surface, to c. 3 mm long, 1 mm broad, with ciliate margins and a short recurved tip. They are opposite but are appressed and closely arranged on the branchlets. The flowers are white, with a rugose floral tube. They are c. 8 mm in diameter, the petals c. 3 mm long, rounded but narrowing towards the base. There are 20 stamens with flattened filaments.

Flowering Period: September

Distribution and Habitat in the Geraldton District

This species has been collected once, from near Yuna, where it was found in a patch of *Casuarina* and *Eucalyptus* woodland in a farmland area.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

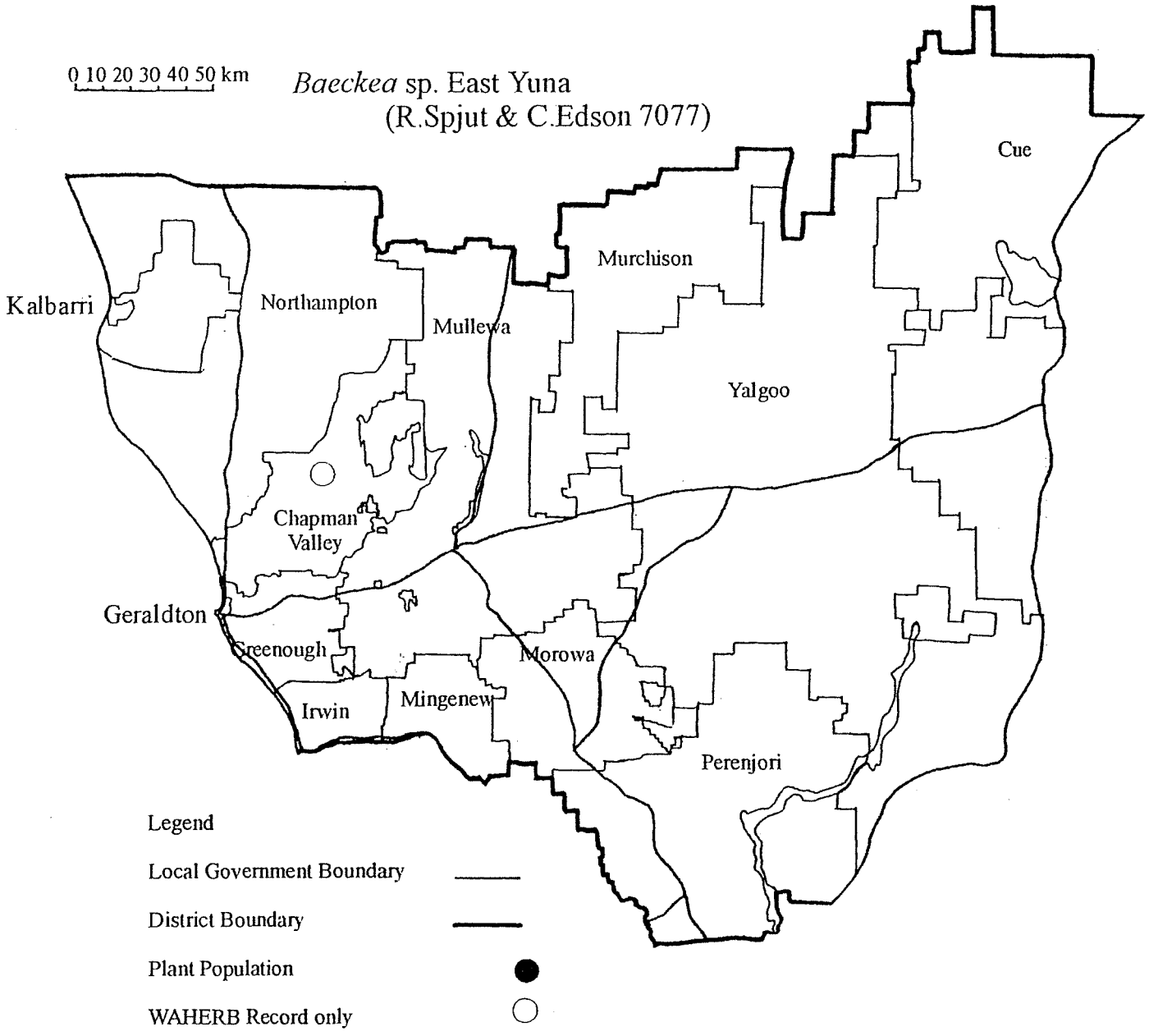
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* Near Yuna	CV	-	13.9.1981	-	-

Response to Disturbance

Unknown

Research Requirements

- Further survey is required.
- Taxonomic work is required.


0 10 20 30 40 50 km
Baeckea sp. East Yuna
(R.Spjut & C.Edson 7077)
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Baeckea sp. London Bridge (M.E.Trudgen 5393) MYRTACEAE

A low, open, woody shrub up to 50 cm tall, with several stems arising from close to the ground. The leaves are linear-elliptic, to c. 3 mm long, 0.5 mm wide, thick, flat on the upper surface, rounded beneath and warty. They have a pointed tip and are arranged closely and are appressed on the short branchlets. The small five-petalled flowers are usually in pairs at the ends of the branchlets, arising from the leaf axils on stalks c. 1.5 mm long. They are c. 5 mm in diameter. The floral tube and outside of the pointed calyx lobes have glandular dots. The petals are dark rusty red in colour, ovate, narrowing abruptly towards the base, c. 2 mm long. There are c. 50 stamens with stout, terete filaments in a single dense ring. They are graduated in length, being longest opposite the petals, diminishing in length away from the petals so that the shortest are opposite the calyx lobes. The style is short and stout. The fruits are urn-shaped.

Flowering Period: October-November

Distribution and Habitat in the Geraldton District

Several populations have been found on low breakaways around Sandstone, also further south near Youanmi and to the west of Sandstone, with a total geographic range of just over 100 km.

This species grows in small pockets of pale brown loamy soil on low breakaways of red-brown laterite, with scattered low shrubs of *Olearia, Micromyrtus, Leucopogon, Eriostemon, Eremophila* and *Melaleuca.*

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. London Bridge, Sandstone	S	Crown Reserve	29.10.1994	50+	Healthy
2. Near Sandstone	S	Crown Reserve	29.10.1994	30+	Healthy
3. NE of Youanmi	S	Pastoral Lease	28.10.1994	50+	Healthy
4. NE of Youanmi	S	Pastoral Lease	18.7.1996	50+	Healthy
5. W of Sandstone	S	Shire Road Verge	19.7.1994	1	Healthy
6. E of Mt Magnet	MM	Pastoral Lease	30.10.1994	10	Healthy
7. ESE of Sandstone	S	?Crown Reserve	18.7.1996	30+	Healthy
8. ESE of Sandstone	S	Pastoral Lease	18.7.1996	20+	Healthy
9. NW of Black Hill	S	Pastoral Lease	18.7.1996	20+	Healthy

Response to Disturbance

Unknown

Management Requirements

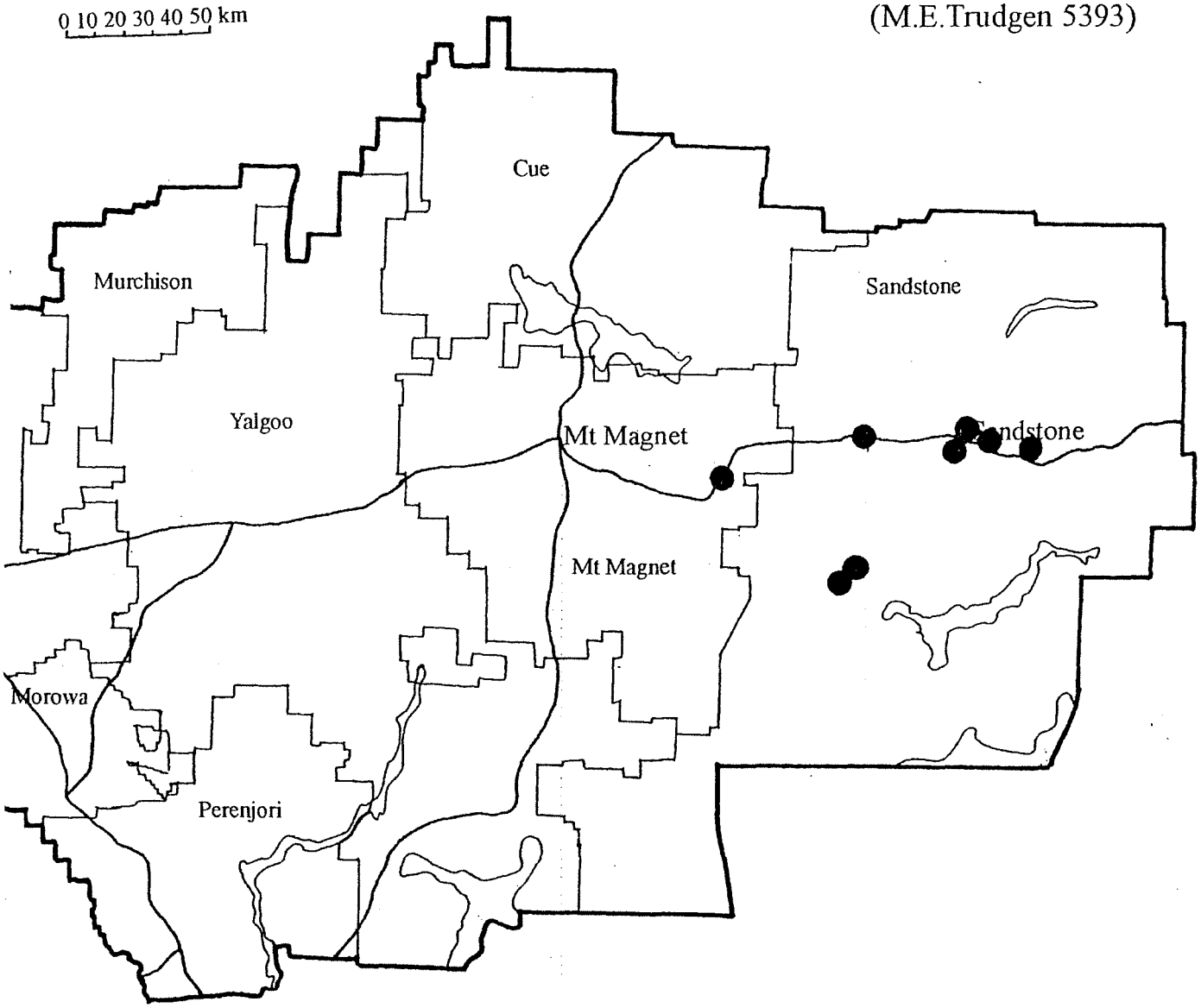
- Maintain liaison with land managers.
- Ensure that road verge population is marked.

[#] now Priority 3 (updated at December 1999)

Research Requirements

- Further survey is required.
- Taxonomic work is required.

Baeckea sp. London Bridge
(M.E.Trudgen 5393)



Legend

Local Government Boundary

District Boundary

Plant Population

WAHERB Record only

Baeckea sp. Mount Barloweerie (J.Z.Weber 5079) MYRTACEAE

A low shrub to 1 m, rounded in shape. The leaves are alternately arranged, spreading, elliptic in shape, c. 2 mm long. They are thick, blunt-ended, bright green, with glandular hairs on the upper surface when young. The flowers are pale pink and flushed pink in bud. They are clustered in small groups at the ends of the branchlets. Each flower is c. 9 mm in diameter, with a rugose floral tube. The petals are rounded, c. 4 mm long. There are 20 stamens with slightly flattened filaments, united at the base, forming a raised ring. The style is c. 1.5 mm long.

Flowering Period: August-October

Distribution and Habitat in the Geraldton District

This species was known from one collection made in 1975 from Mt Barloweerie, which is just north of the boundary of the Geraldton District, and was found 2 km south of the peak, just within the District, on the same range of hills in 1995.

This taxon grows on rocky slopes in pale brown loam with metamorphic rocks. It occurs in open low scrub with species of *Acacia* and *Hemigenia* and with *Wurmbea inframedia.*

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

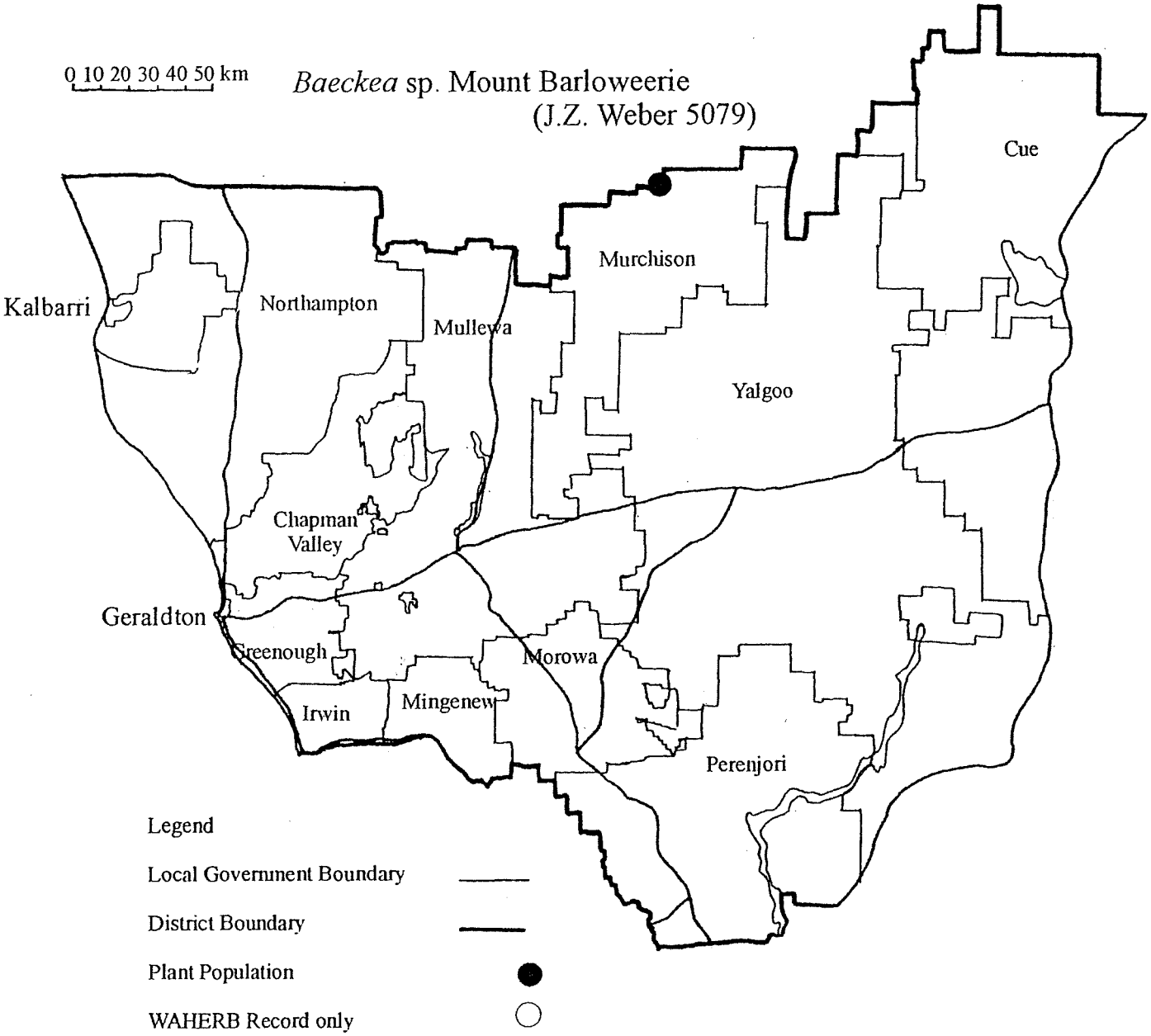
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. S of Mt Barloweerie	Mur	Pastoral Lease	4.8.1995	20+	Healthy

Response to Disturbance

Unknown

Research Requirements

- Further survey is required.
- Taxonomic work is required.


0 10 20 30 40 50 km
Baeckea sp. Mount Barloweerie
(J.Z. Weber 5079)
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Baeckea sp. Paynes Find (S.Patrick 1095) MYRTACEAE

An upright, bushy shrub 1.5 to 4 m tall, often flowering to ground level. The leaves are obovate, to 4 mm long and 2 mm wide, thin, slightly folded, with a minutely dentate margin. The flowers are white to pale pink with dark pink centres. They are grouped in umbels on peduncles c. 1 cm long at the ends of the branchlets. Each flower is c. 5 mm in diameter. The floral tube has five faint ridges. The petals are rounded, c. 2 mm long, with undulate edges. There are 10 stamens which have slightly flattened filaments.

Flowering Period: April, July-October

Distribution and Habitat in the Geraldton District

Has been collected from four localities over a range of 30 km around Paynes Find.

Grows on or around large granite outcrops in brown sandy loam. Occurs in open low woodland or scrub, with *Calycopeplus ephedroides, Thryptomene mucronulata, Kunzea baxteri, Acacia grasbyi, Melaleuca uncinata* and *Borya* sp.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SW of Paynes Find	Y	Pastoral Lease	7.10.1993	50+	Healthy
2. N of Paynes Find	Y	MRWA Road Reserve	16.7.1996	50+	Healthy
3.* N of Paynes Find	Y	-	3.8.1976	-	-
4. NW of Paynes Find	Y	-	3.9.1967	-	-

Response to Disturbance

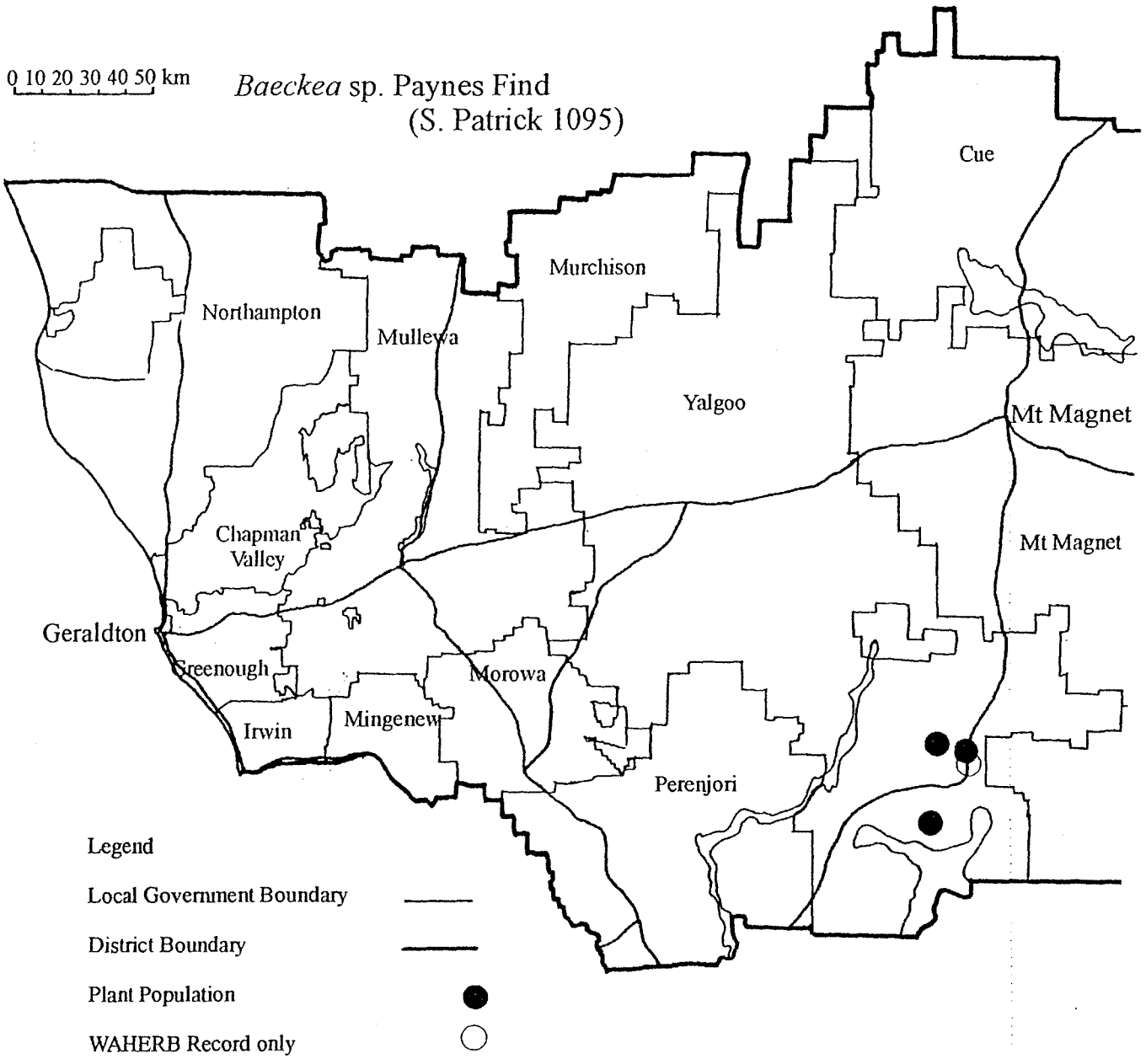
Unknown

Management Requirements

- Ensure that road verge population is marked.

Research Requirements

- Further survey is required.
- Taxonomic work is required.


0 10 20 30 40 50 km
Baeckea sp. Paynes Find
(S. Patrick 1095)
Cue
Murchison
Northampton
Mullewa
Yalgoo
Mt Magnet
Chapman Valley
Mt Magnet
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Baeckea sp. Perenjori (J.W.Green 1516) MYRTACEAE

A low, rounded shrub to 50 cm tall and 1 m in diameter, with numerous short branchlets spreading divaricately from the main branches. The leaves are minute, obovate or elliptic, c. 1.25 mm long, 0.5 mm broad, somewhat folded and with a denticulate edge. They are closely arranged at the ends of short branchlets. The flowers are pink. They are arranged in dense clusters on branchlets at the ends of the branches. Each flower has a five-ridged floral tube and is c. 5 mm in diameter, the rounded petals are c. 2 mm long. There are 10 stamens with flattened filaments.

Flowering Period: June, August

Distribution and Habitat in the Geraldton District

Known from east of Perenjori and Morawa over a range of c. 20 km. The only population known at present occurs on granite on the upper part of a breakaway, where it grows in yellow-brown sandy loam in open scrub below open York gum woodland, with *Allocasuarina campestris, Eremophila latrobei, Hakea recurva, Calytrix* and *Borya* species. Another population was recorded growing in red clay with *Acacia acuminata* and *Melaleuca uncinata.*

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. NE of Perenjori	P	Nature Reserve	20.6.1995	10+	Healthy
2.* N of Caron	P	-	25.8.1965	-	-
3.* E of Perenjori	P	-	22.8.1957	-	-

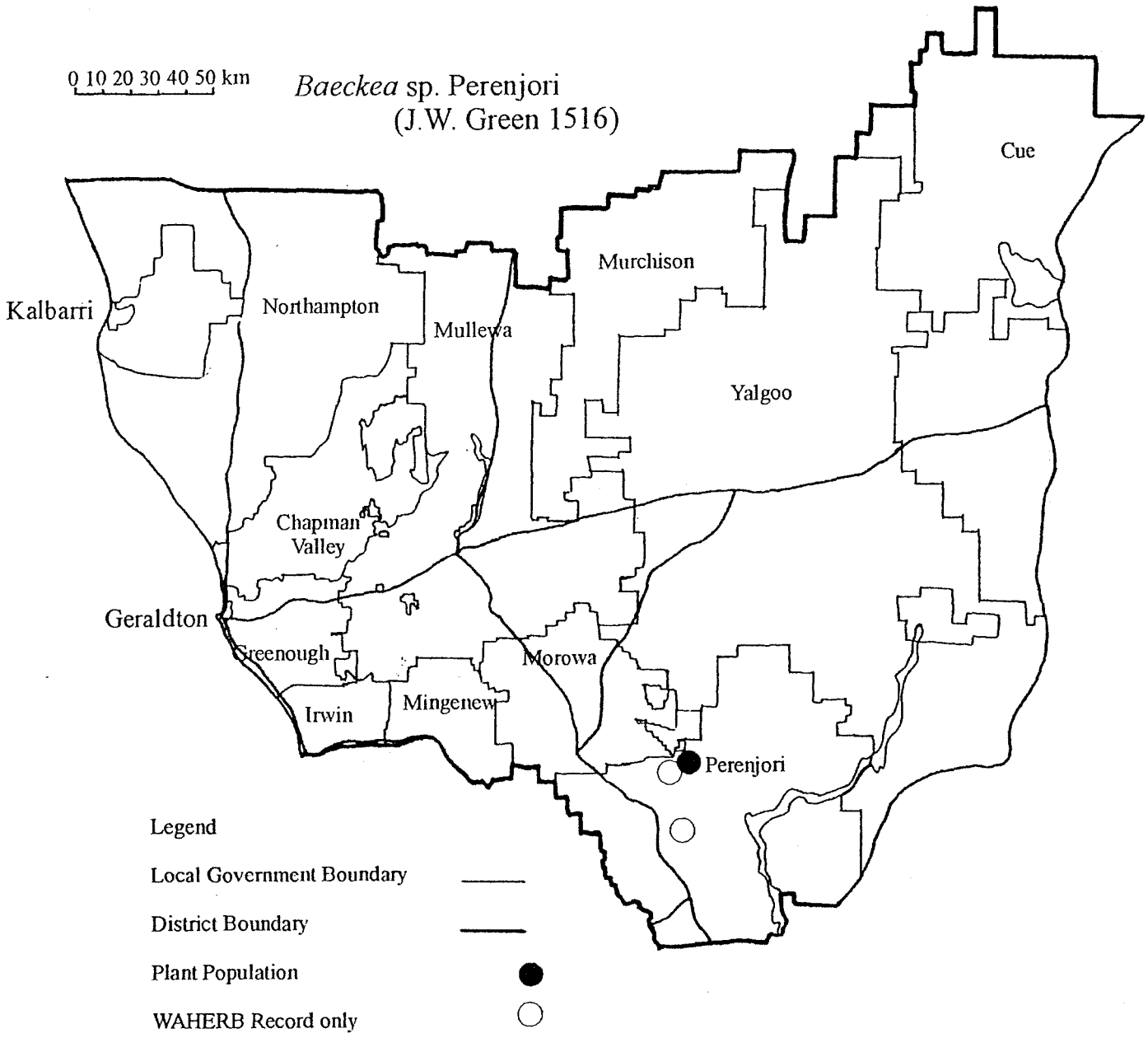
Response to Disturbance

Unknown

Research Requirements

- Further survey is required.
- Taxonomic work is required.

[#] now Priority 2 (updated at December 1999)


0 10 20 30 40 50 km
Baeckea sp. Perenjori
(J.W. Green 1516)
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Baeckea sp. Sandstone (C.A.Gardner s.n. 26.Oct.1963) MYRTACEAE

An upright shrub to 1 m tall. The leaves are alternate, thick, oblong, concave with a recurved tip. They are warty on the lower surface and are c. 1.5 mm long. The flowers are white. They arise singly from the axils of the upper leaves on the branchlets, forming few-flowered clusters. The floral tube has five blunt ridges. Each flower is c. 5 mm in diameter. The calyx lobes are triangular and keeled, curved forward, between the rounded petals which are c. 2 mm long. There are 20 stamens with slightly flattened filaments arranged in groups opposite the calyx lobes.

Flowering Period: October

Distribution and Habitat in the Geraldton District

This taxon has been collected once in the Geraldton District from west of Sandstone and has also been found in 1975 from further north of Sandstone in the Goldfields Region.

The population in the Geraldton District grows in deep red-brown sand in a species-rich swale between sand ridges. It occurs with other shrubs over *Triodia* sp. with *Labichea eremaea, Acacia* and *Eucalyptus* species.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. W of Sandstone	S	Shire Road Verge	30.10.1994	10+	Healthy

Response to Disturbance

Unknown

Management Requirements

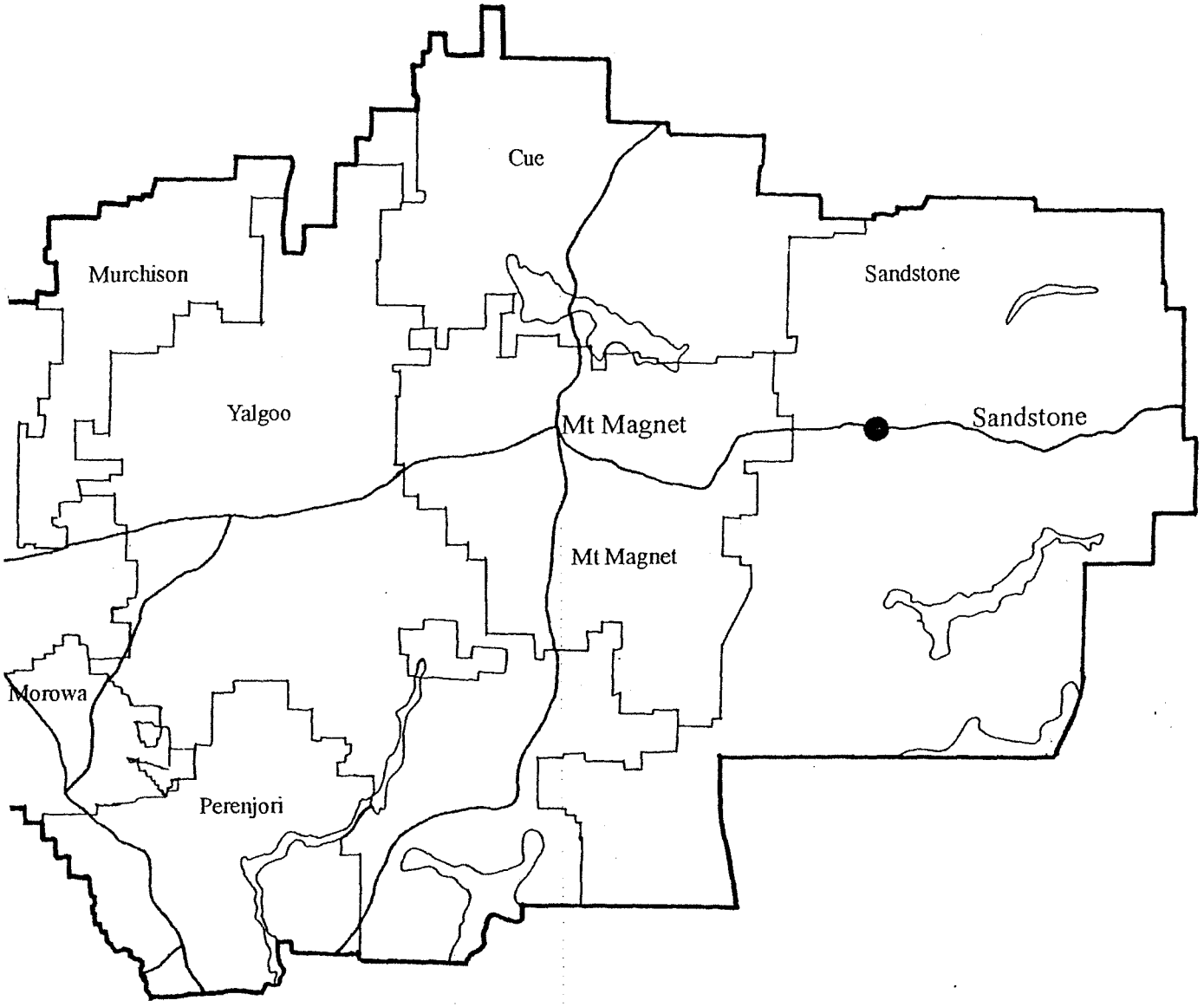
- Ensure that the road verge population is marked.

Research Requirements

- Further survey is required.
- Taxonomic work is required.

0 10 20 30 40 50 km

Baeckea sp. Sandstone
(C.A.Gardner s.n. 26. Oct.1963)



Legend

Local Government Boundary

District Boundary

Plant Population

WAHERB Record only

Baeckea sp. Walkaway (A.S.George 11249) MYRTACEAE

A many-stemmed, upright shrub growing to 2 m tall and 1 m in diameter. The bark on the lower stems is rough and dark grey and is smooth and mid-grey on the upper stems. The leaves are yellow-green. They are opposite, elliptic in shape, with a mucronate recurved tip and are c. 8 mm long. The flowers are grouped, two or three together on peduncles c. 4 mm long, arising from the axils of the upper leaves. They are c. 5 mm in diameter and have white incurved petals which are c. 2 mm long. There are 20 stamens with white or pink flattened filaments and pink anthers. The disc is yellow-green, the hypanthium green.

Flowering Period: December-April

Distribution and Habitat in the Geraldton District

This taxon occurs from north-east of Geraldton south-east to the Burma Road area over a range of c. 50 km.

Grows in yellow-brown sand on gently undulating plain in *Grevillea* and banksia tall shrubland over *Grevillea, Calothamnus, Verticordia and Conospermum* shrubland with *Ecdeicolea monostachya* and *Mesomelaena* sp. sedgeland or in clayey white sand over laterite amongst low scrub with *Grevillea candelabroides, Verticordia monadelpha, V. densiflora* and species of *Melaleuca* and *Acacia.*

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Burma Road	G	Nature Reserve	13.11.1996	1 000+	Healthy
2. Burma Road	G	Shire Road Reserve	15.3.1999	50+	Healthy
3. S of Ambania	Mu	Shire Road Reserve	6.12.1994	15	-
4. SW of Ambania	Mu	MRWA Road Reserve	6.12.1994	4	-
5. NW of Mingenew	Mi	Shire Road Reserve	6.12.1994	-	-
6. Mt Fanny	G	-	8.3.1992	"a few plants"	-
7. WNW of Coaramooly Pool	CV	-	28.11.1997	-	-
8. ESE of Mumbemarra Hill	CV	-	29.11.1997	-	-
9. Valentine Road	G	-	28.11.1997	-	-
10.*E of Nanson	CV	-	3.1960	-	-

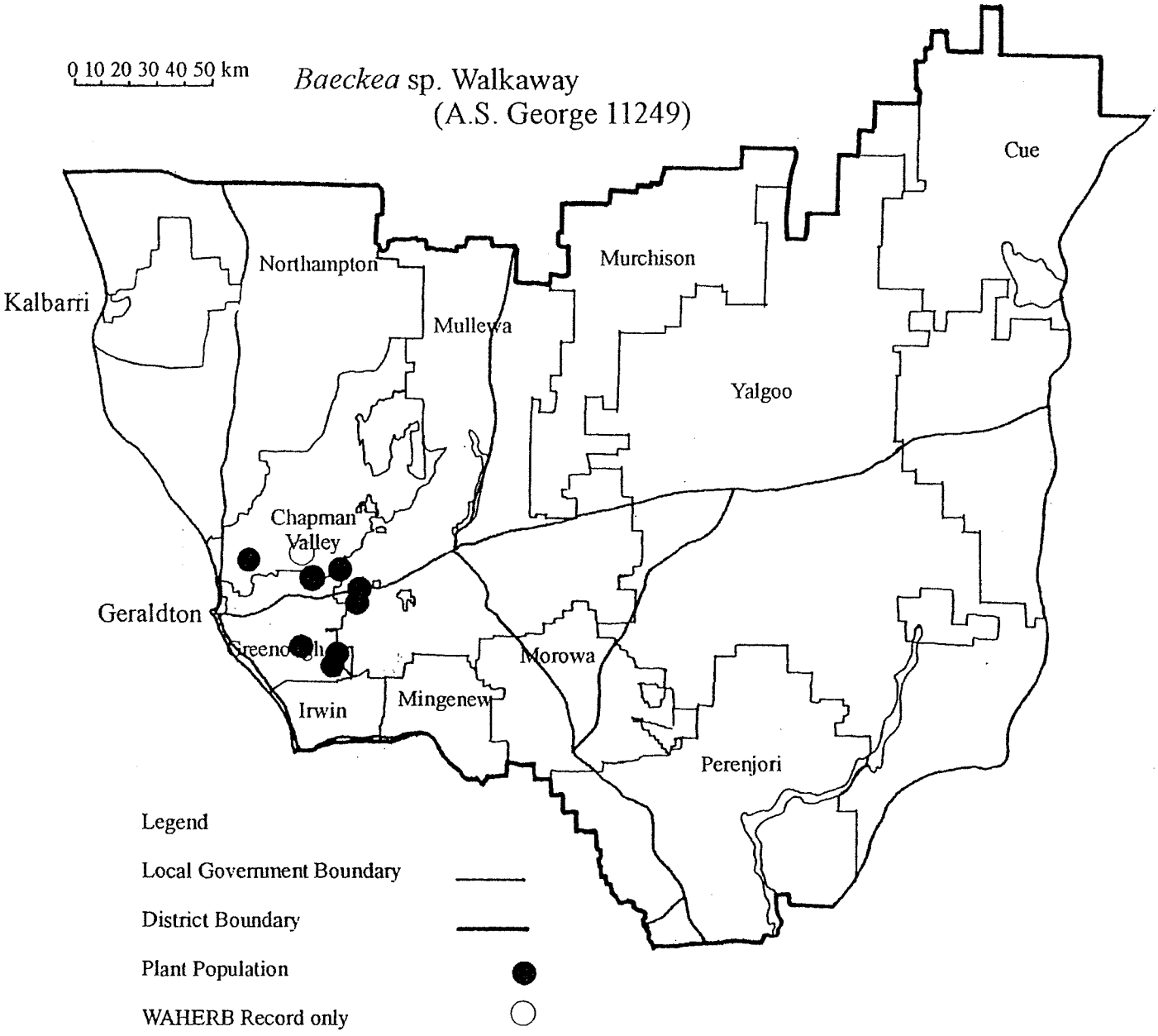
Response to Disturbance

Unknown

Research Requirements

- Further survey is required.
- Taxonomic work is required.

[#] now Priority 3 (updated at December 1999)


0 10 20 30 40 50 km
Baeckea sp. Walkaway
(A.S. George 11249)
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Banksia elegans Fraser Road variant (A.C.Burns 27) PROTEACEAE

Elegant Banksia

A small tree to 3 m tall, with a stout trunk with grey tessellated bark. The leaves are 20-45 cm long 12-18 mm wide, with triangular teeth. The inflorescence is spherical to ovoid, larger than that of the typical species in which it is 6-7 cm wide at flowering. The flowers are pale yellow. The fruiting cones have 1-5 curved follicles.

This population lies c. 50 km north of the range of the species and differs from the typical variety in the larger inflorescences.

Flowering Period: November-January

Distribution and Habitat in the Geraldton District

This variant occurs east of Walkaway where it grows on road verges and uncleared private land over c. 3 km.

Grows on flat sandplain in open low banksia woodland over heath to 1 m, with *Banksia prionotes, B. menziesii, Grevillea leucopteris, Acacia, Hakea* and *Ptilotus* species on pale yellow sand.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. E of Walkaway	G	Shire Road Reserve	27.1.1994	22+	Healthy
2. E of Walkaway	G	Private	27.1.1994	1+	Healthy

Response to Disturbance

The typical variety is known to resprout from its lignotuber and epicormic buds after fire. Sucker regrowth is also stimulated by fire.

Management Requirements

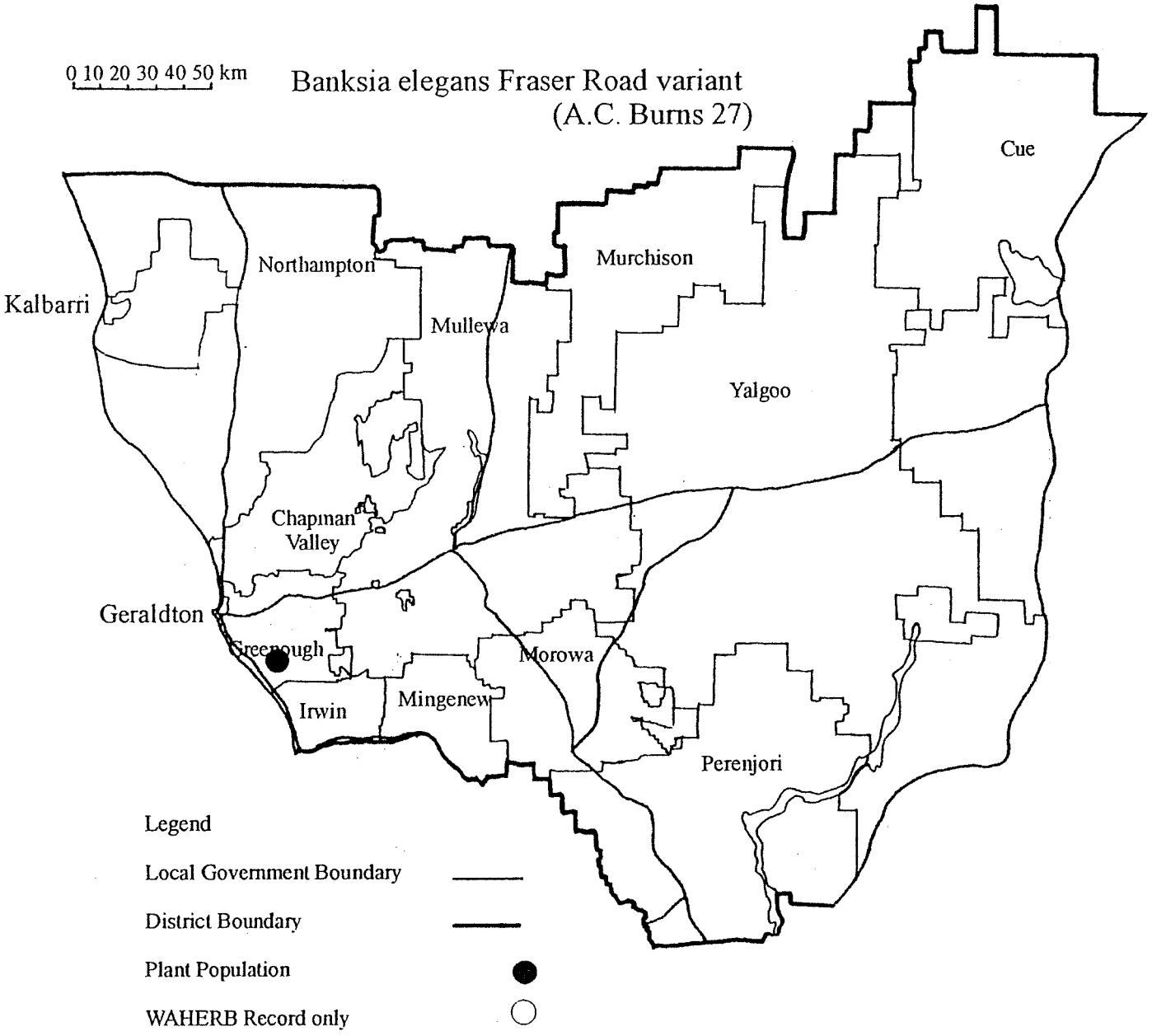
- Maintain liaison with private landowner.
- Monitor road verge population.

Research Requirements

- Further survey is required, particularly to confirm reports of the taxon further west from the known road verge population.

References

George (1981, 1984b), Taylor & Hopper (1988).


0 10 20 30 40 50 km
Banksia elegans Fraser Road variant
(A.C. Burns 27)
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Calytrix verruculosa Craven MYRTACEAE

A compact, bushy shrub to 75 cm tall. The branchlets are minutely verrucose. The leaves are fresh green in colour. They are alternate with small stipules up to 75 mm long. They are up to 10 mm long and 1.5 mm wide, shallowly crescent-shaped in cross-section. The flowers are scattered. The cheiridium is 12-14 mm long with the lobes tapering to long points. The hypanthium is 12-16 mm long, glabrous, with ten ribs, and is partly free from the style. The calyx segments are joined at the base, with ovate blades and awns to 20 mm long. The petals are up to 14 mm long and are usually bright pink in colour, but one population from near Meekatharra had white flowers and red buds. There are 22-27 stamens in a single row. The anthers have a prominent connective which appears not to restrict the movement of the anther. The style is 13-15 mm long.

This species forms a group with *Calytrix decandra, C. duplistipulata, C. praecipua* and *C. glutinosa,* all having a long hypanthium, pinkish petals and anthers in a single row. *C. decandra* has smooth branchlets and a very prominent anther connective which restricts anther movement. It occurs on the south coast. *C. duplistipulata* has two-paired prominent stipules up to 1 mm long and occurs from Hyden east to the Fraser Range. *C. praecipua* has decussate leaves and occurs further east. *C. glutinosa* has a five-ribbed hypanthium and grows from Northampton south to the Perth area and east to Wubin.

Flowering Period: October

Distribution and Habitat in the Geraldton District

This species is known in the Geraldton District from one collection made on the northern boundary north of Cue. It has also been collected three times from north of Meekatharra and once from south of the town, most recently in 1986. These populations occur over a range of c. 140 km. The species has also been collected once from south of Laverton, which is c. 400 km to the south-east.

In the Geraldton District, the species was growing in loamy sandy soil, and near Meekatharra, it has been found on shallow hardpan plain with sparse mulga and on a brown clayey sandbank in open scrub.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* N of Cue	C	-	13.10.1945	-	-

Response to Disturbance

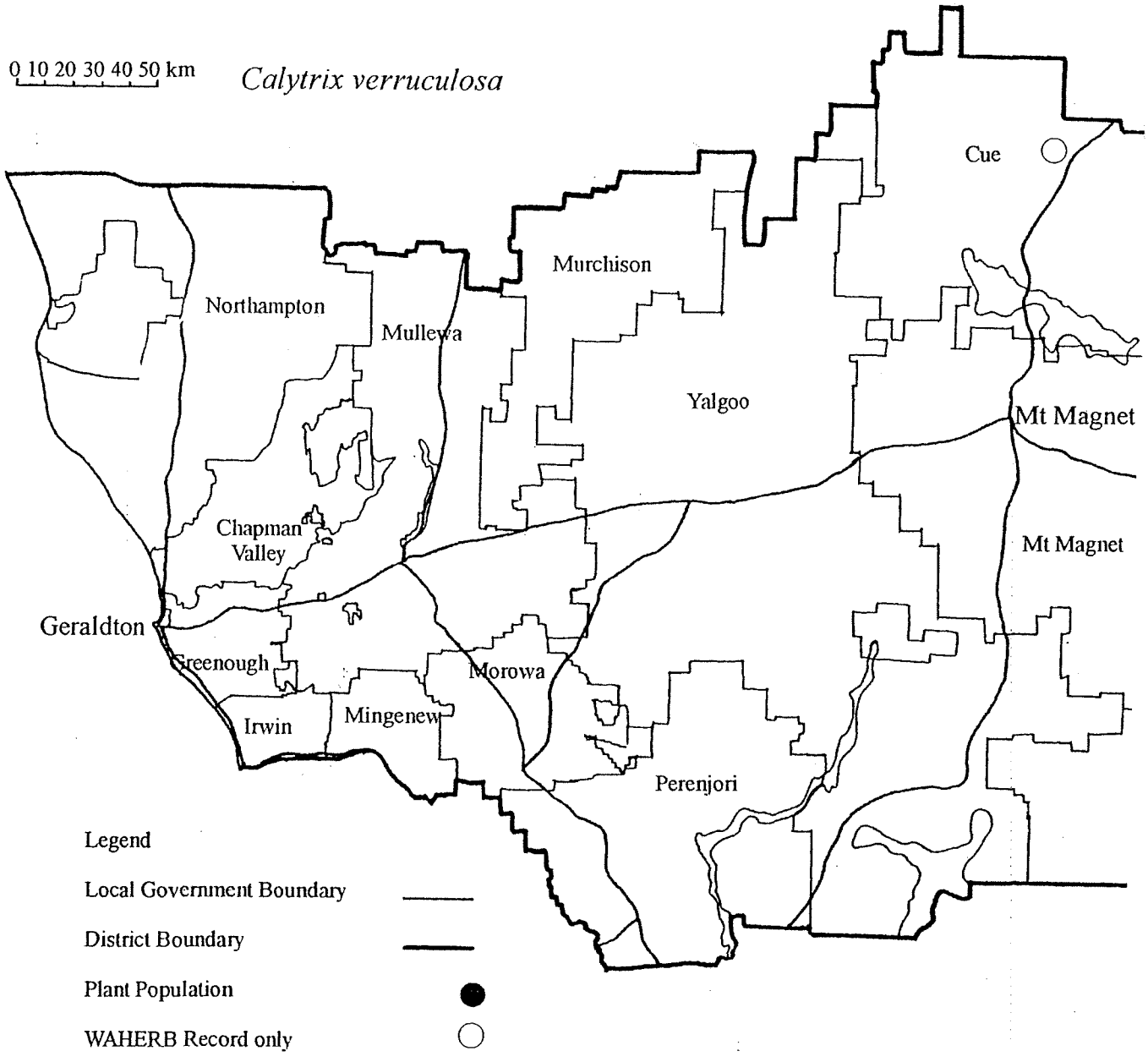
Unknown

Research Requirements

– Further survey is required to refind this species, particularly in the Cue to Meekatharra area.

References

Craven (1987b).


0 10 20 30 40 50 km
Calytrix verruculosa
Cue
Murchison
Northampton
Mullewa
Yalgoo
Mt Magnet
Chapman Valley
Mt Magnet
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Chamelaucium oenanthum N.G.Marchant & Keighery ms MYRTACEAE

This undescribed species has been identified in the past as *Chamelaucium vinosum* and as *Chamelaucium* sp. Coolcalalaya (A.H.Burbidge 4233).

An erect, bushy shrub to 2 m tall. The leaves are linear with hooked tips, up to 20 mm long, The flowers are arranged in groups on peduncles c. 3 cm long. They are c. 5 mm in diameter, the floral tube c. 7 mm long, finely ribbed. The petals are rounded, c. 3 mm in length, red-purple in colour or rarely white. The style is c. 4 mm long, with a ring of hairs below the stigma.

Flowering Period: September-November

Distribution and Habitat in the Geraldton District

This species is known from the Eurardy, Nerren Nerren and Coolcalalaya areas and also further south from the Hutt River.

Grows on flats in yellow or red sand, in shrubland and open mallee of *Eucalyptus eudesmoides, E. jucunda, E. sheathiana* and *E. oldfieldii,* with *Callitris columellaris, Bursaria occidentalis, Olearia axillaris, Acacia* and *Grevillea* species over open grasses and herbs or with *Verticordia monadelpha, Melaleuca megacephala* and *Ecdeiocolea monostachya.* It is reported to be common on Nanga and Cooloomia land systems.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Murchison House Station	N	Pastoral Lease	2.11.1995	100+	Healthy
2. N of Eurardy	N	VCL	30.11.1991	"occasional"	-
3. N of Eurardy	N	VCL	?1991	-	-
4. SE of Coolcalalaya	N	VCL	12.10.1988	"uncommon"	-
5.* N of Eurardy	N	Pastoral Lease	11.11.1979	-	-
6. Hutt River	N	-	24.10.1994	-	-

Response to Disturbance

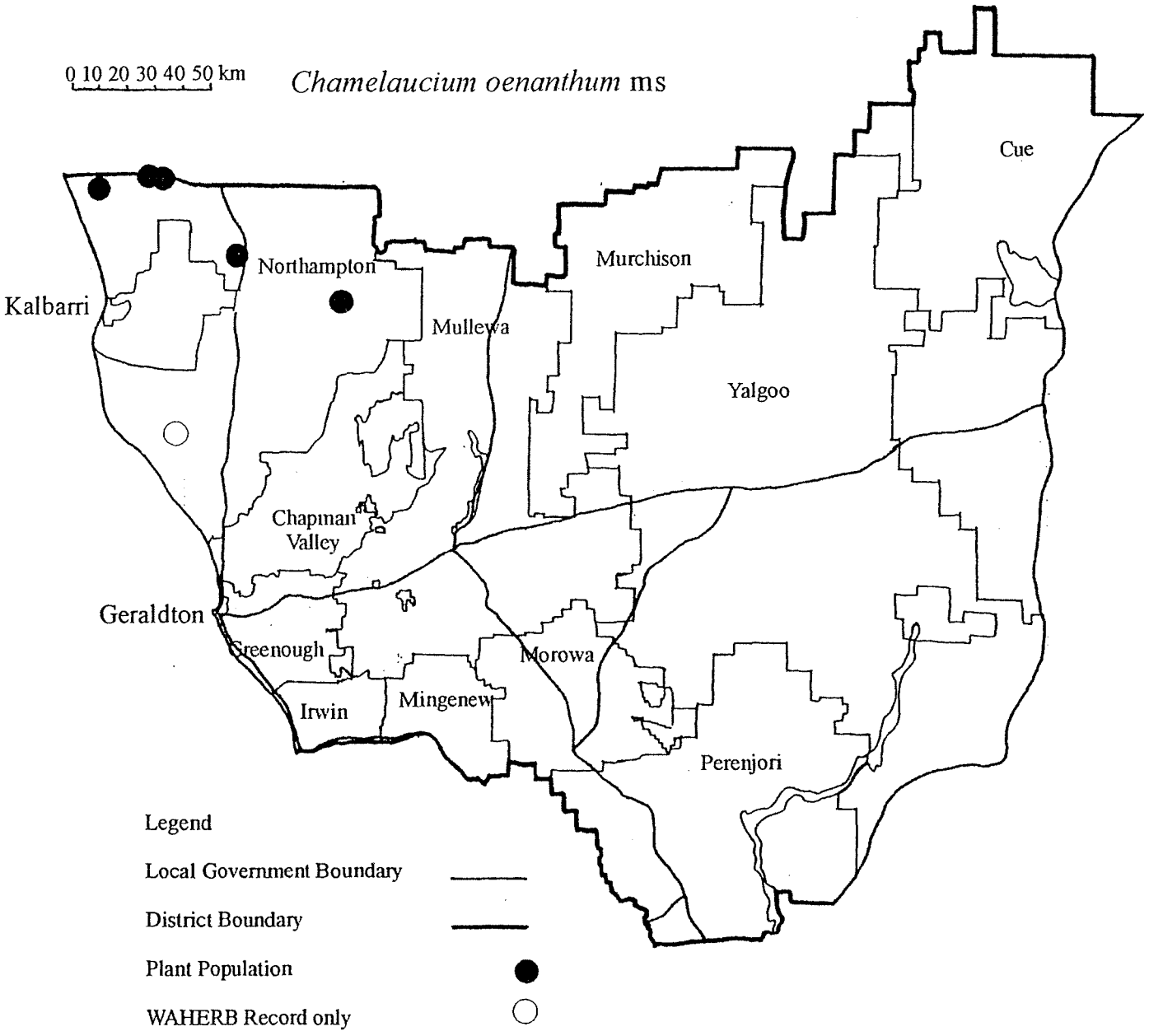
Unknown

Research Requirements

- Further survey is required.
- Taxonomic work is required.

References

Burbidge (1990).


0 10 20 30 40 50 km
Chamelaucium oenanthum ms
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Chamelaucium repens (A.S.George) N.G.Marchant & Keighery ms MYRTACEAE

[*Darwinia repens*]

Creeping (Darwinia) Waxflower

A prostrate glabrous shrub, with short erect branchlets, 2-2.5 cm high. The prostrate stems root at the nodes and may be up to 85 cm long. The leaves are opposite, crowded towards the top of each shoot, linear, 5-10 mm long. The flowers grow in the leaf axils on short stalks. They are red, with a cylindrical calyx tube 4 mm long, and oval-ovate petals 2-3 mm long. The style is red, slender, 15 mm long.

Flowering Period: July-August

Distribution and Habitat in the Geraldton District

Occurs in the Tardun to Mingenew area.

Found on rocky shallow soils in loamy clay, often on or near breakaways, on laterite or granite. Grows in open low *Acacia* scrub in open low woodland of *Eucalyptus wandoo* or *E. loxophleba.* Other associated species include *Hakea recurva, Allocasuarina campestris, Melaleuca cardiophylla, M. nematophylla, M. radula, Banksia sphaerocarpa* and *Astroloma serratifolium.* The most southerly population grows in open low woodland of *Eucalyptus loxophleba,* in tall *Acacia acuminata* shrubland with *Dodonaea inaequifolia, Allocasuarina campestris* and *Hakea trifurcata.*

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SE of Tardun	Mu	Private	25.10.1988	1 000+	Healthy
2. Canna	Mo	Private	15.11.1989	100 est.	Healthy
3. E of Mingenew	Mo	Shire Road Reserve, Private	8.7.1995	20+	Moderate, some weed infestation

Response to Disturbance

Two populations on private land are in areas which have been grazed by sheep for many years.

Management Requirements

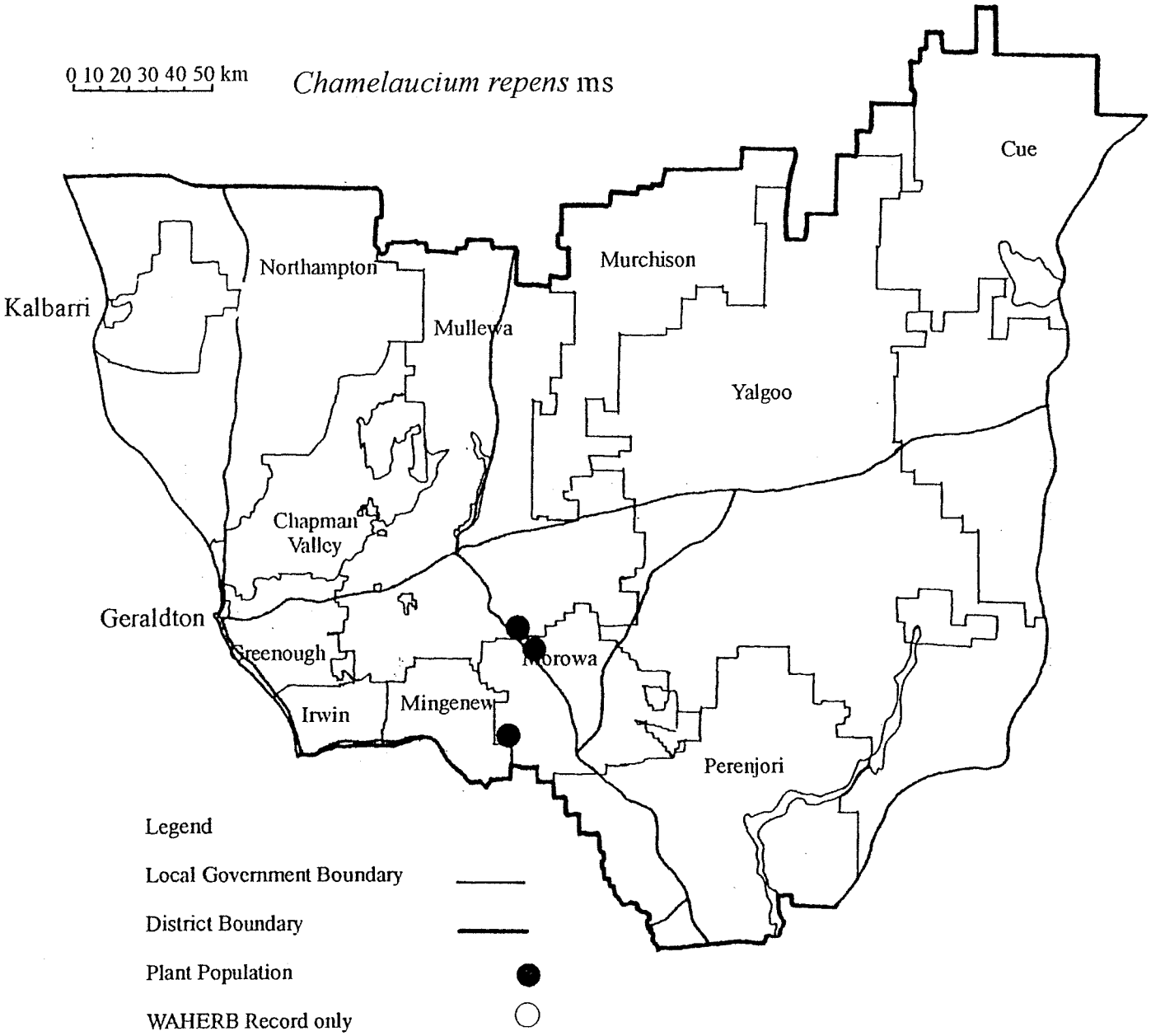
- Ensure that the road verge population is marked.
- Maintain liaison with private landowners.
- Monitor all populations at regular intervals.

Research Requirements

- Urgent further survey is required, particularly in suitable habitat on reserves and remnant natural vegetation east of Mingenew.
- Populations 1 and 2 require further survey to determine accurate numbers of plants and precise locations of the populations and to obtain voucher specimens.

References

George (1967).


0 10 20 30 40 50 km
Chamelaucium repens ms
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Chamelaucium sp. Yalgoo (Y.Chadwick 1816) MYRTACEAE

A low shrub c. 0.5 m tall, with erect, bushy growth. The leaves are narrow and sessile with glandular spots. They are 6-11 mm long. The flowers are small, c. 4 mm long, with a strongly ribbed floral tube and ciliate calyx lobes. The petals are white. The style may be exserted from the flower or included within it.

Flowering Period: June-September

Distribution and Habitat in the Geraldton District

This species is known from an area east of Mullewa to Paynes Find, over a range of c. 160 km.

Grows on granite or in red-brown loam over dolerite, in tall shrubland of *Melaleuca uncinata* and *Acacia* sp. over open low shrubs, including *Grevillea scabra, Cryptandra micrantha* and *Hybanthus* sp.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. W of Warriedar	Y	Shire Road Verge, Pastoral Lease (Mining Lease)	17.7.1994	30+	Healthy
2.* NE of Paynes Find	Y	-	3.9.1984	-	-
3.* Wuraga	Y	-	24.8.1975	-	-
4.* E of Wuraga	Y	-	3.9.1969	-	-

Response to Disturbance

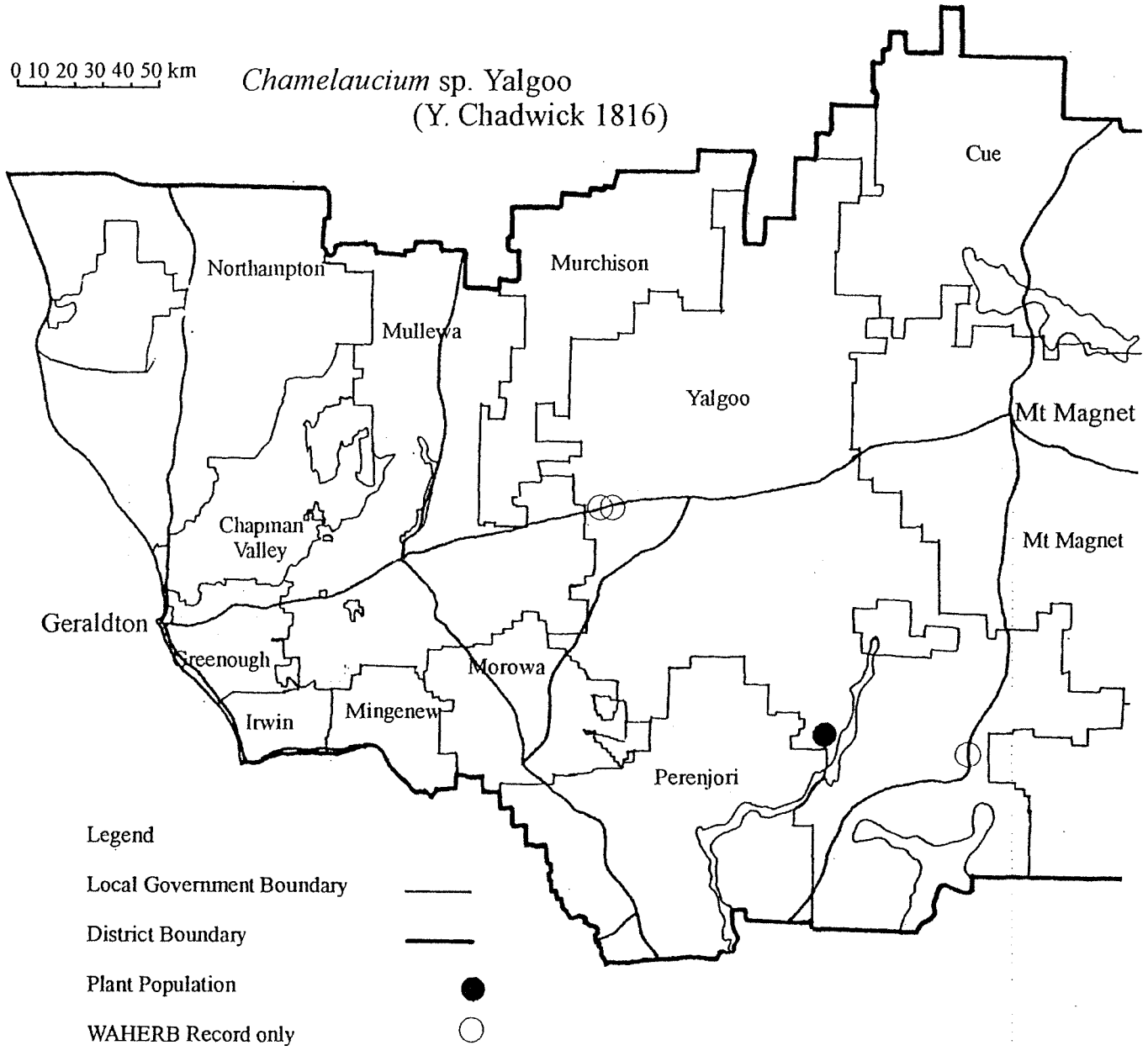
Unknown

Management Requirements

- Ensure that road verge population is marked.
- Maintain liaison with landowner.

Research Requirements

- Further survey is required, particularly to refind populations 2-4.
- Taxonomic work is required.


0 10 20 30 40 50 km
Chamelaucium sp. Yalgoo
(Y. Chadwick 1816)
Cue
Murchison
Northampton
Mullewa
Yalgoo
Mt Magnet
Chapman Valley
Mt Magnet
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Dithyrostegia gracilis P.S.Short ASTERACEAE

An annual herb to c. 25 cm tall. The main stems are erect, branching dichotomously. The leaves are sessile and almost linear, to 9 mm long and 2 mm wide. The flowers are in compound heads to 4.5 mm long and 3.5 mm in diameter, the receptacle of each head has long hairs. The compound heads are made up of 6-20 heads with one flower in each. There is one entire papery capitular bract surrounding each one. The flowers have a 5-lobed corolla.

This species is related to *Dithyrostegia amplexicaulis,* which has larger leaves and compound heads, capitular bracts with long hairs at the apex and woolly hairs on the general receptacle.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

This species is known only from the type collection made from Yuin Station in 1975, north-east of Yalgoo. Despite several searches the species has not been refound.

No details of habitat were made with the collection.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* Yuin Station	Y	Pastoral Lease	2.9.1975	-	-

Response to Disturbance

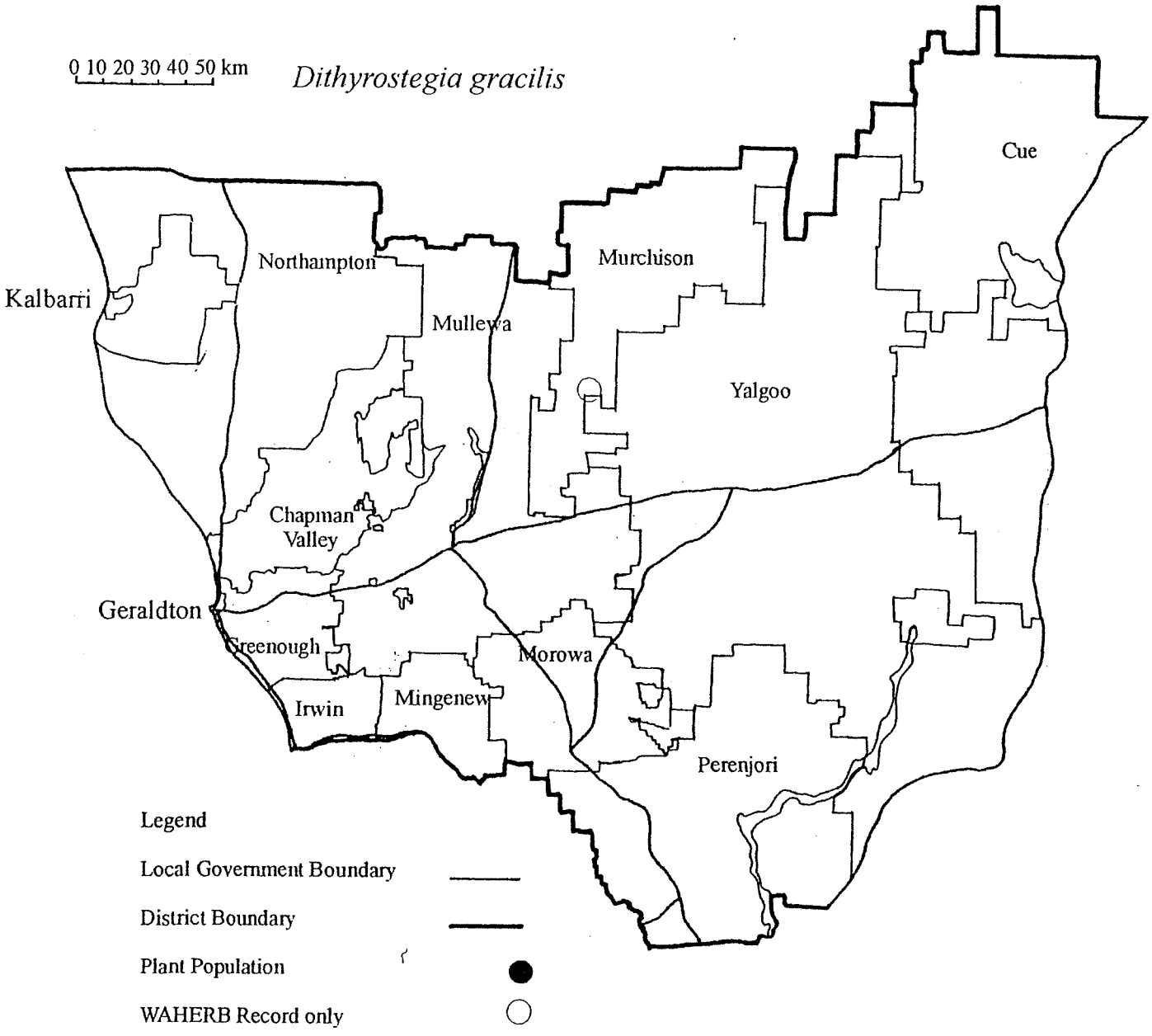
Unknown

Research Requirements

– Further survey is required.

References

Short (1989b).


0 10 20 30 40 50 km
Dithyrostegia gracilis
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Eremophila rostrata Chinnock ms MYOPORACEAE

An erect, rounded shrub 1.5 to 3 m tall. The leaves are glabrous, dark green and glossy. They are terete, c. 1 mm in diameter. The flowers are pendulous and have small calyx lobes. The corolla is scarlet, light pink inside, without spots, bulbous at the base. The upper lip of the corolla is 2-lobed, the lower lip 3-lobed. The stamens extend beyond the corolla throat. The fruits are strongly compressed laterally, convex and keeled above, beak-like. Both margins are winged.

Flowering Period: July-October

Distribution and Habitat in the Geraldton District

Has been collected from south-east of Perenjori and north of Cue. The two localities are 280 km apart.

At the southern locality, the plants grow on decomposed granite in sandy light brown loam, in open scrub of mallees and *Acacia.* The other population grows on stony, buff-coloured saline clays at the base of a quartzite hill, in scrub of *Acacia* and *Eremophila* species with *Acacia aneura.*

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. N of Cue	C	Crown Reserve	19.1.1999	2 since 1990. Four years previous to 1990 the population was of more plants.	Population disturbed by mining activity, plants healthy
2.* SE of Perenjori	P	Private	16.9.1981	20	-

Response to Disturbance

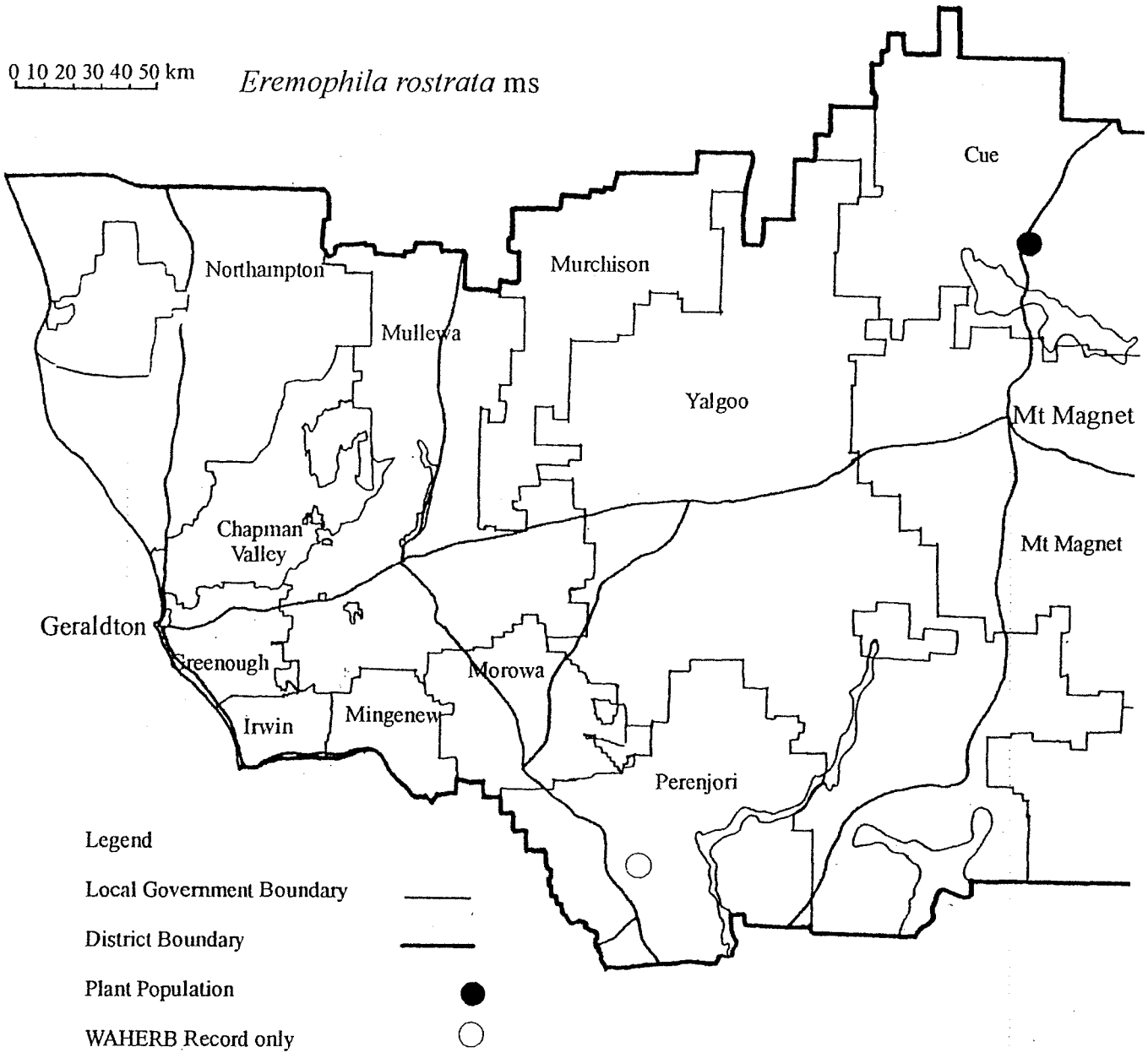
Unknown

Management Requirements

- Ensure that population 1 is marked.
- Maintain liaison with land managers.

Research Requirements

- Further survey is required, particularly to refind the population near Perenjori and to survey further in suitable habitat on conservation reserves.


0 10 20 30 40 50 km
Eremophila rostrata ms
Cue
Murchison
Northampton
Mullewa
Yalgoo
Mt Magnet
Chapman Valley
Mt Magnet
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Eriostemon nutans Paul G.Wilson RUTACEAE

An upright, bushy shrub to 1 m tall, with glandular warty branchlets and terete leaves c. 11 mm long with large glandular warts. The flowers are solitary and nodding on slender stalks c. 8 mm long. The flowers are cylindrical, c. 11 mm long, 7 mm broad, with overlapping petals which are pink and cream or green and yellow, becoming red with age. The stamens are erect, each anther with a small white point. The ovary has spreading carpels with a pair of hollow terminal lobes. The style is as long as the stamens.

This species is related to *Eriostemon coccineus* and *E. pachyphyllus* but differs in the presence of the large hollow terminal lobes of the carpels.

Flowering Period: April, July-September

Distribution and Habitat in the Geraldton District

Occurs in an area south-east of Paynes Find, with one record from further north to the south-east of Mt Magnet. It has also been collected several times from an area in the Merredin District on the east side of Lake Moore near the State Barrier Fence.

Grows on plains in York gum woodland over tall *Acacia* shrubland with other low shrubs in red clayey loam or yellow clayey sand. Associated species include *Callitris* sp., *Eucalyptus leptopoda, Alyxia buxifolia, Phebalium tuberculosum, P. canaliculatum, Eriostemon tomentellus* and *E. sericeus.*

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* Ninghan	Y	Pastoral Lease	17.8.1953	-	-
2. Mt Gibson	Y	Pastoral Lease (Mining Lease)	15.7.1994	100+	Healthy
3. NE of Wubin	P	-	13.9.1990	"Frequent"	-
4. Whitewells	P	Pastoral Lease	26.8.1993	"Frequent"	-
5. NE of Wubin	P	MRWA Road Verge, Pastoral Lease	14.7.1994	200+	Healthy
6. SE of Mt Magnet	MM	Pastoral Lease	17.11.1993	-	-

Response to Disturbance

Unknown

Management Requirements

- Ensure that road verge population is marked.
- Maintain liaison with land managers.

Research Requirements

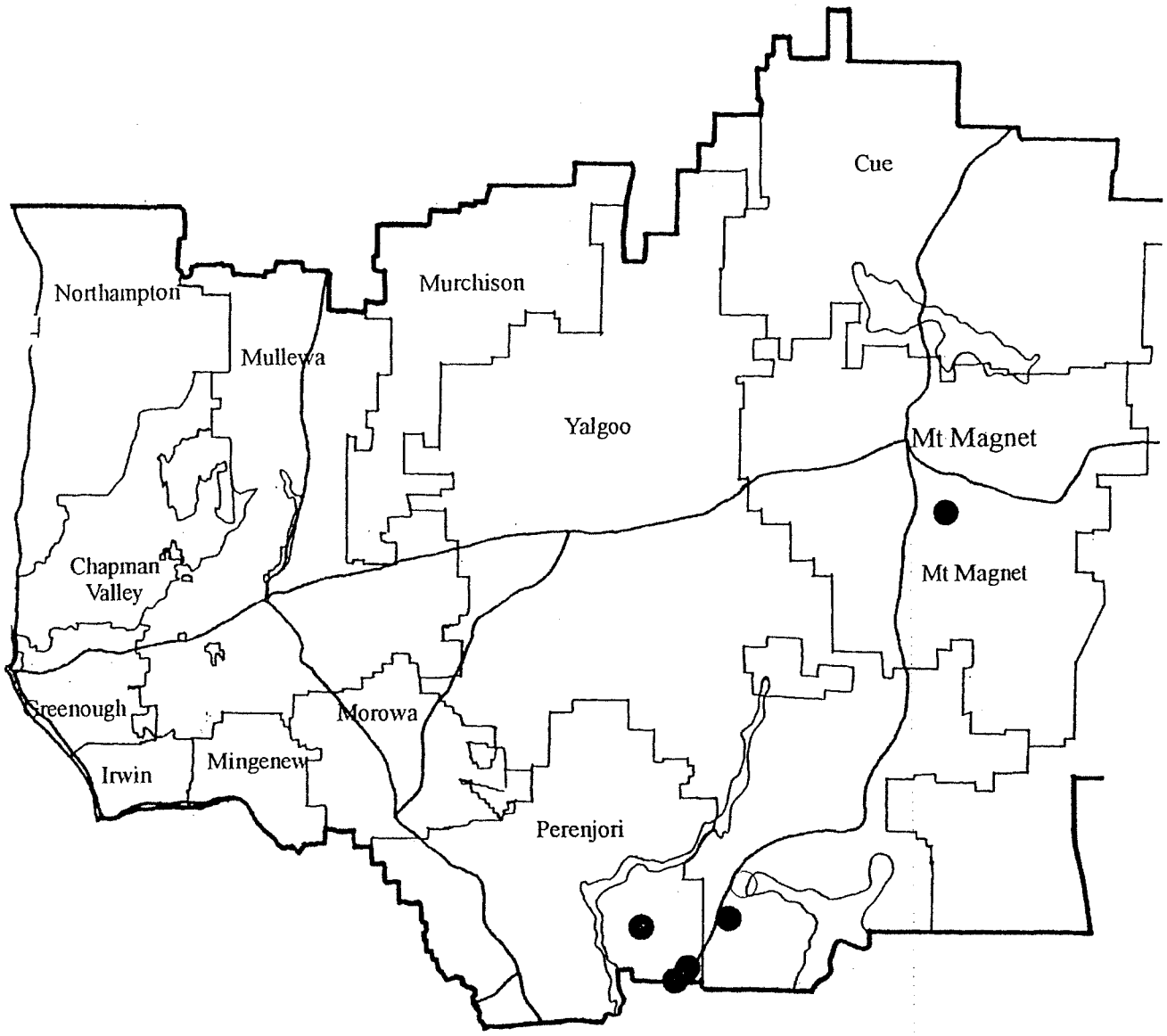
- Further survey is required, particularly to refind and survey populations 3, 4 and 6 and those recorded in the past outside the District.

References

Wilson (1970).

0 10 20 30 40 50 km

Eriostemon nutans



Legend

Local Government Boundary

District Boundary

Plant Population

WAHERB Record only

Erymophyllum hemisphaericum Paul G.Wilson ASTERACEAE

This species is known only from the type collection made by Oldfield pre 1863.

It is a glabrous herb to 25 cm high, the stems single or branching at the base. The leaves are filiform, c. 30 mm long at the base of the plant, decreasing in size upwards on the stems. The flower heads are arranged 2-6 in open cymes. The whorl of bracts surrounding the flower head is hemispherical, c. 6 mm high and glossy. The outer bracts are leaf-like, the intermediate bracts have a pale brown horny base and the inner bracts have an obovate lamina c. 5 mm long. There are about 20 flowers in each head. The achenes are narrow-ovate with a densely silky villous covering of hairs. The pappus bristles are c. 4 mm long, prominently dentate.

The type collection of this species is also that of *Erymophyllum ramosum* subsp. *involucratum,* which has a glandular puberulous indumentum and also differs in the shape of the involucre, shape of the innermost involucral bracts and the pappus bristles. E. *hemisphaericum* is most similar to *E. tenellum* which has linear to narrow oblong laminae of the inner involucral bracts, about 2 mm long.

Flowering Period: Unknown

Distribution and Habitat in the Geraldton District

The type collection was made from Champion Bay at Geraldton.

There are no details of the habitat in which it was found.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* Champion Bay	-	-	pre 1863	-	-

Response to Disturbance

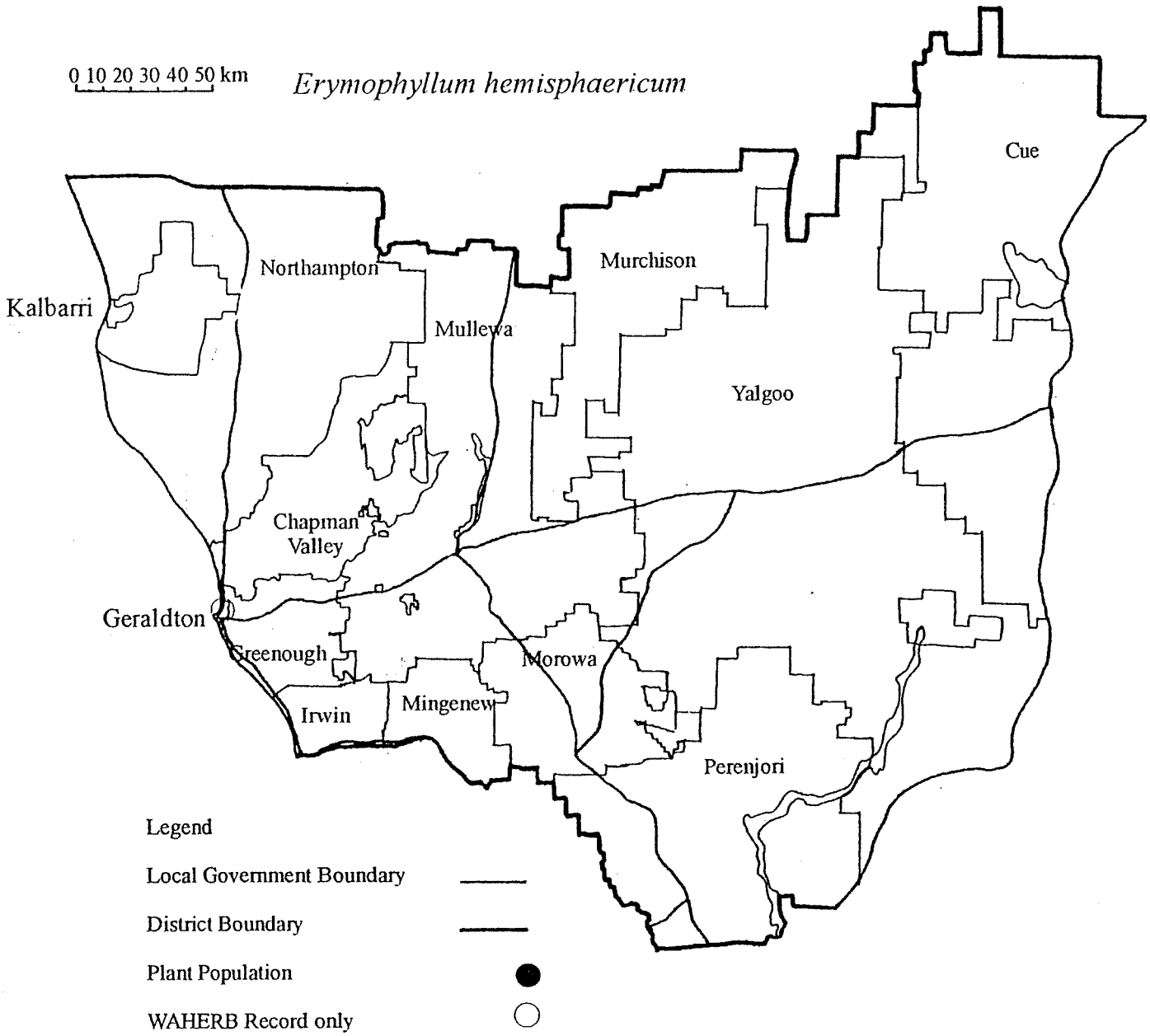
Unknown

Research Requirements

– Further survey is required to try to refind this species.

References

Mueller (1863), Wilson (1989).


0 10 20 30 40 50 km
Erymophyllum hemisphaericum
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Eucalyptus macrocarpa Hook. x *pyriformis* Turcz. MYRTACEAE

This hybrid is a mallee 1.2-3 m x 5-15 m. The stems may have a brown flaking stocking and are smooth and cream to grey above or may have patches of brown flaking bark. The leaves are petiolate, ovate-lanceolate in shape and are opposite to alternate and glaucous. The buds are large, ovoid, to 4 x 4.5 cm in diameter, the bud cap with a short beak. The flowers are red, pink or yellow. The fruits have peduncles to 1.5 cm long and are often ridged and have a moderately protruding disc. They are up to 5 cm in diameter.

The most northerly population, which occurs in the Geraldton District, is a hybrid of *Eucalyptus macrocarpa* subsp. *elachantha* and is a low mallee to 1.5 m with small narrow leaves.

Flowering Period: April and August-December

Distribution and Habitat in the Geraldton District

The only known population in the Geraldton District occurs west of Mingenew and this is the most northern known location for this hybrid, which occurs mainly within the Moora District along the eastern side south to the Calingiri area, whilst the most southerly population occurs south-east of Bolgart in the Merredin District. There is also a record from Cunderdin 70 km south-east of Bolgart.

Grows on yellow or grey sand or sandy loam, sometimes over gravel or associated with laterite, in low heath, sometimes in tall scrub with *Actinostrobus* sp. or in open mallee woodland. It occurs on slopes, ridges and hilltops and often grows in association with *E. macrocarpa*.

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. NW of Mingenew	Mi	Shire Road Reserve	18.5.1994	4	Healthy

Response to Disturbance

Unknown

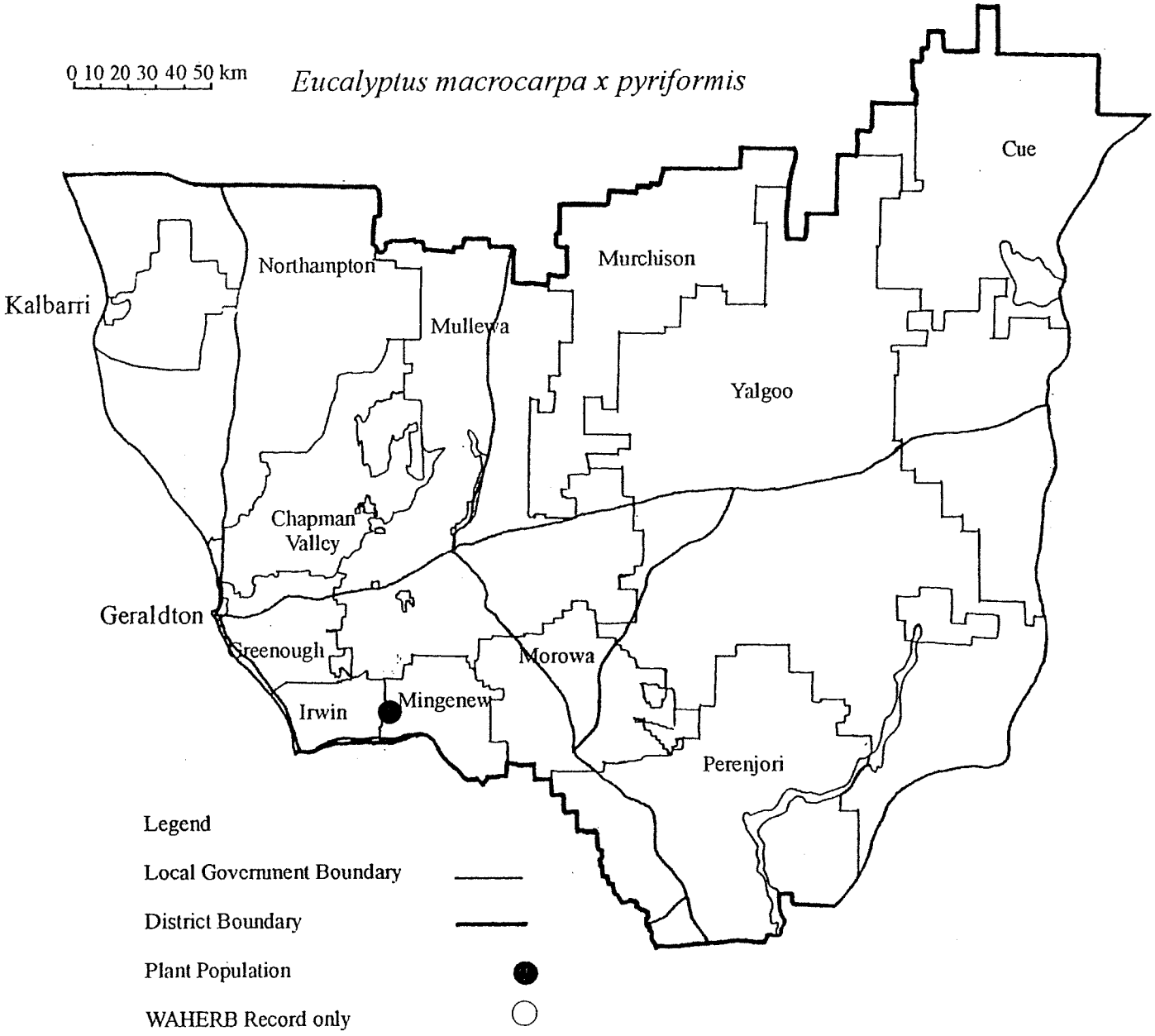
Management Requirements

- Ensure that road verge population is marked.
- Maintain liaison with land managers.

Research Requirements

- Further survey is required in the area of the known population in the District, particularly on conservation reserves.

[#] now Priority 3 (updated at December 1999)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Eucalyptus macrocarpa x pyriformis
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Eucalyptus sargentii Maiden subsp. *fallens* L.A.S.Johnson & K.D.Hill

MYRTACEAE

Salt river gum

A tree to 6 m or a mallee to 5 m. The dark fibrous bark is persistent at the base of the trunk on larger individuals only, and the bark is smooth, grey, olive red-brown or bronze above. The leaves are narrow-lanceolate, 5-8 cm long, 6-12 mm wide. The inflorescences are simple and axillary, with seven flowers in each, the peduncle 12-16 mm long, the pedicels 4-8 mm long. The buds are cylindrical, 25-30 mm long, with the elongate-conical cap three or more times longer than the hypanthium. The flowers are pale yellow in colour. The fruits are 8-9 mm in diameter, 10-12 mm long, cylindrical to obconical in shape.

This subspecies differs from the typical subspecies in its larger buds and fruits. It is a shorter tree or mallee, the bark sometimes not persistent on the lower trunk and the leaves are slightly smaller.

Flowering Period: August

Distribution and Habitat in the Geraldton District

Known from two populations, near Binnu and c. 60 km further north on Eurardy Station.

Grows around saline lakes or creeks in yellow sand. Associated species include *Melaleuca uncinata, Acacia* and *Calothamnus* species.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Eurardy	N	Pastoral Lease	9.10.1986	5	-
2. N of Binnu	N	Crown Reserve	4.11.1985	-	-

Response to Disturbance

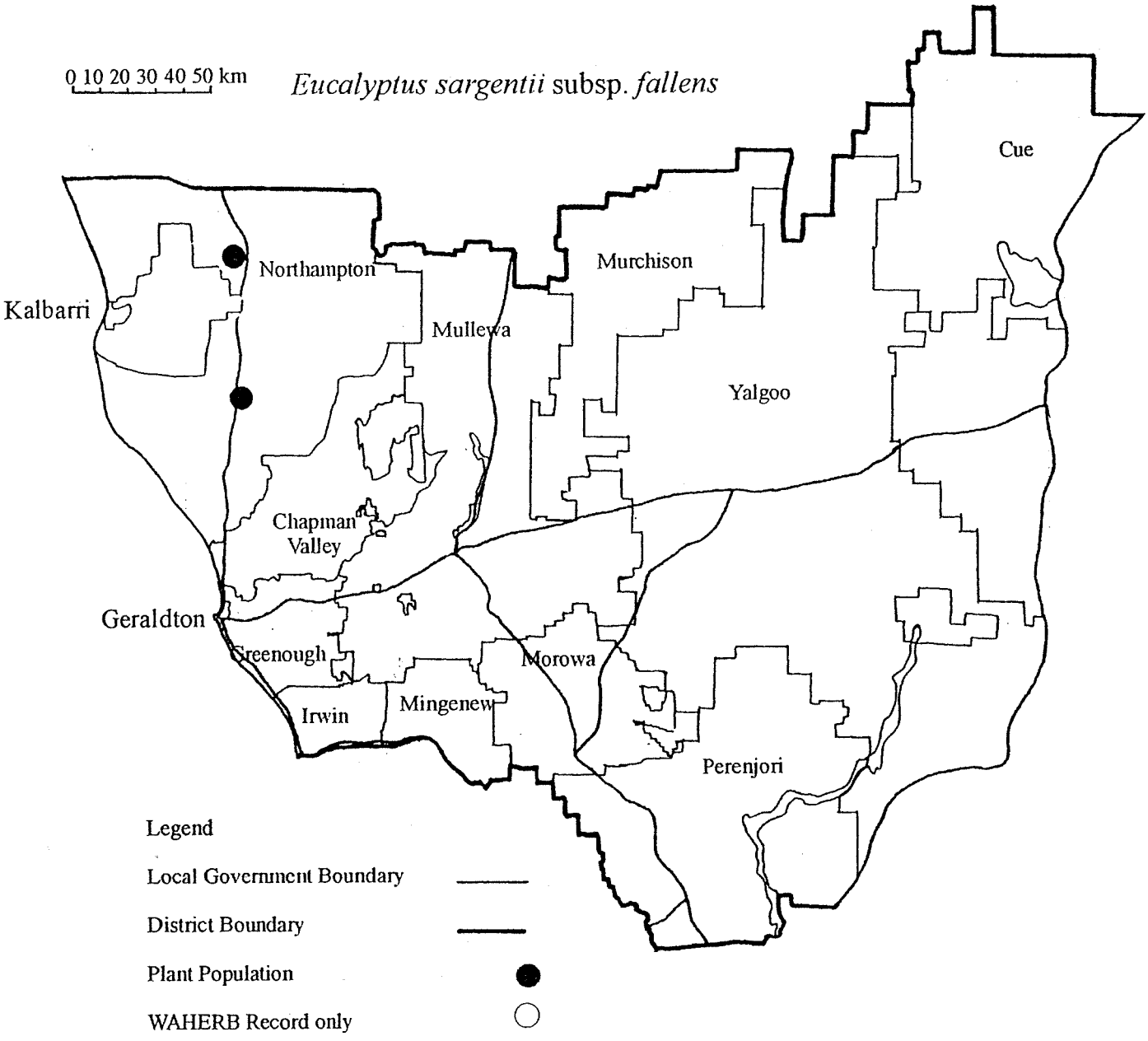
Unknown

Research Requirements

- Further survey is required, particularly to refind and survey population 2 and to establish the full extent of the taxon.

References

Johnson & Hill (1992).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Eucalyptus sargentii subsp. fallens
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Frankenia bracteata Turcz. FRANKENIACEAE

Broad Bract Frankenia

A small, spreading shrub, with shining red stems. The leaves are linear, to c. 8 mm long. They are smooth and shining on the upper surface, with recurved margins, concealing the hairy lower surface. They are opposite, grouped in clusters. The flowers are grouped in dense heads, surrounded by bracts and bracteoles which are broader than the leaves, flat, lanceolate to ovate in shape, ciliate and overlapping to conceal the calyces of the flowers. The flowers have five petals 9-12 mm long, six stamens and a three-branched style.

Flowering Period: October

Distribution and Habitat in the Geraldton District

Has been collected once in the Geraldton District from east of Mullewa and has also been recorded from the Merredin District at Waeel and from near Esperance.

Grows as a ground cover on open, sandy, saline soils.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* E of Mullewa	Mu	-	1.10.1962	-	-

Response to Disturbance

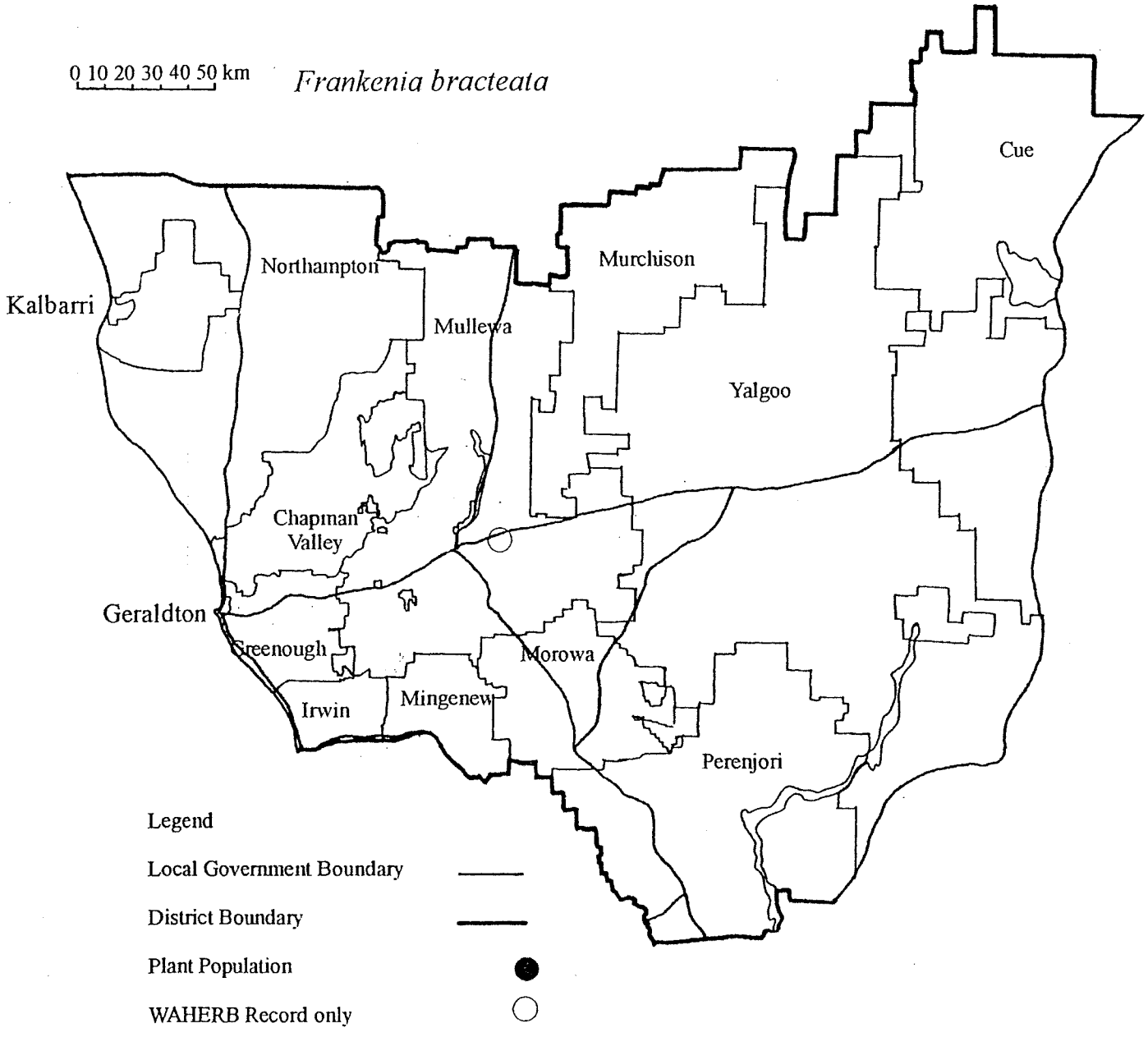
Unknown

Research Requirements

- Further survey is required to refind this species.
- Further taxonomic work is required in this genus.

References

Barnsley (1982), Bentham (1863), Blackall & Grieve (1974), Diels & Pritzel (1904-5), Mollemans *et al.* (1993).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Frankenia bracteata
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Gastrolobium propinquum C.A.Gardner FABACEAE

Hutt River Poison

An upright, branched shrub 1 to 2 m tall. The branches are hairless and angled by continuations of the leaf stalks. The leaves are mostly in threes and are simple, narrow, tapering at the base on short slender stalks, erect or slightly spreading, 4-5 cm long. They do not curve outwards in the upper half, or only slightly, and are somewhat folded lengthwise, olive to blue-green in colour. They are the same colour on each side and narrow abruptly to a fine point. The fine black stipules are not persistent. The racemes are elongated and loose, usually at the branch ends or in the upper leaf axils. The bracts which conceal the flower buds are entire, acute, chestnut brown. The calyx is c. 3 mm long and has a few close-lying hairs. The corolla is orange-yellow, c. 6 mm long.

Gardner (1955) distinguishes the populations from White Peak and Isseka as having bluish leaves, those from the Hutt River area having olivaceous green leaves.

Aplin (1969) describes the taxon from around Mullewa as a larger shrub with longer, olive green leaves which do not taper towards the base and are more flattened.

This species is closely related to *Gastrolobium oxyloboides,* Champion Bay Poison, (the Latin *propinquum* meaning near or closely connected with) and is easily confused when not in flower. *G. propinquum* is a taller, more branched shrub, and when in flower has smaller flowers, the calyx with a sparse covering of hairs. The racemes have more flowers and the chestnut brown bracts are longer than the calyx.

Flowering Period: June-November

Distribution and Habitat in the Geraldton District

This species is known from north-west of Northampton over a range of c. 20 km. Populations south of Northampton and east of Mullewa have not been refound recently.

Grows in grey clay, grey-brown sandy clay or brown clayey loam, in flat winter-wet areas and creek lines in shrubland. Associated species include *Melaleuca uncinata, Callitris canescens* and *Acacia* sp.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Yerina Springs Road	N	Shire Road Reserve	9.8.1994	3	Moderate, weed infestation and water erosion
2. Yerina Springs Road	N	Shire Road Verge	9.8.1994	5+	Moderate
3. Yerina Springs Road	N	Shire Road Verge, Private	9.8.1994	20+	Moderate to poor, weed infestation and disturbance
4. Yerina Springs Road	N	Shire Road Verge	9.8.1994	20+	Poor, weed infestation
5. Yallabatharra Road	N	Shire Road Verge	9.8.1994	0 (1 in 1989)	-
6. Swamp Road	N	Shire Road Verge, Private	4.7.1995	500+	Healthy
7. Yallabatharra Road	N	Shire Road Verge, Private	8.8.1994	10+	Healthy

Populations Known in the Geraldton District (Cont'd)

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
8. Rob Road	N	Private	8.8.1994	4	Healthy
9. Port Gregory Road	N	Shire Road Verge	9.8.1989	15	-
10. Rob Road	N	Shire Road Verge, Private	24.6.1997	10+	-
11.*White Peak	N	-	2.9.1947	-	-
12.*Isseka	N	-	20.6.1953	-	-
13.*Northampton	N	-	11.1959	-	-
14.*E of Mullewa	Mu	-	8.1986	-	-
15.*Mullewa	Mu	-	11.9.1962	-	-
16.*Geraldton	CV	-	1.1962	-	-

Response to Disturbance

Unknown

Management Requirements

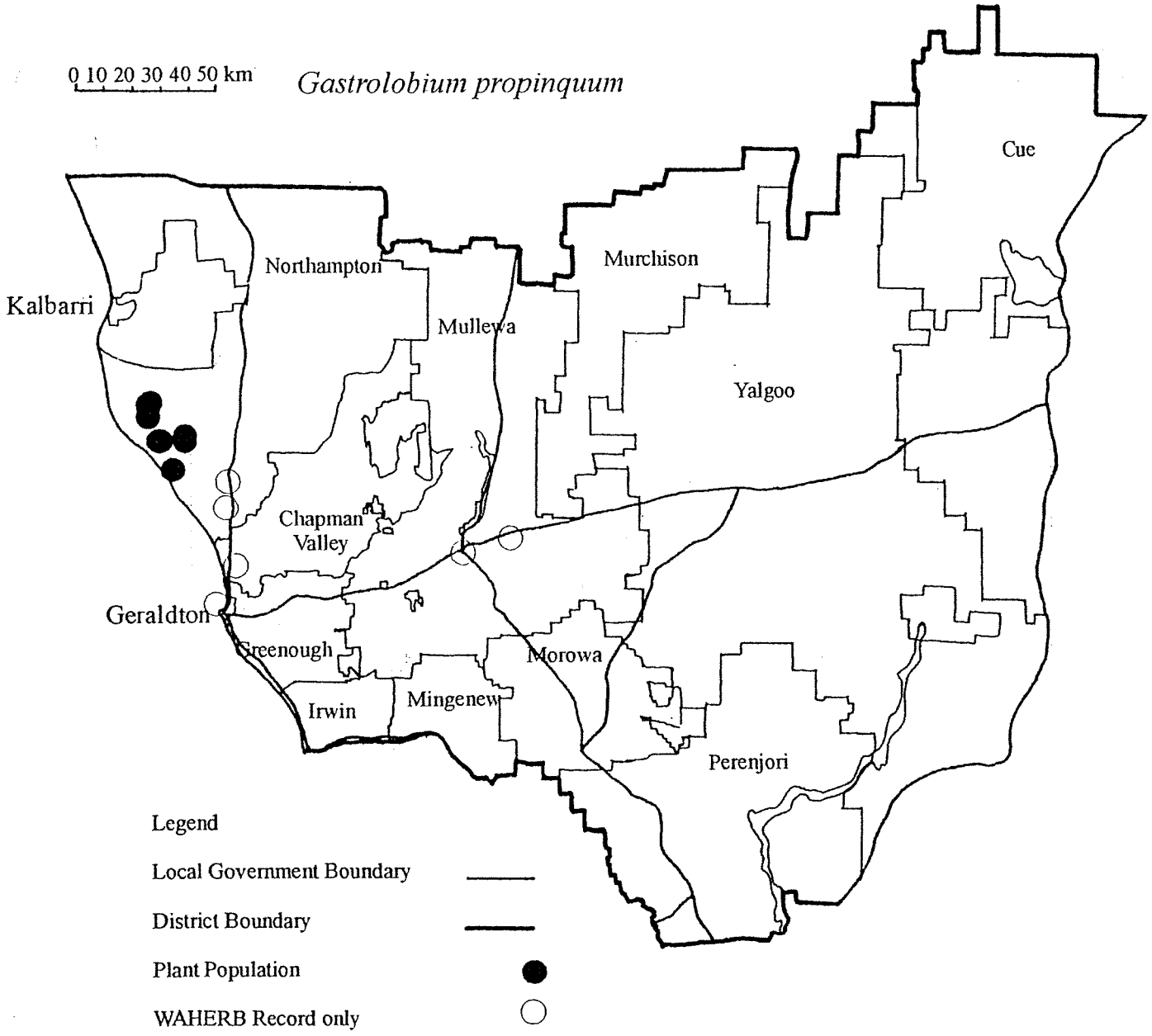
- Ensure that road verge populations are marked.
- Maintain liaison with land managers.

Research Requirements

- Urgent further survey is required, particularly to refind populations 11, 12, 14 and 15, and to find populations on conservation reserves within and around the range of the species.

References

Aplin (1969), Crisp & Weston (1987), Everist (1981), Gardner (1955), Gardner & Bennetts (1956), Sampson & Hopper (1989, 1990).


0 10 20 30 40 50 km
Gastrolobium propinquum
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Gastrolobium rotundifolium Meisn. FABACEAE

Gilbernine Poison

A low, erect shrub to 0.6 m tall. The leaves are opposite, with a pair of persistent stipules united with the lower part of the leaf stalk. The leaves are usually broad, with undulate margins, oblong in shape, tapering to a pointed tip. A form from between Miling and Walebing in the Moora District has narrow leaves with the margins rolled under. The branches and young leaves are hairy but the leaves become hairless with age, dark green and hairless above and pale underneath. The flowers are orange-yellow with reddish-brown to purple markings. They are borne in dense racemes at the ends of the branches. The flower bracts are broad, chestnut brown in colour and conceal the buds until they open. The fruit is a short, broad and hairy pod.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

This species has been recorded in the Geraldton District at Mingenew. It is known from several populations on private land and a road reserve near Watheroo in the Moora District but has been collected in the past from a number of locations in the Moora District further to the south-east between Miling and Calingiri, and from much further south in the wheatbelt near Wagin in the Katanning District.

In the Geraldton District, this species has been recorded on a breakaway, growing in grey-white clay loam, in shrubland with *Acacia acuminata, Melaleuca* and *Allocasuarina* species. Elsewhere it has been found growing in white sandy clay soils or gravelly loam on quartzite ridges and granite, or on flat, sandy clay soil in open low woodland of *Eucalyptus wandoo* and *E. loxophleba* with low open scrub. Associated species include *Allocasuarina campestris* and *Melaleuca radula.* Prefers open areas (Gardner & Bennetts 1956) but also grows in woodland.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. N of Mingenew	Mi	Private	12.9.1996	"Frequent"	-

Response to Disturbance

The plant is known to sucker if cut off at ground level, so may resprout after fire. It contains monofluoro-acetate and is toxic to stock.

Management Requirements

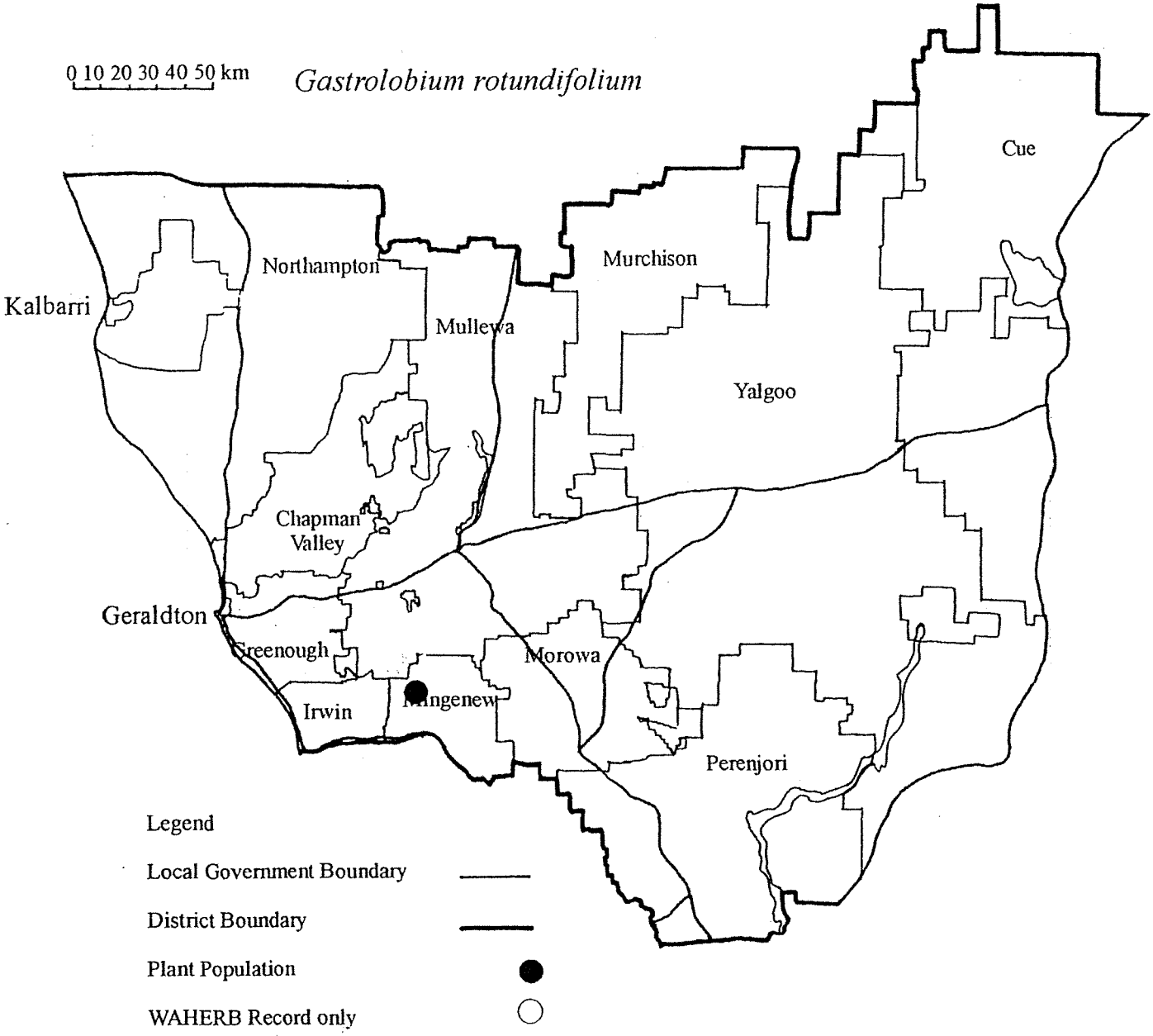
- Maintain liaison with landowner.

Research Requirements

- Further survey is required to resurvey population 1 and to find further populations, particularly on conservation reserves in the Mingenew area.

References

Aplin (1969, 1973), Bentham (1864), Everist (1981), Gardner & Bennetts (1956), Leigh *et al.* (1984), Sampson & Hopper (1990).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Gastrolobium rotundifolium
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Gnephosis cassiniana P.S.Short ASTERACEAE

An annual herb 1-6 cm high, with the main stems ascending to erect, simple or branching at the base. The leaves are opposite at the base, becoming alternate. They are sessile, elliptic or ovate, succulent and glabrous, to 1.2 cm long and 2.4 mm wide. The flowers are in ellipsoid or obovoid compound heads, to 1.2 cm long, 0.8 cm broad. The bracts subtending the compound heads do not form a conspicuous involucre but grade into the bracts below the heads, which are obovate to widely ovate, to 3.8 mm long and 3.9 mm broad. Their upper margins are narrowly thin and transparent, the lower margins have long hairs. There are up to 30 heads in each compound head, each with one leaf-like, green, fairly succulent bract overlapping the capitular bracts. The florets are yellow, 4-16 in each small flower head. Each has a five-lobed corolla and five stamens. The fruit is obovoid, to 0.5 mm long, without a pappus.

This species is similar to *Gnephosis brevifolia* and *G. ericephala* but differs in its succulent leaves and succulent capitulum bracts with hyaline margins. It also resembles some forms of *G. tenuissima* which has scale-like hairs on the leaves and main stems.

Flowering Period: September-October

Distribution and Habitat in the Geraldton District

Occurs from Binnu, north of Northampton, south-east to Warriedar, west of Paynes Find, over a range of c. 270 km. Grows on saline, sand or clay soils, along drainage lines, salt lakes and saline depressions, amongst open low shrubland of *Halosarcia, Atriplex* and *Maireana* species.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. S of Binnu	N	MRWA Road Verge, Rail Reserve	26.9.1995	10 000+	Healthy, some weed infestation
2. W of Yalgoo	Mu	-	8.10.1989	-	-
3. E of Mullewa	Mu	MRWA Road Verge, Rail Reserve	5.10.1994	c. 30	Moderate
4. Warriedar	Y	Pastoral Lease	26.9.1986	-	-
5. SE of Mullewa	Mu	MRWA Road Verge, Private	29.9.1995	1 000+	Healthy to moderate, some weed infestation

Response to Disturbance

Unknown

Management Requirements

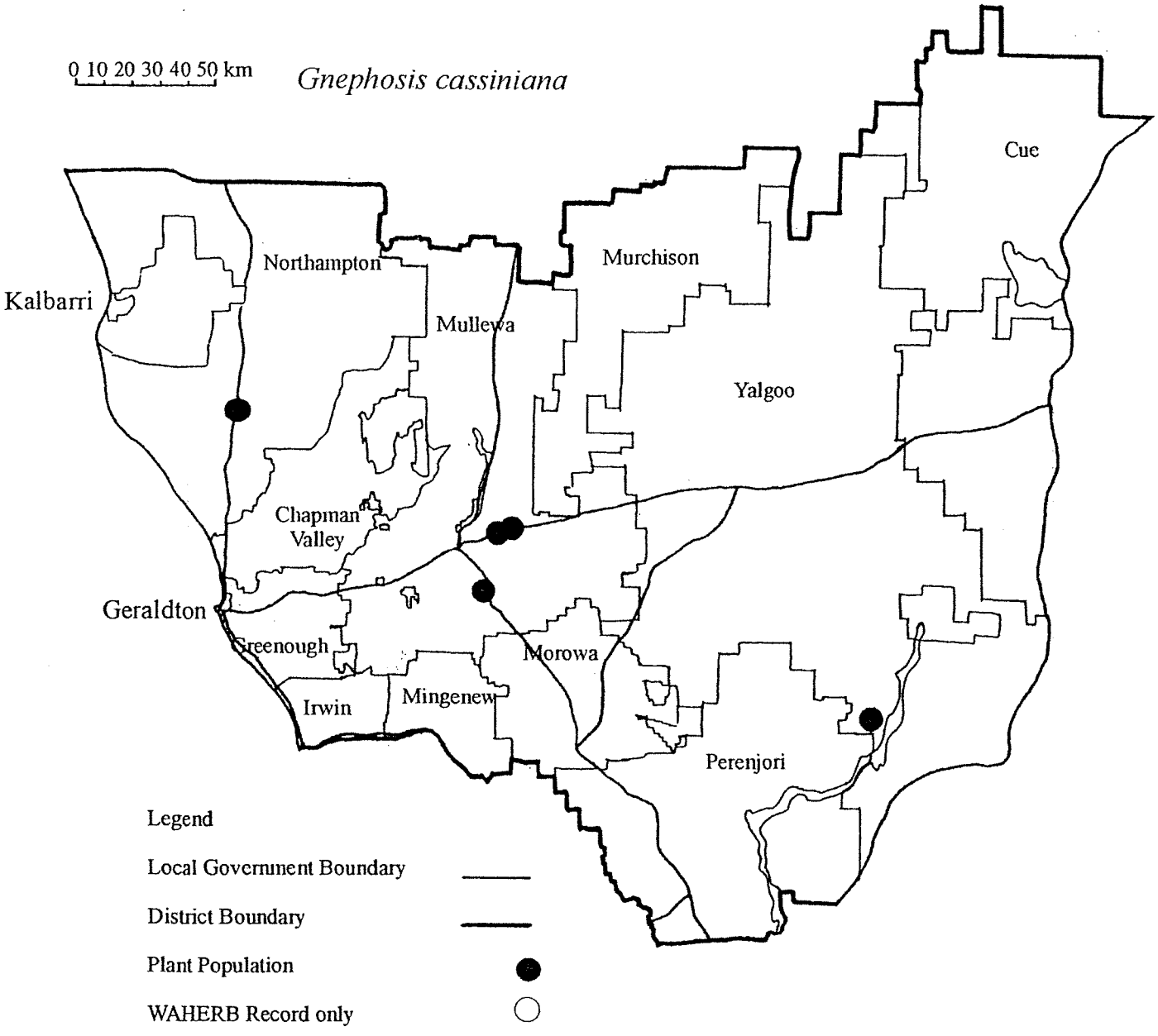
- Ensure that road verge and rail reserve populations are marked.
- Maintain liaison with landowner and managers.

Research Requirements

- Further survey is required, particularly to refind and survey populations 2 and 4.

References

Short (1990).


0 10 20 30 40 50 km
Gnephosis cassiniana
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Gnephosis setifera P.S.Short ASTERACEAE

An annual herb with a single compound head which is sessile in a basal rosette of leaves, or branching, with prostrate stems to 0.5 cm long. The leaves are sessile, entire, oblanceolate to spathulate, to 1.5 cm long, 0.26 mm wide, with scattered bristles. The compound heads are broadly flattened, up to 0.5 cm high and 1.6 cm in diameter. The leaf-like bracts surrounding the compound heads form a conspicuous involucre. There are 10-45 heads within each compound head, each surrounded by two or three rows of bracts, the outer ones leaf-like, the inner partly transparent. There are 5-11 florets in each head, each with a tubular five-lobed corolla and five stamens. The fruits are obovoid, dark pink, without a pappus.

This species differs from others in the genus in that it is prostrate, not erect, and has compound heads which have an involucre, the involucre being absent in other species. It also has a branched general receptacle, not unbranched as in the other species, and the hairs on the plant are bristle-like, not scale-like.

Flowering Period: September

Distribution and Habitat in the Geraldton District

This species is known from three populations in the Morowa to Lake Monger area over a range of c. 75 km.

Grows in sandy saline soils on saline lake systems and in one locality, on a sandy ridge. It occurs in association with low shrub species, including *Halosarcia, Atriplex* and *Gunniopsis.*

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. S of Morowa	Mo	?MRWA Road Verge, Private	29.9.1994	-	-
2. SE of Bunjil	P	-	16.9.1986	-	Area of sand extraction
3. ESE of Perenjori	P	-	19.9.1987	-	-

Response to Disturbance

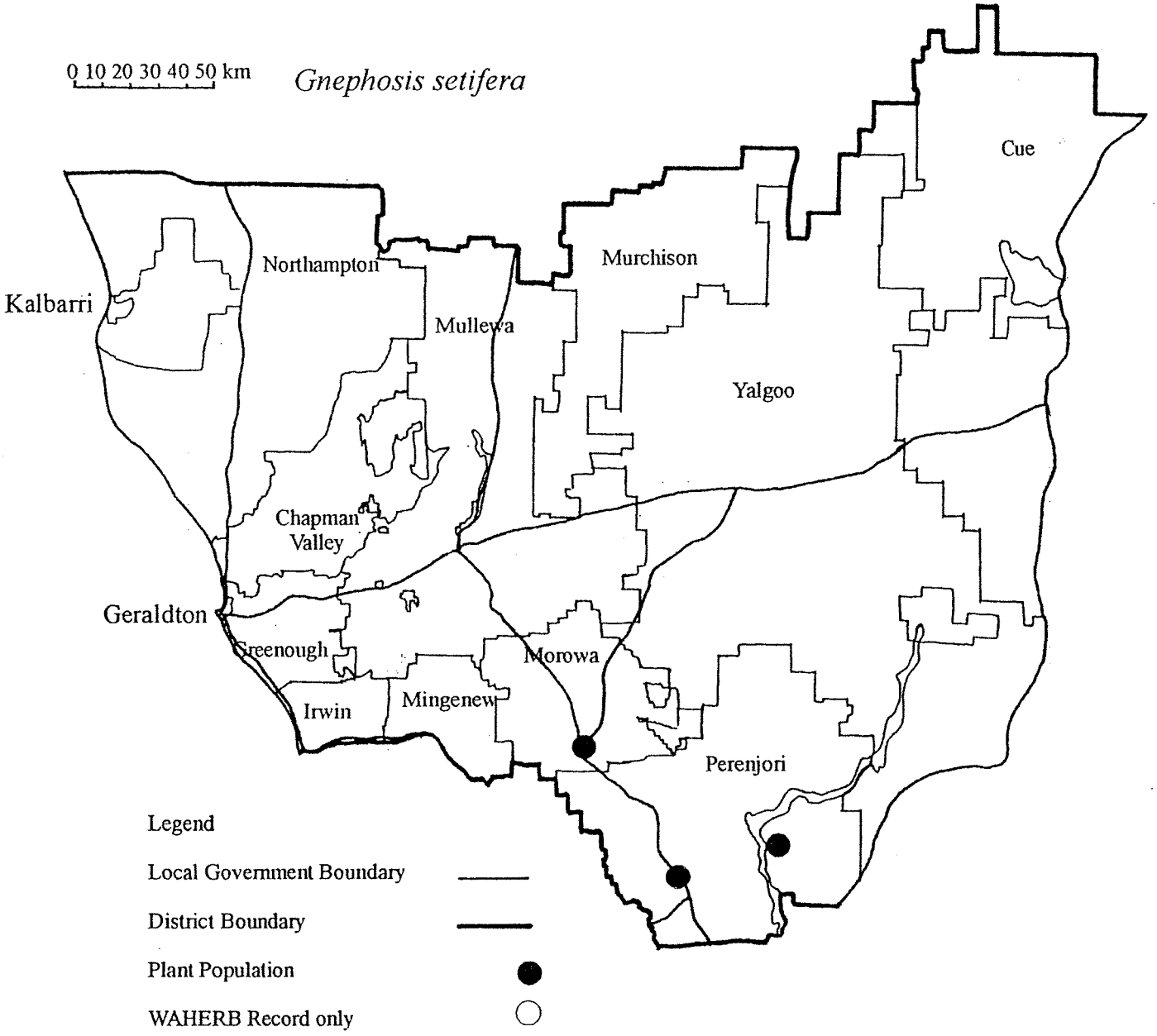
Unknown

Research Requirements

- Further survey is required to find and resurvey all known populations and to find further populations.

References

Short (1990).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Gnephosis setifera
Cue
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Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Gompholobium asperulum (S.Moore) Crisp FABACEAE

This species was originally described by Moore in 1920 as *Burtonia asperula* and was transferred to *Gompholobium* by Crisp and Weston in 1987. It was described from specimens collected by Stoward from the Wongan Hills.

G. asperulum is a compact, dwarf shrub 10-30 cm tall, the branches densely clothed in stiff hairs. The leaves are pinnate, with 5-7 narrow, hispid, linear leaflets, with revolute margins. They are 3-4 mm long, on short, densely hairy petioles c. 1 mm long. The flowers are pea-shaped, with a calyx 5 mm long, hairless apart from the margins, and petals 7 mm long. They are mauve to purple in colour, the standard paler than the keel, which is sometimes described as maroon or reddish-purple in colour.

Flowering Period: August-October

Distribution and Habitat in the Geraldton District

Has been collected in the Geraldton District between Ajana and Latham, a distance of c. 270 km. It also occurs between Merredin and Kalgoorlie.

At population 1 in the Geraldton District, the species grows in brown loam with laterite in open mallee woodland and tall *Acacia* shrubland, with *Grevillea integrifolia, G. paradoxa, Keraudrenia integrifolia, Cassia* and *Glischrocaryon* species. Near Ajana it was recorded growing on sand. Populations further east have been recorded from yellow clayey sand and yellow sand over laterite, in shrubland.

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SE of Mullewa	Mu	Nature Reserve	29.9.1995	1+	Healthy
2.* E of Mullewa	Mu	-	20.9.1968	-	-
3.* Near Ajana	N	-	20.8.1960	-	-
4.* Between Bunjil & Latham	P	-	10.1961	-	-

Response to Disturbance

A population near Coolgardie was growing on a disturbed roadside. Population 1 was close to the edge of a graded track.

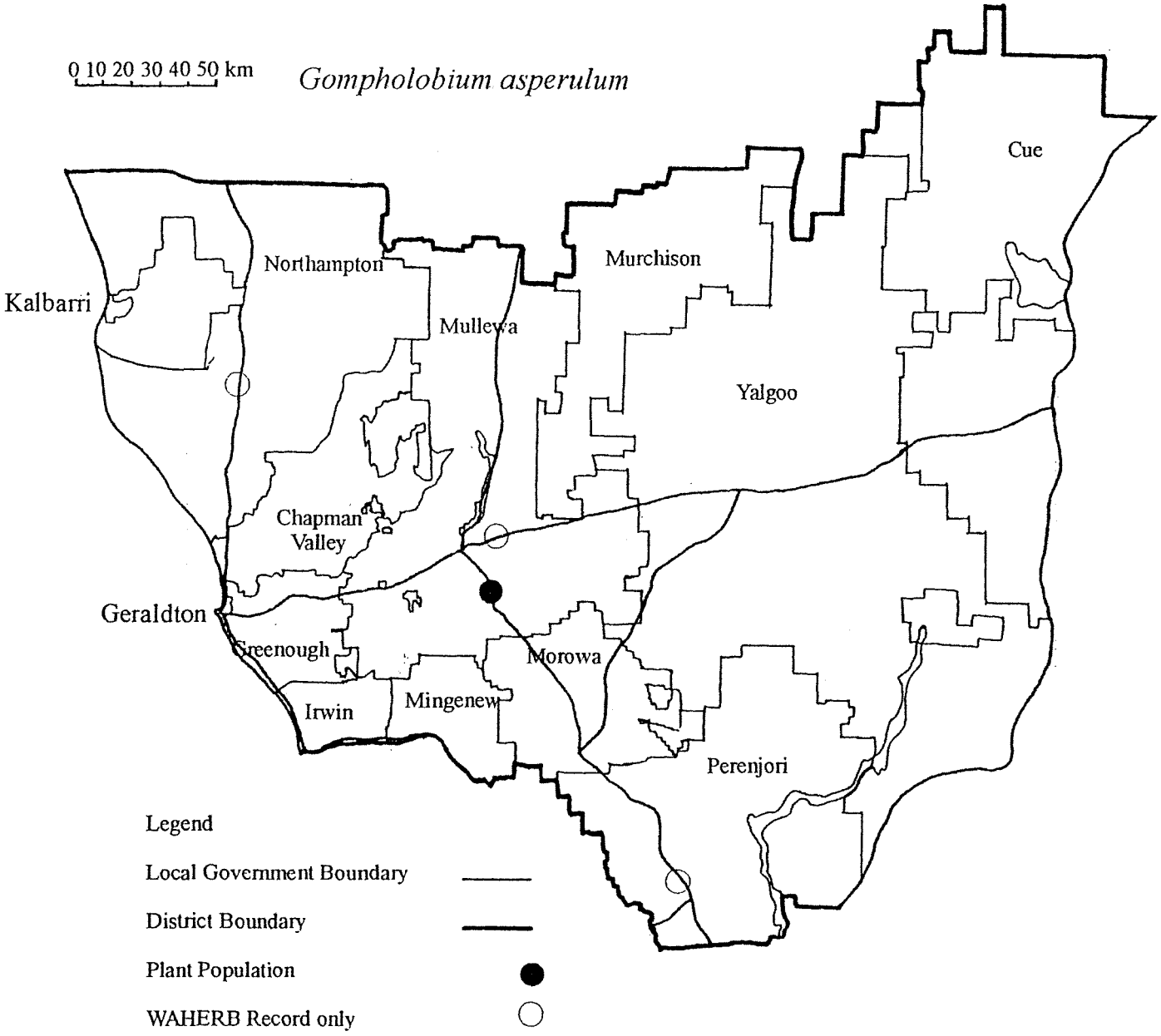
Research Requirements

- Further survey is required at population 1 to discover the full extent of the population, and in suitable habitat throughout the range of the species.

References

Crisp & Weston (1987), Moore (1920).

[#] now Priority 3 (updated at December 1999)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Gompholobium asperulum
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Goodenia perryi Carolin GOODENIACEAE

A herb, growing obliquely upward to 30 cm tall, with silvery, cottony hairs. The basal leaves are oblanceolate, 4-5 cm long, 6-10 mm wide. The flowering raceme is up to 15 cm long, with leaf-like bracts, but smaller. The flower has a corolla 15-18 mm long, with a few short hairs on the inside. It is pale blue in colour, hairless on the outside. The abaxial lobes are 8-9 mm long, the wings c. 3 mm wide. The indusium is suborbicular, c. 2 mm in diameter.

This species is similar to *Goodenia incana* which has hairs on the outside of the corolla.

Flowering Period: October-November

Distribution and Habitat in the Geraldton District

This species was originally collected from Bunjil in the Geraldton District. A further population was found more recently from south-south-west of Mt Gibson and another in the same area on the District boundary. It has also been collected from an unspecified locality on Lake Moore and from south of Ballidu to Mollerin in the Merredin District.

Grows in yellow sand or yellow clayey sand in open shrubland.

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SSW of Mt Gibson	Y	-	21.11.1992	"occasional"	-
2. SW of Mt Gibson	Y	-	21.11.1992	"occasional"	-
3.* Bunjil	P	-	15.10.1961	-	-

Response to Disturbance

A population near Kalannie was growing on the edge of a gravel pit.

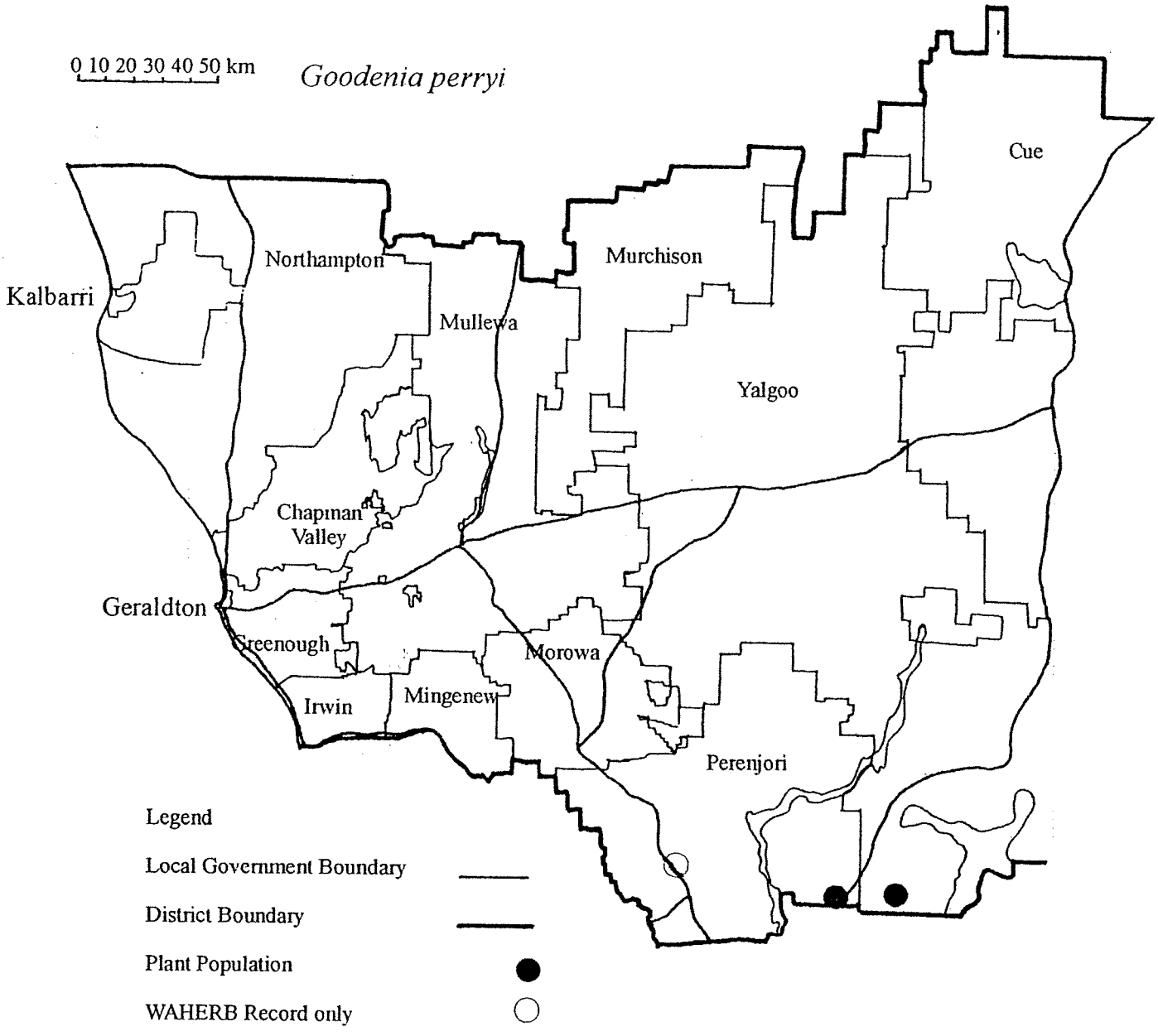
Research Requirements

Further survey is required.

References

Carolin (1990b, 1992).

[#] now Priority 3 (updated at December 1999)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Goodenia perryi
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Goodenia pusilliflora F.Muell. GOODENIACEAE

A prostrate herb with long spreading hairs. The branches bend upwards, the plants becoming up to c. 8 cm tall and c. 30 cm wide, but often smaller. The leaves in the basal rosette are oblong to narrowly oblanceolate, with dentate or lyrate margins. They are 1.5-8 cm long, 5-15 mm wide. The flowers are in racemes to 20 cm long, with leaf-like bracts. The pedicels are 1-7 cm long, without bracteoles. The corolla is 5-7 mm long, yellow in colour, hairy inside towards the base. The indusium is depressed obovate in shape, 1 mm long and is notched.

This species differs from most others in the genus in presence of a notch in the margin of the indusium. *Goodenia mimuloides* also has this character but has much larger flowers, the corolla being 12-25 mm long. *G. pinnatafida* is also similar but does not have a notched indusium.

Flowering Period: July-October

Distribution and Habitat in the Geraldton District

This species had been collected once in the Geraldton District from north-east of Geraldton until several populations were found in 1996 and 1997 north-west of Paynes Find. Elsewhere in Western Australia it occurs at Wongan Hills, in the Merredin to Kalgoorlie area and south-west of Ravensthorpe. It also occurs in the drier parts of South Australia, New South Wales and Victoria.

Grows around clay pans and in drainage lines in brown clay or red sandy clay or clay loam in open shrubland, low *Acacia* woodland or in chenopod dwarf scrub, with *Cephalipterum drummondii.* In the Coolgardie area, it is recorded from loam on flats in open woodland of salmon gum. It is also recorded from breakaways or on valley slopes on granite in light brown loamy sand, in tall open shrubland with *Dodonaea lobulata.*

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. NW of Paynes Find	Y	Pastoral Lease CALM	20.8.1997	100+	Healthy
2. NW of Paynes Find	Y	Pastoral Lease CALM	17.8.1997	1 000+	Healthy
3. NW of Paynes Find	Y	Pastoral Lease CALM	9.9.1996	10+	Healthy
4. NW of Paynes Find	Y	Pastoral Lease CALM	9.8.1997	5+	Moderate, weed infestation & grazing
5. NW of Paynes Find	Y	Pastoral Lease CALM	20.8.1997	100+	Healthy
6.* ENE of Geraldton	Mu	-	17.8.1963	-	-

Response to Disturbance

Unknown

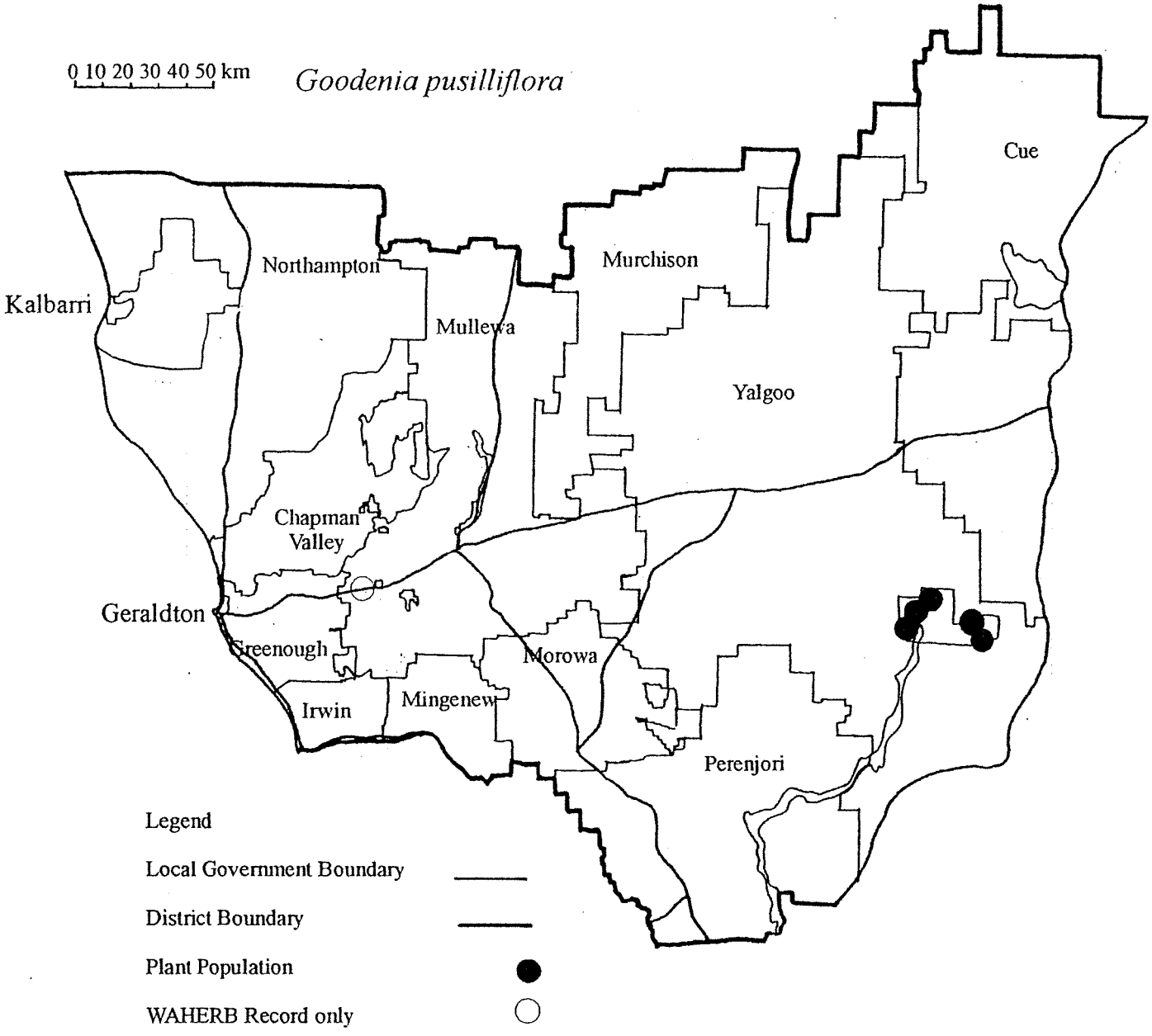
Research Requirements

– Further survey is required.

[#] species has been taken off the Priority Flora list (updated at December 1999)

References

Carolin (1992), Mueller (1888).



Grevillea fililoba (McGill.) P.Olde & N.Marriott PROTEACEAE

Ellendale Pool Grevillea

This species was described as a subspecies of *Grevillea thelemanniana* by McGillivray in 1986 and raised to specific level by Olde and Marriott in 1994. The species was cultivated in California in 1908 but was not cultivated in Australia until c. 1985.

G. fililoba is a spreading, dense shrub, to 1.5 m high and 3 m wide. The branchlets at first have sparse silky appressed hairs to 1.5 mm long,. The leaves are 2-4.5 cm long, sometimes the lower lobes divided again. The leaf lobes are spreading, linear, obtuse and curved, 0.3-0.7 mm wide and 0.2-2 cm long. The upper surface of the leaf-lobes is sparsely silky and the lamina of the lower surface is not exposed. The flower heads are hemispherical to almost globose, loose, usually almost erect, with the flowers often opening from the apex downwards. The flowers are 9-10 mm long, the pistil 24-28 mm long. The perianth limb is glabrous on the outside. The style is glabrous, at first exserted and looped upward, gently incurved after anthesis, gradually dilated to the style end, the pollen presenter 1.5-1.8 mm long. The flowers are pink to bright red with a white limb, the style pink with a green tip. The ovary is sub-triangular in side view, on a stalk 4.5-4.8 mm long.

This species is similar to *G. thelemanniana* and *G. pinaster,* which have simple or once divided leaves. *G. preissii* is also similar but has more dense inflorescences arranged more on one side of the axis, coarser leaf lobes, mostly more than 0.8 mm wide and a smaller pollen presenter.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

This species is known from one population south-east of Geraldton on the Greenough River, although it is reported from the Irwin River also (Olde & Marriott 1994-5).

Occurs in low dense scrub on the crest of a hill, growing in red to yellow sand over laterite.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SW of Ellendale Pool	G	MRWA & Shire Road Verges, Private	16.8.1996	50+	Moderate

Response to Disturbance

Unknown

Management Requirements

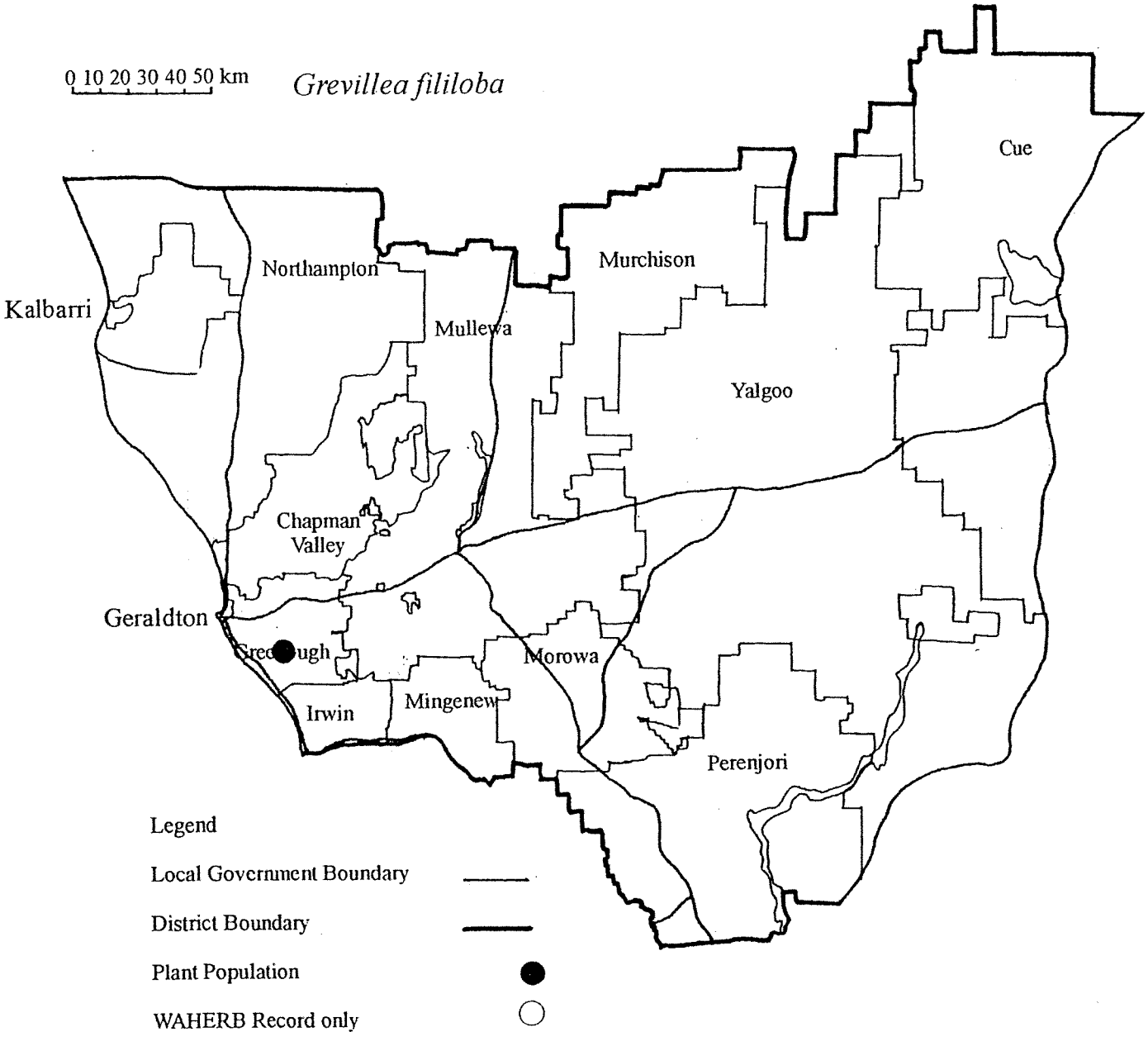
- Ensure that the road verge population is marked.
- Maintain liaison with land owner and land managers.

Research Requirements

- Urgent further survey is required.

References

McGillivray (1986), McGillivray & Makinson (1993), Olde & Marriott (1994-5).


0 10 20 30 40 50 km
Grevillea fililoba
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Grevillea murex McGill. PROTEACEAE

An upright, much-branched shrub 1-2 m tall, with somewhat hairy branchlets. The leaves are 8-10 mm long and have stalks to 1.5 mm long. They are divided into 4-5 linear to oblong lobes with blunt tips. The flower heads are dome-shaped at the ends of the branches, 1-2 cm long and c. 2 cm across. The flowers are cream to yellow in colour, hairless on the outside and c. 3 mm long, with the pistil 9-10 mm long, the ovary glabrous and the pollen presenter oblique and almost flat. The fruits are oblong to ellipsoid, 9-13 mm long, with thick coats and covered with irregular spiny protuberances to 2.5 mm high. These give the fruit the appearance of a murex shell.

Related to *Grevillea crithmifolia* but differs in the hairy branchlets, smaller leaves, flat torus and seed pod with a hard coat which has conspicuous irregular projections.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

Occurs in the Geraldton District to the east-north-east of Yandanooka and also occurs 8 km further south in the Moora District in a restricted area over 6 km north-east of Arrino.

Grows in open York gum woodland over open low scrub with grasses and herbs. Grows in lateritic gravel and brown clay loam or red clayey sand, on gentle lower valley slopes or flat areas. Associated species include *Eucalyptus loxophleba, Allocasuarina campestris, Calothamnus* and *Melaleuca* species.

The population east of Yandanooka is of c. 50 plants. All populations are on narrow road reserves, disturbed and with weed infestation.

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. ENE of Yandanooka	Mi	Shire Road Reserve	3.10.1994	50+	Moderate, weed infestation, damage from fencing, narrow road reserve

Response to Disturbance

Unknown

Management Requirements

- Ensure that population is marked.
- Maintain liaison with Shire.

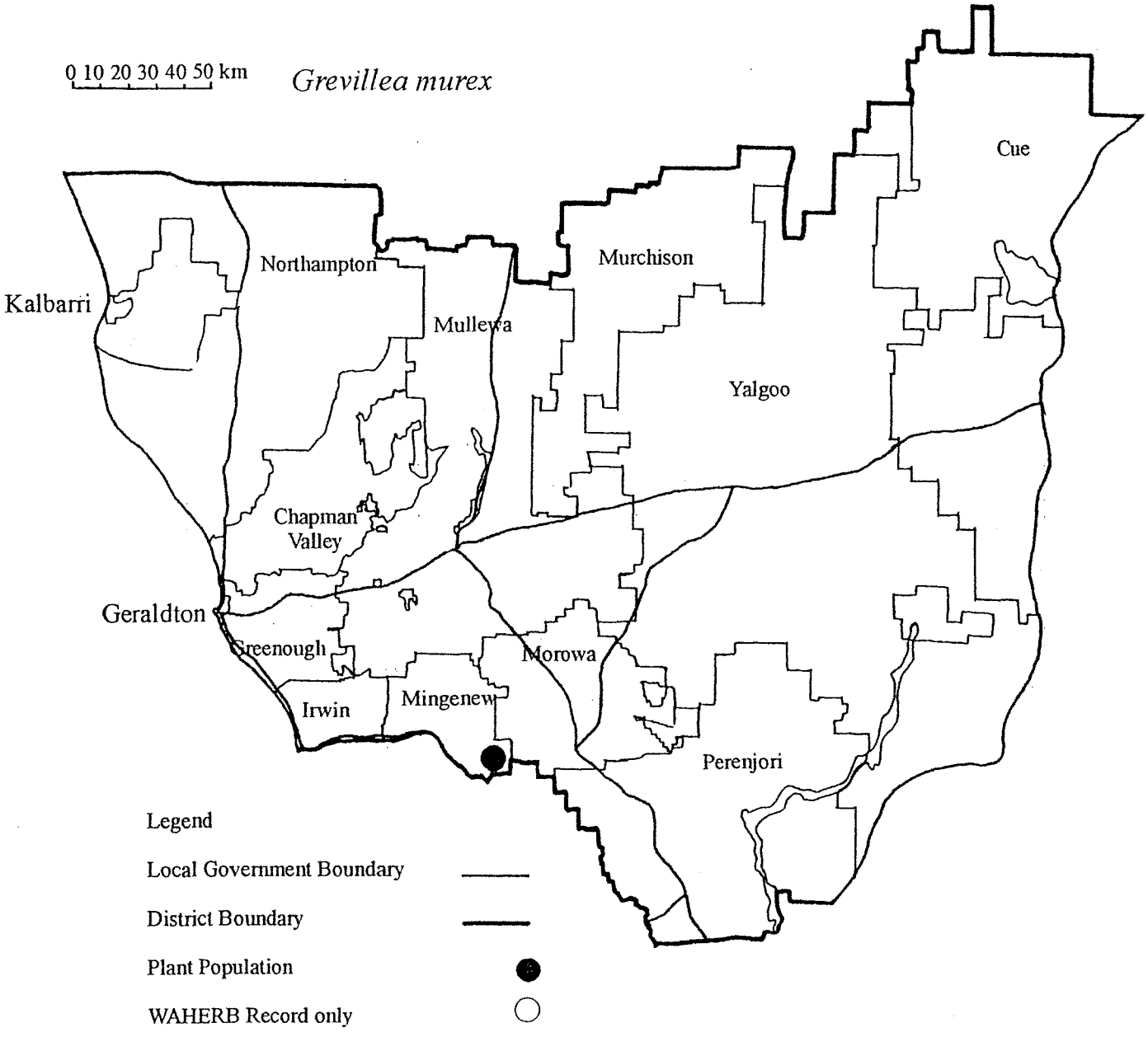
Research Requirements

- Further survey is required on conservation reserves and other remnant vegetation in the area.
- Collect seed for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.

[#] now Declared Rare Flora (updated at December 1999)

References

McGillivray & Makinson (1993), Olde & Marriott (1994-5).



Grevillea phanerophlebia Diels PROTEACEAE

Prominent Vein Grevillea

A spreading shrub to 1.5 m tall, with branchlets which are glabrous or with sparse, appressed, silky hairs. The leaves are glabrous on the upper surface, the lower surface is exposed and has sparse hairs. The venation on the upper leaf surface is clearly visible, the midrib evident or raised. The leaves are somewhat fan-shaped, 2-4.5 cm long, 3-5 cm wide, but divided into three lobes which are deeply trifid or bifid. The lobes end in sharp points. They are grey-green to green in colour, the veins yellow when fresh. The flowers are grouped in axillary, dome-shaped racemes. Each white flower is c. 3 mm long on a stalk 6-8 mm long. The perianth is hairless on the outside and regular in shape, the limb not recurved. The pistil is 3.5-3.9 mm long, with a glabrous ovary. The style is dilated. The fruits have faint wrinkles.

This species is similar to *Grevillea manglesii* subsp. *dissectifolia* which has a glabrous lower leaf surface and rugose fruits. *G. amplexans* differs in its stem-clasping leaf bases and smooth fruits.

Flowering Period: May, June, September

Distribution and Habitat in the Geraldton District

This species is known from one population at Mingenew and another from east of Geraldton, but has been recorded in the past between Mingenew and Mullewa.

This species grows in grey clayey sand or yellow sand, at the edge of tammar or tall *Acacia* scrub, with mallee eucalypts in heath. Associated species include *Allocasuarina campestris, Acacia saligna* and *Hakea, Grevillea* and *Jacksonia* species.

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Mingenew	Mi	Shire Reserve	14.10.1994	3	Moderate, weed infestation & recreational damage
2. Eradu	G	Rail Reserve	1.11.1994	2	Moderate, plants not refound 16.3.1999
3.* Mullewa Plains	-	-	21.9.1931	-	-

Response to Disturbance

Unknown

Management Requirements

- Ensure that population 2 is marked.
- Maintain liaison with land managers.

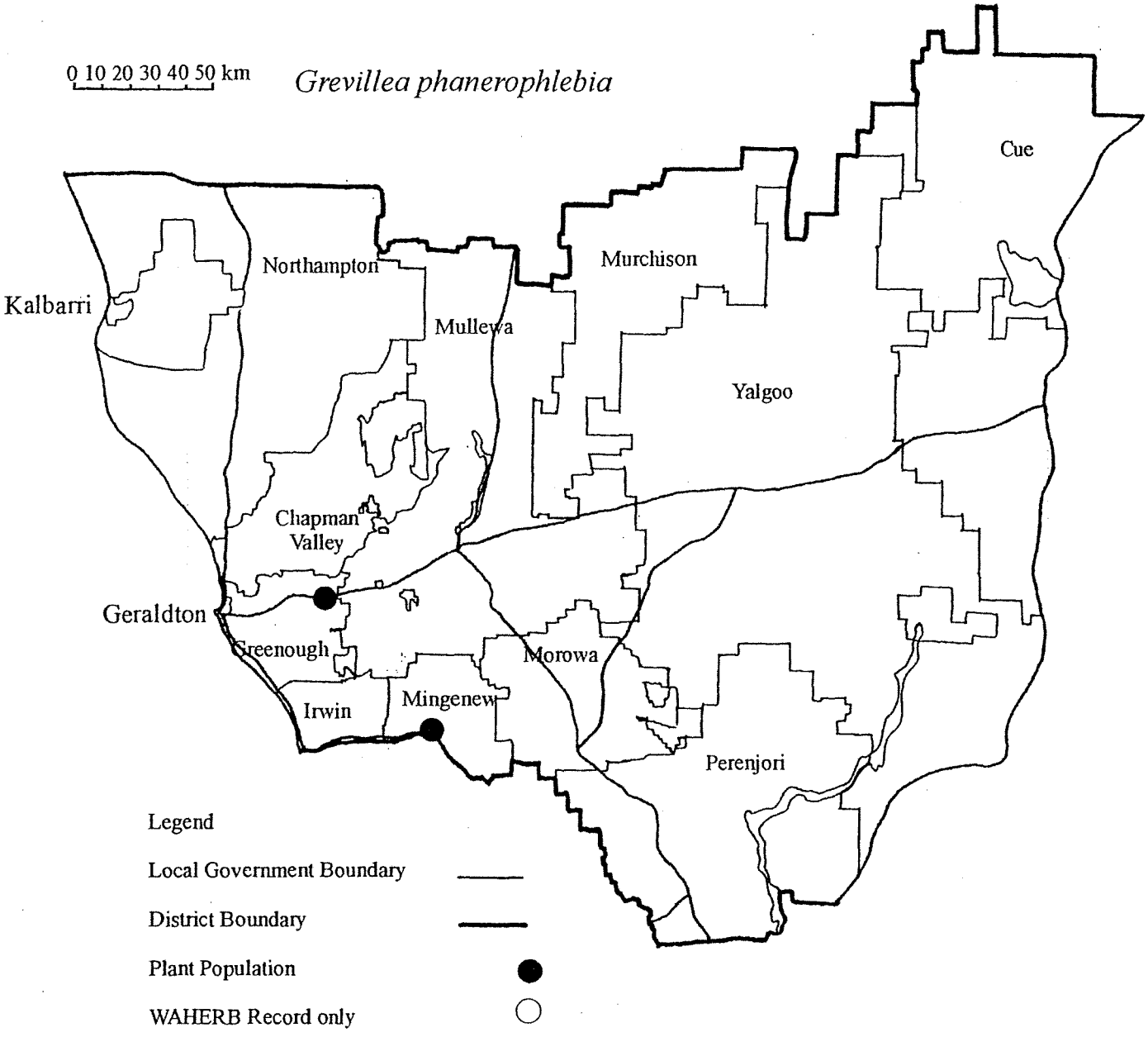
Research Requirements

- Urgent further survey is required.

[#] now Declared Rare Flora (updated at December 1999)

References

Diels & Pritzel (1904-5), McGillivray & Makinson (1993), Olde & Marriott (1994-5).



Grevillea scabrida C.A.Gardner PROTEACEAE

An upright, dense shrub to 1.5 m tall with silky, angular branchlets. The leaves are simple and entire, the upper surface is rough and ribbed, the apex hooked. They are 0.5-1.5 mm wide and 1-8 cm long, silvery green in colour. The flower heads are stalked and are umbel-like, the flower stalks arising from a common point, the flowers almost on the same level. They are terminal or in the axils of the upper leaves and are 1 cm long and 1 cm wide. The perianth is small, less than 2 mm wide, silky-hairy on the outside, bearded on the inside in the lower half. It is zygomorphic in shape, the limb recurved. The torus is almost straight. The stalk of the ovary is glabrous, 0.7-1 mm long. The ovary is silky-hairy at the apex. The fruits are held erect.

This species is similar to *Grevillea lissopleura* which has straight smooth leaves and occurs further east.

Flowering Period: July-August

Distribution and Habitat in the Geraldton District

Occurs over a range of c. 80 km between Karara and Lake Moore, to the west and south-west of Paynes Find.

Grows in red loam over dolerite or ironstone or in red sandy clay or sandy loam over granite, on hills or granite exposures, often along drainage lines. Grows in tall open shrubland of *Acacia aneura, Allocasuarina campestris, A. tesselata* or *Melaleuca uncinata.* It has also been found to occur in woodland of *Eucalyptus loxophleba* over *Acacia acuminata* shrubland with scattered *Allocasuarina* sp.

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Mt Singleton	Y	Pastoral Lease	6.10.1993	20+	Healthy
2. Mt Gibson	Y	Pastoral Lease	15.7.1994	500+	Healthy
3. N of Mt Gibson	Y	MRWA Road Verge	15.7.1994	10+	Healthy
4. N of Rothsay	P	Shire Road Verge, Pastoral Lease	17.7.1994	500+	Healthy
5. S of Karara	P	Pastoral Lease	17.7.1994	50+	Healthy
6. N of Mt Mulgine	P	Crown Reserve, Shire Road Verge	17.7.1994	500+	Healthy
7. Bullajungadeah Hills	Y	Shire Road Verge, Pastoral Lease	18.7.1994	30+	Healthy
8. NE of Mt Gibson	Y	Pastoral Lease	16.7.1996	1 000+	Healthy
9. SE of Mt Gibson	Y	Pastoral Lease	21.11.1992	"abundant"	-

Response to Disturbance

Unknown

Management Requirements

- Ensure that road verge populations are marked.
- Maintain liaison with land managers.

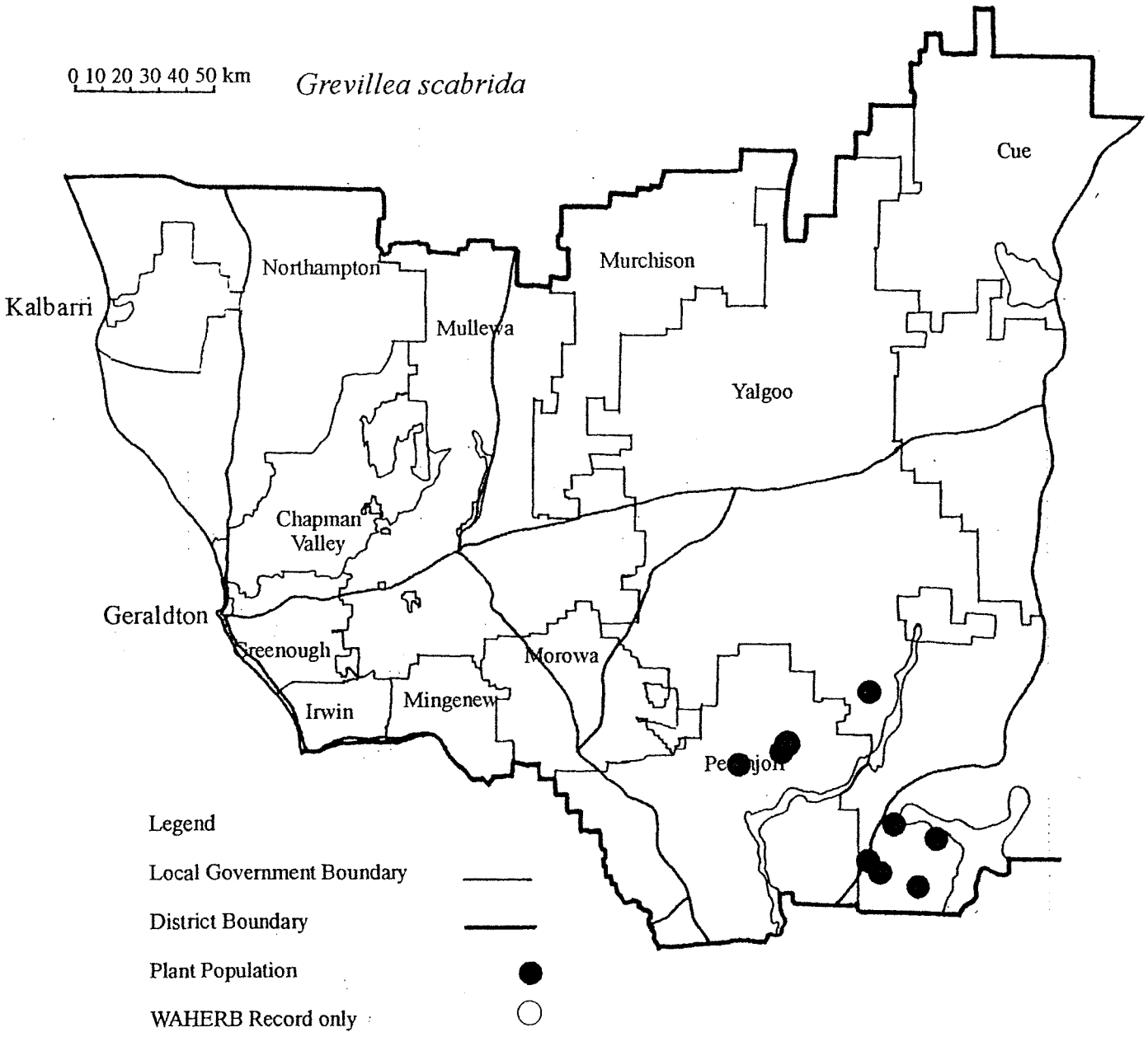
[#] now Priority 3 (updated at December 1999)

Research Requirements

– Further survey is required.

References

Gardner (1936), McGillivray & Makinson (1993), Olde & Marriott (1994-5).



Grevillea subtiliflora McGill. PROTEACEAE

An open shrub to c. 2.5 m tall, with widely spreading branches which are silky-hairy, and divided leaves 2.5-4.5 cm long with fine, sharply pointed lobes. The leaves are twice pinnately divided, the widely spreading lobes each being further pinnately divided, the lobes 1-2 cm long, 0.5-1 mm wide. The flowers are in long, branched, cylindrical spikes 6-8 cm long and are white in colour. Each flower is c. 2.5 mm long, on a pedicel to 7 mm long, the torus straight. They are curled in bud, smooth on the outside, but with a basal beard on the inside. The pistil is 4-5 mm long. The fruits are 8-10 mm long, glabrous and fairly smooth.

This species is related to *Grevillea intricata* but differs in the presence of long silky hairs on the branchlets, less intricate foliage and flowers with a few hairs at the base.

Flowering Period: April, July-October

Distribution and Habitat in the Geraldton District

Known from a small area to the south-west of Paynes Find, where it is known from one range of hills, but has also been recorded in the past from three locations along the highway.

Grows on hill slopes in tall open *Acacia* shrubland with *Allocasuarina tesselata* and *Melaleuca uncinata,* usually in red loam over dolerite, although at one locality it was growing in red winter-wet soil with granite.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Mt Singleton	Y	Pastoral Lease	6.10.1993	10+	Healthy
2. Mt Gibson	Y	Pastoral Lease	15.7.1994	2	Healthy
3.* SW of Paynes Find	Y	-	16.6.1976	"frequent"	-
4.* Paynes Find	Y	-	9.1938	-	-
5.* SW of Paynes Find	Y	-	8.9.1938	-	-

Response to Disturbance

Unknown

Management Requirements

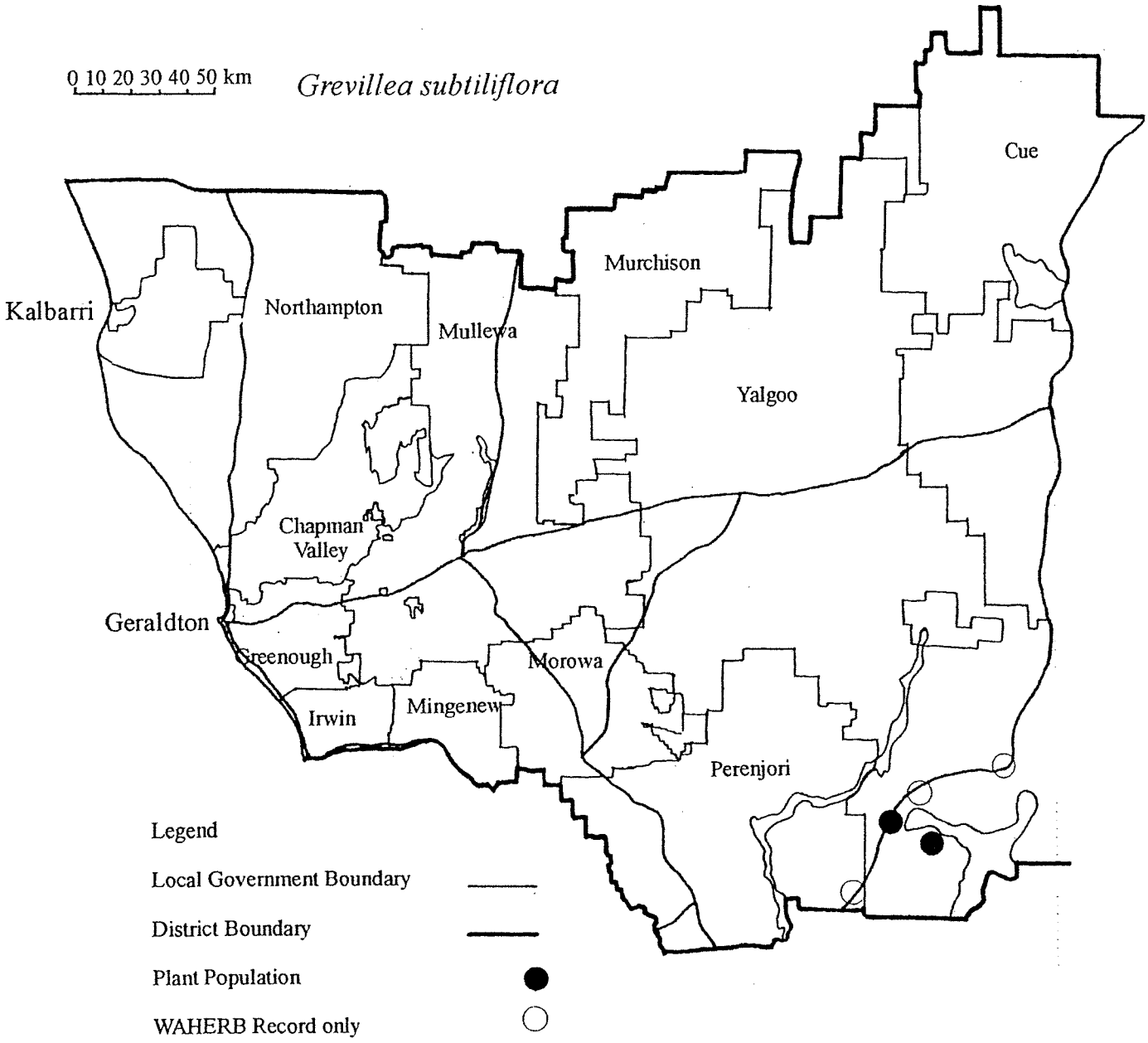
- Maintain liaison with land managers.

Research Requirements

- Further survey is required.

References

McGillivray (1986), McGillivray & Makinson (1993), Olde & Marriott (1994-5).


0 10 20 30 40 50 km
Grevillea subtiliflora
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Gunniopsis rubra Chinnock AIZOACEAE

A low, succulent herb, 1-2 cm tall, 2-12 cm across, the plant changing in colour from red to green as it matures. The branches are smooth when fresh, striate when dry, with oblong linear leaves which are subterete, to 10 mm long, 1 mm wide. The flowers may be stalked and have a free perianth of four triangular green segments, the margins with large scattered papillae when fresh, to 4.5 long, 2.1 mm long. The outside surface is green to red, ridged, the inner surface green and smooth. There are four stamens which alternate with the perianth segments. The ovary is of four fused carpels, with four thread-like stigmas. The fruit is an ovoid capsule with four valves which are not bifid at the apex. The seeds are brown, smooth, biconvex in shape and furrowed along the edge opposite the point of attachment.

The specific name refers to the red colour which the plant develops as it matures.

Flowering Period: September-October

Distribution and Habitat in the Geraldton District

In the Geraldton District, this species is known from two populations north-west of Paynes Find, where it grows in thin granitic soils on the plateau above a breakaway in very open *Acacia* shrubland over scattered low shrubs and herbs, and also on sandy clay on flats nearby near a clay pan, in similar vegetation. It has also been recorded from south-east of Perenjori, growing in granitic sandy loam. Further populations of this poorly collected species are known from the Ballidu area, south of the Geraldton District, and from south-east of the District, to the north-north-west of Bullfinch and north-east of Kalannie. In these areas it is recorded from upland red-brown loams, sandy loam of valley flats under open *Eucalyptus loxophleba* and clay loam under eucalypts with *Calocephalus drummondii.*

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Burnerbinmah	Y	Pastoral Lease	11.9.1996	10+	Healthy
2. Burnerbinmah	Y	Pastoral Lease	11.9.1996	20+	Healthy
3.* SE of Perenjori	P	-	21.10.1981	"Very common to abundant"	-

Response to Disturbance

Unknown

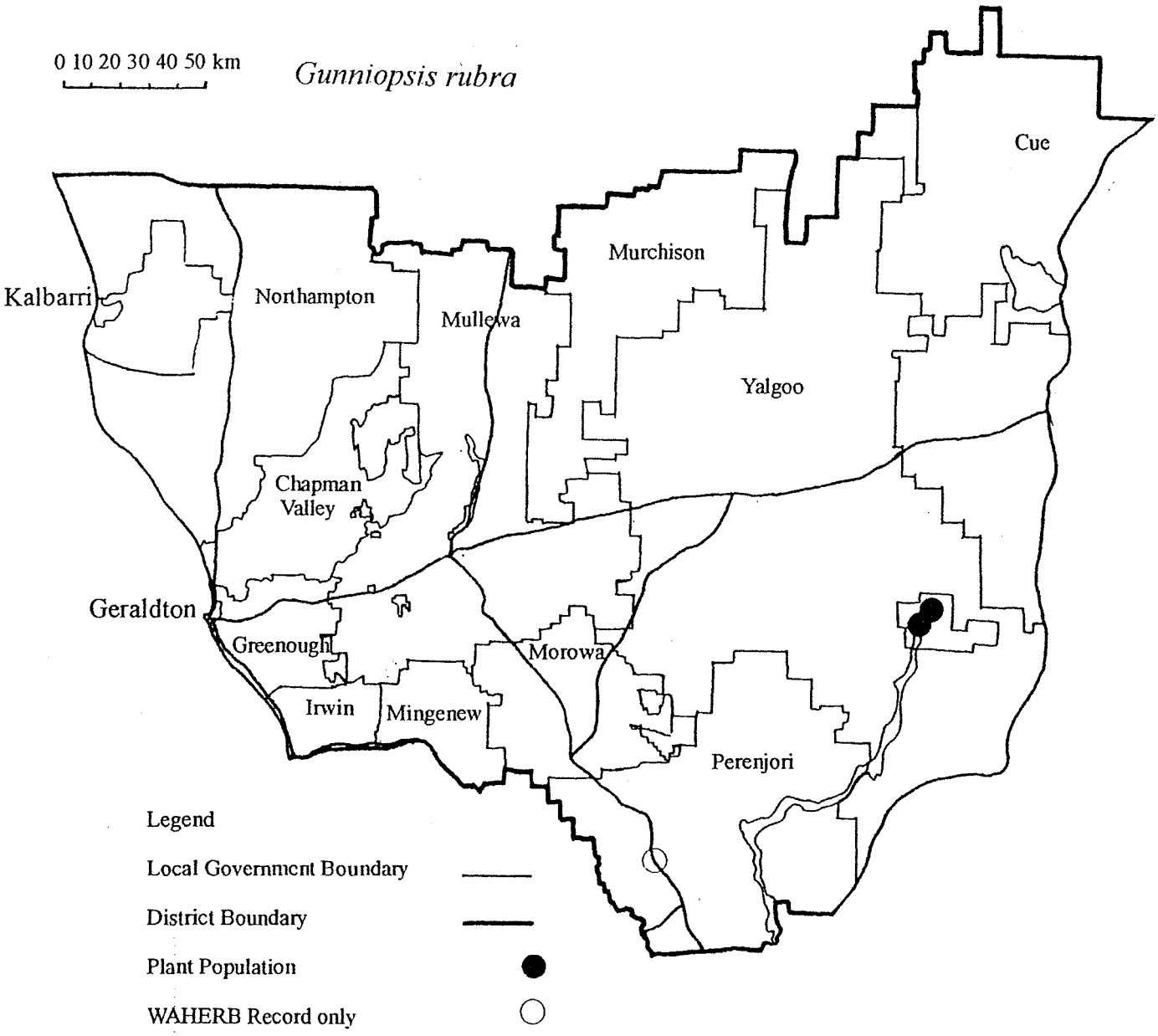
Research Requirements

- Further survey is required for this species which is probably more common than present recordings indicate, being overlooked owing to its small size.

References

Chinnock (1983).

[#] now Priority 3 (updated at December 1999)


0 10 20 30 40 50 km
Gunniopsis rubra
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Homalocalyx chapmanii Craven MYRTACEAE

Homalocalyx chapmanii is an erect shrub to 50 cm tall. The leaves are small and alternate with very short petioles. They are narrowly oblong to obovate, up to 3.5 mm long and up to 1.3 mm broad. Stipules are present. There are 3-20 clustered inflorescences in the lower leaf axils of new growth, the shoot apex continuing growth. Each flower has a pair of persistent bracteoles joined to form the cheiridium. There are bud scales present. The hypanthium is short, pubescent, with 10 ribs, and the apex of the ovary is concave. There are five reflexed and persistent sepals which are rounded, with an irregularly toothed edge, up to 7.2 mm long. The five petals are magenta to light purple in colour, rounded, up to 3.5 mm long. There are 40-50 stamens of which the filaments are the same colour as the petals. The style is persistent. The fruit is dry and indehiscent, with one seed.

Flowering Period: September-October

Distribution and Habitat in the Geraldton District

The species occurs in the Northampton to Hutt River area in the Geraldton District and has also been collected several times from the area north-east of Eneabba in the Moora District.

At population 1, it was recorded growing in shrubland on orange gravelly sand on undulating terrain. Associated species included *Calothamnus homalophyllus, Verticordia monadelpha, Dicrastylis fulva* and *Casuarina* sp. Elsewhere it has been recorded in open heath on yellow or light brown sand, in low open heath on shallow greyish sand over weathered granite or on grey-brown clay over laterite in shrubland. One collection was from a somewhat damp valley flat (E. Griffin, personal communication).

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. N of Northampton	N	MRWA Road Reserve	2.10.1988	"locally rare"	-
2. S of Hutt River	N	-	29.10.1990	-	-
3.* Geraldton area	-	-	21.9.1932	-	-

Response to Disturbance

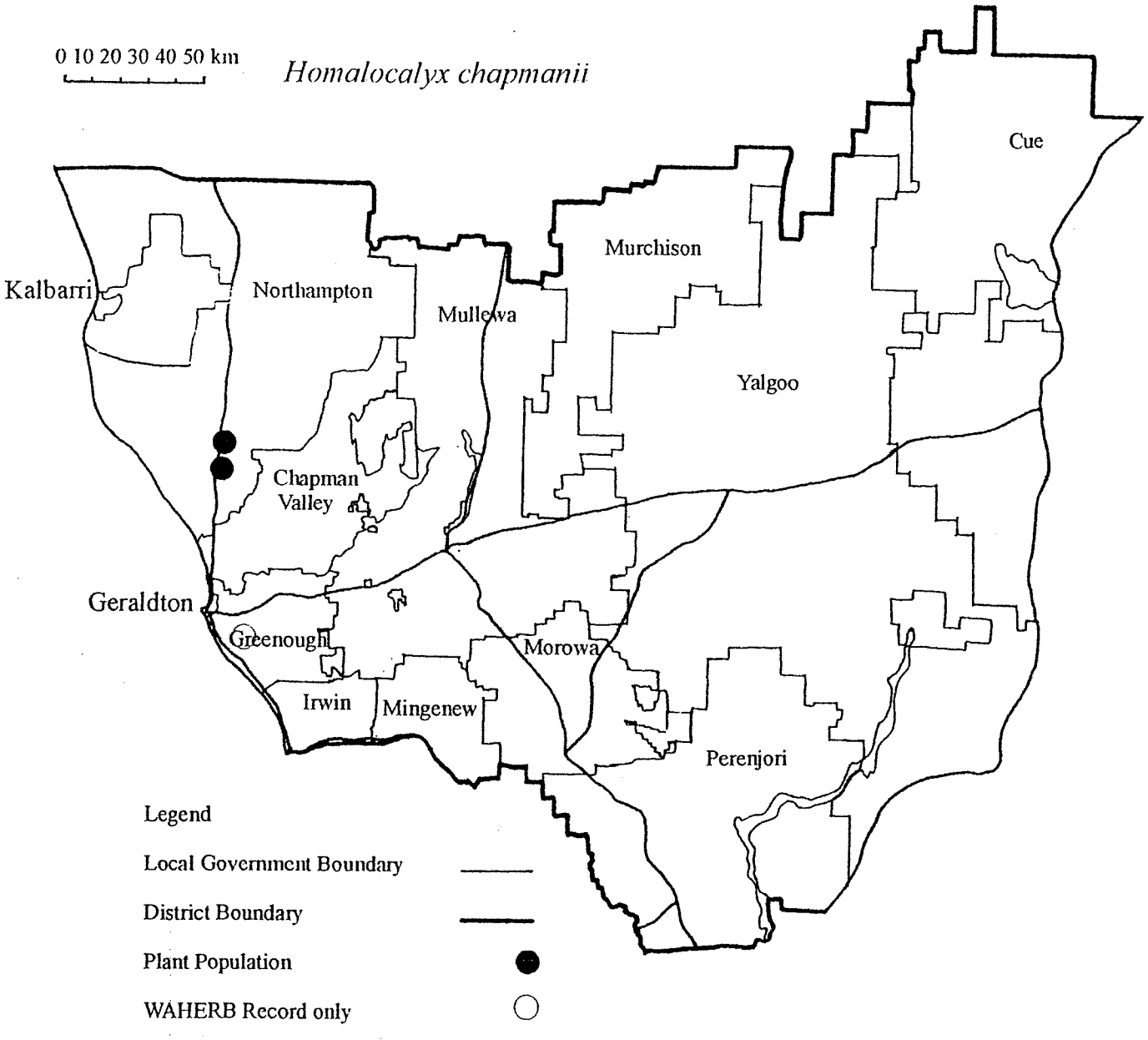
Unknown

Research Requirements

- Further survey is required, particularly to refind, survey and mark populations 1 and 2.

References

Craven (1987a).


0 10 20 30 40 50 km
Homalocalyx chapmanii
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Homalocalyx inerrabundus Craven MYRTACEAE

A shrub to 5 cm tall, glabrous apart from the hypanthium. The leaves are spreading to ascending, to 7.5 mm long, 1.2 mm wide, narrowly oblong to linear, broadly triangular in cross-section. There are 1-20 flower heads scattered in the leaf axils. The cheiridium is compressed funnel-shaped, to 5.8 mm long, keeled. The hypanthium is pubescent and the ovary apex is strongly convex. The sepals are deciduous and the violet petals are obovate or broader, to 5.5 mm long. There are 23-37 stamens in two rows.

Flowering Period: September-October

Distribution and Habitat in the Geraldton District

It is thought that this species occurs mainly in the East Yuna area, as the collector of the specimen recorded from Geraldton lives in the East Yuna area, and the specimen recorded from Mt Magnet may have been collected further west, both localities having very different habitats to that at East Yuna.

This species has been recorded growing in pale brown fine sandy loam and yellow sand, in shrubland with *Acacia neurophylla, Allocasuarina campestris, Melaleuca uncinata* and *Hakea pycnoneura.*

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SE of Yuna	Mu	Nature Reserve	3.9.1991	"Plentiful"	-
2.* SE of Yuna	CV	Nature Reserve	12.10.1976	"Common"	-
3.* Geraldton	G	-	10.1966	-	-
4.* Mt Magnet	MM	-	2.10.1959	-	

Response to Disturbance

Unknown

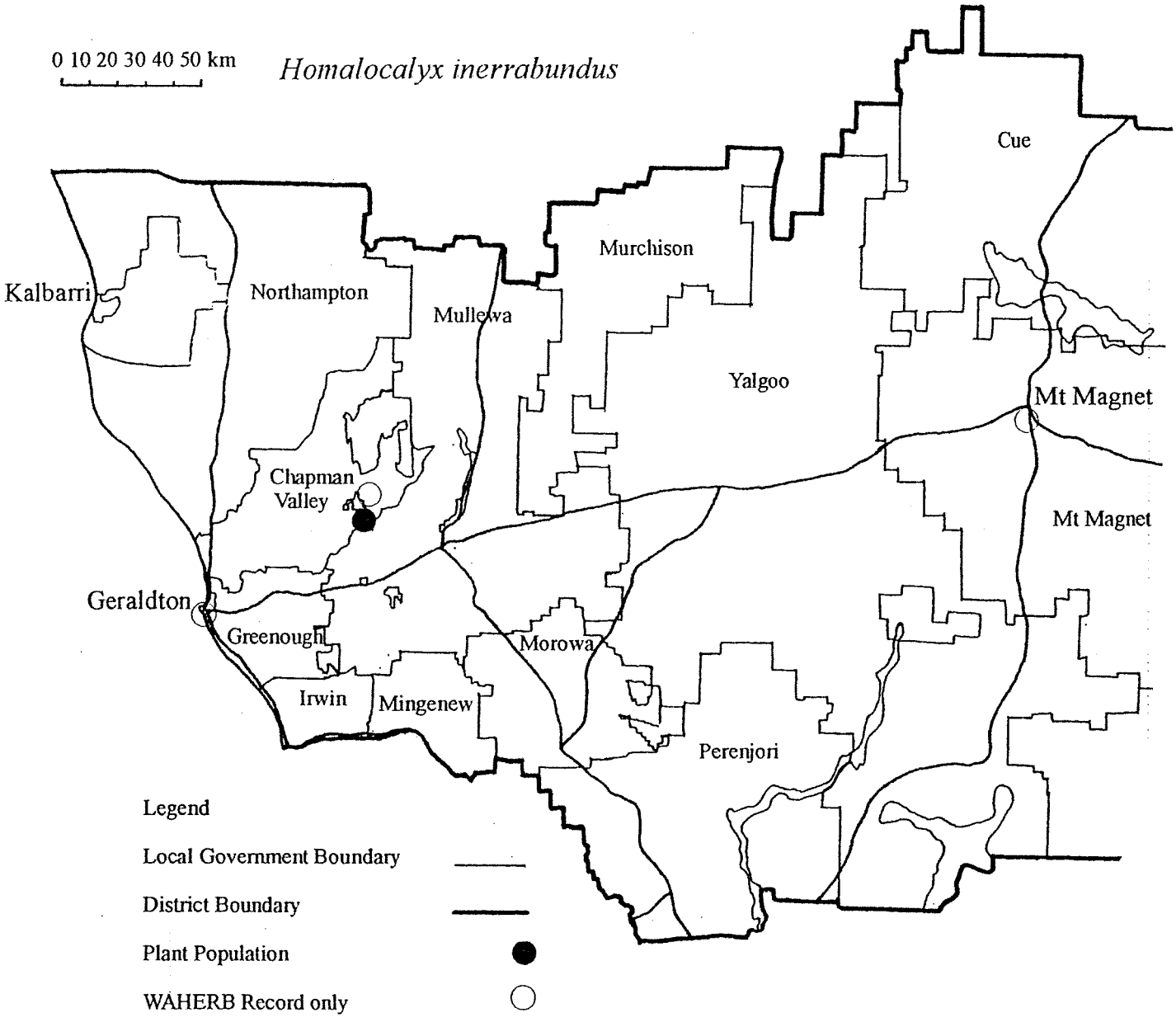
Research Requirements

- Further survey is required, particularly in the Yuna area, and also in the Mullewa-Pindar area, as it is thought that population 4 may have been found along the Geraldton-Mt Magnet Road rather than at Mt Magnet.

References

Craven (1987a).

[#] now Priority 2 (updated at December 1999)


0 10 20 30 40 50 km
Homalocalyx inerrabundus
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Mt Magnet
Chapman Valley
Mt Magnet
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Hyalosperma stoveae (D.A.Cooke) Paul G.Wilson ASTERACEAE

A semi-prostrate, much-branched annual to 50 mm in diameter. The plant has a moderate covering of long, soft, straight hairs. The branches are slender and the sub-opposite leaves are fleshy, elliptic to obovate, 4-5 mm long. The involucre is broadly cup-shaped, c. 1.7 mm high, 2 mm in diameter. There are two rows of bracts c. 2 mm long, obovate with a rounded apex, the inner involucral bracts are hyaline, with the apex sometimes semi-opaque. There are numerous fertile florets, each with 6-8 plumose pappus bristles. The corolla is narrow-cylindrical, shortly three-lobed. There are three anthers and a very shortly lobed style. The fruit is an achene 0.5 mm long, broadly obovoid, colourless to pale brown. The pappus and corolla are attached to the achene to one side.

This species is similar to *Hyalosperma demissum* but has more villous branches, broader leaves and a smooth achene to which the pappus and corolla are attached off centre.

Flowering Period: September

Distribution and Habitat in the Geraldton District

Until the population was found in the Geraldton District, this species was known from one other collection made in Western Australia from a few kilometres east of the south-east corner of the Geraldton District and c. 65 kms south-east of the known population in the District. It is also known from three other localities in Victoria and South Australia.

In the Geraldton District, this species grows on orange sand over coarse orange silty sand and laterite on the slopes above a wide, shallow drainage line. It grows on open sand in open *Acacia acuminata* scrub over 2 m tall with a myrtaceous shrub layer c. 1 m tall over spinifex and herbs. The other population in Western Australia occurs on red-brown sandy clay in open scrub with *Acacia aneura.* In South Australia, it was recorded from *A. aneura* woodland and in Victoria, in mallee woodland.

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. NW of Paynes Find	Y	Pastoral Lease CALM	10.9.1996	10+	Healthy

Response to Disturbance

Unknown

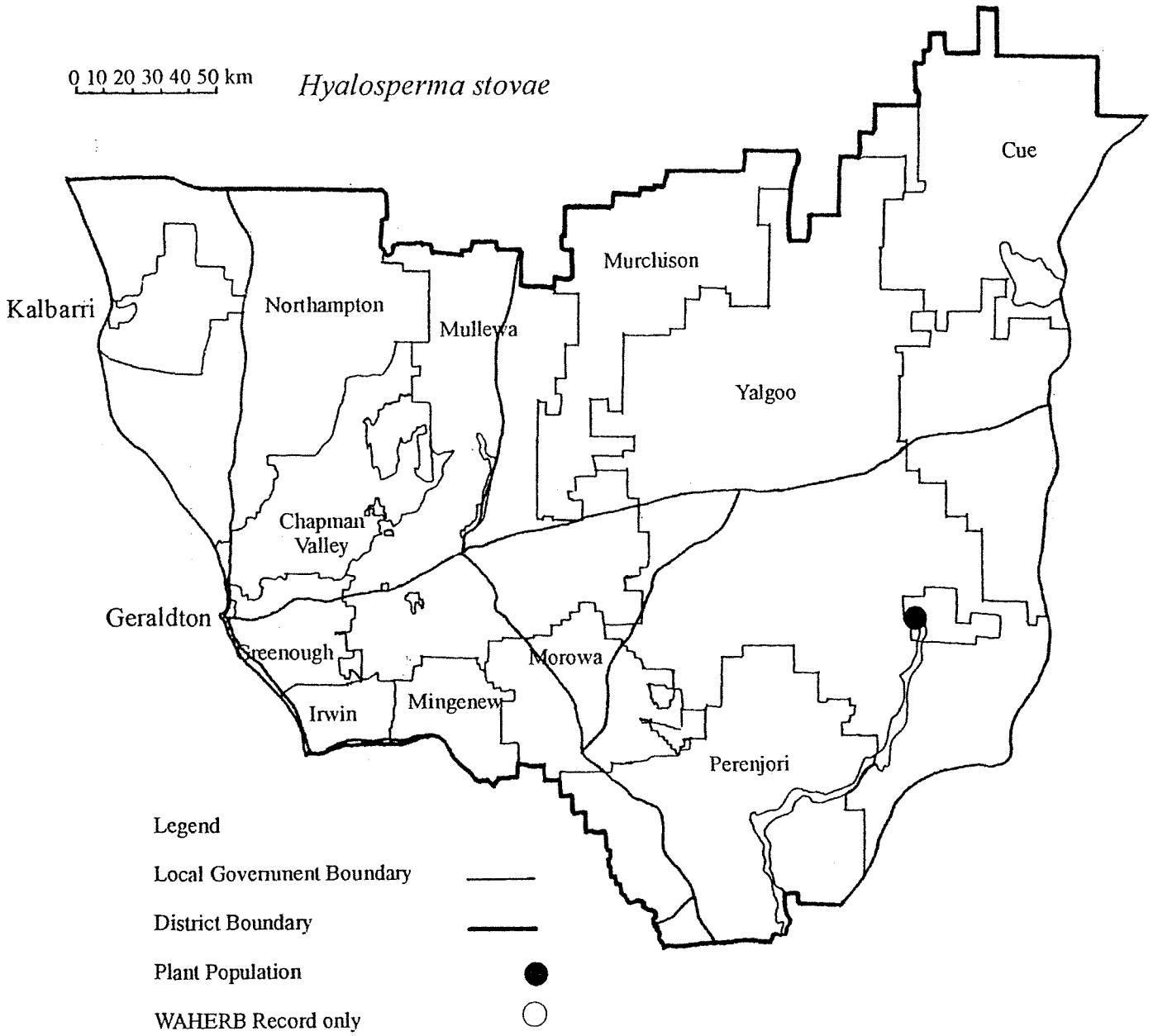
Research Requirements

- Further survey is required.

References

Wilson (1989).

[#] now Priority 2 (updated at December 1999)


0 10 20 30 40 50 km
Hyalosperma stovae
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Hybanthus cymulosus C.A.Gardner VIOLACEAE

A perennial herb to c. 70 cm tall, with narrow leaves, 20-50 mm long, the stipules flat, 0.1-0.5 mm long, usually divided into three equal or irregular narrow lobes, giving the margin a jagged appearance. The flowers are grouped into axillary dichasia, with three to many flowers, the flowers close together and the inflorescence not extending much beyond the leaves. There are five lanceolate green sepals. The flowers have one broad lower petal, which is pale violet with a yellow throat and is 9-15 mm long. The four lateral petals are narrow, 2-4 mm long. There are 1-3 dark brown seeds in the capsule, which is 5 mm long.

This species is similar to *Hybanthus floribundus,* from which it differs in the much larger flowers, narrow sepals and cymose inflorescence.

Flowering Period: January, May, July-August

Distribution and Habitat in the Geraldton District

This species is known over a restricted range of c. 25 km to the south-west of Paynes Find. It has been collected in the past from the northern end of a range of hills and from a range to the south-west, but only two populations have been found recently at the southern end of the more northerly range.

Grows in red clay or clay loam over basalt, usually on hills along drainage lines or in shaded areas beneath trees. Population 7 was recorded from loamy soil on flats. Associated vegetation at the known populations is of open tall *Acacia* shrubland, with *Acacia acuminata, Allocasuarina tesselata, A. dielsiana, Melaleuca radula, Grevillea subtilliflora, Dodonaea inaequifolia* and sparse *Eucalyptus loxophleba.*

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Mt Gibson	Y	Pastoral Lease	15.7.1994	7	Moderate, plants grazed
2. Mt Gibson	Y	Pastoral Lease	15.7.1994	1 000+	Healthy-moderate, most plants grazed
3.* N of Ninghan	Y	Pastoral Lease	17.1.1962	-	-
4.* Mt Singleton	Y	Pastoral Lease	24.5.1968	-	"Most plants eaten by sheep"
5.* Mt Singleton	Y	Pastoral Lease	19.9.1967	"Abundant"	-
6.* Mt Singleton	Y	Pastoral Lease	24.5.1968	-	-
7.* NE of Wubin	Y	-	1.7.1951	-	-

Response to Disturbance

Unknown

Management Requirements

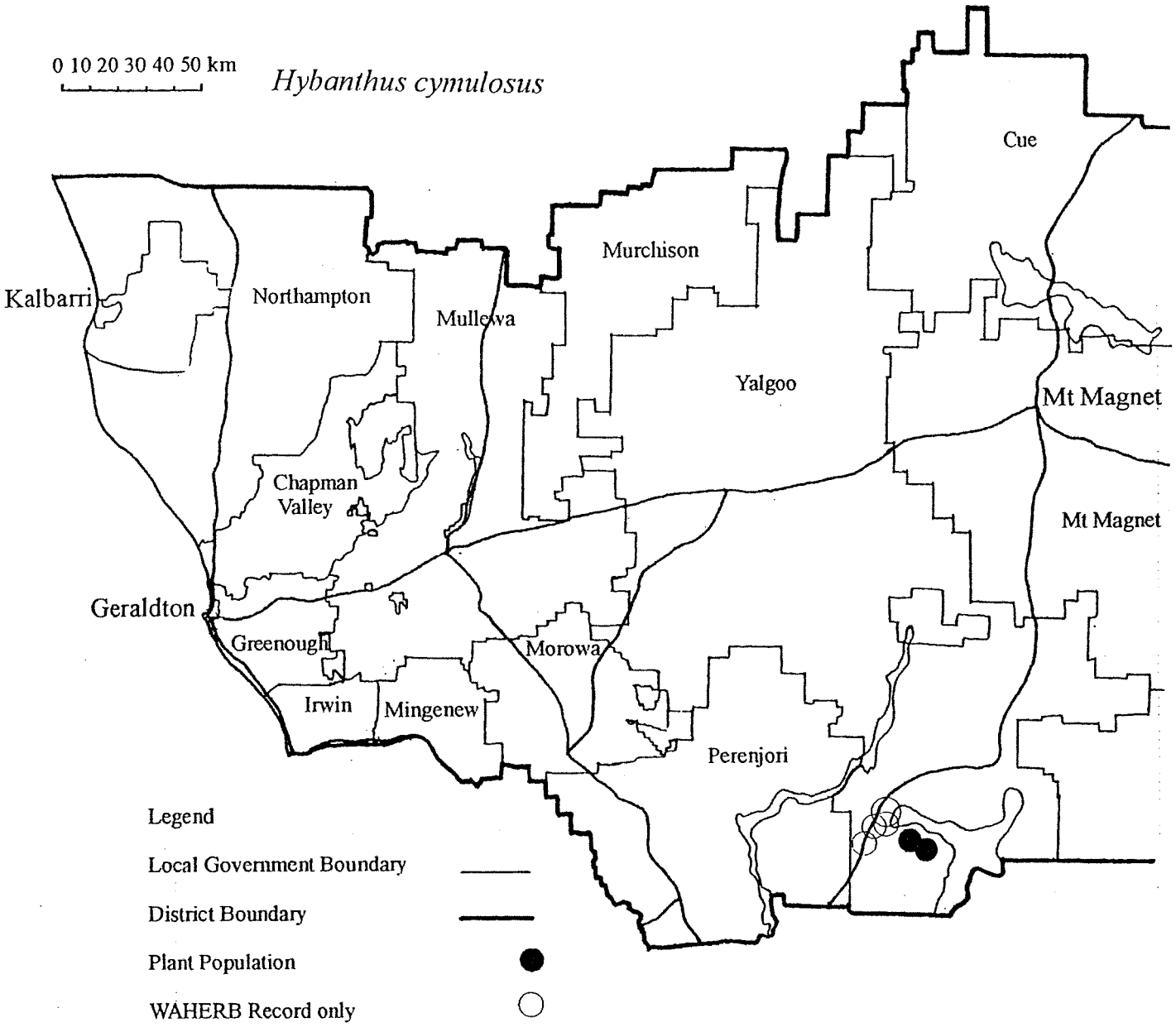
– This species appears to be palatable to grazing animals. Both known populations require fencing.

Research Requirements

– Urgent further survey is required.

References

Bennett (1972), Gardner (1936), George (1982).


0 10 20 30 40 50 km
Hybanthus cymulosus
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Mt Magnet
Chapman Valley
Mt Magnet
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Hydrocotyle sp. Warriedar (P.G.Wilson 12267) APIACEAE

A low annual plant, c. 3 cm tall, with toothed stipules and cordate leaves divided to the middle into three lobes, the upper one with three teeth, the outer ones with four teeth. The flowers are in umbels, each flower with five minute calyx lobes, five small petals and five stamens opposite the calyx lobes. The fruit is composed of two fruitlets, each with a prominent medial rib formed into a lobe much shorter than the wing. It has short tubercles and only one fruitlet is winged, the wing broader than the body of the fruit and without marginal hairs. The fruit has reddish and green tints in its colouration.

This species is similar to *Hydrocotyle coorowensis* and is probably a subspecies or variant. *H. coorowensis* has pale brown fruits with long tubercles and with large marginal hairs on the wing.

Flowering Period: September

Distribution and Habitat in the Geraldton District

This taxon is known from a single collection made on Warriedar Station where it occurred in mixed scrub on red loam.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. W of Warriedar	P	-	26.9.1986	-	-

Response to Disturbance

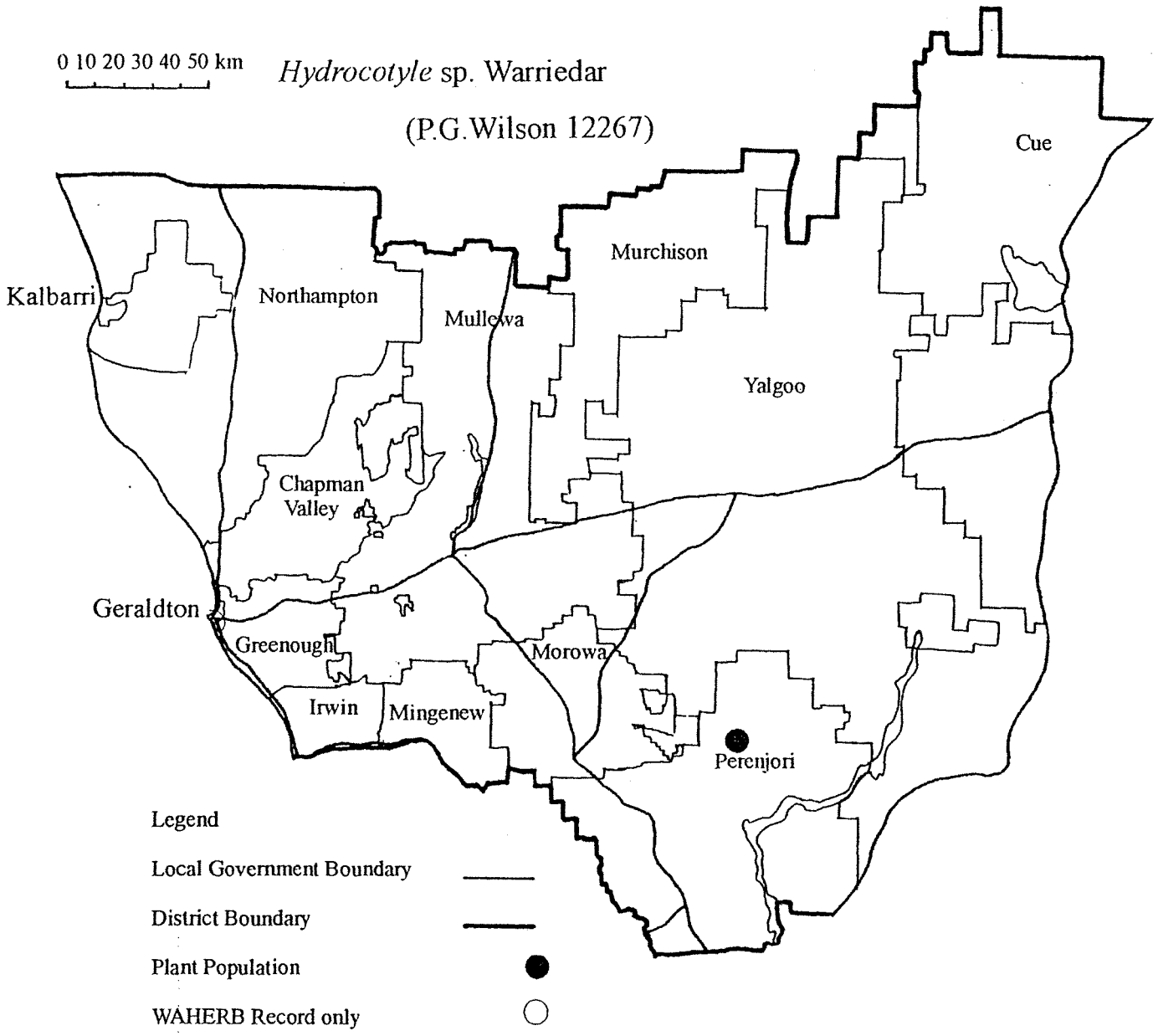
Unknown

Research Requirements

– Further survey is required, particularly to refind and survey population 1.

References

B. Rye (personal communication).


0 10 20 30 40 50 km
Hydrocotyle sp. Warriedar
(P.G.Wilson 12267)
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Jacksonia sp. Cundeelee (B.Severne 74146) FABACEAE

An upright, broom-like, leafless shrub or tree from 1 m to 4 m tall, spreading to 2 m. The flowers are orange in colour and the fruits are densely covered with long, spreading white hairs.

Flowering Period: October-December

Distribution and Habitat in the Geraldton District

This species has been collected three times, twice from north-west of Mt Magnet in the Geraldton District and once from near Cundeelee, east of Kalgoorlie.

One population in the Geraldton District is recorded growing in alluvium on a breakaway, the other on red sand. There are no habitat details recorded for the third collection.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

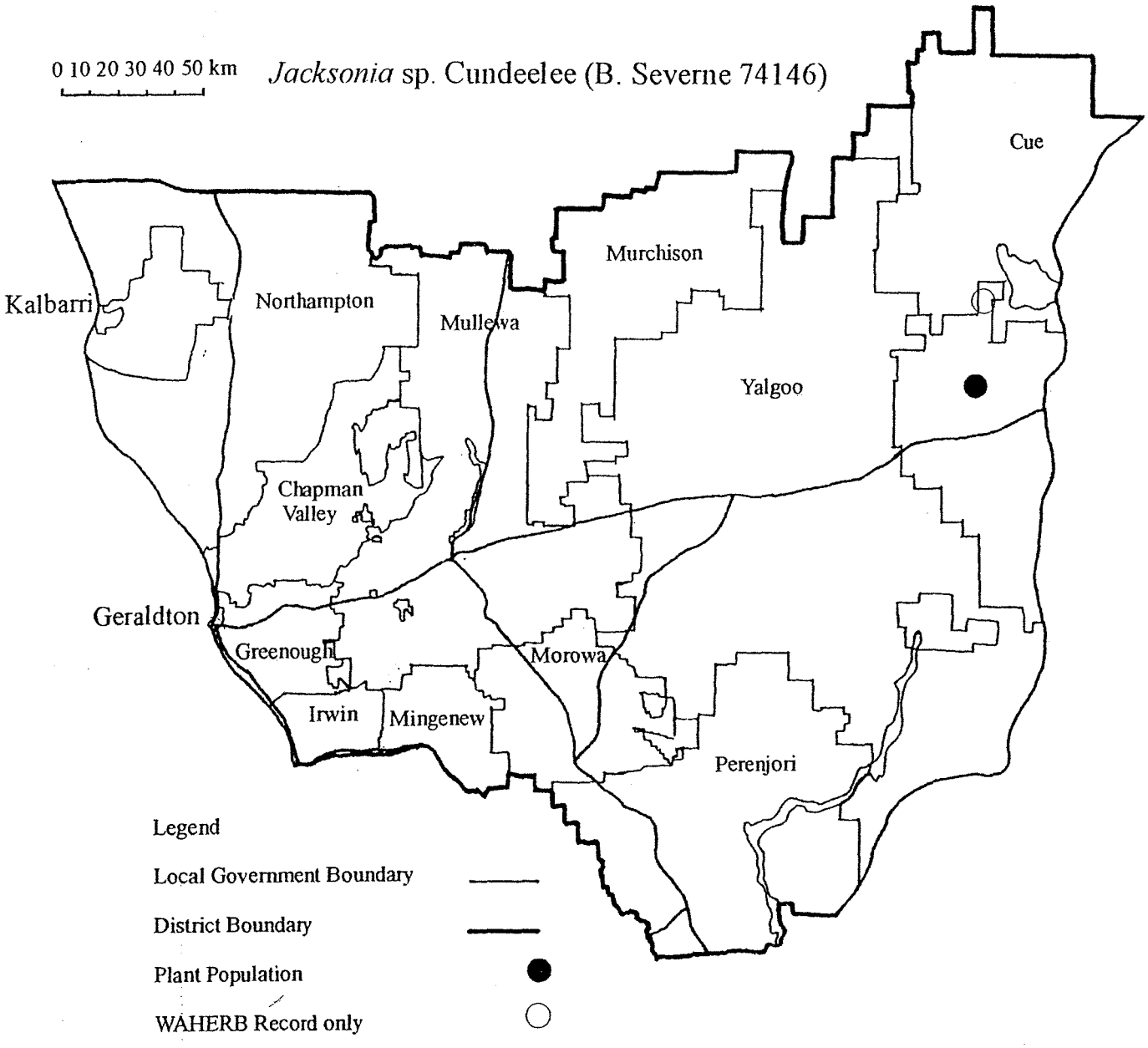
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Dalgaranga Road, Mt Magnet	MM	-	1.12.1996	-	-
2. Lakeside Station	MM	Pastoral Lease	3.10.1965	-	-

Response to Disturbance

Unknown

Research Requirements

- Further survey is required, particularly to refind and survey populations 1 and 2.


0 10 20 30 40 50 km
Jacksonia sp. Cundeelee (B. Severne 74146)
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Korthalsella leucothrix Barlow VISCACEAE

A parasitic, much-branched plant to 9 cm high, with one to four stems arising from the haustorial attachment to the host stem. The stems have many nodes, the internodes are compressed-flattened but rounded at the edges, widest at the apex, up to 3 mm wide. They are without visible veins. There are rudimentary leaves c. 0.7 mm high. The flowers are in clusters at each node, with c. 20 flowers in each cluster in 3-4 rows. They arise from a cushion-like mound of white hairs. The male flowers are solitary or few in the centre of each cluster, the female flowers around and below them. Each flower has three tepals. There are three anthers in the male flowers. The fruit is ellipsoid, c. 3 mm long.

This species was reduced to synonymy with *Korthalsella japonica* f. *japonica* by Molvray in 1997. However, this has not been followed by the Western Australian Herbarium.

Flowering Period: August

Distribution and Habitat in the Geraldton District

This species has been collected in Western Australia once from the Geraldton District east of Lake Monger and once from between Kalgoorlie and Wiluna in 1993. There are also several collections from South Australia, the most recent made in 1980.

Grows in semi-arid woodland, where it is parasitic on *Acacia* species, including *A. acuminata* in the Geraldton District, on *A. craspedocarpa* near Kalgoorlie and on *A. ramulosa* and *A. aneura* elsewhere. The area of occurrence at Wanarra was searched in 1994 but the species was not refound. However, the population may still be present in the fringing *Acacia* woodland around a granite rock.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* Wanarra	P	Pastoral Lease	12.8.1960	-	-

Response to Disturbance

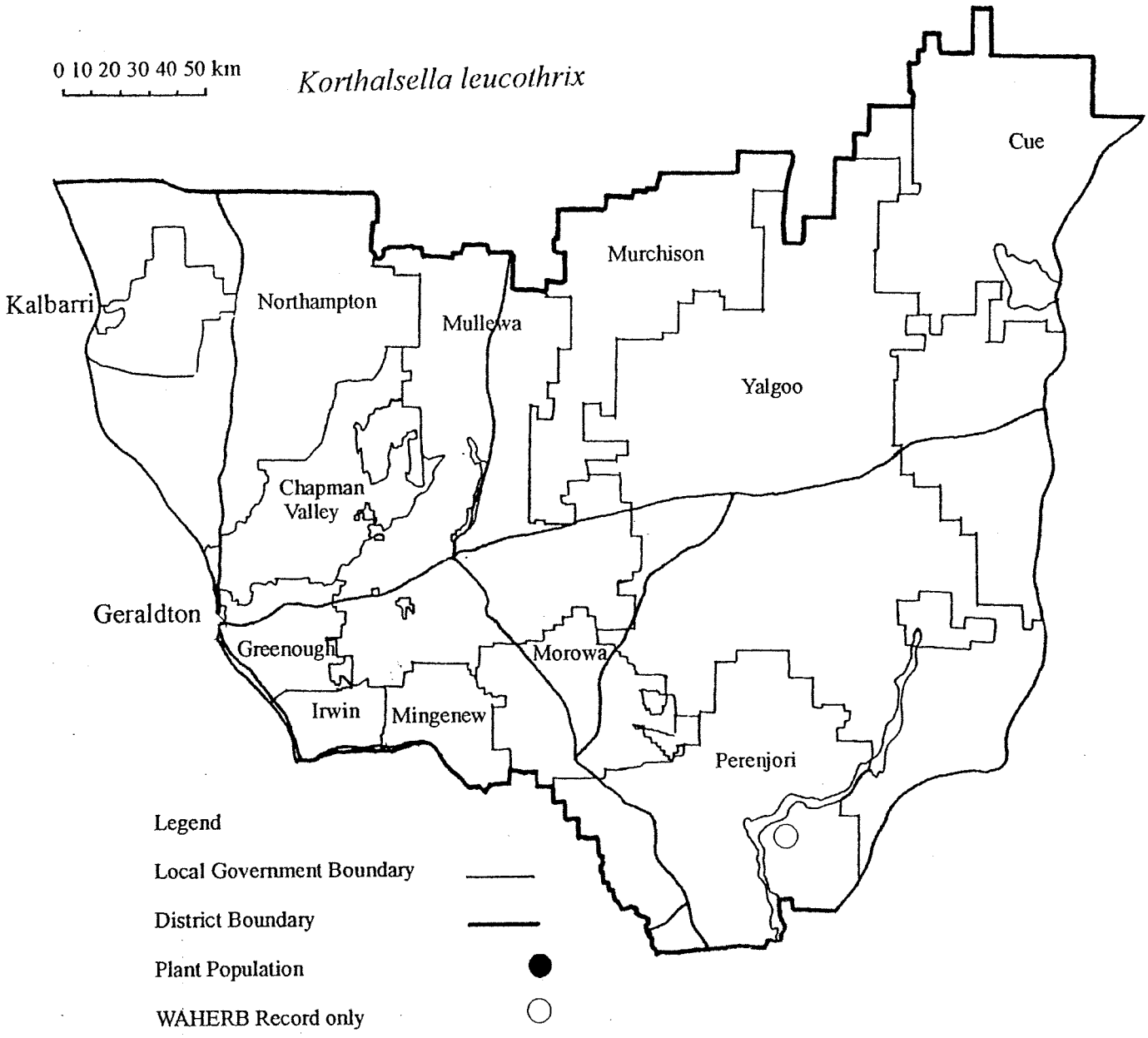
Unknown

Research Requirements

– Further survey is required.

References

Barlow (1983, 1984), Molvray (1997).


0 10 20 30 40 50 km
Korthalsella leucothrix
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Labichea eremaea C.A.Gardner CAESALPINACEAE

A compact, rigid shrub to 0.8 m tall, with the leaves divided into 5-7 narrow, rigid leaflets which arise from one point on a short stalk. Each leaflet is folded length-wise and has a sharp pointed tip and margins rolled under. The central leaflet is up to 2.8 cm long and 3.5 cm wide, those on either side are shorter. The flowers are mostly in pairs, on short stalks. They are c. 1.5 cm in diameter, each with five sepals and four elliptic golden petals and with a dark red spot at the base of one petal. There are two dark red stamens, one of which is much longer than the other. The fruit is an obliquely oblong pod to 1.8 cm long.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

This species is known over a range of 12 km to the west of Sandstone. It has also been reported from the Youanmi area, which is c. 80 km to the south-west.

Grows on red sand in spinifex sandplain with open *Acacia* scrub and sometimes with emergent mallees and *Eucalyptus gongylocarpa*. Usually grows in species-rich swales between sand ridges. Associated species include *Mirbelia seorsiflora, Grevillea eriostachya, Stylidium induratum* and species of *Keraudrenia, Anthotroche, Jacksonia, Goodenia, Lachnostachys* and *Hakea*.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. W of Sandstone	S	Shire Road Verge, Pastoral Lease	16.9.1996	13	Healthy
2. W of Sandstone	S	Shire Road Verge	16.9.1996	8 and 50+ seedlings	Healthy
3. W of Sandstone	S	Shire Road Verge	16.9.1996	60+	Healthy
4. W of Sandstone	S	Shire Road Verge	16.9.1996	50+	Healthy

Response to Disturbance

This species has been found only on disturbed areas, graded road edges, in spoon drains and at population 1, on an area burnt a few years previously. In 1942, the species was described by Charles Gardner as growing to 80 cm tall. No plants were found taller than 60 cm in 1996, the majority being much shorter, although it was recorded as growing to 80 cm in 1982. It appears that these populations may be of younger plants than those observed from 1931 onwards, possibly a result of more frequent road maintenance in recent years.

Management Requirements

- Ensure that known populations are marked.

Research Requirements

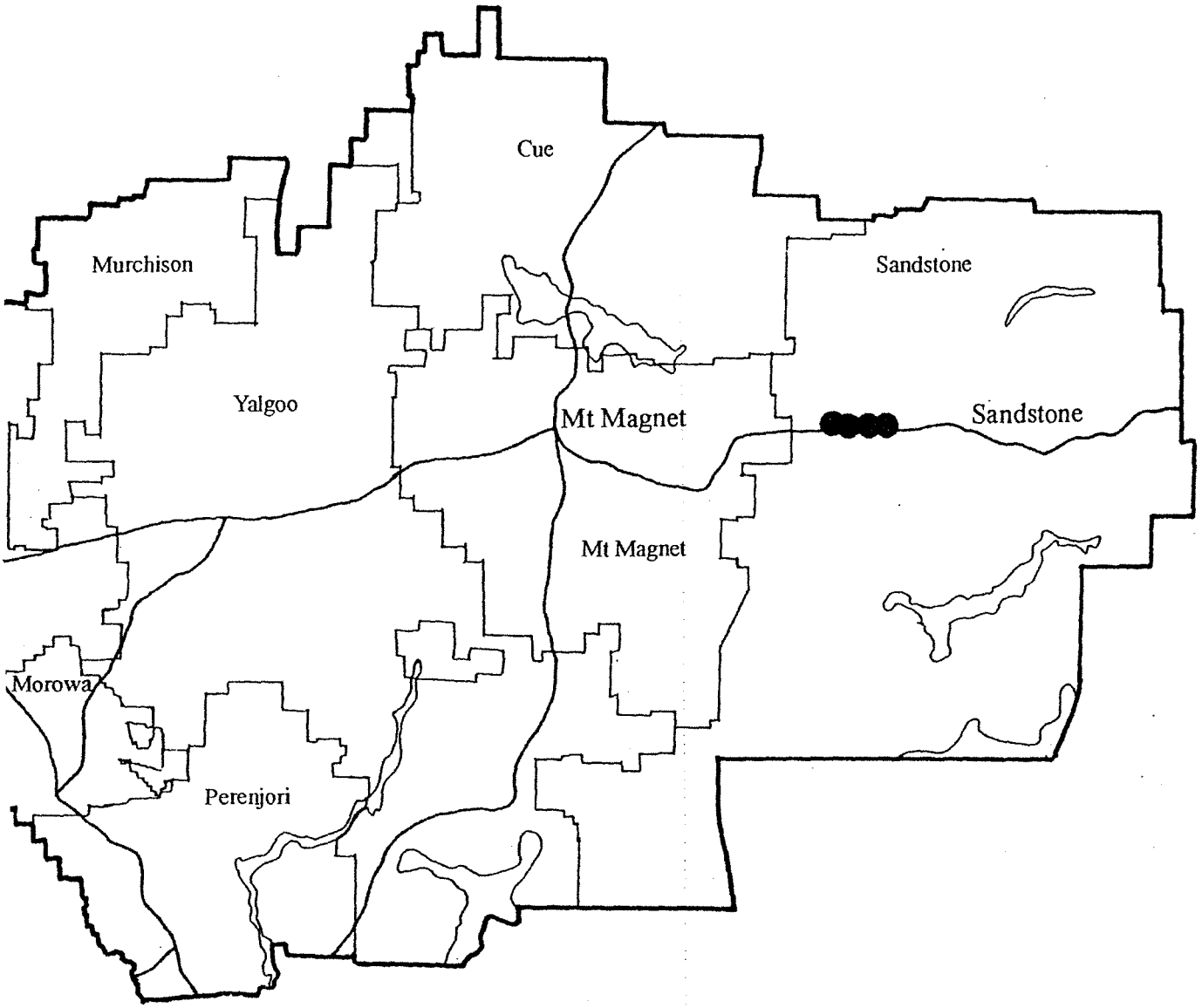
- Monitor the plants at population 1, growing in undisturbed sandplain south of the road. Numbers of plants and their size should be monitored.
- Further survey is required, particularly in suitable habitat in areas recently burnt or disturbed in the Sandstone area, and on road verges in the Youanmi area.

References

Gardner (1942a), Ross (1985).

0 10 20 30 40 50 km

Labichea eremaea



Legend

Local Government Boundary

District Boundary

Plant Population

WAHERB Record only

Labichea obtrullata J.H.Ross CAESALPINACEAE

This species is a shrub of unknown height. The leaves are somewhat leathery and are made up of three leaflets, arising from one point on a short stalk. They are mainly hairless on the upper surface, with scattered hooked and/or appressed hairs on the margins and midrib of the lower surface. The central leaflet is longest, elliptic to narrow-oblong in shape, 3.3-7.5 cm long, 0.75-1 cm wide. The lateral leaflets are up to 3.8 cm long and 2.2 cm wide, very variable in shape, but appear to have arisen from lateral fusion of three or four leaflets, so are obtrullate (broadly fan-shaped or shaped like a bricklayer's trowel) with three angles (or sometimes four) ending in pungent points. Occasionally they may be kidney-shaped with two points or narrow elliptic with one point. The stipules are narrow-triangular, to 2 mm long. The flowers are arranged in 3-7 flowered racemes which are longer than the leaves. Each flower has four or five sepals and four yellow petals, 7.5-11 mm long, 5.8 mm broad. There are two anthers, one much longer than the other. The pods and seeds are unknown.

This species is related to *Labichea lanceolata* but differs in its distinctive lateral leaflets.

Flowering Period: October

Distribution and Habitat in the Geraldton District

This species has been collected twice from a large station to the west of Yalgoo, but no precise locality or habitat details were recorded.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* W of Yalgoo	Y	Pastoral Lease	10.1963	-	-

Response to Disturbance

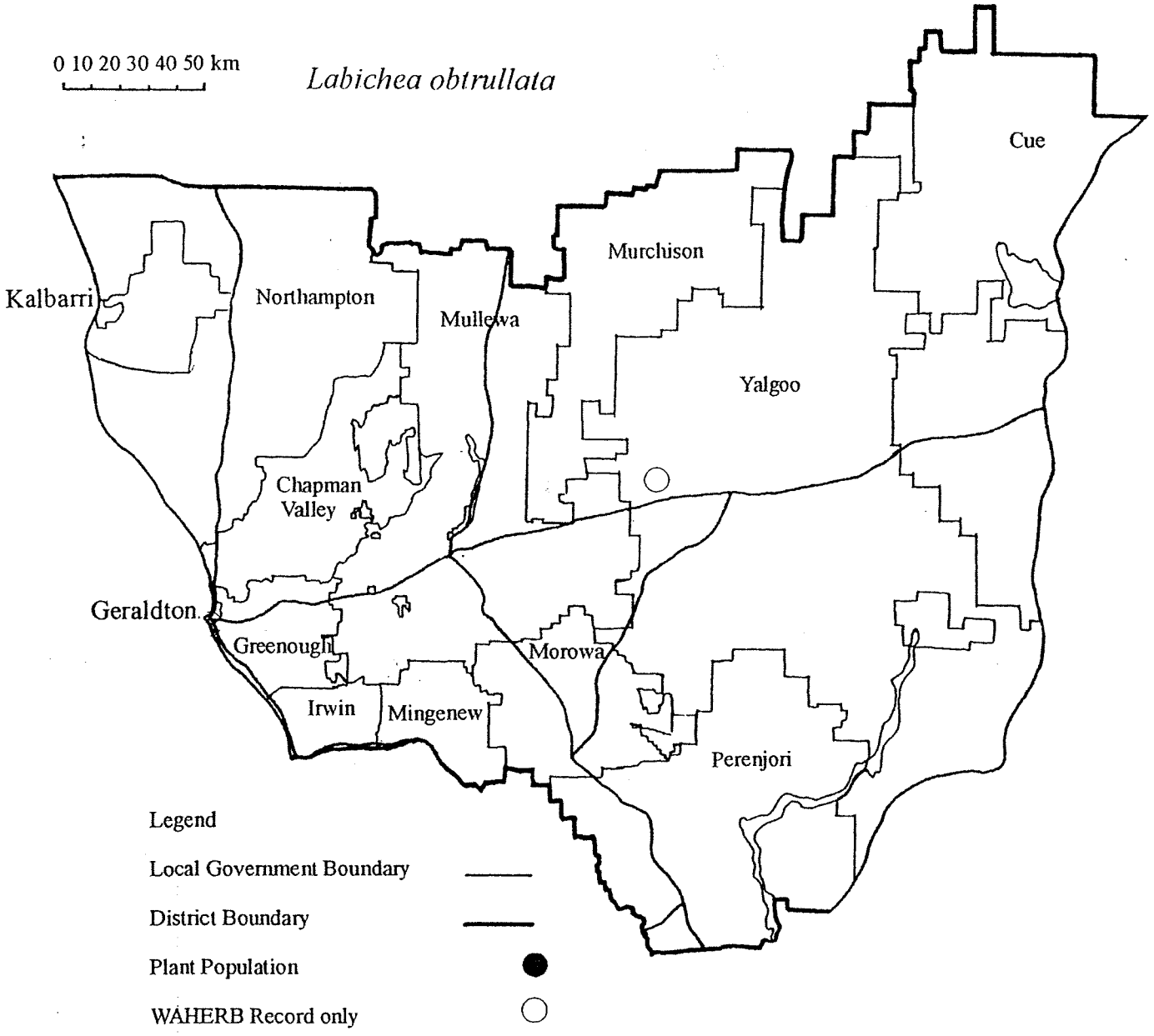
Unknown

Research Requirements

- Further survey is required, particularly on creek lines in rocky areas and low hills on areas to the west and north of Yalgoo.

References

Ross (1985).


0 10 20 30 40 50 km
Labichea obtrullata
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Lepidium merrallii F.Muell. BRASSICACEAE

A glabrous herb, erect to spreading, to 18 cm tall. The basal leaves are bipinnate to bipinnatisect, narrowing at the base, the stem leaves reducing to entire and linear, c. 1 mm wide. The flowers are grouped in elongating racemes, each flower on a stalk to 5 mm long, erect to spreading. The four sepals are c. 0.75 mm long and the petals are rudimentary. There are four stamens. The flat seed pod is glabrous, 2.5 mm long, 2 mm broad, slightly winged, forming a shallow notch at the apex. The stigma is sessile.

The combination of the small pod, absent petals, leaves not clasping at the base and four stamens characterise this species.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

This species has been found once in the Geraldton District, north-west of Paynes Find. It was growing on open clay pan areas along a shallow creek line, on sandy clay loam of a tributary flood plain over hardpan, in open mulga scrub with scattered saltbush and ephemerals.

This is the fifth collection of this species. In the past it has been collected twice from the Parker Range south of Southern Cross by E. Merrall in 1890, from near Coolgardie by S. Moore in 1895, and from near Koolyanobbing by K. Newbey in 1981. The latter collection was made from a flat valley floor, growing in red crumbly clay loam. No other details of habitat have been recorded.

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Burnerbinmah	Y	Pastoral Lease	20.8.1997	10+	Healthy

Response to Disturbance

Unknown

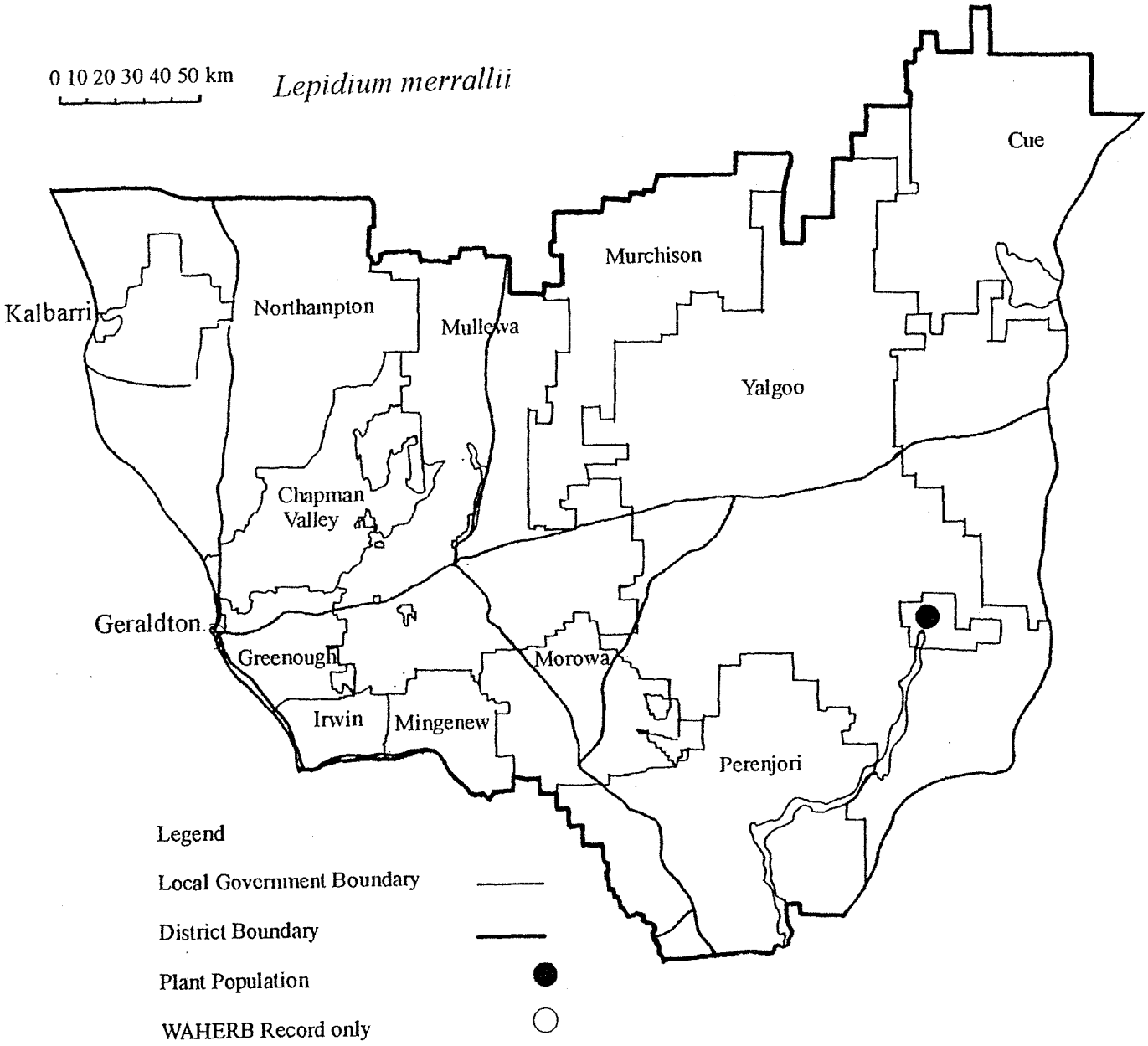
Research Requirements

- Further survey is required.

References

Hewson (1982a, 1982b).

[#] now Priority 2 (updated at December 1999)


0 10 20 30 40 50 km
Lepidium merrallii
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Lepidium sagittulatum Thell. BRASSICACEAE

Lepidium sagittulatum is a erect annual herb 20-30 cm tall. The leaves have ear-shaped basal lobes. The basal leaves are twice pinnately divided, the stem leaves are entire, reducing up the stems to subulate-lanceolate in shape. The flowers are grouped in an elongated raceme, with hairless flower stalks. Each flower has four sepals c. 0.75 mm long and four rudimentary petals shorter than the sepals, being linear in shape or they may be absent. There are two stamens. The silicula is 2-2.5 mm long, to 2 mm wide, elliptic to obovate in shape, slightly winged in the upper half, the wing forming a slight apical notch.

Flowering Period: September

Distribution and Habitat in the Geraldton District

This species is known from South Australia, Queensland and New South Wales. Two collections made in September 1949 from Mingenew are the only known occurrence of the species in Western Australia. No further details of locality or habitat were recorded and it is thought that this occurrence may be an introduction.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* Mingenew	Mi	-	26.9.1949	-	-

Response to Disturbance

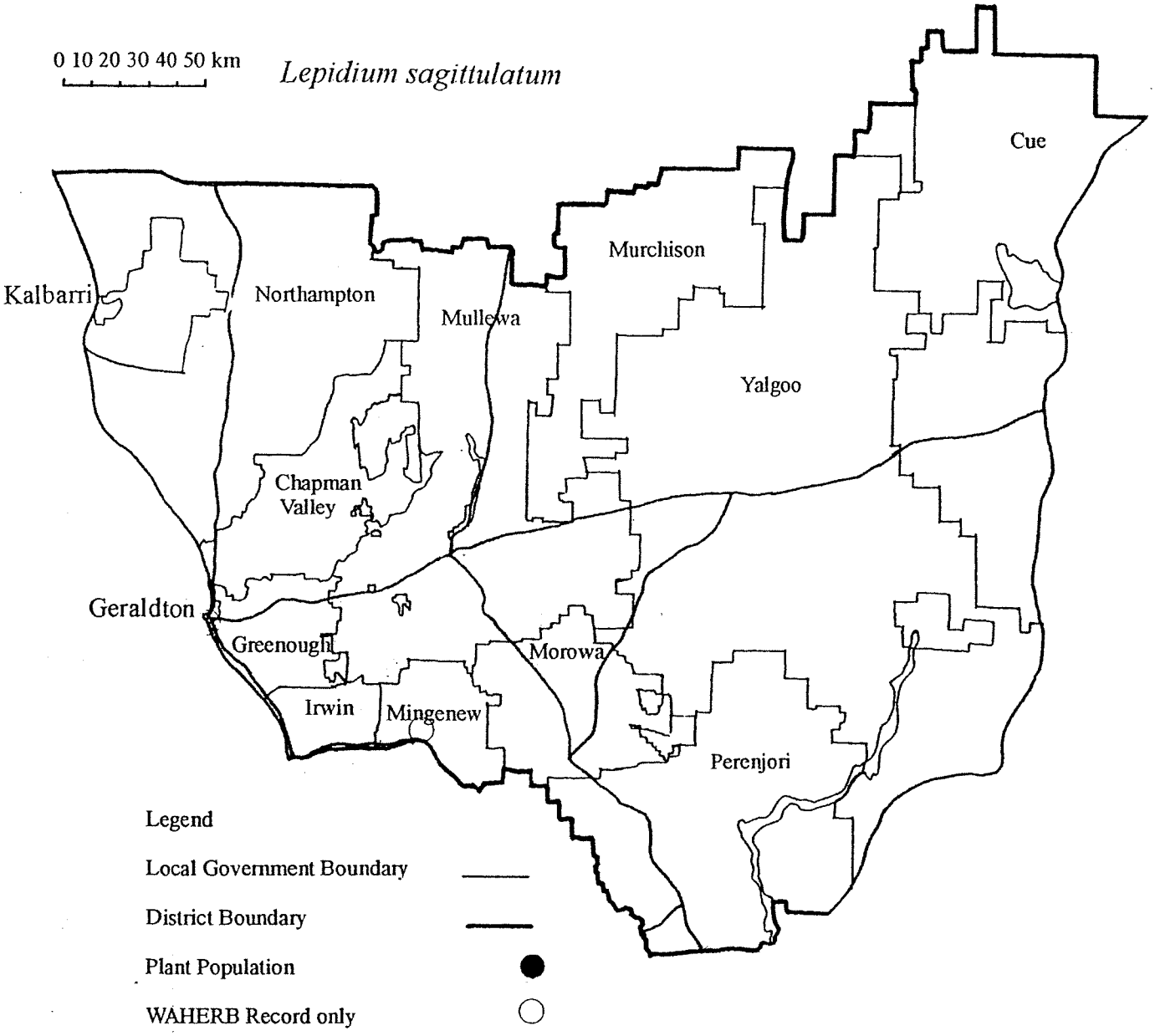
Unknown

Research Requirements

– Further survey is required.

References

Hewson (1982a, 1982b).


0 10 20 30 40 50 km
Lepidium sagittulatum
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Lepidium scandens Hewson BRASSICACEAE

An ascending, twining or scrambling shrub, 40 cm to 2 m tall with hairless stems. The leaves are succulent, glabrous and linear, to 5 cm long and 2 mm wide. The flowers are in elongated racemes. Each flower has four sepals 2-3 mm long and four white obovate petals 3-4 mm long, somewhat hooded at the base. There are six stamens. The fruit is a hairless silicula, c. 5 mm long, 4 mm broad, with a broad wing, so that the apex is deeply notched. (Fruiting specimen not fully mature.)

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

This species has been collected from three localities over a range from north to south of c. 70 km in an area north-north-west of Yalgoo. It was originally found in 1931 on the Sanford River in the Geraldton District, then in 1974 on a tributary of the Roderick River about 10 km north-west of the District boundary. The most recent collection was made in 1987 from further south on the Greenough River.

Grows in red sand or brown clayey sand on river banks or saline river flats in tall shrubland.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Greenough River	Y	Pastoral Lease	18.9.1987	"Frequent"	-
2.* Sanford River	Mur	Pastoral Lease	23.8.1931	-	-

Response to Disturbance

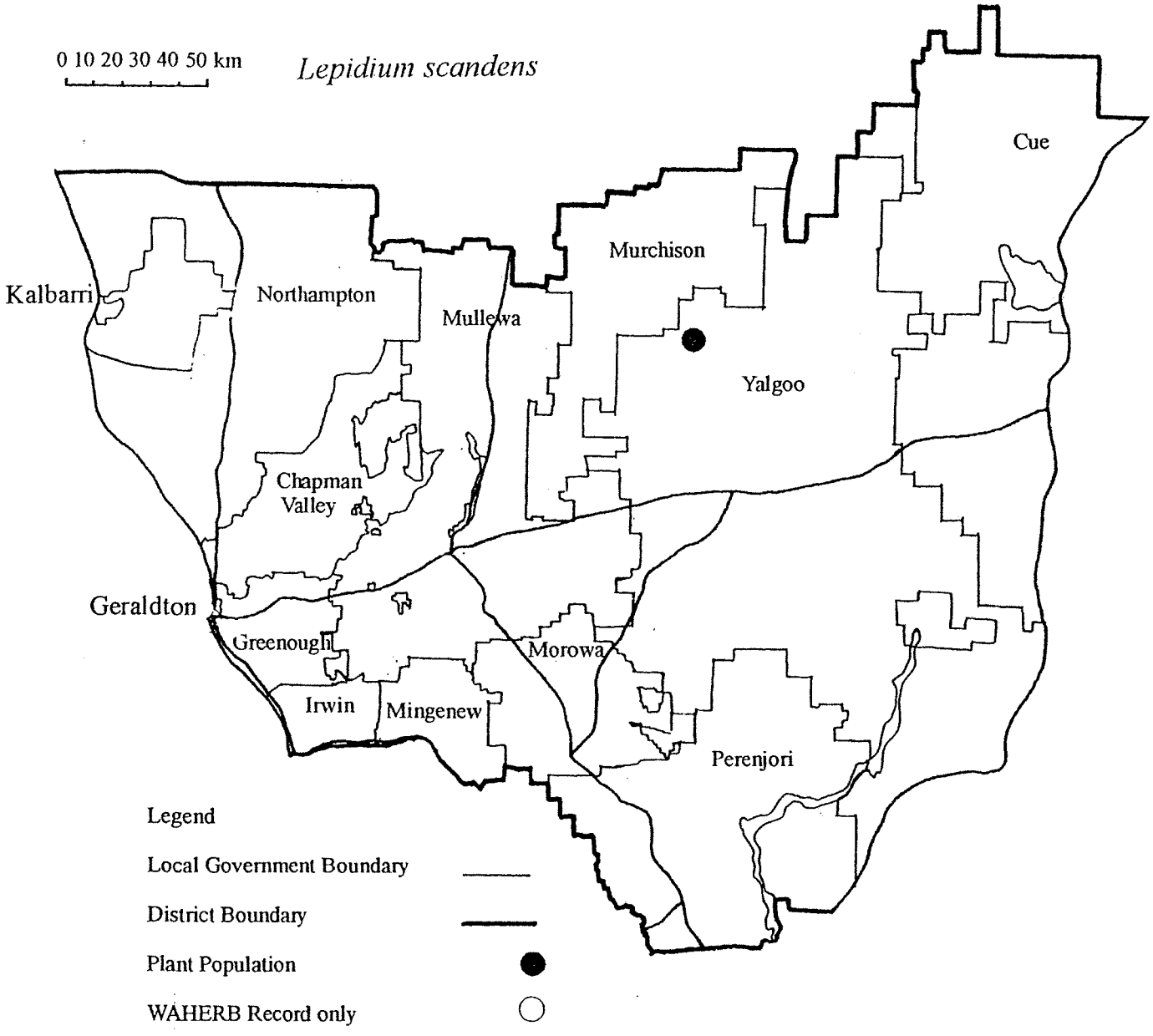
Unknown

Research Requirements

- Further survey is required.

References

Hewson (1982a, 1982b).


0 10 20 30 40 50 km
Lepidium scandens
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Leptospermum exsertum Joy Thomps. MYRTACEAE

This species was described in 1989 and has been collected only four times.

It is a sparsely-branched shrub to 0.6 m tall. The leaves are well spaced, thick and concave, broad and heart- or wedge-shaped. There is often a shallow notch at the apex and the tip is recurved. The flowers are 5-8 mm in diameter, occurring singly or two together. They are reported to be fragrant. The sepals are up to 2 mm long, triangular and keeled. There are five white petals and the stamens are in bundles of five. The fruits are 3 mm in diameter, the lower part is pubescent. The valves are glabrous and project high above the hypanthium rim, almost as far as the tips of the long erect sepals.

This species is named for the distinctive long exserted fruit valves.

Flowering Period: August-October

Distribution and Habitat in the Geraldton District

Occurs in the Mullewa to Perenjori area, but the species is poorly recorded, with little habitat information and no precise locations.

Grows on sandplain in *Acacia* thicket or on sandy clay in heath.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Mullewa Shire	Mu	-	10.1989	-	-
2.* E of Tardun	Mu	Private	27.9.1973	-	-
3.* Mullewa	Mu	-	21.8.1964	-	-
4.* Perenjori	P	-	20.9.1931	-	-

Response to Disturbance

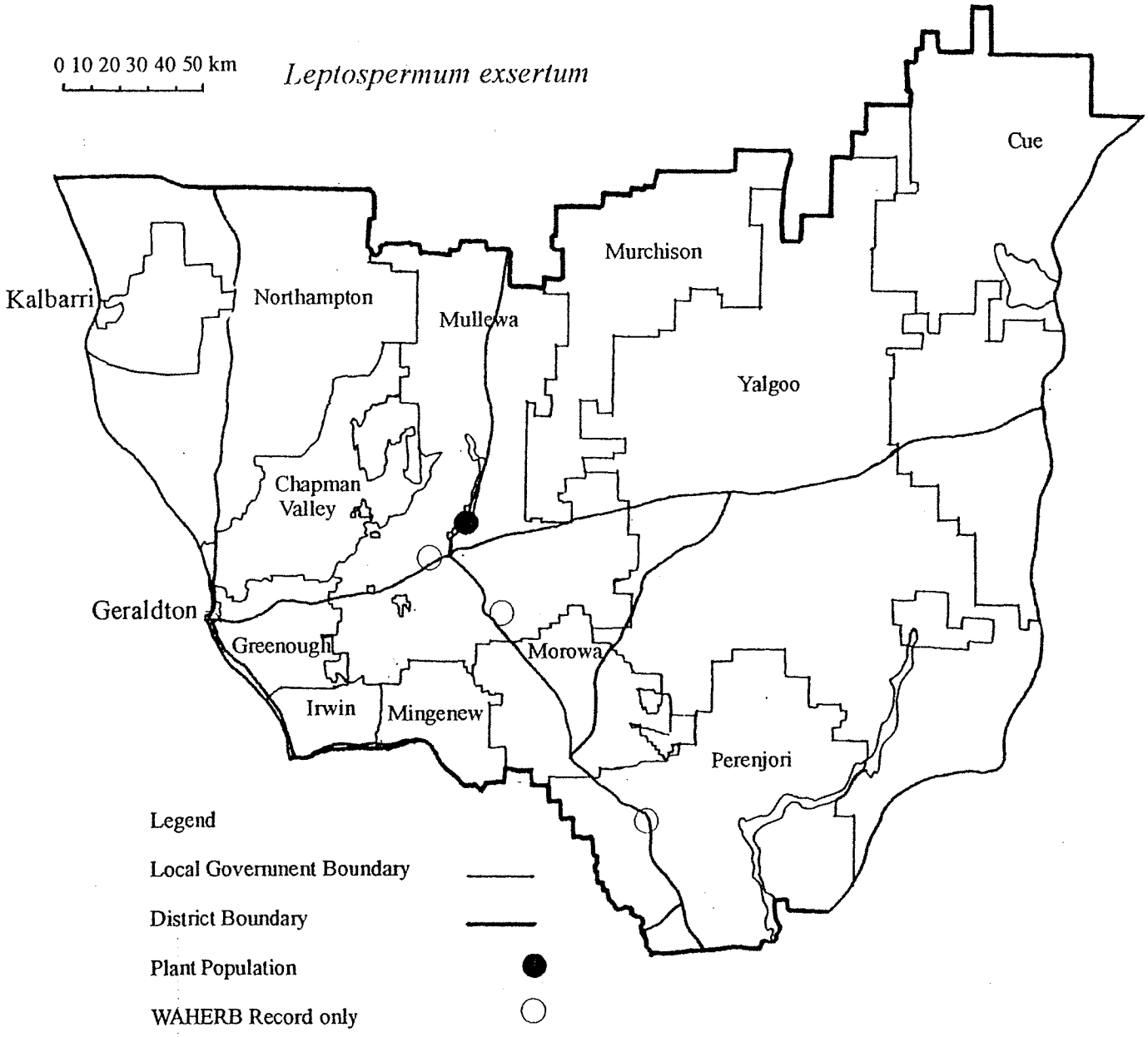
Unknown

Research Requirements

- Further survey is required.

References

Thompson (1989).


0 10 20 30 40 50 km
Leptospermum exsertum
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Leucopogon oblongus J.M.Powell ms EPACRIDACEAE

An erect, compact shrub to 1 m tall and 1.3 m across, the stems and branches greyish-brown. The leaves are up to 1.5 cm long, c. 3 mm broad, with the margins rolled under. They spread almost horizontally and are medium green above, glaucous below. The flowers are in terminal spikes. The bracteoles and sepals are red-purple in colour. The buds are pink-tipped. The flowers have a greyish-mauve calyx and a white corolla, pink-tinged on the outside.

Flowering Period: July-September

Distribution and Habitat in the Geraldton District

This species has been collected several times between Geraldton and Northampton and most records appear to have been made over c. 1 km from an area now a nature reserve, where the population still occurs. However, there is also an earlier record from c. 4.5 km further north (population 4) and another population is known from private land c. 15 km further south.

Occurs on the lower slopes of sandstone mesas, where it grows in sandy clay and loam in heath with emergent mallees. Associated species include *Melaleuca megacephala, M. cardiophylla* and *Gastrolobium spinosum.*

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. S of Northampton	N	Nature Reserve	18.6.1996	55+	Healthy
2.* S of Northampton	N	-	7.7.1982	"locally common"	-
3. N of Geraldton	CV	Private	15.8.1996	common	Healthy
4.* S of Northampton	N	-	7.9.1962	-	-

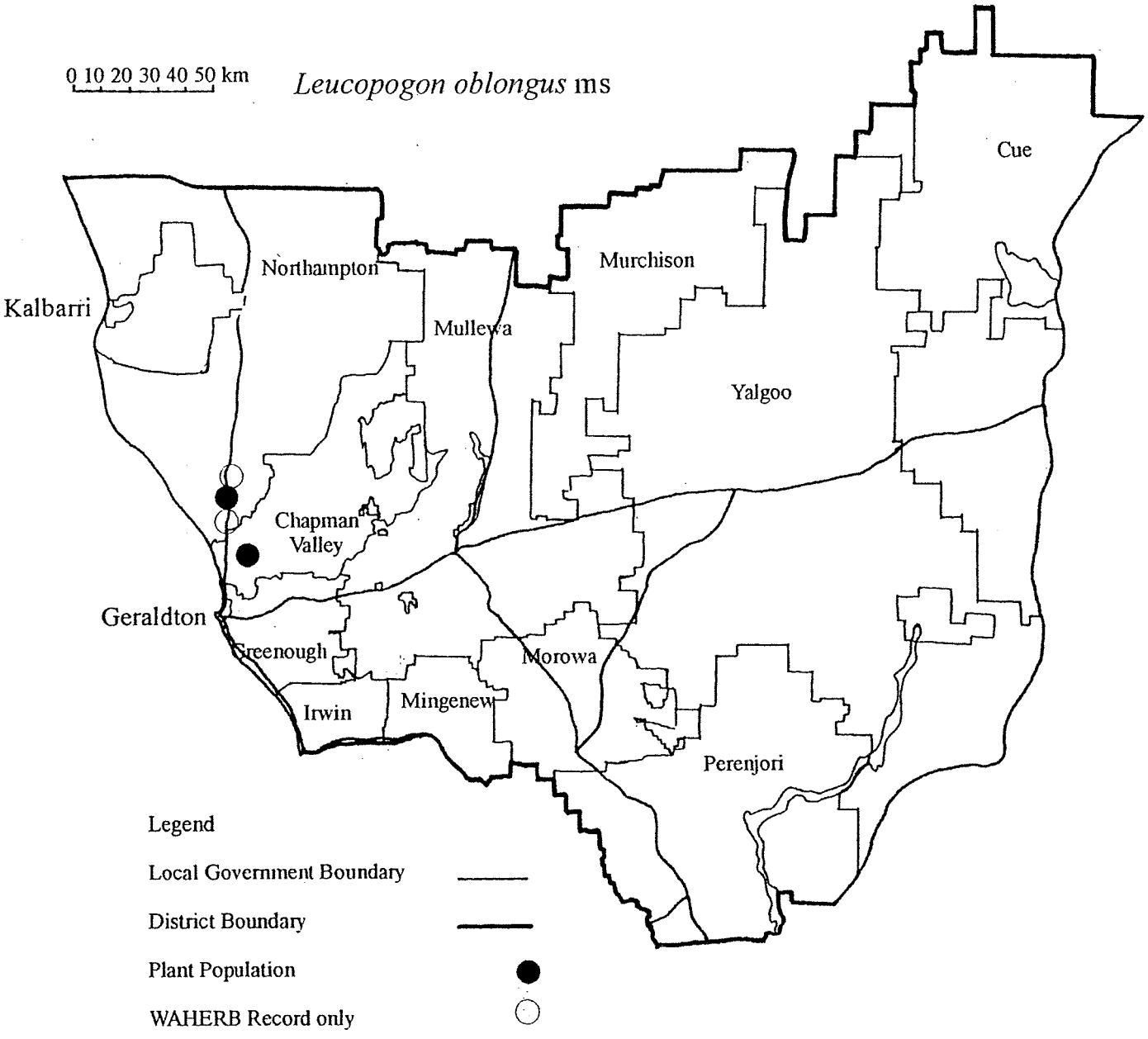
Response to Disturbance

Unknown

Research Requirements

- Further survey is required, particularly on reserves north of population 1, in order to refind population 4, and on other areas of suitable habitat which are restricted to the Moresby Range.

[#] now Priority 2 (updated at December 1999)


0 10 20 30 40 50 km
Leucopogon oblongus ms
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Leucopogon teretostylus J.M.Powell ms EPACRIDACEAE

An erect shrub 80-90 cm tall. The leaves are thickened, narrow-lanceolate in shape, with an obtuse apex. They are 1 cm long, 3 mm wide. The underside of the leaf is finely striate. The flowers are arranged in long terminal spikes and have white petals.

This species has affinity to *Leucopogon tenuis* but has different leaf and floral characters.

Flowering Period: June-September

Distribution and Habitat in the Geraldton District

This species has been recorded in the past from the Greenough Flats in the Geraldton District. It has also been recorded in 1990 from the Parker Range near Southern Cross in the Merredin District.

In the Merredin District, *L. teretostylis* ms grows on orange-brown clay sand with rock fragments and shale on breakaway slopes.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Greenough Flats	-	-	-	-	-

Response to Disturbance

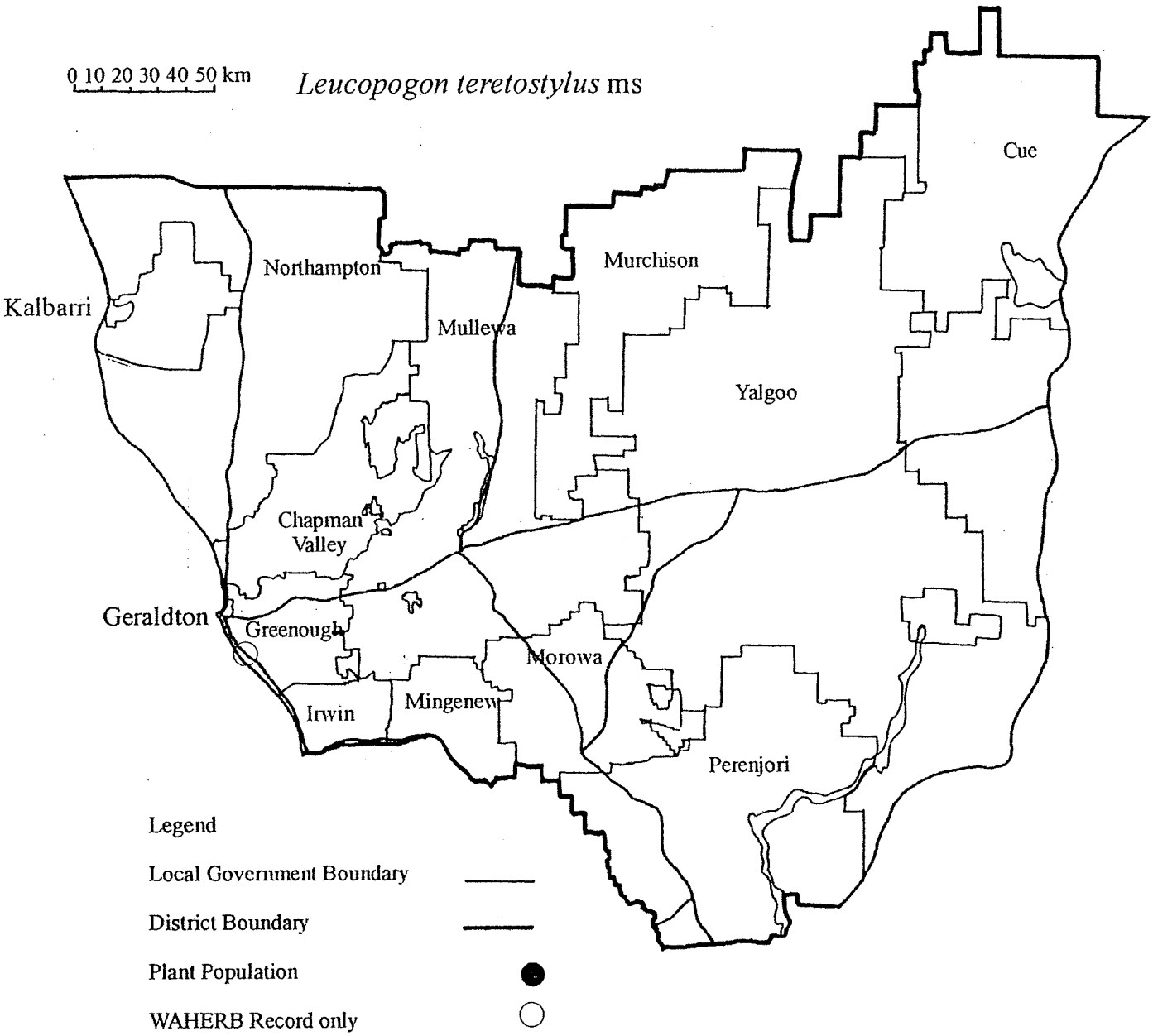
Unknown

Research Requirements

– Further survey is required.

References

J. Powell (personal communication).


0 10 20 30 40 50 km
Leucopogon teretostylus ms
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Levenhookia octomaculata F.L.Erickson & J.H.Willis STYLIDIACEAE

Eight-spotted Stylewort, Dotted Stylewort

This species was described in 1956 from specimens collected at Bolgart in the south of the Moora District.

A small plant 5-6 cm tall. There are a few hairless leaves which at the base of the stem are spathulate or obovate, 1-2 mm wide, on a stalk of equal length. They are longer and narrower higher up the stem. The flowers are arranged in umbels. The calyx tube is glandular-hairy but the lobes are more or less glabrous. The corolla tube is very short and the four petals are pink with two dark spots near the base of each. As in other species of *Levenhookia,* the column is stout, erect and short. The labellum is large with a hood-shaped part which covers the column and anthers, and in this species, has a long claw. The capsule is globose.

This species is close to *L. stipitata,* which is more glandular-hairy and has unspotted petals, flowering earlier. Three other species have spotted throats, *L. leptantha, L. preissii* and *L. pauciflora,* but are all more glandular-hairy with non-umbellate inflorescences, shorter pedicels and a single spot at the base of each petal.

Flowering Period: September-November

Distribution and Habitat in the Geraldton District

Although this species has a relatively wide geographic distribution of over 400 km from Bolgart in the south, north to the Kalbarri area, it is poorly collected, possibly owing to its small size. It was described from specimens collected at Bolgart and has been found recently in the Hill River area. In the Geraldton District, it occurs in the Kalbarri area, south-east to north of Morowa.

This species grows in compact colonies in jam and wandoo woodland in the south and in brown clayey sand over laterite in woodland on a gully bank further north. In the Geraldton District, habitat ranges from clay over laterite in *Melaleuca* woodland to white sand over sandstone in scrubland with *Melaleuca filifolia* and *M. megacephala,* or yellow sand and gravel in tall shrubland and heath with *Allocasuarina campestris, Acacia rostellifera* and *Ecdeiocolea monostachya.*

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. NW of Ajana	N	National Park	10.10.1995	47	Healthy
2. Near Canna	Mo	-	15.9.1993	-	-
3. SE of Kalbarri	N	National Park	3.10.1991	-	-
4. E of Geraldton	CV	Water Reserve	23.10.1992	-	-
5. NE of Kalbarri	N	National Park	28.9.1989	-	-
6. S of Kalbarri	N	National Park	8.10.1988	-	-

Response to Disturbance

Unknown

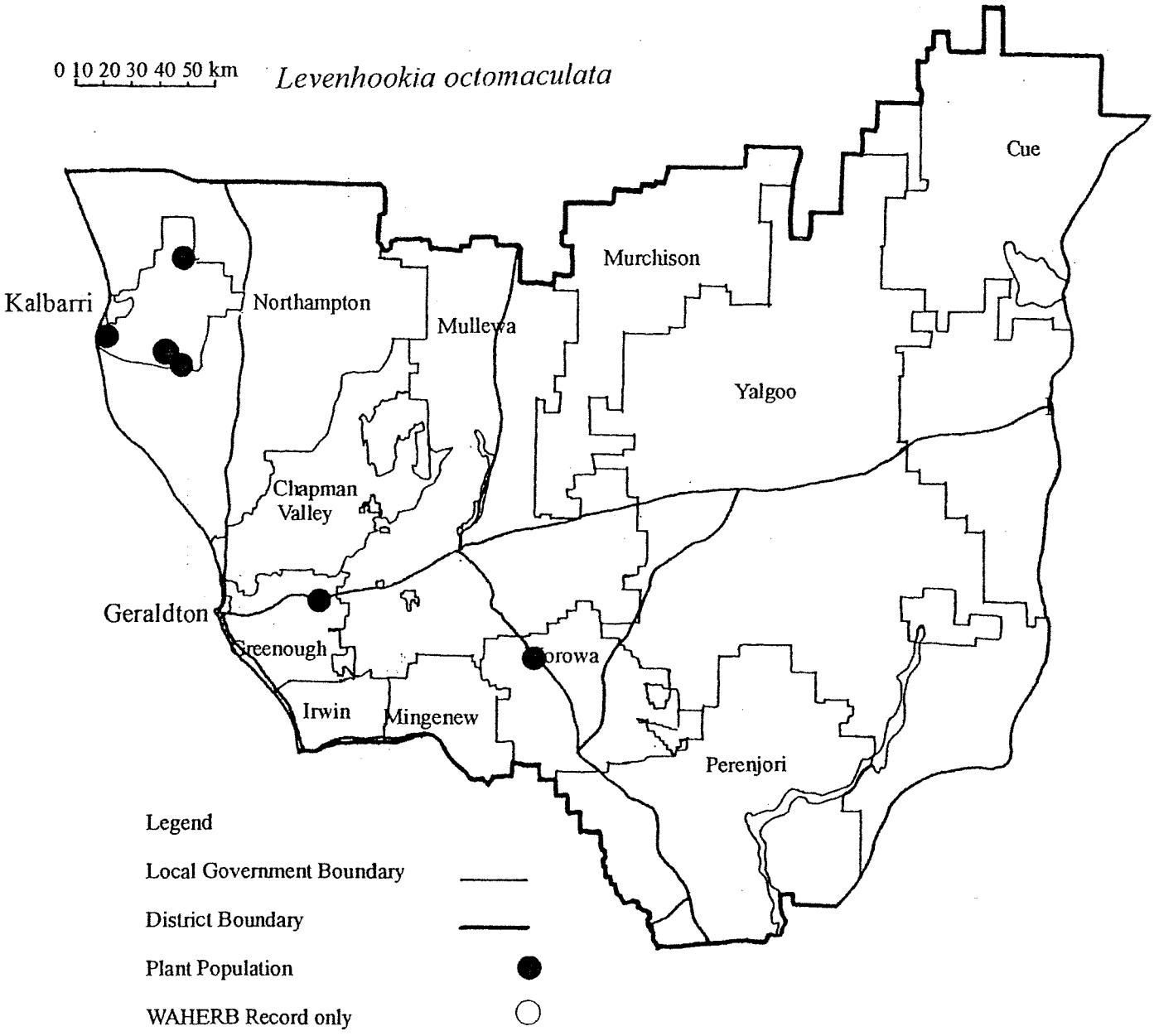
Research Requirements

- Further survey is required.

[#] now Priority 3 (updated at December 1999)

References

Grieve & Blackall (1975), Erickson & Willis (1956b), Erickson (1981).



Macarthuria georgeana Keighery MOLLUGINACEAE

An erect, glabrous subshrub with terete stems which are warty, rusty brown or glaucous. The leaves are reduced to triangular scale up to 2 mm long, appressed to the stems. The flowers are arranged in cymes of one or two flowers which are attached to the sides of the stems. There are numerous dark brown bracts up to 1.3 mm long. The flowers are on stalks 2-3 mm long and have conspicuous white petals about 4 mm long. The ovary has one ovule in each compartment.

Several characters distinguish this species from others in the genus. These are the verrucose and often rusty brown stems, few-flowered inflorescences and large flowers with petals.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

Although this species has been collected six times, all the collections appear to have been made at two localities about five kilometres apart, near the North West Coastal Highway north of the Murchison River.

Grows in deep yellow sand on gently undulating sandplains and sand ridges. Occurs in scrub heath and scrub with mallees.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.*N of the Murchison River	N	-	6.9.1966	-	-
2.*N of Northampton	N	-	6.8.1976	-	-

Response to Disturbance

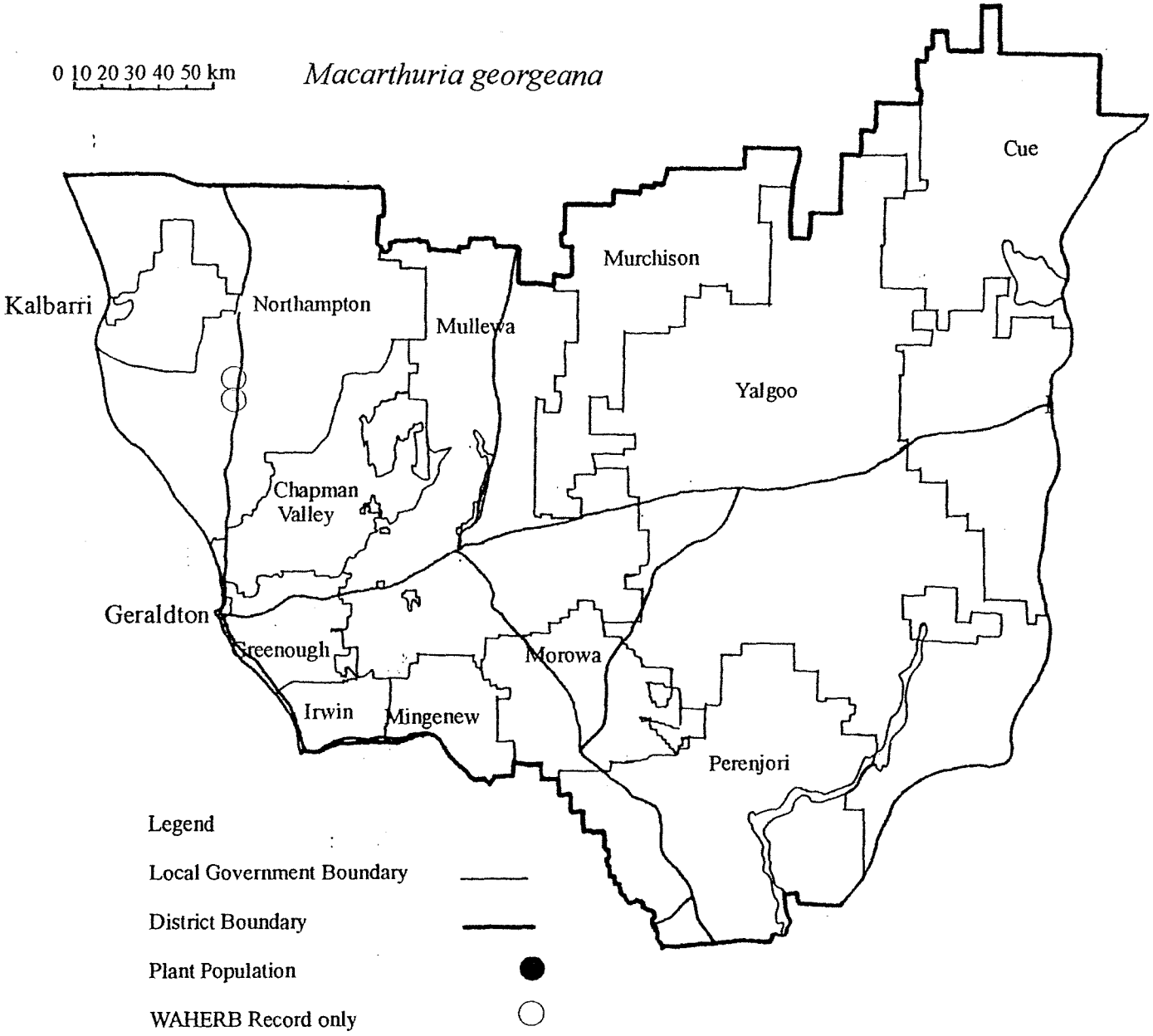
Survives fires by regeneration from a woody rootstock.

Research Requirements

– Further survey is required to refind and resurvey population 1 and to find further populations.

References

Keighery (1983), Lepschi (1996).


0 10 20 30 40 50 km
Macarthuria georgeana
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Malleostemon sp. Bulga Downs (S.van Vreeswyk 3138) MYRTACEAE

An erect shrub 40 cm tall. The leaves are terete, with a mucronate, recurved point and are c. 5 mm long, densely clustered at the ends of the branchlets. The flowers are grouped at the ends of the branchlets, each arising from a bract which is expanded in the lower half into a thin, almost transparent lamina which surrounds the base of the flower. Each flower is c. 5 mm in diameter, with five rounded petals, white or pale pink in colour, c. 2 mm long, with undulate, crisped margins.

Flowering Period: September

Distribution and Habitat in the Geraldton District

This taxon has been collected only once, from the east side of the Geraldton District, south-east of Sandstone.

It was recorded growing in red clayey sand over hardpan, amongst spinifex with *Eucalyptus gongylocarpa.*

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SE of Sandstone	S	Pastoral Lease	16.9.1992	"frequent"	-

Response to Disturbance

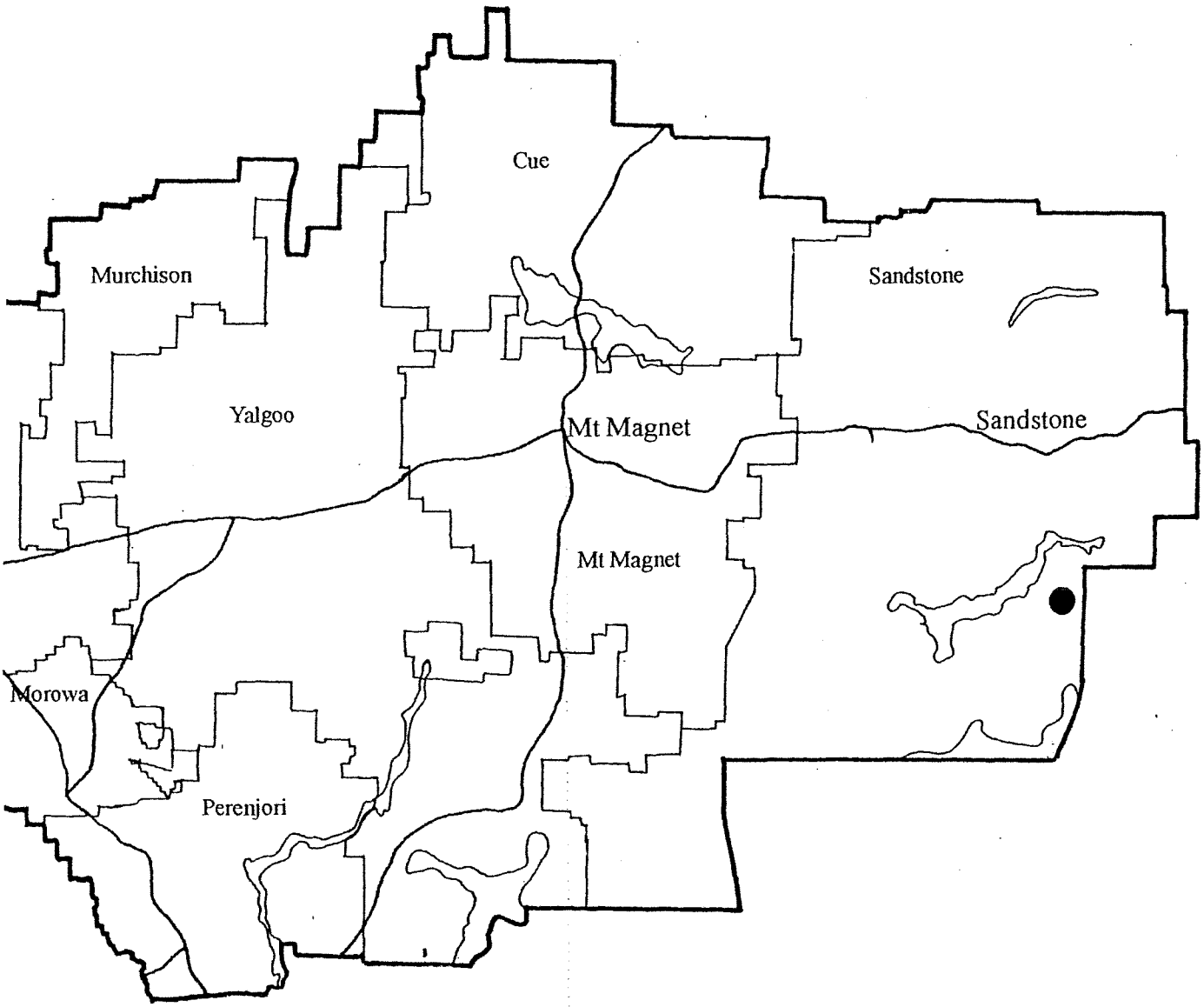
Unknown

Research Requirements

- Further survey is required to refind and resurvey population 1 and to find further populations.
- Taxonomic work is required.

0 10 20 30 40 50 km

Malleostemon sp. Bulga Downs
(S. Van Vreeswyk 3138)



Legend

Local Government Boundary

District Boundary

Plant Population

WAHERB Record only

Malleostemon sp. Erangy Springs (M.E.Trudgen 12030) MYRTACEAE

A shrub 45 cm tall and 1-1.5 m wide. The leaves are oblong to obovate, 1-1.5 mm long, thick, with a mucronate tip. The flowers have white to pink petals and are c. 3 mm in diameter. The hypanthium is cylindrical to obconical, the base truncate, c. 0.8 mm long, with oil glands. The calyx lobes are semicircular to transverse oblong, with a large hyaline edge.

Flowering Period: October-December

Distribution and Habitat in the Geraldton District

This taxon has been collected from an area south-west of Mullewa at two localities c. 30 km apart.

It has been found on gently undulating sandplain, growing in grey sand in tall open *Acacia* shrubland over low open heath with *Jacksonia, Verticordia* and *Melaleuca* species and with *Plectrachne danthonioides.*

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

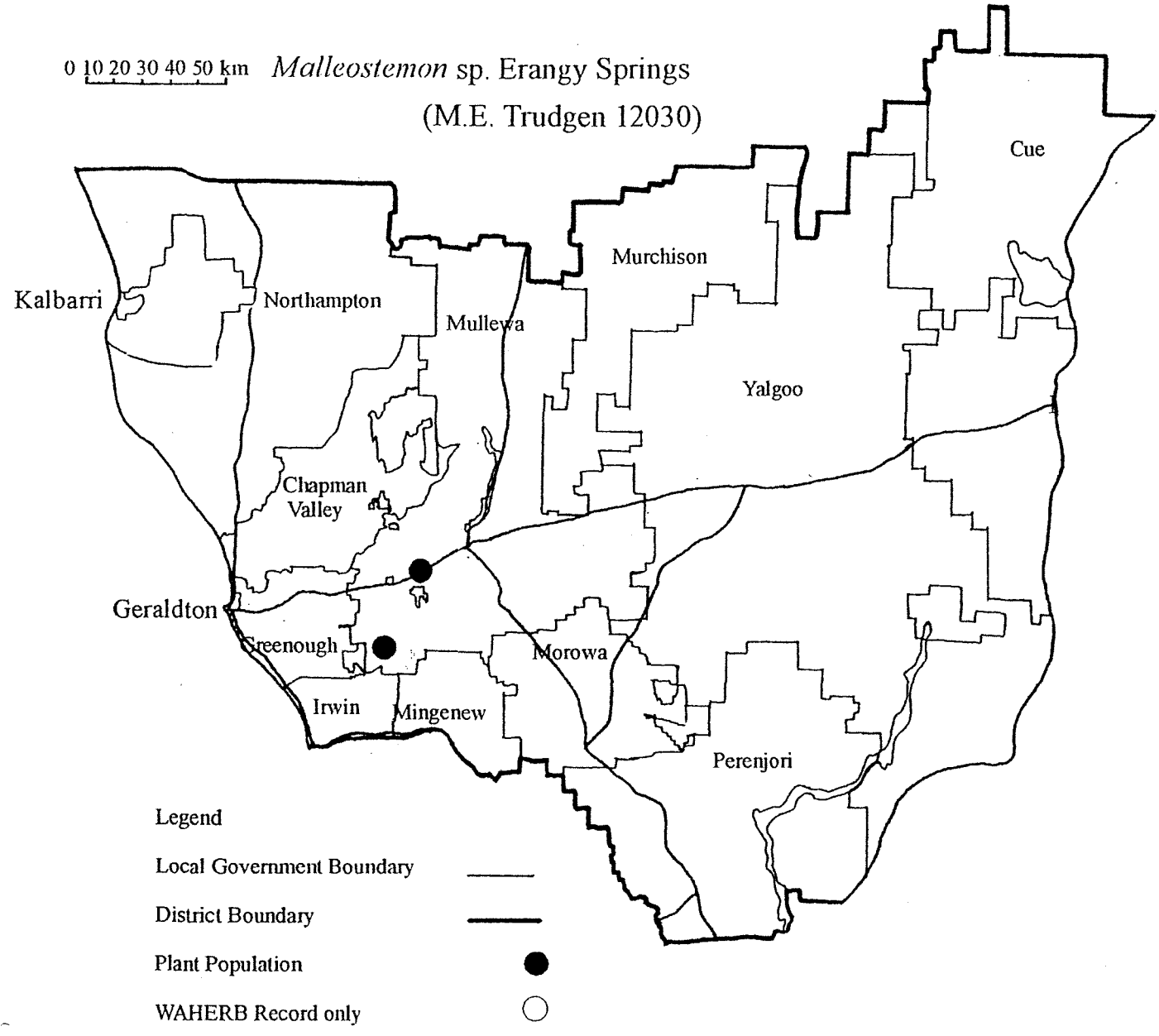
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SE of Eradu	Mu	-	6.12.1993	-	-
2. Indarra	Mu	-	25.10.1995	-	-

Response to Disturbance

Unknown

Research Requirements

- Further survey is required to refind and resurvey populations 1 and 2 and to find further populations on conservation reserves in the area.
- Taxonomic work is required.


0 10 20 30 40 50 km
Malleostemon sp. Erangy Springs
(M.E. Trudgen 12030)
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Malleostemon sp. Hardabutt Rapids (D.Bellairs 1654A) MYRTACEAE

A shrub 1-2 m tall, with small elliptic leaves c. 1 mm long. They are thick and concave on the upper surface. The bracteoles are elliptic, keeled, with hyaline margins. The flowers are pale pink or white in colour. They are c. 4 mm in diameter, almost sessile. The petals are c. 2 mm long.

This taxon is allied to *Malleostemon roseus* but differs in the shape of leaves and bracteoles, more or less sessile flowers with larger petals, and in the shape of the staminophore, which is more flared.

Flowering Period: October

Distribution and Habitat in the Geraldton District

This species has been found once in the Geraldton District, south-east of Kalbarri, where it was growing in red rocky clay on slopes above a river, with species of *Acacia* and *Grevillea.* It has also been recorded once from just north of the District to the east of Nerren Nerren Station, where it was growing on sandplain.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

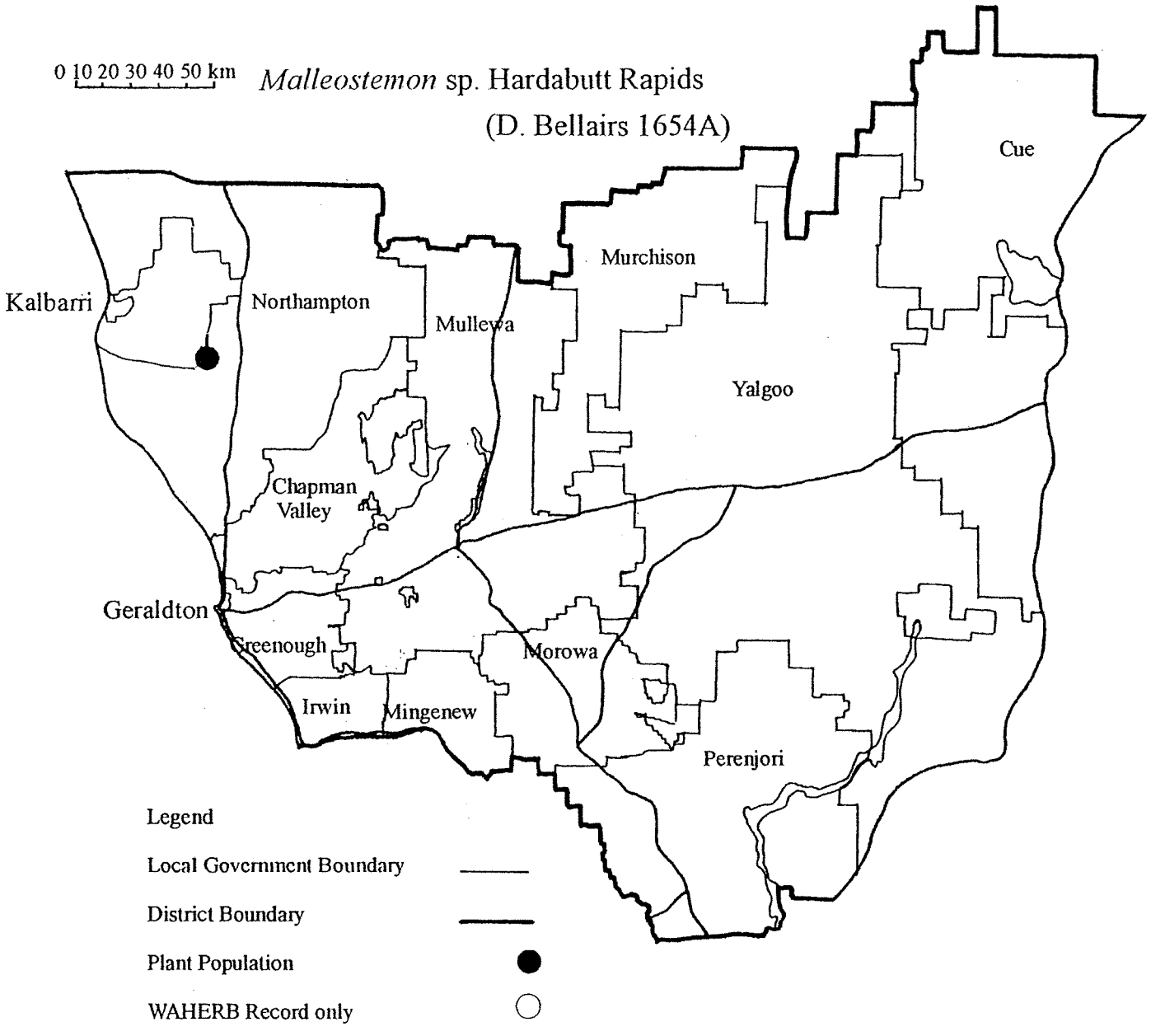
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Kalbarri	N	Crown Reserve	7.10.1979	"frequent"	-

Response to Disturbance

Unknown

Research Requirements

- Further survey is required to refind and resurvey population 1 and to find further populations on conservation reserves in the area.
- Taxonomic work is required.


0 10 20 30 40 50 km
Malleostemon sp. Hardabutt Rapids
(D. Bellairs 1654A)
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Malleostemon sp. Mullewa (B.Winson B7365) MYRTACEAE

A dense, low shrub, spreading and sometimes flat-topped, 30-50 cm tall, to 1.3 m wide. The leaves are narrow, thick, blunt, c. 1.5 mm long and 0.5 mm wide. The flowers are white with pink centres. They are c. 4 mm in diameter. The calyx lobes are rounded with dentate edges. The petals are rounded with dentate edges, c. 1.5 mm long. There are five geniculate stamens inserted opposite the calyx lobes.

Flowering Period: August, October-December

Distribution and Habitat in the Geraldton District

Has been recorded from three localities over c. 70 km between Geraldton and Mullewa.

Grows on flats or hill slopes in brown sandy clay in open scrub.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

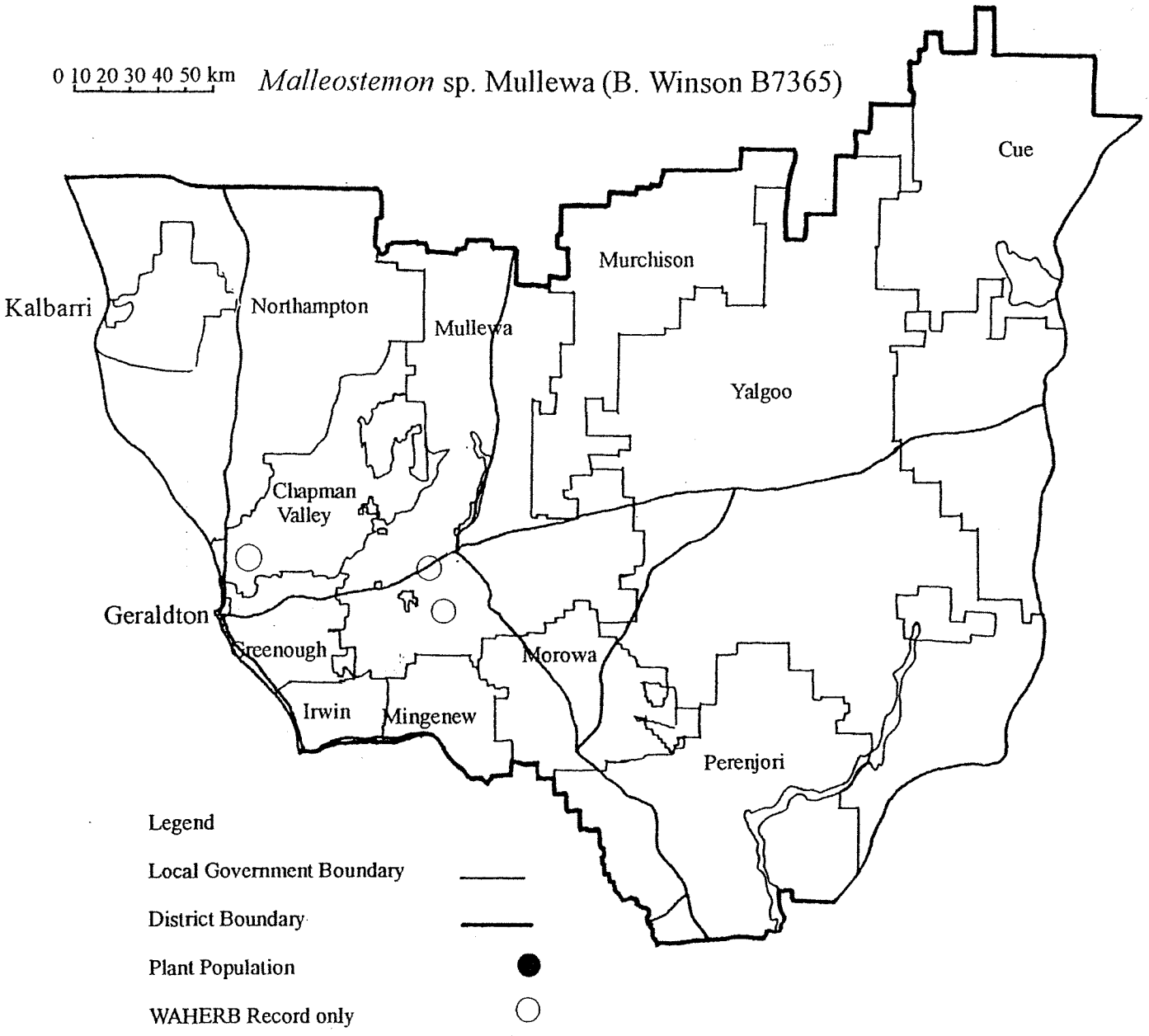
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* WSW of Mullewa	Mu	-	23.12.1963	-	-
2.* SW of Mullewa	Mu	-	11.1980	-	-
3.* NW of Geraldton	CV	Private	25.8.1983	"frequent"	-

Response to Disturbance

Unknown

Research Requirements

- Further survey is required to refind and resurvey populations 1-3 and to find further populations.
- Taxonomic work is required.


0 10 20 30 40 50 km
Malleostemon sp. Mullewa (B. Winson B7365)
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Malleostemon sp. Unmade Road (E.A.Griffin 7537) MYRTACEAE

A shrub, height and habit unknown. The leaves are opposite, broadly elliptic with a pointed apex, c. 2 mm long, and 1.3 mm broad. The flowers are arranged on short stalks in rounded umbels on flattened peduncles c. 1.5 mm long in the upper leaf axils, forming spikes on the upper branchlets. The flowers are c. 2 mm in diameter, with a rugose calyx tube. The calyx lobes are rounded, flat and petaloid. The petals are pale pink, with undulated edges and are cupped. There are five geniculate stamens.

Flowering Period: October

Distribution and Habitat in the Geraldton District

This taxon has been collected once from east of Geraldton.

It grows on sandplain in pale yellow sand in long unburnt vegetation of open shrub mallee, with low scrub and low heath. Associated species include *Eucalyptus arachnaea, Calothamnus quadrifidus* and *Allocasuarina campestris.*

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

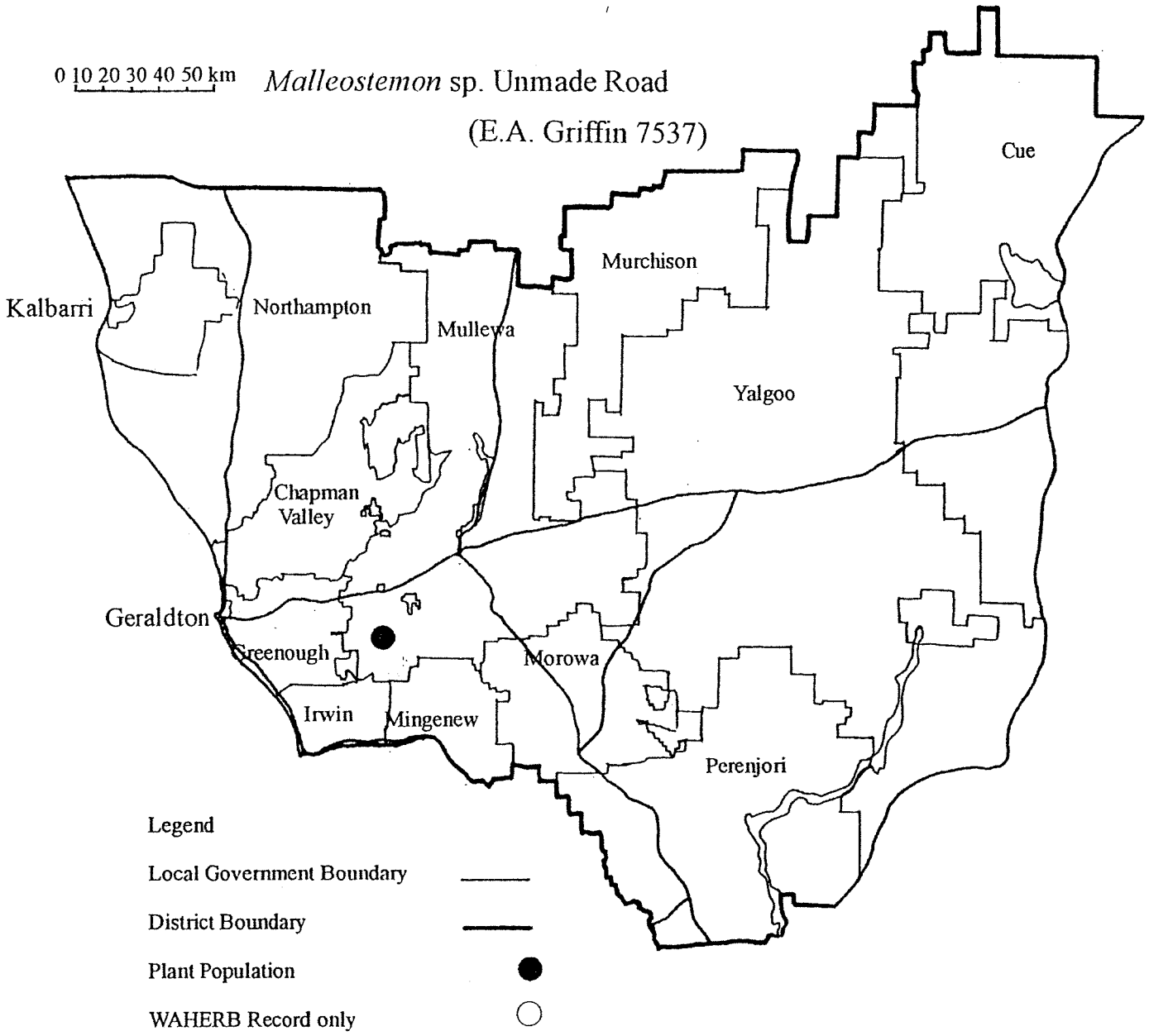
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Unmade Road	Mu	-	24.10.1992	-	-

Response to Disturbance

Unknown

Research Requirements

- Further survey is required to refind and resurvey population 1 and to find further populations.
- Taxonomic work is required.


0 10 20 30 40 50 km
Malleostemon sp. Unmade Road
(E.A. Griffin 7537)
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Malleostemon sp. Woolgorong Station (M.Officer 100) MYRTACEAE

An upright shrub 2 m tall, the leaves linear with a recurved mucronate tip. They are c. 4 mm long and 0.75 mm wide and are clustered towards the ends of the branchlets. The flowers occur singly in the upper leaf axils on stalks to 2 mm long, forming small flower clusters. They are white with a pinkish centre and are c. 4.5 mm broad. The hypanthium has glands. The calyx lobes are petaloid, broader than long, and the petals are rounded, c. 2 mm long. The are five geniculate anthers.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

This taxon has been collected once, from north of Pindar.

Grows in thick scrub in deep red sand in Wanderrie.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

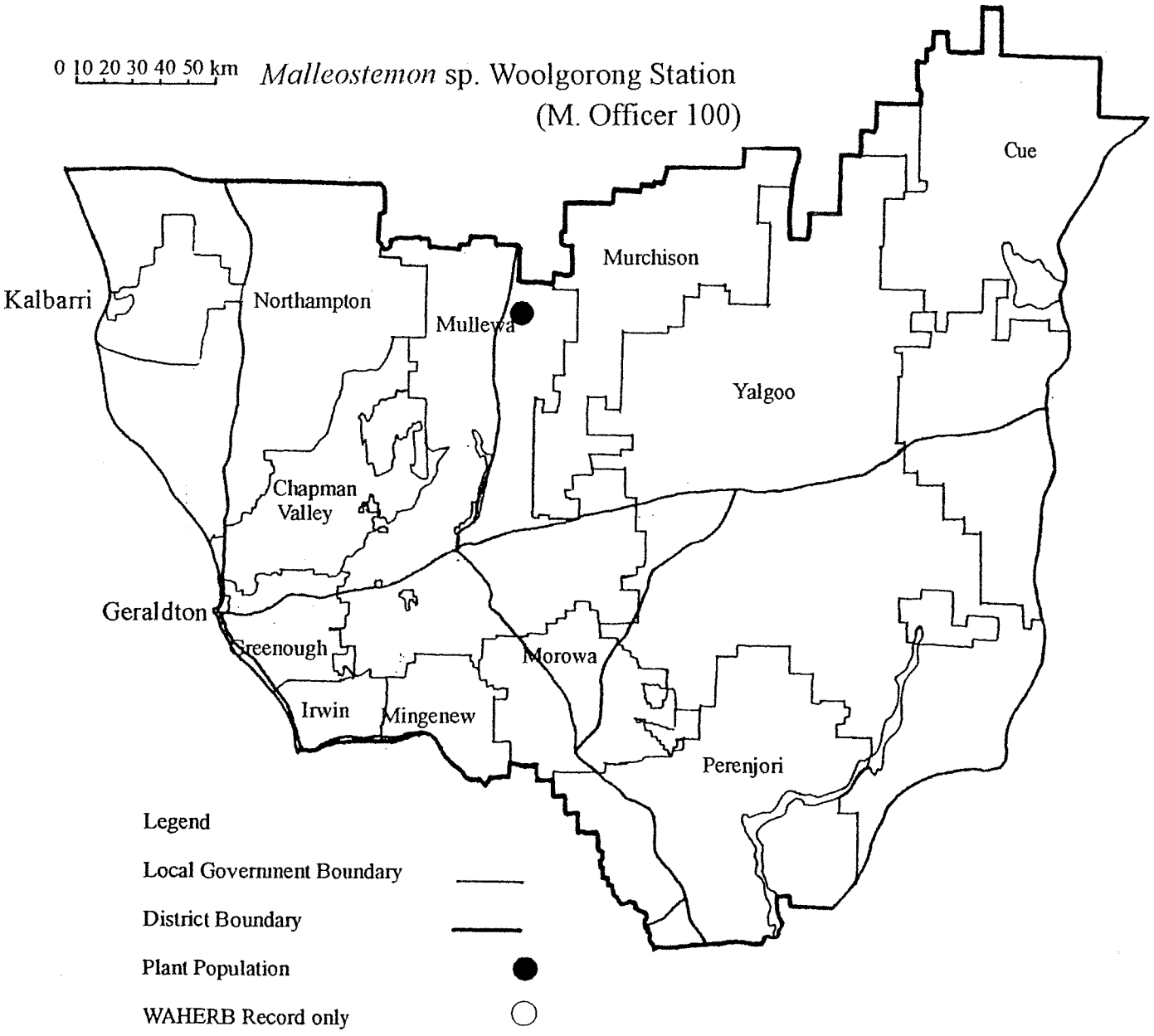
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Woolgorong	Mu	Pastoral Lease	1.9.1995	-	-

Response to Disturbance

Unknown

Research Requirements

- Further survey is required to refind and resurvey population 1 and to find further populations.
- Taxonomic work is required.


0 10 20 30 40 50 km
Malleostemon sp. Woolgorong Station
(M. Officer 100)
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Malleostemon sp. Yalgoo Road (Morawa Tree Committee 329) MYRTACEAE

A shrub to 2 m tall with linear, terete leaves with a mucronate apex. They are about 3.5 mm long and 0.6 mm broad. The white flowers are grouped two or three together on pedicels c. 2 mm long in the upper leaf axils. They are c. 4 mm in diameter. The calyx tube has five ridges which extend up to form the keel of the triangular calyx lobes which have petaloid margins. The petals are rounded, with undulate margins. There are five geniculate stamens.

Flowering Period: September

Distribution and Habitat in the Geraldton District

Known from one area north-east of Morowa where it grows in sand in *Acacia* shrubland.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

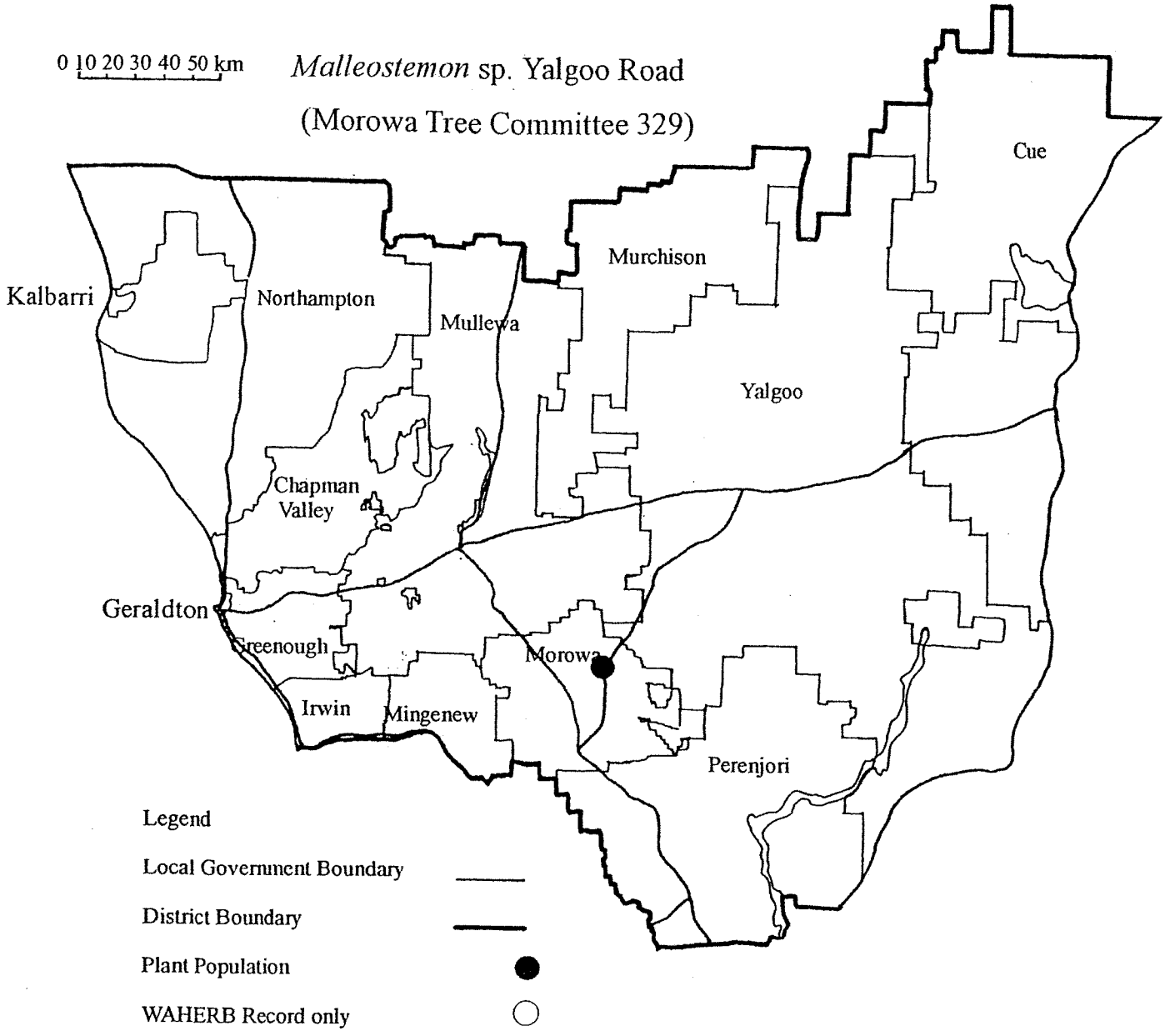
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. NE of Morowa	Mo	Crown Reserve	22.9.1993	"abundant"	-

Response to Disturbance

Unknown

Research Requirements

- Further survey is required to refind and resurvey population 1 and to find further populations.
- Taxonomic work is required.


0 10 20 30 40 50 km
Malleostemon sp. Yalgoo Road
(Morowa Tree Committee 329)
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Micromyrtus cuensis J.W.Green ms MYRTACEAE

An erect, slender shrub, 0.5-2.5 m tall. The leaves are oblong, c. 2 mm long and 1 mm wide. They are arranged decussately along the branchlets. The flowers are white, c. 3 mm in diameter. The calyx tube is urceolate, the calyx lobes shortly triangular. The petals are rounded, with a minutely denticulate edge. There are ten stamens in two rows, one inserted lower than the other in the flower.

Flowering Period: June-September

Distribution and Habitat in the Geraldton District

This species has been found west of Paynes Find and at Cue and to the north-west of Cue. A population from north of Mullewa has an affinity to this species and was found on open lateritic areas above a breakaway.

Was recorded at Cue from granite outcrops, and north-west of Cue and west of Paynes Find in brown or red loam on ironstone hills in *Acacia* scrub. Associated species at population 2 include *Calycopeplis ephedroides, Thryptomene* sp. and mallee eucalypts.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

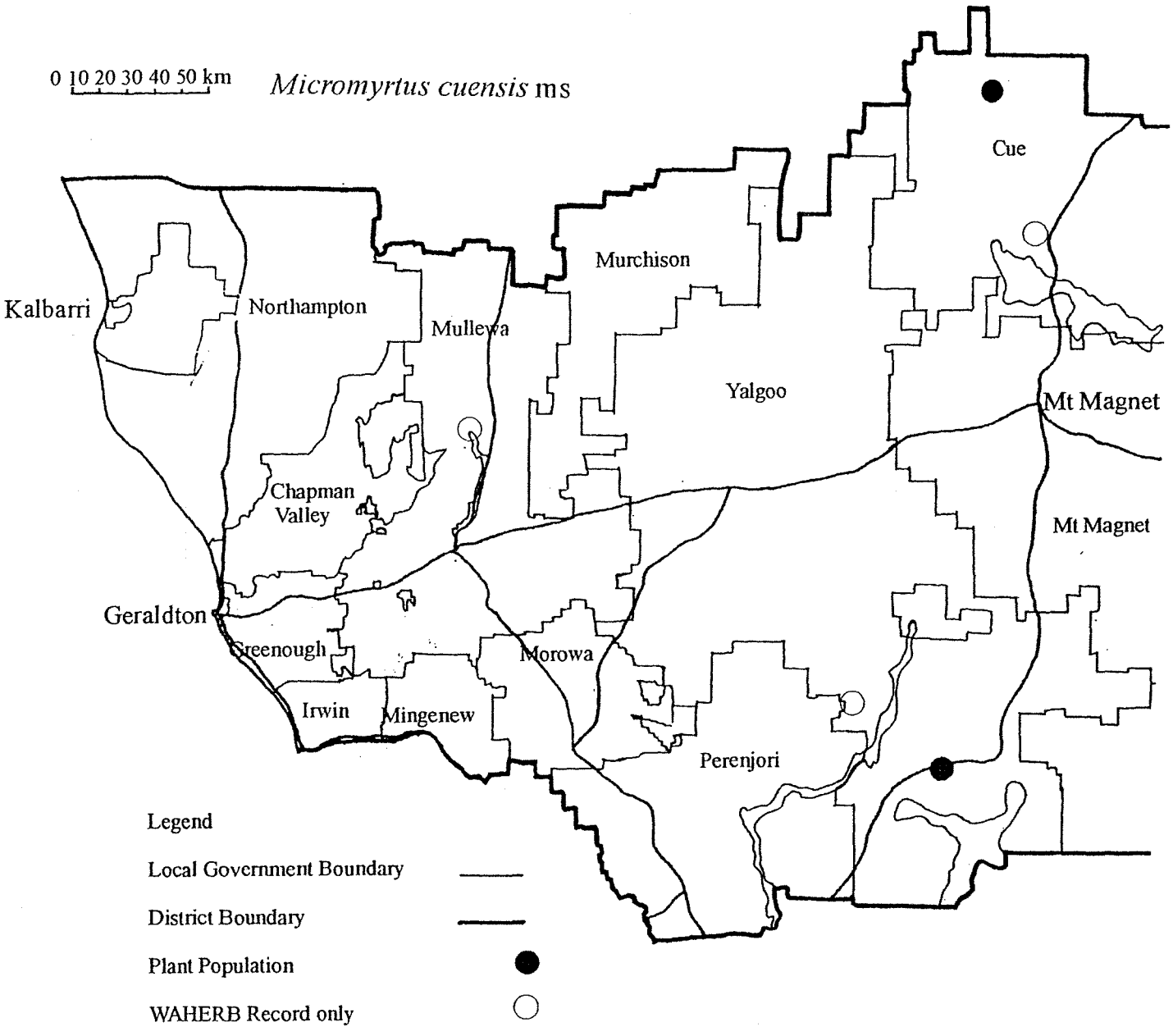
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Weld Range	C	Pastoral Lease	3.8.1995	4+	Healthy
2. SW of Paynes Find	Y	MRWA Road Verge	24.6.1995	20+	Healthy
3.* W of Warriedar	Y	-	26.9.1986	-	-
4.* Tallering	Mu	-	14.9.1978	-	-
5.* Cue	C	-	7.1926	-	-

Response to Disturbance

Unknown

Research Requirements

- Further survey is required, particularly around Cue and Paynes Find, to refind and survey populations 3-5 and to find further populations.
- Taxonomic work is required.


0 10 20 30 40 50 km
Micromyrtus cuensis ms
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Mt Magnet
Chapman Valley
Mt Magnet
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Micromyrtus racemosa Benth. var. *mucronata* J.W.Green ms MYRTACEAE

An open, spreading shrub to 1.3 m tall. The leaves are narrow-linear, c. 3-4 mm long, 0.5 mm broad, crowded towards the ends of the branchlets. They are three-angled, 1-grooved below. The apex has a minute, sharp, abrupt point. The floral tube is scarcely shorter than the peduncle at the base. The flowers have white petals and dark red centres. They are c. 2 mm in diameter on stalks c. 1 mm. The narrow cylindrical calyx tube is c. 2 mm long and has ten ridges. The calyx lobes are blunt and petaloid. The petals are c. 1.5 mm long, longer than broad. There are ten stamens.

Flowering Period: April, June-October

Distribution and Habitat in the Geraldton District

This variety of *Micromyrtus racemosa* is known only from the summit and upper slopes of a range of hills to the south-west of Paynes Find.

Grows in red loam and granitic soil amongst greenstones and dolerite in tall shrubland and thickets of *Allocasuarina* and *Acacia* species. Associated species include *Allocasuarina tesselata, Thryptomene mucronulata, Acacia jibberdingensis* and *Scaevola spinescens.*

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

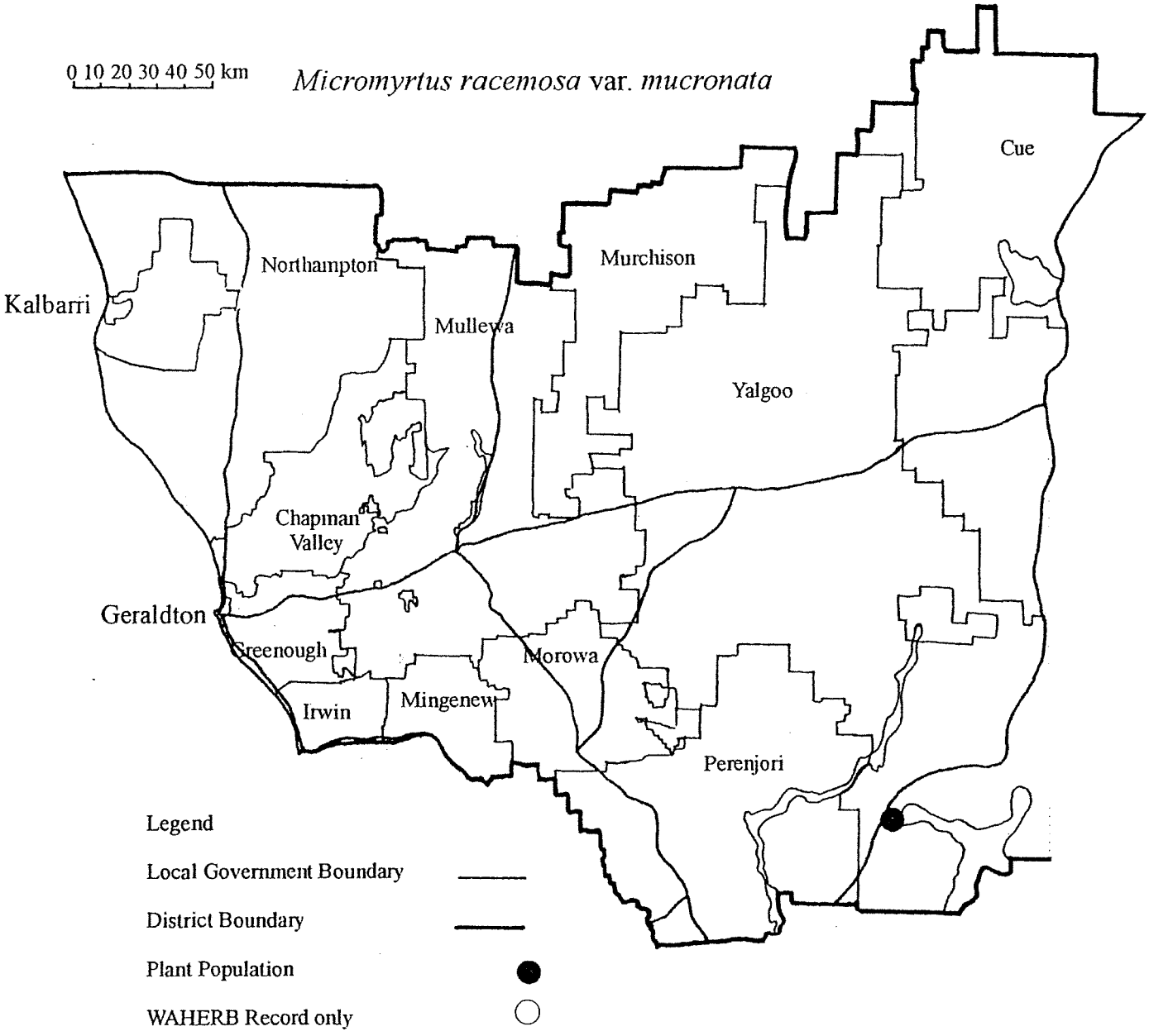
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SW of Paynes Find	Y	Pastoral Lease	6.10.1993	100+	Healthy

Response to Disturbance

Unknown

Research Requirements

- Further survey is required to establish the full extent of this taxon in the range of hills where it occurs and to find populations in other areas.
- Taxonomic work is required.


0 10 20 30 40 50 km
Micromyrtus racemosa var. mucronata
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Micromyrtus sp. Warriedar (S.Patrick 1879A) MYRTACEAE

An upright, sparse shrub to c. 1 m tall, with three-angled narrow leaves to c. 9 mm long and 0.5 mm wide clustered towards the ends of the branchlets. The flowers are c. 3 mm in diameter and have a tubular hypanthium c. 2 mm long. The petals are yellow.

Flowering Period: July, October

Distribution and Habitat in the Geraldton District

This taxon has been found twice in an area to the west and west-north-west of Paynes Find.

It grows on steep slopes amongst doleritic rocks in open tall scrub of *Acacia* sp. and *Calycopeplus ephedroides* over low scrub. Associated species include *Melaleuca nesophylla, Eremophila* and *Callitris* species. It has also been found on a granite hill.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

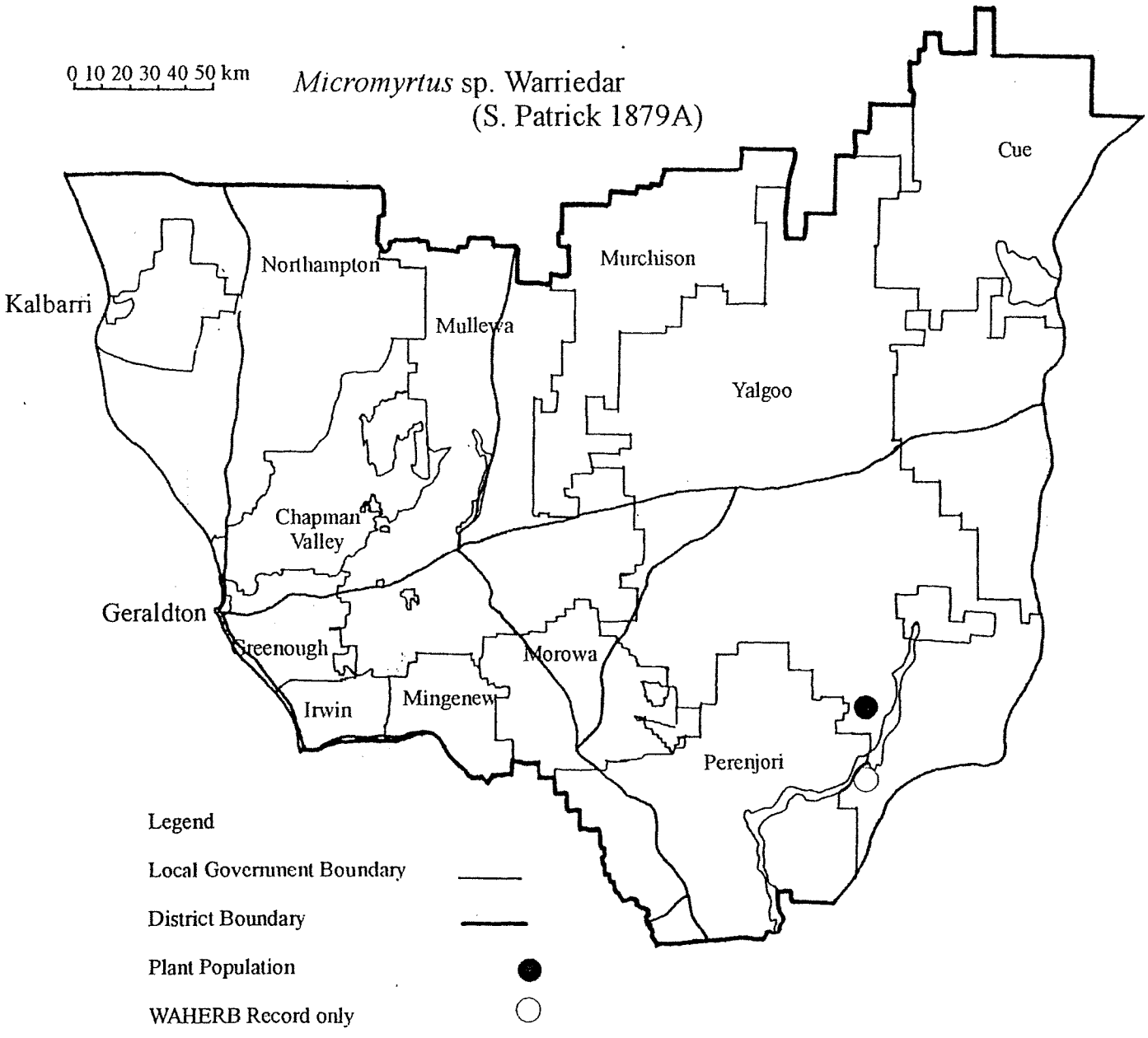
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Warriedar	Y	Pastoral Lease	18.7.1994	50+	Moderate, some evidence of grazing by goats
2.* W of Paynes Find	Y	-	17.10.1975	-	-

Response to Disturbance

Unknown

Research Requirements

- Further survey is required to refind and resurvey population 2 and to find further populations.
- Taxonomic work is required.


0 10 20 30 40 50 km
Micromyrtus sp. Warriedar
(S. Patrick 1879A)
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Persoonia brachystylis F.Muell. PROTEACEAE

Short-styled Persoonia

This species was first collected by Oldfield from Murchison River in the 1860s and was not re-collected until 1980, when Peter Weston found two small populations in the Kalbarri area.

An erect, spreading shrub 1-2 m tall, branching from the base, the bark smooth but sometimes fissured and flaking at the base. The branches are densely hairy when young, becoming glabrous. The leaves are alternate, spreading or upright, narrow, sometimes widening slightly towards the apex. They are 4.5-15 cm long, 2-10 mm wide and are flat or convex with the margins recurved or rolled back. The flowers arise close to the leaves in terminal or axillary inflorescences on a rachis 7-25 cm long. The flowers are yellow, on hairy stalks to 15 mm long. The perianth is moderately hairy on the outside and is zygomorphic. The gynoecium, which is about half the length of the stamens, is hooked so that the tip sits in the pouch of the ventral tepal. There are two hypogynous glands. The anthers are white, partly joined to the perianth. The fruit is an ellipsoid to ovoid drupe, compressed, 10-12 mm long.

Flowering Period: November, December

Distribution and Habitat in the Geraldton District

This species is known from two small populations near Kalbarri over a range of 22 km. Grows in small populations.

Grows in deep yellow or grey-white sands over laterite on slopes in low heath or scrub. Associated species include *Baeckea robusta, Grevillea leucopteris, G. trachytheca, Calothamnus blepharospermus, Acacia scirpifolia, Melaleuca megalocephala, Lachnostachys eriobotrya* and *Conospermum stoechadis.*

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. E of Kalbarri	N	Private	29.11.1986	3	Healthy
2. S of Junga	N	National Park	27.9.1995	15+	Healthy
3.* NE of Kalbarri	N	National Park	12.1980	Several plants	-
4.* NE of Kalbarri	N	National Park	12.1980	Several plants	-

Response to Disturbance

The area of population 2 was burnt c. 1991. Most plants occur in the unburnt area.

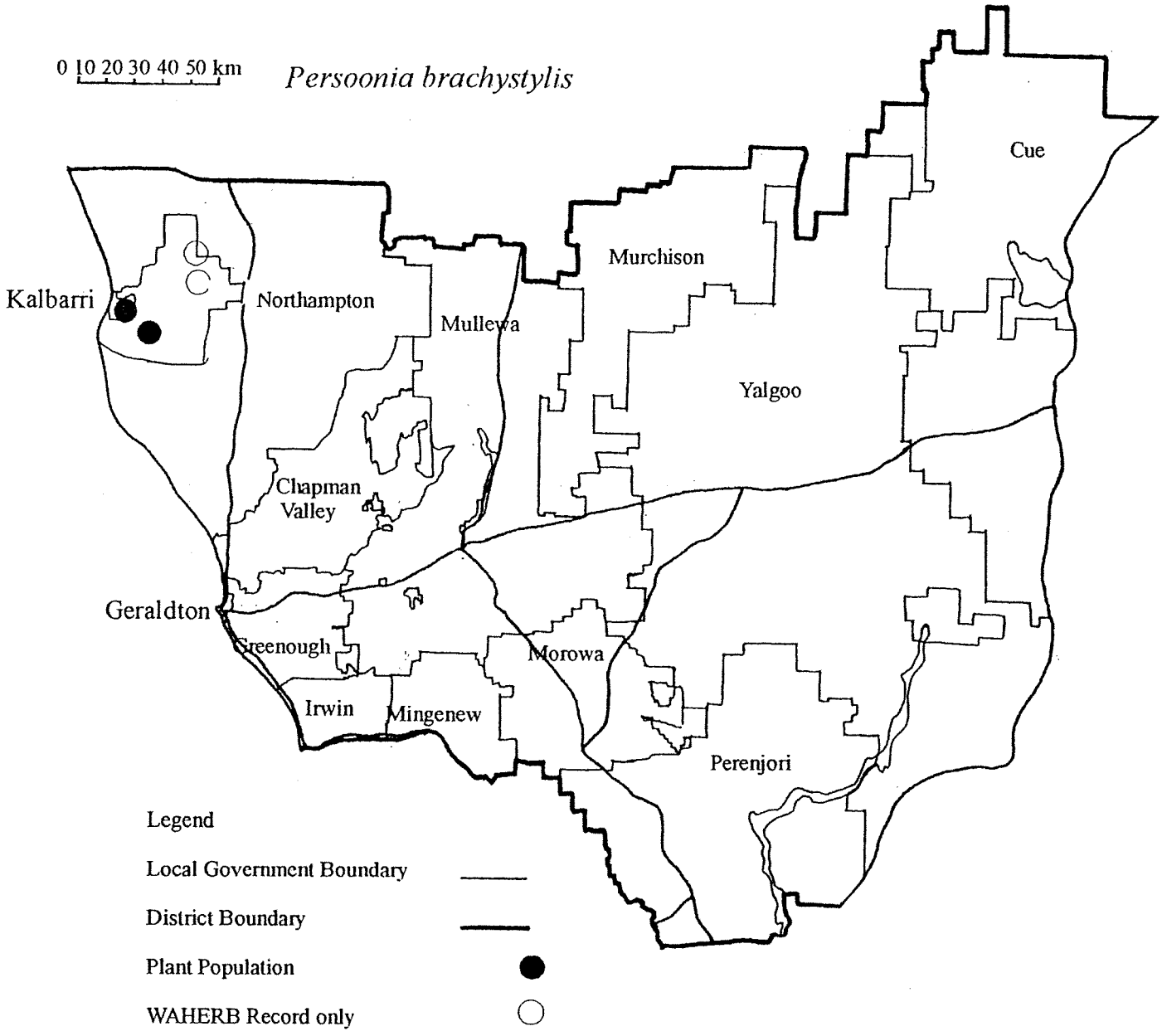
Research Requirements

- Requires further survey, particularly in Kalbarri National Park, to refind and resurvey populations 3 and 4 and to find further populations.

[#] now Priority 2 (updated at December 1999)

References

Bentham (1870), Mueller (1868), Weston (1994, 1995).



Persoonia kararae P.H.Weston PROTEACEAE

An erect, spreading shrub 1-5 m tall, with alternate, linear, flattened leaves, 8-14 cm long, 3-3.5 mm wide. They are spreading to sub-erect. The yellow flowers are grouped 1-10 in short, terminal or subterminal inflorescences, on hairy stalks 5-7 mm long. The tepals are hairy on the outside, asymmetrical, with the ventral tepal forming a pouch below the anther. They are 11.5-13.5 mm long, 1.2-1.4 mm wide. The gynoecium is half the length of the stamens, hooked so that the tip sits in the pouch of the lower tepal. The fruit is a globose drupe.

This species is similar to *Persoonia stricta* but differs in its more hairy tepals and spreading leaves, shorter inflorescences and narrower tepals. The collections of *P. kararae* were originally identified as *P. saundersiana,* which has a perianth almost glabrous on the outside, trigonous to subterete leaves and an inflorescence up to 10 cm long.

Flowering Period: October-November

Distribution and Habitat in the Geraldton District

This species has been collected twice in consecutive years from Karara Station, but despite at least two more recent searches, has not been seen there since.

Grows in thickets on sandplain.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.*Karara	P	Pastoral Lease	28.10.1975	-	-

Response to Disturbance

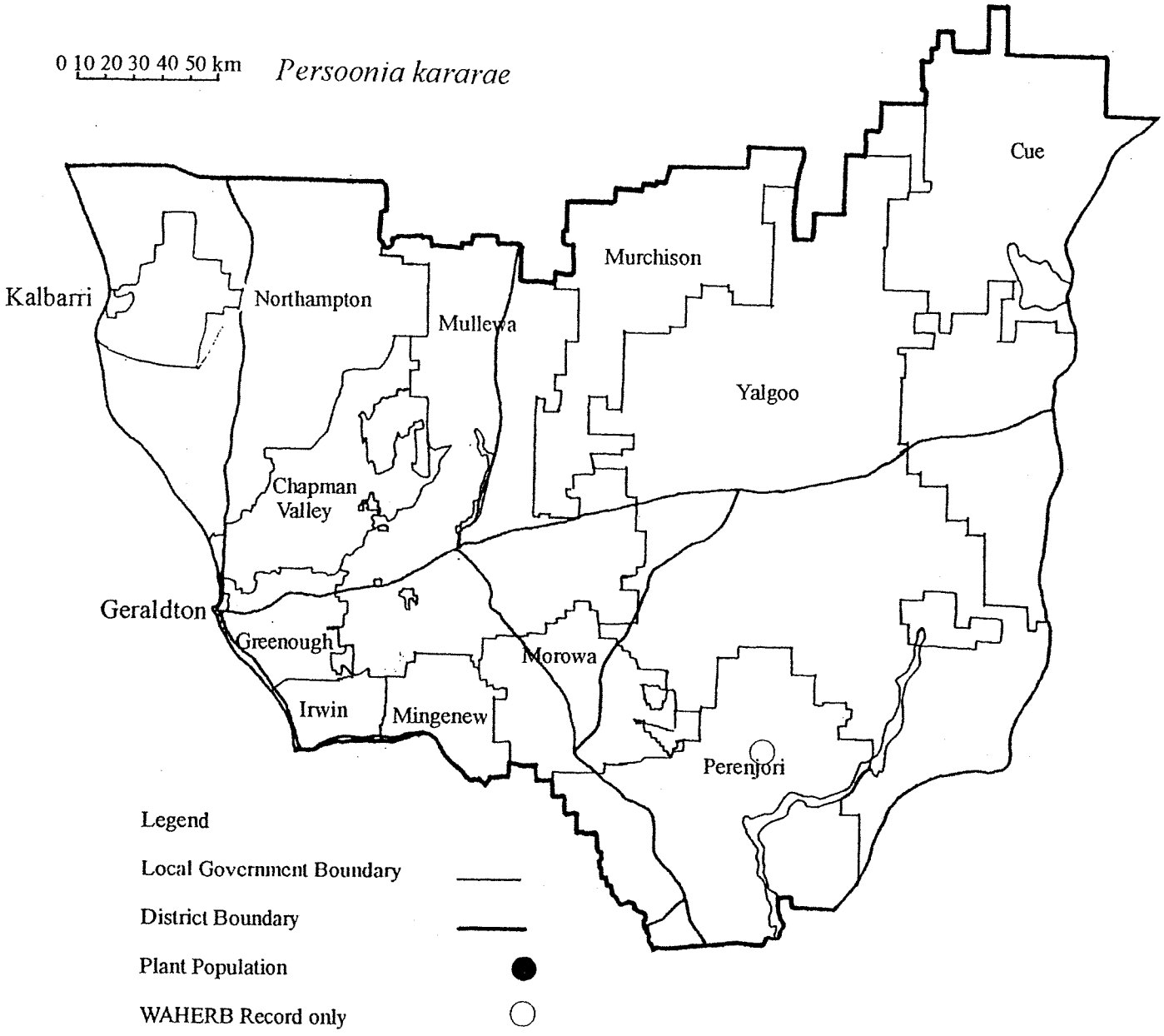
Unknown

Research Requirements

- Further survey is required during the flowering season, as the shrub superficially resembles a wattle and would therefore be difficult to find unless flowering.

References

Weston (1994, 1995).


0 10 20 30 40 50 km
Persoonia kararae
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Persoonia papillosa P.H.Weston PROTEACEAE

An erect shrub about 0.3 m tall, the branchlets hairy when young, becoming glabrous. The leaves are held upright and are alternate, linear, dorsiventrally compressed, with six prominent parallel veins. They are hairy when young, the hairs less than 2 mm long. They are 1.5-3 cm long, 1-1.3 mm wide and are not pungent. The epidermis of the leaf is papillose and scabrous. The inflorescence is 1-20 flowered, to 6 cm long, the flowers subtended by scale leaves and leaves. Each flower has a hairy stalk up to 14 mm long. The perianth is regular, with hairy tepals which are up to 11 mm long and 2 mm wide. The flower colour is unknown. The gynoecium is longer than the anthers, which have appendages. The ovary is densely hairy, with spreading hairs directed upwards, which are darker towards the apex of the ovary, greyish at the base and reddish at the apex. The fruit is not known.

This species resembles *Persoonia angustiflora* and some forms of *P. trinervis* but differs in its inflorescences, which are longer, having more flowers, and which are subtended by leaves. *P. angustiflora* has less densely papillose leaves and those of *P. trinervis* are broader. The combination of regular flowers, densely hairy ovary with upward spreading hairs and non-pungent leaves distinguish this species from all others in the genus.

Flowering Period: September-January

Distribution and Habitat in the Geraldton District

This species has been collected only twice, from the Murchison River and south-west of Yuna. There are no details of habitat but both specimens were collected from sand.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* SW of Yuna	-	-	8.9.1962	-	-
2.* Murchison River	-	-	4.1.1959	-	-

Response to Disturbance

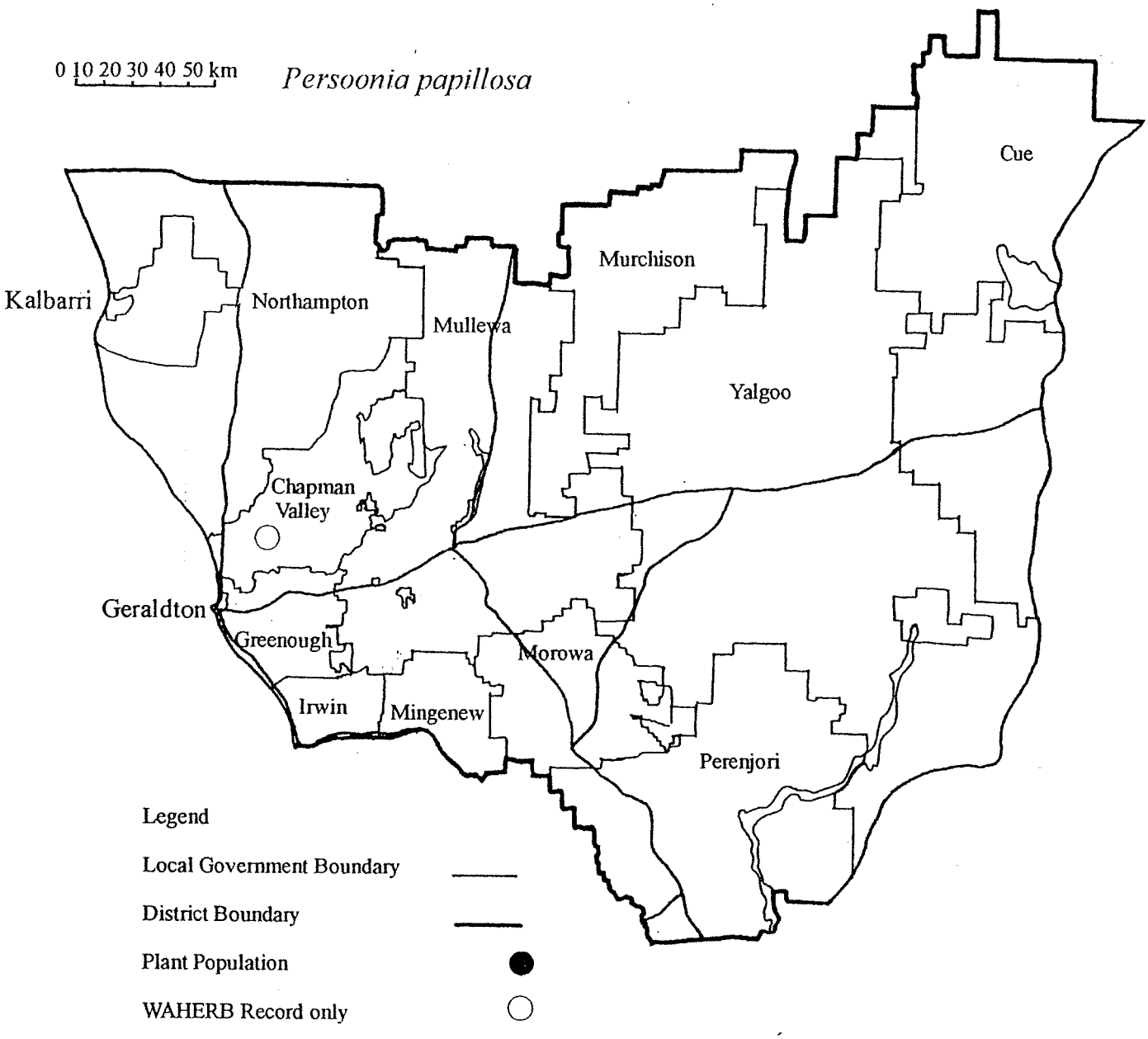
Unknown

Research Requirements

- Further survey is required to refind populations of this species and to find further populations on conservation reserves.

References

Weston (1994, 1995).


0 10 20 30 40 50 km
Persoonia papillosa
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Persoonia pentasticha P.H.Weston PROTEACEAE

[*Persoonia* sp. Mingenew (S.D.Hopper 6561)]

An erect, bushy and fairly dense shrub 0.4-1.8 m tall. The leaves are alternate, linear, sub-terete, with five narrow longitudinal grooves. They are sharp-pointed, with a papillose, scabrous epidermis and are 3.5-12 cm long and 0.7-1.2 mm wide. The flowers are grouped 1-15 in inflorescences to 4.5 cm long. The perianth is yellow, 7-12 mm long, constricted below the anthers which are yellow. The gynoecium is longer than the stamens. The fruit is not known.

This species is similar to *Persoonia chapmaniana,* but has slightly narrower, more flexible and more densely papillose leaves with narrower grooves between the ribs, shorter, fewer-flowered inflorescences and a glabrous gynoecium.

Flowering Period: September-October

Distribution and Habitat in the Geraldton District

This species is known from an area between Mullewa, Perenjori and Paynes Find and has been reported from several populations occurring south-east of Yuna.

It grows in small populations of few plants, often near granite or laterite, in yellow or red-brown sandy loam, in tall shrubland of *Acacia acuminata, A. tetragonophylla, Melaleuca uncinata* or *Calycopeplis ephedroides.*

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. E of Perenjori	P	Water Reserve	16.7.1994	1 (2 in 1988)	Healthy, recreational use of reserve
2. Old Pindar Road	Mu	Shire Road Verge	6.8.1994	1	Moderate, degraded and weedy
3. W of Perenjori	P	Nature Reserve	2.10.1995	1	Healthy
4. E of Morowa	Mo	Private	1.10.1995	2	Healthy
5. Mullewa	Mu	Shire Reserve	18.8.1994	1+	Healthy
6. NE of Wubin	Y	-	8.1988	-	-
7. E of Paynes Find	Y	-	8.1991	-	-
8. S of Paynes Find	Y	-	8.1988	-	-
9. *NW of Morowa	Mo	Private	19.10.1986	2	-
10.*NE of Wubin	P	-	10.8.1963	1	-
11.*Mingenew	Mi	-	11.1907	-	-

Response to Disturbance

Unknown

[#] now Priority 2 (updated at December 1999)

Management Requirements

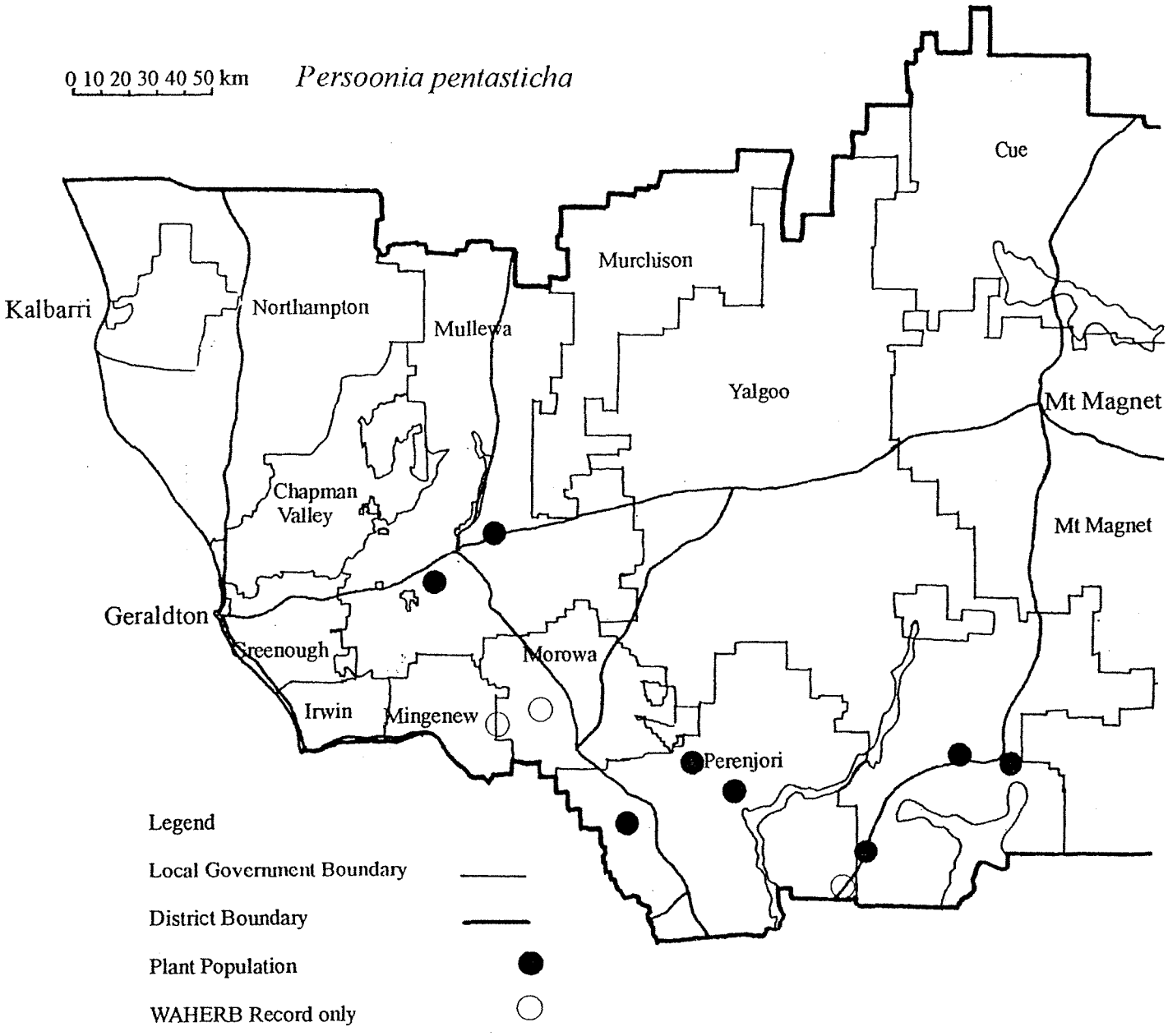
- Population 1 requires assessment of danger from recreational use of the reserve where it occurs.

Research Requirements

- Further survey is required, particularly to survey and voucher population 5, and to refind populations 6-11. Further survey is also required in the area south-east of Yuna.

References

Weston (1994, 1995).



Pityrodia axillaris (Endl.) Druce

CHLOANTHACEAE

Native Foxglove, Woolly Foxglove

A tomentose undershrub to 30 cm tall, with terete stems, the stems, leaves and calyx with a dense white woolly covering of branched hairs but without scales. The leaves are sessile, obovate or oblong-obovate, wedge-shaped and tapering to the base, not constricted towards the middle and with entire margins. They are wrinkled beneath the woolly covering, usually 2-4 cm long, 1-1.5 cm wide. The flowers are solitary or arranged in cymes of 3-5 flowers which form a leafy terminal raceme. The calyx is persistent, divided almost to the base into five obovate lobes, 14-18 mm long,. The corolla is deep red to yellowish scarlet in colour, 2.5-3 cm long. It is glabrous on the outside, with a dense hairy ring inside above the ovary and with minute clubbed hairs extending to the large central lobe of the lower lip. There are five spreading undulate-denticulate corolla lobes. The four stamens extend beyond the corolla tube and the style extends beyond them. The fruit is obovoid, unridged, with two humps at the top, and is enclosed within the persistent calyx.

This species is closely related to *Pityrodia terminalis,* which differs in several characters, including oblong leaves, linear-lanceolate calyx lobes, deep purple-pink to claret red, or pale pink corolla which has fine short hairs on the outside and is glabrous inside apart from a dense hairy ring above the ovary. The lobes are without denticulate margins, the stamens and style do not extend beyond the corolla tube and the fruit is pointed without humps at the top.

It is also related to *P. augustensis,* which has narrowly elliptic leaves, linear-oblong calyx lobes, a deep lilac corolla with branched hairs inside the tube, and with glandular, sparsely woolly hairs on the inside, entire lobes, included stamens and style and a globular fruit.

Flowering Period: July-early December

Distribution and Habitat in the Geraldton District

This species occurs mainly between Pithara in the Merredin District northwards to Morowa in the Geraldton District. There is also a record from further east at Lake Moore with no specific locality information. Grows on yellow sandplain. There are no other details of habitat.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* Perenjori	P	-	2.10.1962	-	-
2.* S of Caron	P	-	15.10.1972	-	-
3.* Latham	P	-	20.9.1971	-	-
4.* Maya	P	-	2.10.1981	-	-
5.* Lake Moore	-	-	27.10.1966	-	-

Response to Disturbance

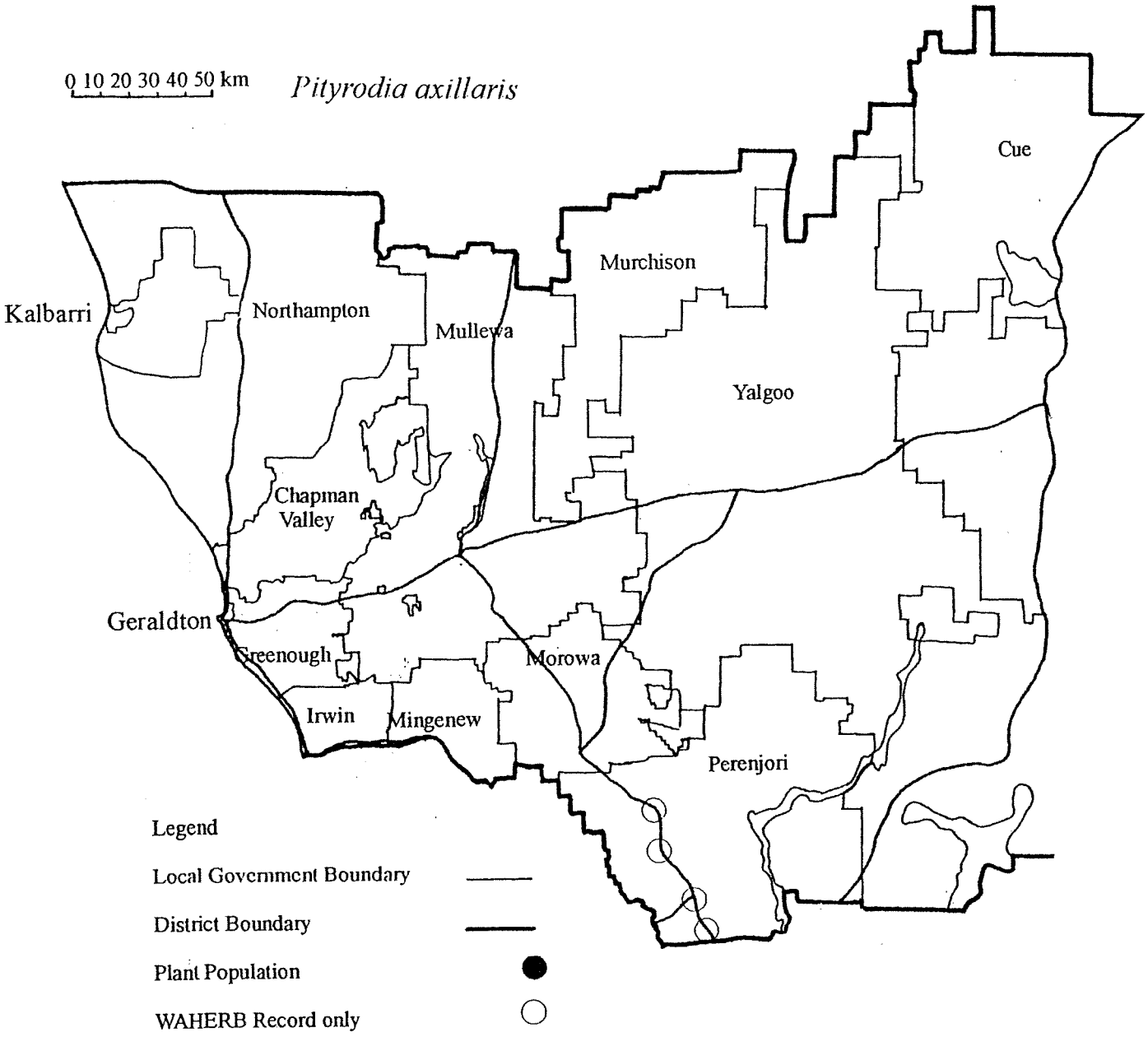
Unknown

Research Requirements

– There have been no collections of this species made since 1981 and it is in urgent need of further survey.

References

Munir (1979).



Pityrodia canaliculata A.S.George CHLOANTHACEAE

This species was first collected in 1931 from west of Sandstone by Charles Gardener and was described in 1967 by Alex George.

Pityrodia canaliculata is a many-stemmed shrub to about 2 m tall, the stems and branches clothed with peltate, fringed scales. The leaves are linear, sessile, scaly on both surfaces, with a longitudinal groove on the upper surface which becomes glabrous. They are 1.5-4.5 cm long, 2-4 mm broad, dark green on the upper surface, pale beneath. The flowers have scaly stalks to 3 mm long and are solitary or in groups of three in the axils of the upper leaves. The calyx is bell-shaped, scaly on the outside and on the inside of the five lobes which are up to 1.5 mm long. The corolla is white with reddish spots in the throat, 8-10 mm long, with scales on the outside and a dense hairy ring beneath the stamens on the inside, extending to the large central lobe of the lower lip. The four stamens and the style project beyond the throat of the corolla. The fruit is enclosed within the persistent calyx and is almost top-shaped, flat at the top, 3-4 mm long, 2.5 mm broad at the top, sparsely glandular with some minute, soft hairs or may be almost glabrous.

This species is closely related to *P. lepidota, P. loricata, P. chrysocalyx* and *P. salvifolia,* all having a covering of flat, shield-shaped scales. *P. canaliculata* is distinguished by the combination of the following characters: narrow-linear leaves, grooved and dark green above, and the flat-topped, sparsely hairy fruit.

Flowering Period: June-September

Distribution and Habitat in the Geraldton District

This species is known from two populations c. 25 km apart in an area west to north-west of Sandstone. The species has been collected many times in the past from west of Sandstone, all collections being along road edges from within a 10 km area, where it is known from only one population at present (population 1).

Grows in open low woodland of *Eucalyptus gongylocarpa* over open *Acacia* shrubland over spinifex, in deep red sand, sometimes at the edge of slight depressions. Associated species include *Acacia aneura, A. grasbyi, Hakea multilineata* and *Eucalyptus leptopoda.*

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. W of Sandstone	S	Shire Road Verge, Pastoral Lease	17.7.1996	500+	Healthy
2. NW of Sandstone	S	Pastoral Lease	17.7.1996	1 000+	Healthy, area burnt a few years previously
3.* W of Sandstone	S	-	18.8.1931	-	-
4.* E of Ankatell	S	-	27.8.1957	-	-
5.* W of Sandstone	S	-	12.9.1966	-	-
6.* Sandstone	S	-	18.8.1931	-	-

Response to Disturbance

Plants are found in disturbed areas of road verges and in areas previously burnt, where they regenerate from rootstock.

Management Requirements

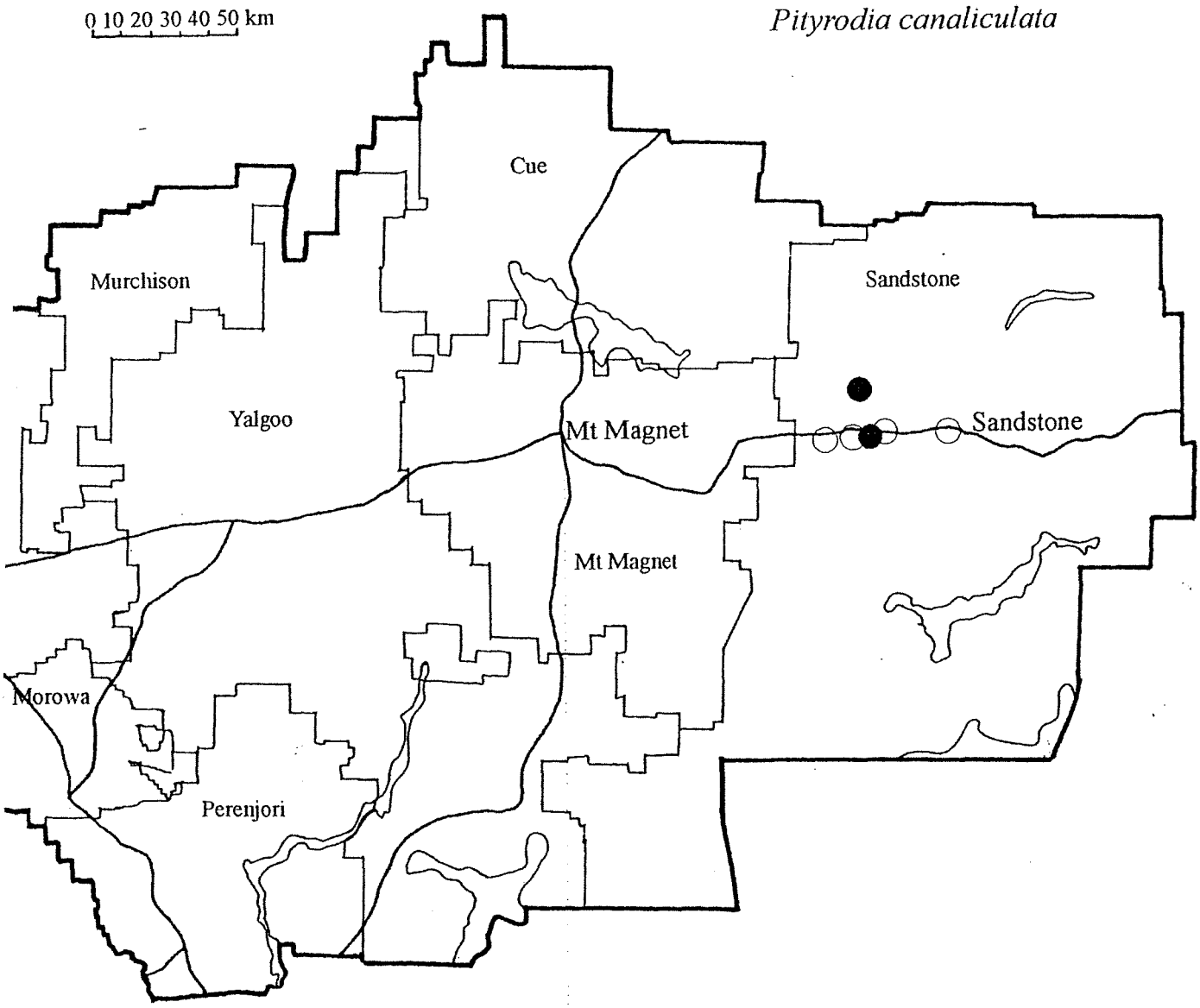
- Maintain liaison with land managers.
- Ensure that road verge population is marked.

Research Requirements

- Further survey is required, particularly in suitable habitat in an area burnt January 1996 north of population 2.

References

George (1967), Munir (1979).



Pityrodia viscida W.Fitzg. CHLOANTHACEAE

This species was described by Fitzgerald from specimens which he collected in 1903 from the Arrino sandplains.

Pityrodia viscida is an erect, branched shrub to 1 m tall. The stems are almost hairless and viscid, or with short, viscid hairs. The leaves are sessile, opposite and oblong-obovate to narrow-elliptic with an obtuse tip, 7-13 mm long, 3-5 mm broad. The upper leaf surface is hairless, viscid and olive green, the lower surface is covered with yellowish-white hairs. The flowers are solitary in the upper leaf axils. The pedicels, lower bract surfaces and outer surface of the calyx are all covered with a viscid pubescence. The corolla is 9-12 mm long, with a tube which is gradually dilated and 4-5 mm long. It is divided into a two-lipped upper lobe and three-lipped lower lobe and is white in colour. There are four stamens in two pairs, the lower pair longer than the upper, the anthers with appendages on the lower end. The ovary is covered with short hairs and the style is slender and hairless, scarcely longer than the corolla tube.

P. viscida is closely related to *P. glutinosa*, which has hairless stems, leaves and outer calyx surfaces. It is also similar *to P. hemigenioides*, which has a cottony white tomentum on stems, leaves and calyx and a corolla tube abruptly dilated from the calyx.

Flowering Period: August-November

Distribution and Habitat in the Geraldton District

An early collection of this species was made by Diels in 1901 from Mingenew, on the southern boundary of the Geraldton District and it has recently been refound south of Mingenew in the Moora District. A population has been found recently just within the Geraldton District, east of Yandanooka. Populations of this species are also known from the Moora District around Three Springs and south-west to south of Eneabba.

Grows in grey or white sand, or yellow-brown sandy loam with laterite, in heath, low scrub and open low woodland on slopes, hilltops and flat areas. Associated species include *Allocasuarina campestris, Gastrolobium spinosum, Hakea trifurcata* and species of *Leptospermum, Hibbertia* and *Acacia.*

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. E of Yandanooka	Mi	Shire Road Reserve	15.2.1995	5+	Moderate, narrow verge
2.* Mingenew	-	-	12.9.1901	-	-

Response to Disturbance

Appears to favour disturbance, as all populations have been found on road verges and tracks in soil disturbed by grading.

Management Requirements

– Ensure that road verge population is marked.

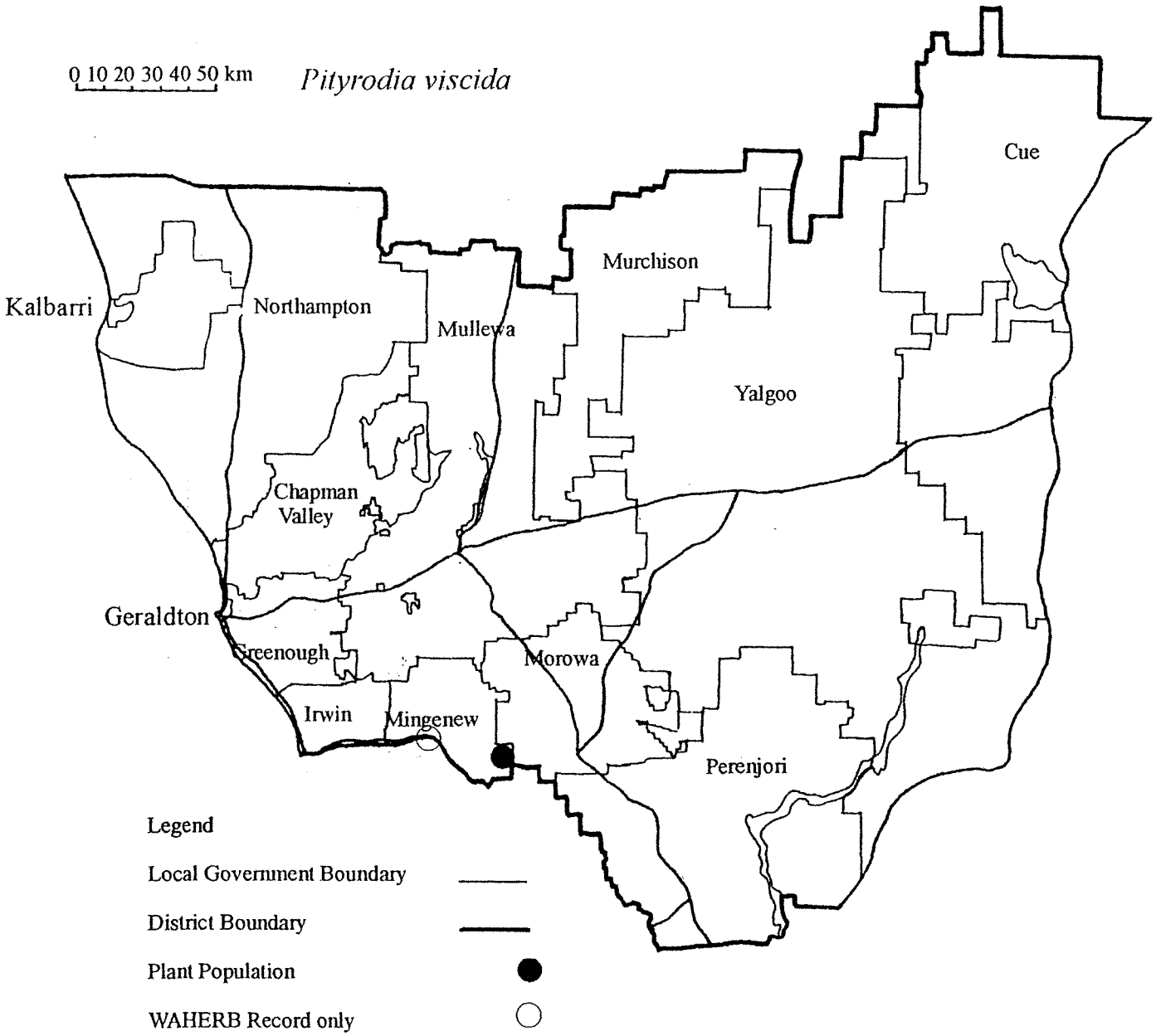
[#] now Priority 3 (updated at December 1999)

Research Requirements

– Further survey is required on conservation reserves.

References

Diels & Pritzel (1904-5), Fitzgerald (1904), Munir (1979).



Prostanthera pedicellata B.J.Conn LAMIACEAE

This species was first collected in 1969 and was described in 1984.

A low shrub, 0.3-1 m tall, sometimes spreading. The branches are glabrous but densely covered with hemispherical glands. The leaves are narrow, oblong to obovate, 5-8 mm long, 1-2.5 mm wide, glandular and spaced along the branches, not clustered. The pedicel is 8-15 mm long, with two narrow prophylls 1-5 mm from the upper end. The calyx is 6-8 mm long, green with a maroon tinge and with two almost equal triangular lobes. The outer surface of the calyx is hairy, sometimes with only a few hairs at the summit, the inner surface is sparsely hairy. The corolla is 20-25 mm long, hairy on the outside. The upper lobe is c. 5-6 mm long, the lateral lobes 2 mm long and the lower lobe 3-5 mm long. It is red in colour. There are four stamens, the anthers are without an appendage. The style is 20-28 mm long, projecting beyond the perianth. The fruit is made up of four nutlets, 2-3 mm long.

This species is similar to *Prostanthera semiteres,* which has calyces with a glabrous outer surface, but sometimes a few hairs towards the summit and leaves which are usually narrower, 0.7-1.5 mm wide. However, there is some overlap with leaf width of *P. pedicellata.* It appears that *P. pedicellata* may be a synonym of *P. semiteres* but may warrant subspecies or varietal status (B. Rye, personal communication).

Flowering Period: September-November

Distribution and Habitat in the Geraldton District

This species is known from two populations just over 2 km apart in the Pindar area.

Grows in tall *Acacia* or *Melaleuca* shrubland over open low shrubs, in yellow or red-brown sandy loam with lateritic gravel, red sand or red brown clay. Associated species include *Melaleuca uncinata, Scaevola spinescens, Malleostemon roseus, Balaustion microphyllum* and *Borya* sp.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. W of Pindar	Mu	Townsite Reserve, MRWA Road Verge	6.10.1994	50+	Healthy-moderate
2. E of Pindar	Mu	Townsite Reserve, MRWA Road Verge	12.11.1996	5+	Healthy-moderate

Response to Disturbance

Unknown

Management Requirements

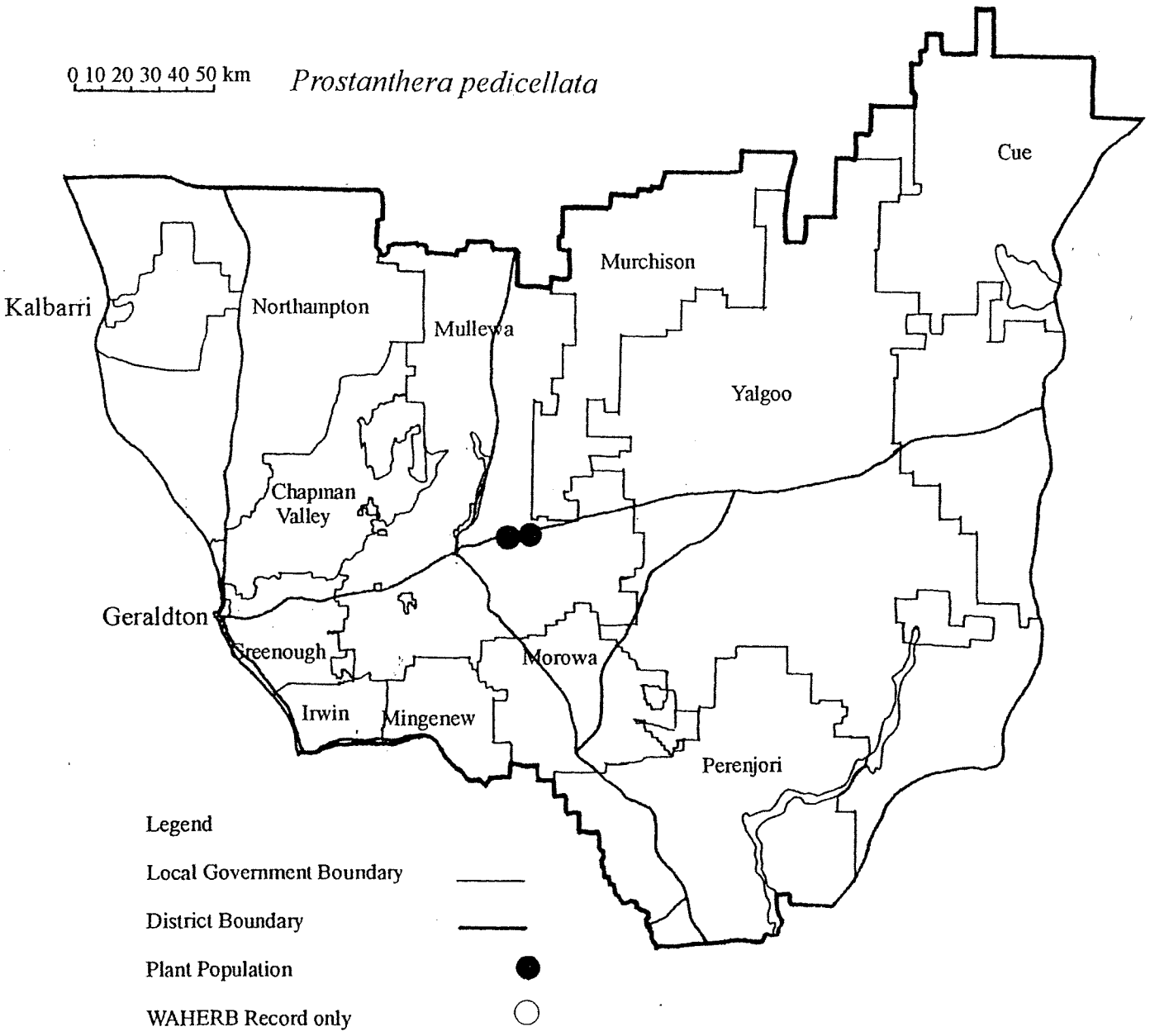
- Ensure that road verge populations are marked.

Research Requirements

– Further survey is required, particularly in the area of occurrence of the two populations and further east in the area of disjunction between *P. pedicella* and *P. semiteres*.

References

Conn (1984).



Prostanthera scutata C.A.Gardner LAMIACEAE

A low, compact shrub to 30 cm tall. The leaves are opposite, 8-15 mm long, broadly elliptic, rounded at the tip and tapering to a short stalk. They are soft and covered with grey curled hairs on both sides. The flowers have a two-lipped calyx, the upper lip twice as long as the lower lip, and with three small lobes. The outer surface of the calyx lobes is sparsely to moderately densely glandular. The calyx is c. 1.2 cm long, expanding to 1.7 cm in fruit. The corolla is pale mauve to blue, tubular at the base and with short rounded lobes, the lower lip with three lobes, the upper lip with two. It is 1.5 cm long and is hairy on the outside. The four stamens are included within the corolla. The fruit consists of four one-seeded nutlets enclosed in the persistent enlarged calyx.

The specific name refers to the shield-like upper lip of the calyx.

Flowering Period: October-January

Distribution and Habitat in the Geraldton District

This species has been collected in the past over a range of about 130 km between Port Gregory and the Mullewa area but has been found only once since 1984.

Grows on open areas of gravelly or clayey sand in tall shrubland. The most recently recorded population grew on yellow-brown clayey sand, in *Actinostrobus* shrubland with mallee eucalypts and with *Grevillea eriostachya, Conospermum stoechadis* and species of *Acacia, Daviesia, Baeckea* and *Grevillea.* The plant was growing on open sand close to a graded road edge.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SE of Ajana	N	Shire Road Verge	2.11.1994	1	Moderate, growing close to road edge
2.* E of Yuna	CV	Shire Road Verge	19.10.1984	-	On disturbed road verge
3.* Near Hutt River	N	-	19.12.1962	-	-
4.* Near Yuna	N	-	5.1.1959	-	-
5.* Wilroy	Mu	-	10.1961	-	-

Response to Disturbance

Possibly a disturbance opportunist. Populations 1 and 2 were growing on disturbed road verges and population 3 on open sand.

Management Requirements

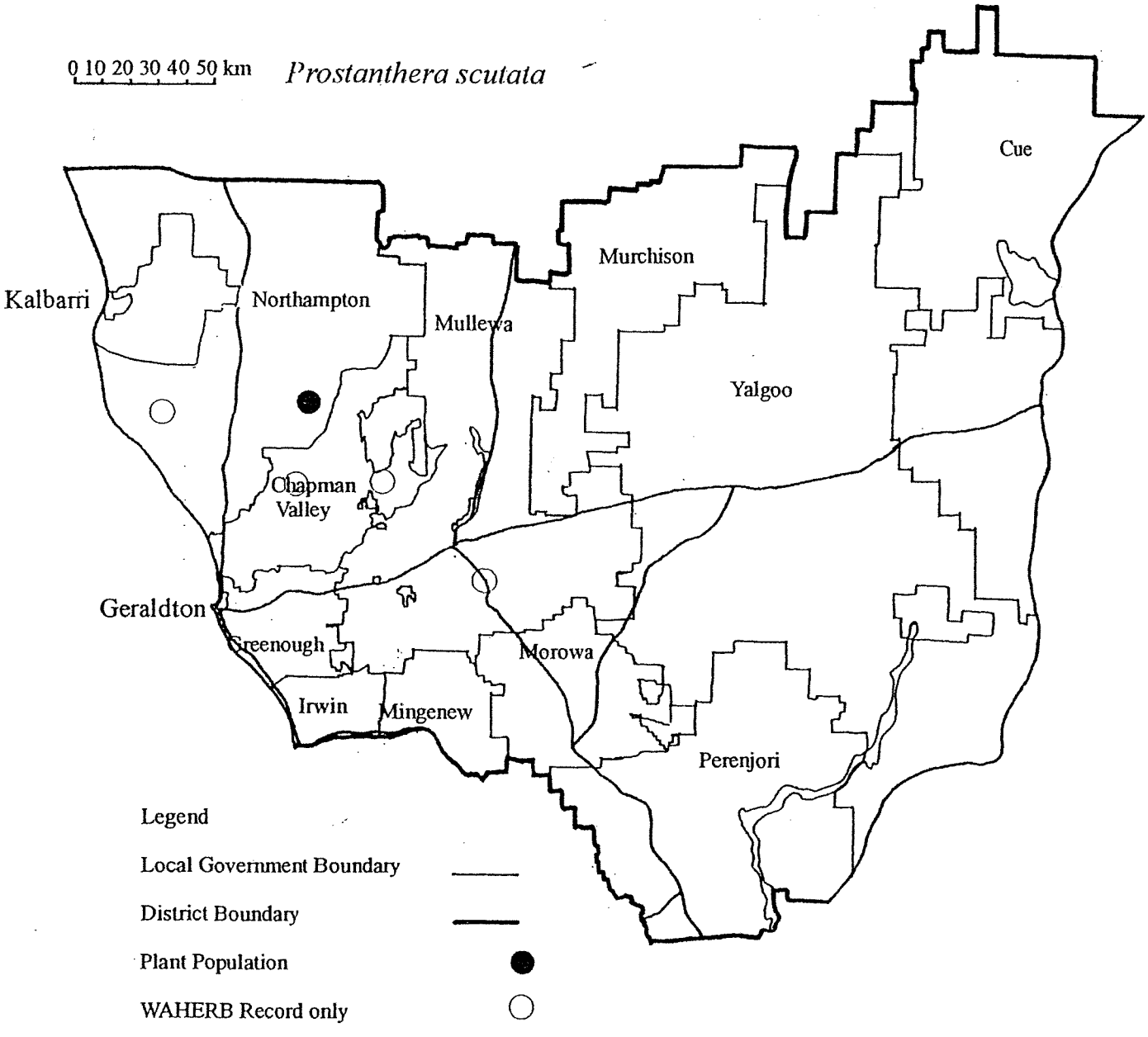
- Ensure that the road verge population is marked.

Research Requirements

- Further survey is required in disturbed areas of suitable habitat, particularly on conservation reserves throughout the area of distribution.

References

Blackall & Grieve (1981), Gardner (1964), Leigh *et al.* (1984), B. Rye (personal communication).


0 10 20 30 40 50 km
Prostanthera scutata
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Ptilotus beardii Benl

AMARANTHACEAE

Low Mulla Mulla

Ptilotus beardii was described in 1979 when it was known from only one collection, made by Dr J.S. Beard after whom it was named.

A much-branched, rigid subshrub to 45 cm tall, spreading to 50 cm broad. The younger shoots and leaves have a cobweb-like covering of hairs. The leaves are alternate, to 10 mm long, 1.2 mm broad, but may be much smaller. The flowers are grouped in hemispherical, terminal spikes of 5-8 flowers, to 3.8 cm across, with a rachis 2-3 mm long so that the spike is broader than long. The bracts and bracteoles are ovate, dry and membranous, the prominent midrib produced into a rigid apex. The bracts are c. 5 mm long, the bracteoles 7.5 mm long. The perianth is elongated, rigid and erect. The tepals are linear, with long hairs on the centre of the outer surface and with deep pink colouration towards the apex. The outer tepals are up to 1.7 cm long, 1.3 mm broad, the inner tepals are smaller with inrolled margins. There are two fertile stamens. The ovary is glabrous and the style is lateral, slender, to 11 mm long, with a head-like stigma.

This species is similar to *P. polakii, P. parvifolius* and *P. remotiflorus. P. beardii* differs in its more spreading habit and cob-web-like hairs. It also differs in its larger inflorescence, which is broader than long, has fewer flowers and is on a longer peduncle. It has bracteoles larger than the bracts and narrower tepals than in any of the allied species.

Flowering Period: Late August-October

Distribution and Habitat in the Geraldton District

This species is known from four or five populations in the Geraldton District where it occurs over a range of c. 60 km to the north-west of Cue. Populations 4 and 5 may be from the same locality. It also occurs to the north of the District, north-west of these populations, where it has been found at four locations, one of which is on a conservation reserve, giving a total range of c. 230 km for the species.

Grows on saline slopes below low breakaway remnants in red-brown loamy clays or yellow-brown sandy clays amongst open low shrubland with species of *Maireana, Frankenia* and *Ptilotus obovatus.*

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SW of Telegoothera Hill	C	Pastoral Lease	31.10.1994	300+	Moderate, some plants grazed
2. SE of Telegoothera Hill	C	Pastoral Lease	25.8.1992	"common"	-
3. NW of Meka Outstation	Y	Pastoral Lease, Shire Road Verge	3.8.1995	200+	Healthy
4. NW of Meka Outstation	Y	Pastoral Lease, Shire Road Verge	3.8.1995	50+	Healthy
5.* W of Meka Outstation	Y	Pastoral Lease	24.9.1987	"frequent"	Heavily grazed

[#] now Priority 3 (updated at December 1999)

Response to Disturbance

Unknown

Management Requirements

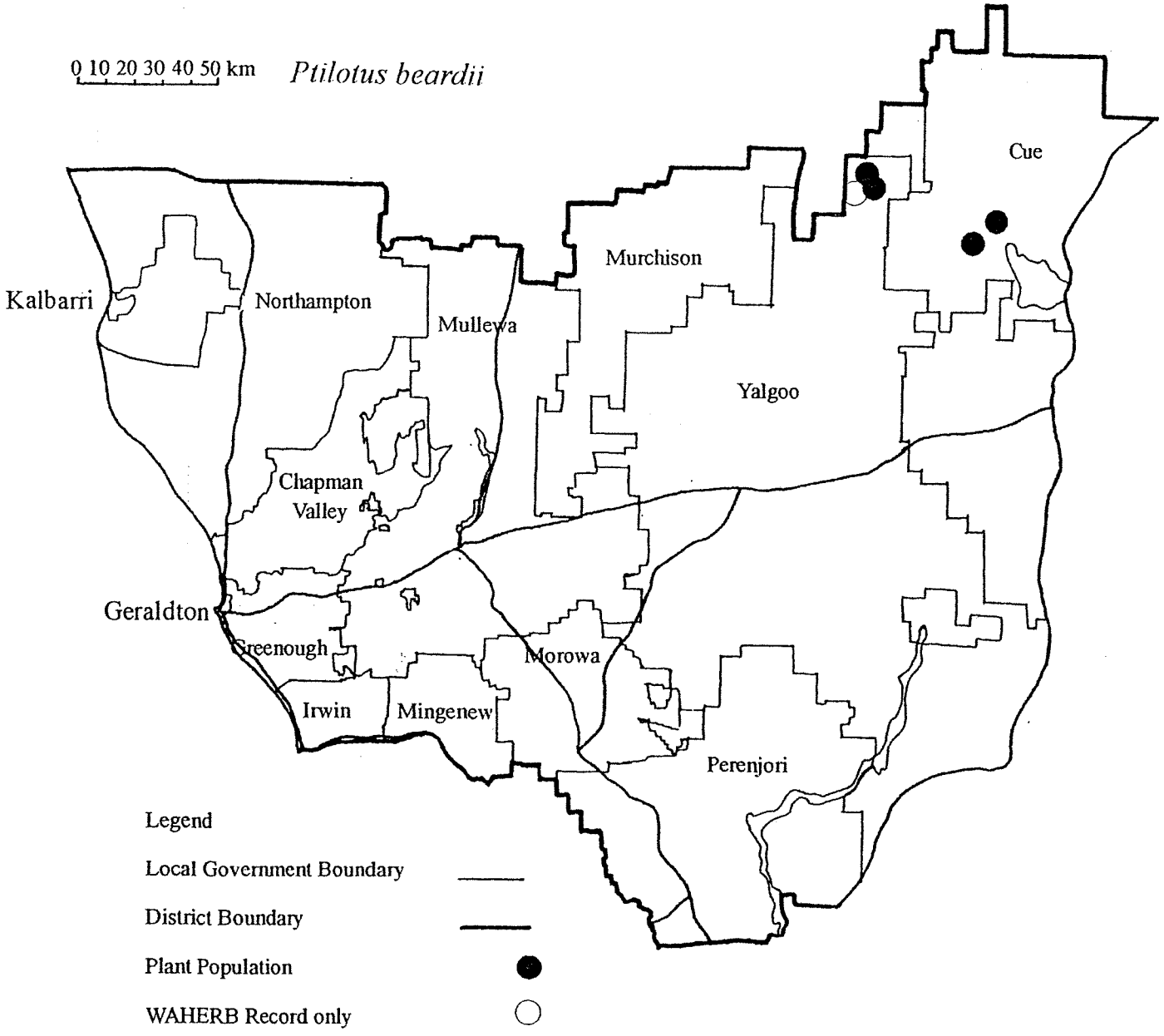
- Ensure that road verge populations are marked.
- Maintain liaison with land managers.

Research Requirements

- Further survey is required.

References

Benl (1979).



Ptilotus chortophytum (Diels) Schinz AMARANTHACEAE

This species was originally described as *Trichinium chortophytum* by Diels in 1905 from specimens collected between Northampton and Port Gregory in 1901.

A small perennial plant with a cushion-like habit, the leaves are densely tufted, sessile, enveloping the base of the shoots. These are tufted to mat-like, short and mainly unbranched, arising from a branched rhizome. The leaves are thick and spathulate, without pointed tips, 10-25 mm long. The flowering spike is greenish, cylindrical and terminal, to 6.5 cm long, 1.5 cm broad. The bracts are usually a conspicuous brown, c. 4.5 mm long. The tepals have dorsal hairs c. 0.8 mm long and glabrous tips. The ovary has a ring of hairs.

This species is closest to *Ptilotus caespitulosus*, which has linear-terete leaves and ovoid spikes.

Flowering Period: September-November

Distribution and Habitat in the Geraldton District

P. chortophytum was collected in 1901 from Northampton and west of Northampton. In 1964 it was found at Hutt River. Since then it has been found only once, in 1975, north-east of Menzies, which is c. 650 km east of its known range in the Geraldton District.

Grows on bare gravelly scree surfaces or near Menzies on rock on a rocky hill. No other details of habitat have been recorded.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* Northampton	N	-	11.1901	-	-
2.* W of Northampton	N	-	28.11.1901	-	-
3.* Hutt River	N	-	10.1964	-	-

Response to Disturbance

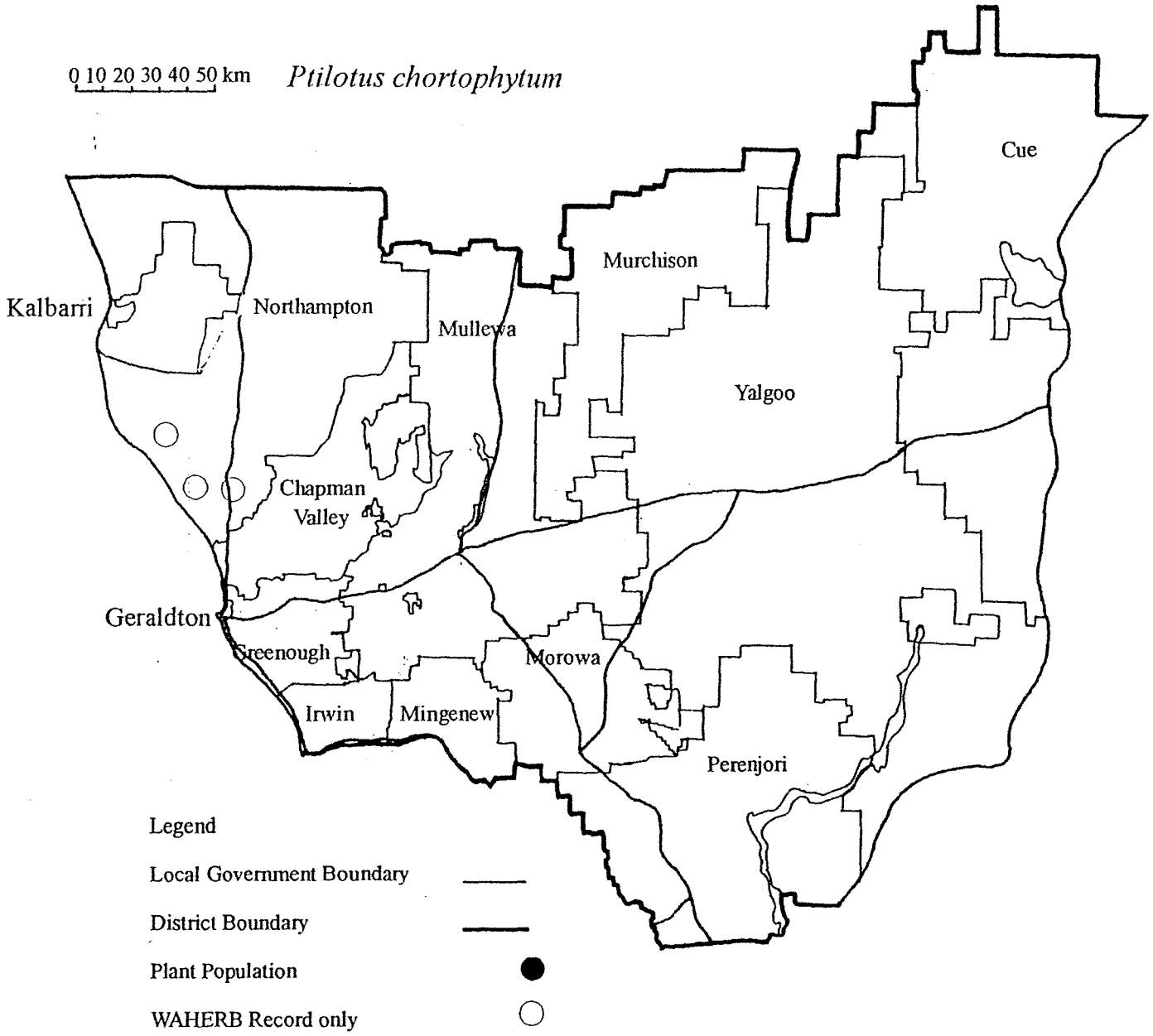
Unknown

Research Requirements

- Further survey is urgently required to refind this species.

References

Benl (1971), Blackall & Grieve (1985), Diels & Pritzel (1904-5).


0 10 20 30 40 50 km
Ptilotus chortophytum
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Rhodanthe collina Paul G.Wilson ASTERACEAE

An erect annual herb to 20 cm tall, branching at and above the base. It has alternate stem leaves which are linear, narrow-oblong or spatulate, to 15 mm long and 2 mm broad. Stems and leaves have sparse septate hairs and sessile, globular glands. The flowers are grouped in solitary heads. Each has a hemispherical involucre c. 5 mm high of pale brown membranous bracts. The outer and intermediate bracts are elliptic in shape. The inner bracts, which each have a broad-elliptic white lamina 6 mm long, surround the head in a single row. There are numerous florets, the outer bisexual and the inner male. The corolla is yellow, narrow-tubular, c. 3.5 mm high, with five lobes. The stamens have an oblong-elliptic anther appendage, with a finely eroded margin and thin delicate anther tails. The style branches are broadened towards the tip, with a rounded long-papillose apex. The achene is obovoid, c. 2 mm long, dark reddish-brown, densely covered with thick white hairs. The pappus has bristles almost as long as the corolla, which are linear-acuminate, shortly plumose and united in a short ring at the base.

The characters of the anther appendages, style apices and achenes distinguish this species from others. It is similar to *Rhodanthe diffusa* in its habit and indumentum.

Flowering Period: August-October

Distribution and Habitat in the Geraldton District

Occurs between Mingenew, Yalgoo and Paynes Find. Grows in exposed situations on rocky hills of quartzite or jasper in red loam. Occurs in open low *Acacia* woodland with *Eremophila* species and other herbs, including. *Erodium crinitum, Schoenia cassiniana, Lawrencella rosea, Cephalipterum drummondii* and *Rhodanthe maryonii.*

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Near Mongers Lake	Y	-	27.9.1986	-	-
2. Badja Station	Y	Pastoral Lease	24.8.1996	"frequent"	-
3.* Mt Gibson	Y	-	4.10.1984	"plentiful"	-
4.* E of Yalgoo	Y	-	3.9.1969	-	-
5.* Mingenew	Mi	-	29.8.1957	-	-

Response to Disturbance

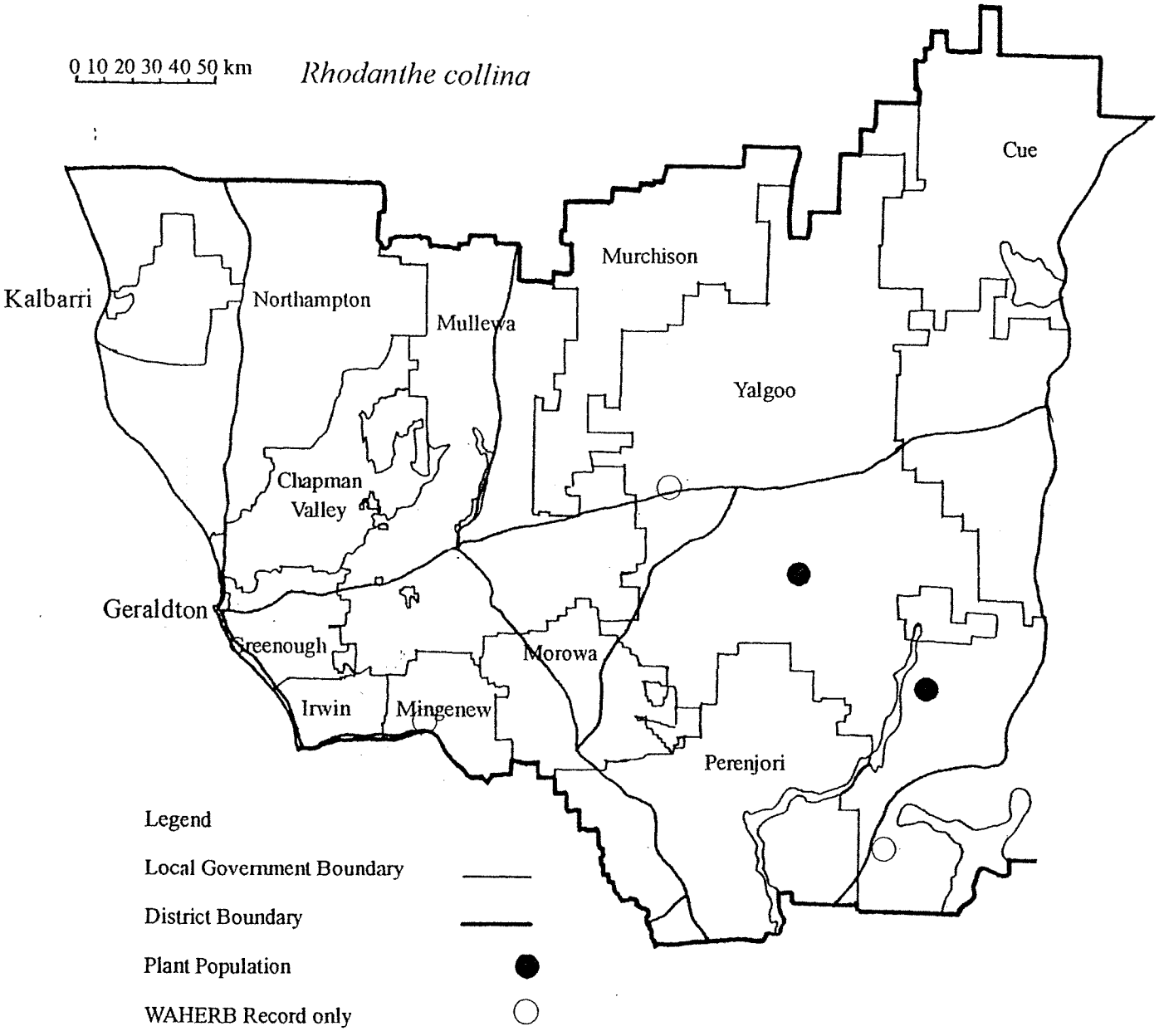
Unknown

Research Requirements

– Further survey is required in suitable habitats and to refind and survey populations 1-3.

References

Wilson (1992b).


0 10 20 30 40 50 km
Rhodanthe collina
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Sauropus sp. Woolgorong (M.Officer 10.8.1994) EUPHORBIACEAE

A rounded shrub to 1 m tall, the branchlets with a resinous covering and irregular projections. The leaves are alternate, spatulate with a notch at the apex. They are up to 12 mm long, 5 mm broad, dark green in colour and are dropped in summer. The stipules are triangular with toothed edges, chestnut in colour. The flowers are yellow, tubular, c. 4 mm long. The fruits are broadly ellipsoid, c. 7 mm long, splitting lengthways into three valves.

Flowering Period: June-August

Distribution and Habitat in the Geraldton District

This taxon is at present known from one population about 70 km north of Pindar. It grows in deep red sand on a gentle slope in low *Acacia* woodland amongst low scrub, with *Eremophila spuria, Grevillea* species and Wanderrie.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

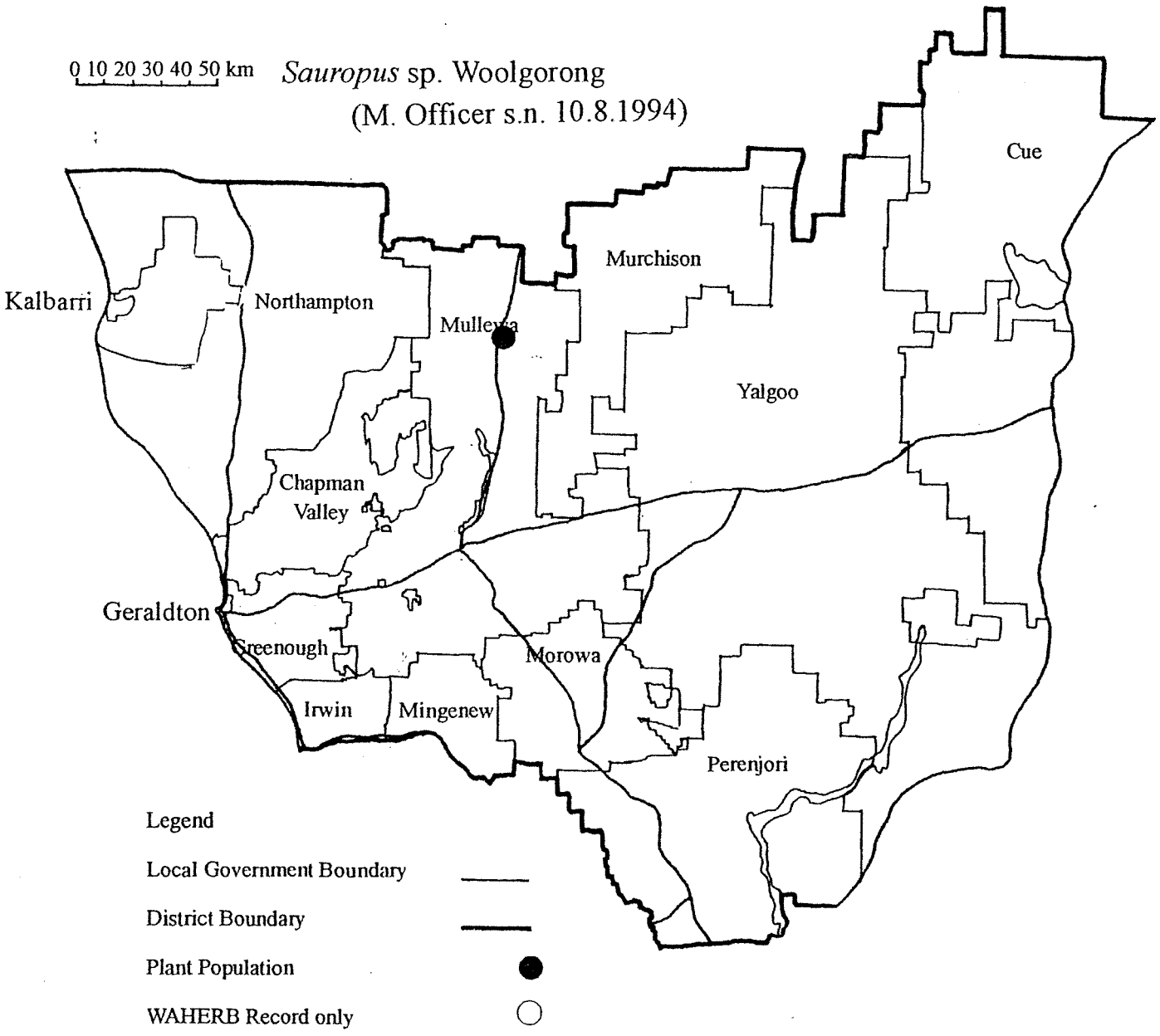
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. W of Woolgorong	Mu	Pastoral Lease	4.8.1995	40+	Moderate, some grazing

Response to Disturbance

Unknown

Research Requirements

- Further survey is required.
- Further taxonomic work is required.


0 10 20 30 40 50 km
Sauropus sp. Woolgorong
(M. Officer s.n. 10.8.1994)
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Schoenia filifolia (Turcz.) Paul G.Wilson subsp. *arenicola* Paul G.Wilson

ASTERACEAE

An annual erect herb to 30 cm high, single-stemmed, with terete leaves. The inflorescence is of open corymbs, with the involucre cylindrical, c. 7 mm high, the innermost bracts with a yellow ovate lamina c. 5 x 2.5 mm. The fruit is a terete achene, the base not excavated. It has short, thick duplex hairs, c. 0.2 mm long. The terminal barbs of the pappus bristles are distinct, not densely clustered, and their tips are acute, not clubbed.

This subspecies differs from subsp. *filifolia* in being single-stemmed, with a cylindrical involucre and in its terete achenes with short duplex hairs.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

This species is known from three collections made from sand hills in the Carnarvon area. However, a collection was made from Champion Bay in 1889, indicating that it was found in the Geraldton area.

In the Carnarvon area, it has been found on sub-coastal sand ridges in heath and in red clay. No habitat details were recorded for the collection from Champion Bay.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* Champion Bay	-	-	1889	-	-

Response to Disturbance

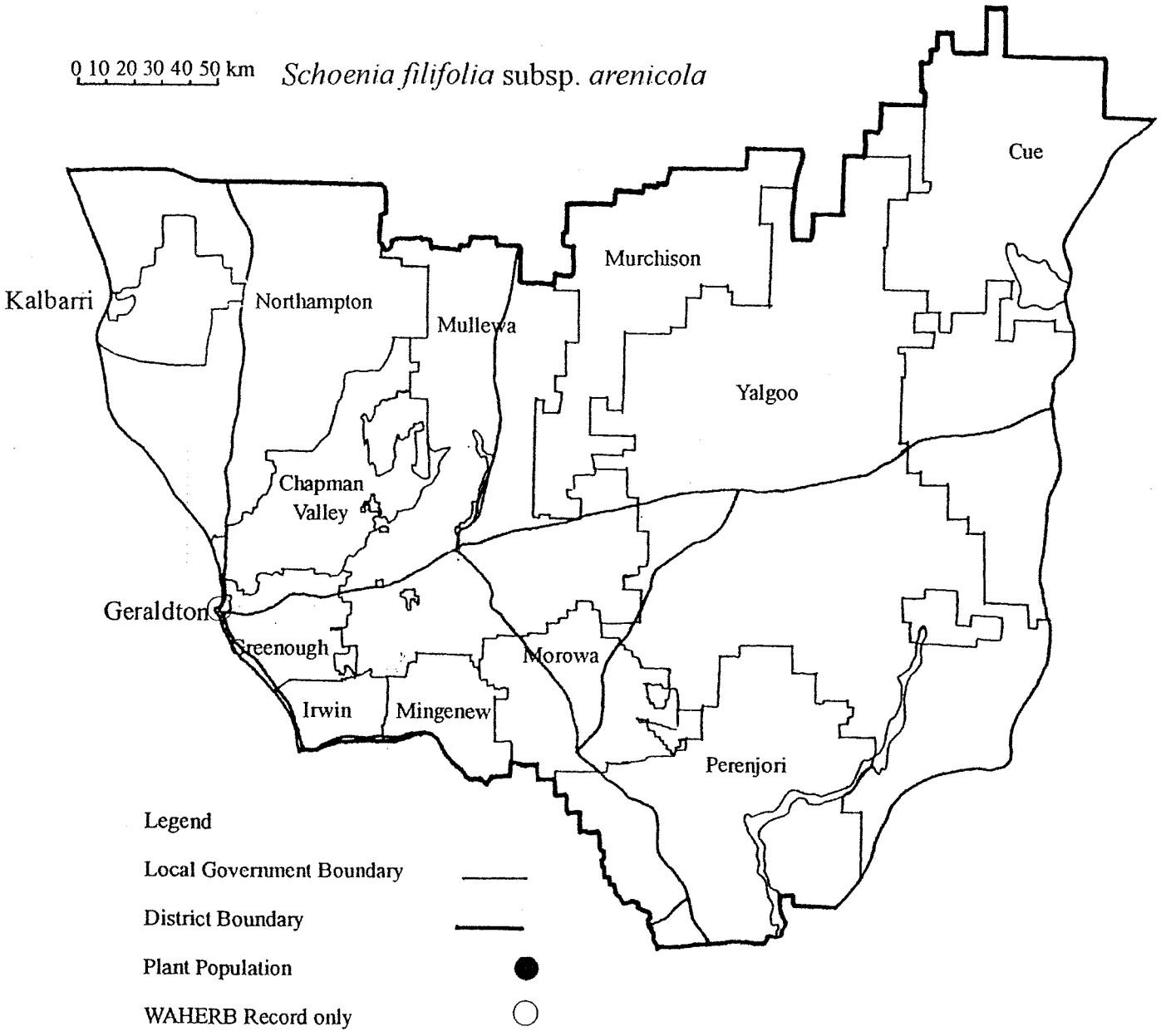
All populations in the Carnarvon area are recorded from roadsides or tracks.

Research Requirements

- Further survey is required to refind this taxon in the Geraldton District.

References

Wilson (1992a).


0 10 20 30 40 50 km
Schoenia filifolia subsp. arenicola
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Schoenia filifolia (Turcz.) Paul G.Wilson subsp. *subulifolia* (F.Muell.) Paul G.Wilson

ASTERACEAE

An annual erect herb to 30 cm high, with terete leaves. The inflorescence is of open corymbs, with the involucre hemispherical., c. 7 mm high, the innermost bracts with a yellow ovate lamina c. 5 x 2.5 mm. The fruit is a terete achene, the base not excavated. The terminal barbs of the pappus bristles are distinct, not densely clustered, and their tips are acute, not clubbed.

This subspecies differs from subspecies *filifolia* in having larger flower heads and with a hemispherical involucre. The achenes are larger, with more dense hairs.

Flowering Period: September

Distribution and Habitat in the Geraldton District

Has been recorded from the south-west of the Geraldton District between Walkaway and Yandanooka.

Grows on swampy flats.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* Walkaway	G	-	29.9.1962	-	-
2.* E of Mingenew	Mi	-	9.1904	-	-
3.* Yandanooka	Mi	-	12.9.1904	-	-
4.* Ebano to Yandanooka	Mi	-	30.9.1904	-	-

Response to Disturbance

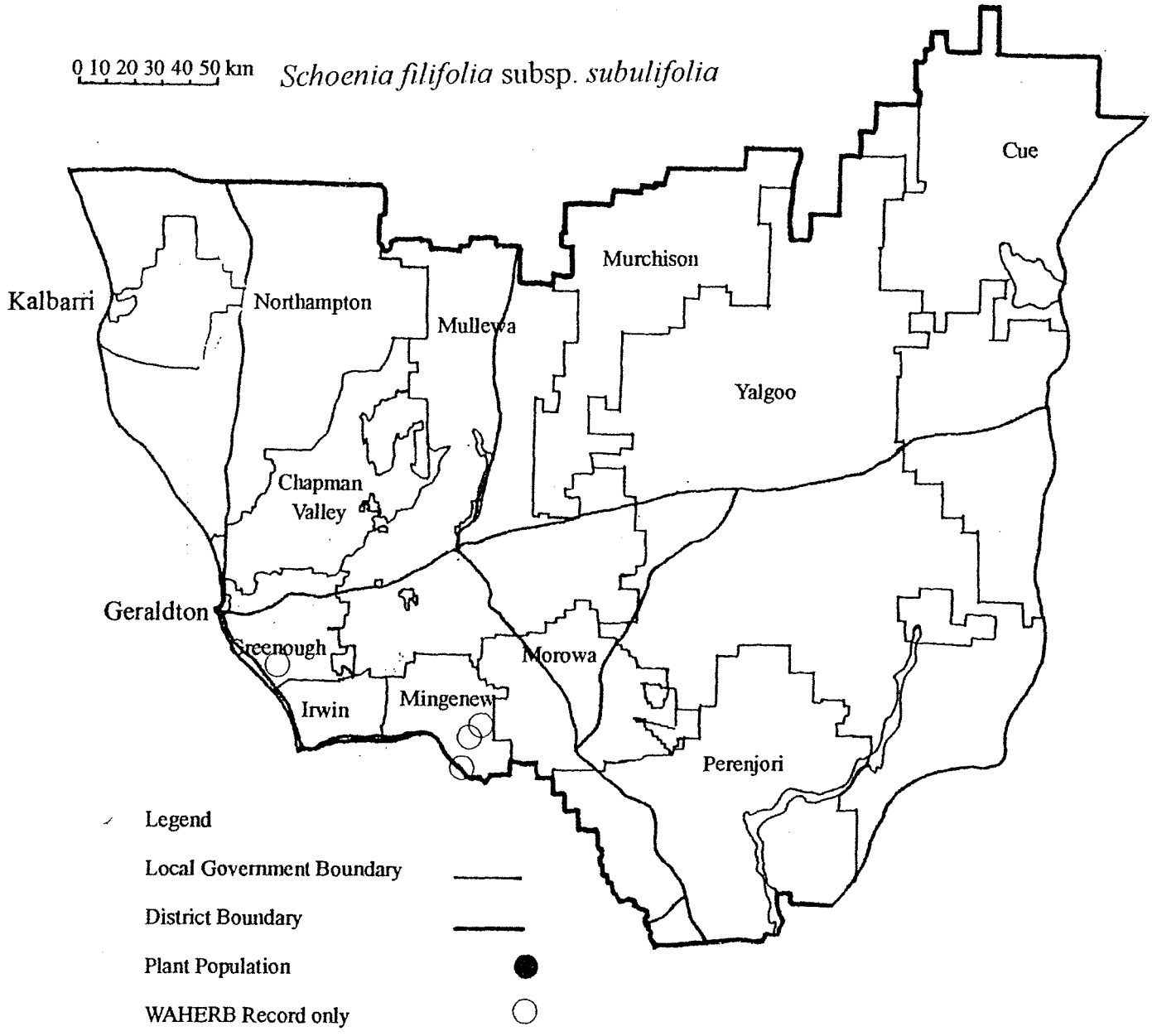
Unknown

Research Requirements

- Further survey is urgently required to refind this taxon.

References

Wilson (1992a).


0 10 20 30 40 50 km
Schoenia filifolia subsp. subulifolia
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Scholtzia cordata Trudgen ms MYRTACEAE

An erect shrub 60-80 cm tall, with straight slender branches. The leaves are decussate, sessile, heart-shaped, c. 3 mm long and 3 mm wide, the bases auriculate. The flowers are grouped in compound umbels on peduncles c. 1.5 cm long, arising from the axils of the upper leaves. They are c. 3.5 mm in diameter and the flower petals are white.

Flowering Period: October-December

Distribution and Habitat in the Geraldton District

Has been collected north of Kalbarri National Park and north of Yuna.

Population 1 grows on a yellow-cream, broad, flat sand ridge. It occurs in scrub of *Actinostrobus* and *Banksia* species with emergent *Eucalyptus jucunda* and *Eucalyptus* species, over open dwarf scrub of myrtaceous species over open low sedges of *Ecdeicolea monostachya.*

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

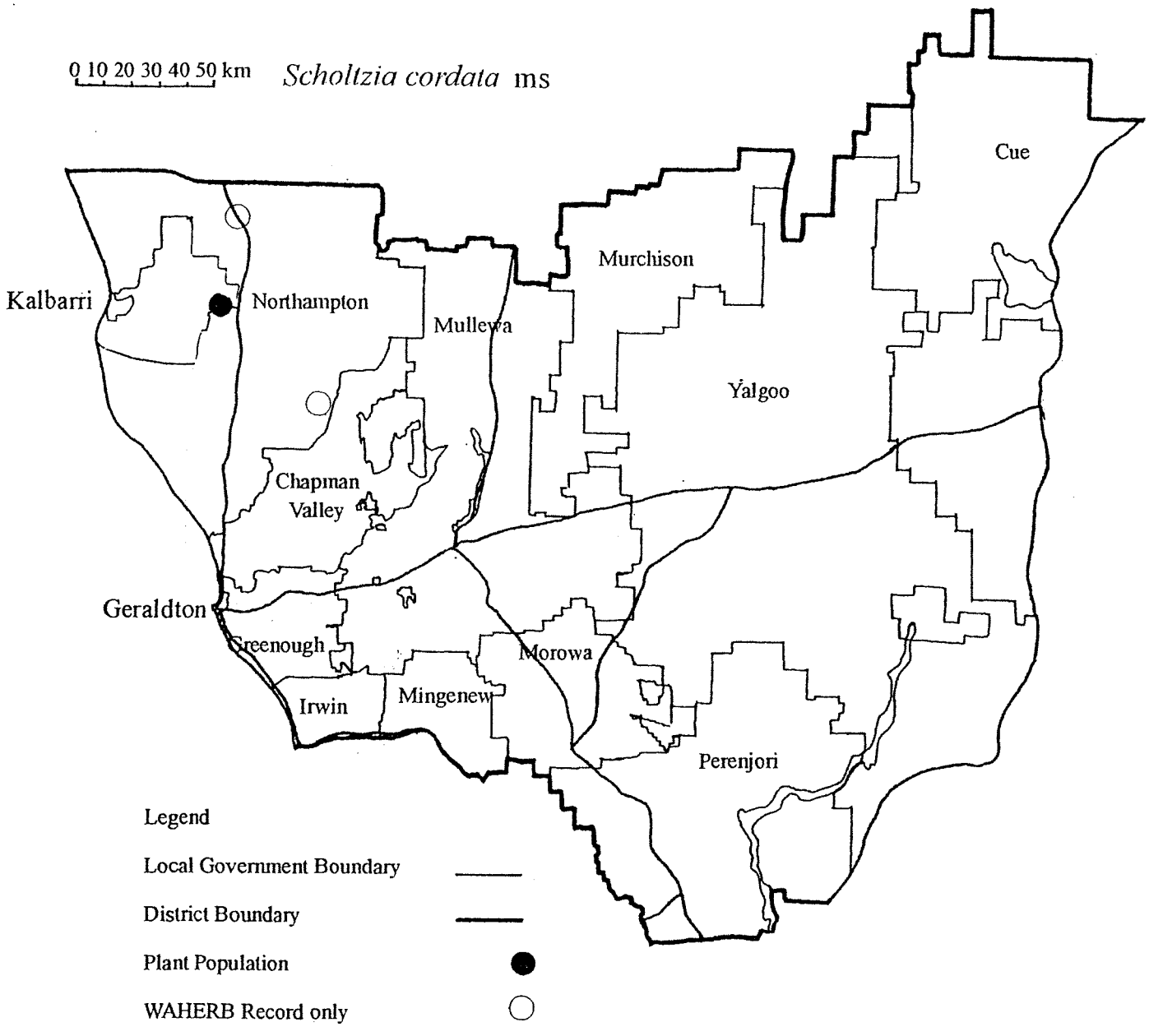
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Kalbarri National Park	N	National Park	24.10.1995	-	-
2.* N of Murchison River	N	-	10.1963	-	-
3.* N of Yuna	N	-	20.12.1962	-	-

Response to Disturbance

Unknown

Research Requirements

– Further survey is required.


0 10 20 30 40 50 km
Scholtzia cordata ms
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Scholtzia sp. Binnu (M.E.Trudgen 2218) MYRTACEAE

An erect shrub 1.3-2 m tall, with light to mid-grey, slightly fibrous bark. There are numerous spreading branches. The leaves have short stalks and are rounded, c. 3 mm wide and 2 mm long, the apex flattened. The flowers are grouped in short-stalked clusters on the upper part of the stems. They are c. 5 mm in diameter. The calyx lobes have a pink petalline edge. The petals are rounded and the petals and stamen filaments are pink, the anthers orange-red. There are c. 15 stamens.

Flowering Period: September-December

Distribution and Habitat in the Geraldton District

Known from one population east of Binnu, where it grows in pale yellow sand on the crest of a north-east to south-west trending sand dune. Associated vegetation is tall shrubland of *Actinostrobus* sp. over shrubland of *Scholtzia, Thryptomene, Calothamnus* and *Grevillea* species.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

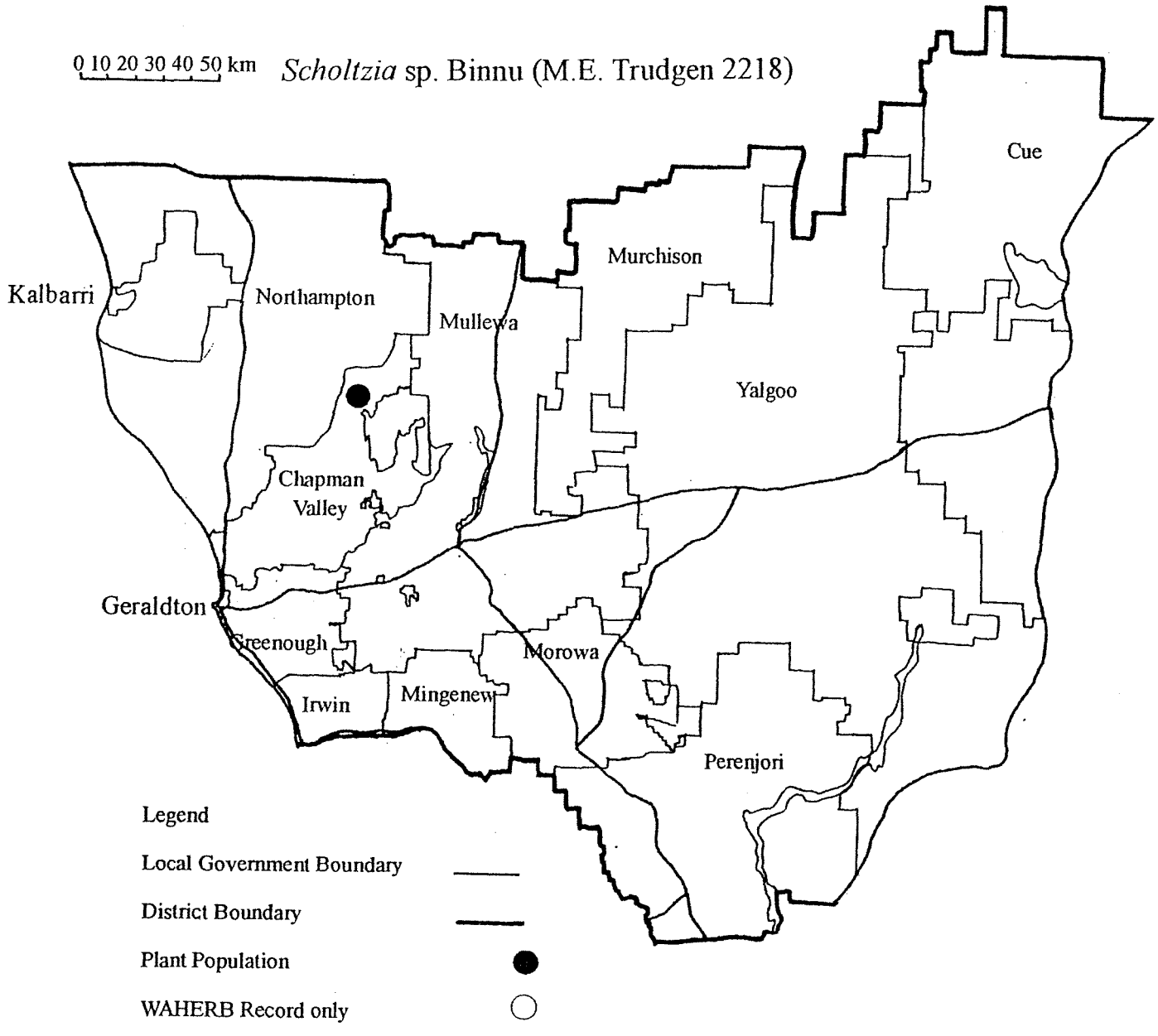
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. E of Binnu	N	VCL	5.12.1993	-	-

Response to Disturbance

Unknown

Research Requirements

- Further survey is required, particularly to refind and survey population 1.
- Taxonomic work is required.


0 10 20 30 40 50 km
Scholtzia sp. Binnu (M.E. Trudgen 2218)
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Scholtzia sp. Binnu East Road (M.E.Trudgen 12013) MYRTACEAE

A fairly erect shrub to 1 m tall. The leaves are yellow-green, sessile, decussate, c. 1 mm wide and 1.5 mm long. They are thick, rounded in shape with a flattened apex, flat on the inner surface and rounded on the lower. The flowers are grouped in small clusters towards the upper ends of the branchlets. Each flower is c. 4 mm in diameter. The petals are pale pink., almost white at the edges. The stamen filaments are pink and the disc is yellow-green.

Flowering Period: September-December

Distribution and Habitat in the Geraldton District

Known from one population east of Binnu, where it grows in pale yellow sand on the crest and slopes of a north-east to south-west trending sand dune. Associated vegetation is tall shrubland of *Actinostrobus* sp. over shrubland of *Scholtzia, Thryptomene, Calothamnus* and *Grevillea* species.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

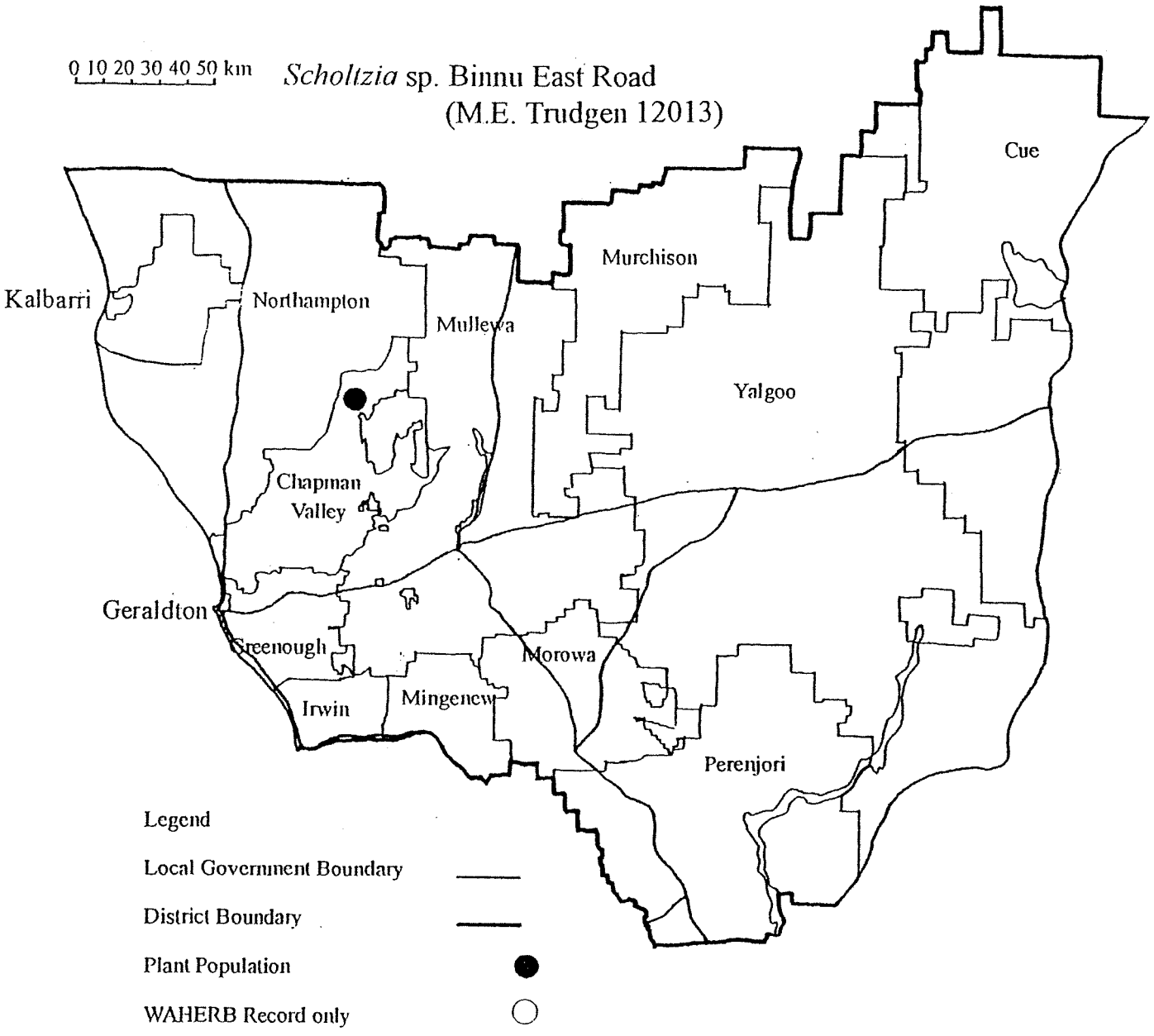
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. E of Binnu	N	VCL	5.12.1993	"abundant on slopes of dune"	-

Response to Disturbance

Unknown

Research Requirements

- Further survey is required, particularly to refind and survey population 1.
- Taxonomic work is required.


0 10 20 30 40 50 km
Scholtzia sp. Binnu East Road
(M.E. Trudgen 12013)
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Scholtzia sp. Eurardy (J.S.Beard 6886) MYRTACEAE

An erect, compact shrub to 1.2 m tall, 1 m in diameter. The leaves are decussate, spathulate, c. 1.25 mm broad and 2 mm long. The flowers are almost sessile, arranged in small umbels on peduncles c. 10 mm long. They are c. 2.5 mm in diameter, the calyx tube is pitted. The petals are pink or cream, or pink and white.

Flowering Period: August, October-December

Distribution and Habitat in the Geraldton District

Has been recorded from four localities north of Kalbarri, one of these being just north of the District boundary. Has been found most recently south-east of Kalbarri, the species having been recorded over a total geographic range of c. 80 km.

Grows in shrubland or wattle thicket on yellow to red-brown sandy clay with laterite, or on red sandy loam.

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SE of Kalbarri	N	National Park	17.8.1994	"abundant"	-
2.* Carnarvon Highway	N	-	12.11.1963	-	-
3.* NNE of Kalbarri	N	Pastoral Lease	19.5.1968	-	-
4.* N of Kalbarri	N	Pastoral Lease	21.10.1973	-	-

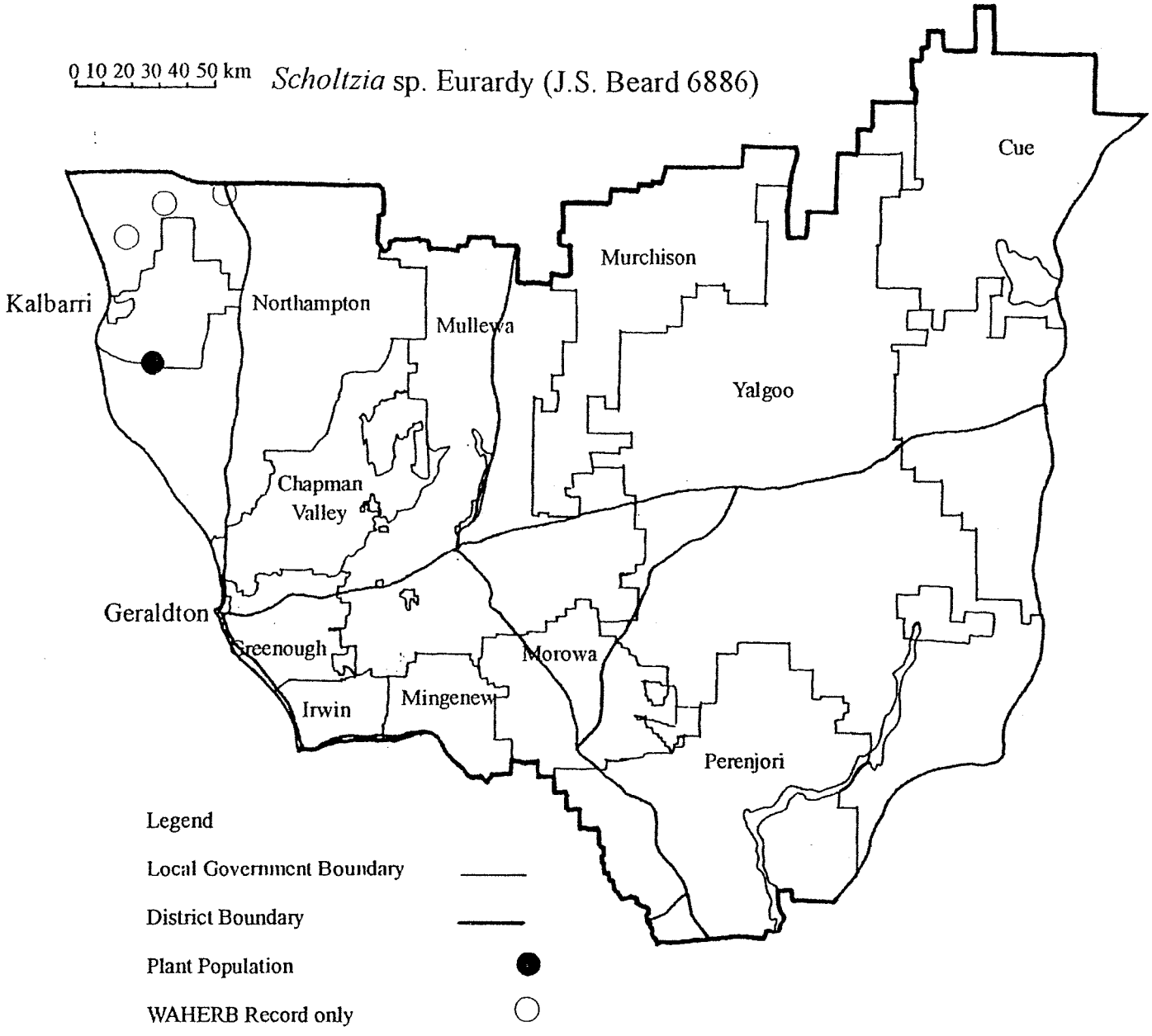
Response to Disturbance

Unknown

Research Requirements

- Further survey is required, particularly to refind and survey population 1.
- Taxonomic work is required.

[#] now Priority 2 (updated at December 1999)


0 10 20 30 40 50 km
Scholtzia sp. Eurardy (J.S. Beard 6886)
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Scholtzia sp. Folly Hill (M.E.Trudgen 12097) MYRTACEAE

An open to diffuse shrub to 1 m tall and 1 m across. The leaves are obovate, to 5 mm long and 3 mm broad. The flowers are sessile, c. 3 mm in diameter, grouped in small umbels on peduncles c. 5 mm long. The petals are white or pale pink. The disc is light green, the anthers brownish, the filaments pink.

Flowering Period: August-October

Distribution and Habitat in the Geraldton District

Occurs near Ajana and in the extreme north-west corner of the Geraldton District, but extends north to the Hamelin area and to south of Carnarvon. One population north of the District was found in 1995 on a nature reserve.

In the northern part of the District, it occurs in thin yellow sand over limestone in shrubland of *Banksia sceptrum*. Near Ajana, it grows in yellow sand on a sand dune in low woodland of *Actinostrobus* sp. over tall open shrubland of *Grevillea* sp. over shrubland of *Baeckea, Conospermum, Beaufortia, Melaleuca* and *Verticordia* species with sedgeland of *Ecdeiocolea monostachya*. North of the District, south of Carnarvon, it occurs on a red sand dune in *Acacia* shrubland over heath with *Scholtzia, Rhagodia* and *Pityrodia* species.

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Ajana	N	-	10.10.1994	-	-
2. Zuytdorp	N	Pastoral Lease	26.8.1994	"occasional"	-

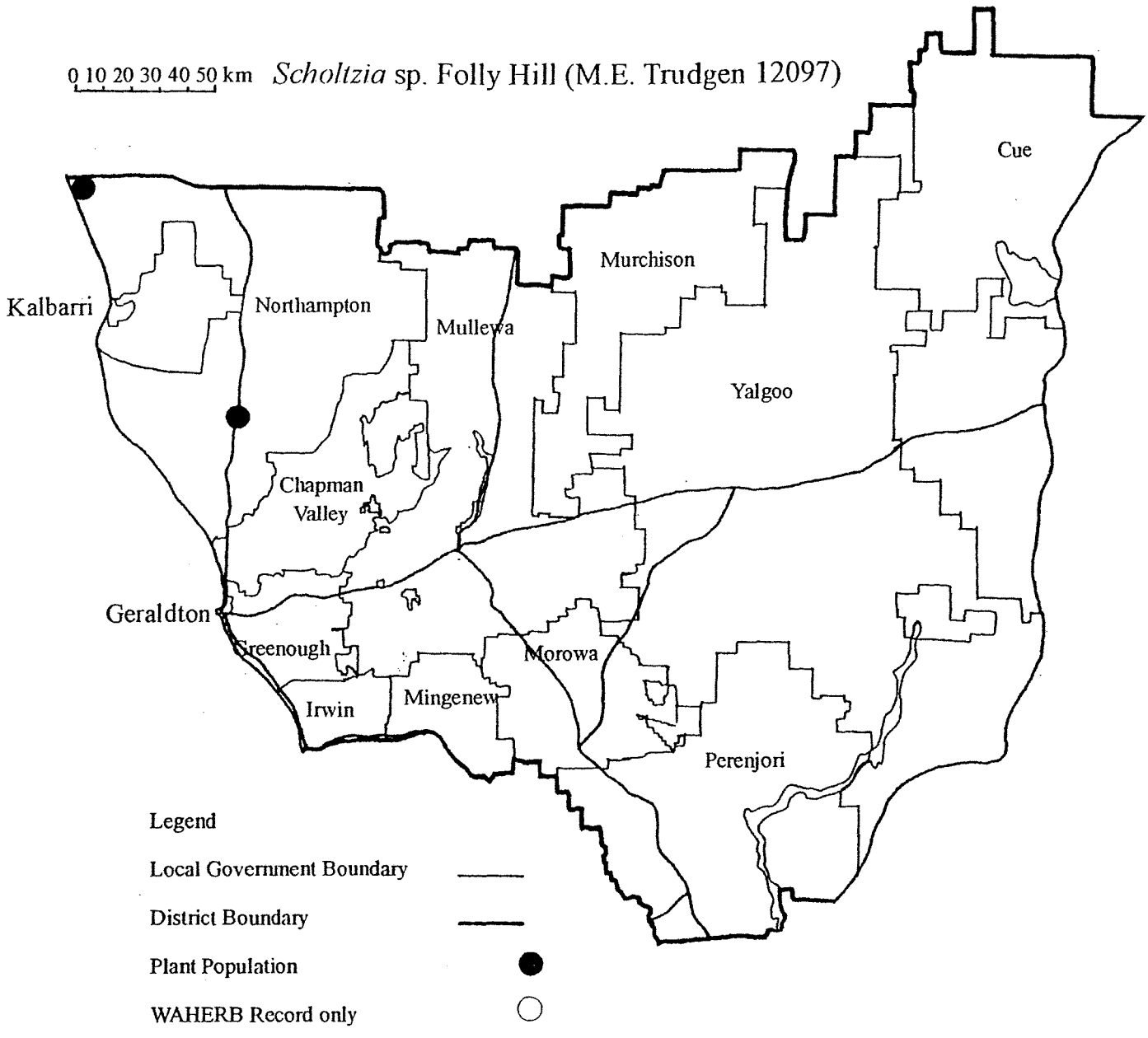
Response to Disturbance

Unknown

Research Requirements

- Further survey is required, particularly to refind and survey populations 1 and 2.
- Taxonomic work is required.

[#] now Priority 2 (updated at December 1999)


0 10 20 30 40 50 km
Scholtzia sp. Folly Hill (M.E. Trudgen 12097)
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Scholtzia sp. Geraldton (F.Lullfitz 3216) MYRTACEAE

A flat-topped or prostrate dense shrub, to 0.3 m tall and 1.3 m in diameter, with pink spikes of flowers. The leaves are obovate to oblong, short-stalked and thick with a ciliate edge. They are c. 2.5 mm long, 2 mm broad. The flowers are arranged in compound umbels on flattened peduncles c. 3 mm long. They are grouped towards the ends of the branchlets, forming loose spikes. The calyx tube is pitted. The calyx is petaloid, with a serrate edge. The petals are white, flushed pink at the base. The five stamens have flattened pink filaments and dark purplish anthers.

Flowering Period: November-December

Distribution and Habitat in the Geraldton District

This taxon has been recorded three times from the Indarra area.

Grows on wet flats below sand dunes in yellow sandy clay, in open scrub of *Melaleuca uncinata,* with *Ecdeicolea monostachya, Melaleuca* and *Drosera* species.

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Indarra	Mu	Nature Reserve	12.11.1996	10+	Healthy
2.* E of Geraldton	Mu	-	23.12.1963	-	-

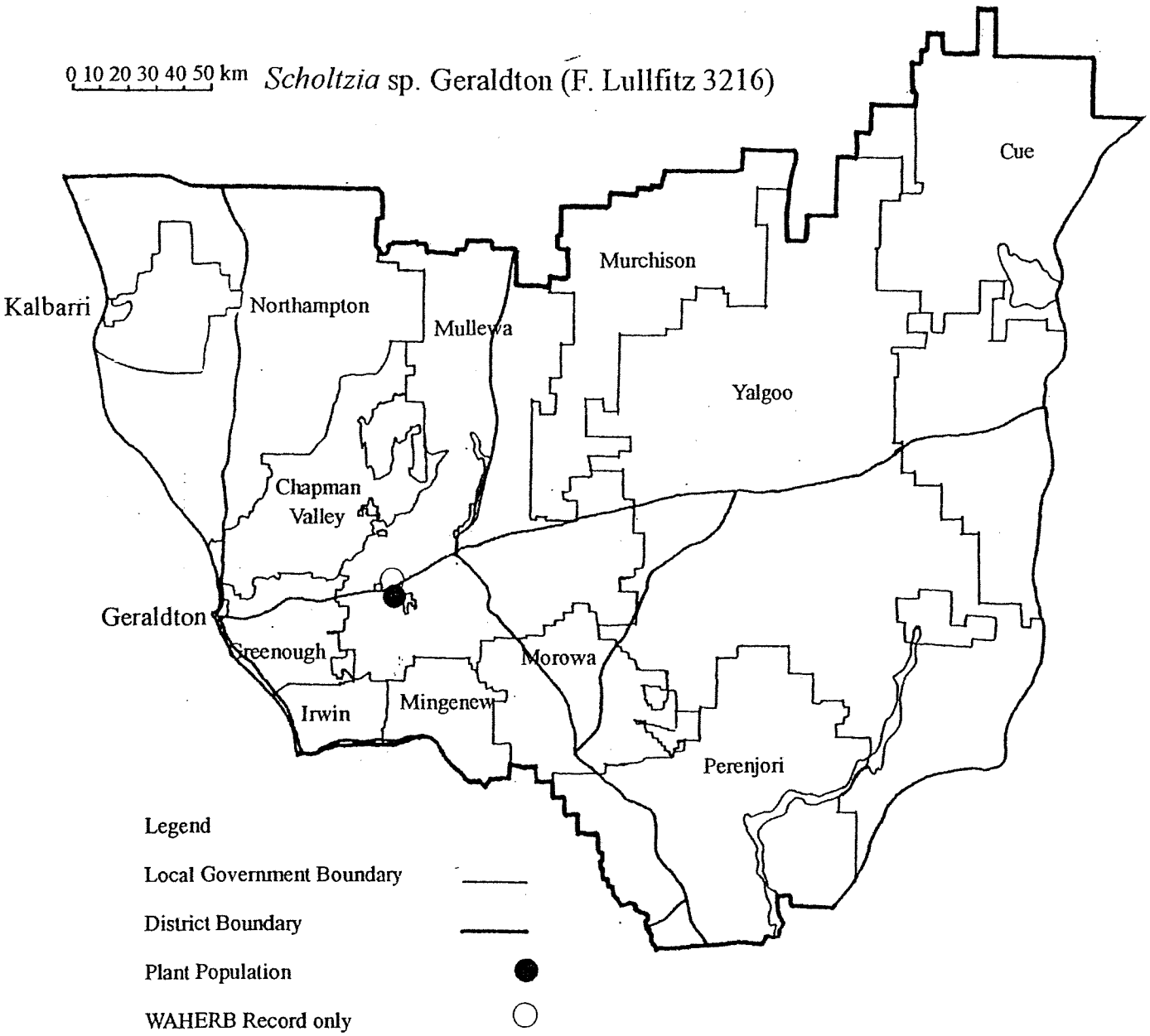
Response to Disturbance

Unknown

Research Requirements

– Further survey is required.

[#] now Priority 2 (updated at December 1999)


0 10 20 30 40 50 km
Scholtzia sp. Geraldton (F. Lullfitz 3216)
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Scholtzia sp. Kojarena (A.M.Ashby 1904) MYRTACEAE

An open, slender, branching shrub, height unknown. The leaves are sessile and decussate, rounded, c. 2 mm long and 2 mm wide. The flowers are c. 3 mm in diameter, grouped in umbels of 4-5 flowers on peduncles c. 5 mm long, forming elongated flowering spikes at the ends of the branchlets. The petals are possibly white to pale pink and there are five stamens.

This taxon is similar to *Scholtzia laxiflora,* but has shorter leaves.

Flowering Period: August

Distribution and Habitat in the Geraldton District

This taxon has been collected once, from near Kojarena, east of Geraldton.

No details of habitat were recorded.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

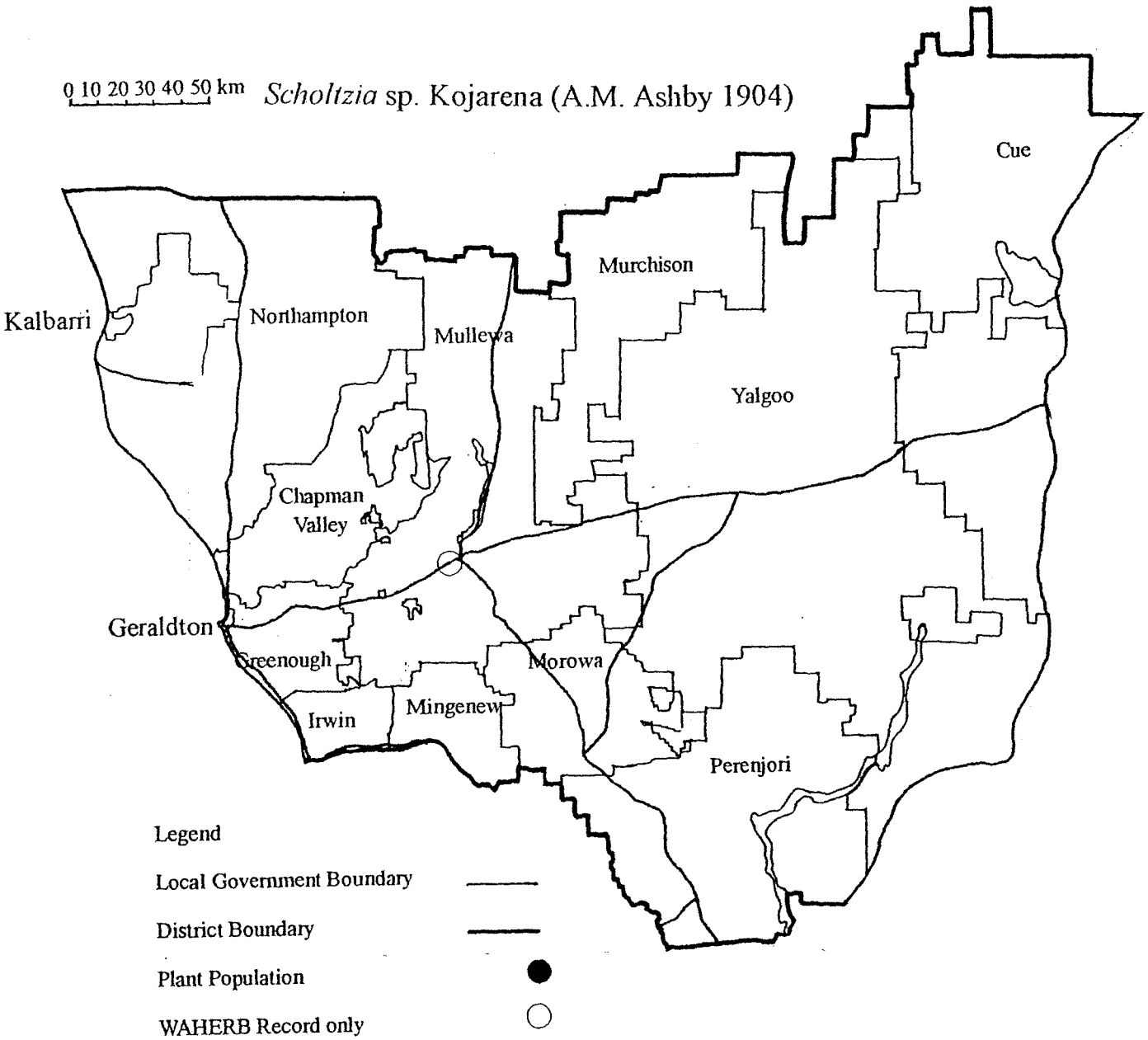
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* Near Kojarena	G	-	14.8.1966	-	-

Response to Disturbance

Unknown

Research Requirements

- Further survey is required.


0 10 20 30 40 50 km
Scholtzia sp. Kojarena (A.M. Ashby 1904)
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Scholtzia sp. Murchison River (A.S.George 7098) MYRTACEAE

A spreading shrub, 1.5 m tall by 1 m diameter. The leaves are c. 4 mm long, the stalk 1 mm long, the obovate blade is 3 mm long. They are decussate and have sparse teeth on the margins. The flowers are c. 4 mm in diameter and are arranged in umbels of c. six flowers on flattened peduncles c. 4 mm long, forming short flower spikes towards the ends of the branchlets. The petals are white or pink. There are up to 10 stamens, which have flattened pink filaments.

Flowering Period: September

Distribution and Habitat in the Geraldton District

This taxon has been collected twice. The first collection was from "Murchison River" where it was growing in sand over sandstone, in heath. The population found more recently occurs south-east of Yuna where it was found at two localities, growing in orange loamy sand in sparse mallee over open tall shrubland of *Actinostrobus* sp. and *Allocasuarina campestris* over sparse mixed shrubs. At the other location, it grows in white loamy sand with pebbles on sandstone outcrop and pavements, in similar vegetation.

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* SE of Yuna	CV	Nature Reserve	14.11.1997	"Uncommon"	-
2.* Murchison River	-	-	7.9.1966	-	-

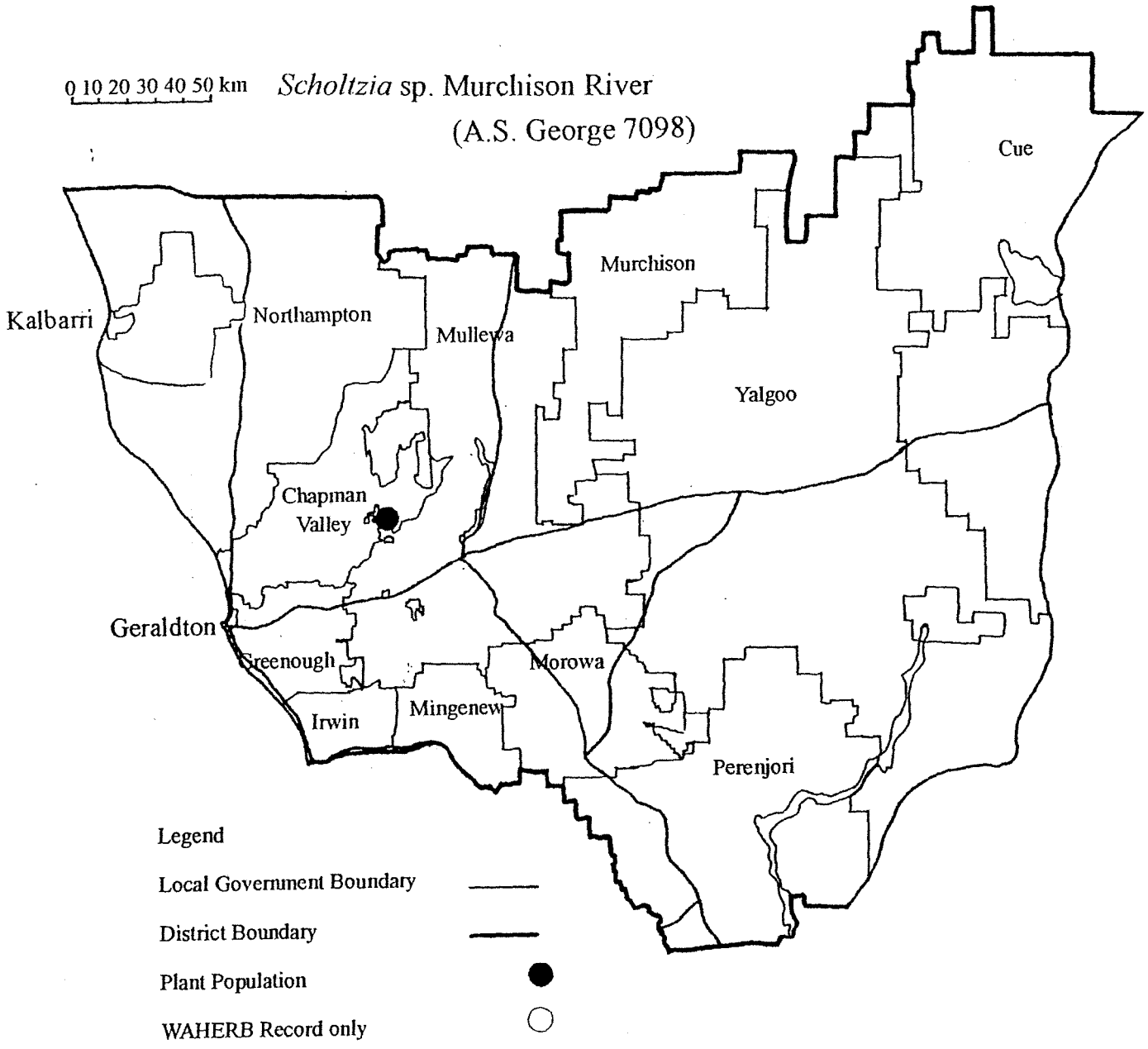
Response to Disturbance

Unknown

Research Requirements

- Further survey is required.

[#] now Priority 2 (updated at December 1999)


0 10 20 30 40 50 km
Scholtzia sp. Murchison River
(A.S. George 7098)
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Scholtzia sp. Nolba (E.Place s.n. Jan. 1964) MYRTACEAE

A shrub with open branching. The leaves have petioles 1 mm long, the blade 4 mm long, 5 mm wide, broadly obovate, with prominent veins and glands. The flowers are c. 3 mm broad, arranged in umbels of c. six flowers on peduncles c. 12 mm long. The fruits are c. 2.5 mm broad, 2 mm long.

This taxon is similar to *Scholtzia uberiflora*, but the leaves have longer petioles and more obvious glands and the fruits are shorter and broader.

Flowering Period: January

Distribution and Habitat in the Geraldton District

This taxon has been collected once, from Nolba, which is east of Northampton.

No details of habitat were recorded.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

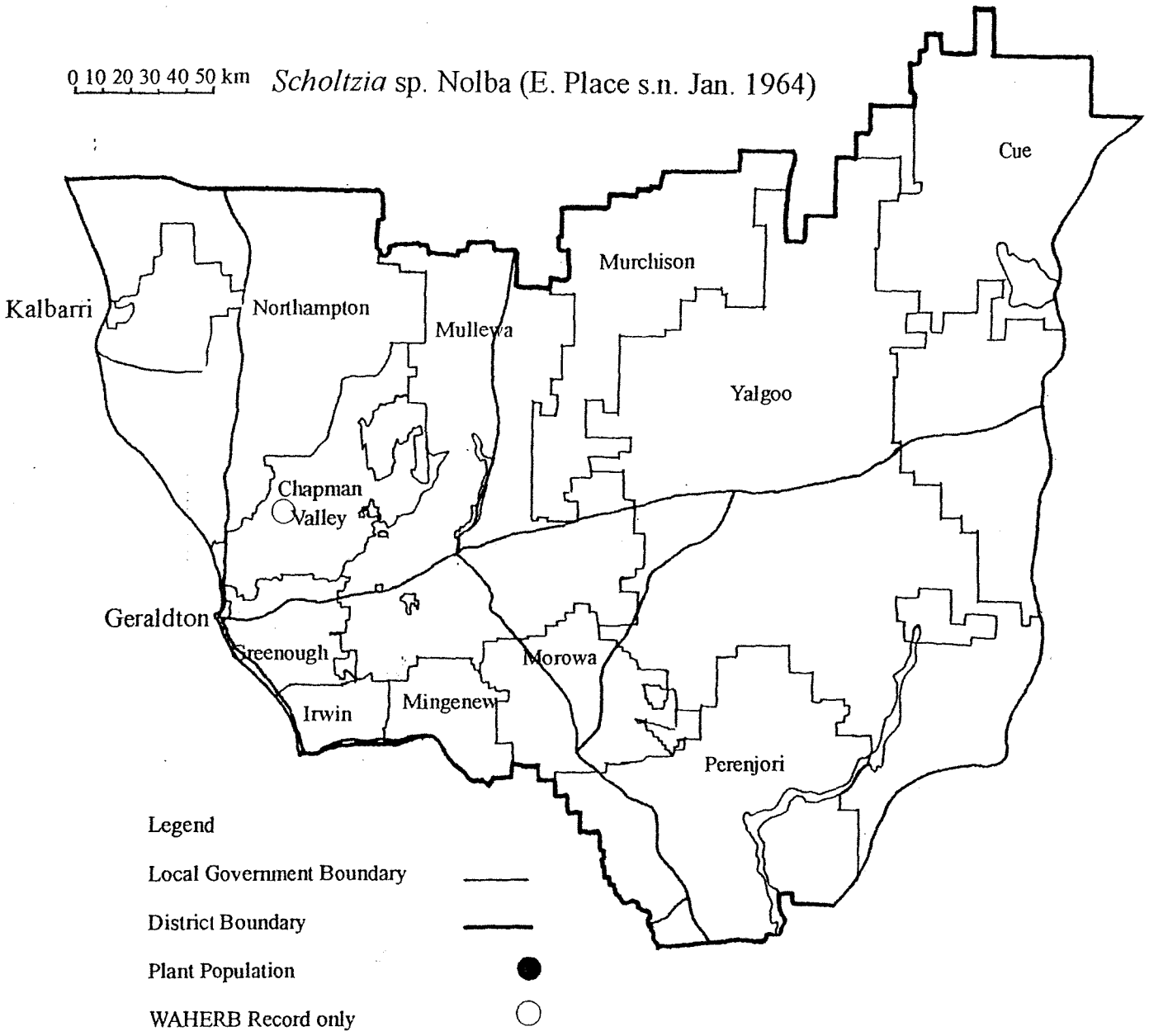
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Nolba	CV	-	1.1964	-	-

Response to Disturbance

Unknown

Research Requirements

- Further survey is required.


0 10 20 30 40 50 km
Scholtzia sp. Nolba (E. Place s.n. Jan. 1964)
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Scholtzia sp. Valentine Road (S.Patrick 2142) MYRTACEAE

A few-stemmed, low shrub with upright stems. The leaves are decussate and sessile, oval in shape, c. 3 mm long. The flowers are pale pink, in few-flowered, dense, axillary clusters towards the ends of the branchlets. The peduncle is c. 3 mm long, the pedicels c. 1 mm. The funnel-shaped hypanthium is wrinkled and pale green. Both the petaloid calyx and the petals have serrate edges.

Flowering Period: October-November

Distribution and Habitat in the Geraldton District

Has been collected once from north-east of Geraldton.

Grows on high ground in yellow sand, in low woodland of *Callitris, Grevillea* and *Xylomelum* sp. over scrub to 1.5 and 2 m, with *Conospermum stoechadis, Grevillea eriostachya, Acacia* and *Calothamnus* species.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

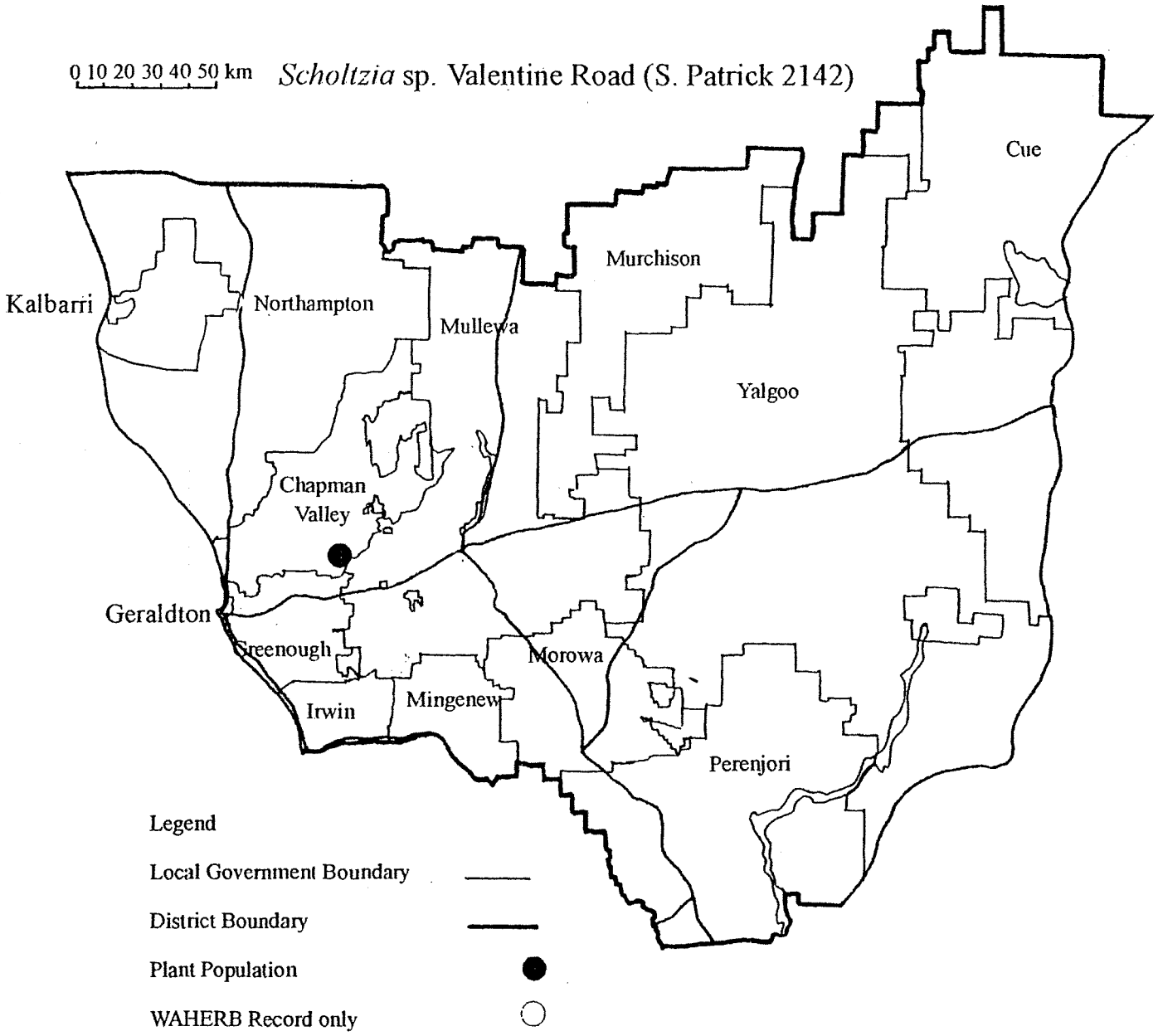
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. NE of Geraldton	CV	Shire Road Verge	1.11.1994	1+	On narrow road verge

Response to Disturbance

Unknown

Research Requirements

- Further survey is required to refind, revoucher and fully survey population 1 and to find further populations.


0 10 20 30 40 50 km
Scholtzia sp. Valentine Road (S. Patrick 2142)
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Scholtzia sp. Whelarra (M.E.Trudgen 12018) MYRTACEAE

A spreading shrub, 50 cm tall and 1 m across, with numerous stems. The bark is light grey. The petals are white.

Flowering Period: ?November

Distribution and Habitat in the Geraldton District

Known from one population east of Binnu, north-east of Geraldton.

Grows on yellow sand on a gently undulating plain, in woodland of mallee eucalypts and *Allocasuarina* sp. over open low heath with *Melaleuca* aff. *cardiophylla* and sedgeland of *Ecdeicola monostachya* sedgeland.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

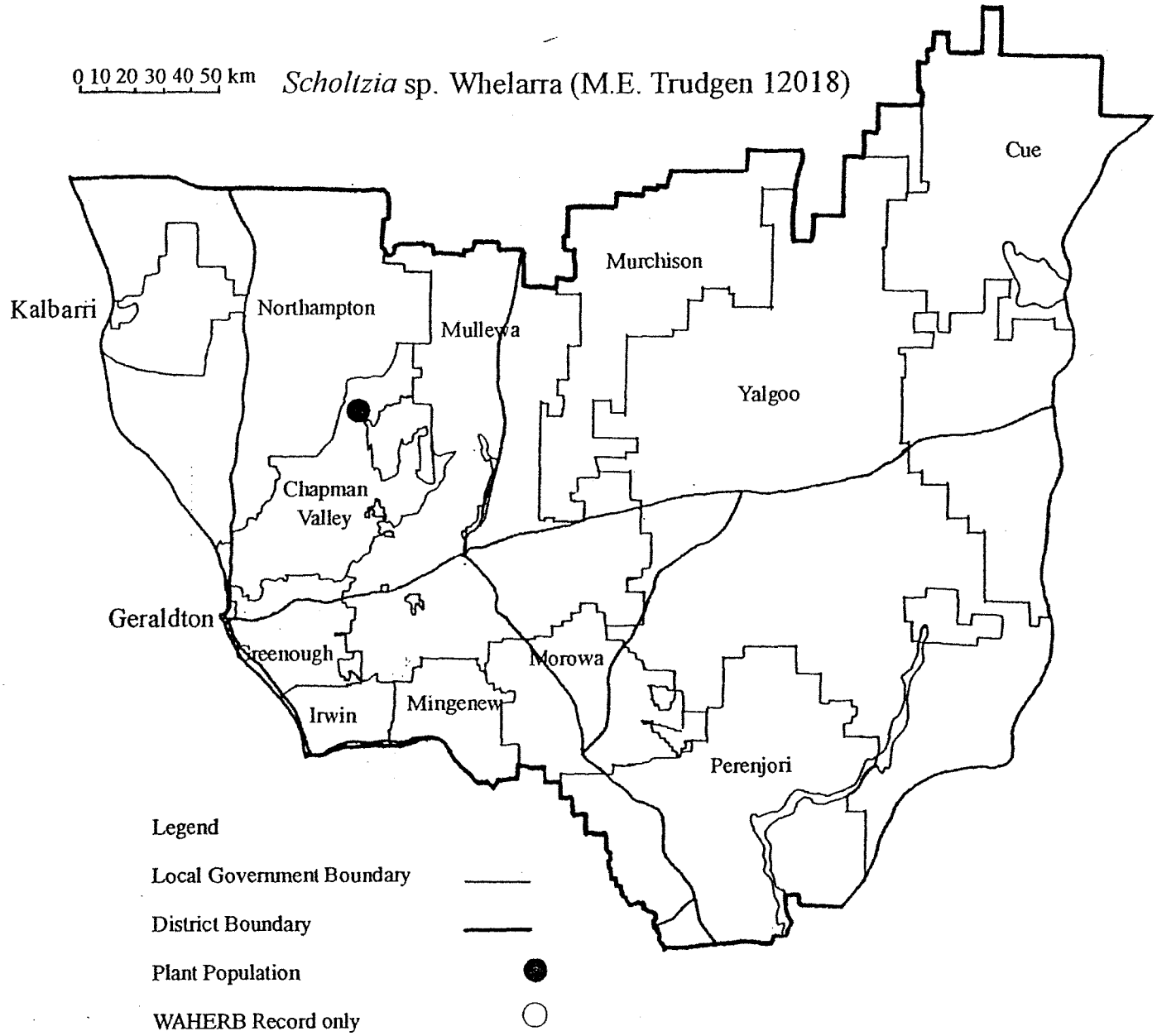
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Binnu East Road	CV	-	5.12.1994	"not very common"	-

Response to Disturbance

Unknown

Research Requirements

- Further survey is required to refind this taxon and to resurvey population 1.


0 10 20 30 40 50 km
Scholtzia sp. Whelarra (M.E. Trudgen 12018)
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Stenanthemum bilobum Rye RHAMNACEAE

A small shrub, with densely stellate-hairy young stems. The stipules are free or shortly joined at the base and are densely stellate-hairy on the outside. The leaves are broadest at the apex, narrowing to the short stalk. They are two-lobed at the apex and are c. 5 x 3 mm. The margins are recurved and they are pale green and densely hairy on both surfaces. The flowers are in head-like clusters 2-3 mm wide, surrounded by brown bracts and leaves. Each flower is probably white or cream in colour. The floral tube is hairy, divided above into five lobes which are hairy on the outer surface. The fruit is a schizocarp.

The leaves of this species distinguish it from others in the genus. It could be confused with *Stenanthemum notiale,* which has the stipules joined for a half to quarter their length, flat or less recurved leaf margins and an entire or acutely toothed leaf apex.

Flowering Period: August

Distribution and Habitat in the Geraldton District

One collection of this species has been made from near Tenindewa, east-north-east of Geraldton.

No details of habitat were recorded.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Near Tenindewa	Mu	-	20.8.1963	-	-

Response to Disturbance

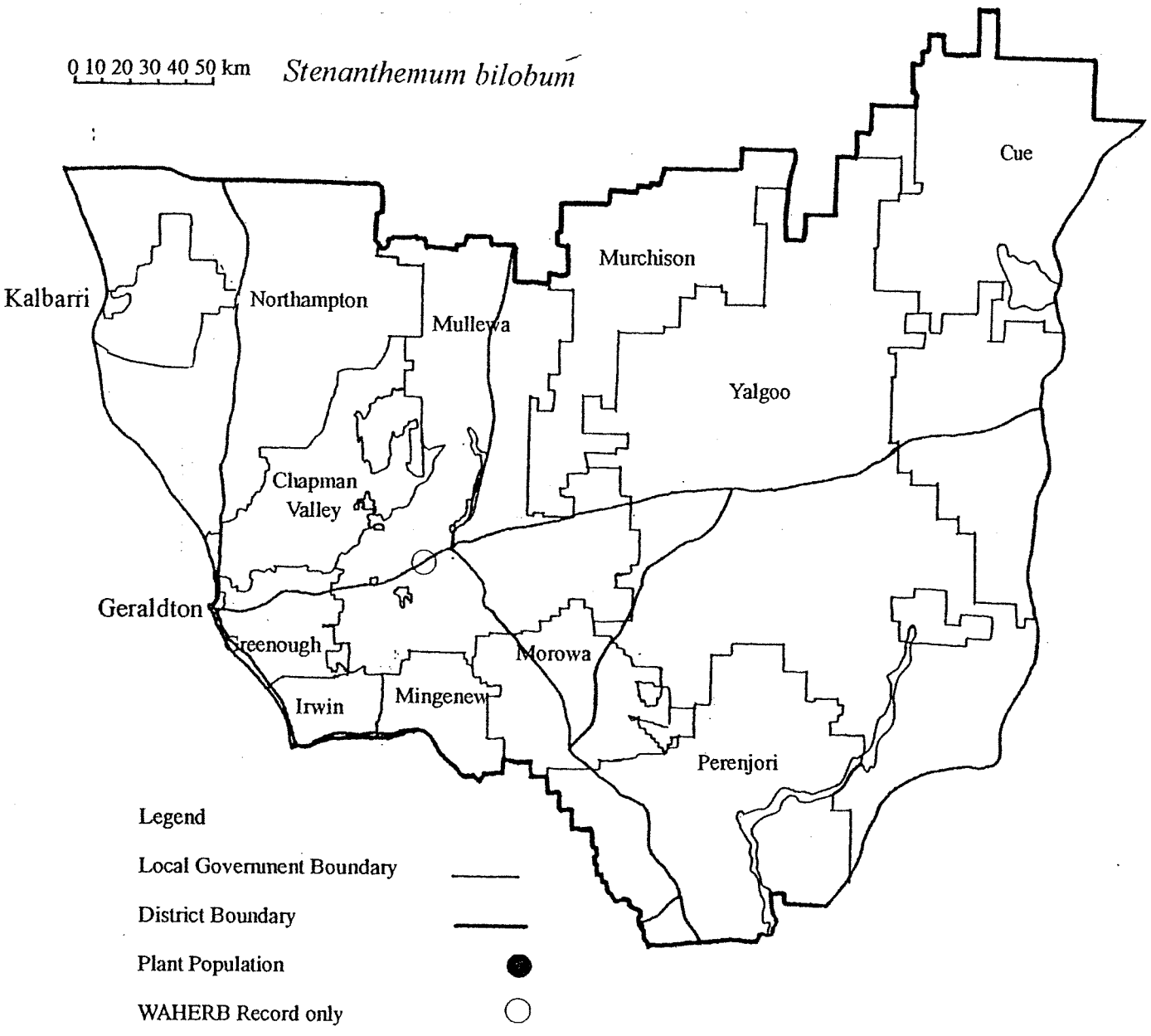
Unknown

Research Requirements

– Further survey is required to refind this species.

References

Rye (1995).


0 10 20 30 40 50 km
Stenanthemum bilobum
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Stenanthemum gracilipes Diels RHAMNACEAE

[*Cryptandra gracilipes*]

A low, erect shrub to 70 cm tall. The leaves are spathulate with an indented apex, 1-2 x 0.6-1.5 cm. The flowers have stalks 3-3 mm long and are arranged in loose cymes which are longer than the leaves. The flowers are obconical tubular, with five petal lobes. They are 5 mm long, cream or white in colour, turning pink.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

Occurs in a restricted area to the west and south of Northampton over a range of c. 30 km.

Grows on hill slopes in low heath or scrub in shallow yellow-brown sandy loam over sandstone conglomerate. Associated species include *Acacia acuminata, Stypandra glauca, Gastrolobium* and *Thryptomene* species and *Eucalyptus redunca.*

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. W of Northampton	N	Shire Reserve	14.8.1996	5+	Healthy
2.*Nanson Road	CV	-	21.8.1983	"Occasional"	-
3.*Nanson Road	CV	-	29.8.1983	-	-
4.*Near Sugar Loaf Peak	N	-	9.9.1966	-	-
5* Wokatherra	CV	-	9.9.1901	-	-

Response to Disturbance

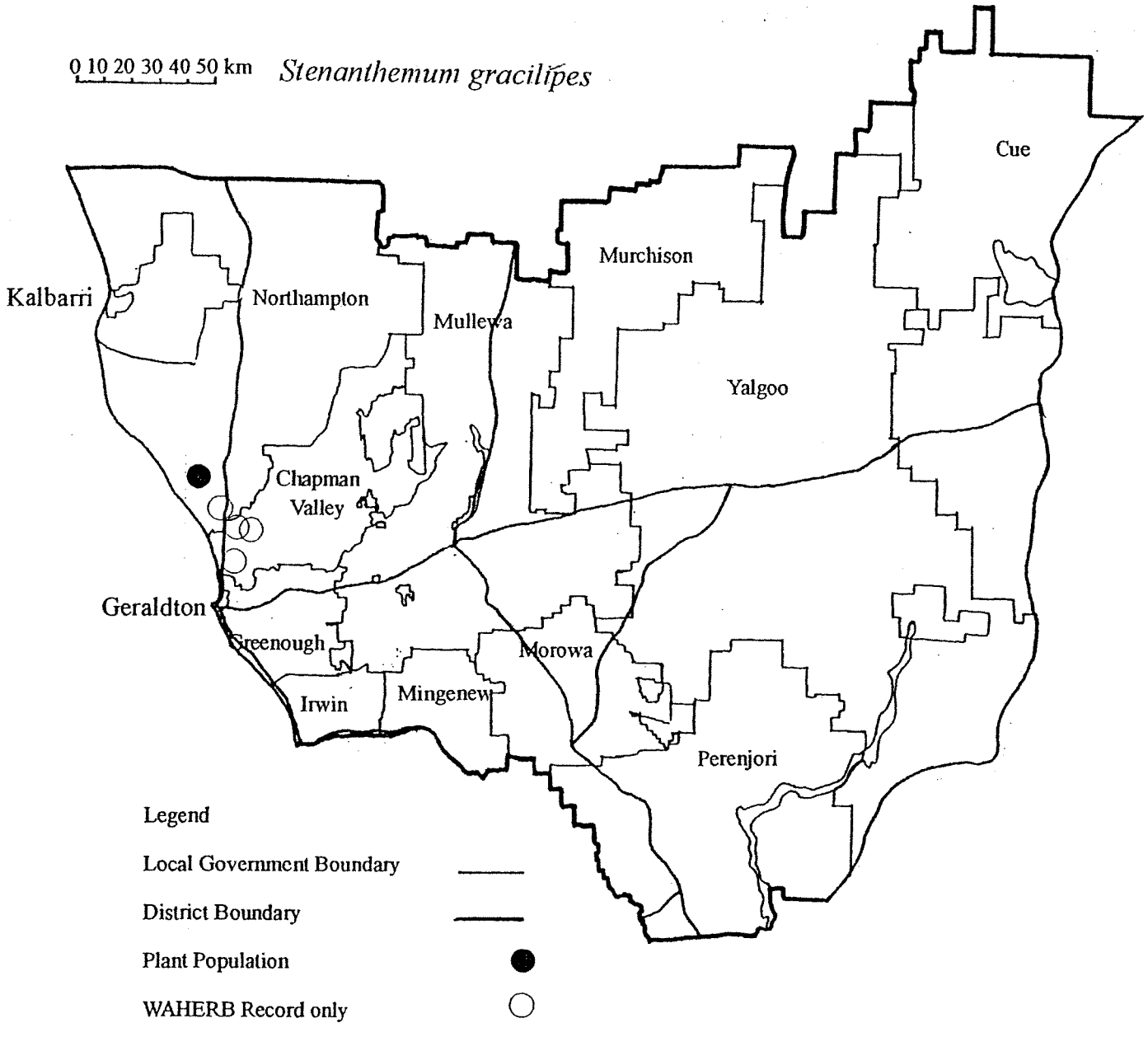
Unknown

Research Requirements

- Further survey is required in suitable habitat.
- Population 1 needs to be resurveyed to establish the full extent of the population, and populations 2-5 need to be refound and surveyed.

References

Diels & Pritzel (1904-5).


0 10 20 30 40 50 km
Stenanthemum gracilipes
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Stenanthemum mediale Rye — RHAMNACEAE

An erect, dwarf shrub, c. 35 cm tall, the young stems with a dense covering of minute stellate hairs. The leaves are broadly obovate, entire with a recurved apex. They are densely hairy on the lower surface and are up to 7 mm long and 4.5 mm broad. The stipules are acute and are joined for up to half their length. The flowers are in clusters 5-8 mm wide, surrounded by broad bracts which are often toothed. Each flower is c. 2.5 mm long, densely hairy with stellate and simple hairs. It is tubular, with sepals to 1.7 mm long. The fruit is a schizocarp to 3.5 mm long.

This species is distinguished by its untoothed leaves and length of the flowers. *Stenanthemum petraeum* appears to occur in the same range but has larger, more shiny leaves, finer, more spreading hairs on the floral tube, a shorter disc and different habitat.

Flowering Period: April-August

Distribution and Habitat in the Geraldton District

This species is known from two localities. One of these, from Black Hill Station, south-east of Sandstone, is within the Geraldton District. The other, from Yellirie, is c. 20 km north-east of the District and c. 120 km from the other population.

Grows in open scrub on red clayey sand.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Black Hill Station	S	Pastoral Lease	31.7.1993	"Frequent"	-

Response to Disturbance

Unknown

Research Requirements

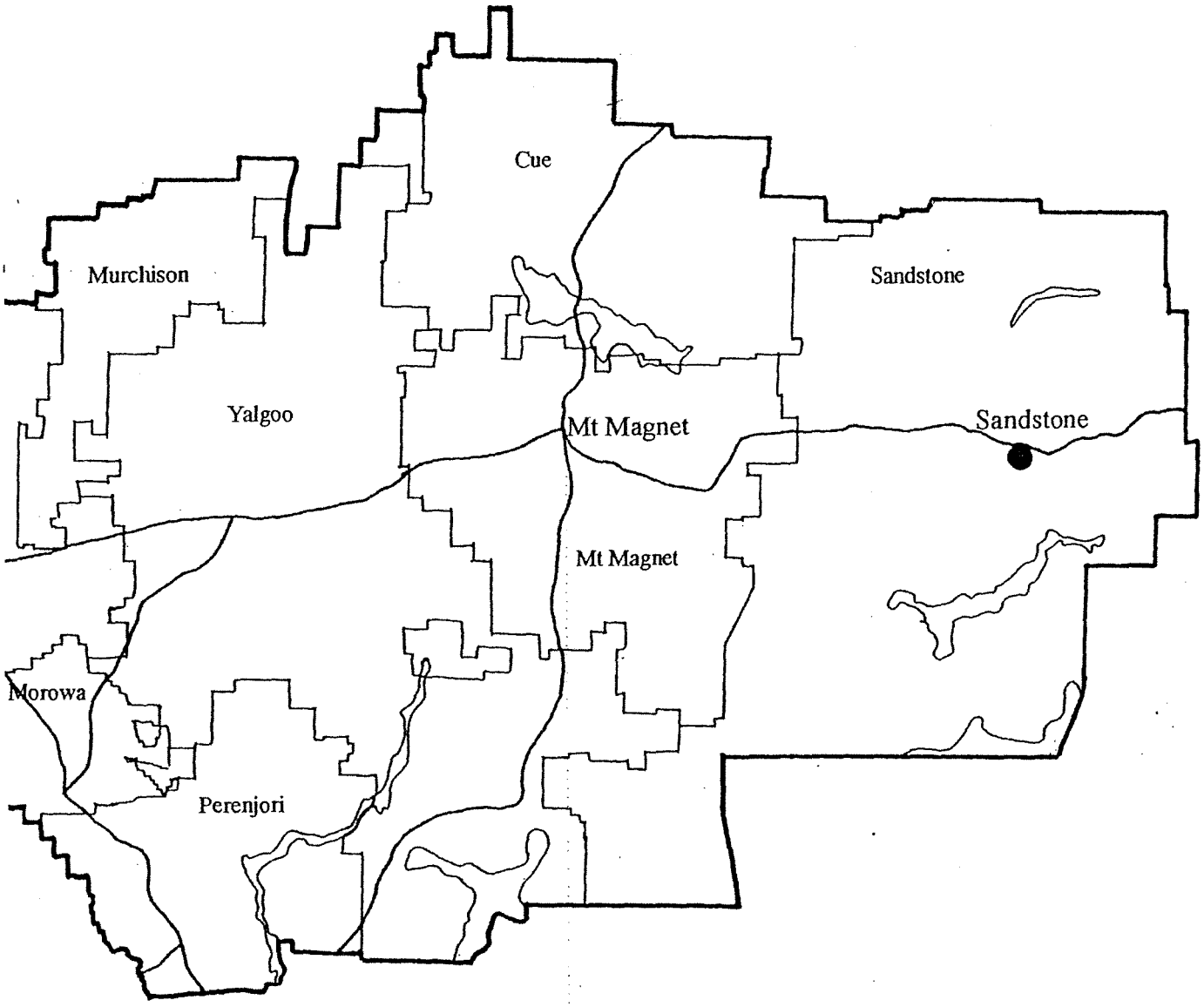
- Further survey is required.

References

Rye (1995).

0 10 20 30 40 50 km

Stenanthemum mediale



Legend

Local Government Boundary

District Boundary

Plant Population

WAHERB Record only

Stylidium pseudocaespitosum Mildbr. STYLIDIACEAE

Stylidium pseudocaespitosum is a perennial plant, with the lower stems thickened and scaly with the remains of the old persistent leaf bases. The leaves are finely scabrous with very short non-glandular hairs and the basal leaves are loosely rosetted, erect and narrow-linear, with short non-glandular hairs on the margins. They are 2-5 cm long, c. 2 mm wide. The flowers are in a simple raceme on a scape with appressed bracts. The calyx lobes are free and obtuse. The flowers are white, striped with dark purple, and the corolla lobes are almost equal, oval in shape, 2-4 mm long and c. 2 mm broad. There are very short, slender throat appendages which are irregularly triangular in shape and membranous. The labellum is small and pointed with two small appendages.

Flowering Period: September

Distribution and Habitat in the Geraldton District

Two collections made in 1901 and 1962 appear to have been made from east of Bookarra, north of Dongara, which is within the Geraldton District. Another made from south of Dongara in 1969 is within the Moora District but this population has not been refound. The species has been collected from three other locations during the 1960s in the Geraldton District. At one location, all plants have been destroyed recently during firebreak construction. The second population consists of only two plants. These populations are located east of Walkaway. A third locality further east has not yet been refound.

The species grows in deep pale yellow sand.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. E of Walkaway	G	-	13.8.1992	-	-
2. Burma Road	G	-	8.1992	2	-
3.* Casuarinas Road	-	-	4.9.1967	-	-

Response to Disturbance

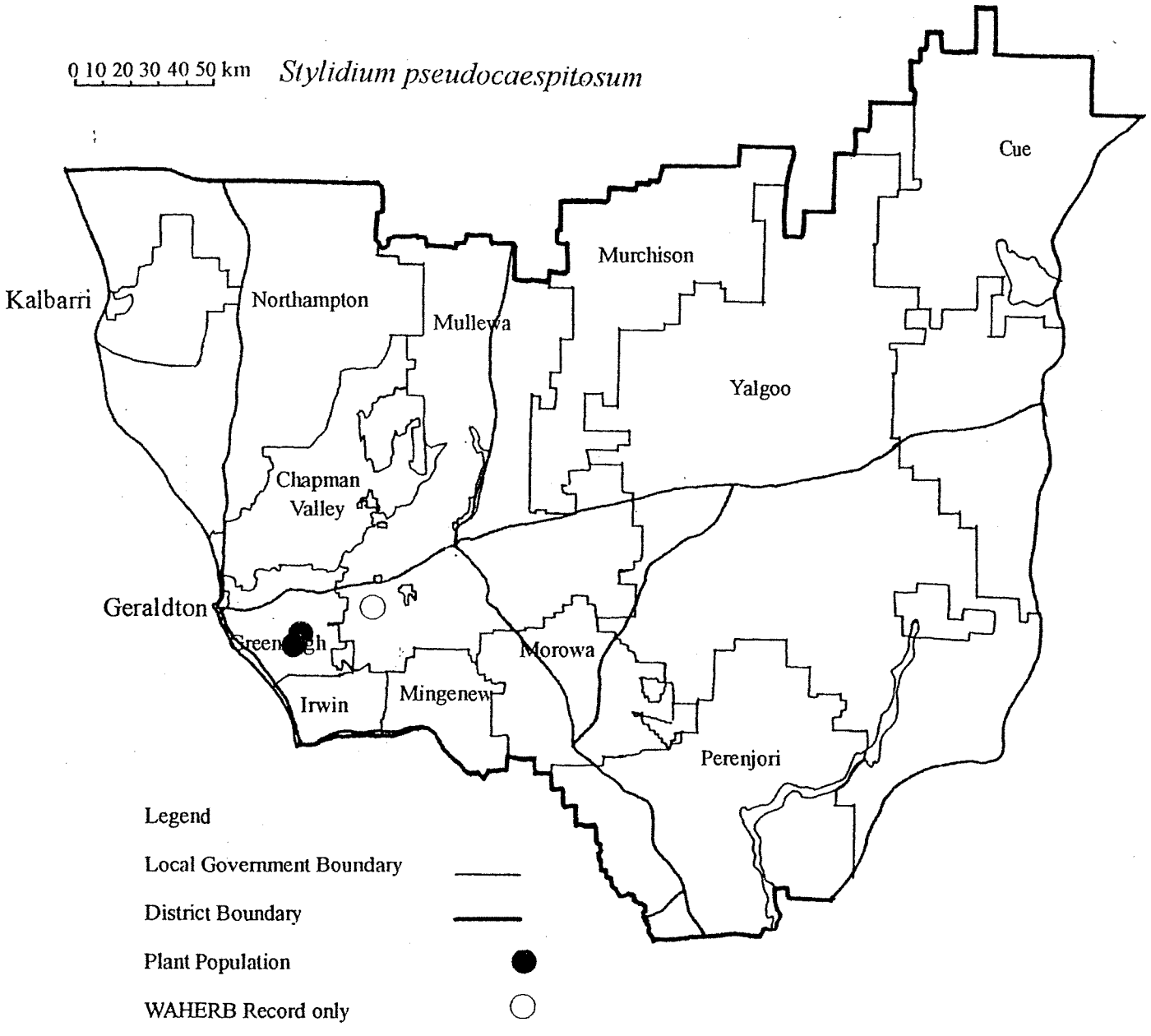
Unknown

Research Requirements

- Further survey work is urgently required.
- Collect seed for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.

References

Erickson (1981), Grieve & Blackall (1982), Leigh *et al.* (1984), Mildbraed (1908).


0 10 20 30 40 50 km
Stylidium pseudocaespitosum
Cue
Murchison
Kalbarri
Northampton
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Thomasia tenuivestita F.Muell. STERCULIACEAE

A shrub to 2.5 m tall with a covering of soft small whitish hairs, without rigid hairs. The leaves have a close covering of soft whitish hairs on both sides and are only slightly lobed. They are ovate-cordate in shape, to c. 4 cm long. The stipules are leafy, oblique or kidney-shaped. The flowers are in slender racemes with rather small flowers. There are three oblong-linear bracteoles. The calyx is up to c. 12.5 mm in diameter, mauve-pink in colour, with broad lobes less than half the length of the calyx and each with a prominent midrib. There are usually no petals or only incomplete ones present. The anthers taper to a long point and staminodes are not present. The ovary is tomentose and three-celled and the style is hairless.

This species is related to *Thomasia grandiflora*. Specimens collected from the Wongan Hills area have been annotated by S. Paust in 1973 as differing from the type description of the species in having large circular stellate-hairy petals. Another specimen from the same area has been identified as *T. tenuivestita* by C.A. Gardner, who noted that the specimen was larger and coarser in form and indumentum than *T. tenuivestita* but best regarded as that species.

Flowering Period: July-October

Distribution and Habitat in the Geraldton District

T. tenuivestita was originally collected from the Murchison River in the Geraldton or Gascoyne Districts. Another early collection is from Champion Bay in the Geraldton area. Several collections identified as this species have been made from the Wongan Hills area in the Merredin District, where a population found in 1990 grows on a nature reserve, and also from Bendering in the Narrogin District, near York in the Swan Region and Winchester in the Moora District.

Near Wongan Hills, it grows in damp areas near granite outcrops in woodland of *Allocasuarina huegeliana* over sedges and with *Grevillea paniculata, Allocasuarina campestris, Caladenia roei* and species of *Alyxia, Gastrolobium* and *Acacia.* At Winchester, it grew in grey loam over clay in York gum woodland with *Podolepis canescens* and species of *Acacia* and *Dianella.*

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.*Murchison River	-	-	Pre 1863	-	-

Response to Disturbance

Unknown

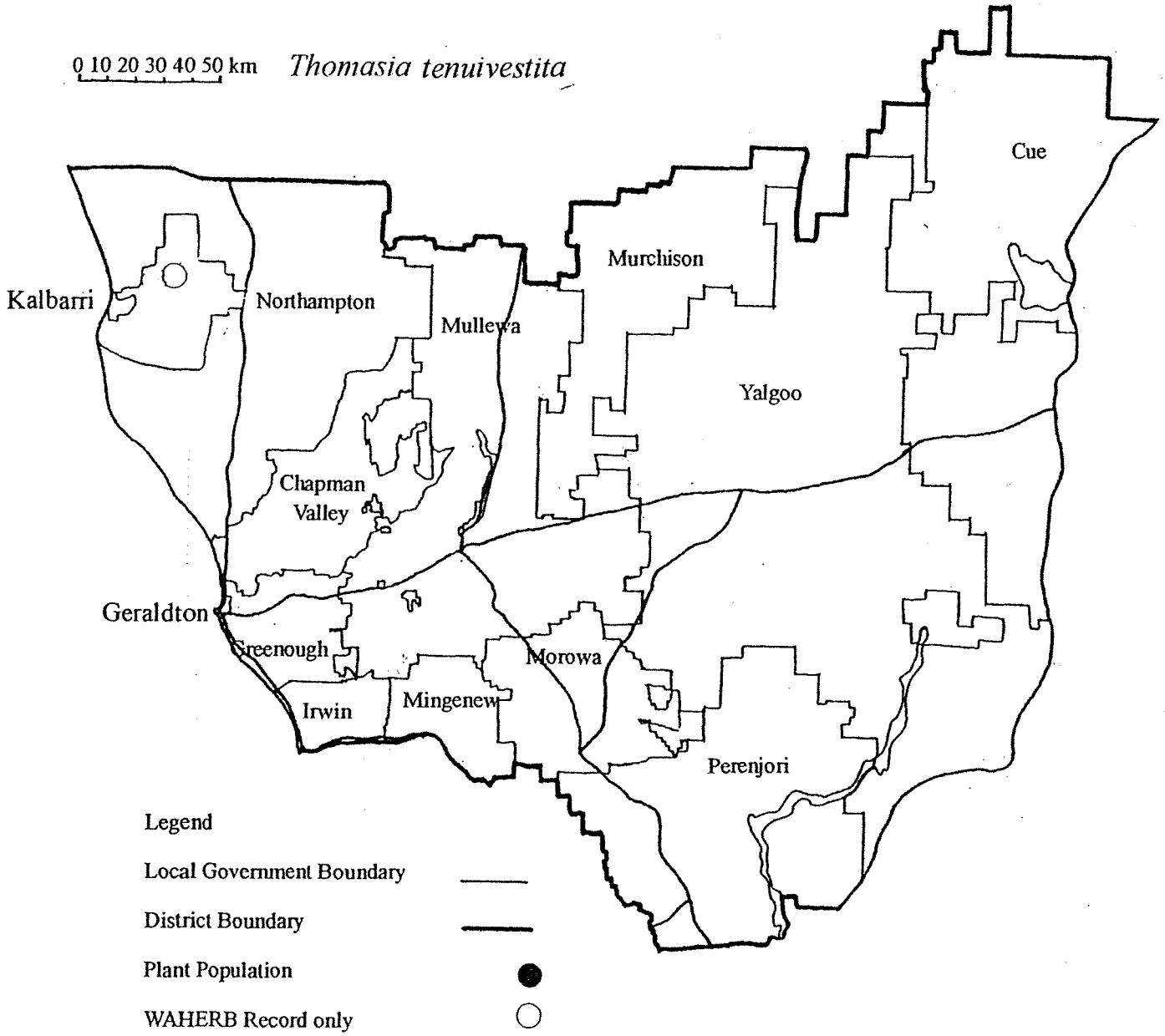
Research Requirements

- Further survey is required, particularly in areas where this species has been recorded in the past, in order to find further extant populations and to remove from the Priority Flora List.

[#] now Priority 3 (updated at December 1999)

References

Bentham (1863), Blackall & Grieve (1985), Mueller (1860), Paust (c. 1973).



Thryptomene ninghanensis J.W.Green ms MYRTACEAE

A shrub 0.8-1.2 m tall. The leaf blades are broadly obovate, 1.7-3 x 1.2-1.8 mm, the upper half recurved. They have a short stalk and prominent glands, particularly on the lower surface. The flowers are pink, purple, pink to white, or red. They occur in subterminal clusters of 2-7 pairs on each branchlet. The bracteoles are ovate, with subpetalloid margins, deciduous. The flowers are c. 1.3 mm in diameter, the floral tube five-ribbed at first, becoming smooth. The five sepals are petalloid and pink, ca 1.3 mm long. The five petals are pale pink to white, c. 1 mm long. There are five stamens, with very short filaments. There are two ovules.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

Has been recorded from north of the Murchison River to the Yuna area, with the earliest collection from much further east, near Mt Singleton, a range of over 300 km.

Grows on yellow sand at the base of sand dunes in scrub of *Callitris* and mallee eucalypt scrub or in orange clayey sand on flats with *Eucalyptus eudesmoides* over heath of *Acacia* and *Kunzea* species. On sandplain, it grows in yellow-light brown sand in *Acacia* scrub with emergent *Eucalyptus jucunda, E. oldfieldii* and *Bursaria occidentalis* over *Thryptomene* sp. open dwarf scrub with *Eriachne* sp. and *Amphipogon strictus.* Has also been recorded on red clay with *Acacia linophylla.*

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. S of Coolcalalaya	N	VCL	30.8.1990	-	-
2. SW of Coolcalalaya	N	Pastoral Lease	31.8.1990	-	-
3.* E of Binnu	N	Shire Road Verge	13.9.1978	-	-
4.* N of the Murchison River	N	-	9.7.1963	"Abundant"	-
5.* SW of Yuna	CV	-	8.9.1962	-	-
6.* Near Mt Singleton	Y	-	8.1953	-	-

Response to Disturbance

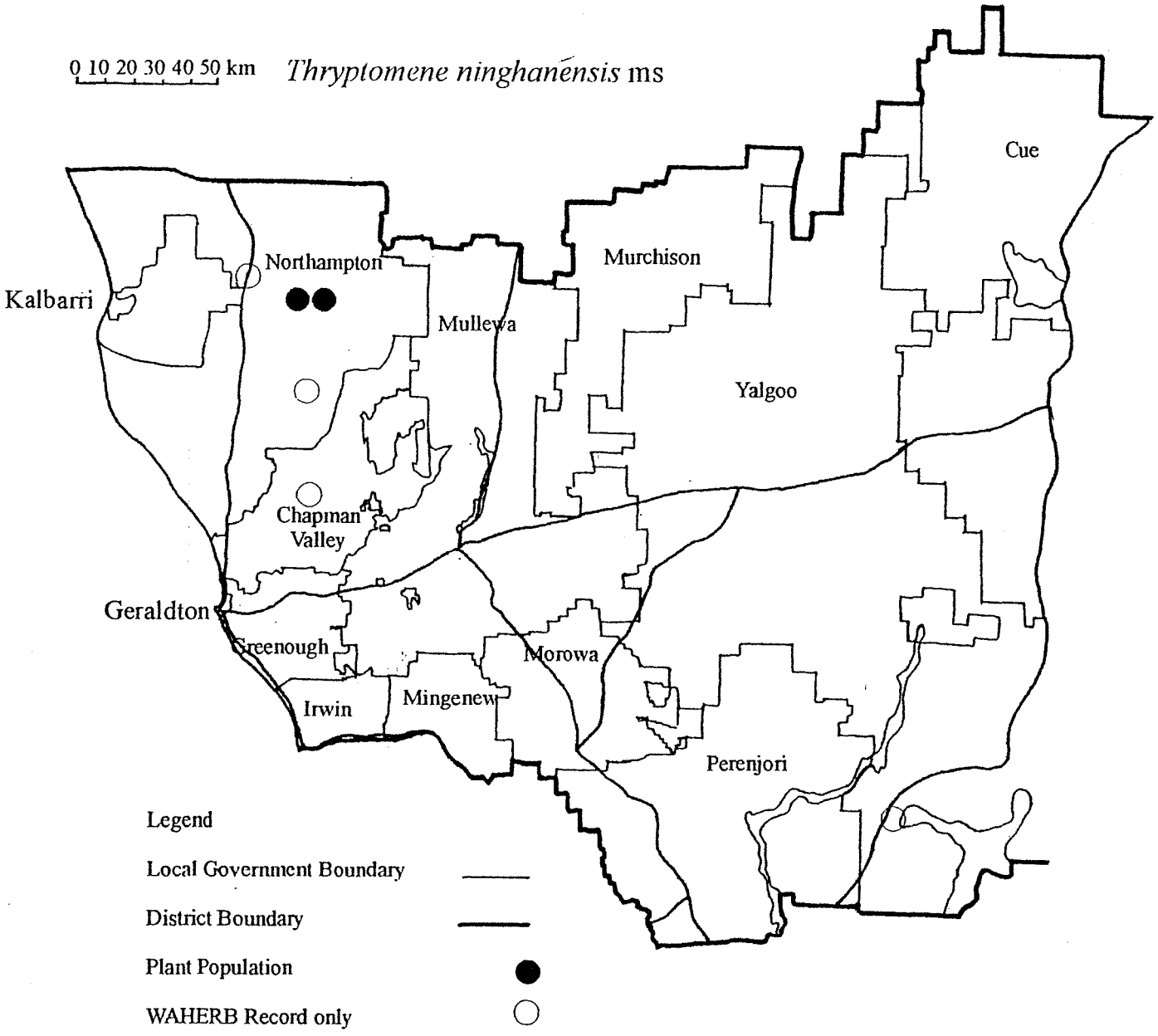
Unknown

Research Requirements

– Further survey is required.

References

B. Rye & M. Trudgen (personal communication).


0 10 20 30 40 50 km
Thryptomene ninghanensis ms
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Thryptomene sp. Binnu East Road (M.E.Trudgen 12012) MYRTACEAE

[*Thryptomene duplica* Rye & Trudgen ms]

A spreading shrub to 80 cm tall and spreading to 2 m across. The lower stems are stout, 2-3 cm in diameter, with grey fibrous bark. The leaves are overlapping, broadly obovate with a short stalk, to 2.6 mm long and 3.5 mm wide, fairly thin, with prominent glands and a pointed tip. The flowers are c. 6 mm in diameter, grouped in two or three pairs, forming small clusters towards the apex of the branchlets. The floral tube is deeply ridged, narrowing to an acutely angled base. The sepals have the centre base gland-dotted and slightly herbaceous, the remainder petaloid and white. They are distinctly shorter than the petals which are also white. There are 15 or more stamens. The ovary is one-celled, with two ovules. The fruit is broadly obconic, c. 2 mm long, with 16 full length ribs and several shorter ones.

The specific name refers to the large number of stamens, which is roughly double the normal number in this genus.

Flowering Period: December

Distribution and Habitat in the Geraldton District

This taxon is known from one population which occurs east of Binnu.

Grows on the crest of a north-east to south-west trending sand dune in pale yellow sand. Grows in tall open shrubland of *Actinostrobus* sp. over shrubland of *Scholtzia, Thryptomene* and *Calothamnus* species.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. E of Binnu	N	-	15.12.1993	"Locally common"	-

Response to Disturbance

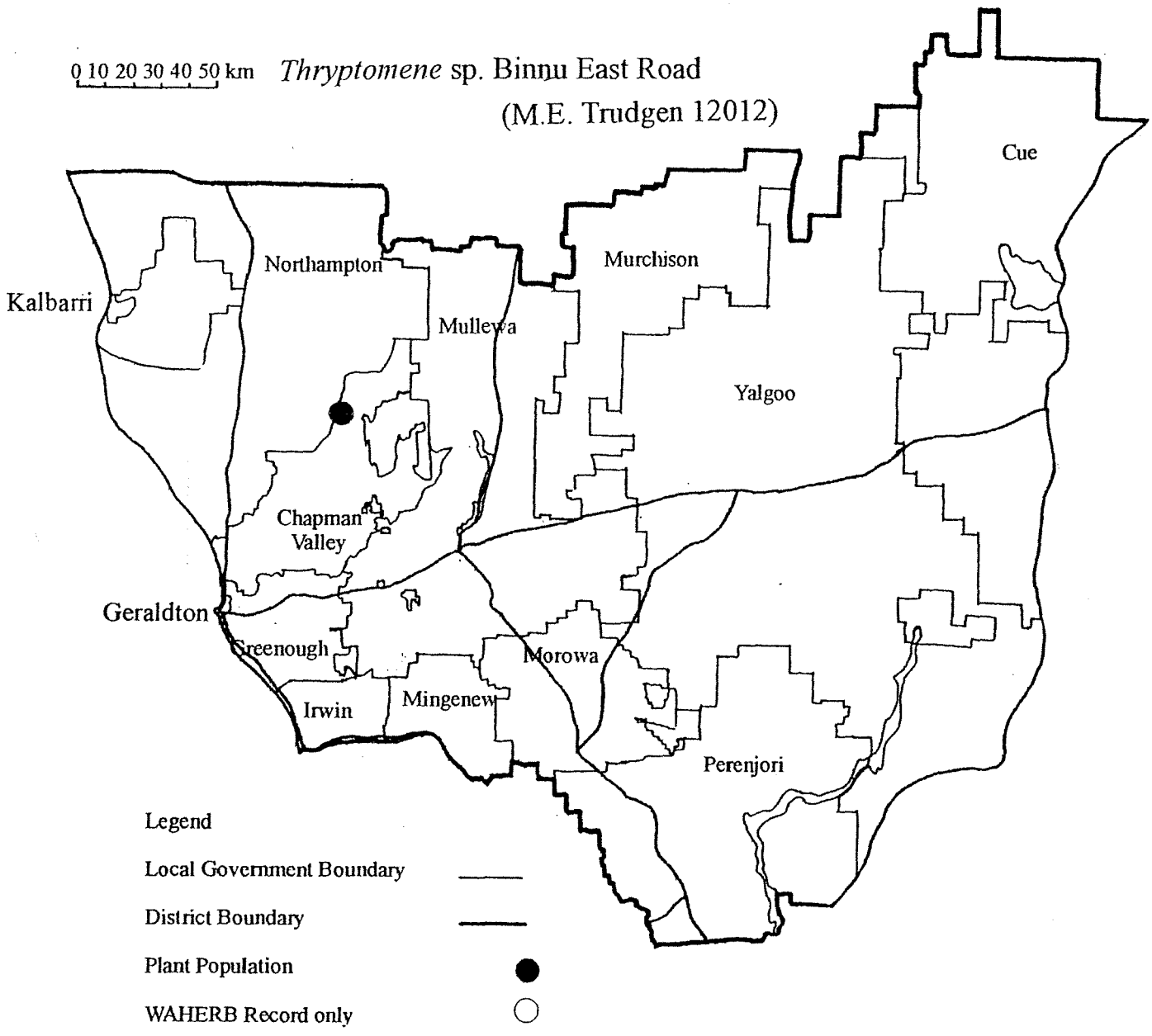
Unknown

Research Requirements

- Further survey is required.
- Further taxonomic work is required.

References

B. Rye & M. Trudgen (personal communication).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Thryptomene sp. Binnu East Road
(M.E. Trudgen 12012)
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Thryptomene sp. Mingenew (Diels & Pritzel 332) MYRTACEAE

[*Thryptomene nitida* Rye & Trudgen ms]

A spreading shrub to 50 cm tall. The leaves are decussate, overlapping, obovate in shape, with short stalks. They are c. 1.5 mm long and have denticulate margins and conspicuous glands. The bracteoles have a thick leaf-like keel and are persistent until after the fruit is shed. There are few flowers, occurring in a small cluster on each branchlet. The peduncles are short. The sepals are petaloid and the petals are pale purple. There are ten stamens. The floral tube is completely smooth in fruit, the base rounded. The ovary is one-celled.

Differs from *Thryptomene baeckeacea* in its broader bracteoles, with broader, thin margins extending further round the floral tube, in its smooth shiny fruit and distinct distribution.

The specific name is from the Latin "*nitidus*" - shining, referring to the smooth floral tube.

Flowering Period: June-September

Distribution and Habitat in the Geraldton District

This species is known from Mingenew in the Geraldton District south-east to Arrino in the Moora District.

Has been recorded growing in sand near a creek bed and on yellow sand in open heath. Also in grey sand over metamorphosed sandstone and in loam.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* Mingenew	Mi	-	1.7.1957	-	-

Response to Disturbance

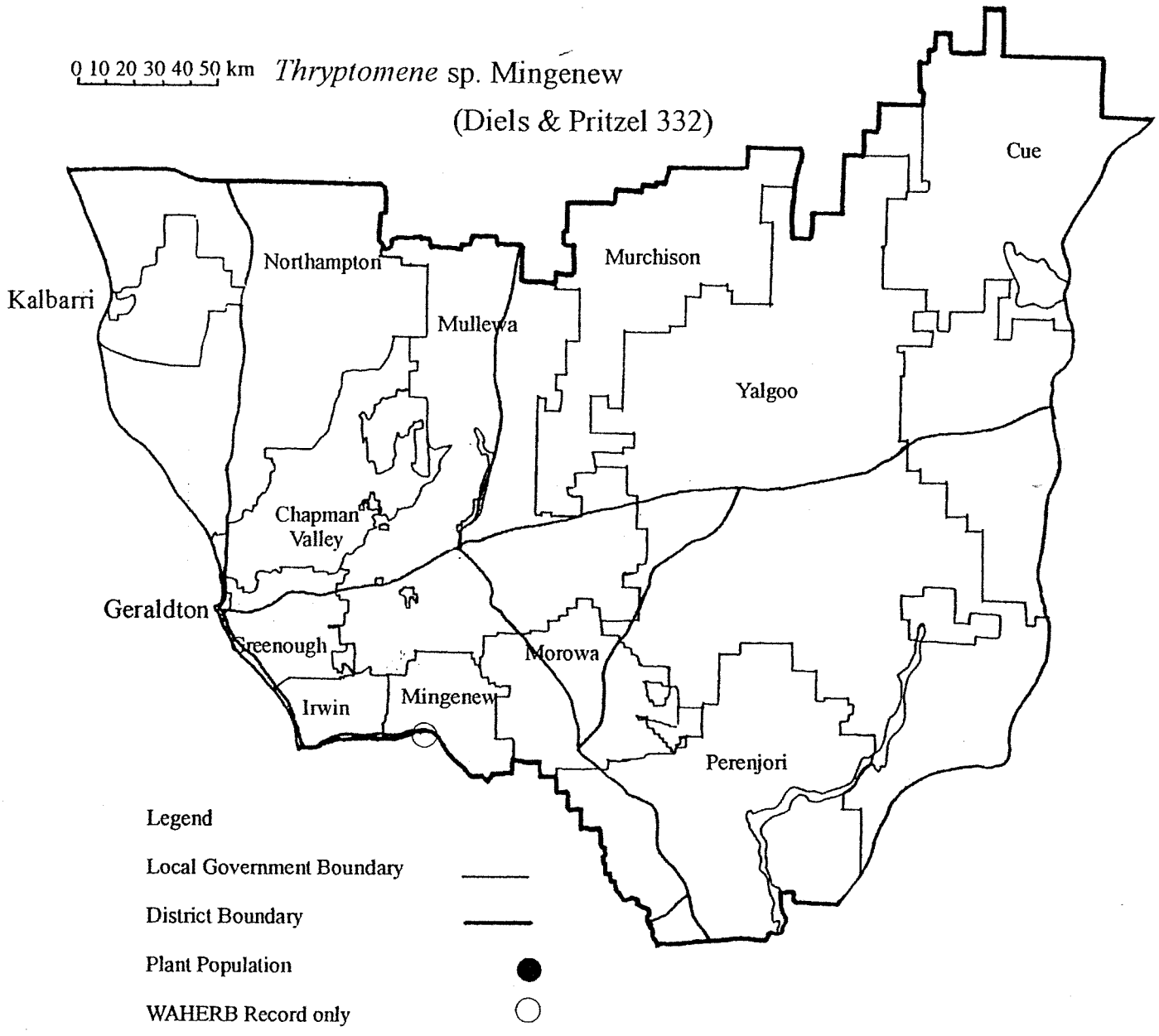
Unknown

Research Requirements

– Further survey is required to refind this species.

References

B. Rye & M. Trudgen (personal communication).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Thryptomene sp. Mingenew
(Diels & Pritzel 332)
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Verticordia comosa A.S.George MYRTACEAE

An erect, open shrub to 2 m, with rounded entire leaves 2-4 mm long. The bracteoles are persistent. The flowers are pale yellow, the sepals are 4 mm long, with plumose lobes and peltate basal auricles covering the hypanthium. The petals are fringed, 4 mm long, with small basal auricles. The stamens have anthers attached basally with a swollen filament apex, the staminodes are channelled and flared towards the apex. The style is 4.5-5.5 mm long, with a one-sided and tufted beard, the hairs to 0.8 mm long.

This species is related to *Verticordia lepidophylla* but differs in its larger leaves with spreading tips, the larger sepals and larger fringed petals and shorter style with tufted beard. The two species occur in separate areas.

Flowering Period: August-December

Distribution and Habitat in the Geraldton District

Has been recorded in the past from west of Morowa in the Geraldton District, and populations are known further south on the boundary of the District and south into the Moora District north-east of Three Springs over a range of c. 25 km.

Grows in deep yellow sand, yellow clayey sand, loamy sand over gravel and in greyish-yellow sand over gravel, in heath, open scrub and open woodland. Associated species include *V. monadelpha, V. densiflora, V. spicata* subsp. *squamosa* and species of *Eucalyptus, Scholtzia, Acacia* and *Grevillea.*

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. E of Yandanooka	Mi	Shire Road Reserve	15.2.1995	1+	Moderate
2. W of Morowa	Mo	-	28.11.1988	-	-
3.* W of Morowa	Mo	-	?1964	-	-

Response to Disturbance

Unknown

Management Requirements

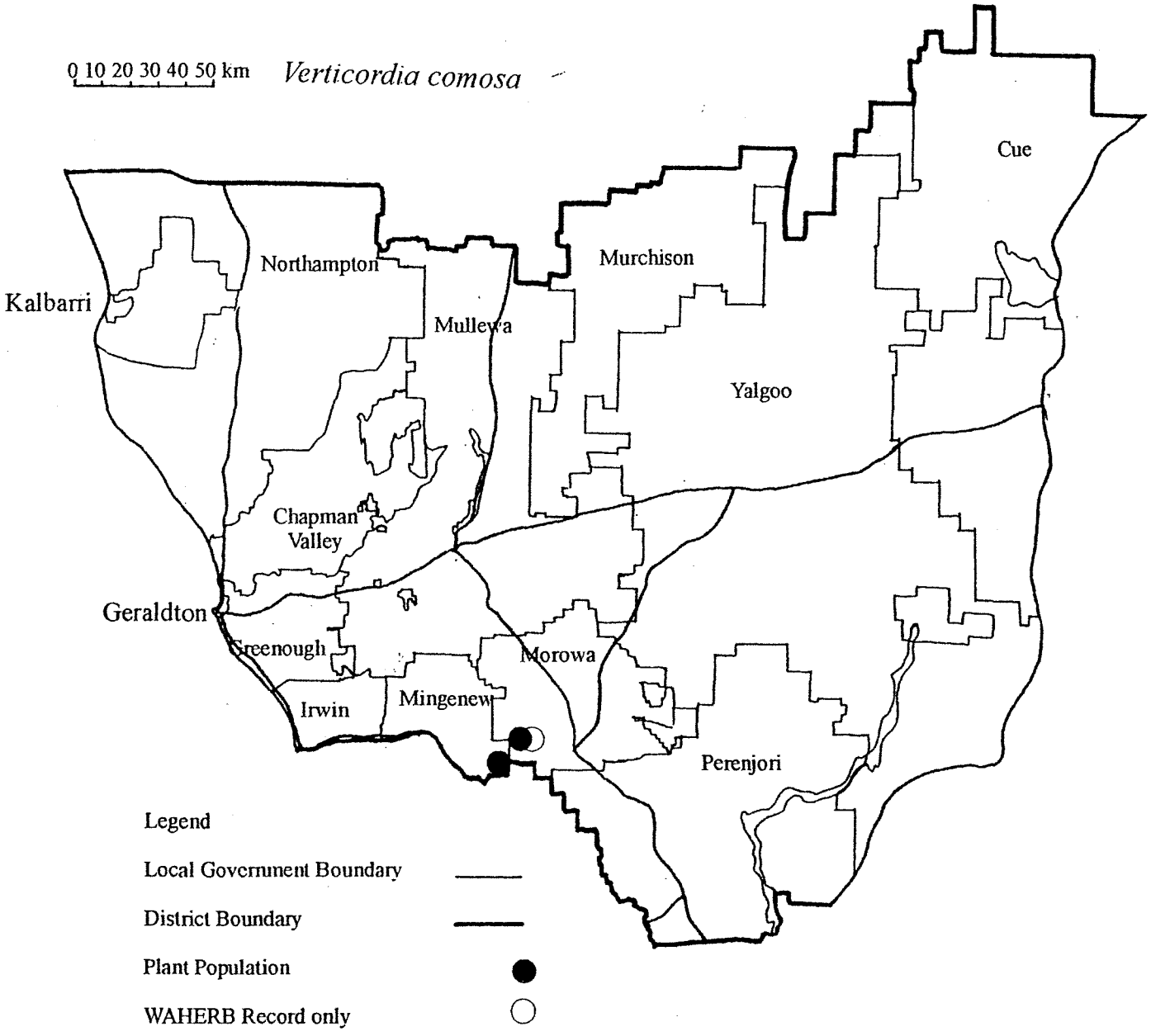
- Ensure that the population is marked.

Research Requirements

- Further survey is required on reserves and remnant vegetation in the area of its known occurrence.
- Collect seed for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.

References

George (1991).


0 10 20 30 40 50 km
Verticordia comosa
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Verticordia dasystylis subsp. *oestopoia* A.S.George MYRTACEAE

A dwarf, mounded, single-stemmed shrub to 30 cm high and 60 cm wide. The leaves are oblong to elliptic in shape, blunt at the apex, 1.5-4 mm long. They have margins that are irregularly toothed or are edged with fine bristles. The flowers are on stalks 3-6 mm long and they are pale creamish-lemon to bright yellow in colour. The sepals are intricately divided into spreading fringed lobes and are 6-7 mm long. Each petal is fringed and is 3 mm long.

This subspecies differs from the other subspecies in that the linear staminodes are shorter, only 0.7 mm long, whereas in the others they are 1.2 mm or longer. The anthers are globular and the style is 8 mm long with white hairs for up to three-quarters of its length.

This species is related to *Verticordia penicillaris* from which it differs in its smaller size and more hairy style. The specific name means hairy or shaggy style. This subspecies was known only from the Arrowsmith area when it was named in 1991. The name "*oestopoia*" is from the Greek for arrow and to make or work, in reference to the name Arrowsmith.

Flowering Period: October-early November

Distribution and Habitat in the Geraldton District

This taxon is now known from two small populations west of Bunjil in the Geraldton District. These are c. 5 km east of the Moora District boundary and c. 60 km east of the location of the original collection which was a few kilometres south of the Arrowsmith River within the Moora District to the north-east of Eneabba. It has not been refound at this location.

Grows in shallow soils of yellowish-grey clay loam or yellow-grey sand over granite in open shrubland with associated species including *Melaleuca radula*, *Acacia uncinata*, *Mirbelia ramulosa*, *V. monadelpha* and *Dodonaea* sp.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. W of Bunjil	P	Shire Road Verge, Private	5.11.1997	130+	Disturbed, on scraped road verge
2. W of Bunjil	P	Shire Road Verge, Private	5.11.1997	20+	Disturbed, rubbish and gravel scrape near population

Response to Disturbance

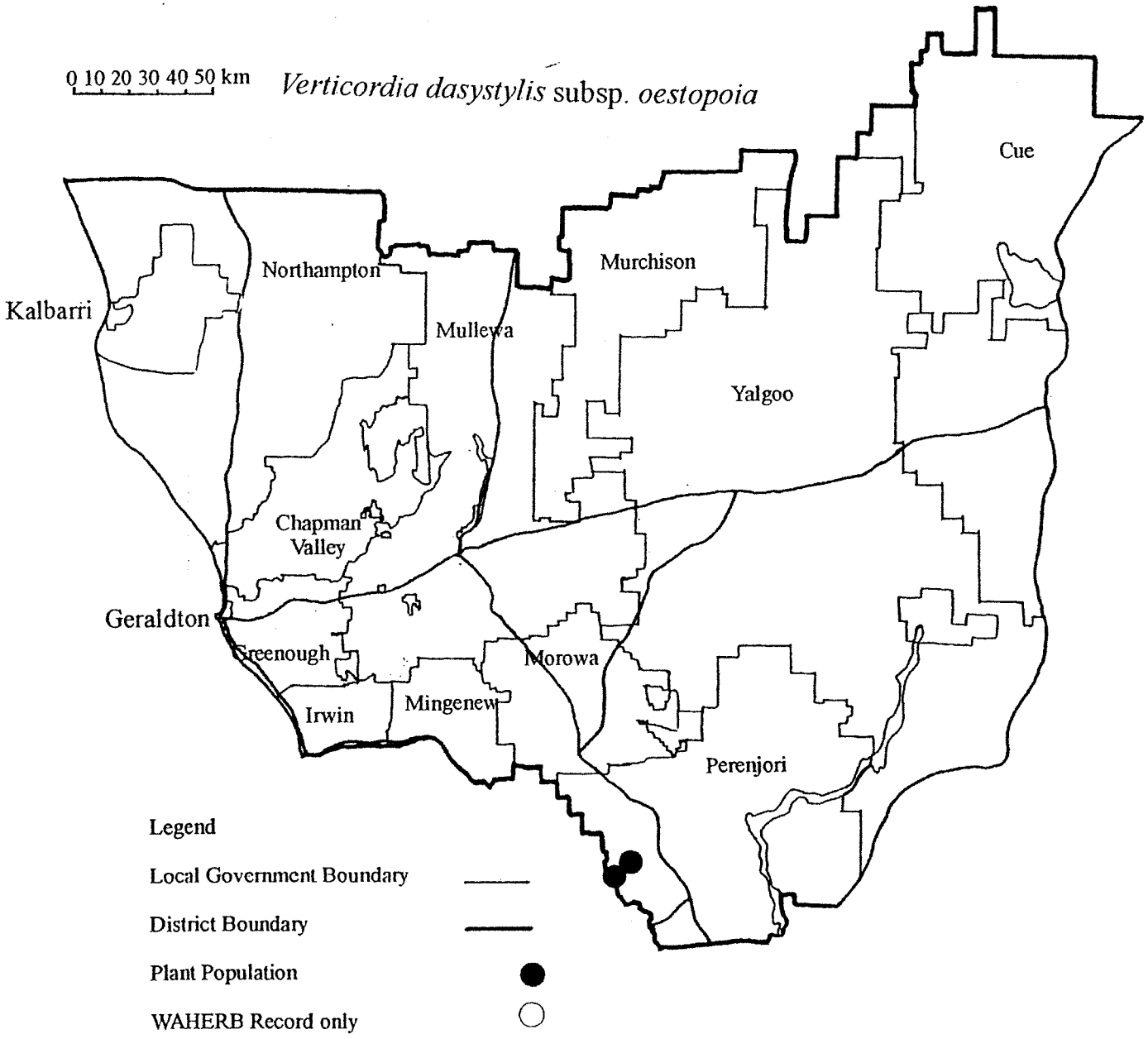
Unknown

Research Requirements

- Further survey is required, particularly in nature reserves in the area of occurrence.
- Collect seed for storage according to the protocols of the Threatened Flora Seed Centre at the Western Australian Herbarium.

References

George (1991).


0 10 20 30 40 50 km
Verticordia dasystylis subsp. oestopoia
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Verticordia x *eurardyensis* E.A.George & A.S.George MYRTACEAE

A low, lignotuberous shrub to 1 m tall. The leaves are spathulate, obovate or elliptic, 1-4 mm long, the floral leaves wider than the stem leaves. The flowers are spreading, arranged in spike-like groups on peduncles 0.5 mm long. The hypanthium is five-ribbed, with thick reflexed appendages up to two-thirds its length. The sepals are plumose, with 8-11 lobes. They are up to 5 mm long, dark magenta to maroon, with deeply fringed auricles. The petals are 2.5-3 mm long, with a fringe c. 2 mm long. They are the same colour as the sepals or a little paler. The stamens and staminodes are joined, the stamens incurved, 2 mm long. The style is up to 6.5 mm long, bent below the apex and bearded all round.

The plants are morphologically intermediate between the parents, are relatively uniform and show no indication of back-crossing to either parent.

This species differs from *Verticordia dichroma* in its narrower, more crowded leaves, shorter peduncles, smaller hypanthium with more acute appendages, sepals with narrower acute lobes and smaller, broader petals. It differs from *V. spicata* in its less crowded leaves, larger hypanthium, longer petal fringe and different flower colour.

Flowering Period: October-November

Distribution and Habitat in the Geraldton District

Known only from the type locality north of Northampton, where it occurs with both the presumed parents, *V. dichroma* var. *dichroma* and *V. spicata* var. *spicata.*

Grows on flat sandplain in yellow sand over clay, over rock along a shallow drainage line with *Actinostrobus arenarius* and low heath, with *V. oculata, V. dichroma* var. *dichroma, V. spicata* var. *spicata, V. capillaris, Beaufortia squarrosa, Calytrix strigosa, Eremaea* and *Petrophile* species.

Two plants occur in undisturbed vegetation, the others in an area adjacent to a firebreak which had been cleared then allowed to regenerate.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Eurardy	N	Pastoral Lease	30.11.1992	27	-

Response to Disturbance

Part of the population occurs in an area which was cleared then left to regenerate about six years previous to its discovery. As *V.* x *eurardyensis* has a lignotuber, it should persist.

Management Requirements

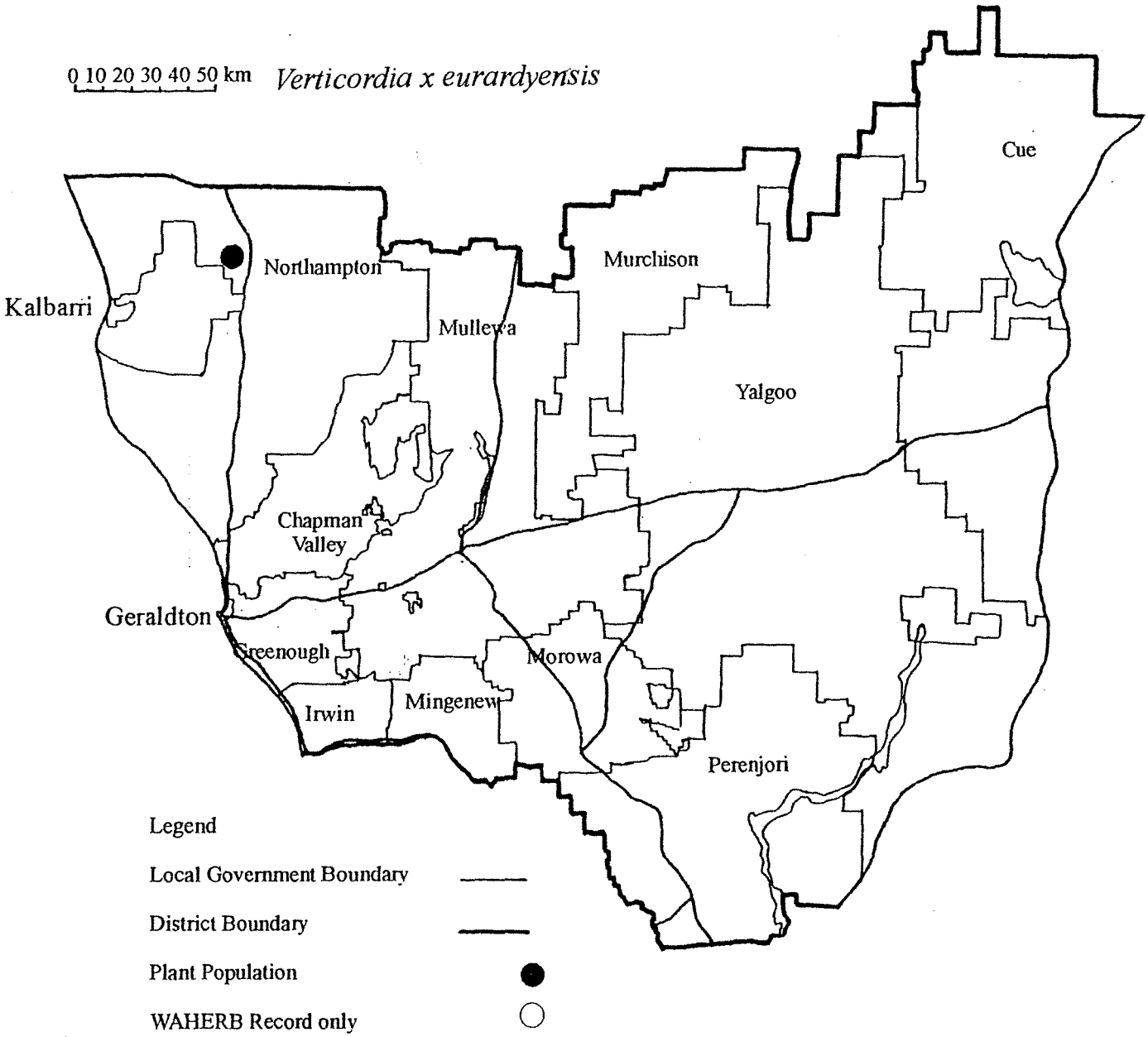
- Maintain liaison with pastoralists on whose land the population occurs.
- Monitor population regularly.

Research Requirements

- Further survey is required.

References

George & George (1994).


0 10 20 30 40 50 km
Verticordia x eurardyensis
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Verticordia fragrans A.S.George MYRTACEAE

An erect shrub 1 to 3 m tall, with open branching. The leaves are orbicular to elliptic and entire in shape, 1.4-4 mm long, the bases partly stem-clasping. The flowers are borne on thick stalks in dense spikes towards the ends of the branches. They are pink and white in colour, both sepals and petals being pink at the base and white above so that the flowers are dark pink at the centre. They have a sweet honey scent. The hypanthium is warty glandular and hairless with five green, broad, thick appendages from the apex. The sepals are 3.5-4 mm long, with 6-9 broad, plumose lobes and basal auricles covering the hypanthium. The petals are 4-4.5 mm long with small basal auricles. They are 4-4.5 mm long, orbicular in shape, erect and entire with cilia towards the base. The stamens are 3.5 mm long and the staminodes are oblong, acute and incurved, 3-3.5 mm long.

Verticordia fragrans differs from closely related species in its pink and white fragrant flowers, the broad sepal lobes and entire upper margins of the prominent petals.

Flowering Period: Late September-November

Distribution and Habitat in the Geraldton District

In the Geraldton District, this species is known only from a collection made in 1959 of uncertain location which was either from Dinner Hill in the Moora District or from Mullewa. The species has also been reported from south-west of Mullewa, so it seems more likely to be the latter. The main distribution of the species is in the Moora District, where it occurs as a few populations to the north and south of Eneabba and one population further south in the Coomalloo area.

Grows in deep white or grey to yellow sand with lateritic gravel beneath or in sandy clay loam in tall shrubland, sometimes with open low woodland of *Eucalyptus todtiana* and *Banksia attenuata* with open heath. Associated species include *V. aurea, V. laciniata, V. grandis* and *V. monadelpha.*

Conservation Status

Current: Priority 1[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SW of Mullewa	Mu	Shire Road Verge	1990/91	1	Not refound more recently
2.* Dinner Hill/Mullewa	-	-	10.1959	-	-

Response to Disturbance

Unknown

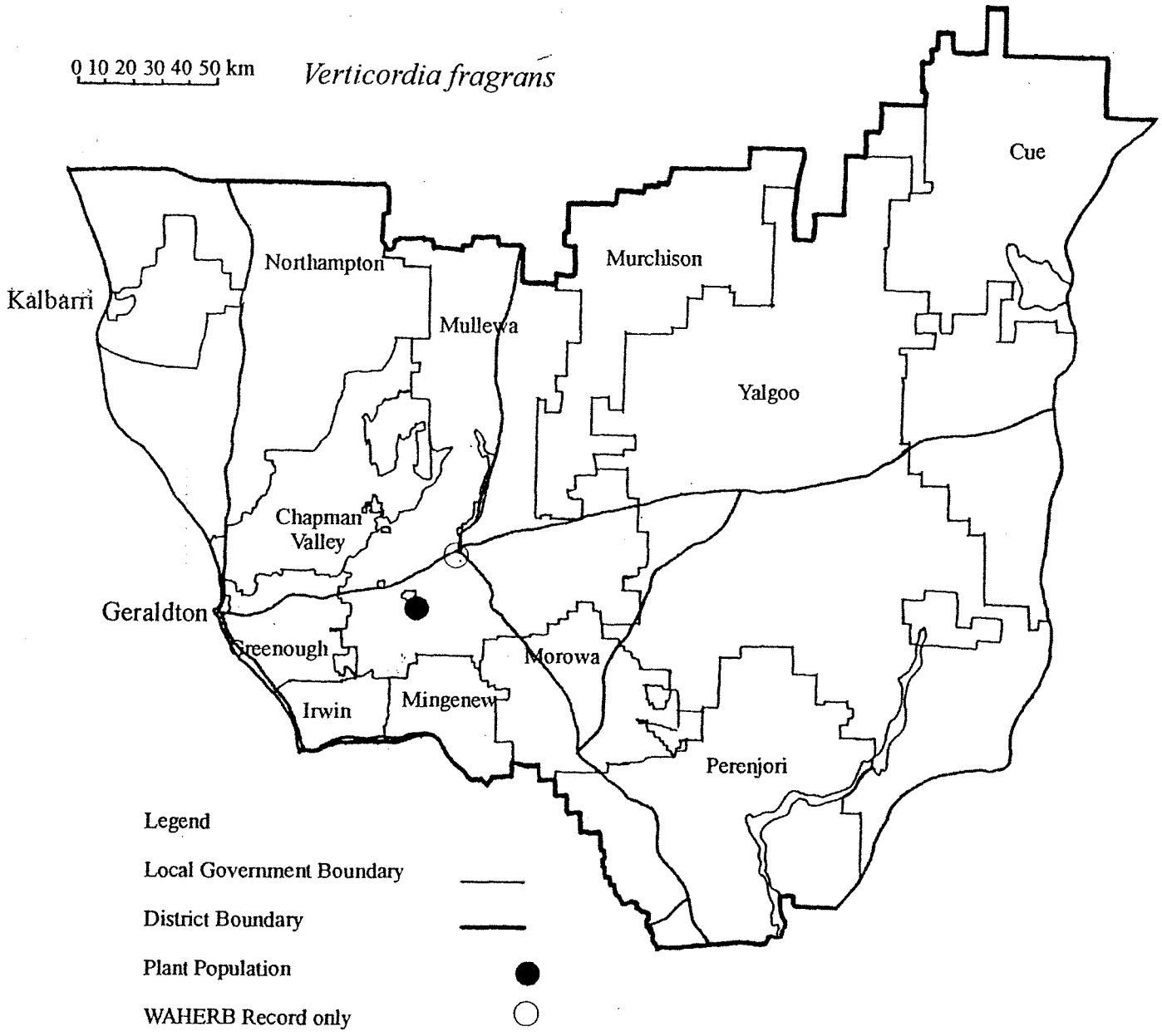
Research Requirements

- Further survey is required in the Mullewa area, particularly on the nature reserve adjacent to population 2, to confirm the presence of the species in that area.

References

George (1991).

[#] now Priority 3 (updated at December 1999)


0 10 20 30 40 50 km
Verticordia fragrans
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Verticordia lepidophylla F.Muell. var. *quantula* A.S.George MYRTACEAE

An erect, spreading shrub to 2.3 m tall and 1 m across, with fibrous bark. The leaves are obovate to orbicular, thick and overlapping on the branchlets. They are c. 2 mm long. The flowers are on short stalks, axillary below the ends of the branchlets. The calyx tube is five-ribbed. The sepals are 2-2.5 mm long, divided less than half-way into shortly fringed lobes, or may be simple with dentate margins. They are pale green or yellow-green. The petals are entire, c. 8 mm long, cream or lemon-cream with white, or may be pale pink. The stamens are united at the base and the staminodes are spathulate, fringed at the ends. The filaments are cream and the anthers brown. The style is exserted, bearded towards the end, which is maroon.

Differs from *Verticordia lepidophylla* var. *lepidophylla* in its smaller sepals which are less deeply lobed and less fringed or simple with a dentate margin, and in its petals which are entire, not dentate.

Flowering Period: October-November

Distribution and Habitat in the Geraldton District

Occurs north of the Murchison River near the vermin proof fence, where it occurs at two localities.

Grows in red sand over limestone in tall shrubland with *Banksia ashbyi*, and in yellow sand in heath with *Banksia* and *Actinostrobus* species.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Vermin Proof Fence	N	Pastoral Lease	29.10.1986	-	-
2. Vermin Proof Fence	N	Pastoral Lease	29.10.1986	-	-
3. S of Vermin Proof Fence	N	-	28.10.1986	"Growing in groups"	-
4. Near Emu Fence	N	VCL	23.11.1992	6	-

Response to Disturbance

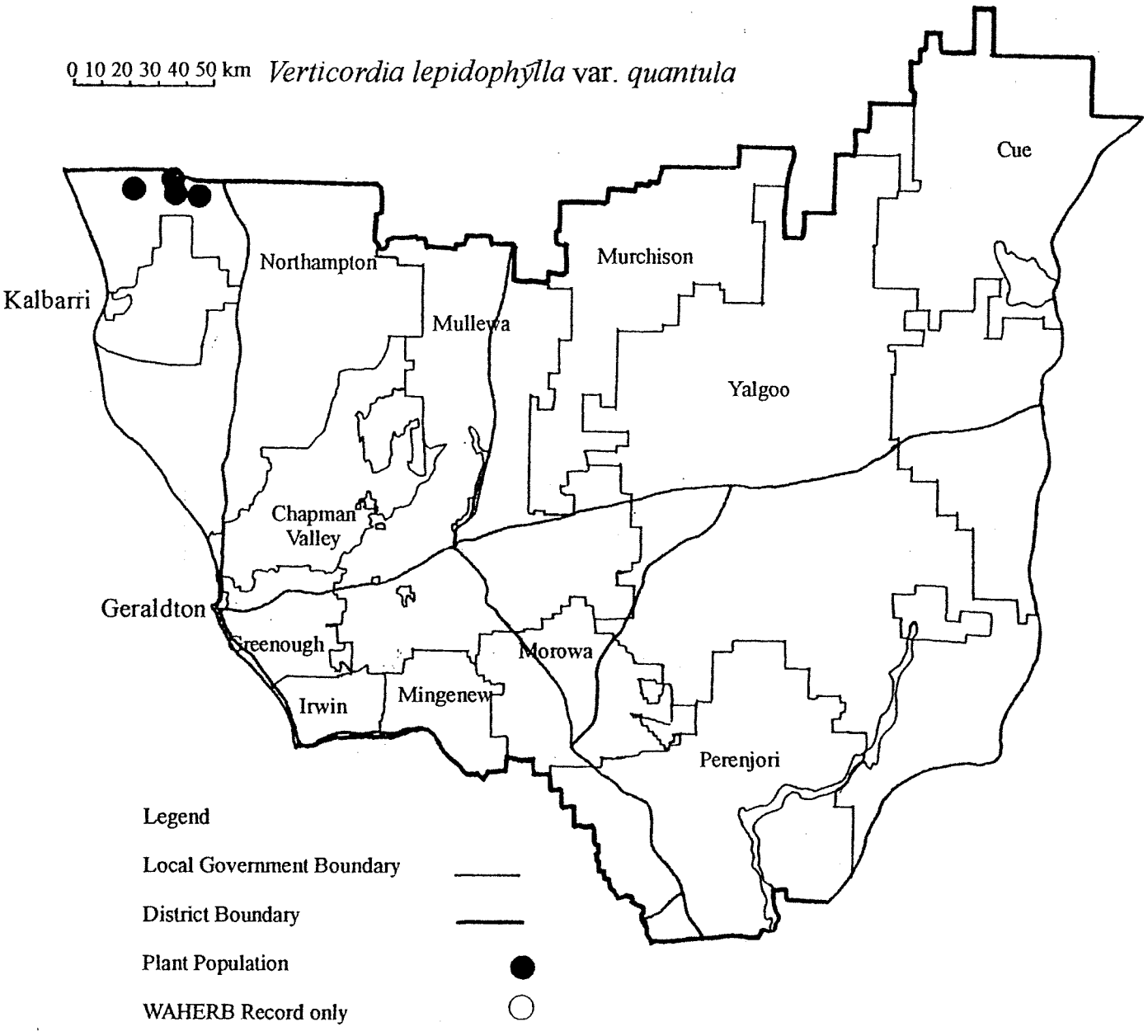
Unknown

Research Requirements

– Further survey is required.

References

Bentham (1866), George (1991), Mueller (1859).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Verticordia lepidophylla var. quantula
Cue
Murchison
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Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Vittadinia cervicularis var. *occidentalis* N.T.Burb. ASTERACEAE

An annual or perennial herb more than 0.3 m tall, sparsely hairy with straight, stiff hairs and with branched leafy stems. The branches are stiff and erect, the leaves are broadly oblanceolate towards the base, becoming narrow higher. They are entire or have a pair of spreading lobes near the middle and are up to 4.5 cm long. The flowers are white, purple or blue. They are arranged in terminal heads with the involucre 10-14 mm long, the inner and intermediate bracts without attenuate, ciliate apices. The ray florets are female, the disc florets hermaphrodite. The fruit is dry, one-seeded and narrow, 8-9 mm long, narrowed or with a short neck below the pappus and the lower part sparsely hairy. There are 5-7 ribs on the faces, of which 2-4 extend to the summit between the ridges.

Flowering Period: September

Distribution and Habitat in the Geraldton District

This variety has been collected five times in the Geraldton District, near Geraldton and further north. It has also been collected from north of Yandanooka, which is further to the south-east. A report of *Vittadinia triloba* was made from Geraldton in 1995. As this species does not occur in Western Australia, the specimen may have been *V. cervicularis* var. *occidentalis*.

No habitat details have been recorded.

Conservation Status

Current: Priority 1

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* Between Northampton & Lynton	N	-	20.9.1932	-	-
2.* White Peak	CV	-	9.1939	-	-
3.* N of Geraldton	G	Shire Reserve	17.8.1965	-	-
4.* Champion Bay	G	-	9.1899	-	-
5.* N of Yandanooka	Mi	-	30.9.1904	-	-

Response to Disturbance

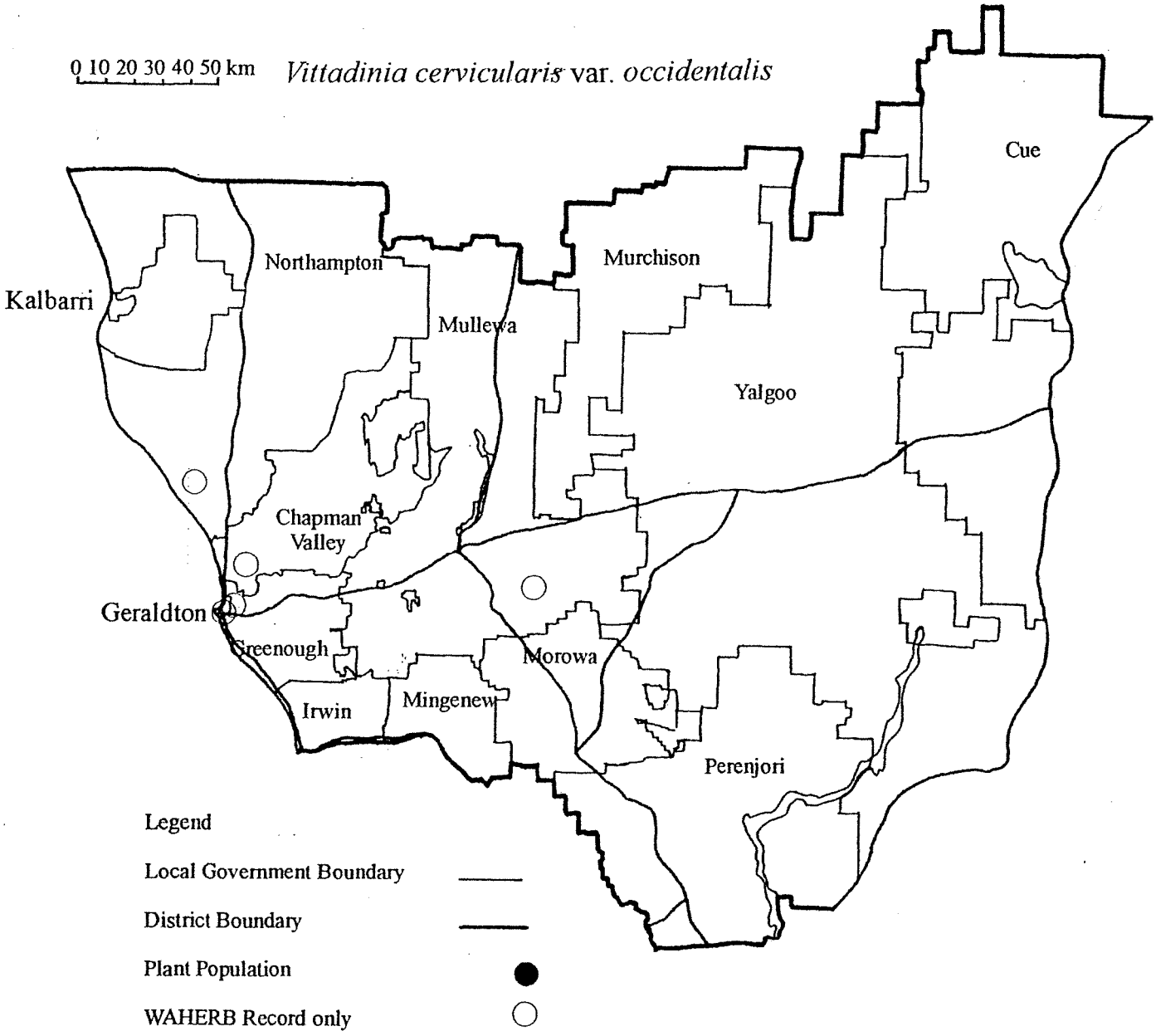
Unknown

Research Requirements

– Further survey is urgently required to refind this taxon.

References

Burbidge (1982).


0 10 20 30 40 50 km
Vittadinia cervicularis var. occidentalis
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Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

B. Priority Two Taxa

Acacia gelasina Maslin MIMOSACEAE

A glabrous shrub, dense and spreading, much-branched at ground level, 1-2.5 m tall. The bark is grey, smooth or finely fissured. The phyllodes are long, oblanceolate to linear-lanceolate, narrowing to the base and with a sharp pointed tip. They are 4-10 cm long, 5-8 mm wide, leathery, one-nerved on each face, the midrib and marginal nerves yellow and the lateral nerves not prominent. There is a gland 1-3 mm above the pulvinus and also one at the base of the mucro. The inflorescences are short racemes, 2-20 mm long with 2-6 globular, densely many-flowered heads on peduncles 1-2 cm long. The flowers have sepals which are almost free, joined only at the base. The pods are broad and flat but rounded over the seeds, thin textured, to 15 cm long, 12-14 mm wide, with up to 10 seeds. The seeds are 7-8 mm long, 6-7 mm wide and have a shallow depression on each face. The funicle is thread-like, not expanded to form an aril.

This species appears to be most closely related to *Acacia murrayana,* a widespread and common arid zone species which differs in having thin, pliable phyllodes and smaller seeds. It is usually tree-like, to 5 m tall, with a waxy coating on the branchlets, and has phyllodes with a gland at the distal end of the pulvinus, shorter peduncles, 4-10 mm long, and papery pods to 9 cm long and 8-12 mm wide.

The specific name is derived from the Latin for a dimple, referring to the depression on the lateral face of the seed.

Flowering Period: June-September

Distribution and Habitat in the Geraldton District

Occurs over a small area over c. 50 km along the North West Coastal Highway north of the Murchison River, extending to just north of the District boundary where the northern most population has been recorded..

Grows on yellow sand in dense tall shrubland with *Actinostrobus arenarius.*

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. N of Murchison River	N	-	3.12.1991	-	-
2. 100 Mile Tank	N	-	3.5.1989	-	-
3.* N of Murchison River	N	-	19.11.1972	-	-
4.* S of Billabong	N	-	8.9.1983	-	-
5.* N of Murchison River	N	-	12.12.1984	-	-
6.* N of Murchison River	N	-	19.12.1962	-	-

Response to Disturbance

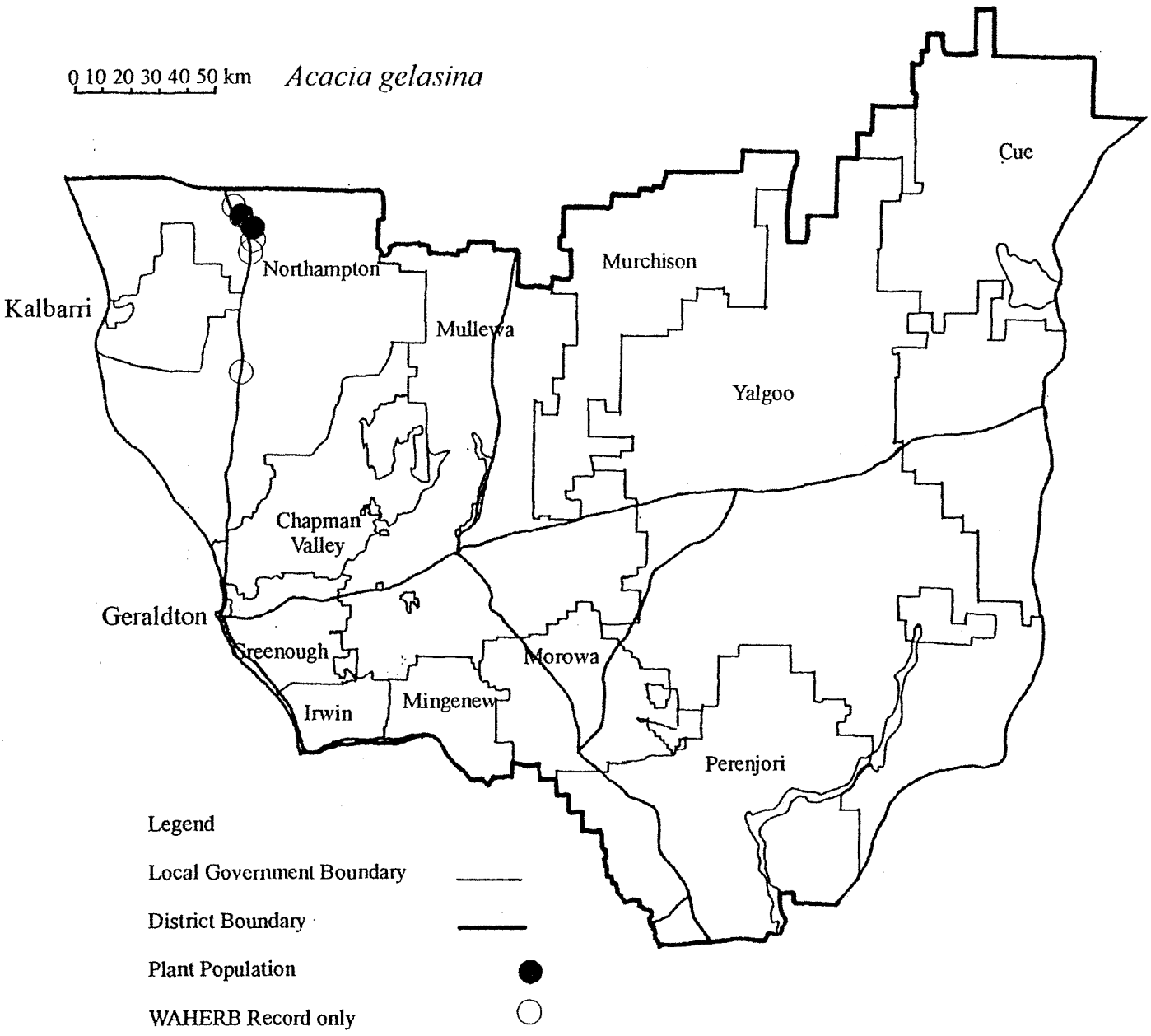
Unknown

Research Requirements

– Further survey is required, particularly on the sandplains north of the Murchison River, to find new populations and to refind and survey all populations previously recorded, particularly within the Kalbarri National Park.

References

Maslin (1995b).



Acacia leptospermoides Benth. subsp. *obovata* Maslin MIMOSACEAE

An open shrub to 1.5 m tall, with broadly obovate to orbicular phyllodes to 13 mm long and 8 mm broad. The inflorescences are simple, on peduncles 4-7 mm long. They are globular, bright yellow, with 30-35 flowers which have their parts in fives. The legumes are curved to c. 30 mm long, 1.5-2 mm wide. The seeds are 2.5 mm long, brown and mottled, with a straight yellowish aril.

Acacia leptospermoides is closely related to *A. ericifolia* which has longer, narrower phyllodes. This subspecies differs from the typical subspecies in its phyllodes, which are broader and somewhat shorter. It differs from *A. leptospermoides* subsp. *psammophila* in its phyllodes being both broader and longer.

Flowering Period: June-August

Distribution and Habitat in the Geraldton District

Occurs in the Geraldton District along the North West Coastal Highway and to the east and west, from south of the Murchison River north to the northern boundary of the District and for c. 60 km further north.

Grows on yellow sandplain, brown sandy loam or grey clay in heath, tall scrubland or with mallee eucalypts. Associated species include *Grevillea annulifera, Conospermum stoechadis, Eucalyptus oldfieldii, E. dongarriensis, E. eudesmoides, Hakea stenophylla, H. bucculent, Santalum acuminatum, Ecdeicolea monostachya, Baeckea and Actinostrobus* species.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. S of Murchison River	N	Shire Road Verge	6.7.1995	2	Moderate, some weed infestation
2. N of Murchison River	N	National Park, MRWA Road Verge	5.7.1995	3	Healthy
3. N of Murchison River	N	National Park, MRWA Road Verge	5.7.1995	1+	Healthy
4. N of Murchison River	N	MRWA Road Verge	5.7.1995	5+	Healthy
5. E of Ogilvie	N	-	25.6.1997	"Frequent"	-
6. N of Murchison River	N	-	18.7.1985	-	-
7.* SE of Kalbarri	N	-	9.1980	-	-

Response to Disturbance

Unknown

Management Requirements

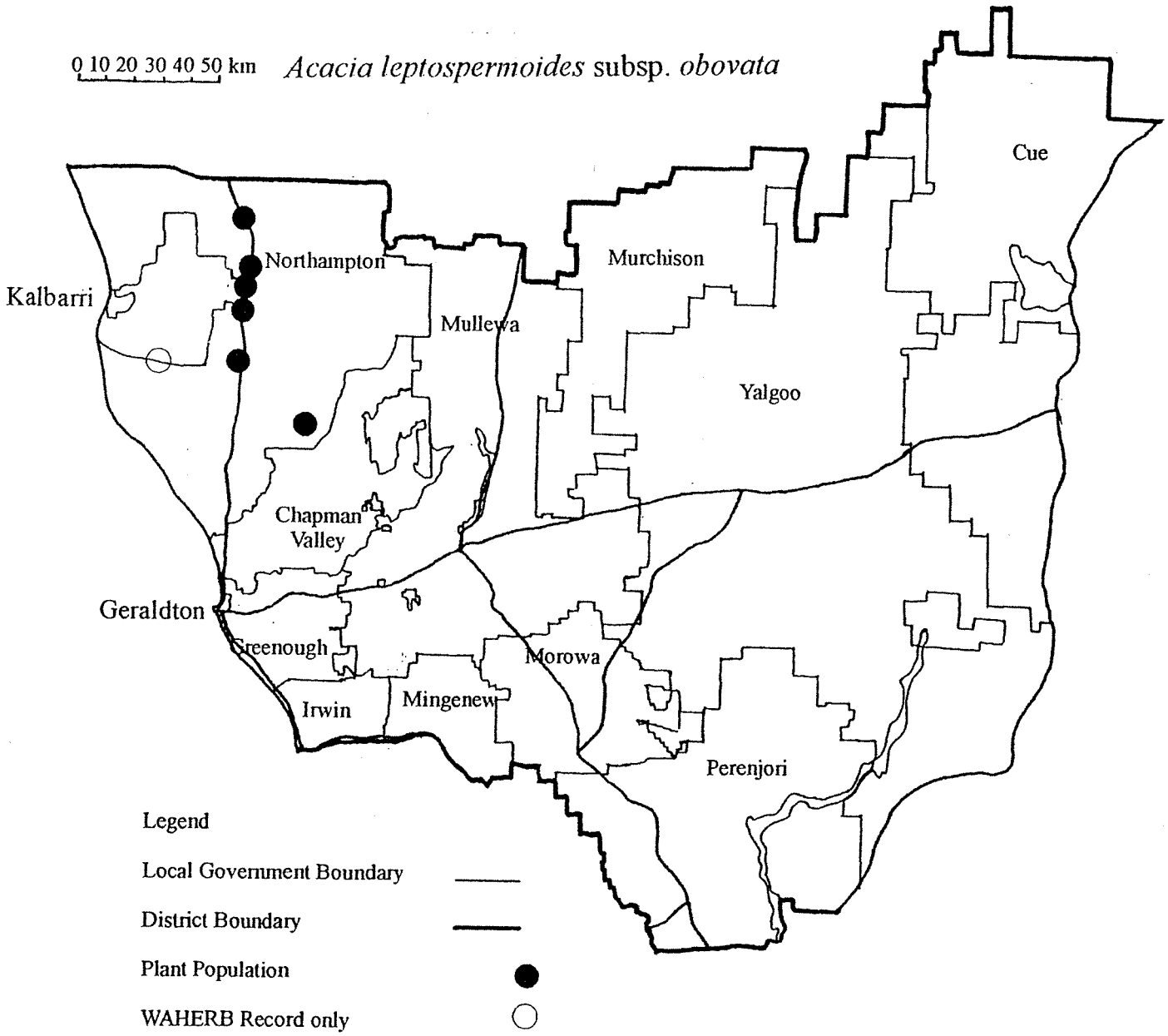
- Ensure that road verge populations are marked.
- Maintain liaison with land managers of land on which the populations occur.

Research Requirements

– Further survey is required on sandplain north and south of the Murchison River, particularly in Kalbarri National Park. Populations 5 and 6 require full survey.

References

Maslin (1978).



Acacia leptospermoides Benth. subsp. *psammophila* (E.Pritz.) Maslin

MIMOSACEAE

This taxon was originally described as a distinct species by Pritzel in 1904.

A spreading shrub to 1.5 m high, it has small phyllodes, 4-7 mm long, 1-2 mm wide, obovate to narrowly obovate and fleshy. They are green and tinged glaucous at the tips. The inflorescences are globular, solitary on peduncles 4-7 mm long. The flowers are bright yellow, with their parts in fives. The pods are light brown, short, c. 30 mm long and curved or once coiled. The seeds are dark brown, slightly mottled, with a white aril.

Flowering Period: July-August

Distribution and Habitat in the Geraldton District

Occurs between Yuna, Mullewa and Wicherina, to the east and north-east of Geraldton.

Usually grows in yellow sand but has been recorded on red sand, gravelly sand or pink sandy clay loam. Occurs in heath associated with tall shrubland, sometimes with mallees. Associated species include *Allocasuarina campestris, Hakea bucculenta, Eucalyptus obtusiflora, Acacia ligulata, A. rostellifera, Actinostrobus arenarius, Melaleuca* and *Calothamnus* species.

Conservation Status

Current: Priority 2[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Bindoo Hill	CV	Nature Reserve	3.4.1994	1+	Healthy
2. E of Yuna	CV	Nature Reserve	2.4.1994	3	Healthy
3. Bindoo Hill	CV	Nature Reserve	3.4.1994	5+	Healthy
4. Erangy Springs Road	Mu	Nature Reserve	6.8.1994	200+	Healthy
5. E of Yuna	CV	Nature Reserve	8.8.1994	100+	Healthy
6. N of The Casuarinas	Mu	Shire Road Verge	7.7.1995	100+	Healthy
7. Ambania	Mu	Crown Reserve	4.12.1991	"Fairly Common"	-
8. Indarra South Road	Mu	-	3.10.1989	-	-
9. N of Eradu	CV	-	28.11.1997	-	Weed infestation
10.*E of Ambania	Mu	-	20.7.1982	-	-
11.*Wicherina	G	Water Reserve	18.8.1974	-	-
12.*Eradu	G	-	9.7.1971	-	-
13.*E of Eradu	Mu	-	1.7.1957	-	-

Response to Disturbance

Unknown

Management Requirements

- Ensure that road verge populations are marked.
- Maintain liaison with land managers.

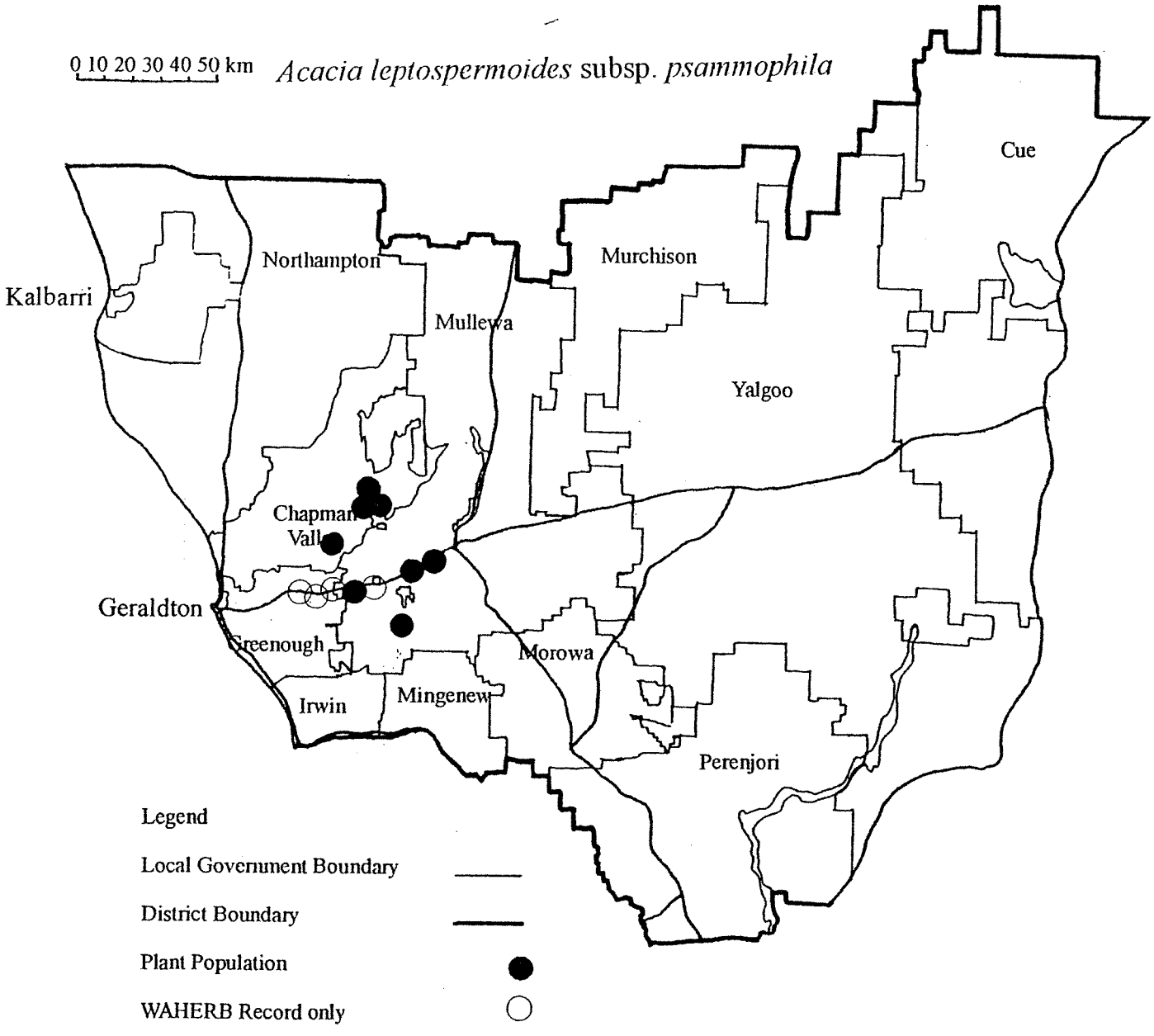
[#] now Priority 3 (updated at December 1999)

Research Requirements

– Further survey is required, particularly to refind and fully survey populations 9-12.

References

Maslin (1978), Diels & Pritzel (1904-5).



Acacia stereophylla Meisn. var. *cylindrata* R.S.Cowan & Maslin MIMOSACEAE

A shrub or small tree, 1-3 m tall, with dark grey-brown fibrous bark. The phyllodes are terete to subterete, 10-18 cm long, 1.3-2 mm broad, mid-green and erect, with the nerves equally distinct and with an unribbed pulvinus. There are two flower heads on stalks 2-5 mm long, at each node. The heads are cylindrical, golden, 18-35 mm long, 6 mm in diameter. The pods are narrowly oblong, restricted between the seeds, papery and pale grey-brown in colour. They are c. 4 cm long, 4-5 mm wide, and hang downwards. The seeds are up to 3.2 mm long, widely elliptic, glossy and tan in colour.

This variety differs from the typical variety of *Acacia stereophylla,* in its phyllodes being terete, not flat, and 1.3-2 mm in diameter, not 3.5-6.5 mm broad. It also differs in that the nerves of the phyllodes are equally distinct and in that the pulvinus lacks an abaxial rib.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

Occurs only in the Kalbarri National Park on the Murchison River.

Grows in sand over sandstone and on sandstone cliffs in *Acacia* shrubland. Associated species include *Ecdeiocolea monostachya* and species of *Eriostemon, Lobelia, Cephalipterum, Casuarina* and *Drakaea.*

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. The Loop	N	National Park	2.10.1991	"Common"	-
2. Z Bend	N	National Park	8.9.1990	"Common"	-

Response to Disturbance

Unknown

Management Requirements

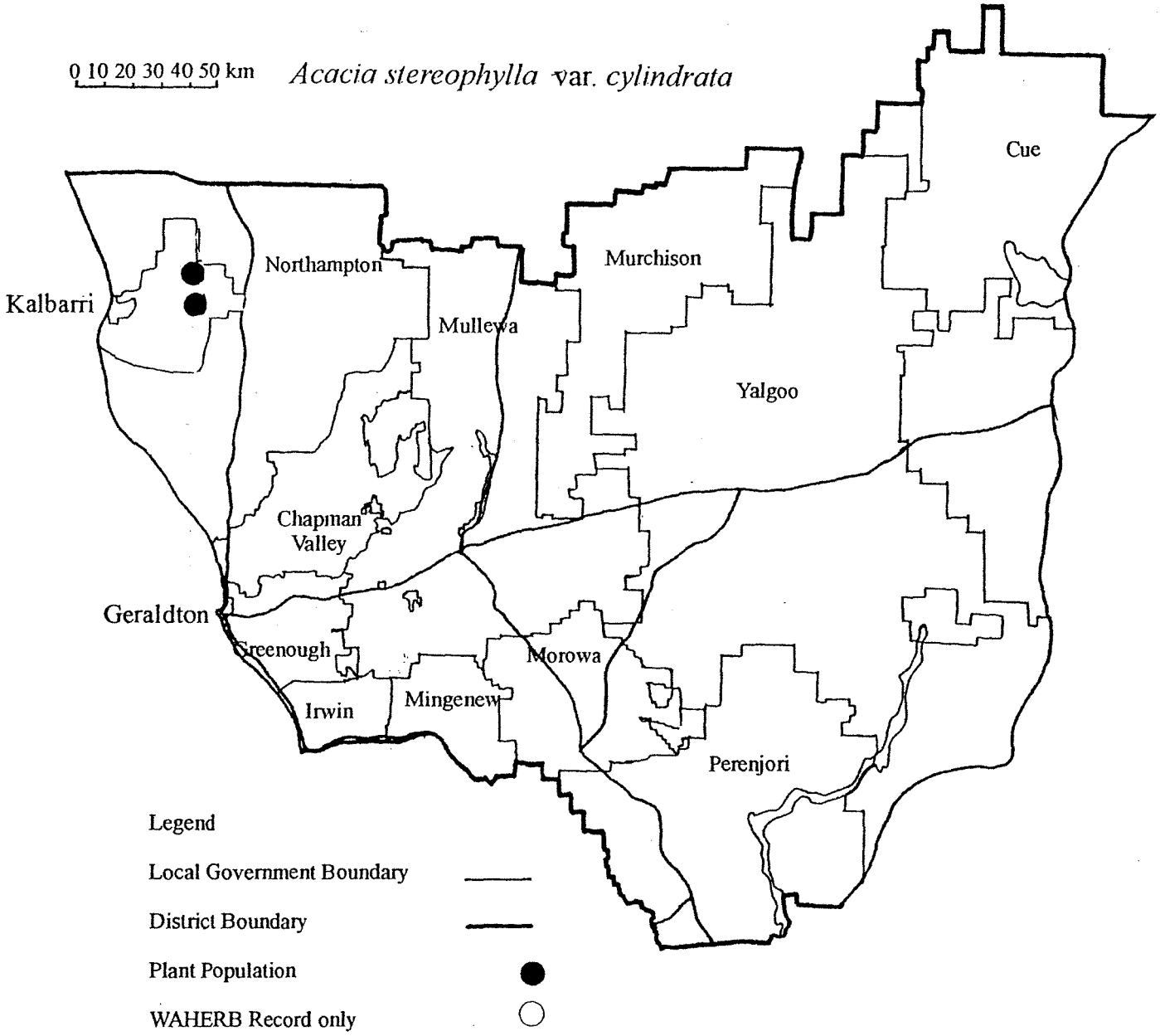
- Ensure that the populations are marked to prevent damage.

Research Requirements

- Further survey is required in suitable habitat to establish the full extent of this taxon in the area.

References

Cowan & Maslin (1995a).


0 10 20 30 40 50 km
Acacia stereophylla var. cylindrata
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Acacia subsessilis A.R.Chapman & Maslin MIMOSACEAE

A rounded shrub 1-2 m tall, sparsely branched at ground level. It has grey bark, fibrous at the base, smooth towards the ends of the branches which are red-brown. They have raised stem projections and numerous small white lenticels. The phyllodes are arranged alternately on the branches. They are sharply pungent and slightly reflexed, subterete, compressed to flat, rigid, 1-3 cm long, 1-1.5 mm broad. There are eight longitudinal nerves, three per face if flat. They are light green during winter and spring but become reddish-brown in colour during summer, contrasting strongly with those of *Acacia tetragonophylla* (an associated species) which remain green. The inflorescences are simple, obloid to ellipsoid, cylindrical, on hairy stalks 2-6 mm long. They are 7-9 mm long, 4-5 mm in diameter. The flowers have their parts in fives, with united sepals. The pods are linear, to 8 cm long, 5-8 mm wide. The seeds are to 5 mm long, shiny, dark brown with a cream aril.

This species superficially resembles *A. colletioides* which has terete phyllodes positioned on raised stem projections, two heads per axil which are shorter and oblongoid in shape, coiled pods and bright yellow seed arils. It is also similar to *A. chapmanii* which has terete phyllodes, persistent, fairly spinose stipules, globular heads and narrower legumes.

Flowering Period: June-August

Distribution and Habitat in the Geraldton District

Occurs between Yalgoo, Paynes Find and Mt Magnet.

Grows in red-brown loam or clay loam or red sand, with gravel or rock fragments on the slopes of low doleritic hills. Occurs in open shrubland with *A. tetragonophylla, A. grasbyi, Ptilotus obovatus* and *Eremophila, Eriostemon* and *Hakea* species over low annual species, including *Cephalipterum drummondii.*

Conservation Status

Current: Priority 2[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. N of Ninghan	Y	Pastoral Lease, Shire Road Verge	31.7.1995	30+	Healthy
2. Bullajungadeah Hills	Y	Pastoral Lease, Shire Road Verge	31.7.1995	30+	Healthy
3. Bullajungadeah Hills	Y	Pastoral Lease, Shire Road Verge	18.7.1994	100+	Healthy
4. E of Yalgoo	Y	MRWA Road Verge, Pastoral Lease	21.7.1994	4	Healthy
5. E of Yalgoo	Y	Crown Reserve	21.6.1995	200+	Healthy
6. N of Yalgoo	Y	Pastoral Lease	19.2.1997	50+	Healthy
7. SW of Yalgoo	Y	Pastoral Lease	20.2.1997	100+	Healthy
8. NW of Mt Magnet	MM	Pastoral Lease	13.8.1987	"Occasional"	-

Response to Disturbance

Unknown

[#] now Priority 3 (updated at December 1999)

Management Requirements

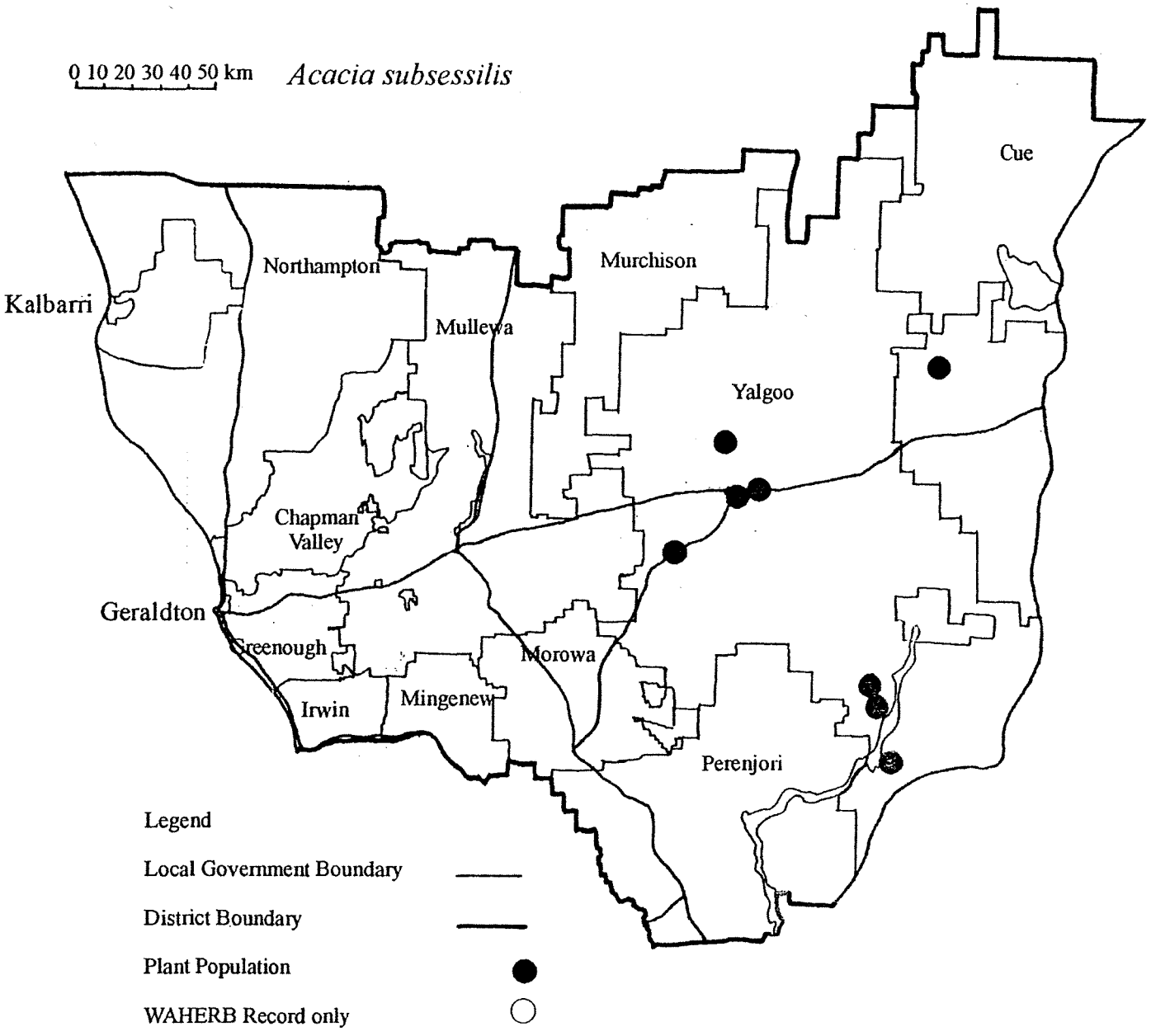
- Ensure that road verge populations are marked.
- Maintain liaison with land managers.

Research Requirements

- Further survey is required, particularly over the low ranges of hills on which this species grows, as most known populations may be much more extensive. Survey is required elsewhere in similar habitat.

References

Chapman & Maslin (1999).



Acanthocarpus parviflorus A.S.George DASYPOGONACEAE

A tufted perennial herb with stems to 40 cm long and with dark green leaves which are crowded on the stems. They are alternate, sessile and linear, the bases closely sheathing the stem. The leaf blade is 3-10 mm long, pungent pointed, with 3-5 leaf nerves. There are open grooves on the upper leaf surface. The flowers are grouped in terminal clusters on stalks 1-2 mm long and with sepals and petals 3 mm long. They are white in colour. The fruit is a warty capsule 4-5 mm long.

This species is distinguished by its small flowers and by the small crowded leaves with few open grooves.

Flowering Period: May-June

Distribution and Habitat in the Geraldton District

Occurs over a range of c. 35 km in the Kalbarri area. Has also been recorded from Shark Bay.

Grows in yellow or red sand and yellow-brown sandy loam over sandstone, on sandstone terraces and slopes along the Murchison River gorges. It is also found on sandstone ridges around Kalbarri.

Acanthocarpus parviflorus is found in open low heath to 1 m, sometimes beneath open low woodland of *Acacia* species or mallee eucalypts. Associated species include *Acacia acuminata, Allocasuarina humilis* and species of *Grevillea, Thryptomene, Melaleuca* and *Jacksonia.*

Conservation Status

Current: Priority 2[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Red Bluff	N	-	2.6.1994	10+	Moderate
2. NE of Kalbarri	N	National Park	2.6.1994	20+	Healthy
3. Red Hill	N	VCL	3.11.1994	5+	Moderate, some weed infestation
4. The Loop	N	National Park	1.6.1994	4	Poor, heavily grazed
5. Z Bend	N	National Park	1.6.1994	20+	Healthy to moderate, some plants grazed
6. Ross Graham Lookout	N	National Park	2.6.1994	30+	Poor, plants grazed
7. Hawkshead Lookout	N	National Park	2.6.1994	50+	Healthy
8. Mushroom Gorge	N	National Park	2.6.1994	10+	Poor, plants dying back

Response to Disturbance

Population 2 was partly burnt and plants were regenerating in the burnt area.

Management Requirements

- Grazed populations require monitoring in relation to goat control. This species appears to be particularly palatable.

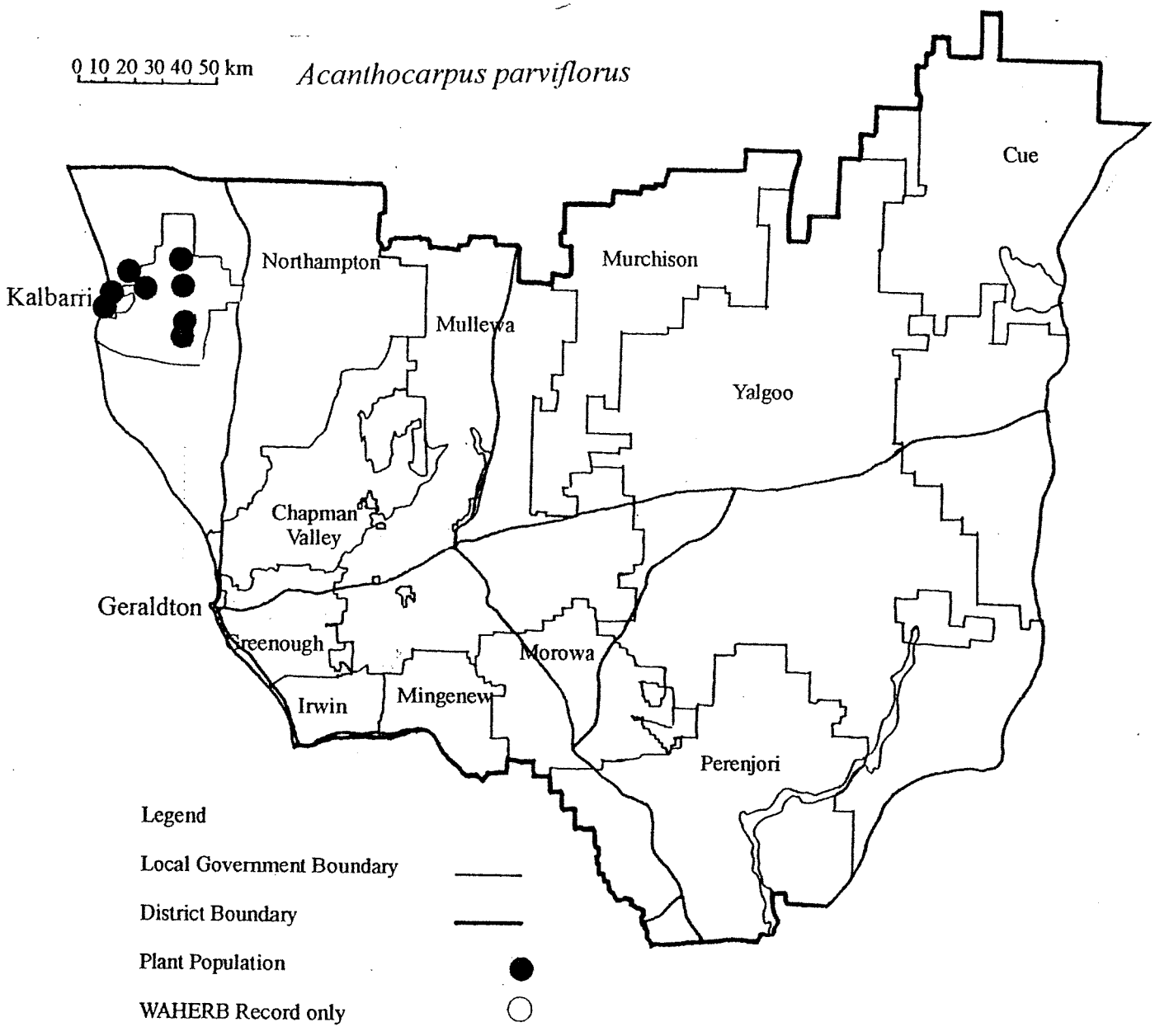
[#] now Priority 3 (updated at December 1999)

Research Requirements

- Further survey is required along the Murchison River, particularly in the National Park, to discover the full extent of this species.

References

George (1986).



Angianthus microcephalus (F.Muell.) Benth. ASTERACEAE

Small-headed Angianthus

An annual herb, prostrate to erect, to 30 cm in diameter and much-branched. The leaves are fleshy, linear to linear-cuneate in shape, c. 6 mm long. There are numerous clusters of flower heads, depressed globular in shape, c. 6 mm in diameter. Each is surrounded by 3-4 floral leaves almost as long as the head. The receptacle is convex. The flowers are yellow, their parts in fives and with a pappus of three ovate scales which are slightly jagged and have a fine awn shorter than the flower.

Flowering Period: October-December

Distribution and Habitat in the Geraldton District

This species has been found most recently in 1994 along the Murchison River north-east of Kalbarri, which is the area where it was originally found by Oldfield in 1867. It is also known in the Geraldton District from south of Cue. Other populations occur further north, from north-west of Cue at Boolardy, which is just north of the Geraldton District, and also on Dirk Hartog Island, and at Shark Bay in the Hamelin Pool and Carrarang areas.

Grows on salt flats along the Murchison estuary on red river sand. Near Cue, it is found on saltpans and on sand at the edge of saltpans, and in the Shark Bay area, on salt flats and the clay of old shell beds.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. NE of Kalbarri	N	Pastoral Lease	30.12.1994	"Occasional"	-
2. 'S of Cue	C	-	7.10.1989	-	-

Response to Disturbance

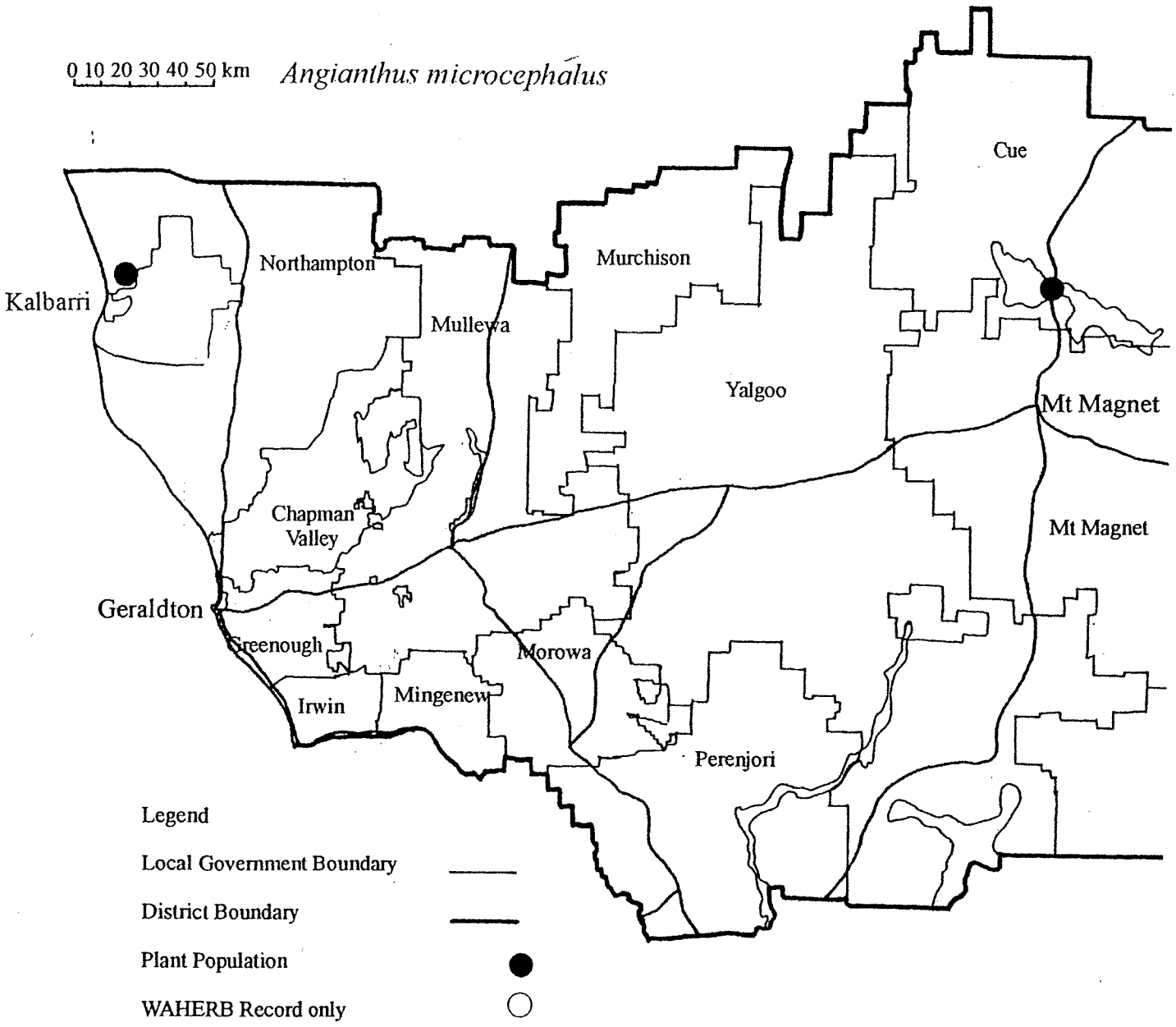
Unknown

Research Requirements

- Further survey is required, particularly to refind and survey fully the previously recorded populations.

References

Bentham (1866).


0 10 20 30 40 50 km
Angianthus microcephalus
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Mt Magnet
Chapman Valley
Mt Magnet
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Anthotroche myoporoides C.A.Gardner SOLANACEAE

Myoporum-like Anthotroche

An erect, rounded shrub to 3 m tall, covered with dense, greyish hairs. The leaves are obovate to elliptic, 20-35 mm long, 5-15 mm wide. The flowers are in loose 4-6 flowered clusters. They are funnel-shaped, with ovate triangular corolla lobes and stamens which do not project beyond the corolla tube. The flower is up to 8.5 mm long, the tube pale greenish with deep violet stripes, the lobes violet or whitish, sometimes with white margins. The fruit is a globose capsule, 3-4 mm in diameter.

This species is distinguished by the leaf shape and by the funnel-shaped flowers with included stamens.

Flowering Period: September

Distribution and Habitat in the Geraldton District

Occurs on the sandplains north of the Murchison River, from north of the Geraldton District at Nerren Nerren and Coolomia, south to the Mullewa area.

Grows on yellow or yellow-brown sand on undulating sandplain, in heath, mallee shrubland or low banksia woodland. Associated species include *Banksia sceptrum, B. ashbyi, Hakea stenophylla, Acacia rostellifera* and *A. scirpifolia.*

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. N of Murchison River	N	MRWA Road Verge	2.11.1994	1+	Healthy
2. E of Ajana	N	-	25.6.1997	"Frequent"	-
3. NE of Kalbarri	N	VCL	27.10.1992	"Common"	-
4. SW of Eurardy	N	National Park	4.11.1986	"Occasional"	-
5. *SE of Yuna	CV	-	7.9.1979	"Locally common but restricted"	-
6. *NW of Indarra	Mu	-	2.9.1979	"Moderately common"	-
7. *Toolonga	N	Nature Reserve	27.9.1978	-	-
8. *North West Coastal Hwy	N	-	2.1.1972	-	-
9. *N of Galena	N	-	15.9.1940	-	-
10.*S of Nerren Nerren	N	-	25.9.1953	-	-
11. N of Ajana	N	National Park	6.10.1998	50+ & hundreds	Healthy

Response to Disturbance

Population 6 was growing in an area which was regenerating after clearance. Some plants at population 11 were on the firebreak.

Management Requirements

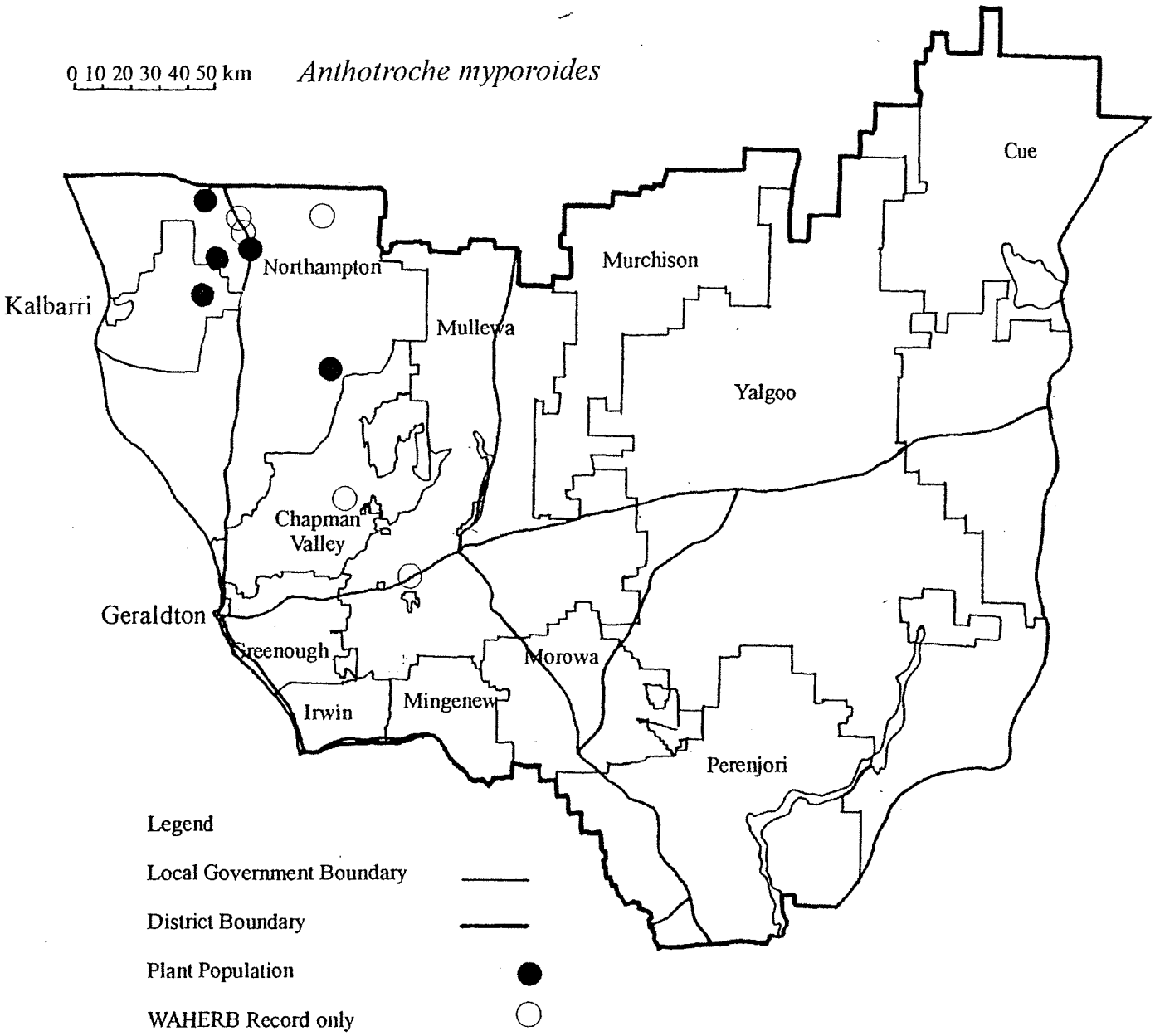
- Ensure that population 1 is marked.
- Maintain liaison with land managers.

Research Requirements

– Further survey is required, particularly to refind all recorded populations and to survey fully.

References

Gardner (1942a), Purdie *et al.* (1982).



Astartea clavifolia C.A.Gardner MYRTACEAE

A many-branched shrub to 1 m tall. The leaves are short and broadly club-shaped, 1.5-2.5 mm long, 1.2 mm broad, with a distinct petiole. They are never clustered on the stems. The flowers are pale pink, with stamens united in five bundles opposite the calyx lobes. There are eight anthers in each bundle. The ovary is two-celled, with six ovules in each cell.

Flowering Period: September

Distribution and Habitat in the Geraldton District

This species was collected by C.A.Gardner in 1931 from near Maya on the southern boundary of the Geraldton District and since then has not been refound there. It was growing in yellow sand but no other details of habitat were recorded. However, the species has been found recently in the Lake Grace to Lake King area, where it grows in grey sand over clay in heath and *Melaleuca* thickets, sometimes near salt lakes.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Near Maya	-	-	21.9.1931	-	-

Response to Disturbance

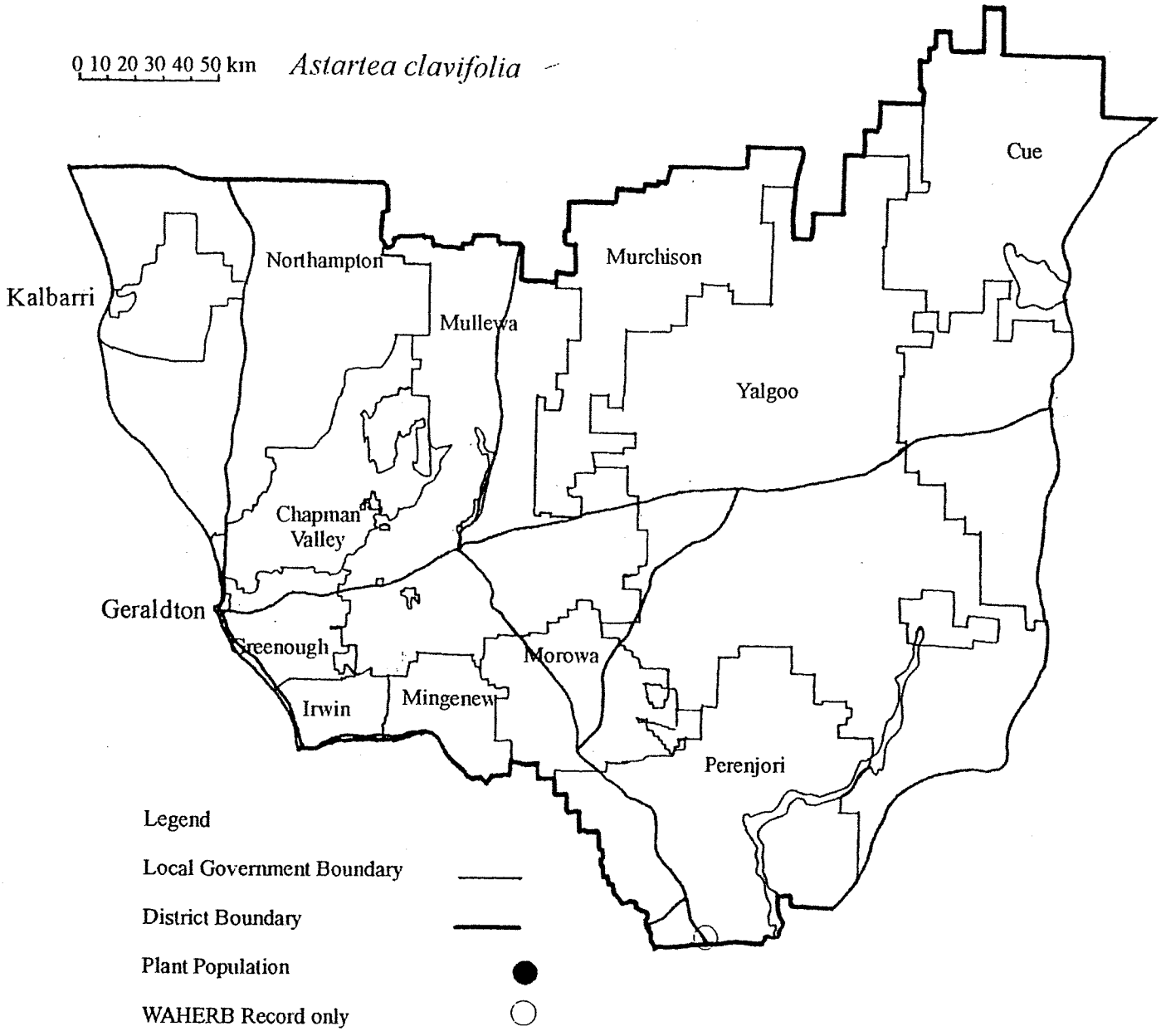
Unknown

Research Requirements

- Further survey is required, particularly in the Maya area.

References

Gardner (1942a).


0 10 20 30 40 50 km
Astartea clavifolia
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Astroloma pedicellatum A.J.G.Wilson ms

EPACRIDACEAE

[*Astroloma* sp. Eneabba (N.Marchant s.n.)]

An undescribed species allied to *Astroloma serratifolium* and first collected in 1965 from north of Badgingarra in the Moora District.

A. pedicellatum ms is an erect to spreading shrub to 1 m high and up to 1.5 m wide, with ovate pungent leaves and pale to dark pink flowers. The flower stalks in this species are generally longer than those of *A. serratifolium*, which has very short pedicels covered with overlapping bracts. *A. pedicellatum* ms has flower stalks up to 4 mm long, with bracts at the base but few on the stalk. The fruits are globular, green to red in colour and with striations.

Flowering Period: October-November, January, March-April

Distribution and Habitat in the Geraldton District

In the Geraldton District, this species occurs north-east of Dongara and near Mingenew. It extends south into the Moora District where it is known from 15 populations from east of Jurien to Arrowsmith and east to Three Springs. The known geographic range is 80 km but may extend to 130 km.

Grows in lateritic gravel over sand or brown loam, brown-yellow clay or white, yellow or grey sandy clay. Occurs in open low wandoo woodland over scrub and low heath. Associated species include *Allocasuarina, Acacia, Gastrolobium* and *Dryandra* species.

Conservation Status

Current: Priority 2[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Strawberry	I	Rail Reserve	15.3.1999	3	Healthy
2. W of Mingenew	M	MRWA Road Verge	5.8.1994	1+	Narrow road verge, weeds
3. NW of Mingenew	Mi	Nature Reserve	1989	-	-
4.* NE of Dongara	Mi	-	13.8.1986	-	-
5.* N of Strawberry	I	-	30.10.1974	-	-

Response to Disturbance

Unknown

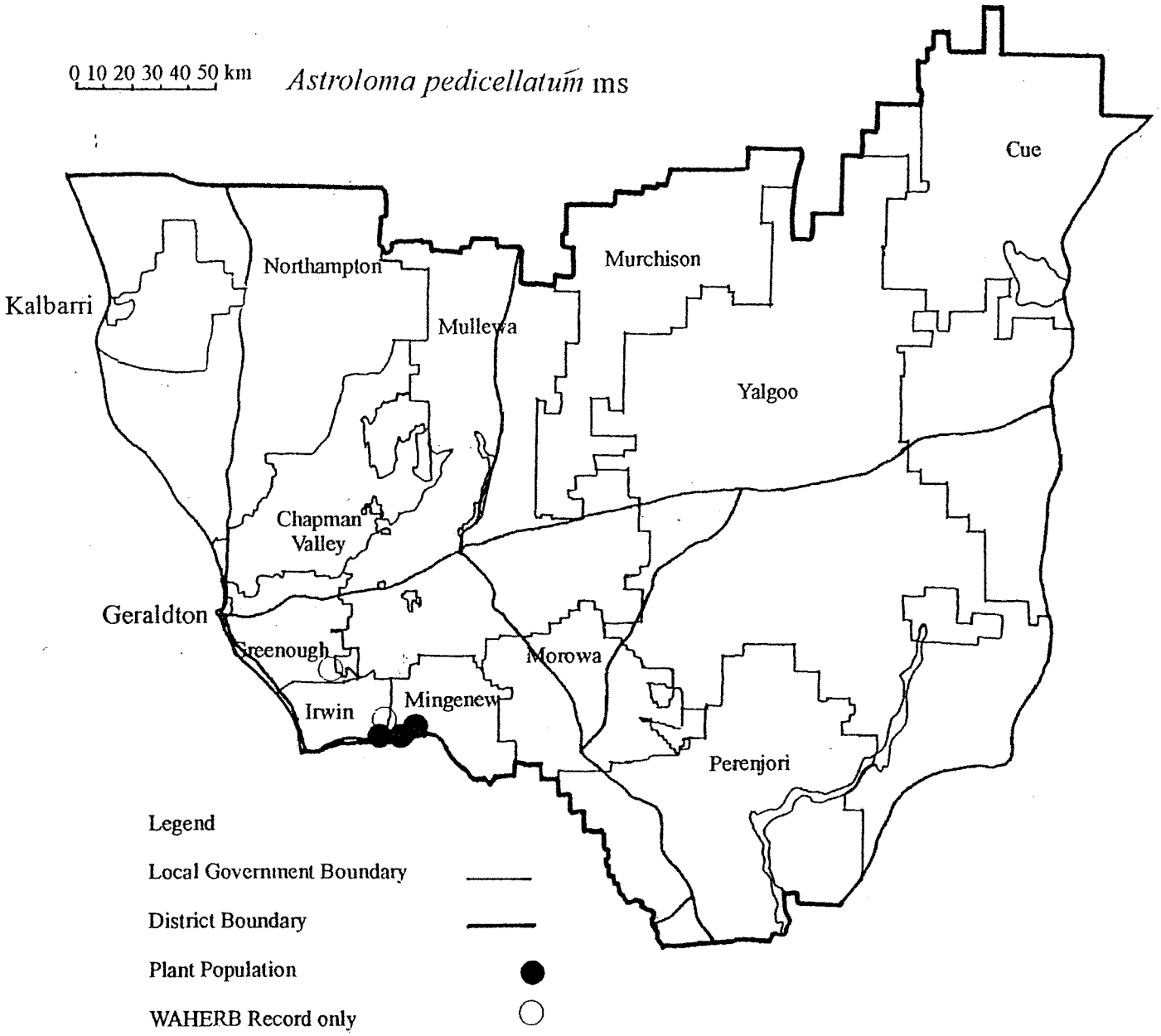
Research Requirements

- Further work is required to clarify the taxonomic status of this taxon.

References

A. Wilson (personal communication).

[#] species has been taken off the Priority Flora list (updated at December 1999)


0 10 20 30 40 50 km
Astroloma pedicellatum ms
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Baeckea subcuneata F.Muell. MYRTACEAE

This species was described by Bentham from material collected by Oldfield from "sandy plains, Murchison River" and has been collected only a few times since then.

An erect shrub to 1.5 m tall, it has obovate-cuneate leaves which are thick and leathery, concave or folded, 3-4 mm long, erect to spreading. The flowers are solitary on thick pedicels 4-6 mm long which have a pair of deciduous bracteoles below the middle. The calyx tube is top- to bell-shaped or hemispherical, the lobes short, broad and thick. The petals are c. 3 mm in diameter, white to pale pink in colour. There are c. 20 separate stamens with the anthers opening by terminal pores and the filaments not flattened. The ovary is three-celled with numerous ovules in each cell.

Flowering Period: August-November

Distribution and Habitat in the Geraldton District

A poorly collected species known from two localities in the Kalbarri area.

Grows on yellow sand over sandstone, on steep slopes above a river gorge and on coastal sandstone outcrops and dunes of reddish-yellow sand. Grows in tall shrubland and heath. Associated species include *Baeckea robusta, Calytrix harvestiana* and *Persoonia angustiflora.*

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. E of Kalbarri	N	National Park	3.11.1994	5+	Healthy
2.* S of Kalbarri	N	National Park	8.10.1982	"Frequent or Occasional"	-

Response to Disturbance

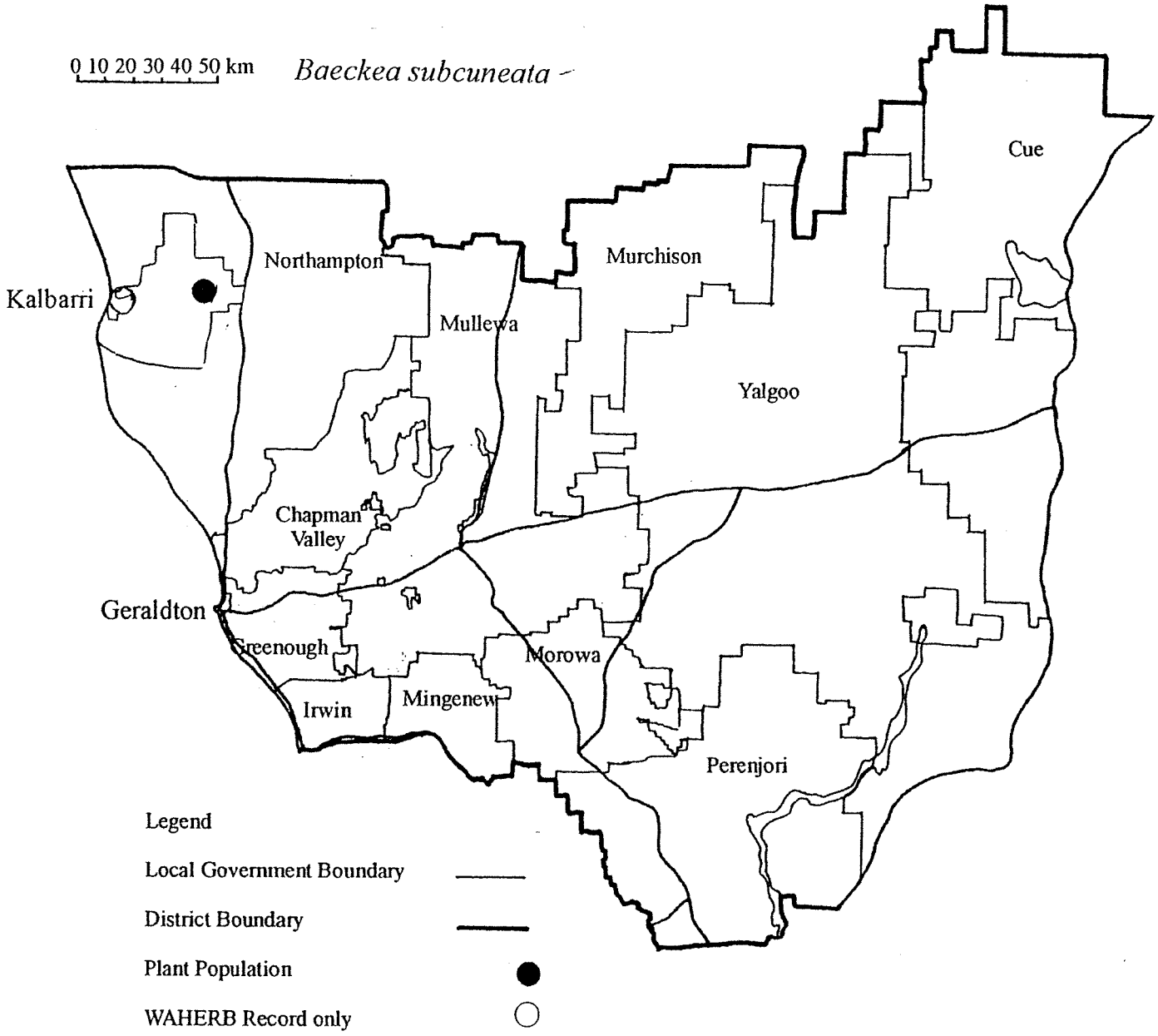
Unknown

Research Requirements

– Further survey is required, particularly in the Kalbarri National Park, and to survey fully populations 1 and 2.

References

Bentham (1866).


0 10 20 30 40 50 km
Baeckea subcuneata -
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Baeckea sp. Whelarra (A.C.Burns 7) MYRTACEAE

A shrub possibly 1m or more in height, with open, slender branchlets. The leaves are linear, c. 2.5 mm long, 0.5 mm broad, thick, glandular, with a mucronate recurved tip. The flowers are grouped two or three together on peduncles c. 2 mm long in the upper leaf axils. The calyx tube is top-shaped, glandular and wrinkled, the lobes short and rounded. The petals are c. 2 mm long, white or ?pale pink. There are ten stamens.

Flowering Period: July-August

Distribution and Habitat in the Geraldton District

This taxon is known only from one collection made in 1966 from east of Yuna with no details recorded of the plant or its habitat.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

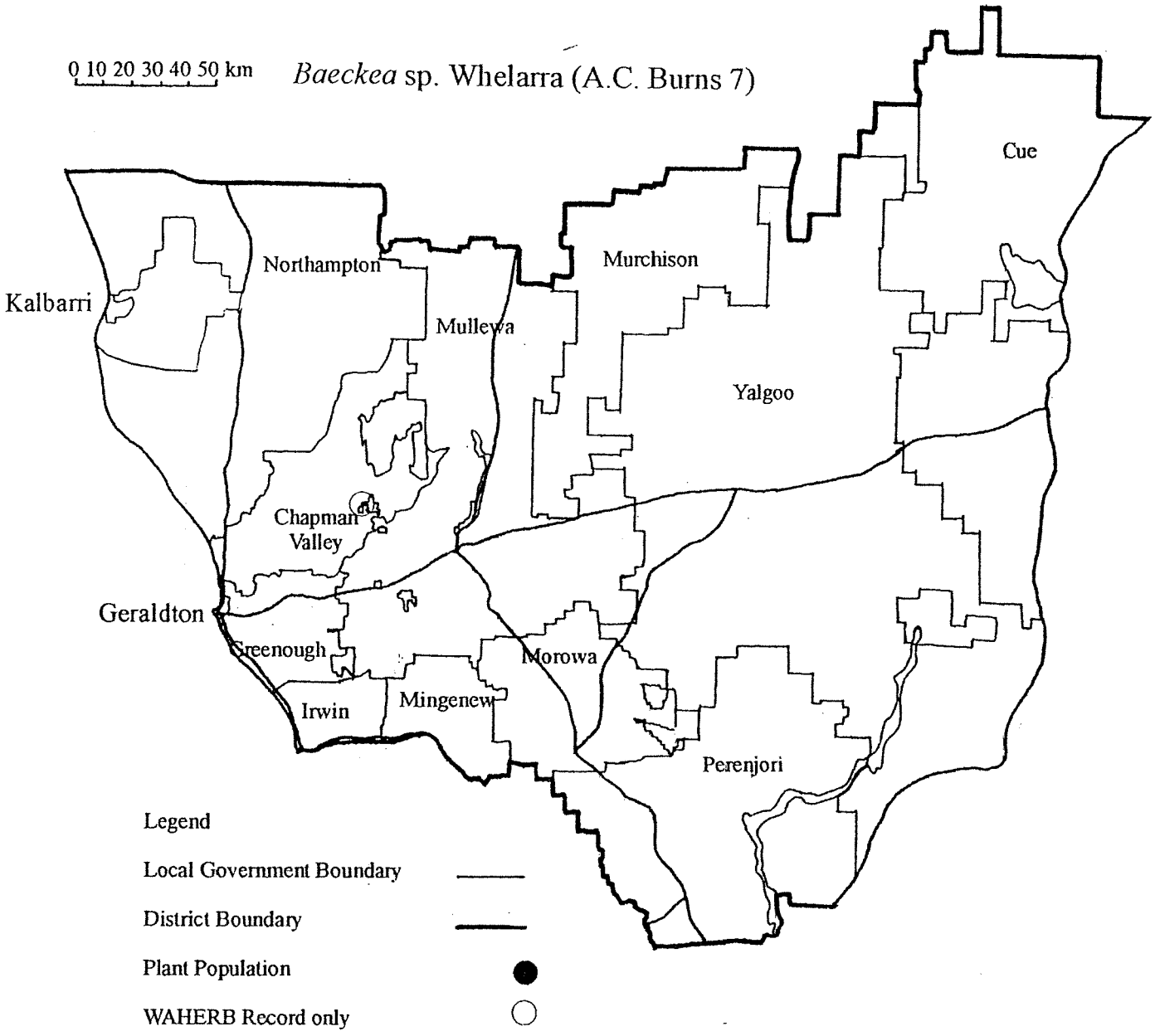
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* E of Yuna	CV	Nature Reserve	31.7.1966	-	-

Response to Disturbance

Unknown

Research Requirements

- Further survey is urgently required to refind this taxon, particularly on the nature reserve where population 1 was recorded.


0 10 20 30 40 50 km
Baeckea sp. Whelarra (A.C. Burns 7)
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Baeckea sp. Yuna (M.E.Trudgen 2224) MYRTACEAE

An erect shrub to 1.5 m tall, 1.2 m across, with ascending branches. The leaves are club-shaped, thick, blunt, c. 1 mm long. The flowers occur singly on short stalks at the upper ends of the branchlets. The hypanthium is green, funnel-shaped and ridged. The petals are concave, c. 3 mm long. They vary from white to pale pink and deep pink. There are c. 20 stamens with flattened pale pink filaments.

Flowering Period: April, June, August-September

Distribution and Habitat in the Geraldton District

Occurs on a nature reserve east of Yuna, where it has been collected several times.

Grows in thin soil of orange sand or pale brown fine sandy loam over sandstone on the slopes above breakaways. Occurs in tall open shrubland to 2 m with *Acacia neurophylla, Melaleuca uncinata, Allocasuarina campestris* and *Hakea pycnoneura.*

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. E of Yuna	CV	Nature Reserve	8.8.1994	50+	Healthy

Response to Disturbance

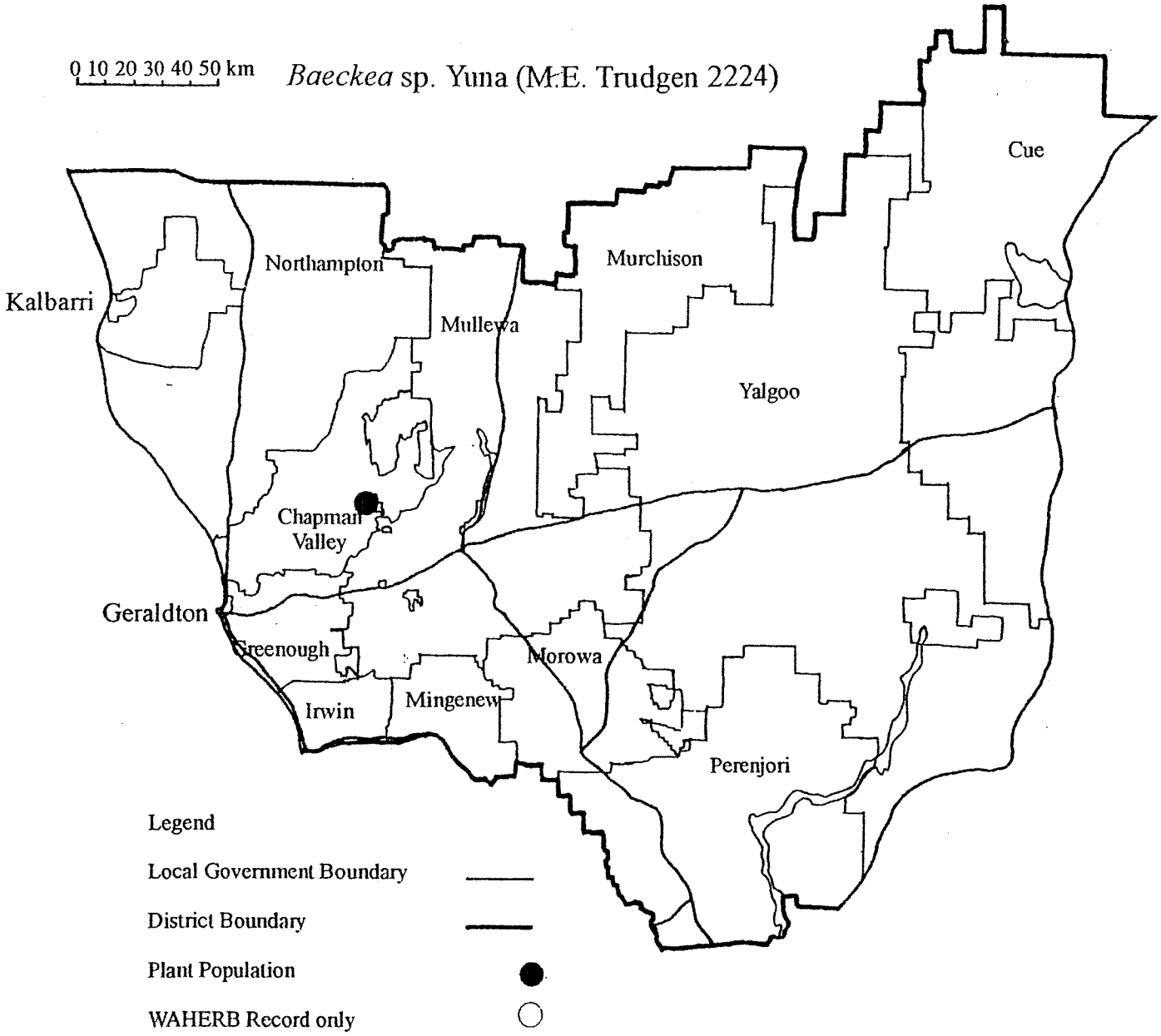
Unknown

Management Requirements

- Monitor population 1 regularly.

Research Requirements

- Further survey is required, both in and around the nature reserve where it occurs.


0 10 20 30 40 50 km
Baeckea sp. Yuna (M.E. Trudgen 2224)
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Bergia auriculata G.J.Leach ELATINACEAE

A prostrate perennial plant, with a dense indumentum of glandular hairs, each with a terminal globular cell. The leaves are opposite, elliptic, with ciliate to toothed margins, 3-4 mm long, 2-3 mm broad. There are stipules to 3 mm long, with laciniate margins. The flowers are solitary on stalks to 7 mm long. They have five ovate hairy sepals to 4.5 mm long. The outer three do not have membranous margins as found on the inner two sepals, but have divided auricles at the base which are referred to in the specific name of the species. The five petals are obovate, white, to 4 mm long. There are ten stamens. The fruit is a globular capsule 2-3 mm long.

The combination of leaves shorter than 6 mm, the presence of glandular hairs with a globular terminal cell and flowers with ten stamens distinguishes this species from others in the genus.

Flowering Period: July, August, October

Distribution and Habitat in the Geraldton District

This species has been collected once in the Geraldton District from north-east of Cue, which is the type locality. It has also been collected three times between Carnarvon and Gasgoyne Junction.

In the Geraldton District, this species is recorded from near a dam, growing on clay. Further north, it has been recorded from mud flats and from a claypan, with fringing *Melaleuca uncinata,* growing in red clay amongst open herbs.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* NE of Cue	C	Pastoral Lease	13.10.1945	-	-

Response to Disturbance

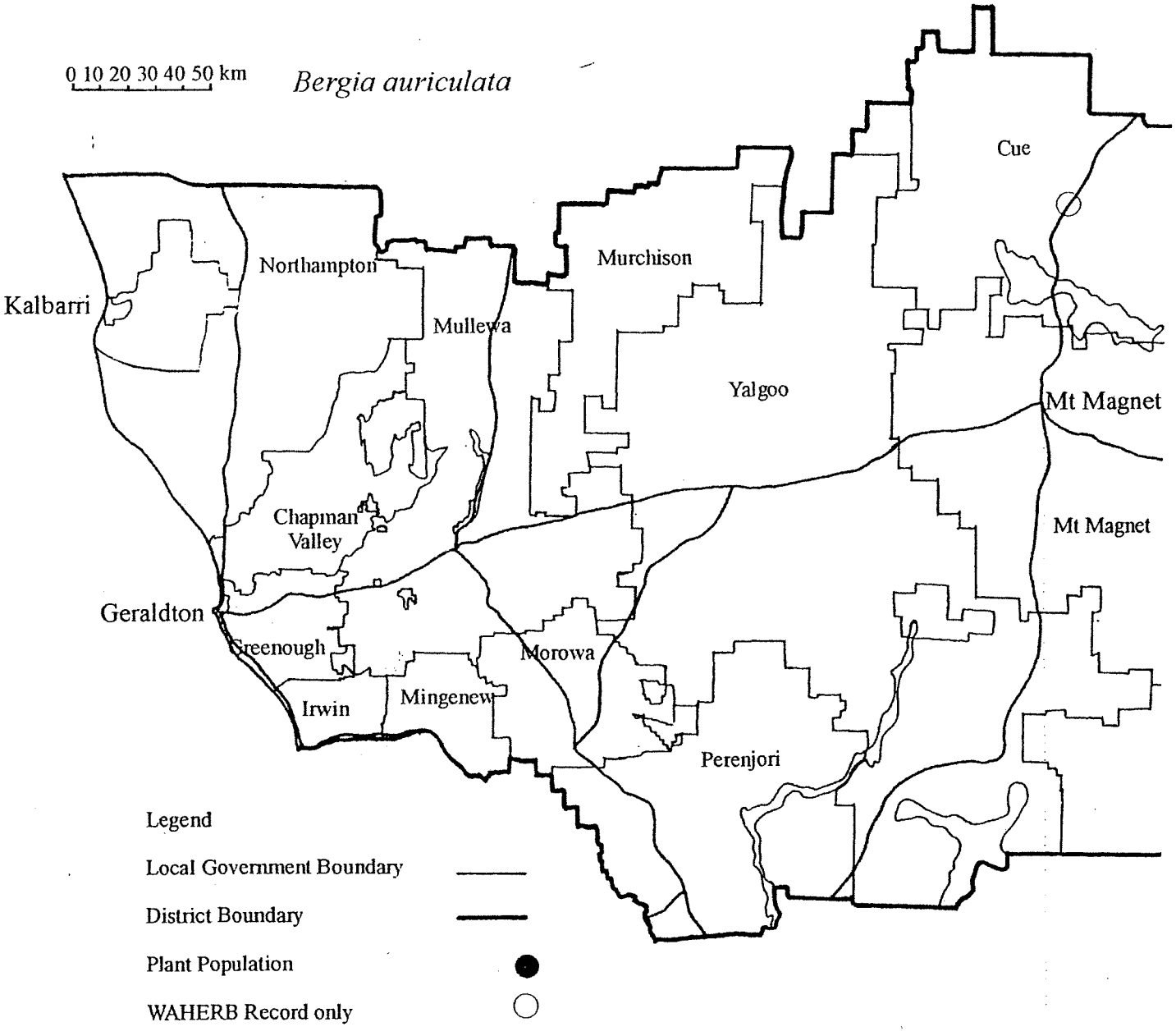
Unknown

Research Requirements

- Further survey is required in suitable habitat in the central northern part of the District.

References

Leach (1989).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Bergia auriculata
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Mt Magnet
Chapman Valley
Mt Magnet
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Beyeria cygnorum (Muell.Arg.) Benth. EUPHORBIACEAE

This species was first collected by James Drummond from between the Moore and Murchison Rivers.

Beyeria cygnorum is a much-branched shrub to c. 90 cm tall, covered with short hairs. The leaves are narrow and alternate, with closely revolute margins. They are ovate or ovate-lanceolate, with a rounded or slightly cordate base and are c. 12 mm long. The male flowers occur singly or in small groups on short, thick pedicels and the female flowers are solitary on longer pedicels. The calyx segments are short and concave, c. 2 mm long, the male flowers hairy on the outside near the base, the female flowers glabrous. The petals are shorter than the calyx and are glabrous. There are numerous stamens with short anthers.

Flowering Period: August

Distribution and Habitat in the Geraldton District

It is thought that this species occurs in the Geraldton District from south of Kalbarri and that it also occurs in the metropolitan area, in the Moora District from west of Eneabba and also in the Shark Bay area and north of Carnarvon. However, there is some uncertainty regarding its taxonomic status which needs to be resolved before these populations can be confirmed. The conservation status of the species can then be reassessed.

In the Geraldton District, this species grows in yellow sand and red-brown sandy clay over limestone, in a gully beneath open low *Eucalyptus* woodland. Associated species include species of *Lasiopetalum, Acacia* and *Eucalyptus.*

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. S of Kalbarri	N	National Park	19.6.1996	500+	Healthy
2. S of Kalbarri	N	National Park	19.6.1996	20+	Healthy
3. S of Kalbarri	N	National Park	24.9.1997	100+	Moderate

Response to Disturbance

In 1994, population 1 had regenerated after a fire two years previously and was abundant.

Management Requirements

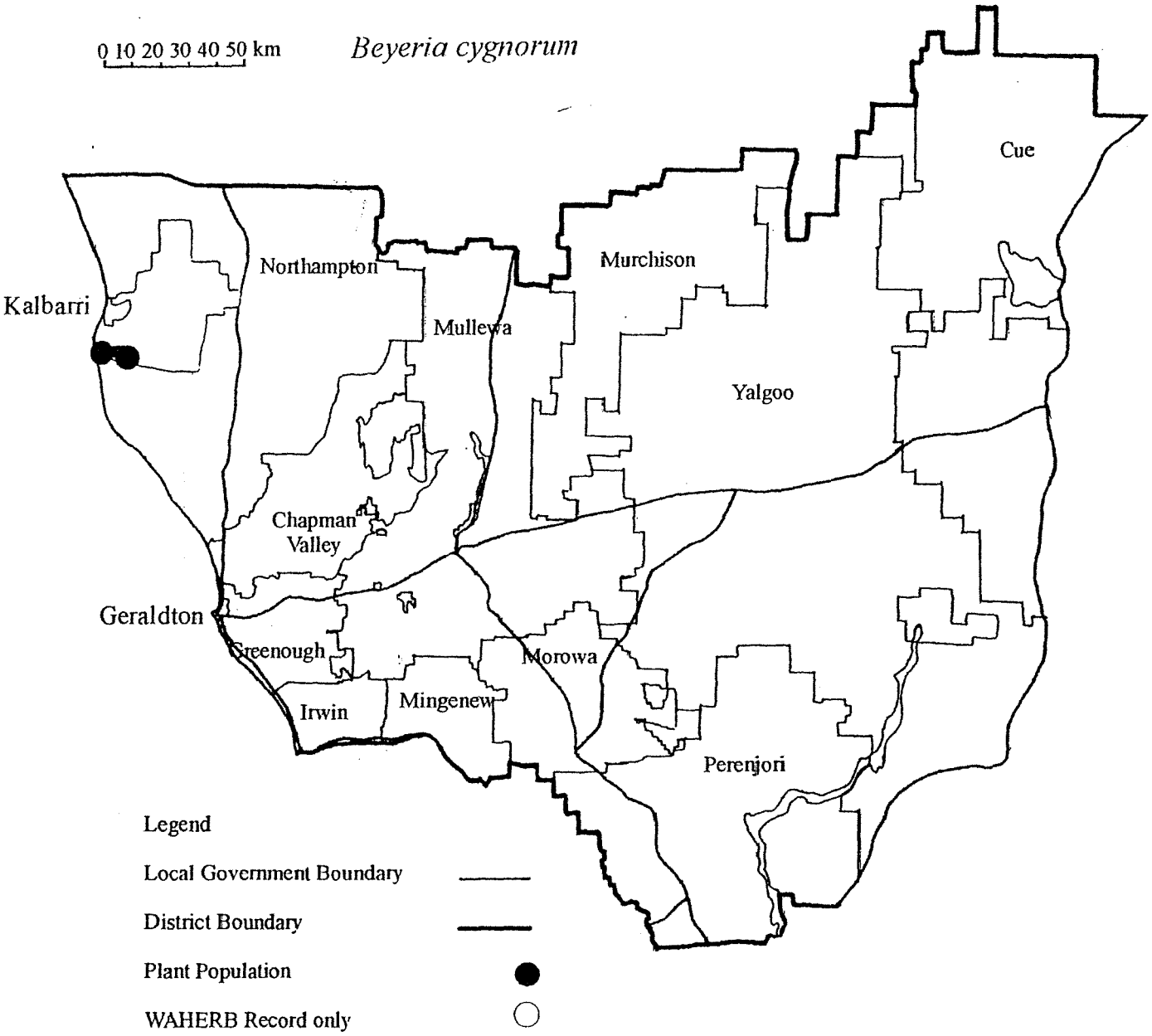
- Monitor the population regularly.

Research Requirements

- Further taxonomic work is required.

References

Bentham (1873), Kelly *et al.* (1993).


0 10 20 30 40 50 km
Beyeria cygnorum
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Calytrix drummondii Craven MYRTACEAE

This species was first collected by James Drummond from an area between the Irwin and Arrowsmith Rivers.

Calytrix drummondii is a shrub to 1 m tall, with closely spaced leaves which are linear, 4-20 mm long, to 1 mm wide. There are no stipules. The flower heads are scattered, with bracteoles joined to form the narrowly funnel-shaped cheiridium, which is 6-8 mm long with a long spreading apex. The hypanthium is 8-13 mm long, with 8-10 ribs, hairless and unequally triangular in cross-section, completely joined to the style. The calyx segments are joined at the base, produced into an awn to 15 mm long. The petals are yellow, 6-8 mm long. There are 55-85 stamens, the filaments yellow and the anther connective prominent, often produced into a blunt horn.

Flowering Period: November-January

Distribution and Habitat in the Geraldton District

Occurs in the Geraldton District from the Kalbarri area and north of Northampton to the southern boundary of the District south-east of Mingenew. It is also known from five populations in the Moora District in the Eneabba area.

Recorded growing on sand over gravel and white, yellow or grey sand, in low heath. Occurs in association with species of *Jacksonia, Melaleuca, Banksia* and *Hibbertia.*

Conservation Status

Current: Priority 2[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SE of Kalbarri	N	National Park	13.11.1987	"frequent"	-
2. Binnu	N	-	10.1994	1 (now dead)	-
3.* N of Northampton	N	-	12.12.1984	-	-
4.* SE of Mingenew	Mi	-	25.11.1974	-	-

Response to Disturbance

Unknown

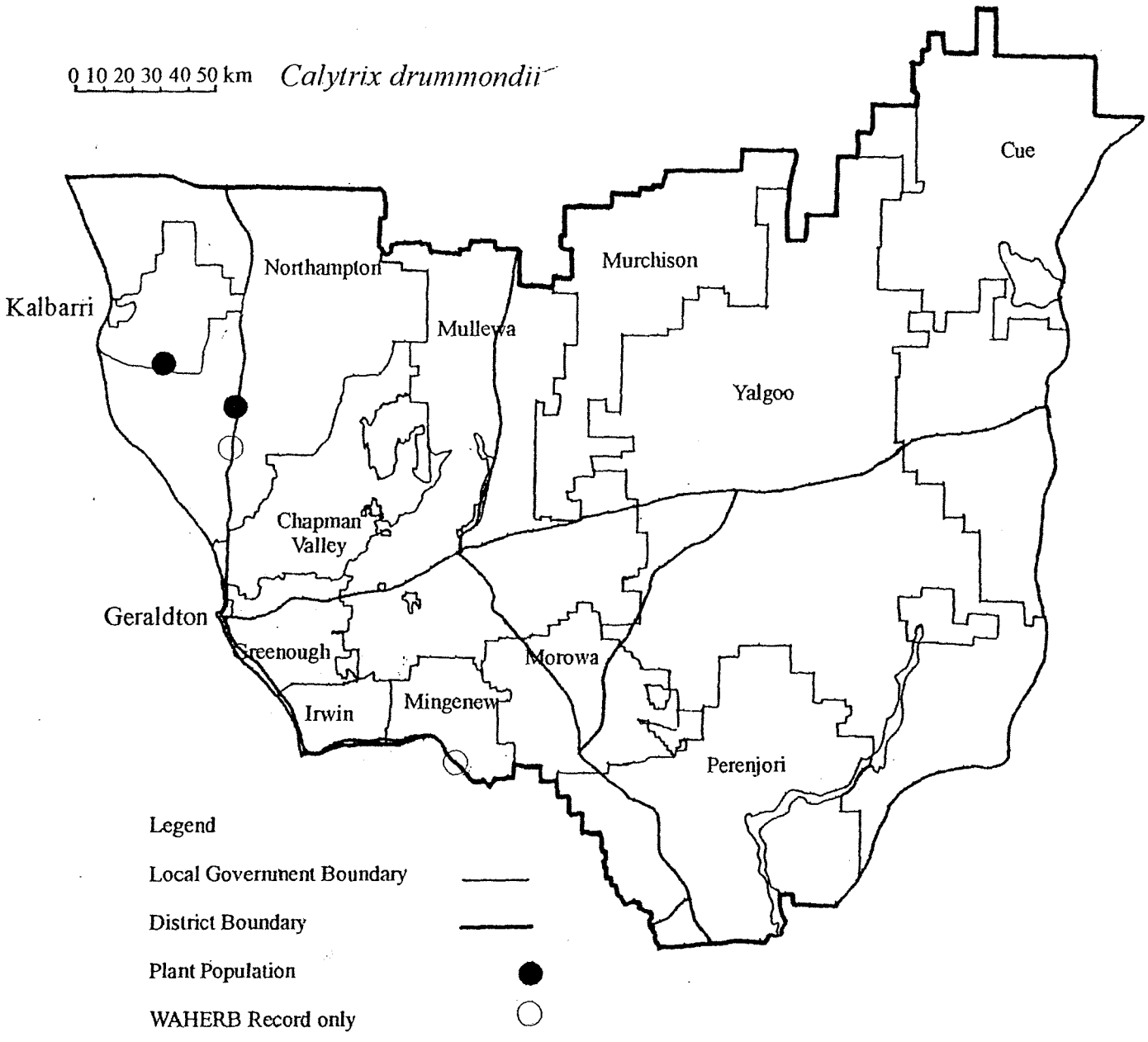
Research Requirements

- Further survey work is required for this species, particularly on conservation reserves northwards from Mingenew, and in the Kalbarri to Northampton area, to resurvey previously recorded populations and to find further populations.

References

Craven (1987b).

[#] now Priority 3 (updated at December 1999)


0 10 20 30 40 50 km
Calytrix drummondii
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Calytrix formosa Craven — MYRTACEAE

A glabrous shrub to 70 cm tall, the apices of the flowering stems continuing the growth. The leaves are 1-2 mm long, the blade in cross-section is broadly obtriangular to semiorbicular. There are stipules to 0.25 mm long. The cheiridium is reduced, 4-6 mm long. The hypanthium is glabrous, ten-ribbed and is completely fused to the style. It is 12-17 mm long and is subovoid in the ovarian region, cylindrical above. The calyx segments are joined at the base, the blade broadly obovate, to 1.75 mm long, with awns 18 mm long which are straight to sinuous in bud. The petals are lanceolate to elliptic, 6-7 mm long, to 3 mm wide. They are pink or rich pink, the basal two-fifths yellow. There are c. 100 stamens with yellow filaments.

This species is similar to *Calytrix brevifolia* in the shape of the hypanthium and the flower colour, but the leaf and cheiridium shapes are somewhat different. In *C. brevifolia*, the calyx awns are curled and twisted in bud. The cheiridium in *C. formosa* is very reduced.

Flowering Period: September-November

Distribution and Habitat in the Geraldton District

This species occurs mainly on sandplains north of the Murchison River but has also been recorded from further to the south-east.

Grows on yellow sand in heath or shrubland with *Grevillea candelabroides, Allocasuarina campestris* and *Conospermum stoechadis* and with *Banksia* and *Actinostrobus* species.

Conservation Status

Current: Priority 2[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. N of Eurardy	N	-	25.11.1996	-	-
2. S of State Barrier Fence	N	VCL	24.10.1995	-	-
3. Kalbarri area	N	National Park	24.10.1995	-	-
4. NE of Kalbarri	N	National Park	27.10.1992	"frequent"	-
5. NE of Kalbarri	N	National Park	27.10.1992	-	-
6. E of Ogilvie	N	-	31.10.1990	-	-
7. SE of Yuna	Mu	Nature Reserve	3.4.1994	1+	Healthy
8. *NE of Kalbarri	N	National Park	8.10.1982	-	-
9. *NE of Kalbarri	N	National Park	12.10.1981	-	-
10.*NE of Kalbarri	N	National Park	12.10.1981	-	-
11.*N of Ajana	N	-	12.11.1963	-	-
12.*N of Ajana	N	-	3.11.1996	-	-
13. Dartmoor Road	CV	-	1992	-	-

Response to Disturbance

Unknown

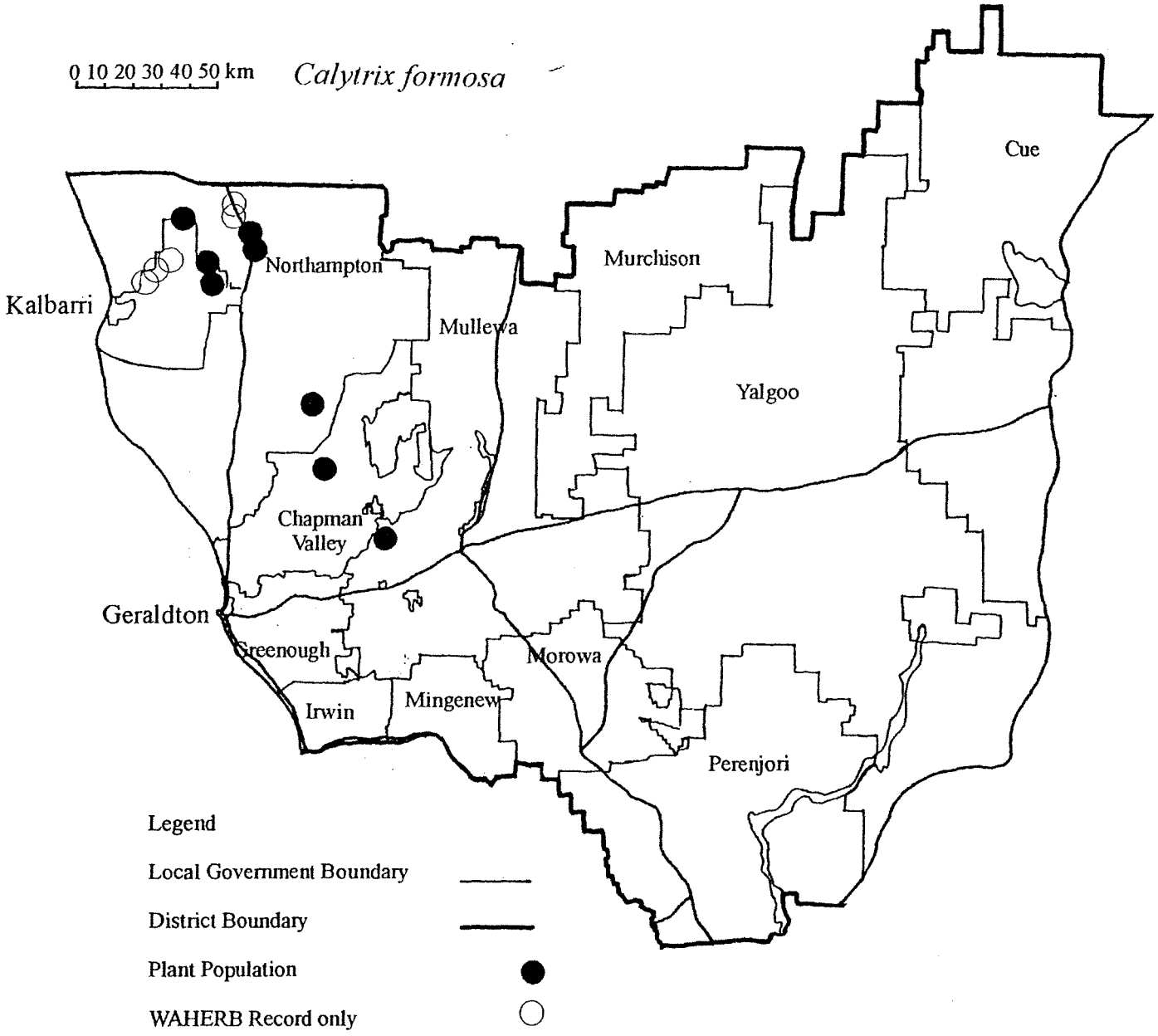
Research Requirements

- Further survey is required, particularly to refind all previously recorded populations and to survey them fully.

[#] now Priority 3 (updated at December 1999)

References

Craven (1987b).



Calytrix harvestiana (F.Muell.) Craven MYRTACEAE

A glabrous shrub to 75 cm tall, the apices of the flowering stems continuing the growth. The leaf blade is glabrous, linear, elliptic to ovate, 2-4.5 mm long. There are no stipules. There are one to many scattered inflorescences. The cheiridium is ellipsoid to vase-shaped, strongly compressed, 3.5-4 mm long. The hypanthium is glabrous, 10-ribbed, free from but tightly surrounding the style. It is articulated just below the calyx segments and is 3.5-4.5 mm long. The calyx segments are up to 3 mm long, fused at the base. The petals are purplish-mauve, purple or violet, the basal two-fifths yellow, becoming reddish after flowering, or entirely yellow. They are up to 6.5 mm long, elliptic to ovate in shape. There are 60-70 pale yellow stamens which may become reddish after flowering.

This species is a member of the *Calytrix depressa* alliance as is *C. purpurea*. The leaf form, the absence of stipules and the compressed cheiridium are features of the group.

Flowering Period: September-December

Distribution and Habitat in the Geraldton District

Occurs from north of Kalbarri to the Yuna area.

Grows on shallow white sand over sandstone in sand heath, or on pale brown, fine, sandy loam in scrub with *Allocasuarina campestris*. It also occurs on yellow sand in heath and shrubland with *Banksia sceptrum, B ashbyi, B. attenuata* and *Actinostrobus* sp.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Z Bend	N	National Park	3.11.1994	20+	Healthy
2. N of Kalbarri	N	Pastoral Lease	21.10.1995	-	-
3. E of Ogilvie	N	-	31.10.1990	-	-
4. NNE of Kalbarri	N	Pastoral Lease	1.11.1986	"Occasional"	-
5.* E of Yuna	CV	Nature Reserve	12.10.1976	"Common"	-
6.* N of Kalbarri	N	Pastoral Lease	21.10.1973	-	-
7.* Hutt River	N	-	20.12.1962	-	-

Response to Disturbance

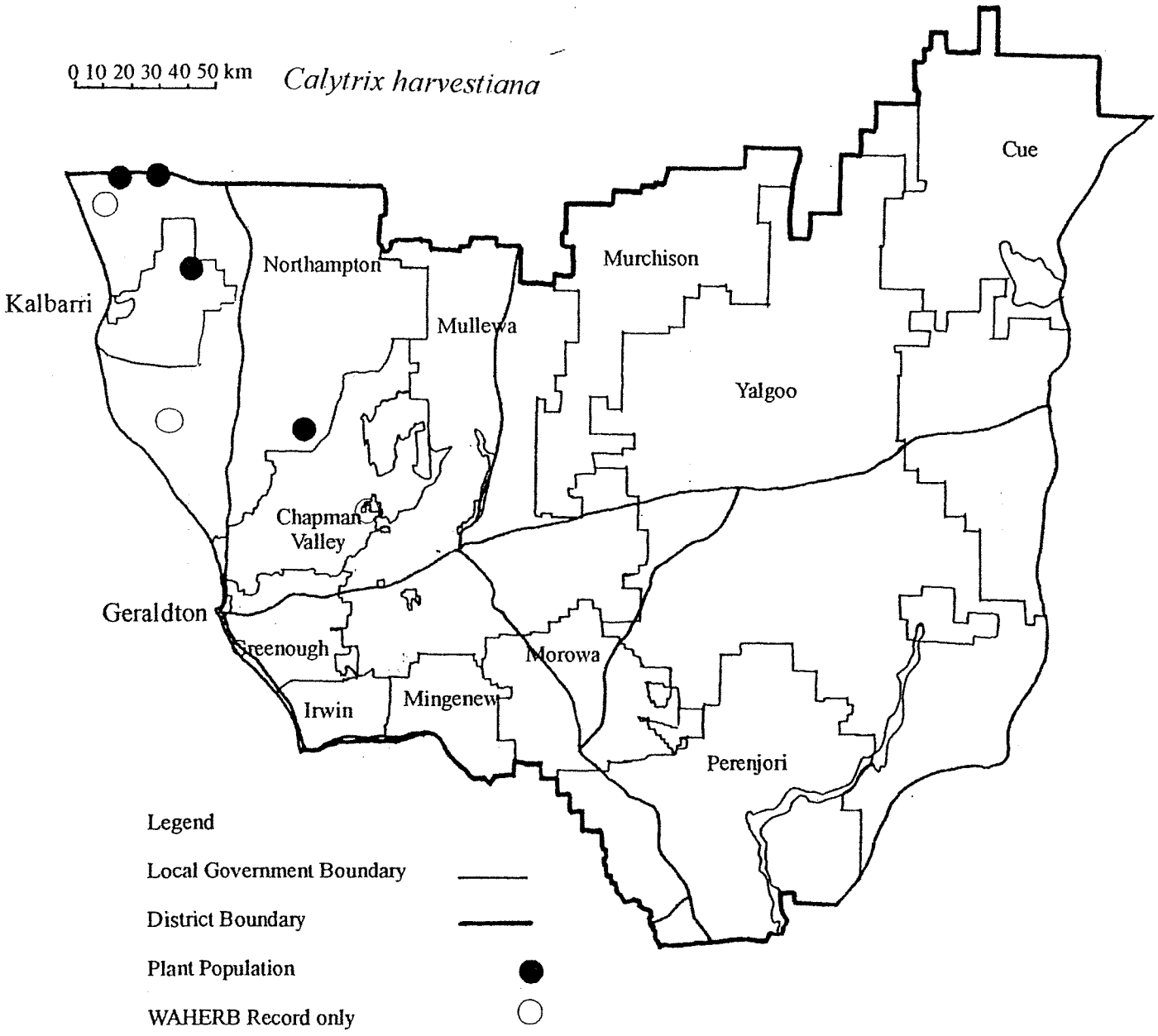
Unknown

Research Requirements

- Further survey is required, particularly to refind all previously recorded populations and to survey them fully.

References

Craven (1987b), Mueller (1878).


0 10 20 30 40 50 km
Calytrix harvestiana
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Calytrix paucicostata Craven MYRTACEAE

A shrub to 2 m tall, which is mainly glabrous. The branchlets are pubescent, the apices of the flowering stems continuing growth. The leaves are somewhat spreading, with a short stalk, the blade linear, 5-10 mm long, to 1 mm wide, broadly obtriangular in cross-section. There are stipules to 0.3 mm long. The projections in the axils of the floral leaves are not swollen. The inflorescences are scattered. The cheiridium has small hairs towards the base and is funnel-shaped and compressed, to 3.5 mm long. The hypanthium is glabrous, orbicular in transverse section, 3- or 4-ribbed. It is completely fused to the style and is 5.5-6.5 mm long. The calyx segments are joined at the base and are rounded and reduced, to 0.75 mm long, without awns. The petals are bright pink, the basal fifth is yellow, becoming pinkish-yellow after flowering. They are egg-shaped to elliptic, to 6 mm long. There are 75-85 stamens, with yellow filaments which become deep pink after flowering.

Flowering Period: September-October

Distribution and Habitat in the Geraldton District

Grows in the Kalbarri area.

Occurs on yellow, grey or white sand in heath or shrubland. Associated species include *Melaleuca megacephala, M. uncinata, Conospermum stoechadis, Adenanthos cygnorum* and *Grevillea leucopteris.*

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. E of Kalbarri	N	National Park	27.9.1995	50+	Healthy
2. NE of Kalbarri	N	Private	27.9.1995	10+	Healthy
3. SE of Kalbarri	N	National Park	27.9.1995	50+	Healthy
4. SSE of Kalbarri	N	National Park	30.10.1990	-	-

Response to Disturbance

Plants at population 3 had been burnt a few years previously and the population was mainly of seedlings to 20 cm tall, which were flowering.

Management Requirements

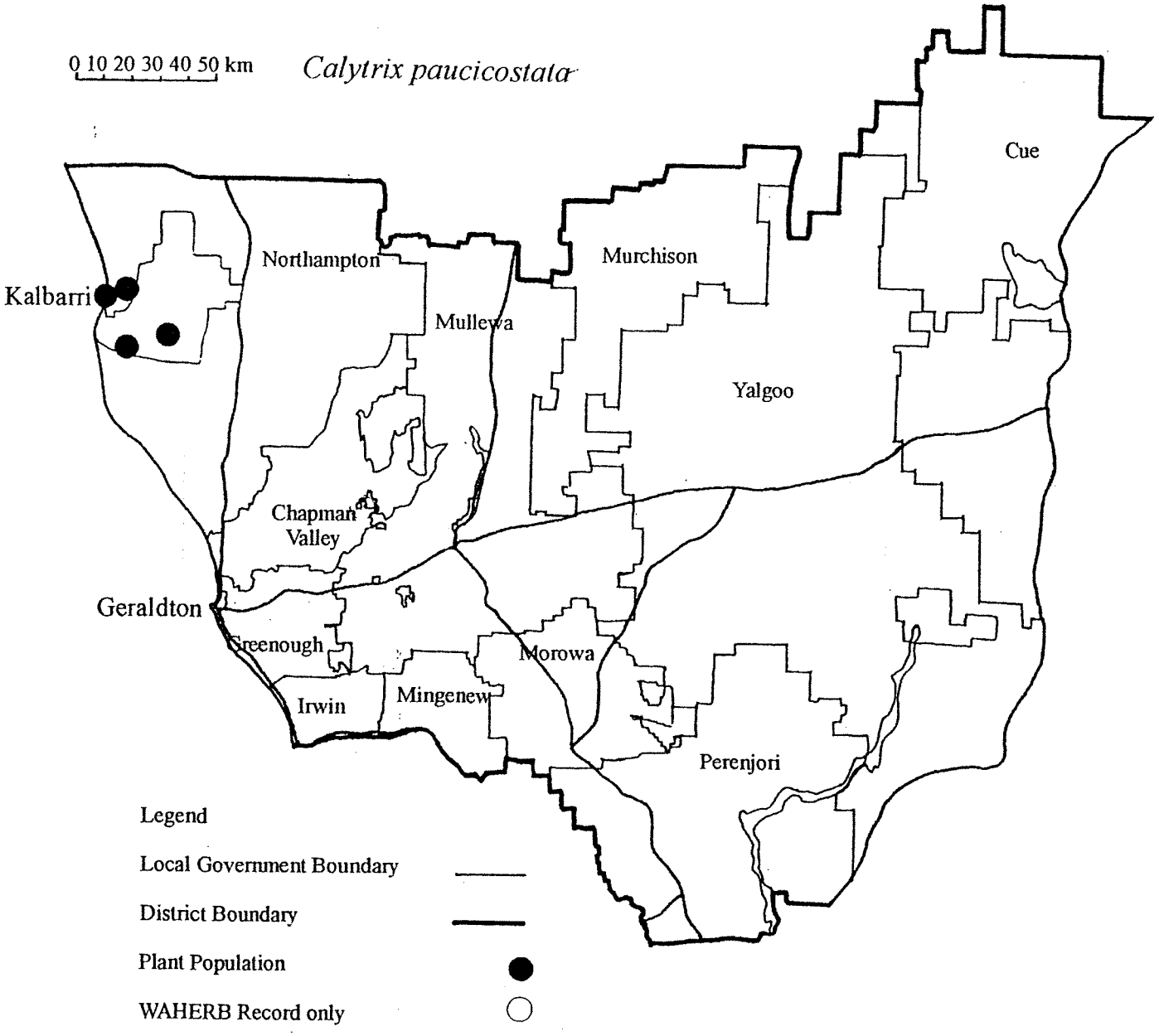
- Maintain liaison with managers of land on which the populations occur.

Research Requirements

- Further survey is required.
- Monitor population 3 to observe regeneration.

References

Craven (1987b).


0 10 20 30 40 50 km
Calytrix paucicostata
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Calytrix purpurea Craven MYRTACEAE

A glabrous shrub to 40 cm tall, with the apices of the flowering stems continuing growth. The leaves are glabrous, the blade linear, 3-10 mm long and 1 mm wide, broadly obtriangular in cross-section. There are no stipules. The inflorescences are scattered. The cheiridium is ellipsoid to obovoid, compressed, to 5.8 mm long. The hypanthium is narrowly obconical, glabrous and short, to 5 mm long, and is 10-ribbed and free from the style. The calyx segments are without an awn or point and are up to 0.6 mm long, joined at the base. The petals are purple, yellow in the basal fifth, this part becoming purplish cream after flowering. They are ovate, to 8.5 mm long. There are 45-55 stamens, the filaments yellow, becoming dirty cream after flowering.

This species is related to *Calytrix depressa,* which also occurs in the Kalbarri area but which differs in the calyx segments being pointed or produced into an awn to 12 mm long.

Flowering Period: September-October

Distribution and Habitat in the Geraldton District

Occurs in the Kalbarri area. Oldfield's collection made in the late 1850s or early 1860s was recorded from Champion Bay, but the species is not recorded as having been collected from the Geraldton area since.

Grows in sand with clay in *Melaleuca* scrub, on white clayey sand with lateritic gravel in heath, or on sandplain on loamy yellow sand with low mallees.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SE of Kalbarri	N	National Park	1.12.1994	"Frequent"	-
2.* NE of Kalbarri	N	National Park	12.10.1981	-	-
3.* Kalbarri	N	National Park	11.10.1981	-	-
4.* E of Junga Dam	N	National Park	1.10.1979	"Common"	-
5.* Hawkshead	N	National Park	10.11.1979	-	-
6.* S of Kalbarri	N	National Park	19.9.1968	-	-
7.* Champion Bay	G	-	c. 1859	-	-

Response to Disturbance

Unknown

Management Requirements

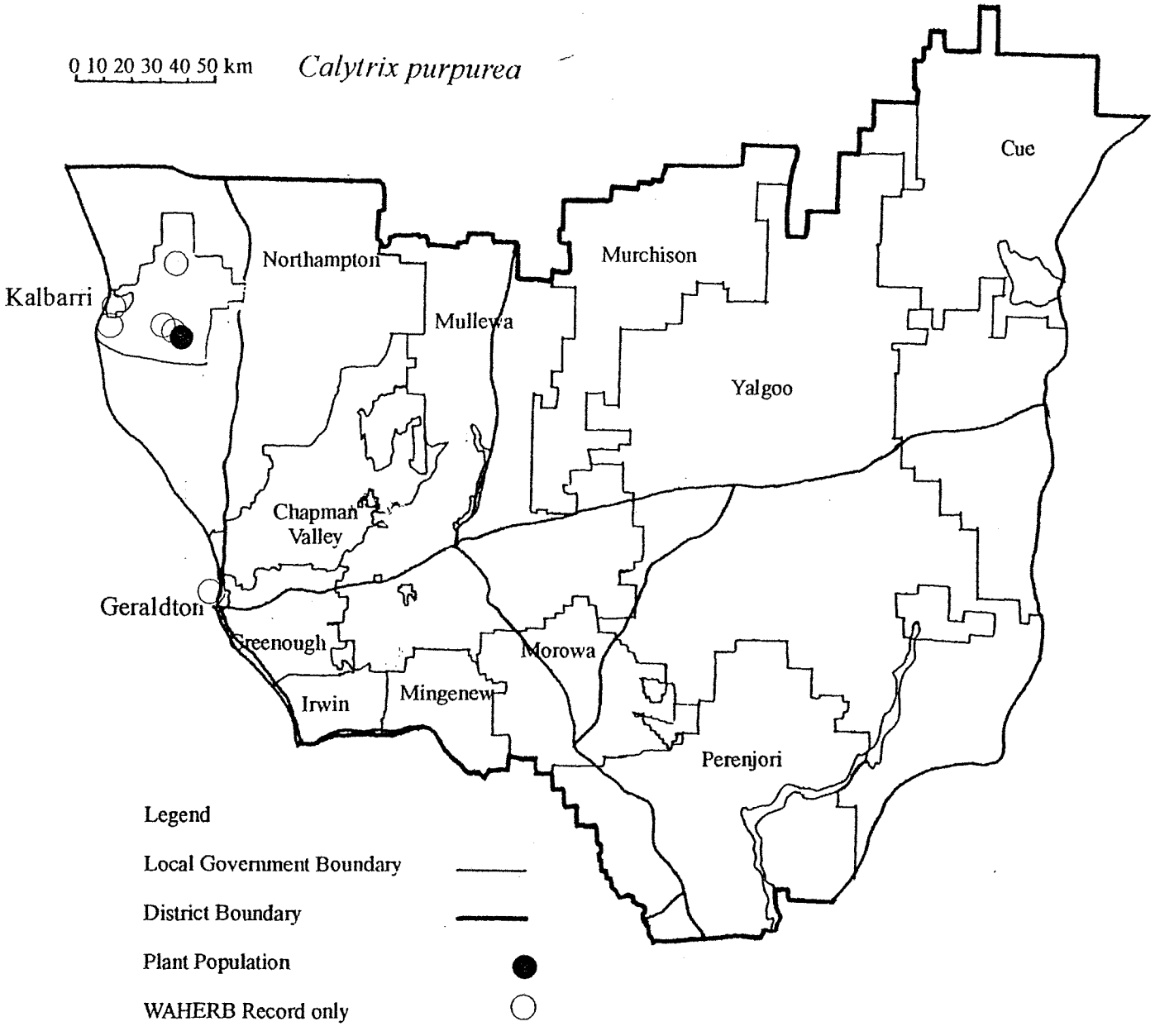
– Population 1-6 should be refound and surveyed fully.

Research Requirements

– Further survey is required for this species in the Kalbarri and Geraldton areas.

References

Craven (1987b), Mueller (1878).


0 10 20 30 40 50 km
Calytrix purpurea
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Chamelaucium marchantii Strid MYRTACEAE

A dense, rounded, glabrous shrub, 1-2 m tall. The branchlets are slender, the leaves grouped densely towards the branchlet ends. The leaves are opposite, narrowly linear, 13-22 mm long, c. 0.5 mm wide. They are semi-circular in cross-section, with a short curved tip and dotted with glands. The flowers are opposite, grouped in 2- or 4-flowered terminal clusters on pedicels to 3.5 mm long. The calyx tube is obconical, with five short, broad, rounded lobes. The five petals are erect, c. 3 mm long, broad and obtuse, yellowish-green in colour. There are ten stamens, alternating with ten staminodes.

This species is probably related to *Chamelaucium uncinatum* but differs most noticeably in the smaller yellowish-green petals. It was also thought to be conspecific with *C. gracile,* which has much smaller, narrower flowers.

Flowering Period: August-December

Distribution and Habitat in the Geraldton District

This species is known from the Kalbarri area, where it occurs over a range of c. 40 km.

Grows in white sand, reddish-yellow sand or red-brown loamy sand around sandstone outcrops in coastal heath, shrubland or low woodland, most known populations growing in coastal areas but also known from one population c. 40 km inland. Associated species include *Melaleuca megacephala, Grevillea pinaster* and *Jacksonia cupulifera.*

Conservation Status

Current: Priority 2[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. S of Red Bluff	N	Private	10.4.1998	100	Moderate, some rabbit predation
2. Mushroom Rock	N	National Park	10.4.1998	30	Moderate, some rabbit predation
3. Red Bluff	N	Private	27.9.1995	10+	Healthy
4. Gabba Gabba	N	Crown Reserve	19.6.1996	10+	Healthy
5. Hardabutt	N	National Park, Private	10.10.1995	16	Healthy
6. N of Kalbarri	N	Crown Reserve	3.11.1994	20+	Moderate, weed infestation & recreational disturbance
7.* Pot Alley	N	National Park	10.1963	-	-

Response to Disturbance

Unknown

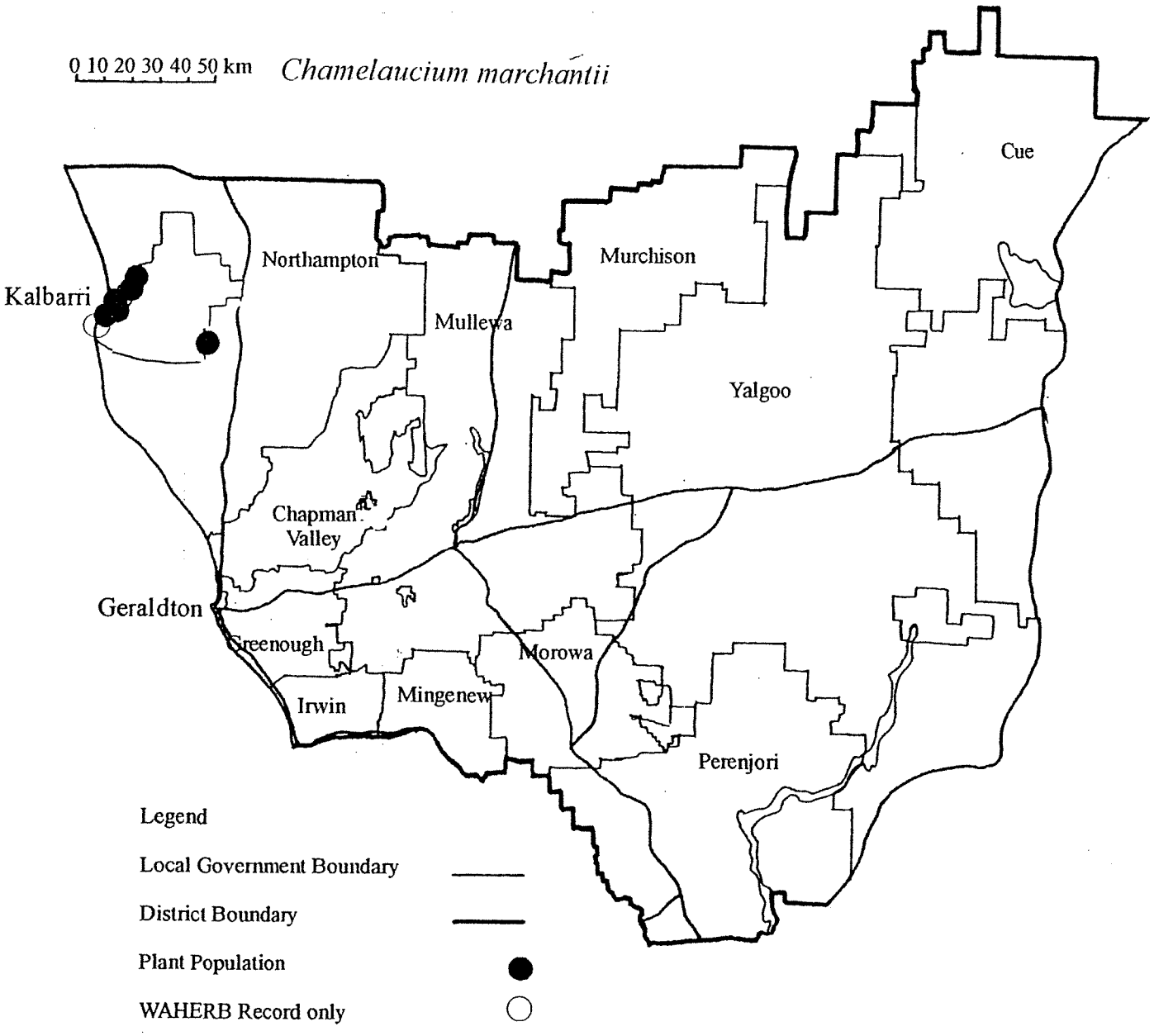
Research Requirements

- Further survey is required, particularly in suitable habitat along the Murchison River.

[#] now Priority 3 (updated at December 1999)

References

Strid (1987).



Comesperma griffinii Keighery ms POLYGALACEAE

A low, rosetted plant, c. 5 cm tall and 8 cm across. It has several stems arising at ground level from a tap root. The leaves are spathulate or lanceolate, to c. 3 cm long, largest at the base, diminishing in size up the stems which are spreading, to 5 cm long. The flowers are in terminal spikes to c. 2.5 cm long. The flowers are small, c. 2 mm long, yellowish-green in colour. The fruits are long, broad at the top with an indented apex so that they are heart-shaped. They are 3 mm broad at the top, tapering to the base and 5 mm long. They are flattened but with a raised area over the seeds on each of the two compartments. Each compartment contains one seed which is black, c. 2 mm long, with a tuft of silvery hairs at the tip.

Flowering Period: October

Distribution and Habitat in the Geraldton District

Known from two collections, one in the Geraldton District from south-east of Mt Gibson, the other in the Moora District from south of Eneabba. It is also reported to occur south-west of Mullewa.

Grows on yellow sand on flat sandplain in a herbfield at the northern location and on grey sand in low open heath near Eneabba.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

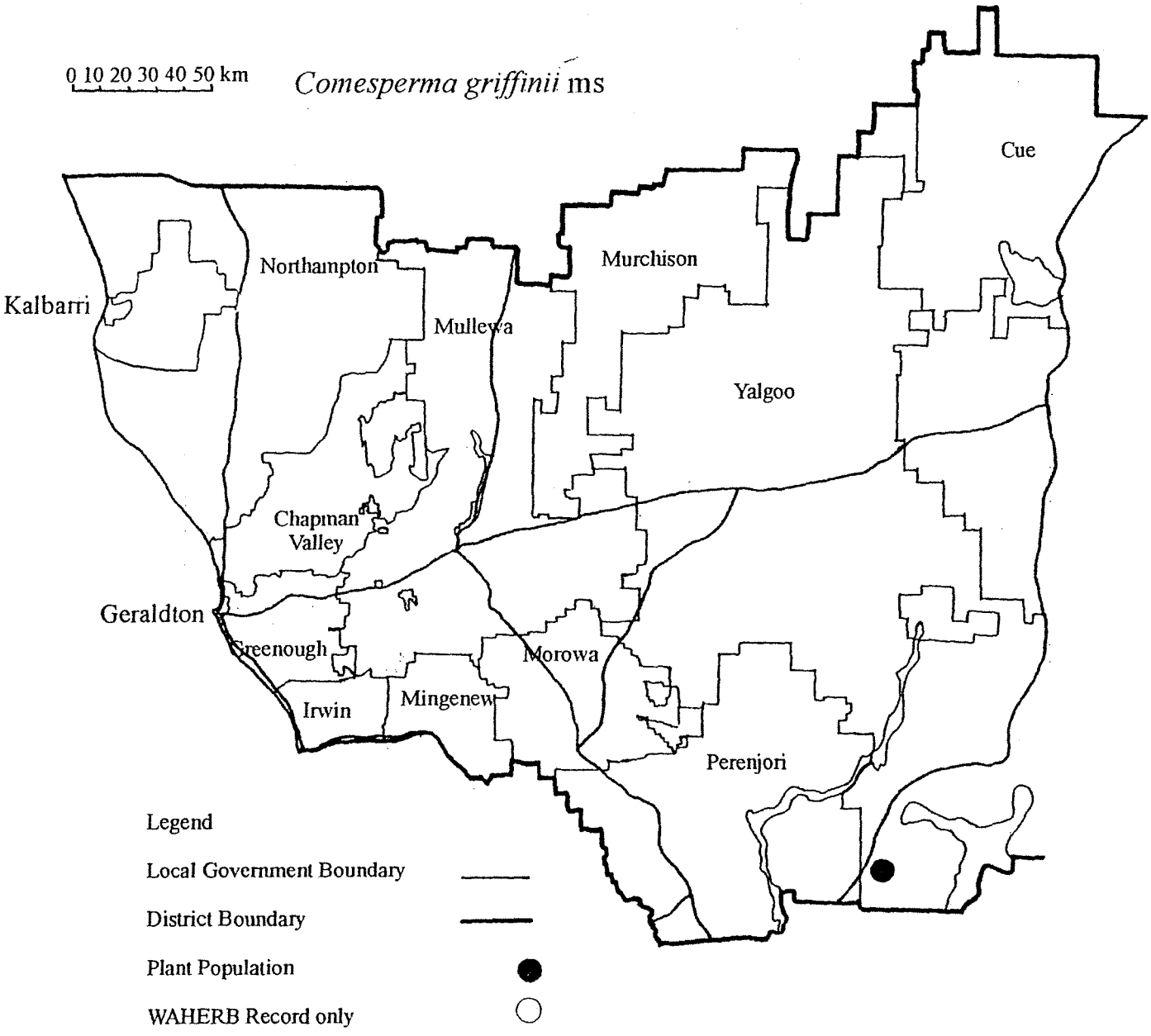
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SW of Mt Gibson	Y	Pastoral Lease	24.10.1992	-	-

Response to Disturbance

Unknown

Research Requirements

- Further survey is required, particularly to refind and survey population 1 and to survey the area south-west of Mullewa.


0 10 20 30 40 50 km
Comesperma griffinii ms
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Comesperma rhadinocarpum F.Muell. POLYGALACEAE

Slender-fruited Comesperma

Comesperma rhadinocarpum was first collected in November 1877 by Mueller "in thickets near the Greenough, Arrowsmith and Irwin Rivers" and a description of the species was published in 1878. The species was presumed extinct until refound in 1977 south of Eneabba, although was not recognised until a further population was found in 1988.

This species is a low perennial herb to 45 cm in height. The leaves are linear lanceolate, 6-10 mm long, with slightly roughened margins. The pea-like flowers are blue and yellow, in long racemes at the end of the stems. The fruit capsules are long and narrow, to 9 mm long, 1.5 mm wide, containing brown seeds, each with a tuft of long hairs at the tip. The specific name refers to these characteristic capsules, from the Greek, *rhadinos* - slender, and *karpos* - fruit.

Flowering Period: Late September-January

Distribution and Habitat in the Geraldton District

The species has been recorded five times since Mueller's early collection. Its distribution ranges from south-west of Mullewa to the Perth Region, with one collection from the Geraldton District south-west of Mullewa.

Grows in yellow or grey sandy clay or sandy soils, in open low scrub. The species may be a disturbance opportunist, having been found twice in disturbed areas and once on a graded road verge.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SW of Mullewa	Mu	Nature Reserve	6.1.1992	25+ in 1988 5 in 1992	Undisturbed

Response to Disturbance

Appears to be a disturbance opportunist. Population 1 has decreased since its discovery in 1988.

Management Requirements

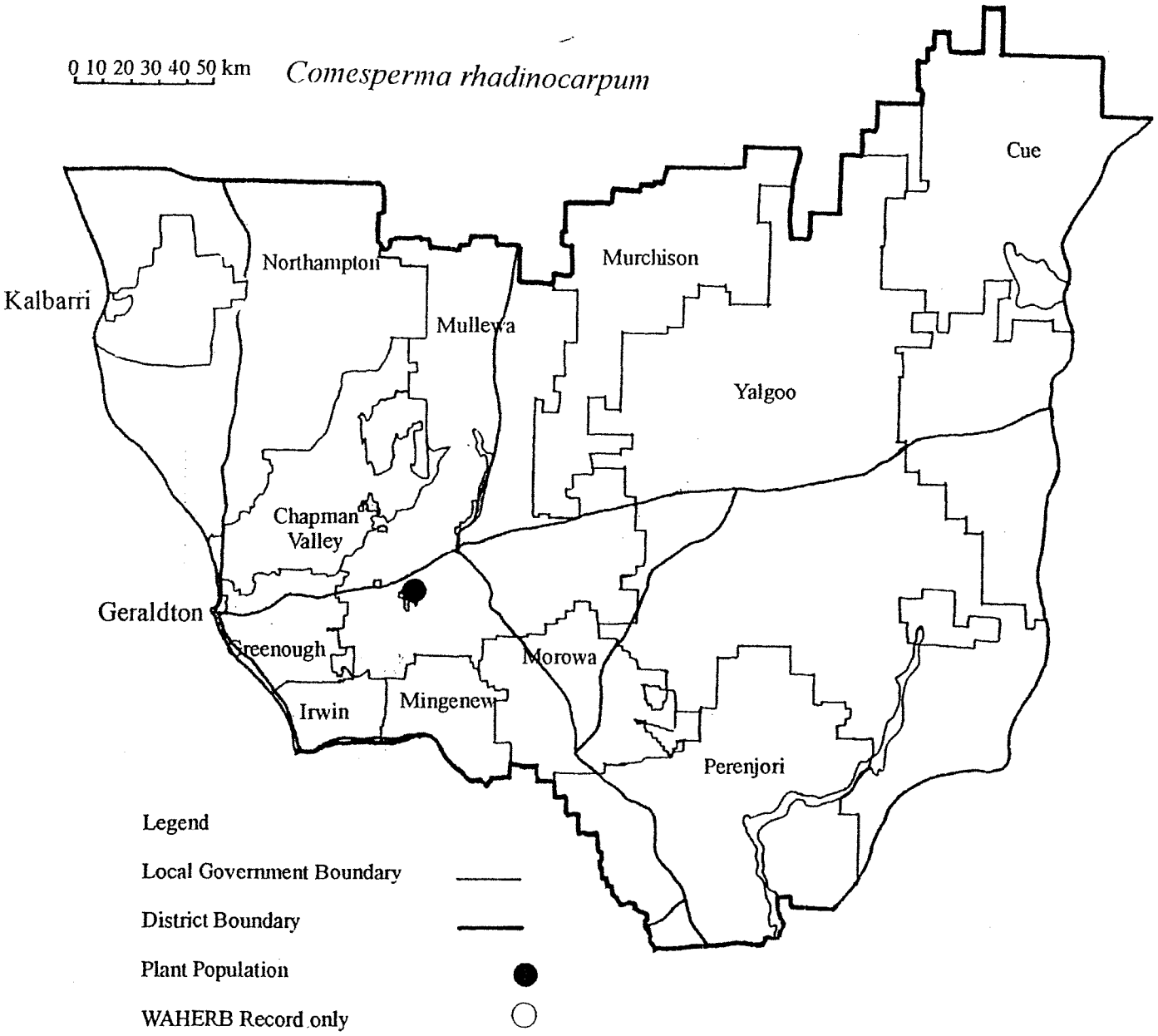
- Monitor the known population which appears to be declining.

Research Requirements

- Further survey is required.

References

Leigh *et al.* (1984), Mueller (1878).


0 10 20 30 40 50 km
Comesperma rhadinocarpum
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Cryptandra glabriflora Benth. RHAMNACEAE

An erect, low shrub to 0.5 m high, with numerous rigid, divaricate branchlets which are sometimes spiny. The leaves are linear or oblong, to 4 mm long, glabrous with rolled back margins. The flowers are hairless, sessile, clustered along the branchlets, with broad brown bracts overlapping to cover the short tube. The calyx is broadly bell-shaped, c. 2 mm long and is divided almost to the base. The five spreading lobes are white, ageing to pink.

This species is distinguished from *Cryptandra myriantha*, which is a common and widespread species, by its spinescent branchlets, very short floral tube and large hairs on the top of the fruit.

Flowering Period: July-August

Distribution and Habitat in the Geraldton District

Known from the Kalbarri area and to the south of the National Park over a range of c. 50 km.

Grows on yellow or grey sand or brown clay over sandstone or on gravelly, brown sandy clay. It occurs in open low heath and *Acacia* shrubland with low heath. Associated species include *Allocasuarina campestris, Astroloma serratifolium, Verticordia, Petrophile* and *Hakea* species. The locality of most populations coincide with occurrences of Windalia Radiolarite, a Cretaceous deep sea deposited sandstone to chert formation.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Yerina Springs Road	N	Private	18.6.1996	30+	Healthy
2. NE of Kalbarri	N	National Park	9.8.1994	50+	Healthy
3. Erriary Road	N	-	9.7.1997	"Frequent"	-
4. NE of Kalbarri	N	National Park	3.7.1991	"Few plants"	-
5. E of Kalbarri	N	National Park	23.7.1984	"Frequent"	-
6.* Mushroom Gorge	N	National Park	10.1972	-	-
7.* SE of Kalbarri	N	National Park	8.5.1968	-	-

Response to Disturbance

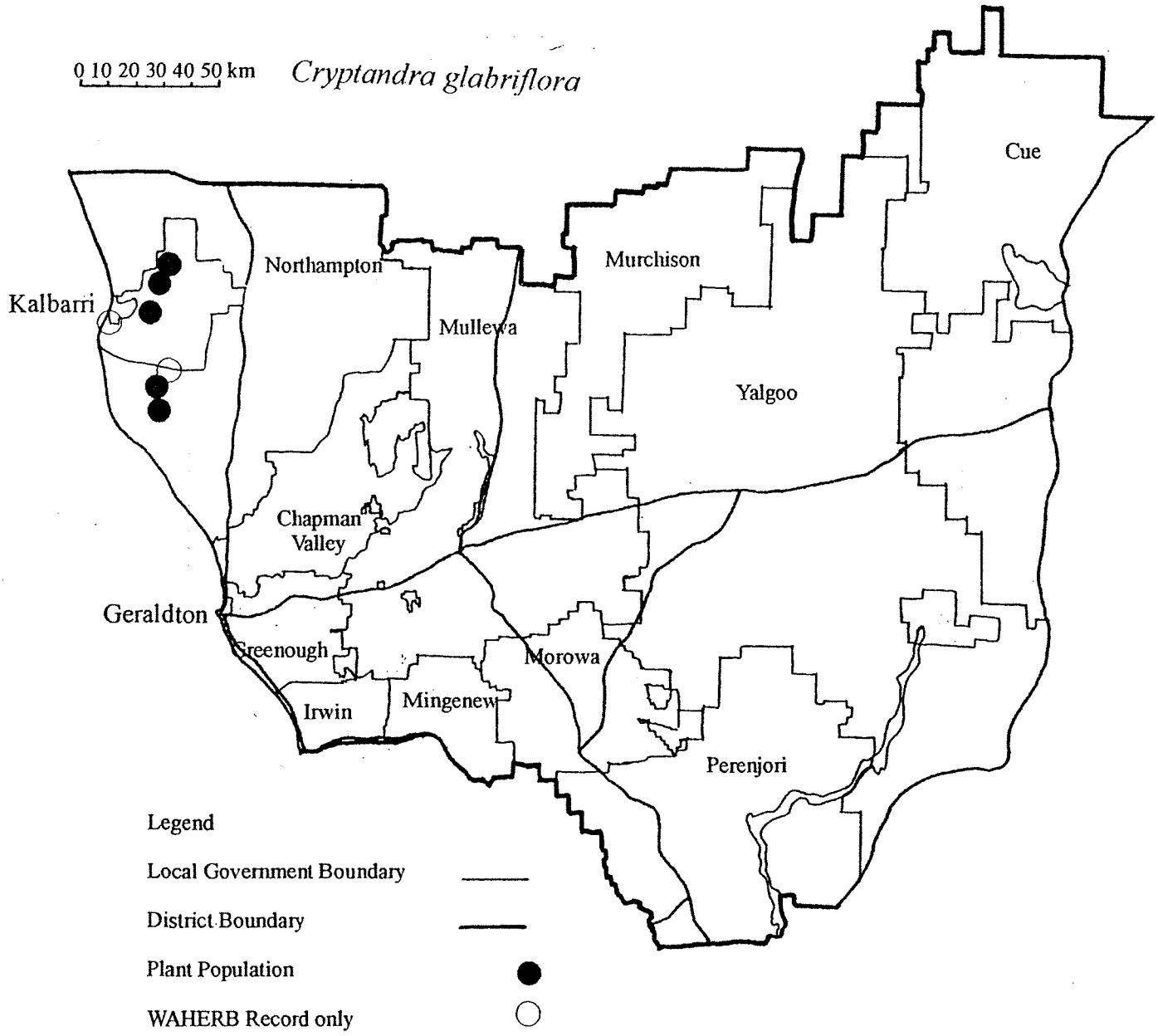
Unknown

Research Requirements

- Further survey is required.

References

Bentham (1863), Rye (1995).


0 10 20 30 40 50 km
Cryptandra glabriflora
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Cryptandra nola Rye RHAMNACEAE

An erect or spreading shrub, 0.3-1 m high. The branchlets are spinescent and the young stems have small stellate hairs which are soon shed. The leaves are oblong to elliptic, to 2.2 mm long and 0.6 mm broad, with stalks to 0.4 mm. They are glabrous or have minute stellate hairs on the upper surface and are densely hairy on the lower surfaces, which are concealed by the curled margins. The flowers are white and glabrous and are sometimes solitary, but usually grouped in loose clusters of 2-8 flowers, 7-11 mm wide. The floral tube is 2-2.5 mm long and the sepals are c. 1.5 mm long, both are stellate hairy. The petal claw is c. 0.3 mm long.

This species is similar to *Cryptandra arbutiflora,* which has simple hairs on the young stems and leaves, longer petioles, glabrous flowers and shorter petal claws.

Flowering Period: June-August

Distribution and Habitat in the Geraldton District

Occurs from east of Yuna to south-east of Canna, over a range of c. 100 km.

Grows on sandy soil over granite or granite conglomerate, or in red-brown loam near rocky areas. Grows in open tall shrubland or in open woodland with scattered shrubs. Associated species include *Eucalyptus loxophleba, Acacia acuminata, Dodoneaea inaequifolia* and species of *Baeckea, Cassia* and *Eremophila.*

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Mullewa	Mu	Shire Reserve	6.8.1994	40+	Healthy
2. ENE of Mullewa	Mu	Private	6.8.1994	100+	Healthy
3. NW of Canna	Mo	Shire Reserve	27.7.1996	"Rare-uncommon"	-
4. SW of Canna	Mo	Shire Reserve	15.9.1993	-	-
5. N of Morawa	Mo	-	19.8.1995	-	-
6. W of Canna	Mo	Private	15.8.1990	"Common"	-
7.* E of Yuna	CV	Nature Reserve	5.6.1966	-	-

Response to Disturbance

Unknown

Management Requirements

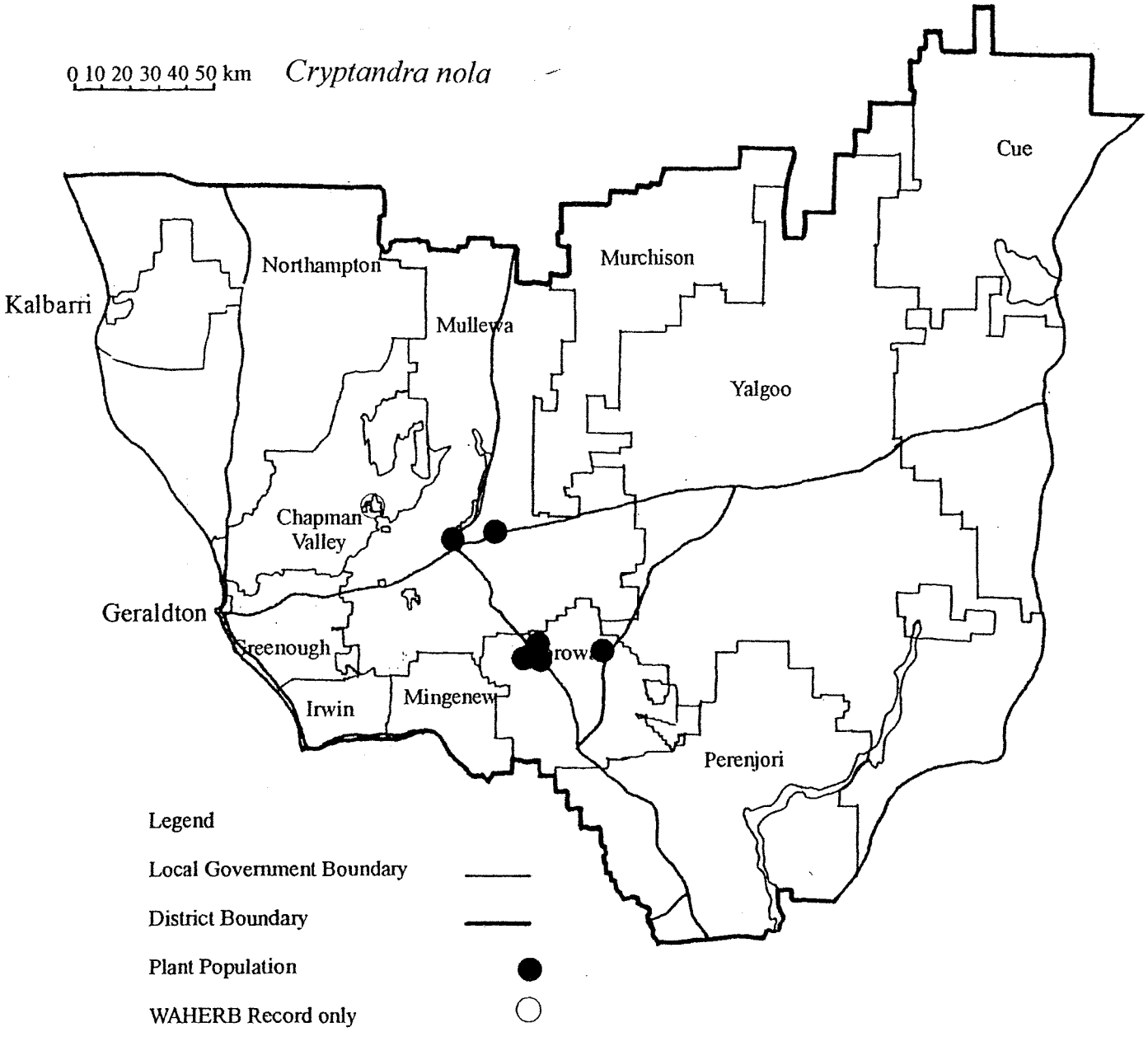
- Maintain liaison with land owners and managers.

Research Requirements

- Further survey is required, particularly to refind and resurvey populations 3-7.

References

Rye (1995).


0 10 20 30 40 50 km
Cryptandra nola
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Cryptandra scoparia Reissek in Lehm. var. *microcephala* Benth. RHAMNACEAE

A low shrub, 20 cm-1 m tall, much-branched, with divaricate branching and numerous slender spines. The leaves are linear, to c. 6 mm long, glabrous, with rolled back margins. The flowers are in dense globular clusters to 6 mm broad, almost sessile, on the main branches and on the short leafy branches. Each flower is stalkless and is surrounded by several brown fringed bracts, half as long as the calyx. The calyx is silky pubescent at first, c. 2 mm long, becoming glabrous or with a tuft of hairs on each lobe. It is broadly bell-shaped, the lobes longer than the tube.

The type variety occurs in the Lesueur to Perth area and has longer spinescent branchlets.

Flowering Period: May-August

Distribution and Habitat in the Geraldton District

Grows on sandplain north of the Murchison River and has been recorded from the Geraldton and Mullewa areas over a range of c. 155 km.

Grows on yellow sand in low scrub and open heath to 1.5 m with *Grevillea leucopteris*, *Banksia sceptrum* and myrtaceous shrubs.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. NW of Eurardy	N	VCL	11.8.1994	1	Healthy
2. NW of Ajana	N	Crown Reserve	1.6.1994	100+	Healthy
3.* Z Bend	N	National Park	21.6.1969	-	-
4.* SW of Mullewa	Mu	-	21.6.1969	-	-
5.* N of Geraldton	G	Shire Reserve	9.8.1965	-	-
6.* S of Kalbarri	N	National Park	7.5.1968	-	-

Response to Disturbance

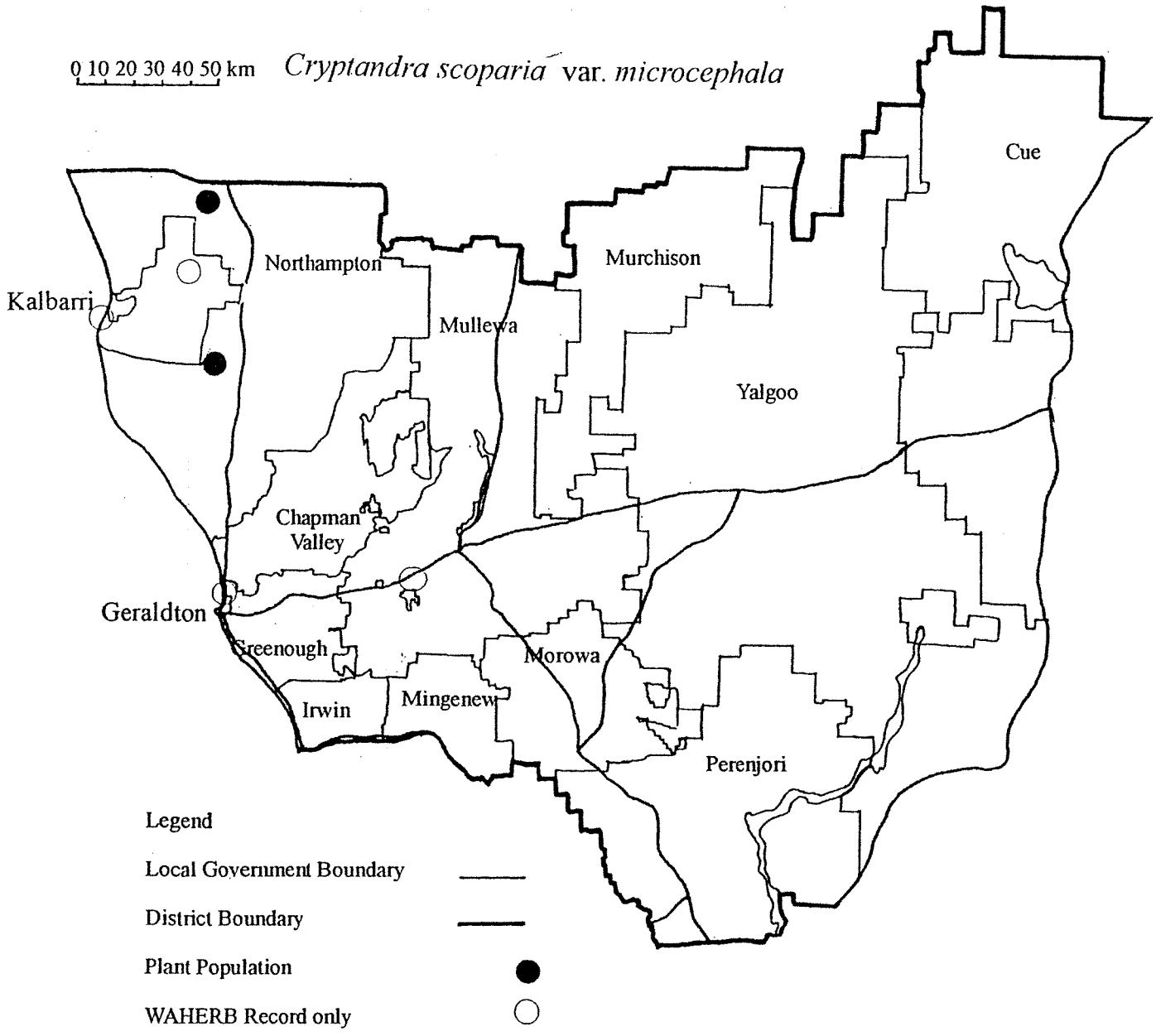
At population 2, the plants were small, regenerating after a fire which had occurred several years previously.

Research Requirements

- Further survey is required, particularly to refind populations 3-6.

References

Bentham (1863), Rye (1995).


0 10 20 30 40 50 km
Cryptandra scoparia var. microcephala
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Dampiera krauseana Rajput & Carolin GOODENIACEAE

An erect, branched subshrub to c. 60 cm tall, with brownish hairs on the young stems. The leaves arising from the stems are sessile, obovate to oblanceolate, toothed at the apex, to 28 mm long, 15 mm wide, glabrous above, hairy below. The leaves below the flowers are much smaller than those lower down. The flowers are in loose terminal racemes to 20 cm long. They have stalks to 4 mm long and reduced sepals covered by a tuft of silky hairs. The corolla is 8-10 mm long, with much-branched grey hairs on the outside. It is deep blue or violet-blue in colour, the wings 2-3 mm wide. The wing of the adaxial petal is obsolete above the auricle. The ovary and fruit are not swollen, the fruit is ovoid, to 4 mm long.

This species is similar to *Dampiera spicigera* which has smaller, more blunt teeth on the leaves and pale grey or yellowish hairs on the young growth.

Flowering Period: March-April, June, August-October

Distribution and Habitat in the Geraldton District

Occurs mainly from Yuna to south of Ambania, but has also been collected in the past from Ajana, north of Northampton.

Grows on yellow sand in open mallee woodland amongst open low shrubs or on pale brown sandy loam in shrubland with *Allocasuarina campestris, Melaleuca uncinata* and *Hakea pycnoneura.*

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. E of Yuna	CV	Nature Reserve	2.4.1994	20+	Healthy
2. E of Geraldton	Mu	-	24.10.1992	-	-
3. Bindoo Hill	Mu	Nature Reserve	10.9.1993	-	-
4.* S of Yuna	-	-	30.8.1967	-	-
5.* Near Eradu	-	-	9.1963	-	-
6.* Ajana	N	-	27.9.1926	-	-

Response to Disturbance

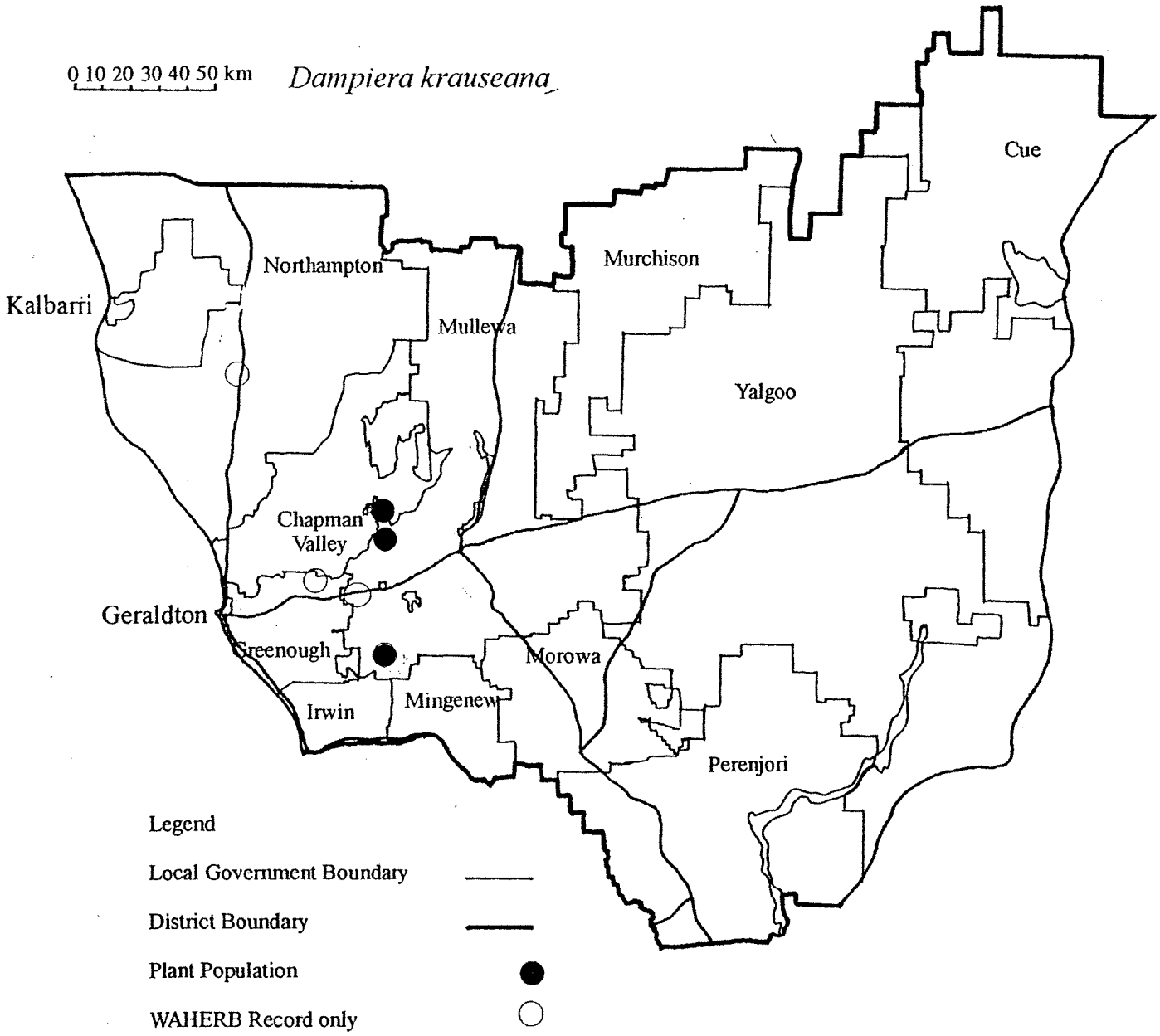
Unknown

Research Requirements

– Further survey is required.

References

Rajput & Carolin (1988, 1992).


0 10 20 30 40 50 km
Dampiera krauseana
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Dicrastylis incana Munir — CHLOANTHACEAE

A shrub 0.3 to 1.5 m tall, with a dense covering of branched hairs on the young stems, leaves and inflorescences. The leaves are opposite, in two rows down the stems. They are sessile, narrowly ovate-triangular to narrowly ovate, to 25 mm long and 7.5 mm wide. The margins are recurved, almost concealing the pale grey-green lower surface with its covering of long white hairs. The upper surface is deeply divided into blister-like sections. The flowers are arranged in panicles to 80 mm x 140 mm. The flowers have their parts in fives or sometimes sixes and are 3-5 mm long. The calyx has white or rusty hairs and narrow lobes. The corolla has a tube to 2.2 mm long and is sparsely hairy on the outside. The lobes are oblong-ovate, the largest lobe to 3.6 mm long, the others to 2.8 mm long. They are white, obtuse, hairy on the outside. The stamens have filaments to 2 mm long and the anther is dark purplish. The style is branched, with hairs.

The original description indicates that this species occasionally produces flowers with parts in fours.

The name *Dicrastylis morrisonii* was published at the same time as *D. incana,* both described from single collections. *D. morrisonii* represents an extreme of the variation found within *D. incana,* being a particularly lush specimen, and additional collections of *D. incana* have been found, representing some intermediate states of the characters originally used to distinguish the two taxa.

Flowering Period: September-November

Distribution and Habitat in the Geraldton District

Occurs between Yuna and Ambania over a range of c. 45 km.

Grows in yellow sand or pale brown clayey sand in heath with other species, including *Actinostrobus arenarius, Conospermum stoechadis, Grevillea eriostachya* and *Acacia* sp.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. E of Eradu	Mu	MRWA Road Verge, Crown Reserve	5.10.1994	14	Healthy
2. N of Eradu	CV	Shire Road Verge	1.11.1994	2	Moderate
3. E of Yuna	CV	Private	8.11.1990	-	-
4.* E of Yuna	CV	Nature Reserve	12.10.1976	-	-
5.* SE of Yuna	CV	-	29.9.1976	-	-
6.* Eradu	G	-	31.10.1963	-	-
7.* W of Yuna	CV	-	5.11.1903	-	-

Response to Disturbance

Population 1 occurred in an area which had been burnt a few years previously.

Management Requirements

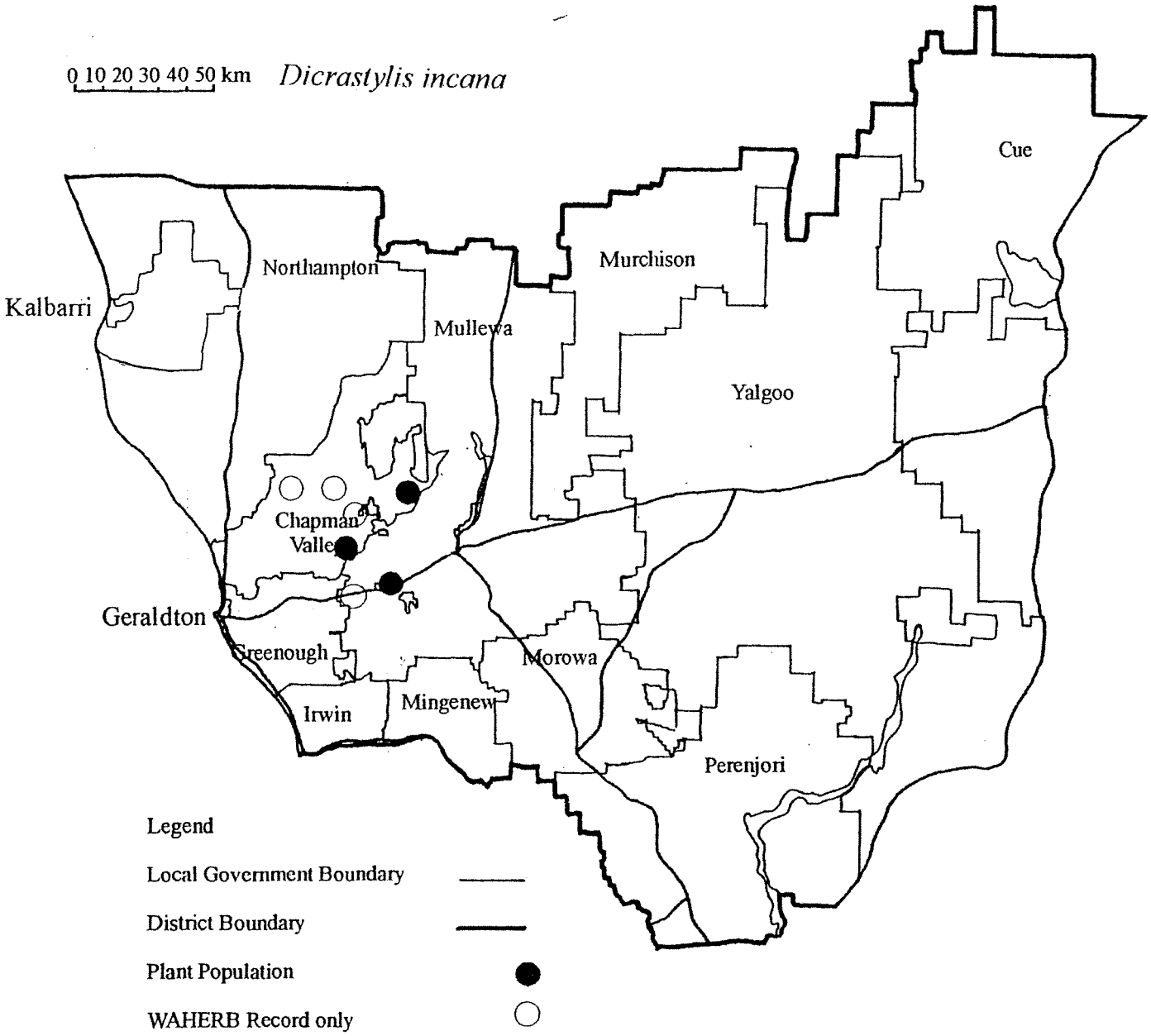
- Ensure that road verge populations are marked.

Research Requirements

– Further survey is required.

References

Munir (1978), B. Rye (personal communication).



Epitriche demissus (A.Gray) P.S.Short ASTERACEAE

Epitriche demissus is a low annual herb 2-5 cm high, with stems which are simple or branching at the upper nodes. The leaves are opposite, sessile and lanceolate, with few hairs, 0.5-1 cm long. The flowers are in compound heads with an involucre of bracts, the outer leaf-like, the inner ones densely hairy. There are 10-20 flowers per head, each with a tubular five-lobed corolla to 1.9 mm long. The fruit is an achene which has a tuft of long hairs at the apex, giving the clusters of flower heads a woolly appearance.

The monotypic genus *Epitriche* is allied to *Angianthus* and this species was included in that genus until the account of *Epitriche* was published in 1983.

Flowering Period: July-September

Distribution and Habitat in the Geraldton District

In the Geraldton District, *E. demissus* is known from south of Morowa and it also occurs about 40 km further to the south-west in the Moora District where two populations are known c. 6 km apart in the Three Springs area.

Grows on the margins of salt lakes in sand or clayey sand with other low herbs and just below open woodland of *Acacia acuminata* with scrub beneath or with *Halosarcia* species only.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* S of Morowa	Mo	-	Pre 1986	"forming dense mats"	-

Response to Disturbance

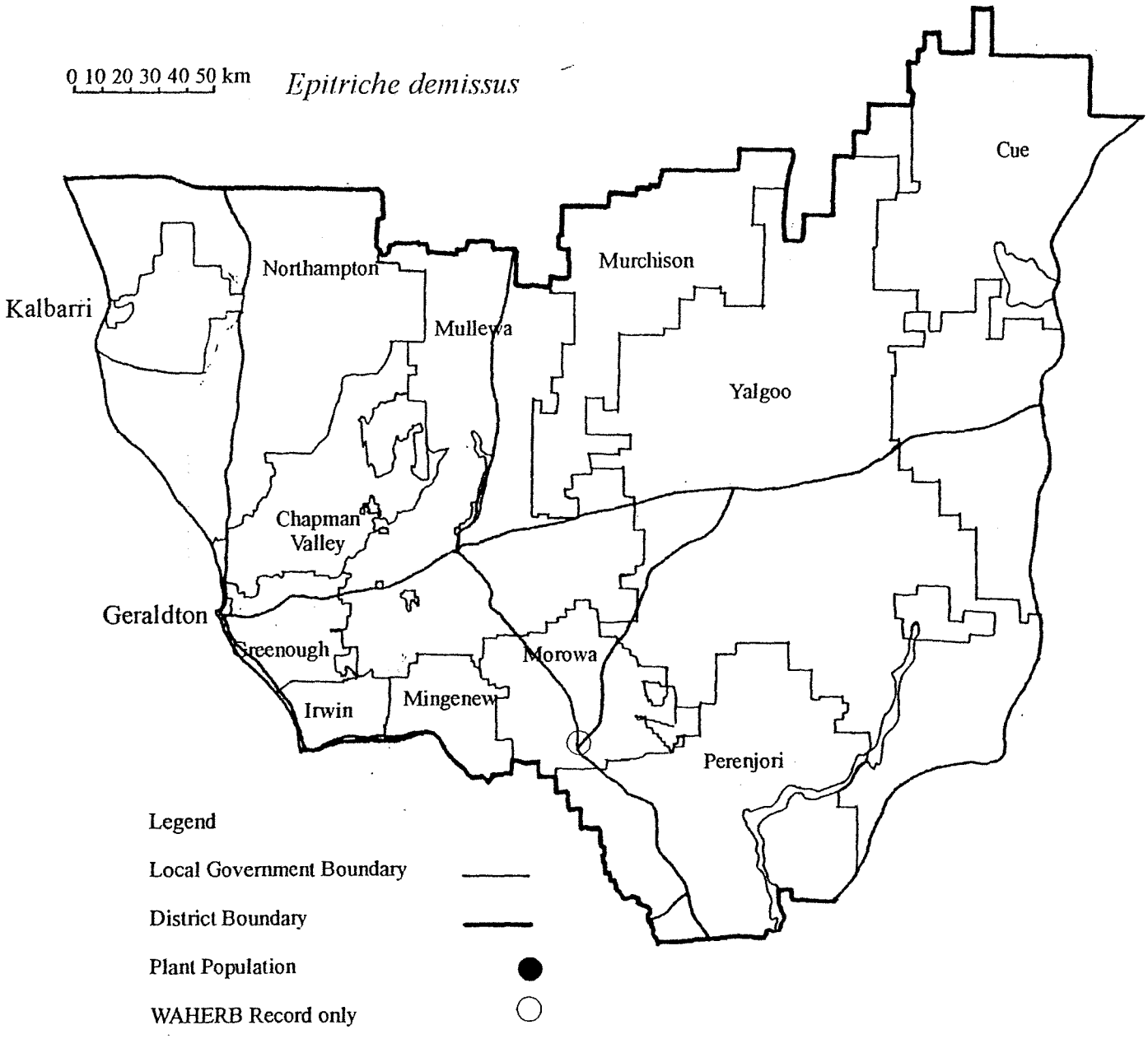
Unknown

Research Requirements

- Further survey is required to refind population 1 and to find further populations around the edges of salt lakes which are extensive in the areas of occurrence.

References

Bentham (1866), Grieve & Blackall (1982), Short (1983).


0 10 20 30 40 50 km
Epitriche demissus
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Eremaea acutifolia F.Muell. MYRTACEAE

Rusty Eremaea

An upright to spreading, flat-topped shrub to 1 m tall, 1.5 m broad. The branchlets have a two-layered covering of hairs. There are 13-15 overwintering bracts per bud, to 3.5 mm long. The longest overwintering bracts (perules) are contracted at the apex, mostly glabrous or with a marginal fringe of hairs. The leaves are narrowly elliptic to linear, tapering to a pointed apex, to 9.5 mm long, 1.2 mm wide. There is one conspicuous vein on the lower surface. The flowers are terminal on short side shoots along the long branches. The hypanthium is shallowly bell-shaped, to 5 mm long. The calyx lobes are triangular and the petals are 3-4 mm long. There are 28-34 stamens per bundle, the filaments are orange or rarely dark pink, to 7.5 mm long. The fruit is top-shaped, to 6 mm long and 9 mm wide, light to coppery brown. The outer surface is rough and flaky, the fruiting valves with two densely hairy lobes covered with protuberances.

This species is distinguished by its needle-like leaves and the position of the flowers on short lateral shoots. This character also occurs in *Eremaea violacea,* which has violet flowers and smooth fruits which have valves with only two protruberances.

Flowering Period: August-November

Distribution and Habitat in the Geraldton District

Occurs to the east and south-east of Geraldton over a range of c. 60 km.

Grows on grey, yellow or white sand in heath or tall heath on upland sandplain.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Kojarena	G	Rail Reserve	5.10.1994	c. 100 + 5 seedlings	Moderate, some plants partly dead and weed infestation
2. E of Walkaway	Mu	Crown Reserve	24.10.1992	-	-
3.* Burma Road	G	Shire Road Verge	23.9.1980	"Common"	-
4.* Casuarina Road	Mu	-	4.9.1967	-	-
5.* SE of Walkaway	I	-	4.9.1966	-	-
6.* SE of Walkaway	I	-	4.9.1966	-	-
7.* Eradu area	G	-	3.10.1966	-	-
8.* Burma Road	G	-	30.8.1963	-	-
9.*S of Mullewa	Mi	-	18.10.1967	-	-

Response to Disturbance

Unknown

Management Requirements

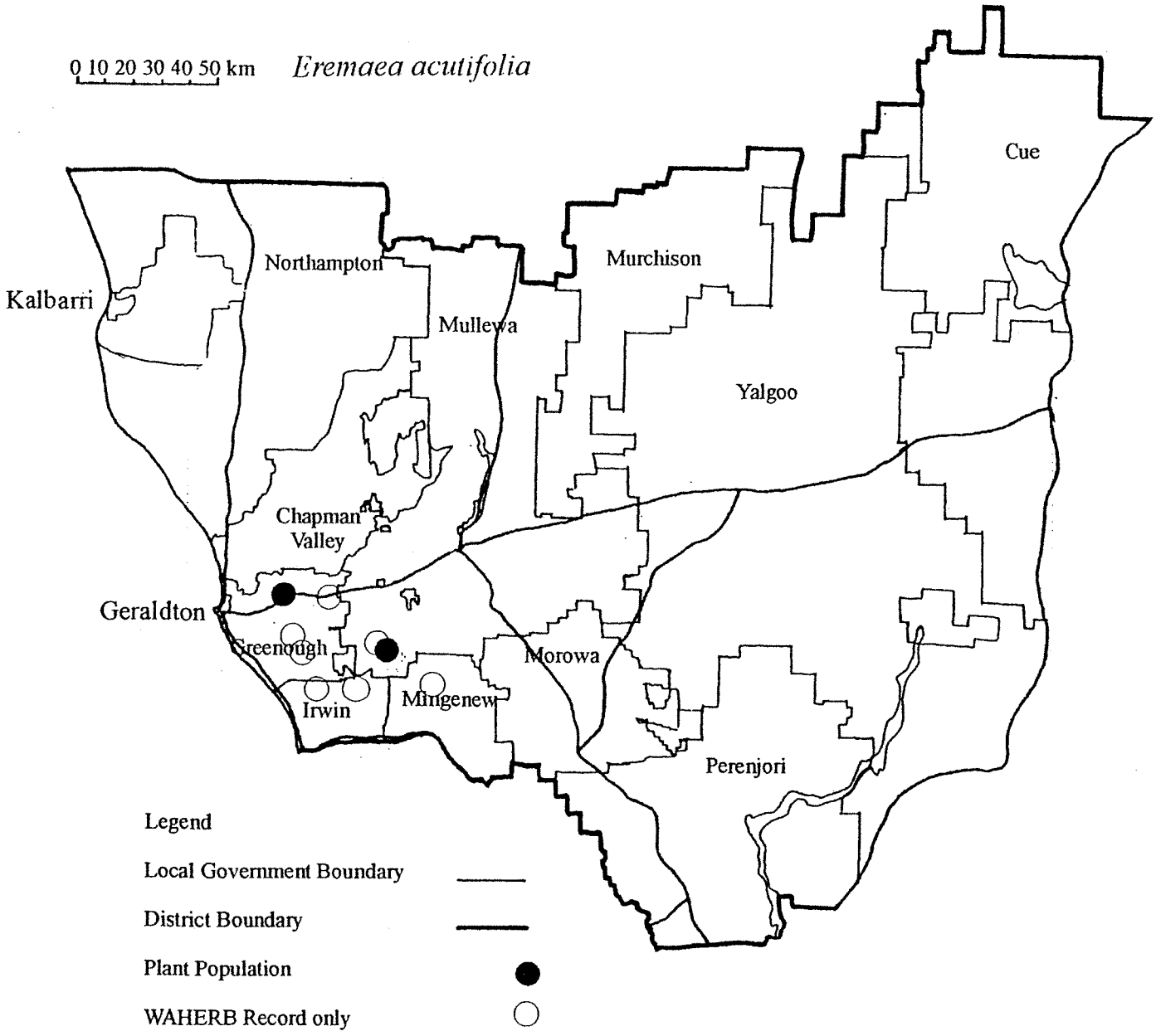
- Ensure that the known populations are marked.

Research Requirements

– Further survey is required.

References

Hnatiuk (1993), Mueller (1860).



Eremophila mirabilis Chinnock ms MYOPORACEAE

A shrub 0.5-1.5 m tall, with a fine grey covering of short woolly hairs on the branches and leaves. The leaves are narrow, to 35 mm long, 2.6 mm broad, with prominent warts on the lower surface. The flowers are solitary, on stalks to 12 mm long. They have five broad sepals with pointed tips, to 20 mm long, 9 mm broad, pale yellow to purple in colour. The corolla is tubular with four lobes, the upper notched. It is cream in colour, (possibly also pink), with carmine spots. The ovary has a covering of glandular hairs. The fruit has four locules with 2-3 seeds per locule.

Flowering Period: September

Distribution and Habitat in the Geraldton District

Known from two populations in the Geraldton District, where it occurs near the northern boundary of the District to the north of Mullewa. It is also known from several populations in the Goldfields Region north of Kalgoorlie.

Grows on low rocky breakaways in shallow red loam, in very open low shrubland with *Verticordia jamesonii, Prostanthera magnifica* and species of *Micromyrtus, Thryptomene, Acacia* and *Eremophila.*

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. NW of Woolgorong	Mu	Pastoral Lease	4.8.1995		Healthy
2. NW of Woolgorong	Mu	Pastoral Lease	-	-	-

Response to Disturbance

Unknown

Management Requirements

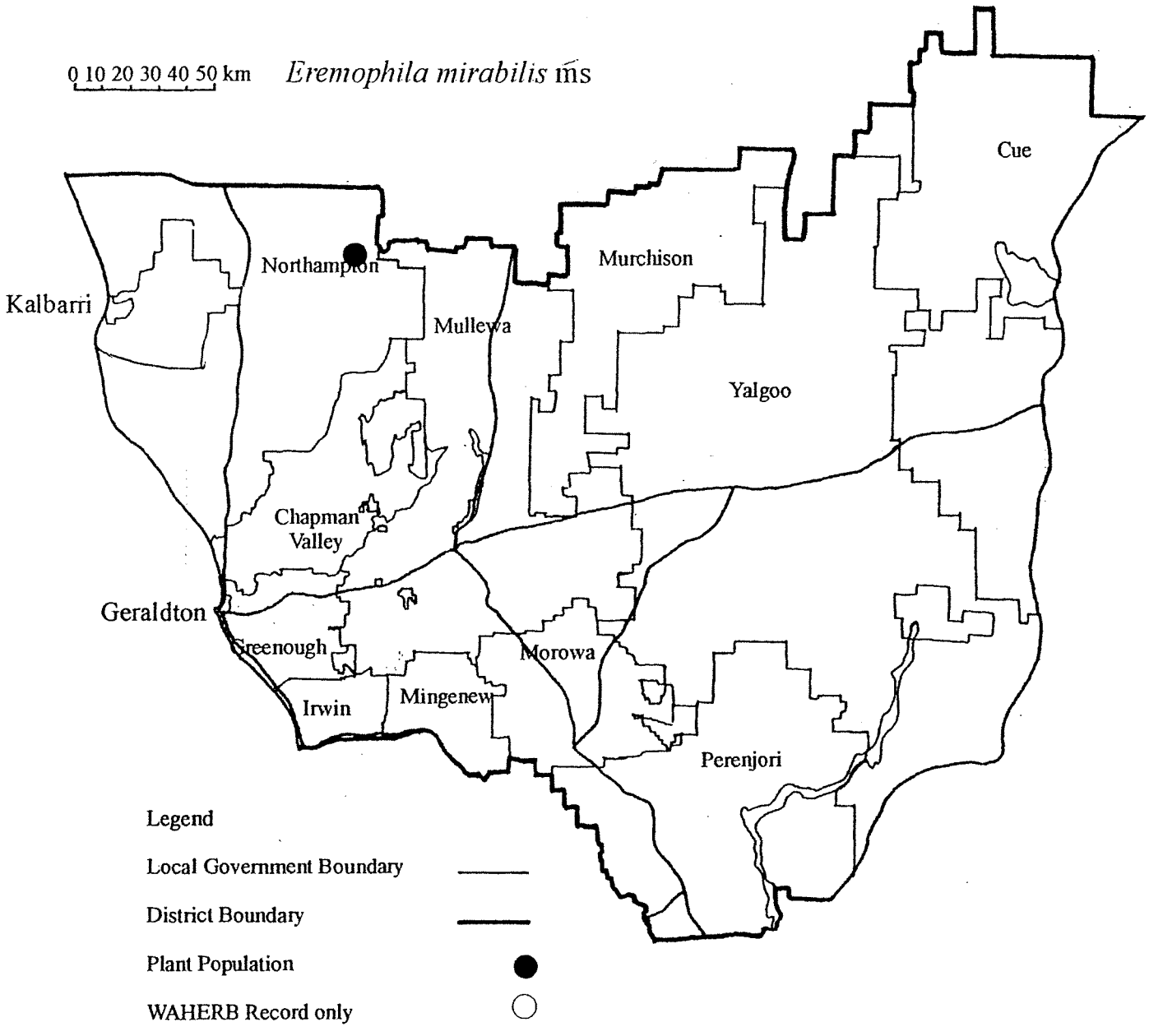
- Maintain liaison with land managers.

Research Requirements

- Further survey is required.

References

R. Chinnock (personal communication).


0 10 20 30 40 50 km
Eremophila mirabilis ms
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Eucalyptus diminuta Brooker & Hopper ms MYRTACEAE

A mallee to 5 m tall, with the stems grey in colour over smooth copper-coloured bark. The leaves are glossy and dark green in colour. The buds are pendant on slender rounded peduncles. The operculum is elongated and cylindrical with slight or no ribbing and the fruits are cup-shaped to cylindrical.

This species is similar to *Eucalyptus stowardii* but differs in its smaller, less glossy leaves, buds and fruits and in the absence of, or reduced ribbing on buds and fruits. The coppery bark also distinguishes the species.

Flowering Period: May, July and September-January

Distribution and Habitat in the Geraldton District

Known from two areas in the Geraldton District, north-east of Geraldton on low stony hills, and north-east of Kalbarri. It also occurs in the Moora District from west of Three Springs over a range of 30 km and with earlier records, from east of Eneabba and Jurien Bay. It has also been found recently near Watheroo, giving a total geographic range of c. 350 km for this species.

Grows along drainage lines or in swampy areas on hillsides or flats, sometimes below breakaways, on quartz, sandstone or sand over laterite in grey, white or yellow-brown sand, grey sandy clay or white kaolin soil. The plants grow emergent over low scrub in shrublands or open low woodland. Associated plants include *Melaleuca uncinata, Grevillea thelemanniana, Eucalyptus blaxellii* and species of *Dryandra, Dodonaea* and *Kunzea.*

Conservation Status

Current: Priority 2[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. NE of Geraldton	CV	Private	26.9.1995	1 clump	Healthy
2. N of Geraldton	CV	Nature Reserve	7.8.1994	1 clump	Healthy
3. NE of Kalbarri	N	Pastoral Lease	17.10.1992	-	-
4. Eurardy	N	Pastoral Lease	10.1992	"occasional"	-
5.* NE of Geraldton	CV	-	16.3.1968	"infrequent"	-

Response to Disturbance

Unknown

Management Requirements

- Maintain liaison with land managers.

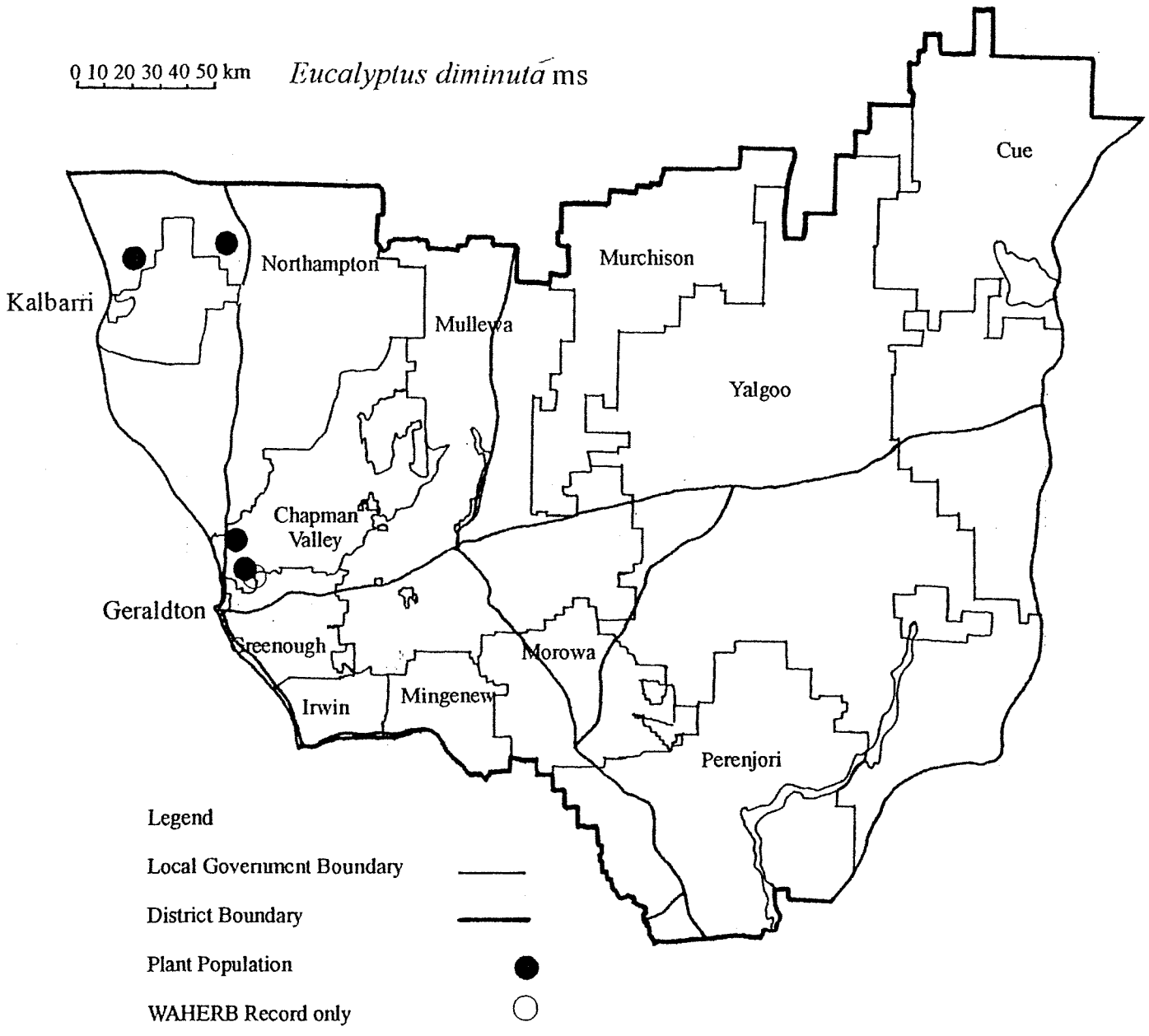
Research Requirements

- Further survey is required, particularly to resurvey populations 3 and 4.

References

Brooker & Kleinig (1990), Kelly *et al.* (1995), Napier *et al.* (1988).

[#] now Priority 3 (updated at December 1999)


0 10 20 30 40 50 km
Eucalyptus diminuta ms
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Frankenia confusa Summerh. FRANKENIACEAE

A low, diffuse shrub to 0.3 m, sometimes scrambling. The young stems have a dense covering of short, upright hairs but later become glabrous. The leaves have short, ciliate petioles and are 1.8-8 mm long, 1-5 mm wide. The lower leaves are oblong to elliptic, rounded at the base, the undersurface mealy and the margins rolled back but the midrib exposed. The upper leaves have cordate bases and are oblong to linear. The flowers are grouped in loose dichasia, with the bracts and bracteoles similar to the leaves. The calyx is 5.5-7 mm long, with dense to sparse hairs on the outside. There are 4-5 pink petals, 8-12 mm long, and six stamens. The style is 3-branched with linear to club-shaped stigmas. There are numerous ovules which are attached to the walls of the ovary. The seeds are densely and minutely pubescent.

Bentham described this as a variety of *Frankenia pauciflora* var. *serpyllifolia*, with leaf margins much less recurved than the typical variety. It was raised to species level by Summerhayes in 1930. *F. pauciflora* has linear leaves to 13 mm long, 1.8 mm wide, with flowers in short, dense dichasia, with 5-6 petals, and smooth or rarely papillose seeds.

Flowering Period: September

Distribution and Habitat in the Geraldton District

A poorly collected species, known from a few collections made on the Murchison River or near it, from south of Kalbarri, Galena to the east, and north of the Geraldton District on the Roderick River, north of Yalgoo.

The known population grows in open low woodland of *Casuarina obesa* amongst open low shrubs, including *Rhagodia* sp., sedges and grasses.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Galena	N	VCL	24.9.1997	1+	Moderate
2.* S of Kalbarri	N	-	-	-	-

Response to Disturbance

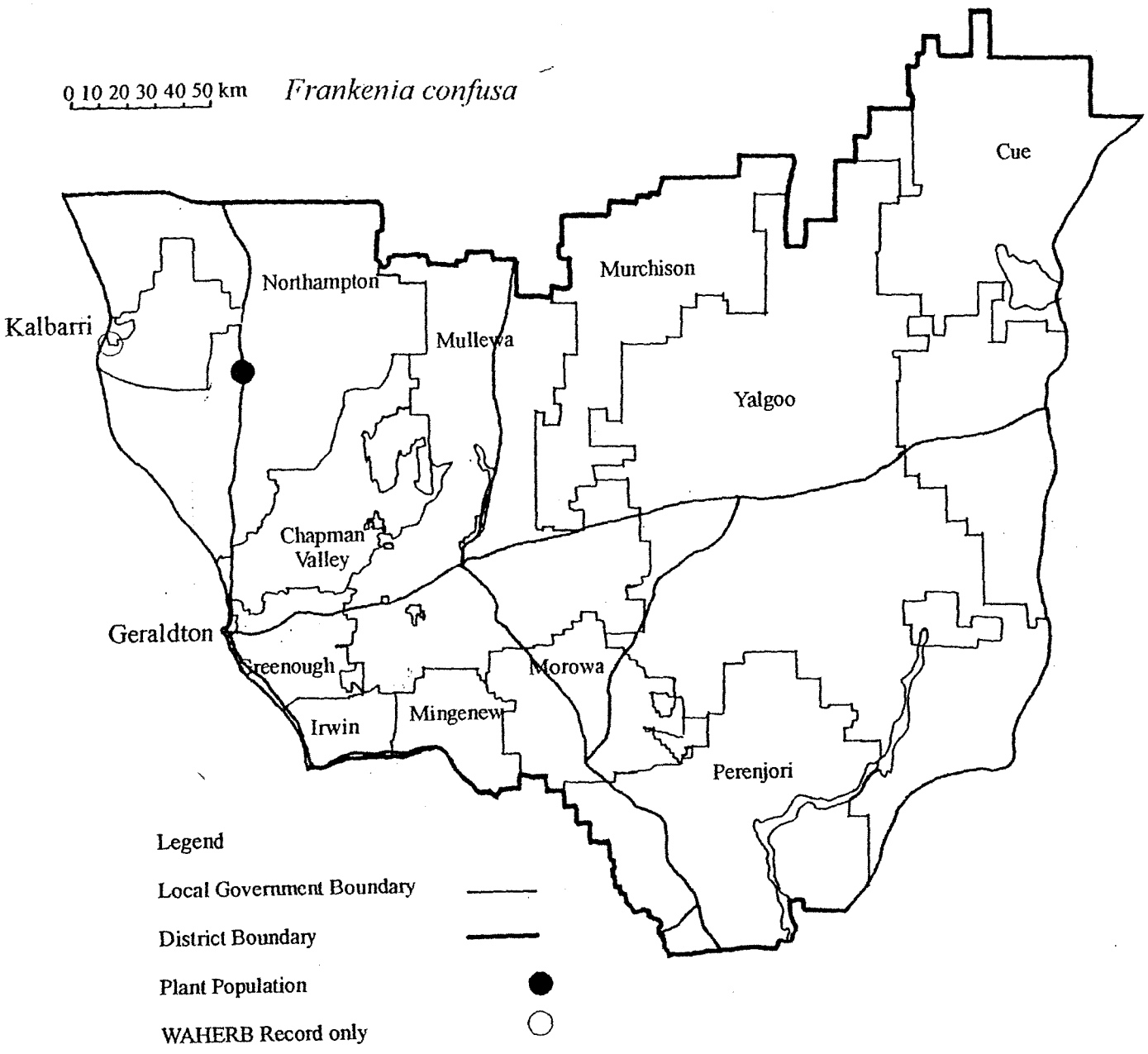
Unknown

Research Requirements

- Further survey is required. The area in which population 1 occurs should be surveyed thoroughly, and further survey is required south of Kalbarri to refind the species in that area.
- Further taxonomic work is required in this genus before the conservation status of this species can be accurately determined.

References

Barnsley (1982), Bentham (1863), Summerhayes (1930).


0 10 20 30 40 50 km
Frankenia confusa
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Grevillea annulifera F.Muell. PROTEACEAE

Pricky Plume Grevillea

An erect, glabrous shrub, 2-4 m tall, usually with the vegetative branches dense at the base and the inflorescences on several taller floral branches, or a spindly shrub with few floral branches. The branchlets are glabrous, the leaves 4.5-7 cm long, spreading, the leaf rachis curved or angled back. They are divided into three or more lobes, usually 5-9, to 3.5 cm long. They are linear, rigid and pungent, the margins rolled back. The inflorescences are grouped in conical to cylindrical dense heads 10-15 cm long, 4 cm wide. The flower stalks are 5-9 mm long. Each flower has a perianth which is green in bud, becoming creamy white, the style creamy white, becoming pink to red. The torus is straight and the nectary annular, the perianth 7-8 mm long, the pistil 28-35 mm long. The fruit is 27-29 mm across, lens to globose-shaped, with a thick coat. The seed is 20 mm long and unwinged.

This species is similar to *Grevillea candicans* which differs in its hard nut-like fruit which does not split open, its hairy branchlets and shorter flower stalks, less than 4 mm long.

Flowering Period: June, September-October

Distribution and Habitat in the Geraldton District

This species occurs in the Geraldton District on sandplain from the north-west corner of the District south-east to the Yuna area. It has also been recorded from just north of the District at Coolomia and once in the Shark Bay area.

Grows on undulating sandplain in yellow sand over limestone near the coast. Occurs in heath, shrubland or low open woodland of *Callitris* sp. or mallee eucalypts. Associated species include *Conospermun stoechadis, Pileanthus peduncularis, Hakea pycnoneura, Calothamnus, Banksia, Acacia, Jacksonia, Verticordia* and *Melaleuca* species.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. NE of Yuna	CV	Nature Reserve	2.11.1994	2	Healthy
2. NE of Kalbarri	N	National Park	3.11.1994	2	Healthy
3. ESE of Kalbarri	N	National Park	3.11.1994	1+	Healthy
4. N of Murchison River	N	National Park, MRWA Road Verge	2.11.1994	100+	Healthy
5. N of Murchison River	N	MRWA Road Verge	2.11.1994	10+	Healthy
6. N of Murchison River	N	VCL	5.7.1995	20+	Healthy
7. N of Murchison River	N	MRWA Road Verge	2.11.1994	1	Healthy
8. N of Murchison River	N	VCL, MRWA Road Verge	5.7.1995	5+	Healthy
9. N of Kalbarri	N	Pastoral Lease	27.10.1992	"Rare"	-
10. NNW of Kalbarri	N	Pastoral Lease	26.8.1994	-	-
11. ENE of Kalbarri	N	National Park	10.11.1986	1	-
12.*E of Yuna	CV	Shire Road Verge	12.10.1976	-	-
13.*Ajana	N	-	9.1960	-	-
14.*NW of Ajana	N	MRWA Road Verge	13.6.1976	-	-
15. NE of Binnu	N	-	2.10.1988	"locally uncommon"	-
16. N of Murchison River	N	MRWA Road Verge	2.11.1994	5+	Healthy

Response to Disturbance

Unknown

Management Requirements

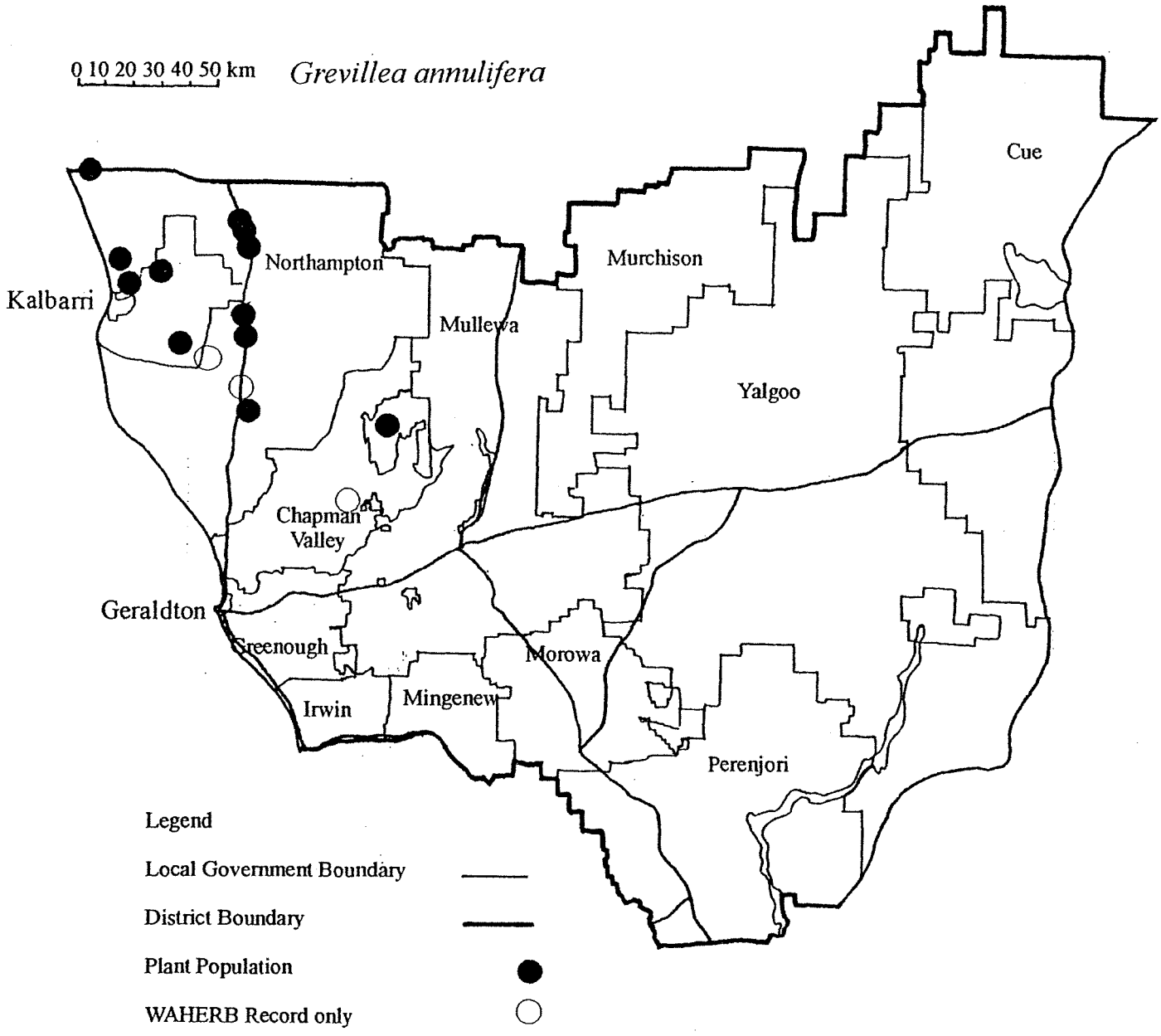
– Ensure that road verge populations are marked.

Research Requirements

– Further survey is required.

References

McGillivray & Makinson (1993), Mueller (1864), Olde & Marriott (1994-5).



Grevillea bracteosa Meisn. PROTEACEAE

Bracted Grevillea

Grevillea bracteosa was described from material collected by James Drummond last century from south-western Western Australia.

An erect, loose shrub to 1-2 m tall, it has narrow leaves which are usually simple but may rarely be divided from near the base into two or three linear segments. They are 5-25 cm long, 1-3 mm wide, without hairs. The margins are rolled over and the midvein is only evident on the lower surface, with two lateral veins evident on either side of the midvein on the upper surface. The inflorescences are terminal, 3-9 cm long, globular in shape. The floral bracts are broad and conspicuous on the buds, 7-14 mm long, elliptic to obovate in shape. The flowers are hairless on the outside, pink, purplish-pink or pale mauve in colour (a white-flowered form occurs near Miling) and they are smaller from the southern part of the species range in the Moora District than from those in populations further north.

The pistil, including ovary, is glabrous, 17-23 mm long, with a transverse torus. The fruits are erect, to 15 mm long and 5 mm wide.

The collection from New Norcia has unusually short pistils, 11-12 mm, longer leaves and the perianth appears pubescent, but Olde and Marriott (1994-5) state that the differences in the small conflorescence form found in the south of the range are inconsistent and do not warrant formal infraspecific recognition.

Flowering Period: August-October in the Geraldton District, September-December in the Moora District

Distribution and Habitat in the Geraldton District

This species is known from the Geraldton District from north of Geraldton to Mullewa and near Morawa, a geographic range of c. 140 km. There are also records from a few localities further south in the Moora District, from Mogumber, New Norcia and north-east of Moora.

In the Geraldton District, G. *bracteosa* has been recorded growing on grey sandy loam in closed scrub, gravelly clay, gravelly sand, sand and sand over gravel, with *Dryandra sessilis.* In the Moora District, it is recorded growing in rugged, stony soil on hills and on granitic loam in heath or tall shrubland, with *G. petrophiloides.*

Conservation Status
Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* Howatharra	CV	-	13.9.1977	-	-
2. Northern Gully	G	MRWA Road Reserve, Rail Reserve	4.9.1996	70 mature, 30 seedlings	Healthy
			16.3.1999	16	Damage by clearance and grading
3.* Near Mullewa	Mu	-	10.1968	-	-
4.* Near Morowa	Mo	-	9.1963	-	-

Response to Disturbance

Unknown

Management Requirements

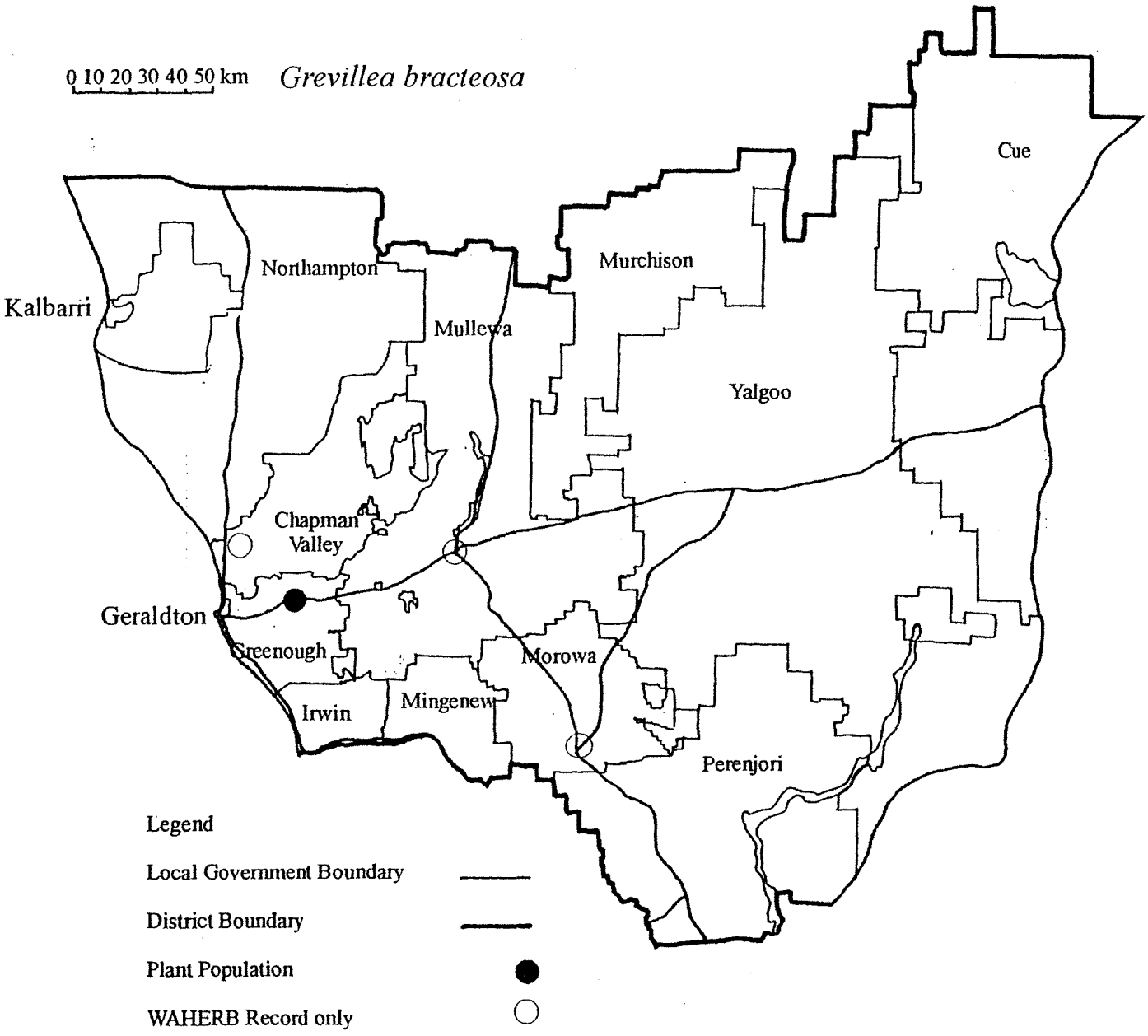
– Ensure that population 2 is marked.

Research Requirements

– Further survey is urgently required.

References

Bentham (1870), Lehmann (1848), McGillivray & Makinson (1993), Olde & Marriott (1994-5).



Grevillea costata C.A.Gardner PROTEACEAE

A compact, rounded shrub to 1.5 m tall, with angular, silky branchlets. The leaves are up to 4.5 cm long, c. 1 mm wide. They are rigid and pungent, fairly thick, the margins rolled back. The flowers are in small, terminal or axillary racemes, the peduncle 2-10 mm long. The perianth is white, 3-4 mm long, with appressed hairs on the outside. The style is 8-9 mm long, with an orbicular pollen presenter. The fruit is swollen, 12-15 mm long, with 7-10 prominent ribs.

This species is similar to *Grevillea inconspicua* and *G. christinae*. *G. inconspicua* differs in its much-branched habit and silvery appearance, with terete branchlets, thinner leaves which are held upright and have a conspicuous midvein on the upper surface. It has shorter pedicels and less prominently ribbed fruit. *G. christinae* has flexible elliptic leaves with the undersurface visible, a pistil with a distinct groove on the lower side and a keel on the upper side, and unribbed fruit.

Flowering Period: May-August

Distribution and Habitat in the Geraldton District

This species is known from the Murchison River over a range of c. 20 km between Ross Graham Lookout and Galena. There is an earlier record from the Binnu area, further south. There is also one record from north of the Geraldton District in the Shark Bay area.

Grows in crevices amongst sandstone or granite rocks in grey silty alluvial sand, brown loamy sand or clay or red clay, in the Murchison River bed and along the river banks. It usually grows in open low woodland of *Casuarina obesa,* with *Eucalyptus camaldulensis, Dodonaea inaequifolia* and *Hakea preissii* over annuals and grasses.

Conservation Status

Current: Priority 2[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SW of Galena	N	Crown Reserve	6.7.1995	30+	Healthy
2. SE of Kalbarri	N	National Park	10.8.1994	10+	Healthy
3. NW of Ajana	N	National Park	10.8.1994	50+	Moderate, some grazing
4. SW of Galena	N	-	10.8.1994	200+	Healthy
5. W of Galena	N	Crown Reserve	12.8.1994	5+	Healthy
6. Galena	N	VCL	2.11.1994	30+	Healthy
7. Hardabutt	N	VCL	15.4.1995	100+	-
8.* S of Binnu	N	-	10.9.1965	-	-

Response to Disturbance

As this species often grows in the bed of the Murchison River, it may be damaged by winter floods. However, it reshoots strongly from the base, usually on the upstream side. Regenerates from lignotuber or epicormic buds after fire.

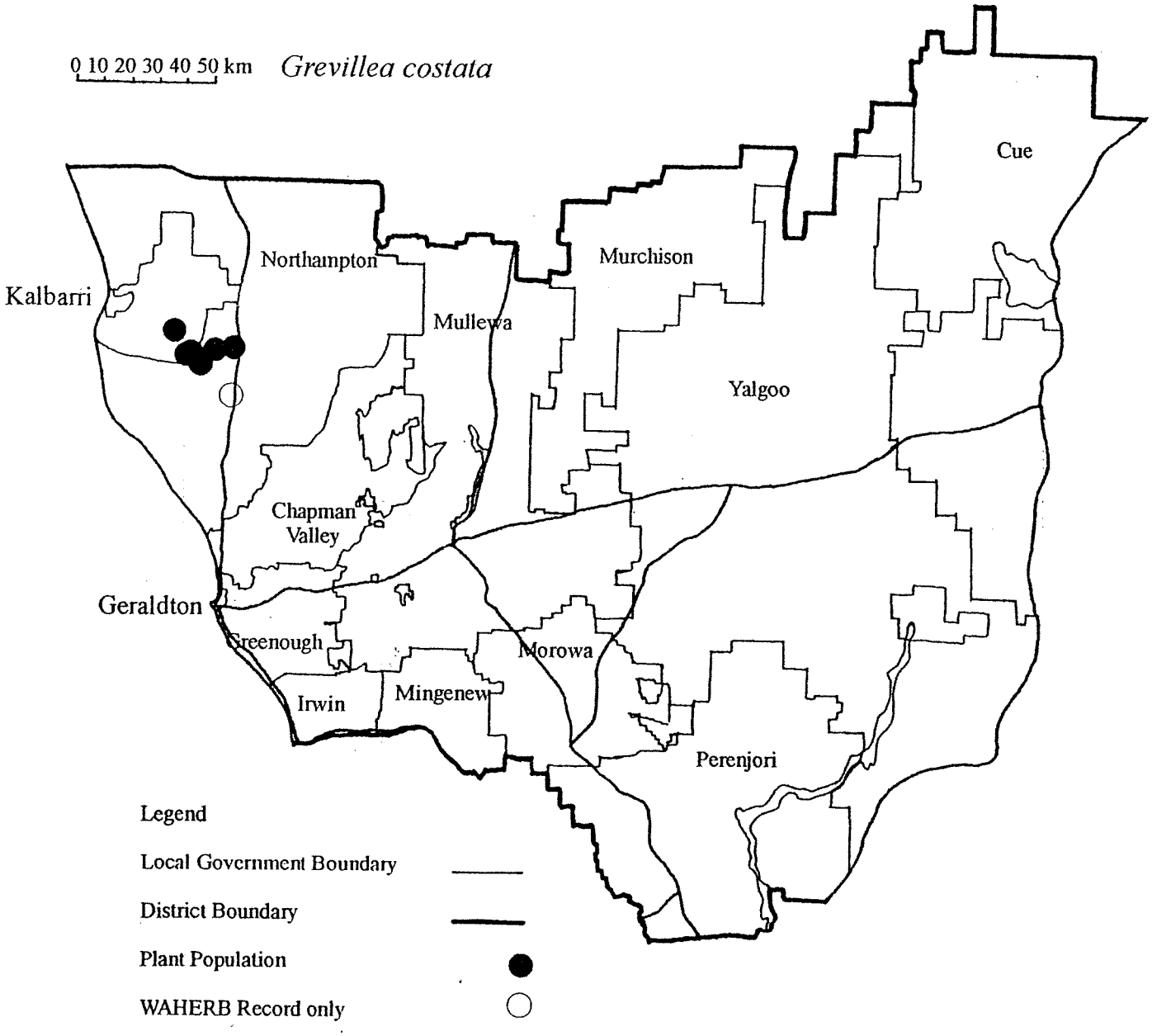
[#] now Priority 3 (updated at December 1999)

Research Requirements

- Further survey is required, particularly upstream and downstream of the known distribution of this species along the Murchison River, to determine the full extent of its range. Further survey is also required south of Binnu to discover whether this species still occurs in that locality.

References

George (1974), McGillivray & Makinson (1993), Olde & Marriott (1994-5).



Grevillea hirtella (Benth.) P.Olde & N.Marriott PROTEACEAE

This species was originally described by Bentham in 1870 as *Grevillea pinaster* var. *hirtella.* In 1986, McGillivray made the new combination *G. thelemanniana* subsp. *hirtella,* and in 1995 it was raised to species level by Olde.

A spreading, single-stemmed shrub to 1 m high, to 2.5 m wide, with spreading hairs on the branchlets. The leaves are up to 2 cm long, either simple and linear or divided into two, three or five obtuse lobes to 8 mm long and up to 1.5 mm wide, with revolute margins. They are loosely hairy to glabrous with a pitted upper surface. The flowers are in loose terminal groups to 1.2 cm long. The pedicels are glabrous. The flowers are pale to deep pink-red, the style red with a green tip. The perianth is up to 9 mm long, the pistil to 23 mm long, the ovary triangular in shape. The fruit is 12-13 mm long, 5-6 mm wide, ribbed at the base.

This species is similar to *G. thelemanniana, G. delta* and *G. obtusifolia. G. thelemanniana* and *G. obtusifolia* have appressed hairs on the leaves and branchlets. *G. delta* has leaves which are mainly twice-divided, and silky pedicels.

Flowering Period: June-October

Distribution and Habitat in the Geraldton District

Occurs between Walkaway and Mingenew over a range of c. 45 km.

Grows in yellow or grey sand and lateritic gravel or brown sandy loam on upland plains. Occurs in low heath, sometimes below open scrub. Associated species include *Banksia scabrella, Allocasuarina campestris, Dryandra fraseri, Hakea trifurcata* and *Hibbertia, Hakea* and *Grevillea* species.

Conservation Status

Current: Priority 2[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Burma Road	G	Nature Reserve	16.8.1996	30+	Healthy
2. Burma Road	G	Nature Reserve	16.8.1996	10+	Healthy
3. Burma Road	G	Shire Road Verge	16.8.1996	10+	Healthy
4. Burma Road	G	Nature Reserve	16.8.1996	10+	Healthy
5. Burma Road	G	Nature Reserve	16.8.1996	100+	Healthy
6. Burma Road	G	Nature Reserve	20.6.1996	4	Healthy
7. Burma Road	I	Shire Road Verge	5.8.1994	1+	Moderate
8. Burma Road	I	Shire Road Verge	5.8.1994	1+	Moderate
9. Burma Road	I	Shire Road Verge	5.8.1994	5+	Moderate
10. Burma Road	I	Shire Road Verge	5.8.1994	2	Healthy
11. Burma Road	I	Shire Road Verge	5.8.1994	1	Healthy
12. Erangy Springs Road	Mu	Shire Road Verge	7.7.1995	6	Healthy
13. Walkaway-Nangetty Road	Mu	Shire Road Verge	7.7.1995	5	Healthy
14. Walkaway-Nangetty Road	Mu	Shire Road Verge	7.7.1995	1+	Healthy
15. Walkaway-Nangetty Road	Mu	Shire Road Verge	7.7.1995	3	Moderate
16. Erangy Springs Road	Mu	Nature Reserve	7.7.1995	10+	Healthy
17. Burma Road	G	Nature Reserve	5.8.1994	2	Moderate, grazed by rabbits
18. Allanooka Springs Road	I	Shire Road Verge	10.7.1991	2	Undisturbed
19. Near Burma Road	I	-	22.10.1992	-	-

[#] now Priority 3 (updated at December 1999)

Populations Known in the Geraldton District (Cont'd)

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
20. Burma Road	G	Nature Reserve	25.10.1992	-	-
21. Nangetty-Walkaway Road	Mu	Shire Road Verge	14.9.1988	"Occasional"	-
22.*S of The Casuarinas	Mu	-	19.7.1973	-	-
23.*Burma Road	G	-	21.8.1966	-	-
24.*E of Walkaway	G	-	9.8.1973	-	-

Response to Disturbance

Unknown

Management Requirements

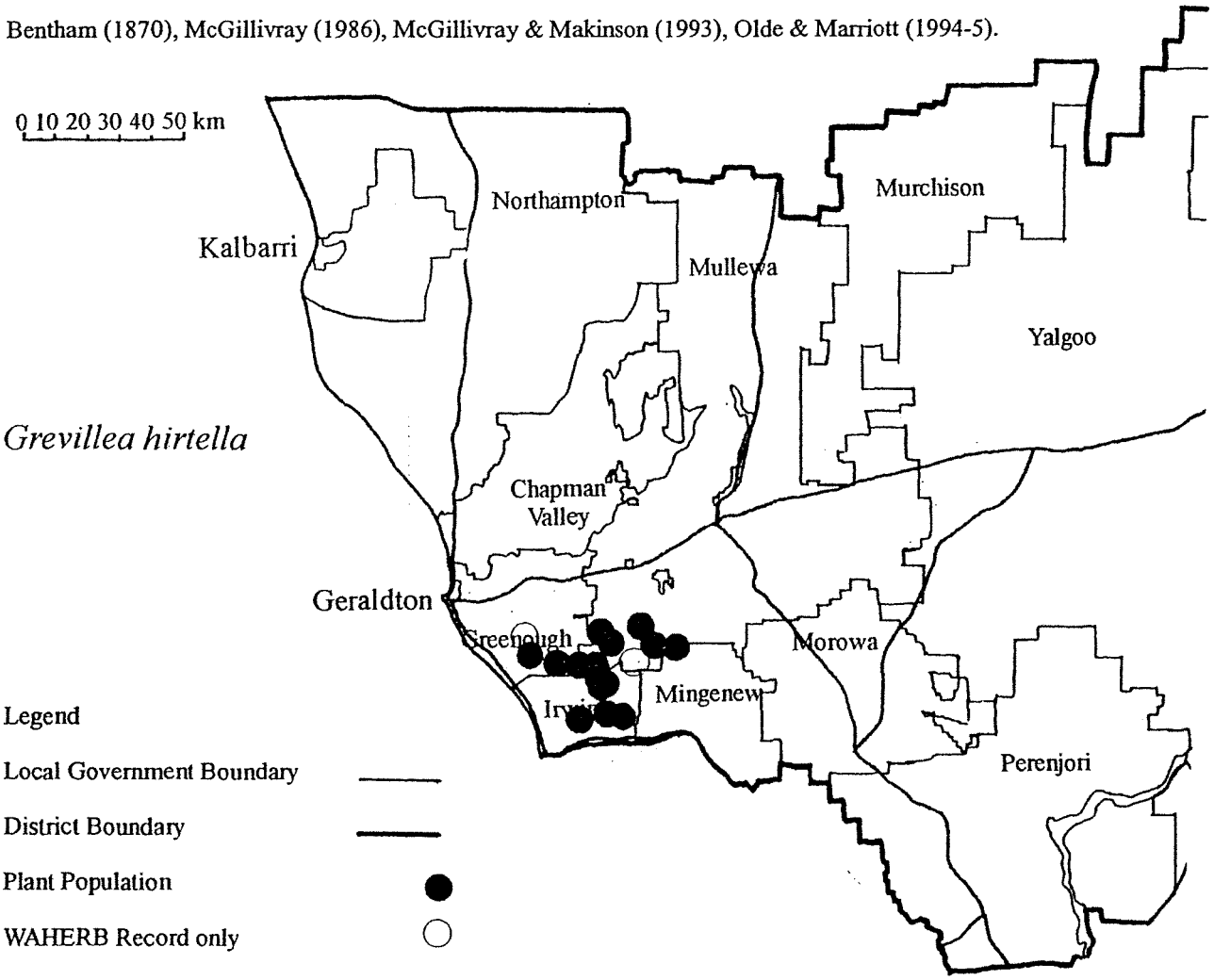
- Ensure that road verge populations are marked.

Research Requirements

- Further survey is required on the edges of this species' known range to determine whether it is confined to the narrow range from which it is presently known.

References

Bentham (1870), McGillivray (1986), McGillivray & Makinson (1993), Olde & Marriott (1994-5).



Grevillea stenomera F.Muell. PROTEACEAE

Lace Net Grevillea

A rounded shrub to 2 m, silvery to bluish-grey. The branchlets are silky-hairy, the leaves silky on the upper surface. They are 4-16 cm long, pinnately divided into 4-16 linear lobes, 4-12.5 cm long. The flowers are in terminal or axillary drooping heads to 6 cm long, hidden within the foliage. The flowers are pale pink, orange-pink or reddish-pink, with a greenish-yellow limb and a greenish-pink style with a green tip. The perianth is 6-7 mm long, the pistil 22-24 mm long. The fruit is 11-13 mm long and is ridged.

This species is most likely to be confused with *Grevillea pinaster,* which may have divided leaves, although they are usually simple. If divided, the leaf lobes are shorter, less than 4 cm long, and the flower heads are shorter, 2-4 cm long.

Flowering Period: May-August, October

Distribution and Habitat in the Geraldton District

Occurs from just south of Kalbarri, north to the northern boundary of the District. It has also been recorded recently from just north of the District and was recorded in 1969 from south of Tamala, c. 50 km north of the District boundary.

Grows in red or yellow sand over limestone, in heath or shrubland. Associated species include *Acacia, Grevillea* and *Melaleuca* species.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. NE of Kalbarri	N	MRWA Road Verge, National Park	9.8.1994	5+	Healthy
2. N of Kalbarri	N	Pastoral Lease	24.5.1994	"Frequent"	-
3. N of Kalbarri	N	Pastoral Lease	27.10.1992	"Common"	-
4.* S of Kalbarri	N	Private	21.7.1977	-	-

Response to Disturbance

Unknown

Management Requirements

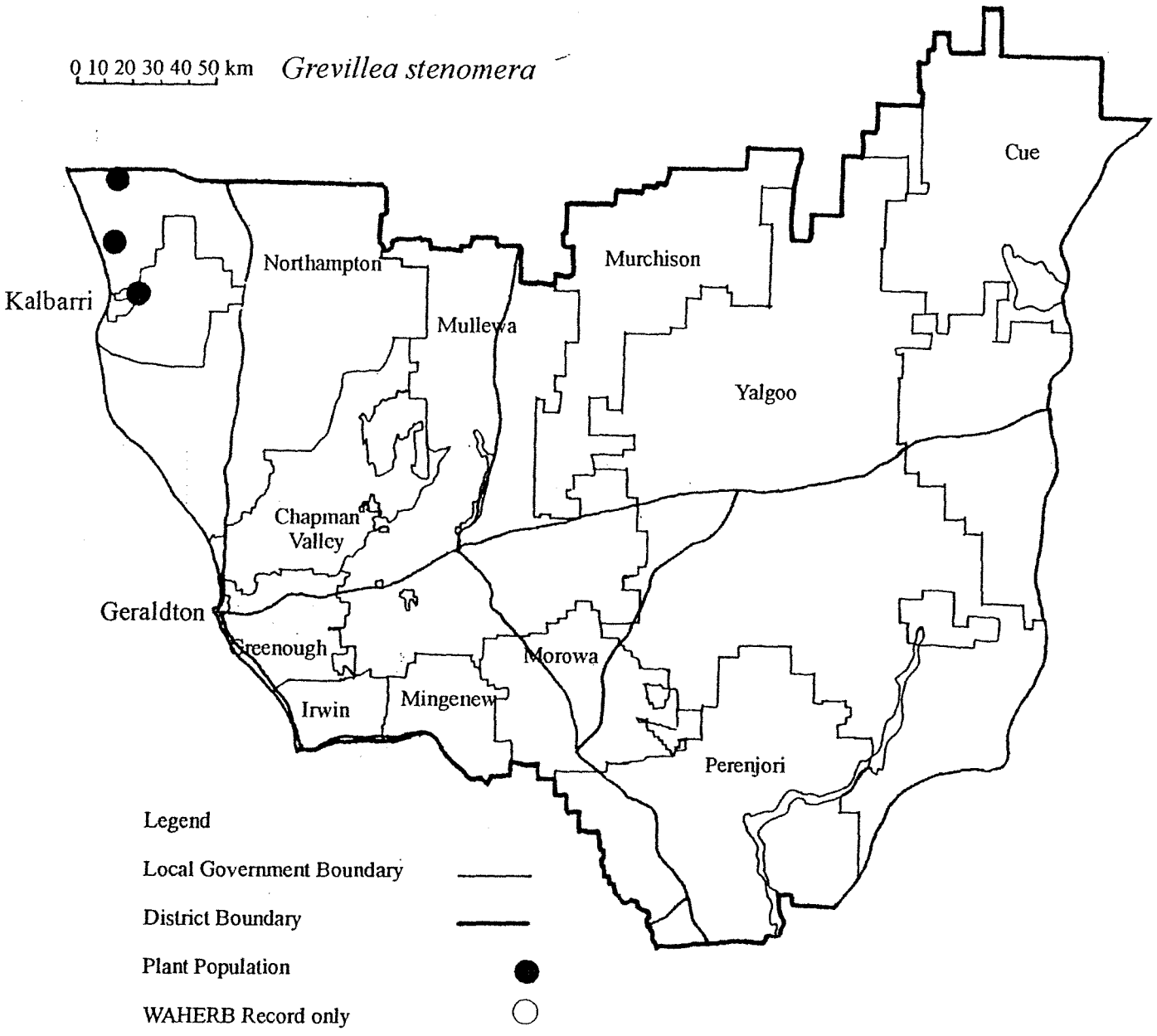
- Ensure that road verge population is marked.

Research Requirements

- Further survey is required.

References

McGillivray & Makinson (1993), Mueller (1864), Olde & Marriott (1994-5).


0 10 20 30 40 50 km
Grevillea stenomera
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Grevillea tenuiloba C.A.Gardner PROTEACEAE

A low, spreading shrub to 0.6 m, with erect branches. The leaves are divided into 5-7 segments which are narrow-linear with sharp points. The leaf margins are smoothly rolled back, concealing the lower surface and appearing doubly-grooved beneath. The leaf lobes are up to 2.5 cm long. The flower heads are terminal, erect or irregularly curved, simple or once-branched and rather dense. They are pendant or lie on the ground around the plant. The flowers are orange in colour with pedicels 2-5 mm long, the perianth to 1 cm long. The outside of the perianth has an indumentum more sparse towards the almost hairless limb and the inner surface is glabrous. The torus is very oblique. The pistil is 23-34 mm long, the ovary with a short stipe and is somewhat hairy, the hairs extending for c. 4 mm up the style. The pollen presenter is oblique and broadly conical. The fruits are c. 1 cm long and hairy.

This species is closely related to *Grevillea erectiloba* but differs in the smaller leaves and flowers, glabrous style and the ovary, which is almost sessile. The leaf segments are flattened, not terete and are rigidly divaricate.

Flowering Period: August-October

Distribution and Habitat in the Geraldton District

G. *tenuiloba* is known from the Pindar to Tardun and Morawa to Mullewa areas in the Geraldton District. Further south, a collection from the Irwin River may have been made within the District or from the Moora District but there is no precise location information. It was collected from near Dandaragan in the Moora District by Gardner in 1932 and has also been recorded from the Wongan Hills to Jibberding area in the Merredin District.

In the Morawa-Mullewa area, this species grows near granite rocks in red clay-loam, in heath. Associated species include *Calycopeplus ephedroides, Allocasuarina campestris, Melaleuca cardiophylla, M. uncinata,* species of *Hakea, Acacia* and *Borya.*

Conservation Status

Current: Priority 2[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Canna	Mu	Nature Reserve, Railway Reserve	7.10.1994	500+	Healthy
2. W of Canna	Mu	MRWA Road Reserve, Private	7.10.1994	50+	Healthy
3.* Pindar-Tardun	Mu	-	28.9.1965	-	-

Response to Disturbance

At population 2, it was observed that many young plants (seedlings) were growing in an area which had been disturbed a few years previously. It is killed by fire and regenerates from seed (Olde & Marriott 1994-5).

Management Requirements

- Ensure that road verge and rail reserve populations are marked.

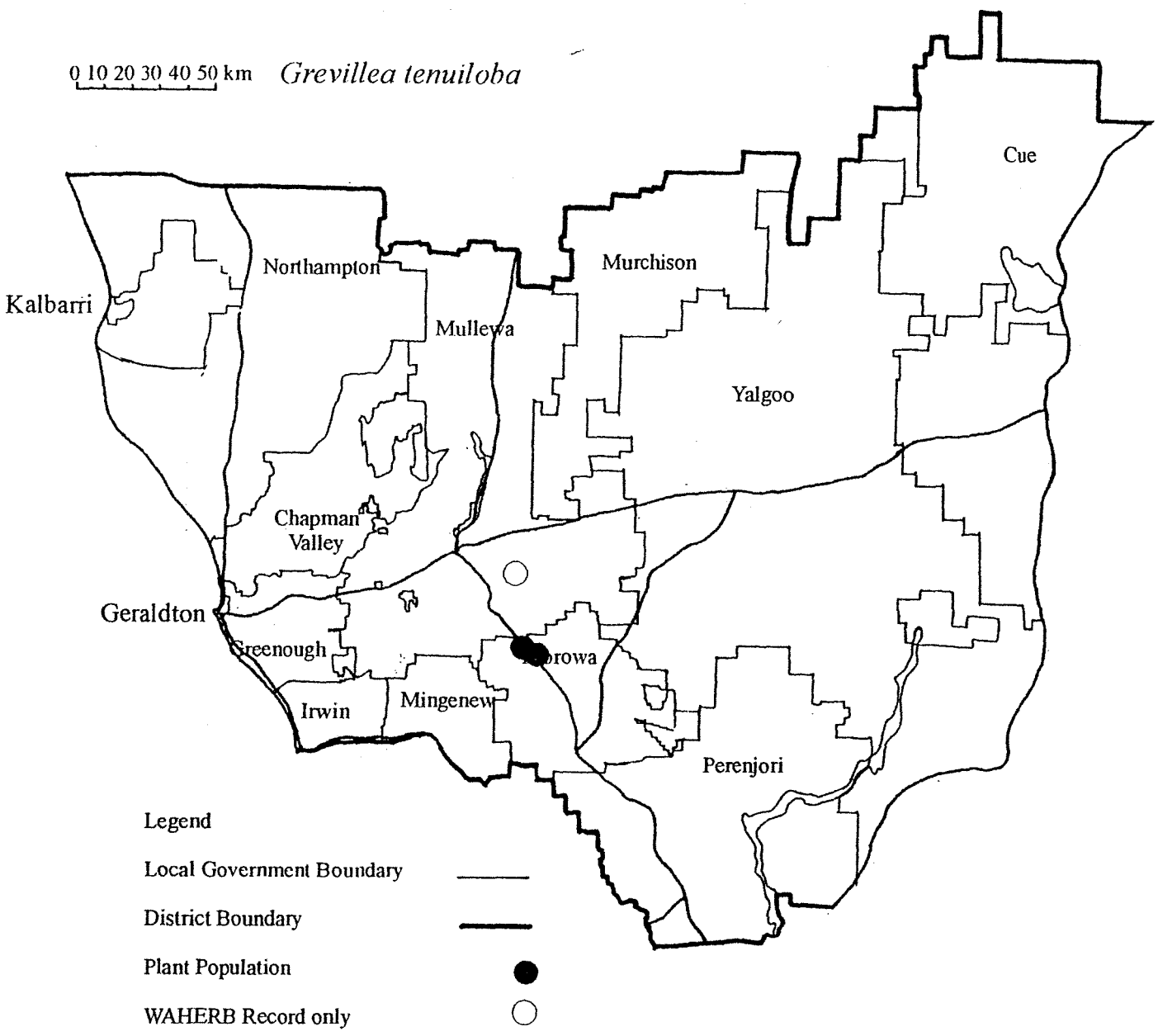
Research Requirements

- Further survey is required, particularly in the Tardun to Pindar area where the species has not been refound recently.

[#] now Priority 3 (updated at December 1999)

References

Gardner (1934), McGillivray & Makinson (1993), Olde & Marriott (1994-5).



Grevillea triloba Meisn. PROTEACEAE

A rounded or spreading shrub to 1.5 m tall and 1.5 m wide, the branchlets with a covering of white hairs. The leaves are 3-7 cm long, sessile and usually divided into three curved lobes, but may be bifid or undivided when they are linear to obovate in shape. The upper surface is loosely hairy, with the midvein and the many acute angled lateral veins very obvious. The lower surface is villous and exposed, the margins loosely rolled. The lobes are weakly pungent. The flowers are in terminal or axillary short-stalked heads, to 3 cm long, 3 cm wide, ovoid-cylindrical to globose, the flowers loosely arranged. The flowers are 3.5 mm long, regular in shape and glabrous. They are white in colour. The pistil is up to 4.3 mm long, the style constricted above the ovary with a flask-shaped swelling above. The pollen presenter is conical. The fruit is 8-10 mm long, ridged, and the seed has a few longitudinal wrinkles.

This species is similar to *Grevillea biternata* which has narrower leaf lobes, lacking the acutely angled veins on the upper surface.

Flowering Period: June-September

Distribution and Habitat in the Geraldton District

This species has been recorded in the past from Port Gregory to south-east of Geraldton, over a range of c. 130 km. At present it is known from just north of Geraldton to north of Northampton over a range of c. 55 km. Although three of the known populations are on nature reserves, many are on narrow road verges and although appearing to be relatively common, further survey is required in the north and south of the past recorded range, as the present known range is very restricted.

Grows on yellow sand over limestone, red-brown sandy loam with sandstone, or brown sandy clay, usually below ridges in gullies and near creeks on heavier soils. Occurs in shrubland with *Acacia rostellifera, A. acuminata, Banksia victoriae, B. attenuata, Melaleuca megacephala, Gastrolobium oxyloboides* and mallee eucalypts.

Conservation Status

Current: Priority 2[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. N of Drummonds Cove	CV	MRWA Road Verge	7.8.1994	1	Healthy
2. N of Drummonds Cove	CV	MRWA Road Verge	7.8.1994	1 000+	Healthy to moderate
3. S of Oakajee	CV	Water Reserve	6.8.1994	50+	Moderate, sand extraction & rubbish
4. N of Mt Sewell	N	Nature Reserve	7.8.1994	1 000+	Healthy
5. Oakajee	CV	Nature Reserve	6.8.1994	2 000+	Healthy
6. Howatharra	CV	Shire Road Verge	7.8.1994	1	Poor
7. N of Howatharra	CV	MRWA Road Verge	7.8.1994	100+	Moderate
8. Geraldton	G	Railway Reserve	3.7.1995	70+	Moderate
9. S of Mt Sewell	N	MRWA Road Verge	3.7.1995	30+	Healthy
10. N of Oakabella	N	Nature Reserve	4.7.1995	1 000+	Healthy
11. N of Wokatherra	CV	Private	15.8.1996	20+	Healthy
12.*S of Northampton	N	-	7.9.1962	-	-
13.*Port Gregory	N	-	-	-	-
14.*N of Northampton	N	MRWA Road Verge	7.8.1994	5+	-
15.*W of Casuarinas	Mu	-	5.8.1976	-	-
16.*S of Northampton	N	-	7.9.1962	-	-

[#] now Priority 3 (updated at December 1999)

Populations Known in the Geraldton District (Cont'd)

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
17.*White Peaks	CV	-	7.7.1959	-	-
18.*Near Drummonds Cove	CV	-	28.10.1978	-	-
19.*Spalding Park	G	Shire Reserve	26.6.1981	"Frequent"	-
20.*E of Geraldton	G	-	26.8.1970	"Scarce"	-
21.*Howatharra	CV	Nature Reserve	-	-	-
22.*N of Northampton	N	-	11.8.1956	-	-

Response to Disturbance

Unknown

Management Requirements

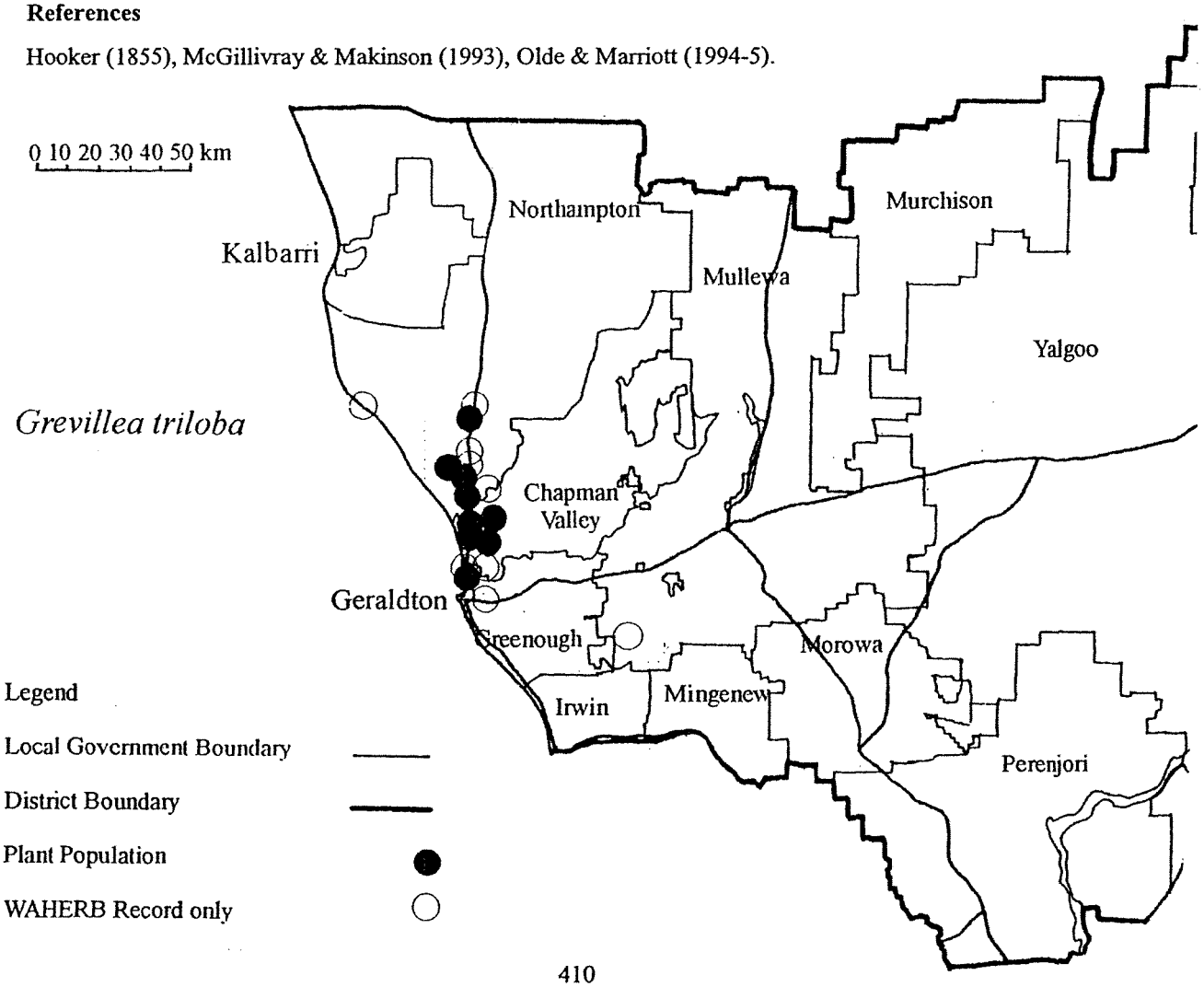
- Ensure that road verge populations are marked.

Research Requirements

- Further survey is required in the Port Gregory area and north of Northampton, and to the east and south-east of Geraldton, where it has been reported from a nature reserve.

References

Hooker (1855), McGillivray & Makinson (1993), Olde & Marriott (1994-5).



Guichenotia quasicalva C.F.Wilkins ms STERCULIACEAE

[*Guichenotia* sp. Passinto (R.J.Cranfield & P.J.Spencer 7941)]

An erect, compact shrub to 50 cm tall. The leaves are up to 3 cm long, 4 mm wide, with inrolled margins and with stellate hairs on both surfaces. The paired stipules are similar in shape to the leaf, but shorter, to 1.5 cm long, the lamina broader towards the base on one side of the midrib. The flowers are borne in loose cymes opposite the leaves on pedicels c. 12 mm long which become broader from the base towards the flower. There are three bracts below each flower. The flowers are mauve in colour, the enlarged calyx c. 1 cm long, divided more than half-way into five acute lobes and with scattered stellate hairs on the outside. There are five reduced, hairless petals at the base of the stamens. The stamen filaments are broad and flattened, the anthers opening by apical pores. The style is stellate-hairy at the base. The ovary has both red papillate hairs and white stellate hairs and has five compartments. The calyx is persistent, enlarging around the fruit after flowering.

Flowering Period: September-October

Distribution and Habitat in the Geraldton District

This species is known from two collections. One in the Geraldton District was made from "Hutt River", probably in 1964, and no other details of habitat or locality were recorded. There is also one population known in the Moora District west of Three Springs, where it grows in a depression along a drainage line in white to grey sandy clay over laterite, in scrub.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Hutt River	N	-	?10.1964	-	-

Response to Disturbance

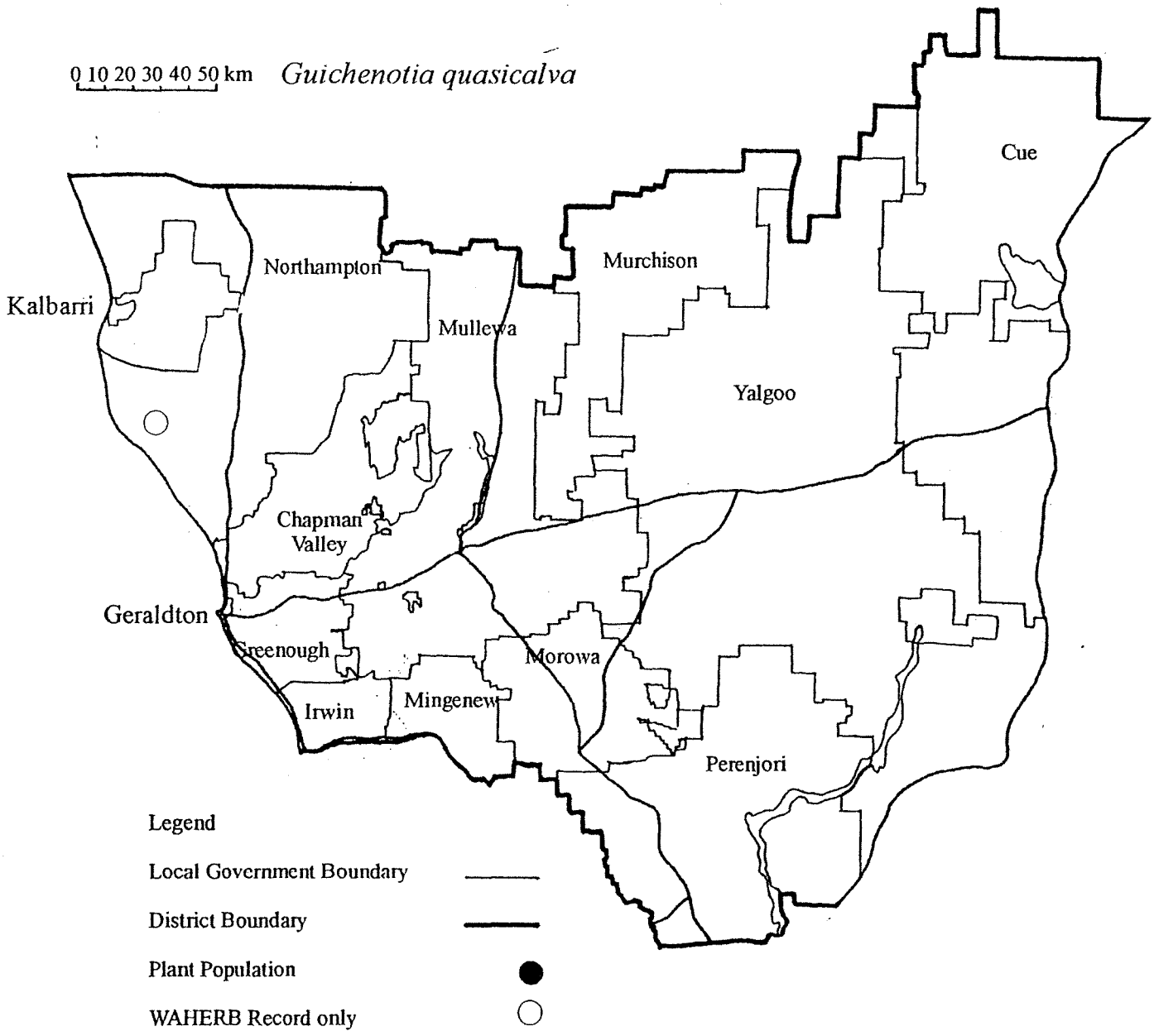
Unknown

Research Requirements

– Further survey is urgently required.

References

C. Wilkins (personal communication).


0 10 20 30 40 50 km
Guichenotia quasicalva
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Hakea oldfieldii Benth. PROTEACEAE

This species was described by Bentham in 1870 from material collected by Oldfield at Champion Bay (Geraldton) and by J.S. Roe "in the interior".

A glabrous, erect shrub to 1-3 m tall, with glaucous branchlets and with terete, ungrooved, pungent pointed leaves which are undivided, or rarely with 2-3 segments, 1-7 cm long, 0.7-1.8 mm wide. The flowers are small, in axillary racemes or clusters, 3-6 mm long, the main axis of the inflorescence (the rachis) 2-3 mm long. The flowers stalks are narrow, short at first, becoming 2.5-9.5 mm long when the flowers are open. The perianth is slender, the tube straight, with a globular erect limb, 1.5-2.5 mm long, cream to white in colour. The torus is shortly stalked and the style has an erect stigmatic cone. The fruit is more or less globular, with a long straight beak, 1.6-2.3 cm long, with fine black pustules and horns 5 mm long. The seed has a wing partly down one side only.

This species can be confused with *Hakea newbeyana,* which has pubescent branchlets and rachis. It is also related to *H. lissocarpha,* which has compound leaves with up to 14 segments which may be grooved, a tomentose rachis and a longer perianth 2.5-4 mm long.

Flowering Period: August-October

Distribution and Habitat in the Geraldton District

Although originally collected from the Geraldton area, this species is known from Busselton to the Stirling Range, where it grows in winter-wet areas in sand, gravelly loam, or red clay over ironstone, in scrub with *Hakea* and *Melaleuca* species.

Conservation Status

Current: Priority 2[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* Champion Bay	-	-	c. 1860	-	-

Response to Disturbance

Unknown

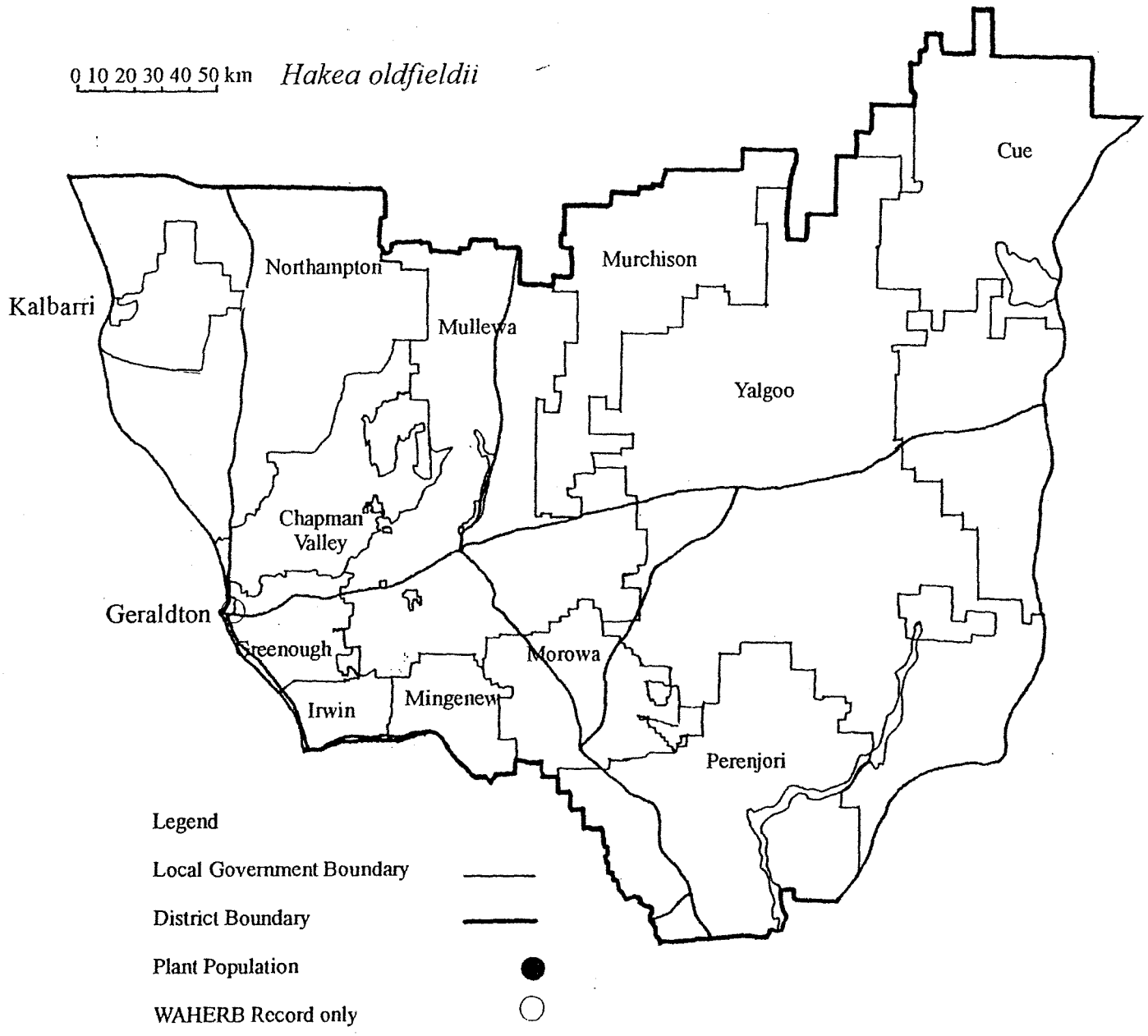
Research Requirements

– Further survey is required in the Geraldton area.

References

R. Barker (personal communication), Bentham (1870).

[#] now Priority 3 (updated at December 1999)


0 10 20 30 40 50 km
Hakea oldfieldii
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Hemiandra bellairsiana B.J.Conn ms — LAMIACEAE

[*Hemiandra* sp. Kalbarri (D.Bellairs 1505)]

An erect, rounded shrub to 2 m high, with ovate leaves. They are opposite, folded and curved, sharply pungent and up to 14 mm long, c. 7 mm wide. The flowers occur in the axils of the upper leaves. They are almost sessile, on stalks to 1 mm long. The calyx is c. 8 mm long and the upper lobe is larger than the lower lobe. The latter is partially overlapped by the lateral parts of the upper lobe and has two short teeth at the apex. The corolla is mauve in colour. One pair of anthers is shorter than the other. The style is c. 12 mm long, divided at the apex into two short stigmas.

Flowering Period: February, September-October

Distribution and Habitat in the Geraldton District

Known from one population in the Kalbarri National Park, where it grows on deep white sand at the base of a gentle north-facing slope, in shrubland to 2 m, with *Melaleuca megacephala, Adenanthos cygnorum, Grevillea leucopteris, Calytrix paucicostata, Jacksonia hakeoides, Lachnostachys* and *Eremaea* species.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SE of Kalbarri	N	National Park	27.9.1995	c. 50	Healthy

Response to Disturbance

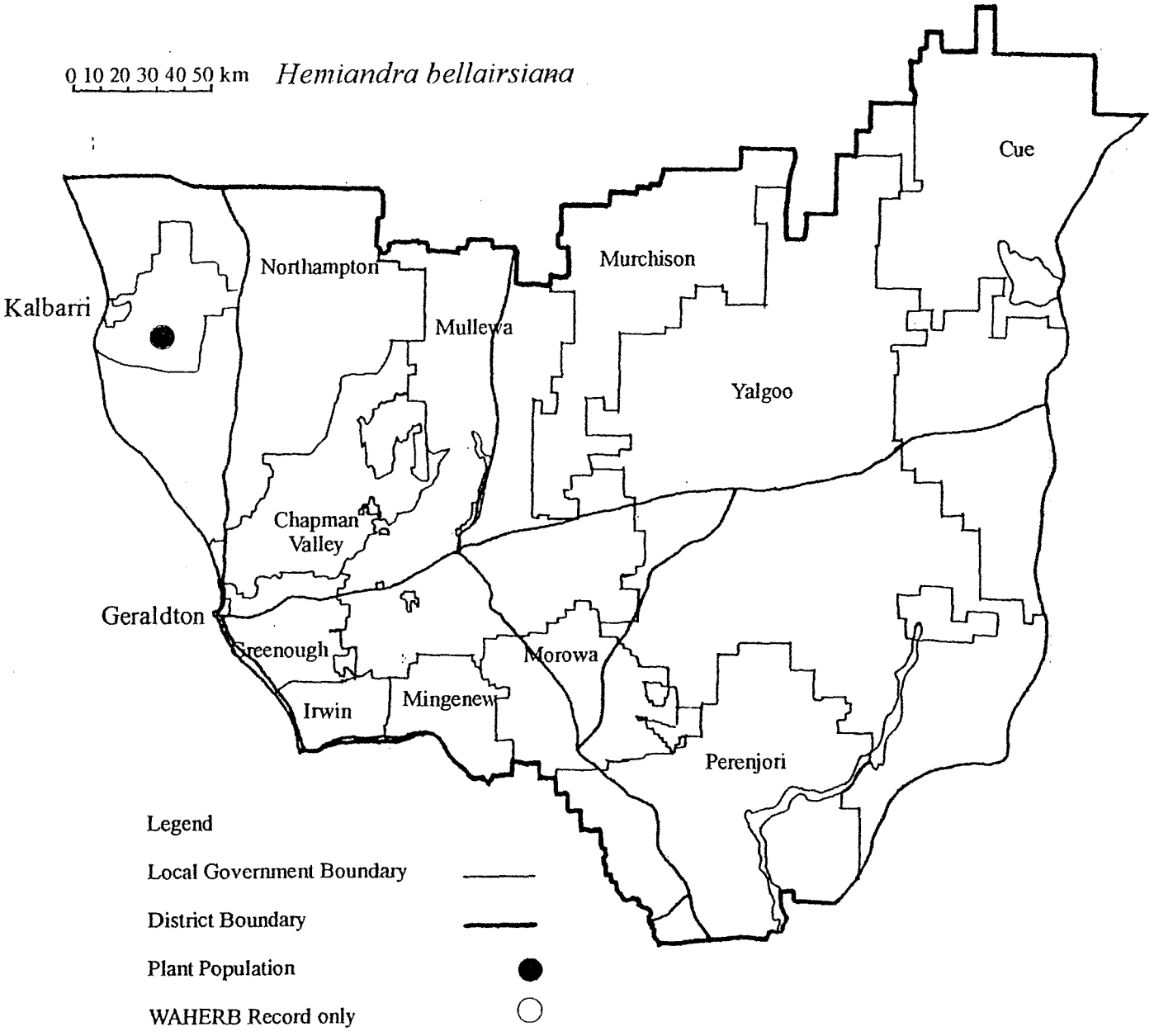
Unknown

Research Requirements

- Further survey is required.

References

B. Conn & M. Tozer (personal communication).


0 10 20 30 40 50 km
Hemiandra bellairsiana
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Jacksonia dendrospinosa Chappill ms FABACEAE

[*Jacksonia* sp. Nerren Nerren (R.J.Cranfield 2576)]

An erect shrub or tree 1.5-5 m tall, 1-3 m in diameter, with divaricate branches and the leaves reduced to scale, leaves 0.5 mm long. The flowers are scattered on the branches, the pedicels 3.6 mm long. The calyx is membranous and green on the inside, the lobes recurved at flowering time. The petals are yellow-orange, the standard taller than wide, reflexed. The wings are shorter than the keel, the keel longer than the standard. The pods are membranous with silky hairs.

Flowering Period: September-November

Distribution and Habitat in the Geraldton District

This species is known from the north-western boundary of the Geraldton District, extending north into the Shark Bay area.

Grows on yellow, orange-brown or red sand or brown sandy clay, in *Acacia* shrubland, banksia woodland or shrubland of *Acacia linophylla* over heath of *Malleostemon* and *Melaleuca* species.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. N of Galena Bridge	N	-	25.4.1992	-	-
2. N of Galena Bridge	N	-	1.10.1991	-	-
3.* N of Murchison River	N	-	20.12.1962	-	-

Response to Disturbance

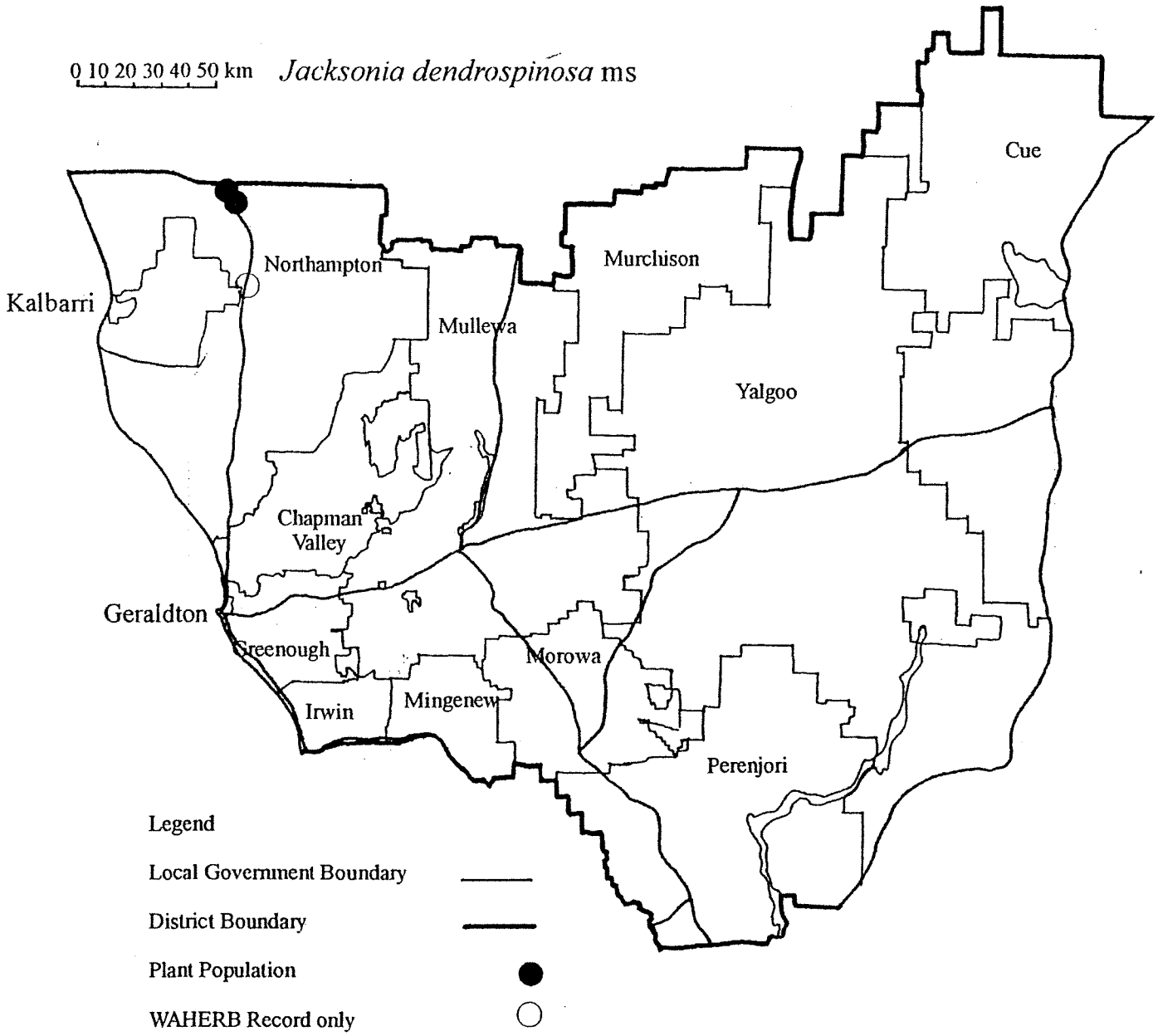
Unknown

Research Requirements

– Further survey is required.

References

J. Chappill (personal communication).


0 10 20 30 40 50 km
Jacksonia dendrospinosa ms
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Leucopogon glaucifolius W.Fitzg. EPACRIDACEAE

Leucopogon glaucifolius is an erect or spreading low shrub to 30 cm tall, with finely-hairy branches and alternate erect leaves to 13 mm long and 2 mm wide. They are glabrous, narrow-oblong in shape, with sharp pointed tips and rolled back margins. The flowers are distributed along the branches in 1-3 flowered spikes in the axils of the leaves. They are held erect. The bracts and bracteoles are pale, with a prominent mucro. The sepals are narrow, pointed and glabrous, with shortly-hairy margins, and the calyx is longer than the corolla tube. The corolla is white, up to 5 mm long, the tube and lobes equal in length. The lobes are revolute, bearded inside and pointed. The anthers are without sterile tips. The fruit is globular and flat-topped in shape, with five ribs, and is c. 4 mm long.

This species is similar to *L. brevicuspis* and *L. propinquus* which are both larger shrubs with longer, broader leaves. The fruit of *L. glaucifolius* also differs in the flat-topped shape and the presence of ribs.

Flowering Period: October in the Geraldton District, also November and December further south

Distribution and Habitat in the Geraldton District

This species was first collected in 1902 from Midland Junction and it is now presumed to be extinct in the metropolitan area.

Since then, several other collections of the species have been made. It has been collected once in the Geraldton District from east of Geraldton, and in the Moora District from four locations to the west and north-west of Dandaragan and one from south of Dongara. There have been further collections of the species from the Stirling Ranges.

In the Geraldton District, this species was collected from a scarp slope, growing in grey sandy gravel and clay. It occurred in low heath with *Melaleuca uncinata, M. coronicarpa* and *Allocasuarina campestris,* in vegetation long unburnt.

In the Moora District, *L. glaucifolius* has been recorded growing in white or grey sand in low woodland of *Banksia menziesii, B. attenuata* and *Eucalyptus todtiana* in scrub. The more northerly population was recorded from low forest of *E. erythrocorys* and low scrub with *Calothamnus quadrifidus,* in brown-orange sand over Tamala limestone.

Conservation Status

Current: Priority 2[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* E of Geraldton	G	Water Reserve	23.10.1992	-	Long unburnt

Response to Disturbance

The population in the Geraldton District and two populations in the Moora District were recorded from areas that had been long unburnt.

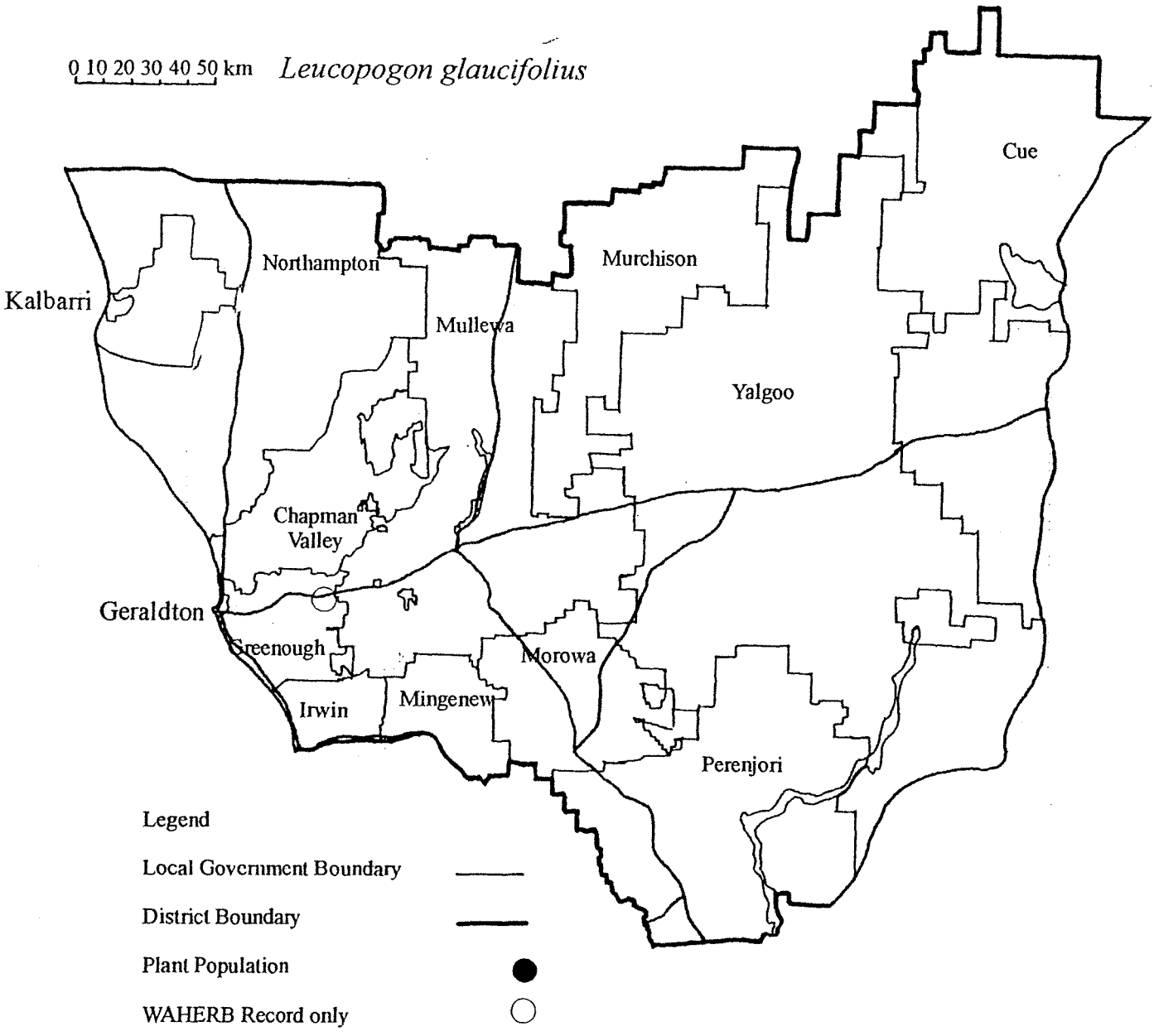
Research Requirements

– Further survey is required.

[#] now Priority 3 (updated at December 1999)

References

Fitzgerald (1903), Kelly *et al.* (1993), Marchant *et al.* (1987).



Malleostemon sp. Cooloomia (S.D.Hopper 1353) MYRTACEAE

A shrub to 1.2 m tall, sometimes straggling and broadly funnel-shaped. The leaves are overlapping, c. 0.75 mm long and c. 0.75 mm broad at the upper end, blunt, tapering sharply to a short stalk. The margin is thin and transparent, with an irregular edge. The flowers are in terminal racemes and are just longer than the leaves or up to half as long again. They are white or pink in colour, c. 3 mm in diameter.

This taxon has a superficial resemblance in size and shape of leaves to *Thryptomene strongylophylla* but is unrelated. Its leaves are also similar to those of *Malleostemon* sp. Nerren Nerren (A.Payne 360), both being part of a complex of species including *M. hursthousei* and *M. minilyaensis.*

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

This taxon was originally collected from c. 30 km north of the Geraldton District but has more recently been found in several locations just within the District between the North West Coastal Highway and the coast.

Grows in thin yellow or orange sand over limestone, and on dunes of red, orange or yellow sand. It is found in shrubland of *Banksia sceptrum* or open mallee of *Eucalyptus gittinsii* or *E. eudesmoides* over *Acacia rostellifera* shrubland over heath. It has also been found in scrub of *Actinostrobus* sp. over low scrub of *Calothamnus borealis, Conospermum microflorum, Melaleuca* and *Malleostemon* species.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Near Zuytdorp Cliffs	N	Pastoral Lease	26.8.1994	"Occasional"	-
2. Near Zuytdorp Cliffs	N	Pastoral Lease	26.8.1994	"Occasional"	-
3. W of North West Coastal Hwy	N	Pastoral Lease	26.8.1994	-	-

Response to Disturbance

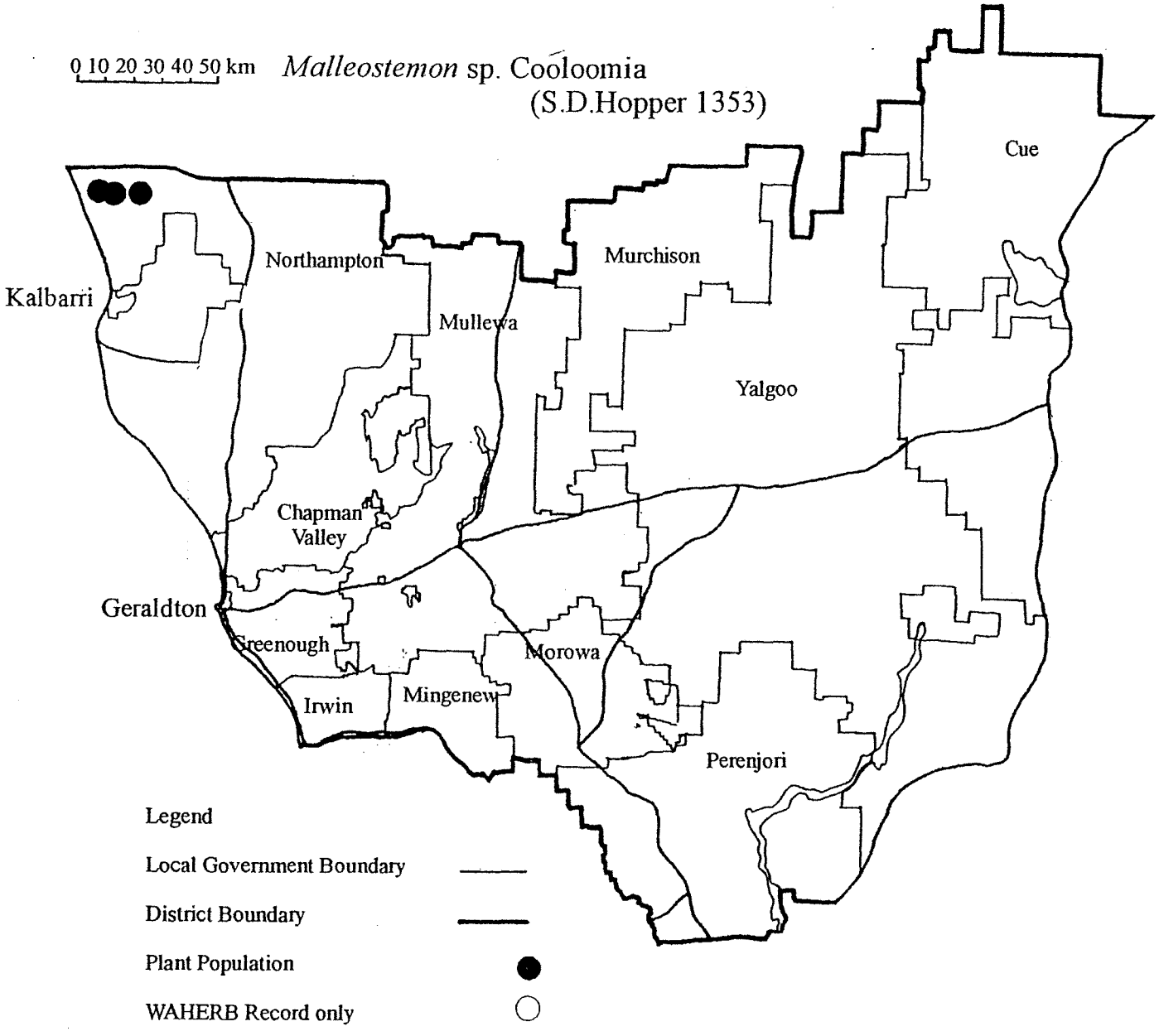
Unknown

Research Requirements

- Further survey is required.

References

M. Trudgen (personal communication).


0 10 20 30 40 50 km
Malleostemon sp. Cooloomia
(S.D.Hopper 1353)
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Malleostemon sp. Kalbarri (L.A.Craven 7083) MYRTACEAE

A slender shrub to 1 m tall. The leaves are crowded, c. 1.5 mm long, oblong in shape, with ciliate edges. The flowers have pale pink petals. They are grouped in short terminal clusters and are c. 3 mm in diameter. There are five stamens with flattened filaments.

Flowering Period: October

Distribution and Habitat in the Geraldton District

This taxon is known from only one area in the Kalbarri National Park, from which it has been collected twice.

Grows in shallow white sand over sandstone or in yellow sand., in heath 1-2 m tall.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

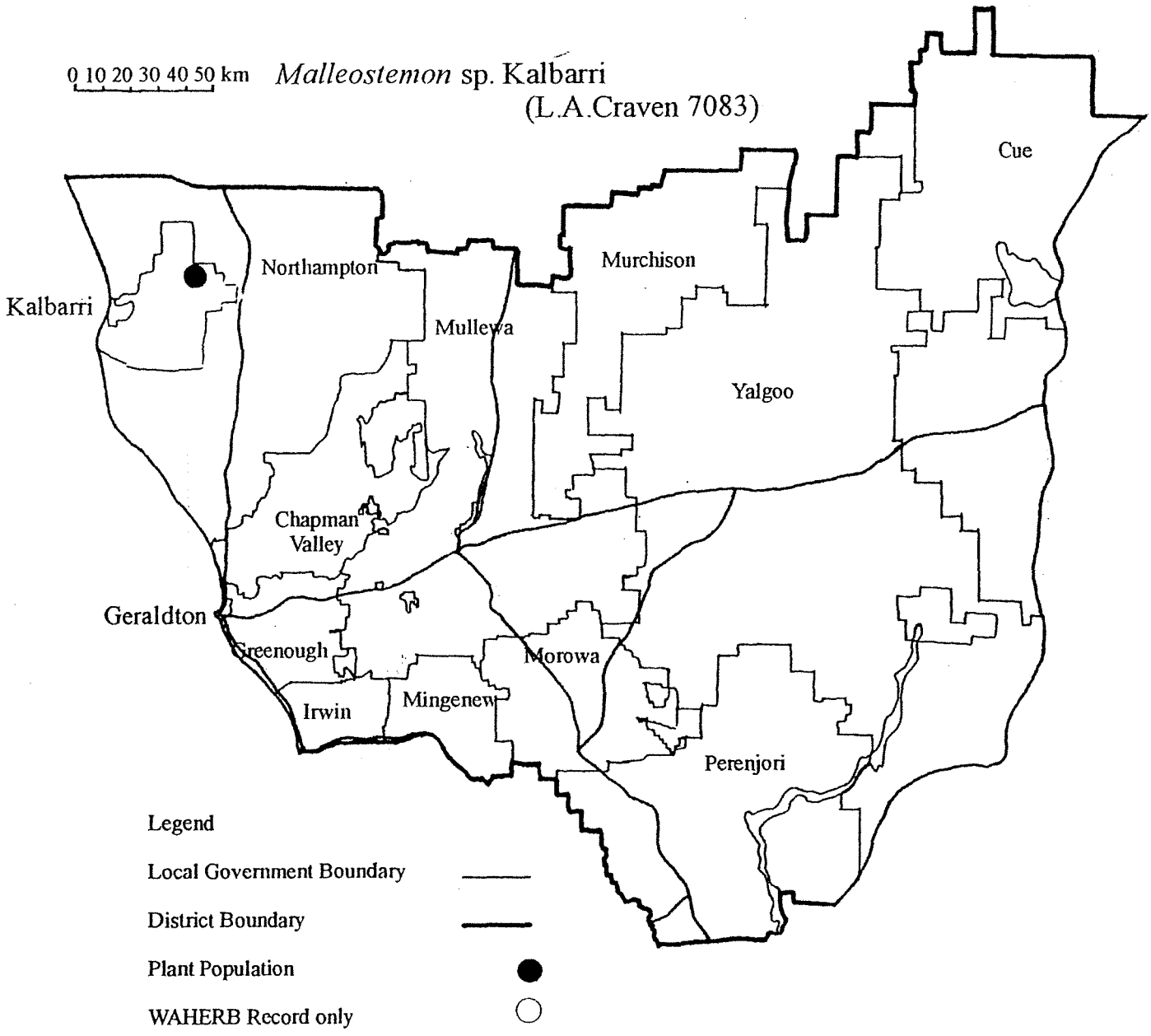
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Murchison River	N	National Park	9.10.1982	-	-

Response to Disturbance

Unknown

Research Requirements

– Further survey is required.


0 10 20 30 40 50 km
Malleostemon sp. Kalbarri
(L.A.Craven 7083)
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Malleostemon sp. Moonyoonooka (R.J.Cranfield 2947) MYRTACEAE

A dense, compact, rounded shrub to 1.5 m tall, with fine broom-like foliage. The leaves are opposite, oblong in shape, c. 1.5 mm long, c. 0.5 mm broad, with large glandular dots. The flowers arise singly in the upper leaf axils. They are white to pink, the disc deep pink, c. 3 mm in diameter, the hypanthium with large glands similar to those on the leaves.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

Known from the Kalbarri and Geraldton areas and has also been reported from east of Geraldton at Indarra.

In the Kalbarri area, this taxon grows in sandy clay with gravel, or in red loam with ironstone on flat or low areas. It is found in low shrubland or heath with species of *Melaleuca, Acacia, Calothamnus* and *Verticordia.* Near Geraldton, it was growing on an east-facing hill slope on brown sandy clay in open scrub.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

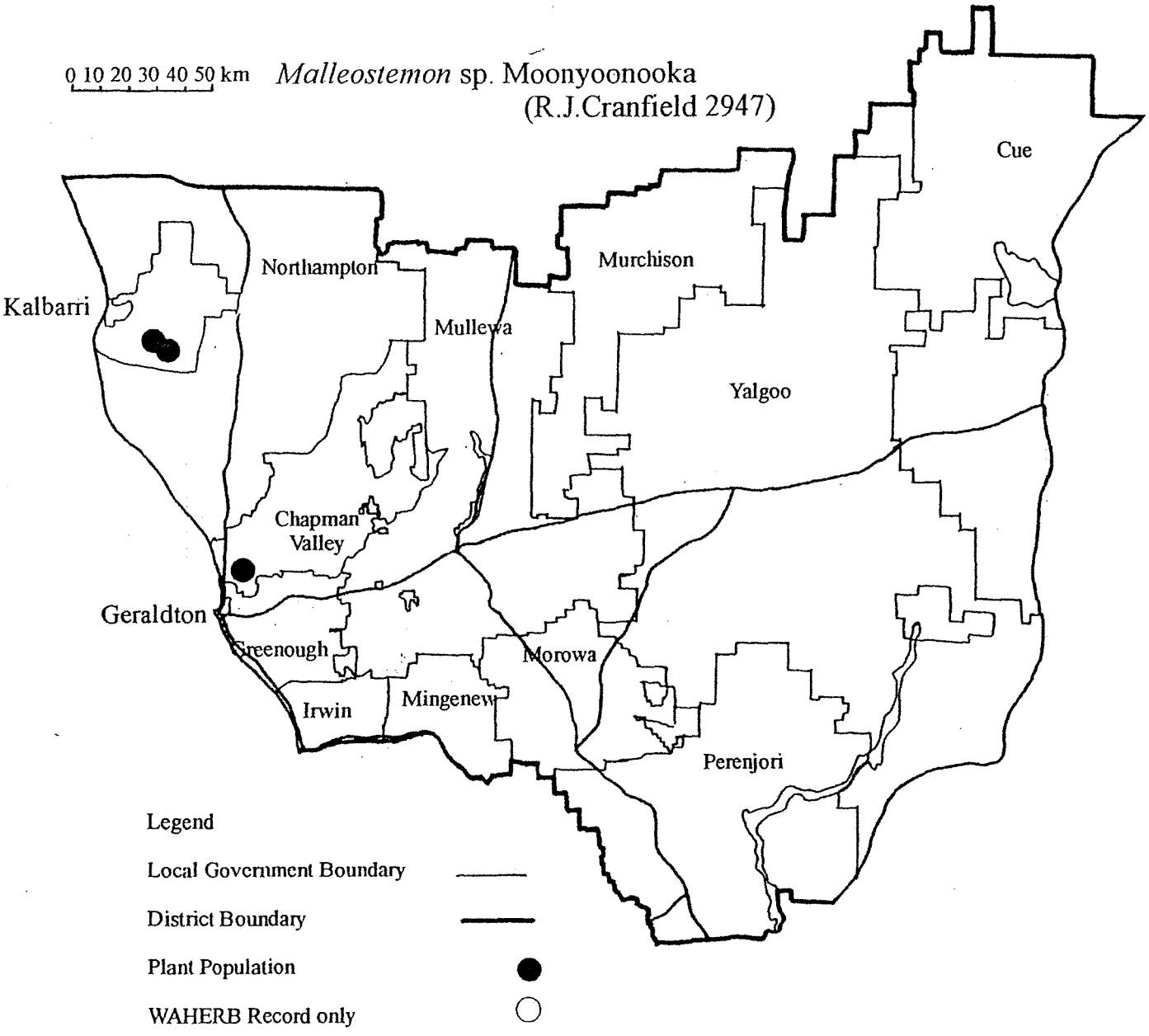
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SE of Kalbarri	N	National Park	22.9.1994	"Locally abundant"	-
2. NE of Geraldton	CV	Private	25.8.1983	"Frequent"	-
3. E of Kalbarri	N	National Park	16.9.1987	-	-

Response to Disturbance

Unknown

Research Requirements

- Further survey is required.


0 10 20 30 40 50 km
Malleostemon sp. Moonyoonooka
(R.J.Cranfield 2947)
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Microcorys tenuifolia Benth. LAMIACEAE

A rounded, sprawling shrub to 0.6 m high, the branchlets and young shoots with white appressed hairs. The leaves are opposite, narrow-linear, 1-2.5 cm long, with recurved margins meeting at the prominent midvein. The flowers are on slender stalks to 6 mm long. The calyx lobes are narrow, c. 1.5 mm long, longer than the summit of the corolla tube. The upper lip of the corolla is short, concave and broadly two-lobed. The lower lip is longer and three-lobed. The connective of the upper stamens is long, the lower end short, dilated and bearded. The flowers are white and brown in colour.

This species has been confused with *Microcorys* sp. Mt Gibson, which differs in its flat leaves and shorter calyx lobes, c. 1 mm long, exceeded by the long corolla tube which has shorter, less spreading lobes. This is now regarded as a separate species.

Flowering Period: October-November, January

Distribution and Habitat in the Geraldton District

This species is known in the Geraldton District from one population north of Galena and three others south-east of Yuna. It has been confused in the past with an undescribed species which occurs in the Sandstone to Mt Gibson area. *M. tenuifolia* is also known from a recently discovered population in the Wongan Hills area of the Merredin District.

In the Geraldton District, this species grows in yellow sand or red loamy sand, in open, low mallee woodland over scrub or open shrubland. Associated species include *Melaleuca uncinata, Malleostemon roseus, Dianella revoluta, Comesperma, Keraudrenia, Calothamnus, Grevillea* and *Thysanotus* species. In the Wongan Hills area, it grows in scrub on a plain in gravelly brown sandy clay.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. N of Galena	N	National Park, MRWA Road Verge	2.11.1994	2 or "Occasional"	Healthy
2. SE of Yuna	CV	Nature Reserve	2.4.1994	1+	Healthy
3. E of Yuna	CV	-	26.11.1997	-	-
4. SE of Yuna	CV	-	28.11.1997	-	Weed infestation

Response to Disturbance

Unknown

Management Requirements

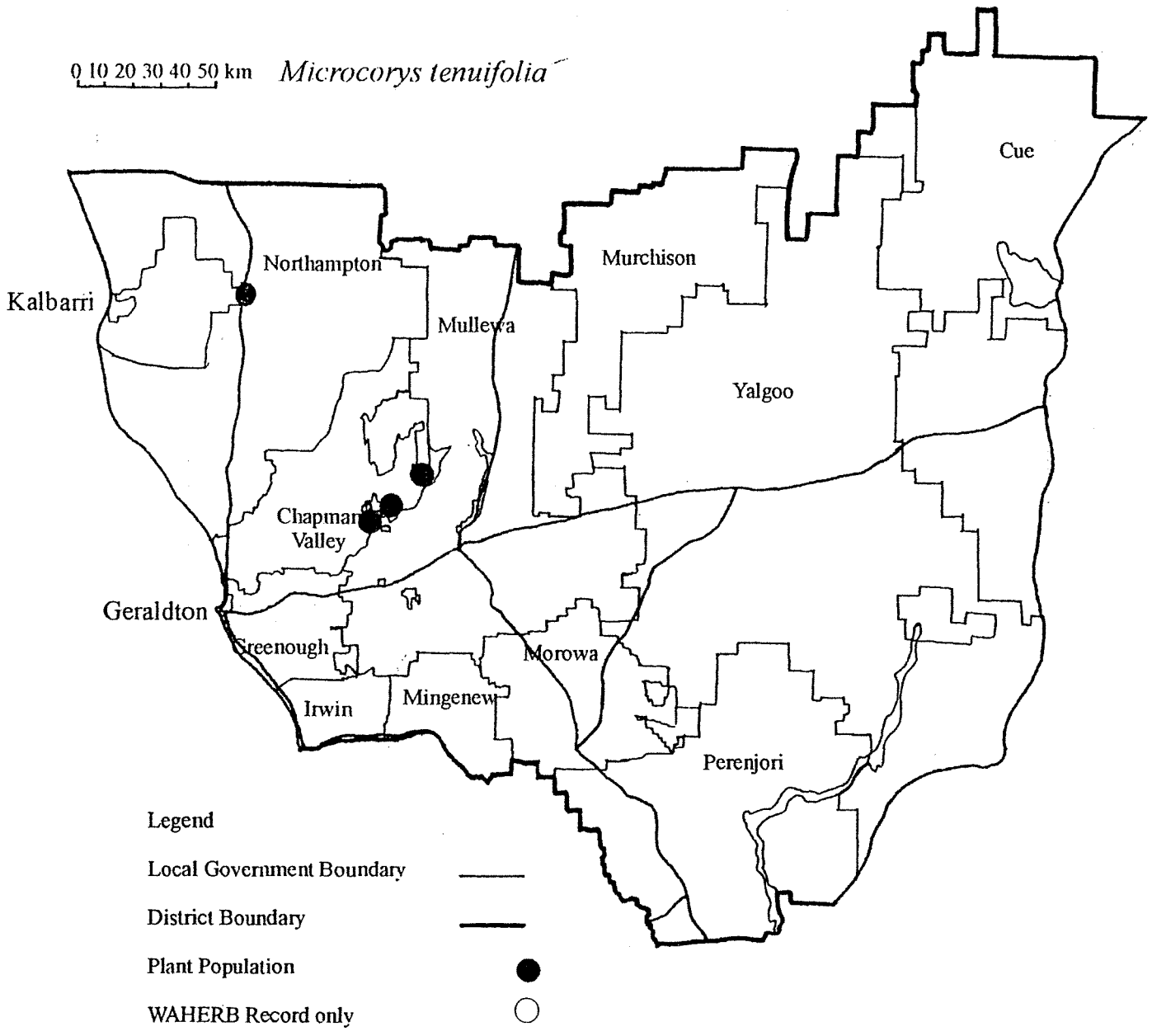
- Ensure that the known populations are marked.
- Ensure that land managers are aware of the populations.

Research Requirements

- Further survey is required.

References

Bentham (1870), B. Rye (personal communication).


0 10 20 30 40 50 km
Microcorys tenuifolia
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Millotia jacksonii P.S.Short ASTERACEAE

[*Millotia* sp. Kalbarri (P.Short 4082)]

An annual herb with a simple or branching stem. The main stems are ascending or erect, to c. 9 cm long. The leaves and stems have a covering of white cottony hairs and stalked, often purplish glandular hairs. The leaves are linear, 2.5-3.5 mm long, the lowest pair being opposite and the upper leaves alternate. The flowers are in solitary heads, each surrounded by a single row of 6-12 involucral bracts. There are 10-60 florets in each head. The corolla is tubular, to 3.1 mm long, with four or five lobes c. 0.8 mm long, forming a bell shape. The corolla is cream in colour, strongly curved at maturity and with stalked glandular hairs on the outside. There are four or five stamens, the anthers are exserted and are up to 0.82 mm long. The fruit is minutely papillate and does not have a pappus. It is c. 2.9 mm long, cylindrical in shape and tapering to a short curved beak. The apex of the fruit is not dilated at the junction between the beak and corolla tube and the beak and corolla harden to form a hook.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

This species is known from one population in the Geraldton District, south-east of Kalbarri. It has also been collected from further south in the Moora District, north-east of Eneabba.

Grows in *Acacia-Allocasuarina* dominated shrubland on the top of sandstone cliffs in shallow sandy depressions in the rock.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SE of Kalbarri	N	National Park	1993	"Locally common"	Undisturbed

Response to Disturbance

Unknown

Management Requirements

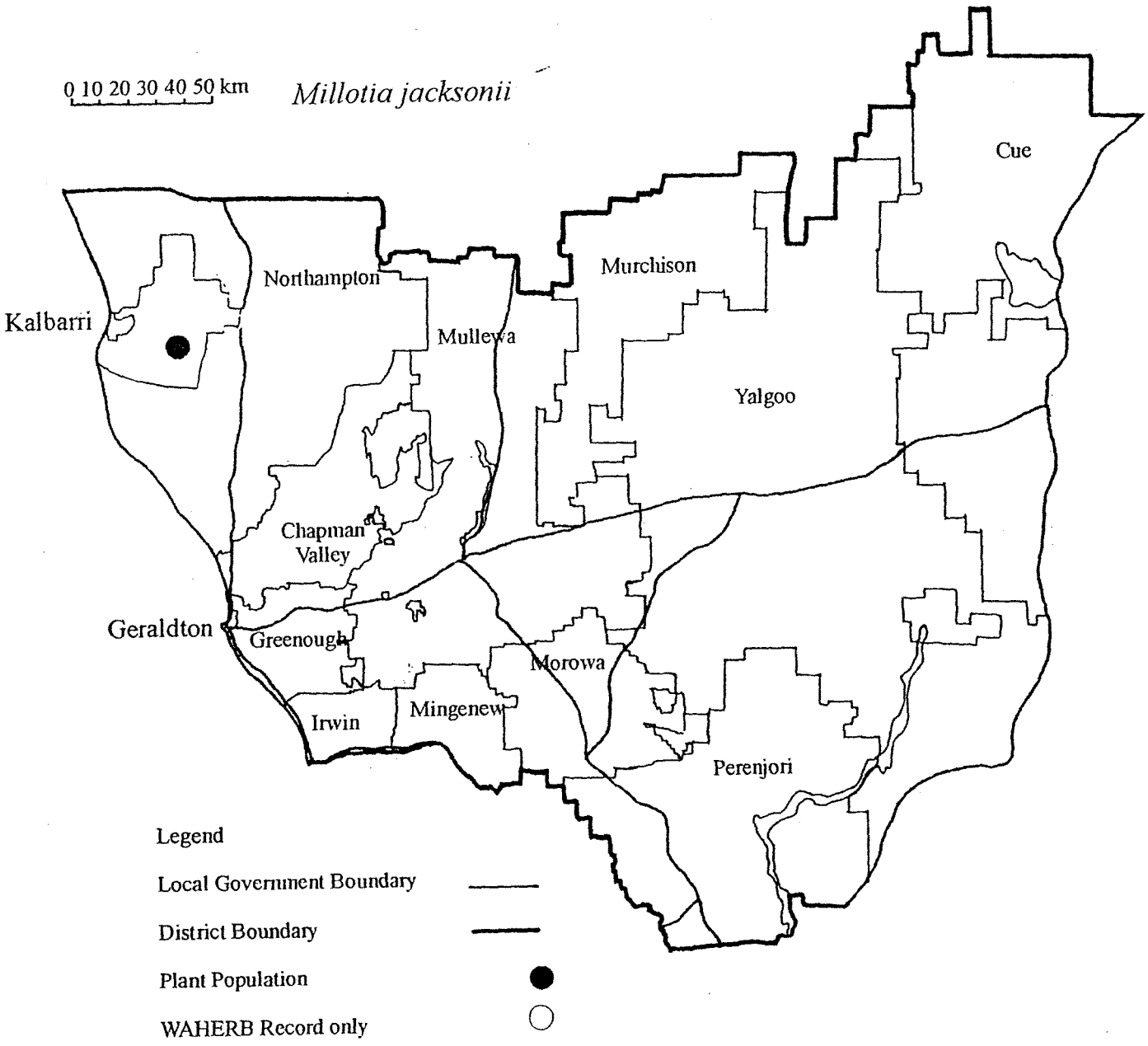
- Ensure that the population is known to land managers to prevent any damage that might occur owing to its location close to a carpark.

Research Requirements

- Further survey is required, particularly to survey the known population fully.

References

Short (1995).


0 10 20 30 40 50 km
Millotia jacksonii
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Mingenew
Irwin
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Murchisonia fragrans Brittan ANTHERICACEAE

A perennial plant with tuberous roots and a basal tuft of 6-16 terete leaves 30-33 cm long, which emerge from the soil at an angle of 45°. The inflorescence is a spike, the scape 12-14 cm long, with c. five flowers in each umbel on stalks 10 mm long. The perianth segments are three-nerved, not twisted after flowering. They are lanceolate, 8-9 mm long, the sepals narrower than the petals which are 3 mm wide, fringed towards the apex. The flowers are 32-36 mm in diameter and are white, greenish-white or pale purple in colour, with a persistent perfume. The six stamens are inserted on the perianth, with linear anthers 3 mm long, without appendages. The filaments are glabrous and flattened. The ovary is superior and there are one or two ovules per locule. The fruit is a capsule with black cylindrical seeds.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

This species is known mainly from the Geraldton District where it occurs on sandplain to the north and south of the lower Murchison River. It has also been recorded twice from north of the District at Mileura and Moorarie on the upper Murchison.

Grows in red, yellow or brown sand, gravelly sand or red loam over granite in shrubland of *Acacia, Melaleuca, Allocasuarina* species or *Casuarina obesa,* or in mallee woodland, usually with *Ecdeicolea* sedges.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. N of Galena	N	National Park, MRWA Road Verge	5.7.1995	5	Healthy
2. S of Binnu	N	Crown Reserve	6.7.1995	5	Healthy
3. W of North West Coastal Highway	N	VCL	11.8.1994	5+	Healthy
4. E of North West Coastal Highway	N	VCL	2.9.1995	-	-
5. NW of Ajana	N	National Park	30.8.1989	"Common but scattered"	-
6.* NE of Kalbarri	N	National Park	27.9.1980	-	-

Response to Disturbance

Unknown

Management Requirements

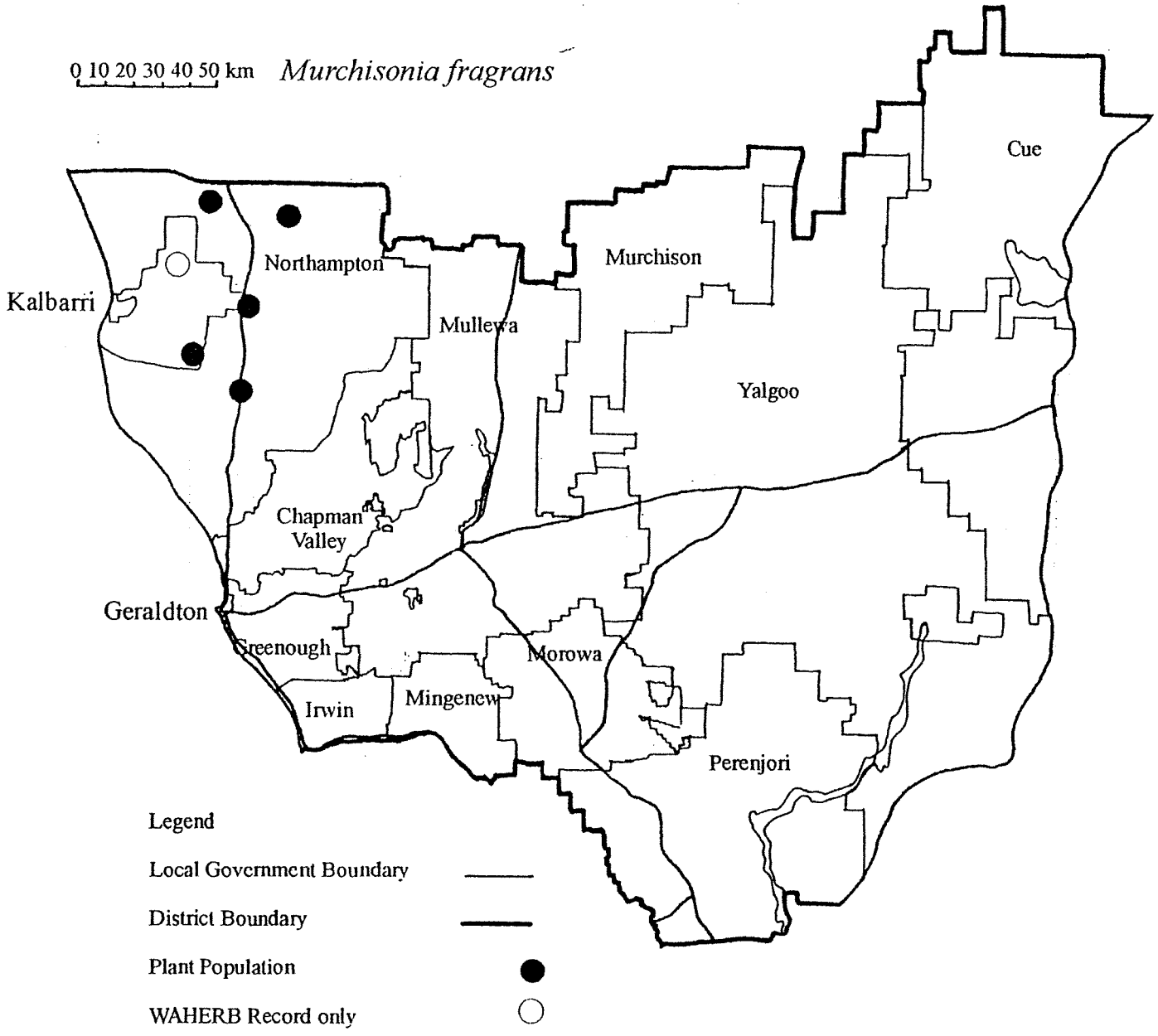
- Ensure that road verge population is marked.

Research Requirements

- Further survey is required.

References

Brittan (1971, 1987).


0 10 20 30 40 50 km
Murchisonia fragrans
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Persoonia chapmaniana P.H.Weston PROTEACEAE

A rounded shrub to 2 m in height, this species has stiff, terete, linear leaves with sharp points and five longitudinal grooves. They are 2-8 cm long, 0.9-1.3 mm broad, often crowded. The flowers are borne in terminal or axillary racemes from the axils of small triangular scale leaves, 0.5-2 mm long. There are 5-30 flowers in each raceme. The flowers are divided into four bright yellow glabrous tepals, each of which is recurved in the upper part and has an anther inserted just below the middle. Each anther has a whitish globular appendage. The ovary is hairy and the style projects beyond the tepals. The fruit is a warty elongated drupe with a succulent outer coat.

Persoonia chapmaniana is distinctive, resembling only *P. pentasticha*, which occurs further north and from which it differs in the densely hairy ovary and glabrous tepals.

Flowering Period: September-November

Distribution and Habitat in the Geraldton District

This species is known in the Geraldton District from one population just within the southern boundary of the District south-west of Latham but occurs mainly from the Moora District between Moora and Three Springs and also from between Kalannie and Kulja on the west side of Lake Moore in the Merredin District.

Grows on yellow sandy loam over clay or white to grey sandy clay, in York gum woodland over open scrub or in open low woodland of *Banksia* and *Actinostrobus* species, usually near lakes. The population in the Geraldton District was growing on islands in a salt lake in tall scrub with species of *Acacia* and *Melaleuca,* other shrubs and a rich herb layer.

Conservation Status

Current: Priority 2[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SW of Latham	P	Private	2.8.1989	-	Undisturbed vegetation in good condition

Response to Disturbance

Unknown

Management Requirements

- Maintain liaison with private landowner.

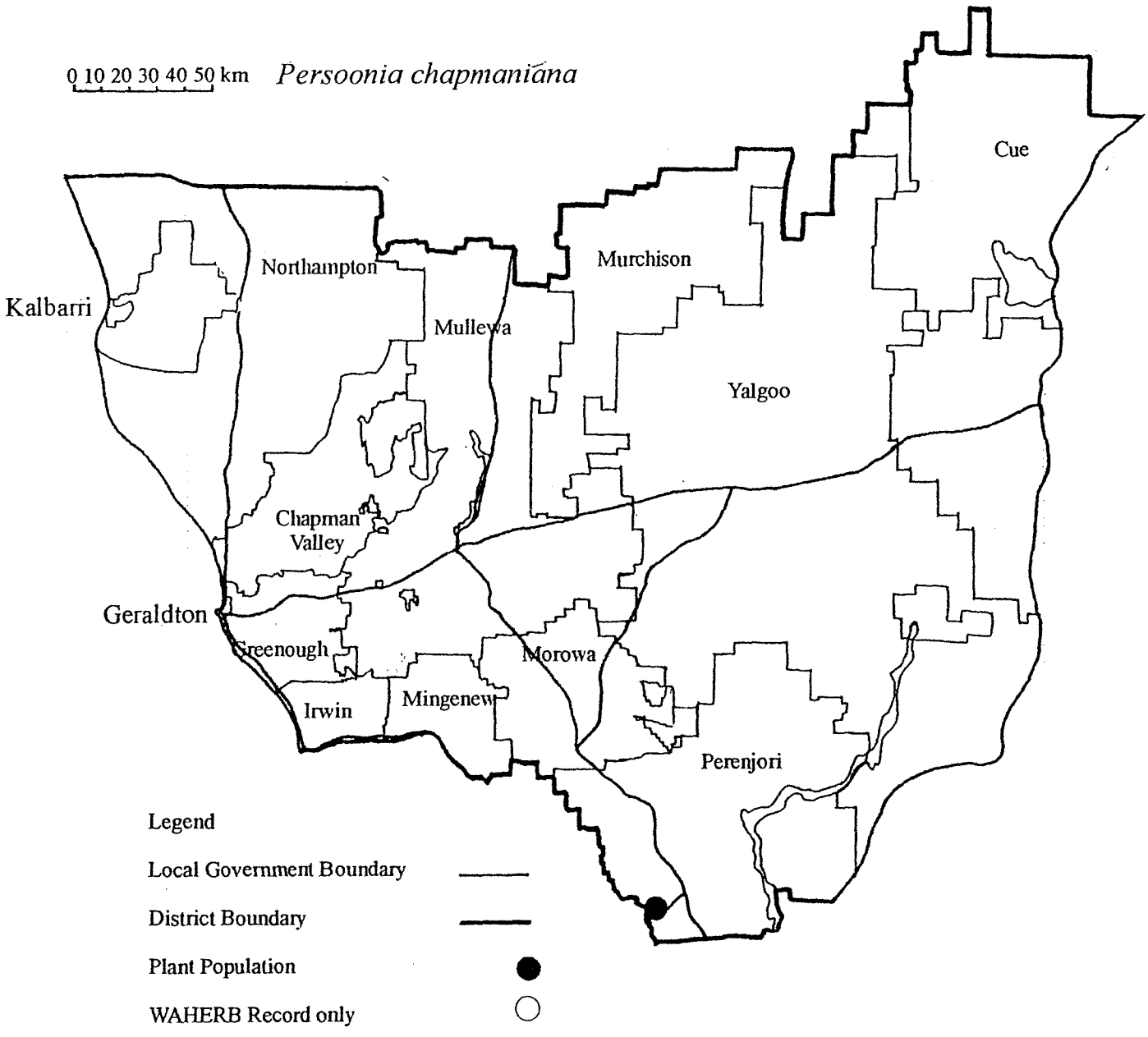
Research Requirements

- Further survey is required, particularly to the north-east of the known population, where there appears to be similar suitable habitat.

[#] now Priority 3 (updated at December 1999)

References

Bentham (1870), Weston (1994).



Pityrodia glutinosa Munir — CHLOANTHACEAE

A spreading shrub, 1-1.5 m tall, with terete stems. The stem, leaves and outside of the calyx are glabrous but are glutinous. The leaves are shortly petiolate, with dentate margins, oblong to narrowly oblong-obovate in shape, the margins towards the tip slightly recurved. The flowers are solitary in the upper leaf axils. The calyx is divided into five lobes 6-7 mm long. The corolla is white, 10-12 mm long, tubular, with two lips. The upper lip is divided into two narrowly elliptic oblong lobes, the lower with a broad central lobe and two narrower side lobes. There is a hairy ring inside the tube near the throat where the four stamens are attached, protruding just beyond the throat. The ovary is globose, densely pubescent, the style shortly bifid, 4-6 mm long. The fruit is obovoid, pubescent, 4-5 mm long, splitting into two nutlets.

Pityrodia glutinosa has recently been combined with *P. glabra* which was separated on characters of the leaf stalk and margin (B. Rye, personal communication). *P. glutinosa* is related to *P. viscida,* which has a short pubescence on the stem and branches. It is also related to *P. hemigenioides*, which has a white to grey covering of short woolly hairs on stem, leaves and calyx.

Flowering Period: August

Distribution and Habitat in the Geraldton District

This species is known mainly from the Shark Bay area but has been recorded once from the Murchison sandplains north of Galena in the Geraldton District. There are also two records from a few kilometres north of the District boundary in the same area.

North of the Geraldton District, this species grows in red or orange sand, sandy clay or sandy loam, in low mallee eucalypt woodland, sometimes with *Banksia* species, or in tall shrubland. No habitat details are recorded for the Geraldton District except that it grows in sand.

Conservation Status

Current: Priority 2[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. N of the Murchison Bridge	N	-	7.8.1987	-	-

Response to Disturbance

Unknown

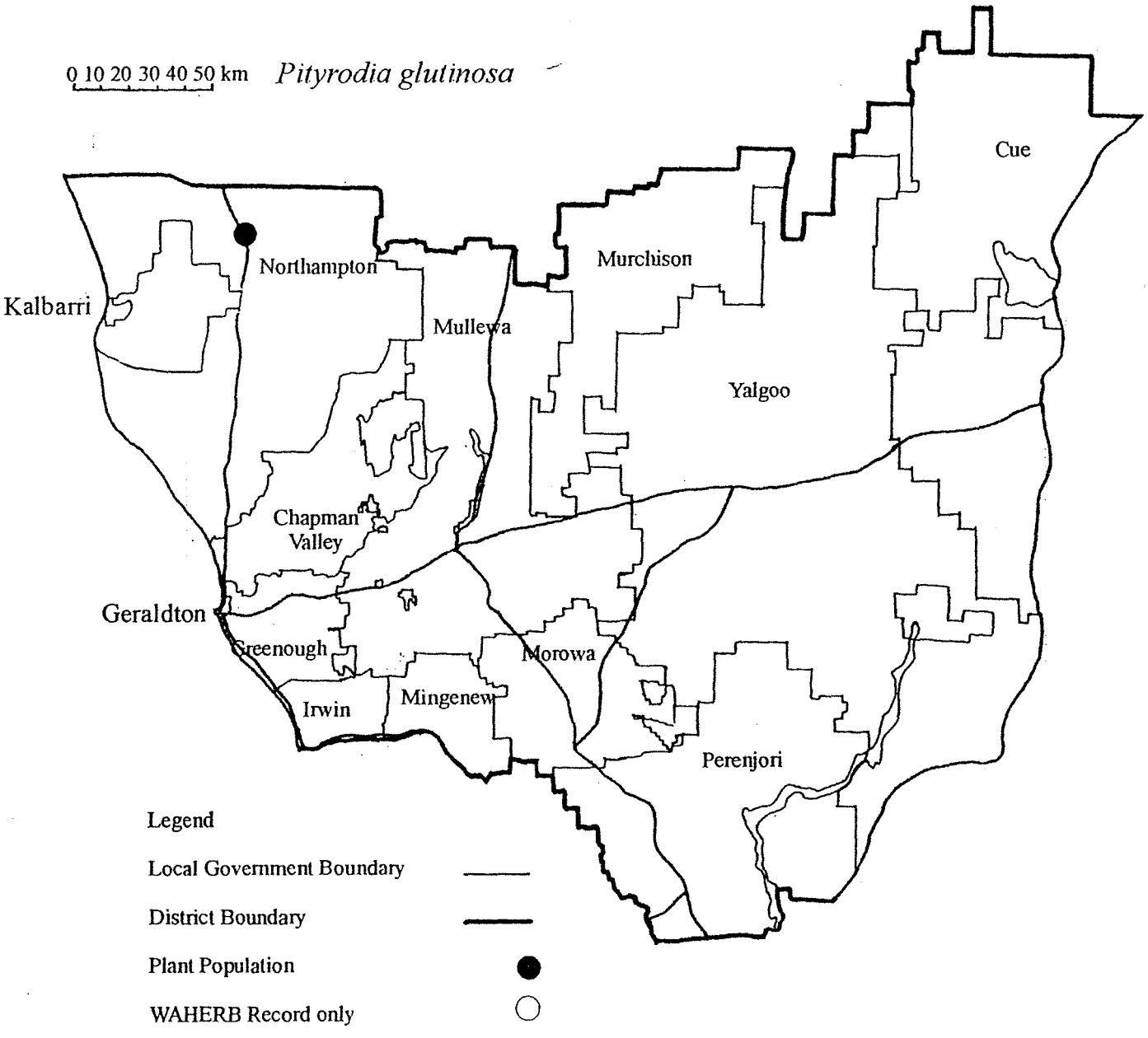
Research Requirements

– Further survey is required.

References

Munir (1979).

[#] now Priority 3 (updated at December 1999)


0 10 20 30 40 50 km
Pityrodia glutinosa
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Platysace sp. Kalbarri (D.& B.Bellairs 1383) APIACEAE

An open, straggling shrub to 30 cm tall, with leafless, ridged, terete stems to 4 mm in diameter and sinuous branchlets with blunt tips. The flowers are cream in colour, grouped in compound umbels c. 6 cm in diameter. Each flower has broad petals c. 1 mm long.

This taxon is closely related to *Platysace ramosissima* and *P. xerophila.*

Flowering Period: October-November

Distribution and Habitat in the Geraldton District

Known from one locality near Kalbarri where it grows in coastal heath in red gravelly soil on sandstone.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. S of Kalbarri	N	-	6.9.1985	-	-

Response to Disturbance

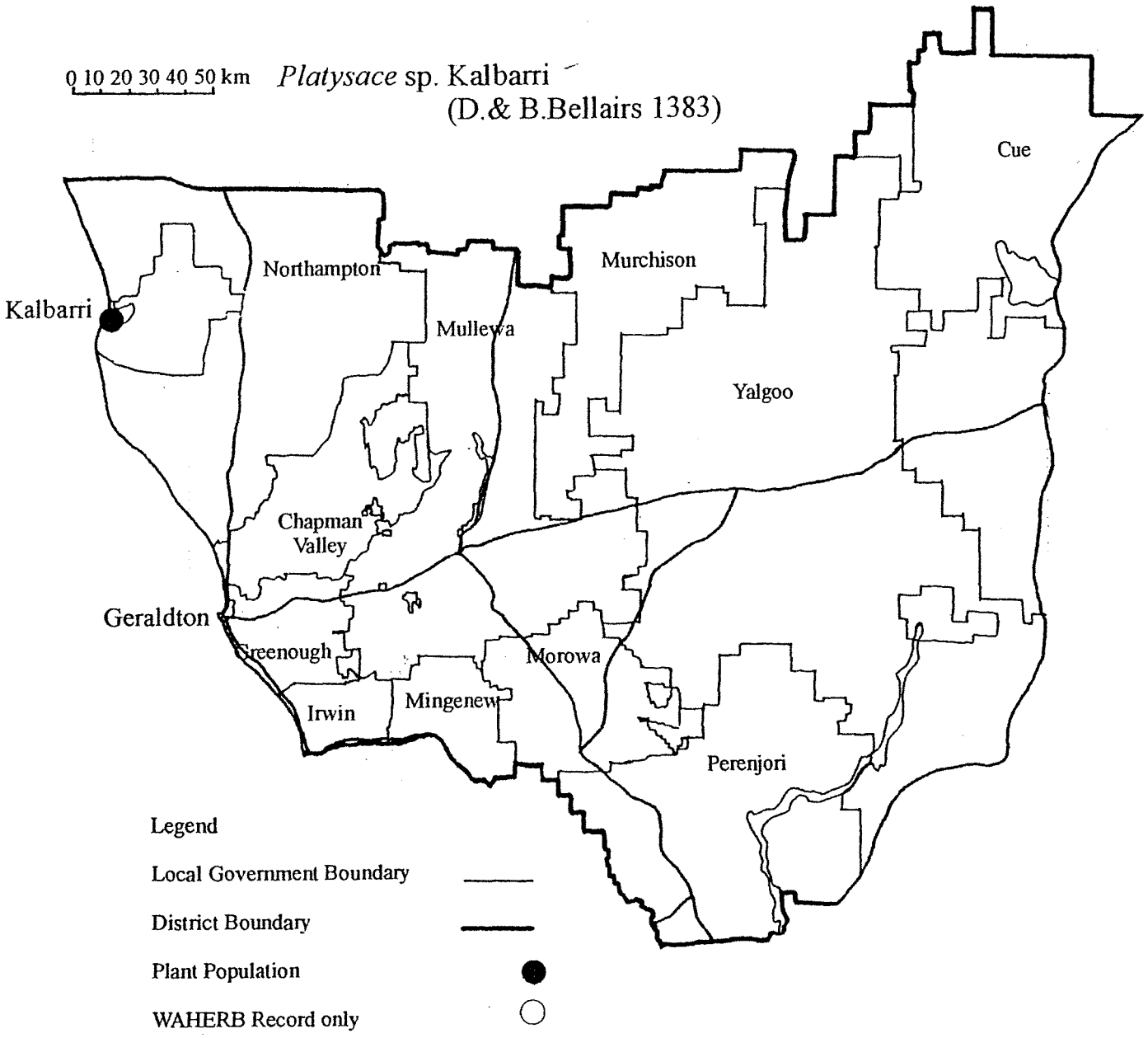
Unknown

Research Requirements

- Further survey is required to refind and survey the previously recorded populations and to make further collections for taxonomic study.
- Further taxonomic study is required.

References

B. Rye (personal communication).


0 10 20 30 40 50 km
Platysace sp. Kalbarri
(D.& B.Bellairs 1383)
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Podotheca uniseta P.S.Short ASTERACEAE

An annual herb with ascending to erect main stems. The leaves are linear, to 4.5 cm long, succulent and green, red or purple in colour. The flower heads are distinct, up to 2.8 cm long, cylindrical in shape. There are tubular florets only and the flower head is surrounded by outer involucral bracts which are herbaceous, appressed and linear to lanceolate in shape. The florets are mainly yellow in colour, with the upper part of the tube usually purple. The fruit is an achene up to 1.9 mm long. It has one pappus bristle at its apex, not five as in other species of *Podotheca.* This separates the species from *P. pritzelii* which also has more succulent outer herbaceous bracts around the flower head which are bright green, not tinged purple. *P. gnaphalioides* is also difficult to separate from *P. uniseta* except by the number of pappus bristles, but there is an ecological difference in that at the type locality it grows mainly under *Melaleuca,* extending only to the outer edge of the samphire zone where it grows with *P. uniseta.*

Flowering Period: September-November

Distribution and Habitat in the Geraldton District

This species has been collected from Lake Monger and south of Morawa in the Geraldton District and from the eastern edge of Lake Moore and south of Pithara in the Merredin District. It has also been recorded from Badgingarra to Three Springs in the Moora District. The total range for the species is c. 130 km.

Grows in the samphire zone around salt lakes on pale red sandy loam, grey or white coarse sand/clay or gravelly loam, sometimes extending into the *Melaleuca* shrub zone. In the Moora District, it occurs on flats or depressions in woodland of *Eucalyptus camaldulensis,* or in low scrub with hummock grasses.

Conservation Status

Current: Priority 2[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. S of Morowa	Mo	-	16.9.1986	-	-
2.* Mongers Lake	P	-	3.9.1982	-	-

Response to Disturbance

Unknown

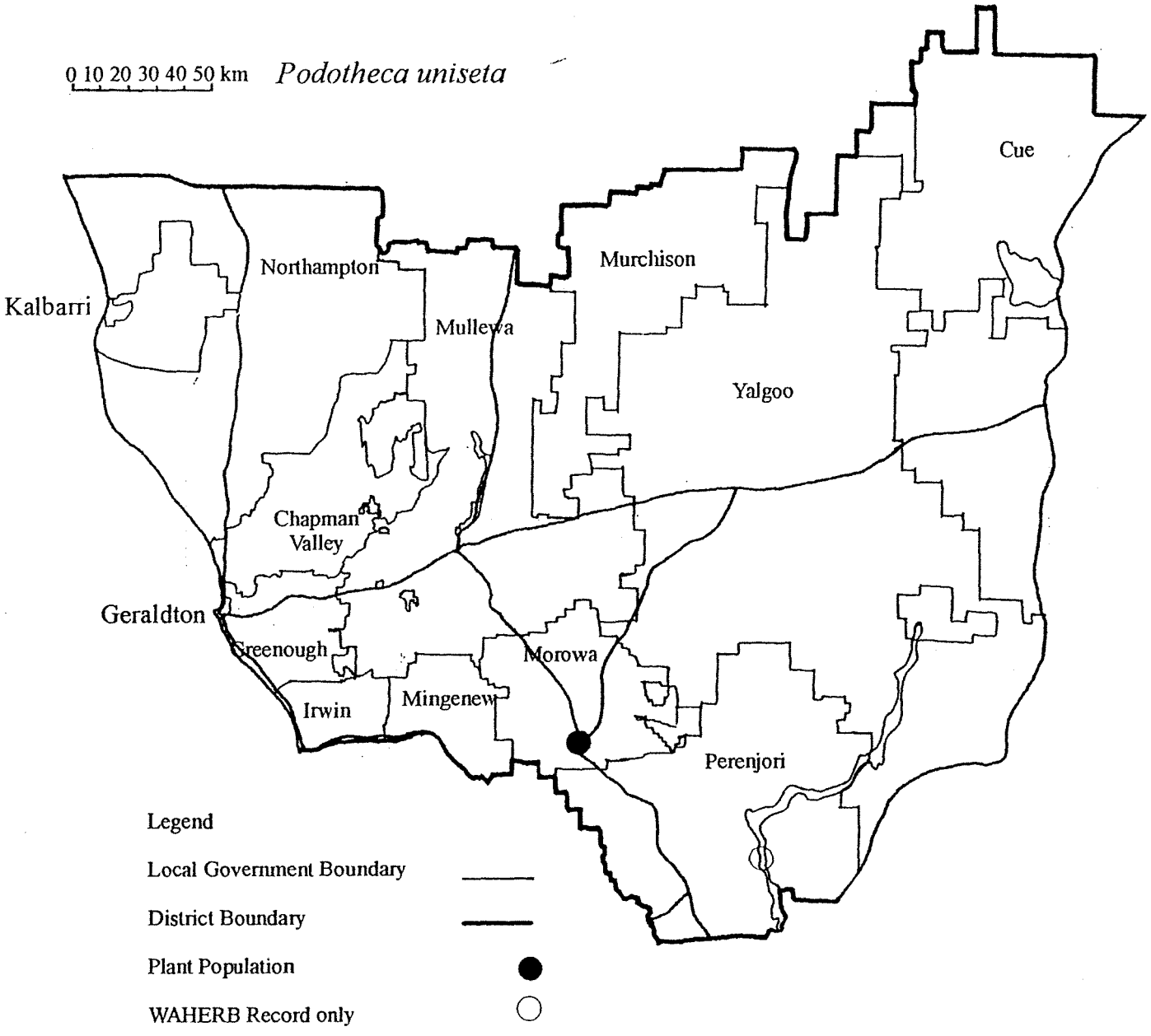
Research Requirements

- Further survey is required.

References

Short (1989a).

[#] now Priority 3 (updated at December 1999)


0 10 20 30 40 50 km
Podotheca uniseta
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Schoenus badius Rye

CYPERACEAE

[*Schoenus* sp. Mt Adams (E.A.Griffin 2811)]

An ephemeral annual herb, 50-120 mm high, glabrous except for the perianth segments. The stems are very slender, the leaves sheathing the base of each stem, the lowest with an open sheath 2-8 mm long, the blade to 14 mm long or may be absent. The upper leaves have a closed sheath 7-15 mm long, the blade is 23-30 mm long. There are 4-6 stalked spikelets on each stem in 1-3 clusters. The spikelets are narrowly ovoid, 5-6 mm long, and there are 2-3 flowers in each. There are three empty basal glumes 1-2.5 mm long, broadly ovate and keeled, chestnut-coloured with green stripes on the margins and keel. The floral glumes are 4-5 mm long. The perianth segments are well developed, are hair-like in the distal half and have long antrorse hairs in the basal half. There are three stamens and a style with three stigmatic branches. The nut is three-lobed with a small pointed apex. It is reticulate-patterned, with 5-8 rows of medium-sized cells on each surface.

This species is similar to *Schoenus pennisetus* which has a smoother nut with a rounded summit, not three-lobed, and numerous rows of small cells on each surface. It has shorter glumes, the floral glumes 3-4.5 mm long.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

This species has been recorded once in the Geraldton District in the Moresby Range north of Geraldton. It was found in a wet area. It has also been recorded from east of Dongara in the Moora District where it was growing on grey sand in low open heath.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.*N of Geraldton	CV	Nature Reserve	16.9.1978	-	-

Response to Disturbance

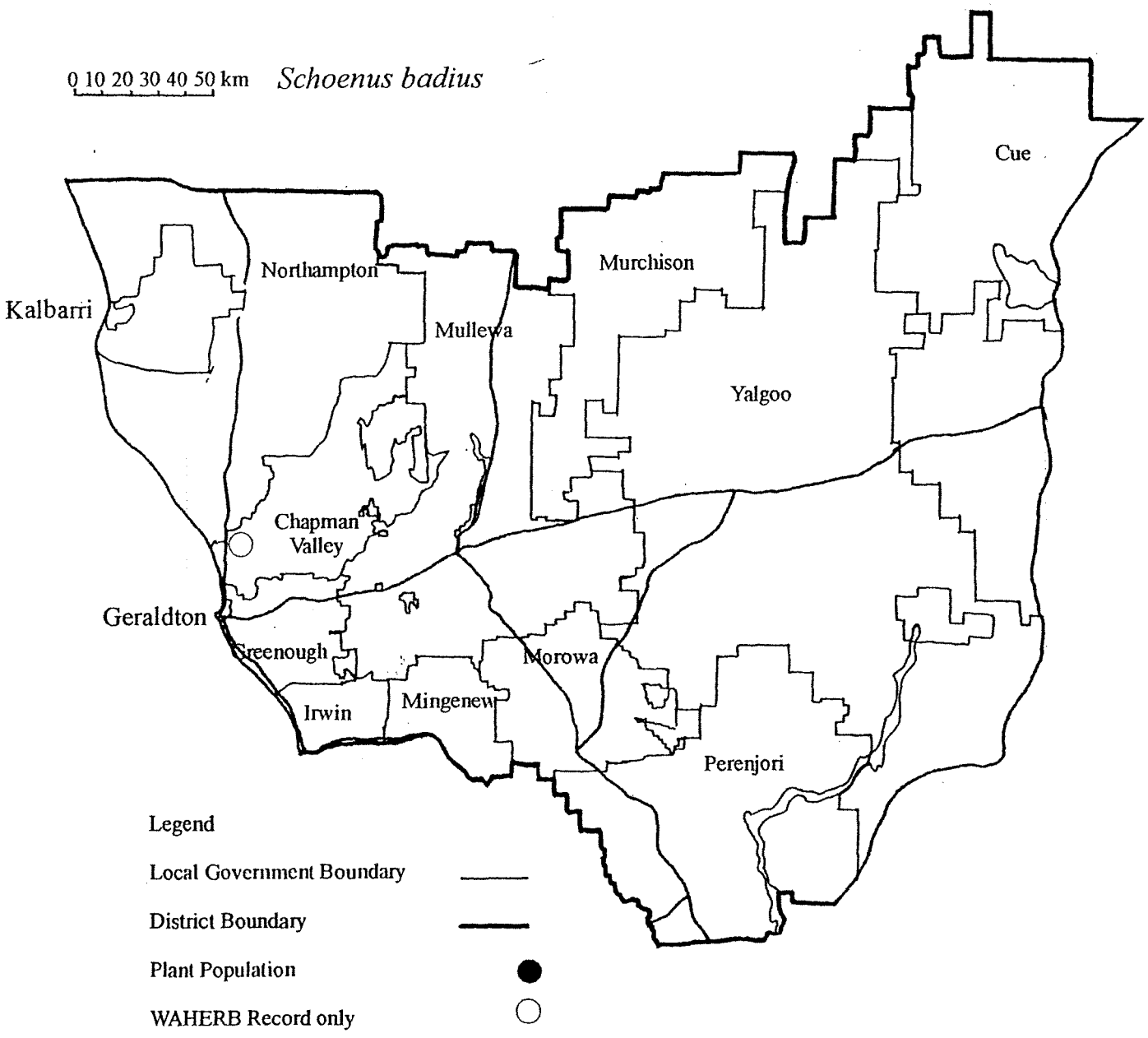
Unknown

Research Requirements

- Further survey is required, particularly in wet years, to refind the previously recorded population and to find further populations.

References

Rye (1997a, 1997b).


0 10 20 30 40 50 km
Schoenus badius
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Schoenus sp. Kalbarri (K.R.Newbey 9352) CYPERACEAE

A spreading, mid-dense, herbaceous annual, 5-9 cm tall, 5-13 cm broad, with the leaves borne towards the base of the plant which is bright medium-green in colour. The stems are c. 1 mm in diameter. The spikelets are strongly compressed, the spikelet axis flexuose at maturity, curved over each nut. The glumes are similar in colour all over. The anthers are 2.5-3.5 mm long. The style is continuous with the ovary. The nut has a short beak and 6-8 rows of square to transversely oblong cells on each surface. It is three-ridged, the ridges smoothly rounded at the summit.

This species is apparently related to *Schoenus elegans.*

Flowering Period: August-October

Distribution and Habitat in the Geraldton District

This taxon is known from one population near Kalbarri where it was recorded from the bed of the Murchison River, growing in damp loamy sand in open low woodland of *Eucalyptus camaldulensis.*

A specimen possibly belonging to the same species has been recorded once from further north in the Mt Augustus area, where it was also growing in low woodland of *E. camaldulensis,* in pale red loamy coarse sand in a drainage line at the base of a large hill.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* ENE of Kalbarri	N	National Park	23.10.1981	"Scattered in patches"	-

Response to Disturbance

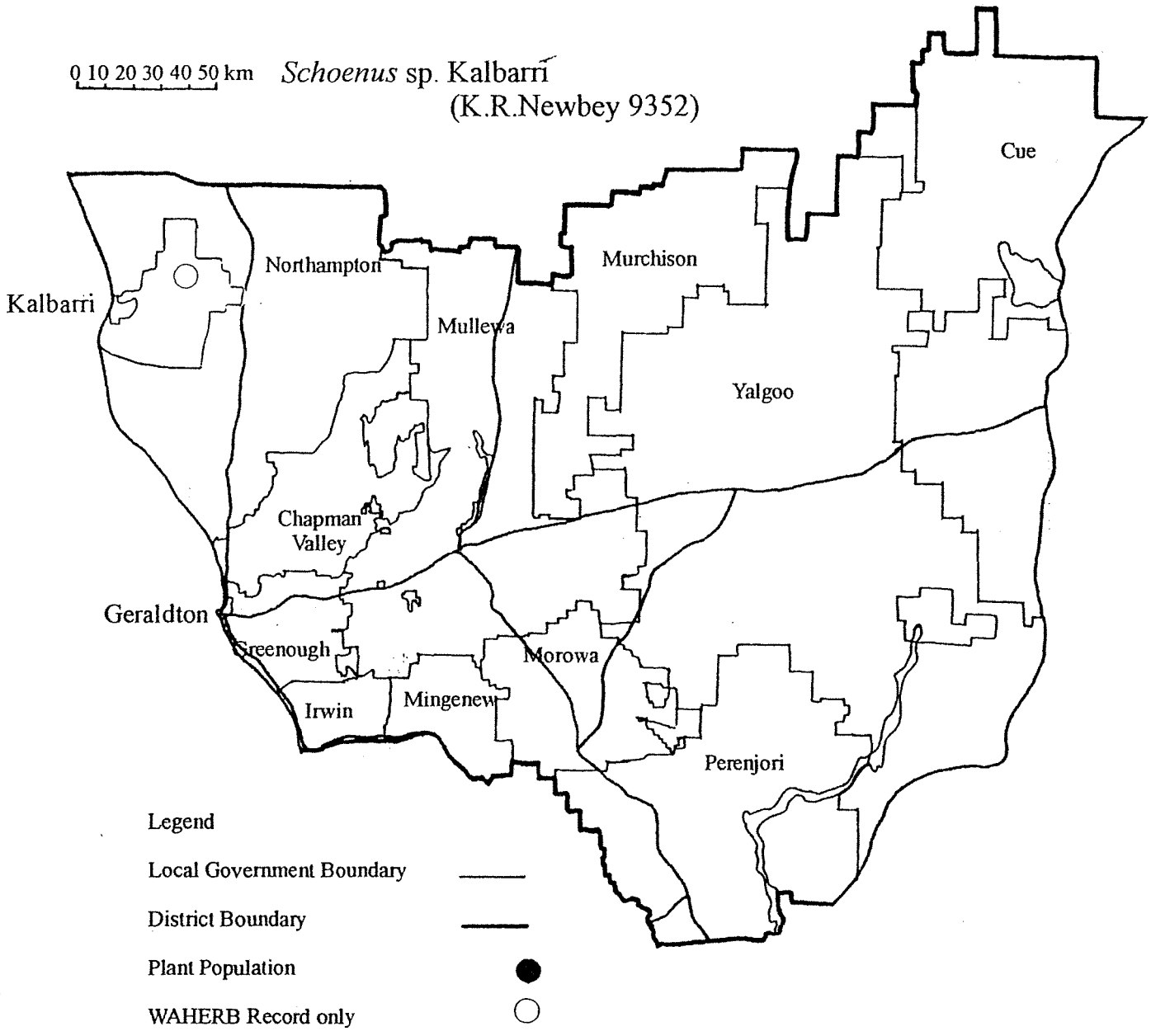
Unknown

Research Requirements

- Further survey is required to refind the recorded population and to find further populations so that further taxonomic study can be made with more material than is at present available.

References

Rye (1997b).


0 10 20 30 40 50 km
Schoenus sp. Kalbarri
(K.R.Newbey 9352)
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Scholtzia sp. East Yuna (A.C.Burns 6) MYRTACEAE

A compact shrub to 2 m tall. The leaves are c. 2 mm long, decussate, short-stalked, rounded in shape with a keel. They are pale green with dark glandular dots. The flowers appear to be white in colour. They are grouped towards the ends of the branchlets. The hypanthium is broad, funnel-shaped and wrinkled, the calyx lobes are pale pink, the petals white to pale pink. There are five stamens and the ovary is 2- or 3-locular.

Flowering Period: June-October

Distribution and Habitat in the Geraldton District

This species has been recorded four times, all populations in the Geraldton District, once from the Murchison River area and three times from south-east of Yuna.

At the Yuna locality, it was recorded from the bottom of a breakaway scree in the outwash zone where it was growing on poorly drained clay and colluvium.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

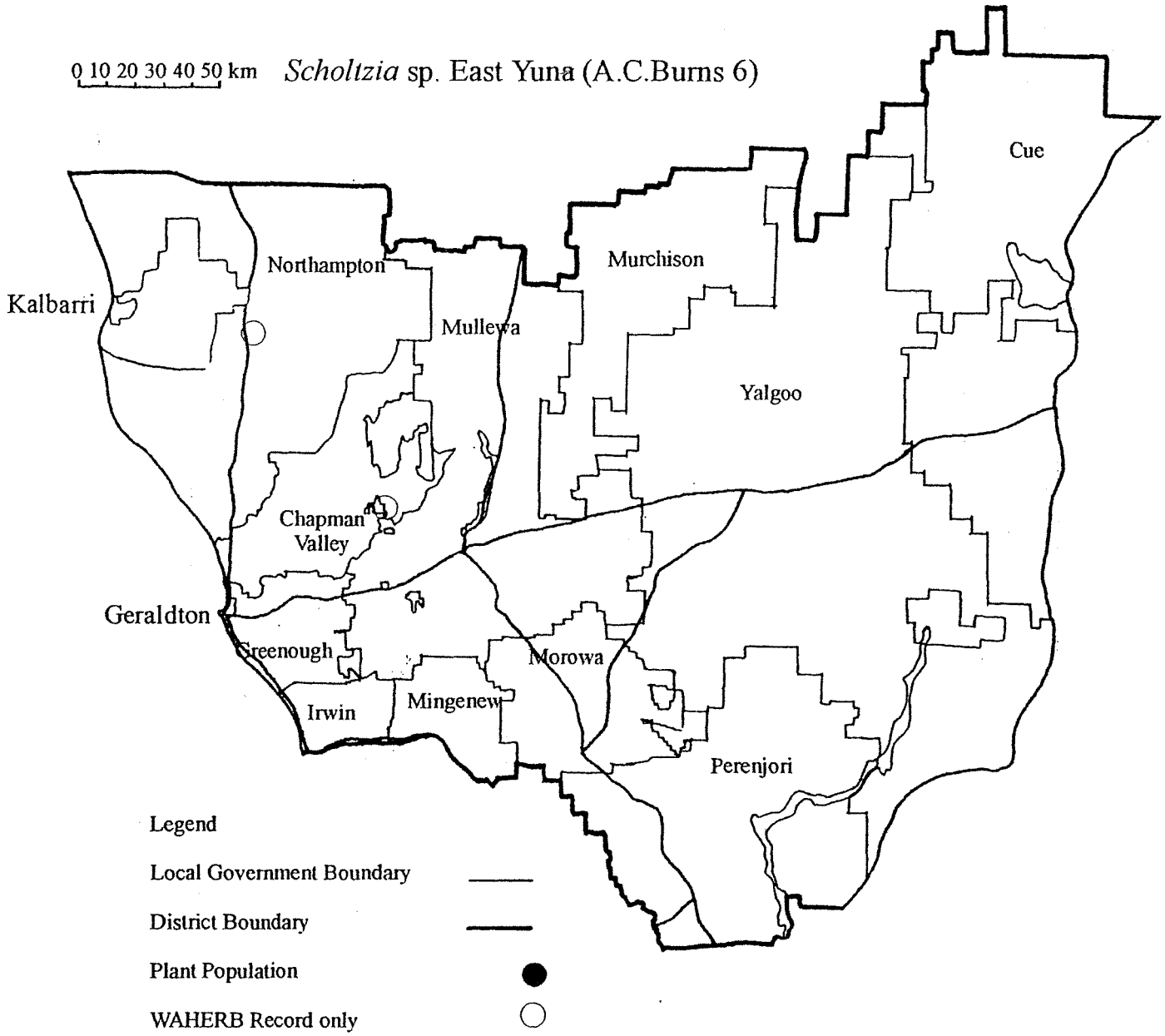
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* SE of Yuna	CV	Nature Reserve	12.10.1976	-	-
2.* N of Murchison River	N	-	22.8.1961	-	-

Response to Disturbance

Unknown

Research Requirements

- Further survey is required.
- Further taxonomic study is required.


0 10 20 30 40 50 km
Scholtzia sp. East Yuna (A.C.Burns 6)
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Scholtzia sp. Eradu (R.D.Royce 8016) MYRTACEAE

A shrub 30 cm to 2 m tall, with decussate obovate leaves c. 2 mm long. The flowers are white or pink, in compact heads on peduncles c. 1 cm long, arising from the axils of the upper leaves.

Flowering Period: October-December

Distribution and Habitat in the Geraldton District

This species has been recorded four times in the Geraldton District, from the Murchison River south-east to the Yuna and Eradu areas where it was reported in 1997 as occurring on East Yuna Nature Reserve in two populations. It has also been found more recently west of Coorow in the Moora District.

Grows in pale grey or yellow sand, orange-brown sandy clay or yellow loamy sand in open low scrub and heath, or under open low woodland in open low scrub. Associated species include *Melaleuca uncinata, M. coronicarpa* and *Allocasuarina campestris,* or *Xylomelum angustifolium, Ecdeiocolea monostachya* and *Daviesia nudiflora.*

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

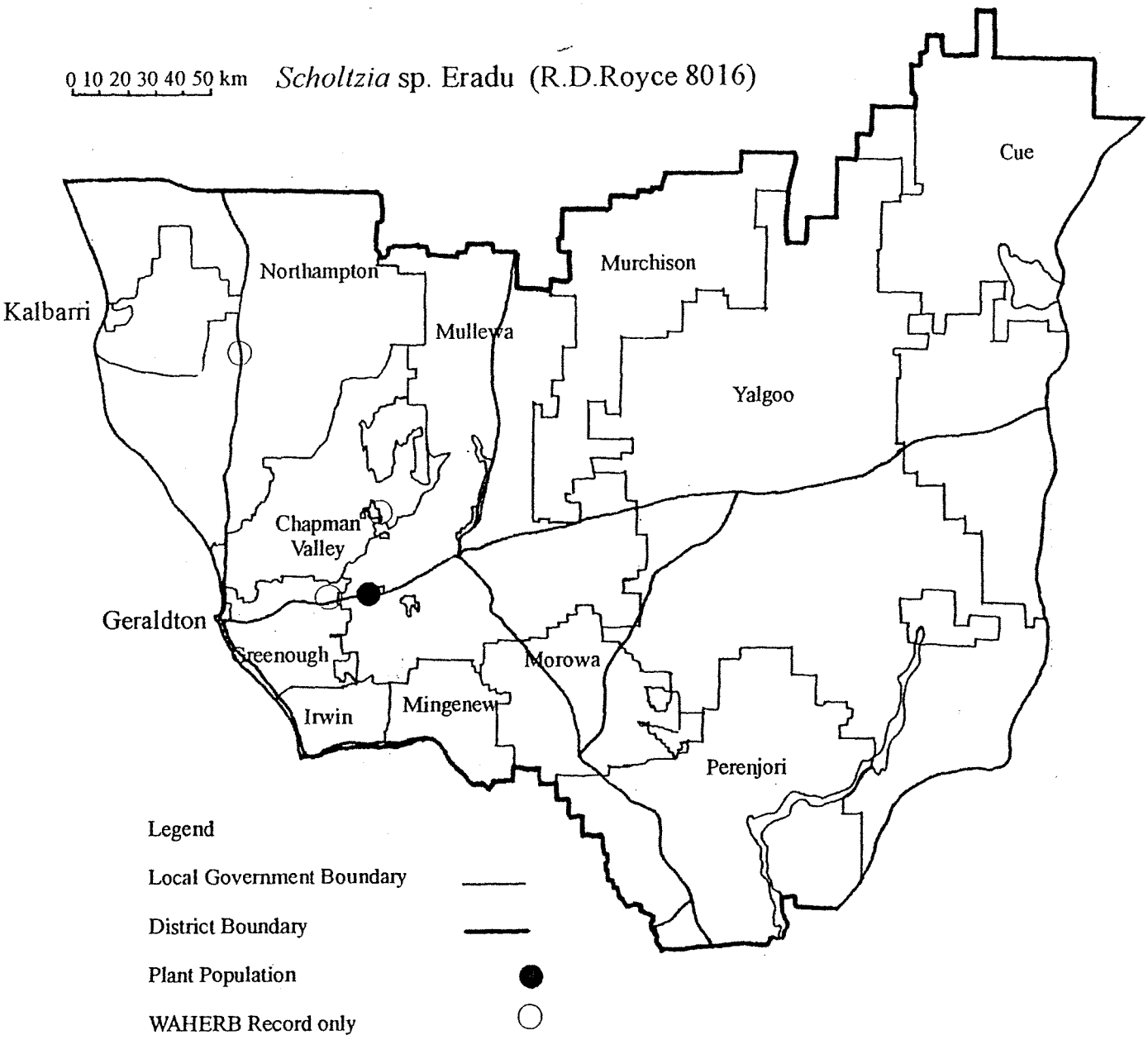
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Near Ambania	Mu	-	24.10.1992	-	-
2.* SE of Yuna	CV	Nature Reserve	19.11.1968	-	-
3.* Eradu	G	-	31.10.1963	-	-
4. Near Murchison River	N	-	-	-	-

Response to Disturbance

Two populations were recorded from areas which had been long unburnt.

Research Requirements

- Further survey is required.
- Further taxonomic study is required.


0 10 20 30 40 50 km
Scholtzia sp. Eradu (R.D.Royce 8016)
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Scholtzia sp. Galena (W.E.Blackall 4728) MYRTACEAE

A shrub 1-1.5 m tall, the branchlets divergent. The leaves are decussate, orbicular, c. 1.5 mm long. The flowers are white to pink in colour, in small terminal heads. The hypanthium is deeply pitted.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

Occurs on sandplain to the north of the Murchison River, north of Galena and to the east, and south-east to the Yuna area.

Grows on red, yellow or orange to brown sand in tall shrubland, or open tree mallee over shrubland with grasses and sedges beneath. Associated species include *Eucalyptus obtusiflora, Ecdeicolea monostachya, Acacia, Pileanthus, Olearia, Triodia* and *Plectrachne* species. It may occur on sand dunes, sandplains or elevated sandy flats.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

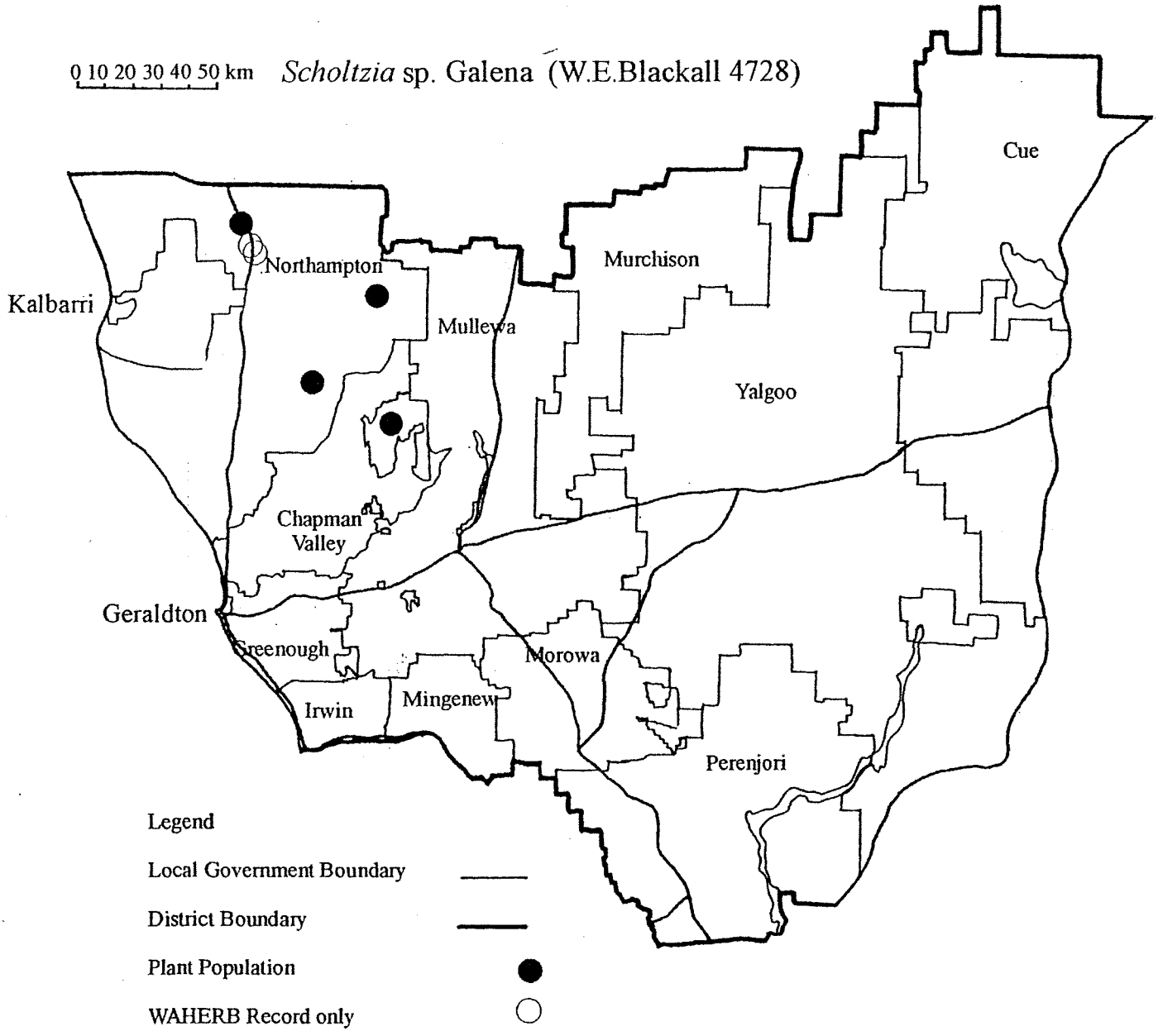
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SE of Coolcalalaya	N	Pastoral Lease	26.8.1991	-	-
2. S of Coolcalalaya	N	VCL	6.9.1990	-	-
3. NE of Yuna	CV	Nature Reserve	14.9.1990	-	-
4. NE of Kalbarri	N	-	29.8.1995	-	-
5.* N of Northampton	N	-	6.8.1976	-	-
6.* N of Galena	N	-	9.1940	-	-

Response to Disturbance

Unknown

Research Requirements

- Further survey is required
- Further taxonomic work is required.


0 10 20 30 40 50 km
Scholtzia sp. Galena (W.E.Blackall 4728)
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Scholtzia sp. Ross Graham Lookout (S.Maley 6) MYRTACEAE

A shrub to 1.5 m tall and 2.5 m across, (or 0.5-1.5 m tall, 1-2.5 m across). It is a spreading shrub or compact and rounded, with horizontal spreading branches in tiers. The stems are well covered with soft bright green linear to elliptic leaves c. 7 mm long and the flowers are on the upper and outer part of the shrub which has dense foliage inside. The flowers are abundant and are grouped in compact axillary heads c. 1 cm in diameter, on peduncles c. 5 mm long, towards the upper ends of the branchlets. The hypanthium is green, the calyx lobes pink, white or deep pink, the petals pale to deep pink, the stamens orange to red.

Flowering Period: August-October

Distribution and Habitat in the Geraldton District

Occurs along the Murchison River Gorge where it grows in white to red or pink to brown sand over sandstone on undulating sandplain on the top of the cliffs above the gorge. It grows in mixed shrubland 3-4 m tall with *Allocasuarina campestris, Jacksonia cupulifera, Acacia scirpifolia* and *Hakea* species over *Melaleuca megacephala* and *Calothamnus* species over *Plectrachne drummondii, Ecdeicolea monostachya, Calocephalus, Thomasia* and *Lepidobolus* species and annual herbs.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SE of Kalbarri	N	National Park	28.9.1995	30+	Healthy
2. NW of Ajana	N	-	7.9.1966	-	-
3. Murchison River	N	-	27.9.1962	-	-

Response to Disturbance

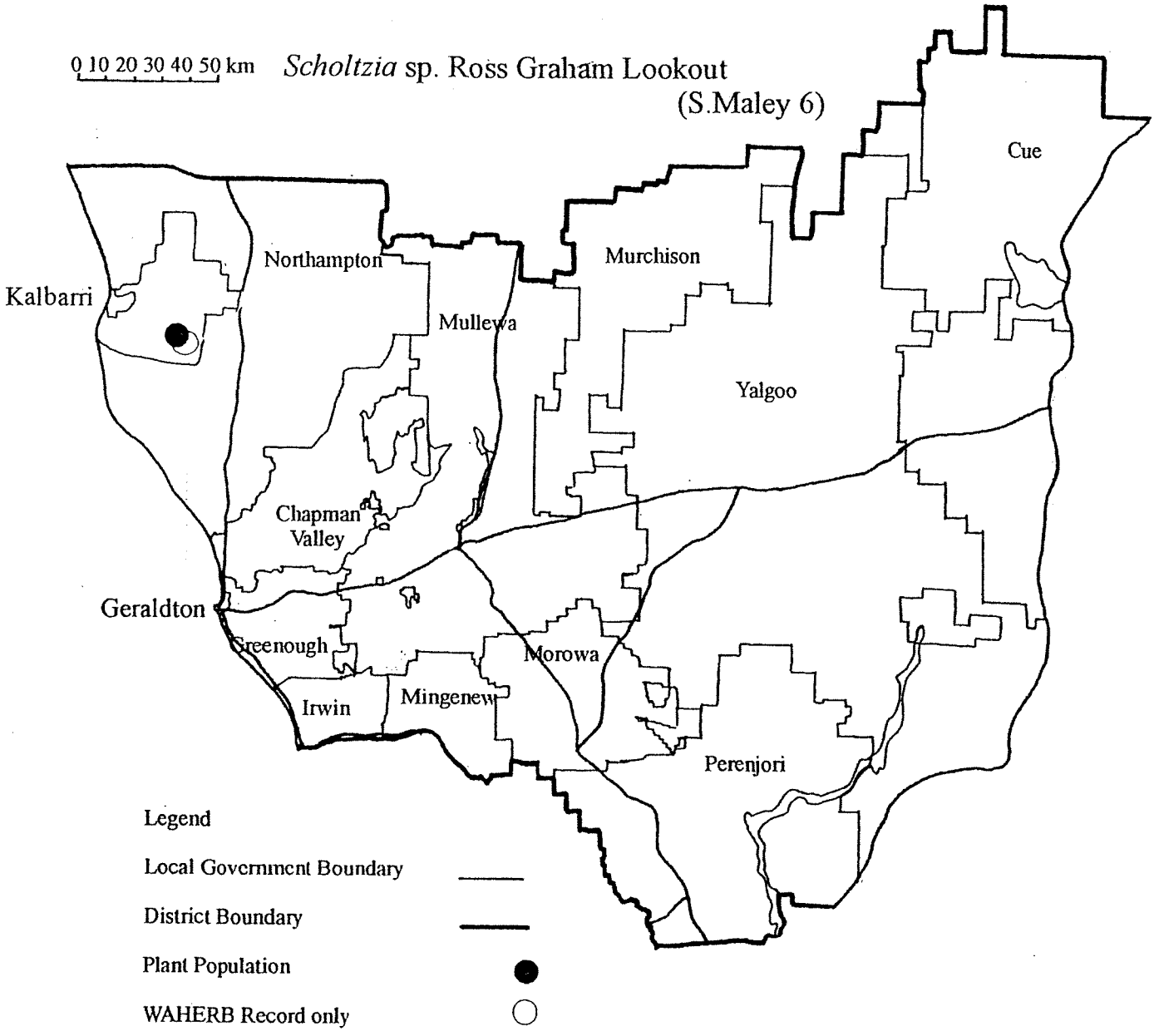
Unknown

Management Requirements

- Ensure that this species is known and protected at the known locality.

Research Requirements

- Further survey is required to determine the extent of the range of this apparently restricted species.
- Further taxonomic work is required.


0 10 20 30 40 50 km
Scholtzia sp. Ross Graham Lookout
(S.Maley 6)
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Scholtzia sp. Z-Bend (Bellairs-Kalflora 912A) MYRTACEAE

A dwarf shrub 60 cm tall, with numerous straight slender branchlets. The leaves are decussate, elliptic and blunt, with glandular dots and are c. 1.3 mm long. The flowers occur singly in the axils of the upper leaves on slender peduncles c. 1.4 mm long. They have white calyx lobes and petals. The hypanthium is short and ridged.

Flowering Period: November

Distribution and Habitat in the Geraldton District

Known from one locality near the Murchison River, east of Kalbarri.

Grows in grey sand over sandstone on sandplain at the edge of the Murchison River Gorge.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

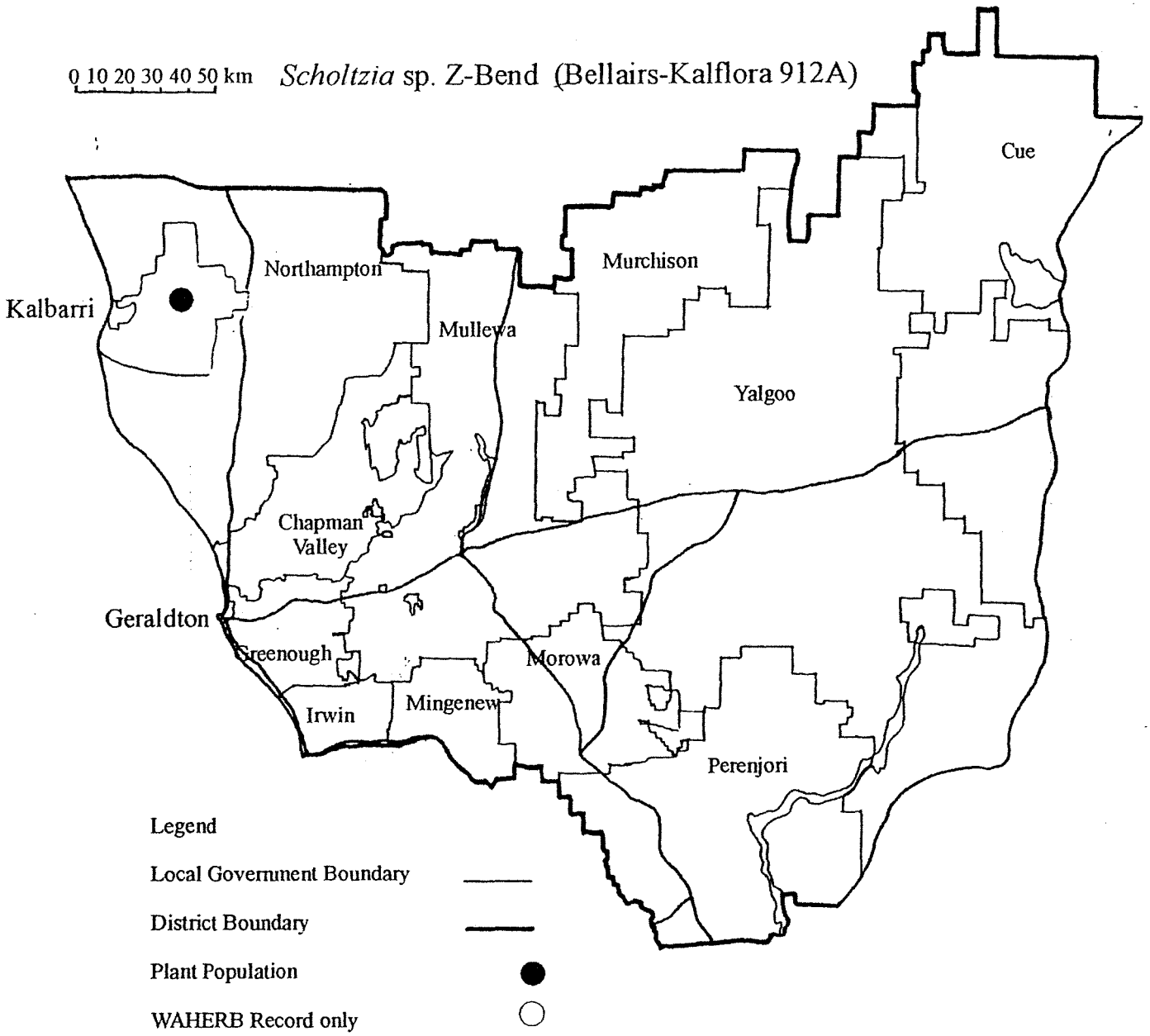
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. E of Kalbarri	N	National Park	17.11.1996	-	-

Response to Disturbance

Unknown

Research Requirements

- Further survey is required.


0 10 20 30 40 50 km
Scholtzia sp. Z-Bend (Bellairs-Kalflora 912A)
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Stenanthemum poicilum Rye RHAMNACEAE

[*Cryptandra* sp. Canna (J.S.Beard 7204)]

An erect to decumbent shrub 0.15-0.5 m tall, the young stems densely hairy with simple and stellate hairs. The stipules are joined at the base for about a quarter of their length. The leaves are broadly obovate, 2.5-7 mm wide, 2.5-6 mm long, on hairy stalks to 1 mm long. The leaf has 2-4 main lateral veins on each side of the midvein on the lower surface. Both surfaces have minute stellate and simple hairs. The flower clusters are 5-12 mm wide, white in colour. The involucral bracts are ovate, 2.5-3.5 mm long, the floral bracts are ovate, c. 3 mm long. The flowers have a tube to 3.7 mm long, the sepals to 1.6 mm long. The flowers have a dense covering of stellate and simple hairs on the outside. The fruit is hairy, to 2.5 mm long, and the seeds are yellow-brown with prominent dark markings.

This species is related to *Stenanthemum pomaderroides,* which has free stipules and larger leaves with 5-8 prominent lateral veins on each side of the midvein. It has a more open branching pattern and the indumentum on the flowers is different, with whiter, more predominant stellate hairs.

Flowering Period: May-June, September-November

Distribution and Habitat in the Geraldton District

Occurs in the Wilroy to Canna and Warriedar areas and there is one isolated record from the Bremer Range west of Norseman.

Grows in red-brown clay or sandy clay, sometimes over ironstone. Occurs in woodland of *Eucalyptus loxophleba* or shrubland with *Acacia, Casuarina* and *Melaleuca* species.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. E of Jasper Hill	P	VCL	22.11.1992	"Frequent"	-
2.* Wilroy	Mu	Nature Reserve	5.6.1977	-	-
3.* Canna	Mo	-	29.10.1974	-	-

Response to Disturbance

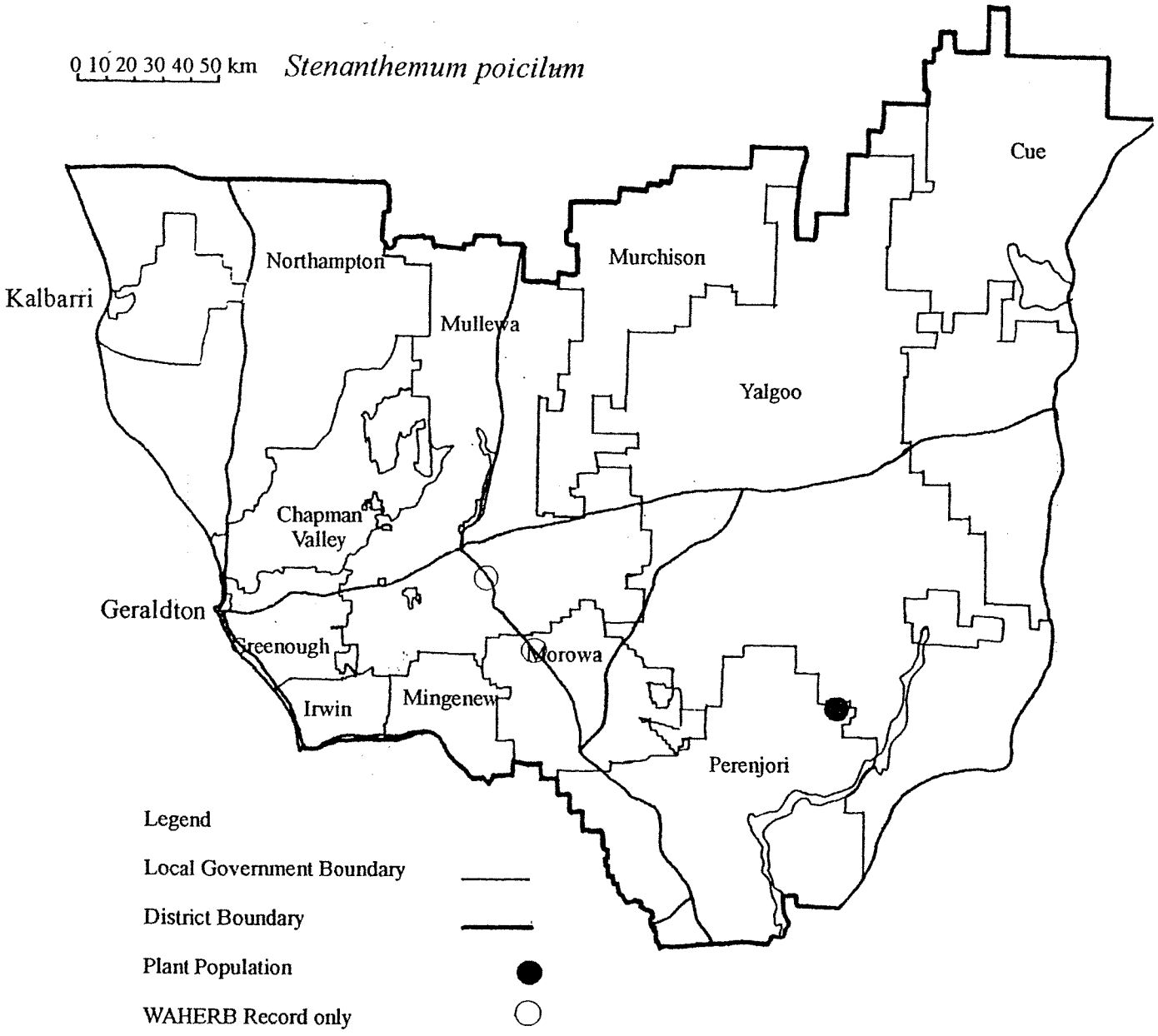
Unknown

Research Requirements

– Further survey is required, particularly on conservation reserves in the Wilroy to Canna area.

References

Rye (1995).


0 10 20 30 40 50 km
Stenanthemum poicilum
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Stylidium diuroides Lindl. subsp. *paucifoliatum* A.Lowrie & Carlquist

STYLIDIACEAE

Northern Donkey Triggerplant

An erect, stilted herb with flowering stems to 30 cm tall. The lower leaves are grass-like, to 4 cm long, forming a basal tuft. There are two whorls of linear leaf-like bracts on the flowering stem and a few bracts above them.

The flowers are in a loose raceme. The calyx is shorter than the flower stalk, with five narrow lobes longer than the tube, hairless except for glandular hairs on the margins. The petals are yellow in colour, each petal rounded-oblong in shape and with a red nerve on the back. They are paired, the lower pair slightly smaller. There are six yellow linear throat appendages and an oval labellum with a long narrow point. The column is longer than the petals and the anthers are dark. The ovary is densely glandular hairy. The fruit is an ovoid capsule.

Differs from *Stylidium diuroides* subsp. *diuroides* in the sparsely-leaved rosette, with smooth leaf surfaces, not minutely papillate, the two-whorled flower stem rather than one-whorled, the terete axis to the flower spike, not angular, the glandular margins of the calyx lobes and densely glandular ovaries, not sparsely glandular.

Flowering Period: September-November

Distribution and Habitat in the Geraldton District

In the Geraldton District, this species is known from the Mingenew to Geraldton area, with an early record from the Mullewa area. It was also recorded at the beginning of this century from Jibberding, just to the south of the District. It is also known south to the Lesueur area and eastward in the Moora District.

Grows in white or grey sand over laterite or in sandy loam over sandstone, sometimes at the top of breakaways, in low open heath to 1 m.

Conservation Status

Current: Priority 2[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. W of Mingenew	I	Rail Reserve	23.9.1990	1 000 est.	Good
2. Burma Road	Mi	Shire Road Reserve	1.10.1991	-	-
3.*E of Geraldton	G	-	19.9.1960	-	-
4.*Mullewa Plains	-	-	21.9.1931	-	-

Response to Disturbance

Unknown

Management Requirements

- Populations 1 and 2 should be refound, fully surveyed and marked.

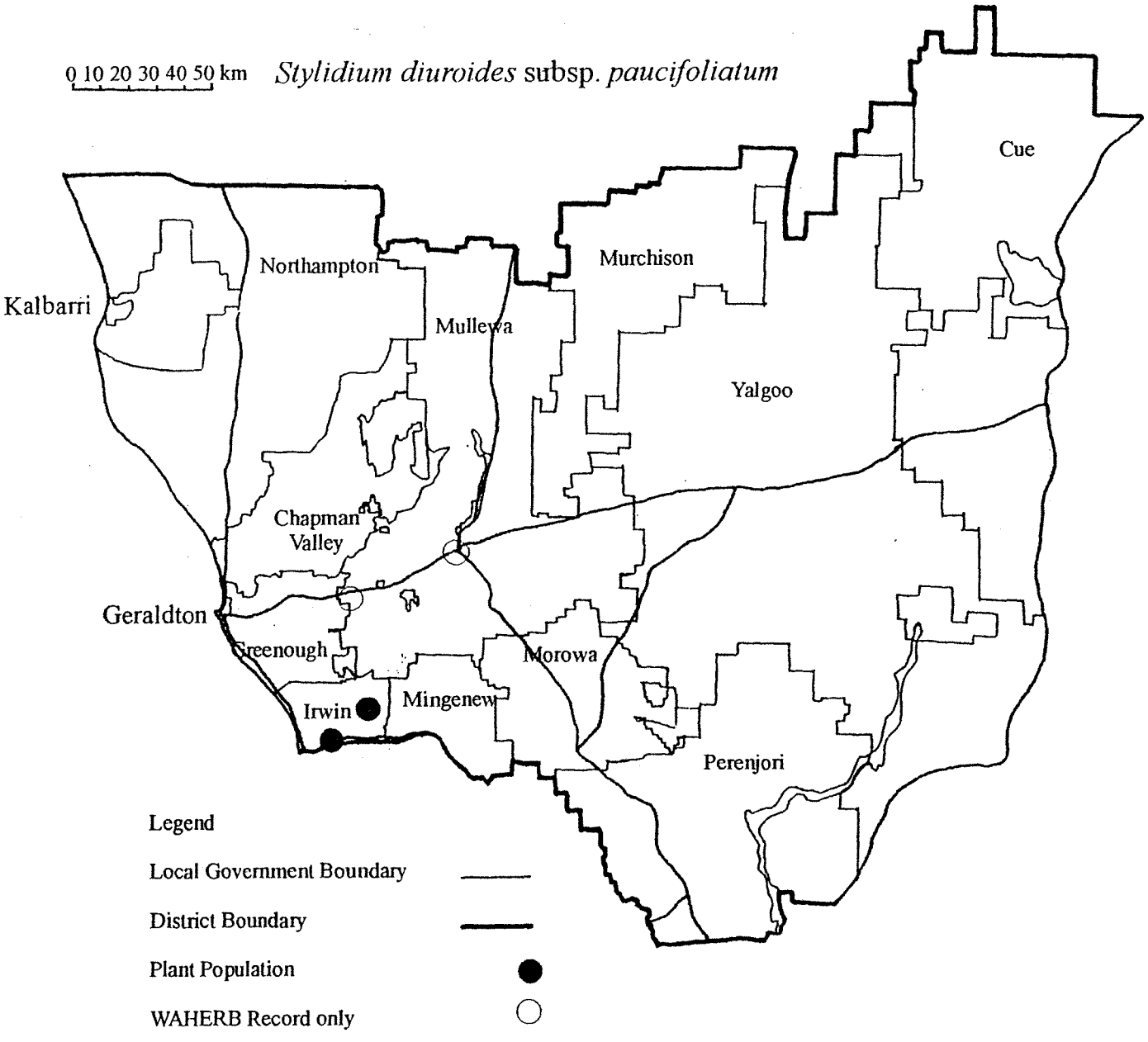
Research Requirements

- Further survey is required.

[#] now Priority 3 (updated at December 1999)

References

Erickson (1981), Lowrie & Carlquist (1991).



Stylidium wilroyense Lowrie, Coates & Kenneally STYLIDIACEAE

[*Stylidium* sp. Coolcalalaya (A.H.Burbidge s.n.)]

A tufted perennial herb 0.3-0.6 m tall. There is a basal rosette of erect or recurved lanceolate leaves, with scale leaves within and the leaf bases surrounded by dense woolly hairs. The leaves are 12-15 cm long, 5-6 mm wide, the side towards the axis is densely scabrid. The flowers are arranged in a tall raceme on a scape 42-47 cm long, with dense glandular hairs. The peduncles are one-flowered, the lower ones 15-20 mm long, the upper ones 4-6 mm long. The flowers have four dark pink vertically paired lobes, to 15 mm long. The labellum is ovate, dark pink, c. 3 mm long, papillose with two basal appendages. There are four pink throat appendages c. 1.5 mm long, the upper two wing-like, the lower two narrowly ovate and forked. The fruit is an ellipsoid capsule 7-8 mm long.

This species is related to *Stylidium caricifolium* but differs in its racemose inflorescence, scape 42-47 cm long, peduncles one-flowered and dense woolly covering amongst the leaf bases.

Flowering Period: September-October

Distribution and Habitat in the Geraldton District

This taxon is known from two small populations south-west of Coolcalaya and two in the Mullewa area, although population 2 has not been refound since 1992 when it was first discovered.

In the Coolcalalaya area, this species grows on yellow sandplain beneath shrubs in open mallee scrub with emergent *Actinostrobus* sp. Associated species include *Allocasuarina campestris*, *Grevillea candelabroides*, *Conospermum stoechadis* and *Thryptomene* sp. In the Mullewa area, it grows in light brown sandy loam or brown loam over laterite in tall *Acacia* shrubland with mallees.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SE of Mullewa	Mu	Nature Reserve, Railway Reserve	29.9.1995	20+	Healthy
2. NE of Mingenew	Mu	Private	2.10.1992	"Frequent"	-
3. SW of Coolcalalaya	N	VCL	5.9.1990	10+	-
4. SW of Coolcalalaya	N	VCL	2.10.1995	2	-

Response to Disturbance

Unknown

Management Requirements

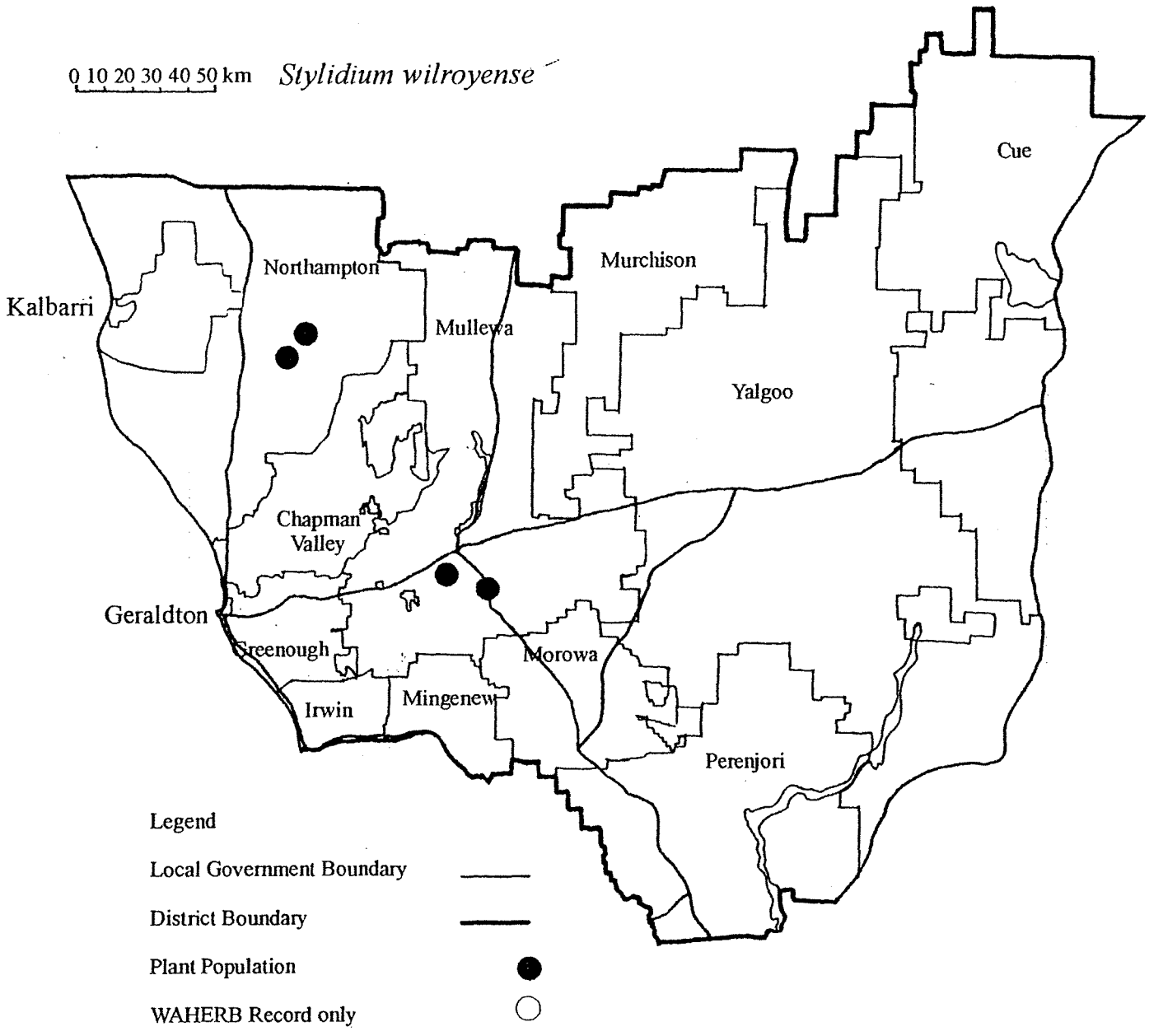
- Ensure that population 1 is marked.

Research Requirements

- Further survey is required.

References

Lowrie *et al.* (1998).


0 10 20 30 40 50 km
Stylidium wilroyense
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Thryptomene stenophylla E.Pritz. MYRTACEAE

A low, spreading shrub 0.3 to 1 m tall. The leaves are soft and linear, with numerous oil glands and dentate, narrow, membranous margins. They are decussately arranged on the branches and are 2-6 mm long, c. 0.75 mm broad. The bracteoles are large, the keel and apex green and leaf-like with broad, glossy, membranous margins. The flowers are pink to purplish-mauve in colour. They are sessile and the calyx tube is rugose and is c. 2 mm broad. The petals are c. 1.5 mm long and there are ten stamens with divergent anther cells.

Flowering Period: June-August

Distribution and Habitat in the Geraldton District

Has been recorded from three localities in the Kalbarri, Geraldton and Ogilvie areas.

Grows in red sand over limestone in *Acacia* shrubland, in lateritic red-brown soil with *Acacia acuminata,* in loam over limestone, yellow sand or sandy clay in scrub to 1.5 m, or in grey sand on sandplain. Other associated species include *Melaleuca megacephala, Alyxia buxifolia, Hibbertia* and *Conospermum* species.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Geraldton	G	Shire Reserve	28.9.1996	200+	Healthy
2. NE of Kalbarri	N	National Park	9.8.1994	5+	Healthy
3. S of Kalbarri	N	-	21.8.1998	100+	Healthy
4.* N of Ogilvie	N	-	11.8.1956	-	-

Response to Disturbance

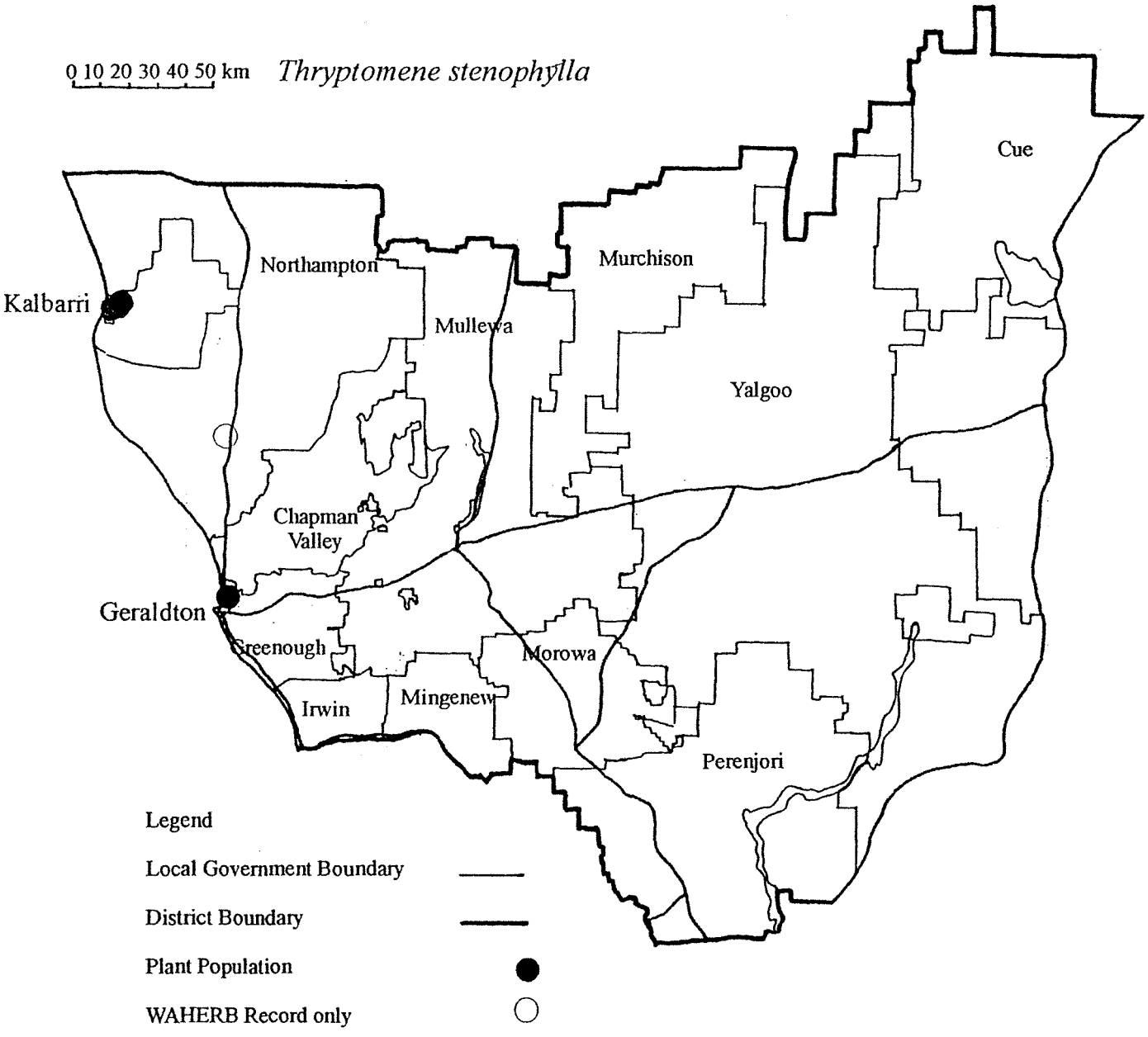
Unknown

Research Requirements

– Further survey is required.

References

Blackall & Grieve (1980), Diels & Pritzel (1904-5).


0 10 20 30 40 50 km
Thryptomene stenophylla
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Thryptomene sp. Eagle Gorge (A.G.Gunness 2360) MYRTACEAE

[*Thryptomene obconica* Rye & Trudgen ms]

A spreading, rounded shrub, 0.3-1 m tall, to 1 m wide. The leaves are wedge-shaped, keeled with glandular dots. They are closely arranged and c. 1.5 mm long. The bracteoles are mainly membranous, the keel somewhat thickened. They are deciduous. The peduncles are long. The flowers are arranged in small clusters at the ends of the branchlets, arising singly from the leaf axils. The sepals are narrowed to an acute folded apex, forming an obconic apex to the flower bud. They are more than half as long as the petals. The petals are pink to white. The floral tube is bell-shaped and papillose, developing rounded blistery projections in fruit. The base is rounded. The ovary is one-celled.

Flowering Period: May and August-September

Distribution and Habitat in the Geraldton District

This species is known from three localities over c. 5 km in the southern part of the Kalbarri National Park. It has also been recorded recently from a few kilometres north of the Geraldton District boundary, north of the Zytdorp National Park.

Grows close to the coast on shallow sandy soil over limestone in low mixed heath, on cliffs, ridges or in gullies. Associated species include *Melaleuca, Myoporum* and *Malleostemon* species.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. S of Kalbarri	N	National Park	19.9.1994	"Abundant"	-
2.* S of Kalbarri	N	National Park	18.8.1977	"Common"	-
3.* S of Kalbarri	N	National Park	16.5.1971	-	-

Response to Disturbance

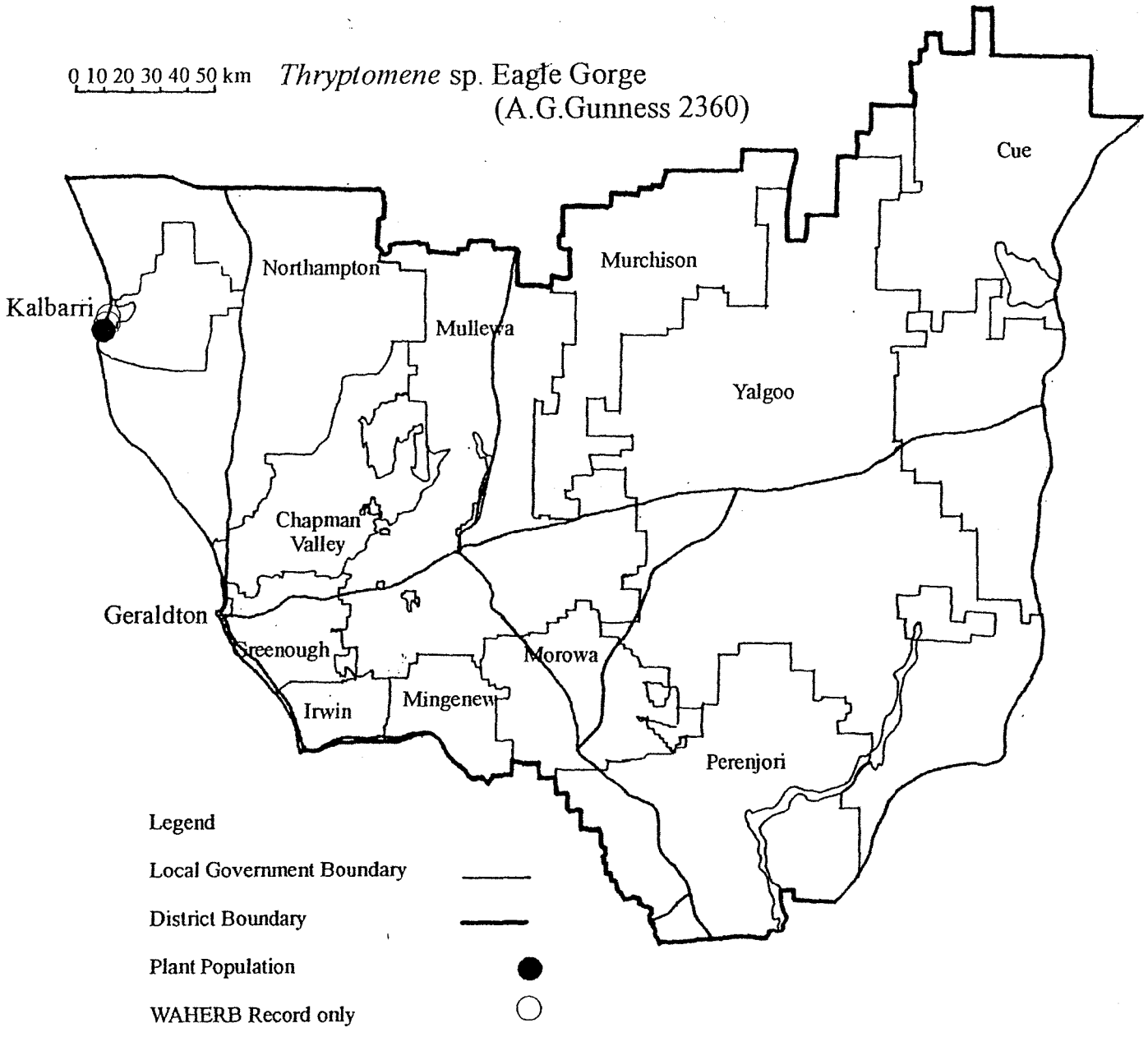
Unknown

Research Requirements

- Further survey is required to refind the previously recorded populations and to survey them fully and to discover new populations.

References

B. Rye & M. Trudgen (personal communication).


0 10 20 30 40 50 km
Thryptomene sp. Eagle Gorge
(A.G.Gunness 2360)
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Thryptomene sp. East Yuna (J.W.Green 4639) MYRTACEAE

[*Thryptomene perpetua* Rye & Trudgen ms]

A sparse, erect shrub 0.6-1 m tall, to 1 m broad. The leaves are broad, fairly thin but stiff. They are obovate in shape, arranged decussately, c. 3 mm long, and are green to grey-green in colour. The young leaves are finely fringed. The flowers are arranged in few-flowered clusters towards the ends of the branchlets. The calyx lobes are very broad and hyaline and the petals are pale pink.

Differs from *Thryptomene baeckeacea* in its larger sepals with broad membranous margins exceeding the apex of the keel, forming a notched apex.

Flowering Period: August-December

Distribution and Habitat in the Geraldton District

This species has been recorded from two nature reserves in the Yuna area and to the south-east in the area west of Mullewa.

Grows on yellow sand or yellow sandy loam in tall scrub of *Allocasuarina campestris,* sometimes with mallees or *Melaleuca uncinata.*

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SE of Yuna	Mu	Nature Reserve	3.4.1994	1+	Healthy
2.* SE of Yuna	CV	Nature Reserve	30.8.1977	-	-
3.* SE of Yuna	CV	Nature Reserve	12.10.1976	-	-
4.* E of Geraldton	Mu	-	14.11.1963	-	-
5.* W of Mullewa	-	-	1960	-	-

Response to Disturbance

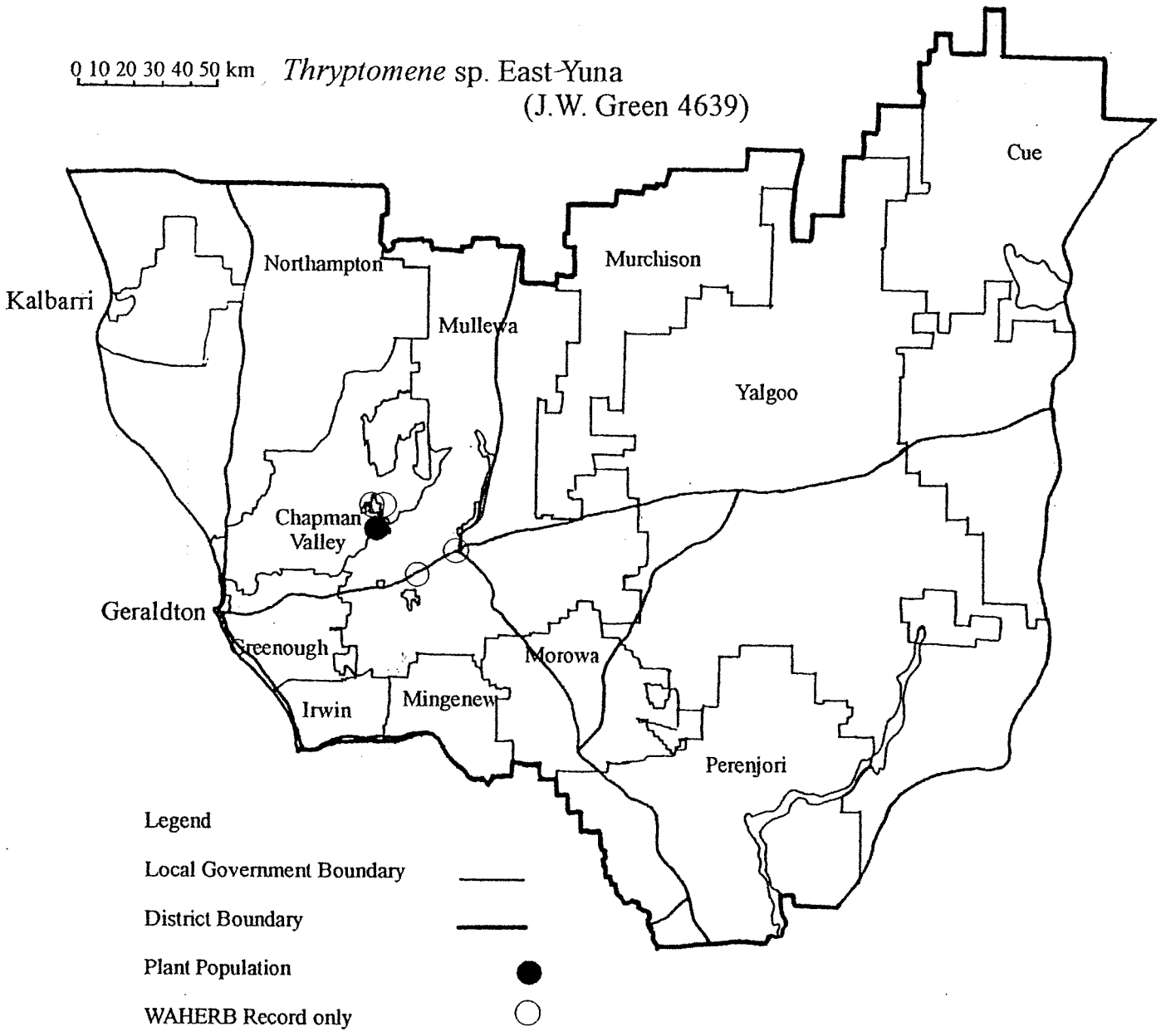
Population 2 was colonising a firebreak. Population 3 was growing in regrowth ten years old.

Research Requirements

- Further survey is required.
- Further taxonomic work is required.

References

B. Rye & M. Trudgen (personal communication).


0 10 20 30 40 50 km
Thryptomene sp. East Yuna
(J.W. Green 4639)
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Thryptomene sp. Eurardy (D.& B.Bellairs 1649) MYRTACEAE

[*Thryptomene bellairsiana* Rye & Trudgen ms]

An upright shrub 50 cm high. The leaves are linear, the adjacent pairs mostly overlapping. The blades are c. 8.5 x 0.4 mm, the lower side keeled, the upper surface infolded. They have glandular dots and taper to a long recurved tip. The bracteoles are mainly thin and membranous and are deciduous. The flowers occur in two or three pairs in a small subterminal cluster on each branchlet. The flowers are c. 4.5 mm in diameter. The five sepals are almost as long as the petals and are rounded at the apex, forming a flat to rounded apex to the flower bud. They are broadly ovate, petaloid and pale pink in colour. The five petals are broadly ovate, c. 1.6 mm long. There are seven or eight stamens. The floral tube is ribbed at the summit and base, pitted and wrinkled in between and rounded at the base. The ovary is one-celled with two ovules.

Thryptomene sp. Eurardy has the narrowest leaves of the *Thryptomene* species. It is most similar to *T. australe* which has shorter, broader leaves, a more elongate, prominently-ribbed floral tube and more numerous ovules.

This species is named after D. and B. Bellairs.

Flowering Period: October-November

Distribution and Habitat in the Geraldton District

This taxon is known from one population east of Kalbarri where it was recorded growing on sandplain in yellow sand.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SW of Eurardy	N	National Park	4.11.1986	"Frequent"	-

Response to Disturbance

Unknown

Management Requirements

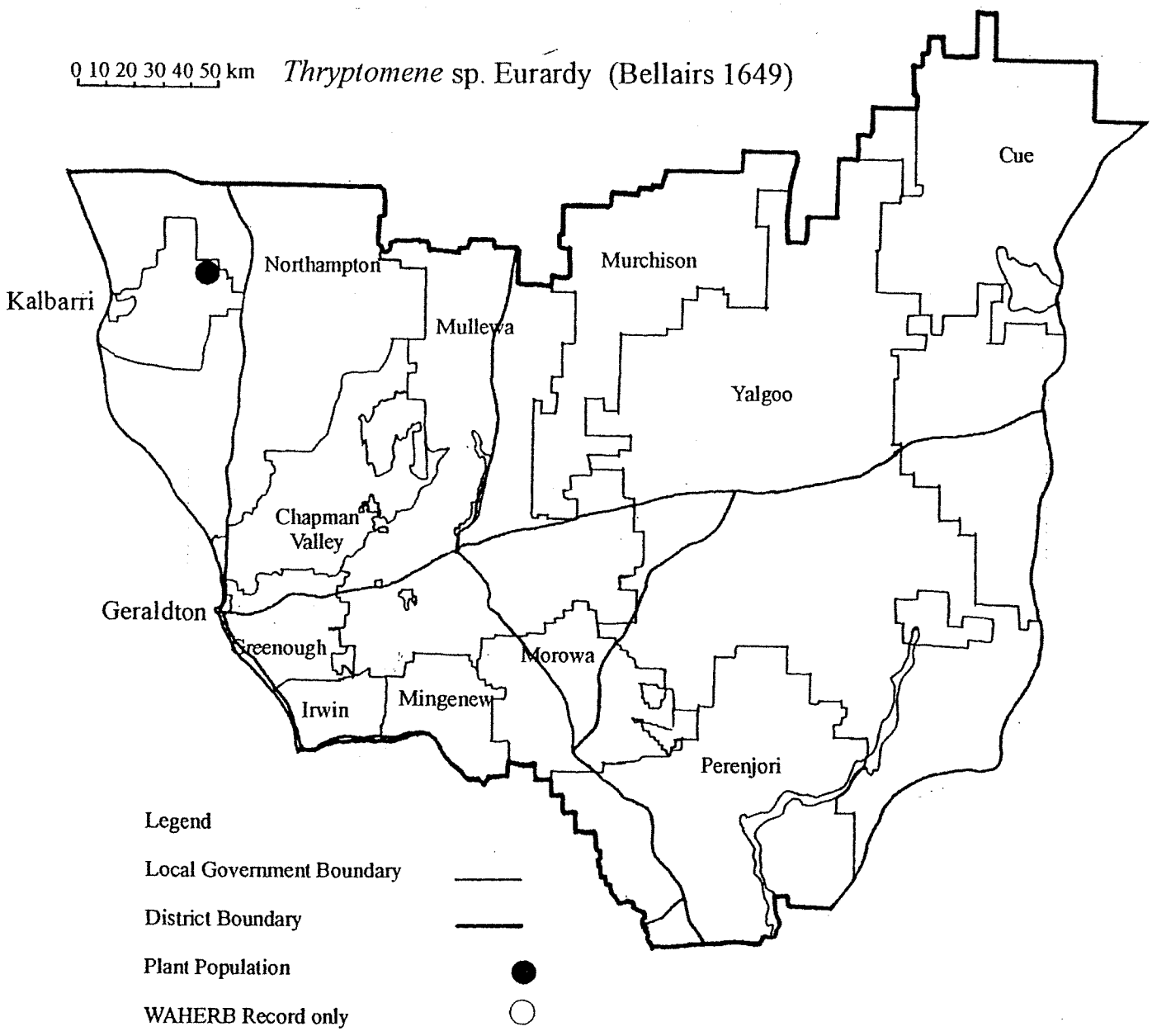
- Ensure that location of the population is known to land managers to prevent accidental damage.

Research Requirements

- Further survey is required to refind and fully survey the known population and to find further populations.

References

B. Rye & M. Trudgen (personal communication).


0 10 20 30 40 50 km
Thryptomene sp. Eurardy (Bellairs 1649)
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Thryptomene sp. Junga Dam (A.G.Gunness 2383A) MYRTACEAE

[*Thryptomene striata* Rye & Trudgen ms]

An erect shrub, compact and rounded, 0.5-1 m tall, 1-1.5 m wide. The leaves are obovate to broadly obovate, overlapping. The blades are to 2.5-3.8 mm long, on stalks 0.6 mm long. They are gland-dotted on both surfaces and have an incurved apex.. The flowers are in 2-7 pairs, grouped in small clusters towards the ends of the branchlets. The bracteoles are broad with thin margins and are persistent in fruit. The flowers are 5-6 mm in diameter if the petals are outspread. The floral tube has 12-16 main indentations between closely packed flattened ribs. There are five sepals, shorter than the petals, the centre base herbaceous, the remainder papery and transparent, deep purplish, with serrate edges. The five petals are erect, 2-2.8 mm long, almost circular, pink or mauve-pink. There are 10 stamens, the filaments pink. The style and ovary are deep pink. There are four ovules in the one-celled ovary. The fruit has flattened ribs, separated by fine line-like grooves. It is narrowed to an acutely angled base.

The specific name refers to the fine grooves resembling lines between the flattened ribs of the floral tube.

This species is similar to *Thryptomene prolifera* but differs in its incurved leaf tips and broader bracteoles.

Flowering Period: September

Distribution and Habitat in the Geraldton District

This taxon is known from one locality east of Kalbarri.

It grows in red loam or sandy soil with ironstone gravel, in low shrubland over herbs with *Acacia, Melaleuca* and *Malleostemon* species.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Junga Dam	N	National Park	22.9.1994	"Dominant"	-

Response to Disturbance

Unknown

Management Requirements

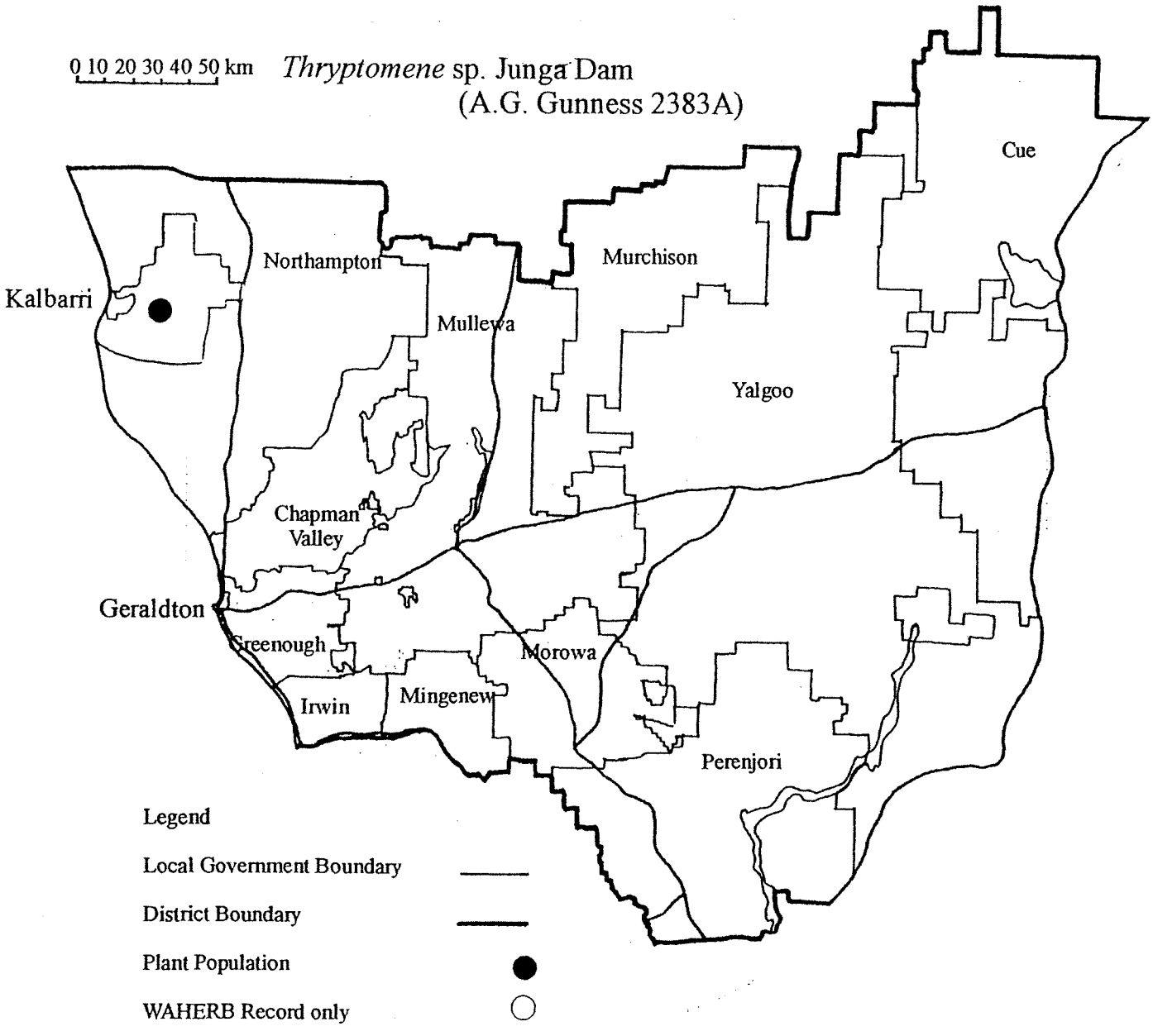
- Ensure that population 1 is known to land managers to prevent accidental damage.

Research Requirements

- Further survey is required, both to survey population 1 fully and to find further populations.

References

B. Rye & M. Trudgen (personal communication).


0 10 20 30 40 50 km
Thryptomene sp. Junga Dam
(A.G. Gunness 2383A)
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Thryptomene sp. Yuna Reserve (A.C.Burns 100) MYRTACEAE

[*Thryptomene papillosa* Rye & Trudgen ms]

An open, diffuse shrub with narrowly obovate leaves to c. 8 mm x 1.5 mm, with glandular dots. The bracteoles are obovate, mainly membranous and persistent in fruit. The flowers are in clusters, usually at the ends of the branchlets. They have pedicels c. 4 mm long. The floral tube is ridged with a rounded base and the sepals are petaloid, shorter than the petals. They are rounded, forming a rounded apex to the bud. The petals are rounded and mauve-pink in colour. There are ten stamens, the staminal filaments are pink and the ovary is pink and one-celled, with two ovules. The floral tube is papillose and pitted in mature fruit and the peduncles at fruiting are longer than the leaves.

This species is closely related to *Thryptomene hyporhytis* and *T. racemulosa* which have more deeply rugose-pitted ornamentation on the floral tube, without papillae at maturity.

Flowering Period: May-August

Distribution and Habitat in the Geraldton District

This taxon is known from one locality south-east of Yuna where it occurs on a nature reserve. It has been collected there eight times but no exact location or details of habitat have been recorded.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* SE of Yuna	CV	Nature Reserve	5.9.1969	-	-

Response to Disturbance

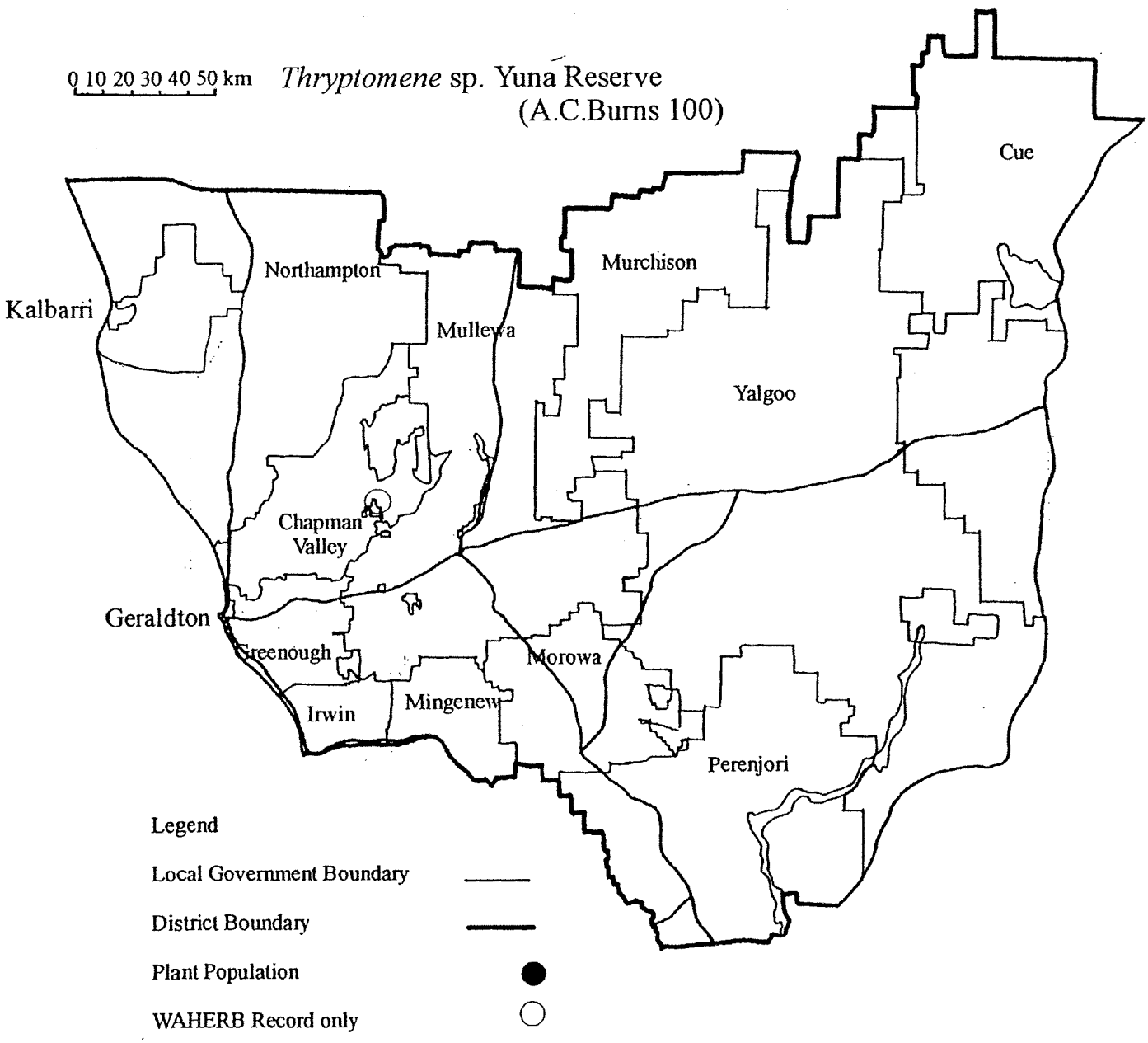
Unknown

Research Requirements

– Further survey is required to refind this taxon.

References

B. Rye & M. Trudgen (personal communication).


0 10 20 30 40 50 km
Thryptomene sp. Yuna Reserve
(A.C.Burns 100)
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Thysanotus kalbarriensis H.R.White & T.Macfarlane ms ANTHERICACEAE

An erect perennial herb 30-75 cm tall, the adult plants without leaves. The stems are terete and ridged, branching paniculately. They are covered with pointed warts and the lower parts also with pointed hairs. The stems branch into equal divisions and there are no sterile branchlets, each ends in a 1-3 flowered umbel of flowers. The bracts are 1.5-3 mm long, purple or green with purple ribs. The pedicels are articulated about the middle, 1-3 mm from the base. The perianth is 11-12 mm long. The three sepals are 2.5 mm wide, with 5-7 nerves. The three purple petals are 6-7 mm wide, with fringed margins, the fringe 4 mm long. There are six stamens, the anthers shedding the pollen from terminal pores. The anthers are straight, not twisted, and are purple above, yellow below. There are three outer anthers which are 3.5-4 mm long and three longer inner anthers 4.5-5 mm long.

This species resembles *Thysanotus spiniger* in its dichotomous branching, pointed hairs, warts and seven sepal nerves, but *T. kalbarriensis* ms differs in its distinctive colouration, the anther length and lack of sterile branchlets.

Flowering Period: September-November

Distribution and Habitat in the Geraldton District

This species has been collected five times since 1980 from the Kalbarri area but only three precise localities have been recorded.

Grows on sandplain in yellow sand and on sandy, gravelly flats in banksia shrubland. Associated species include *B. sceptrum, B. attenuata, Grevillea leucopteris, Olax benthamiana, Acacia scirpifolia, Conospermum stoechadis, Anigozanthos manglesii,* species of *Glischrocaryon* and *Verticordia.*

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. NE of Kalbarri	N	National Park	3.11.1994	10+	Healthy
2. SE of Kalbarri	N	National Park	23.10.1993	100	Undisturbed
3. NE of Kalbarri	N	National Park	28.9.1989	-	-

Response to Disturbance

Population 3 was recorded from an area with burnt banksias and other shrubs.

Management Requirements

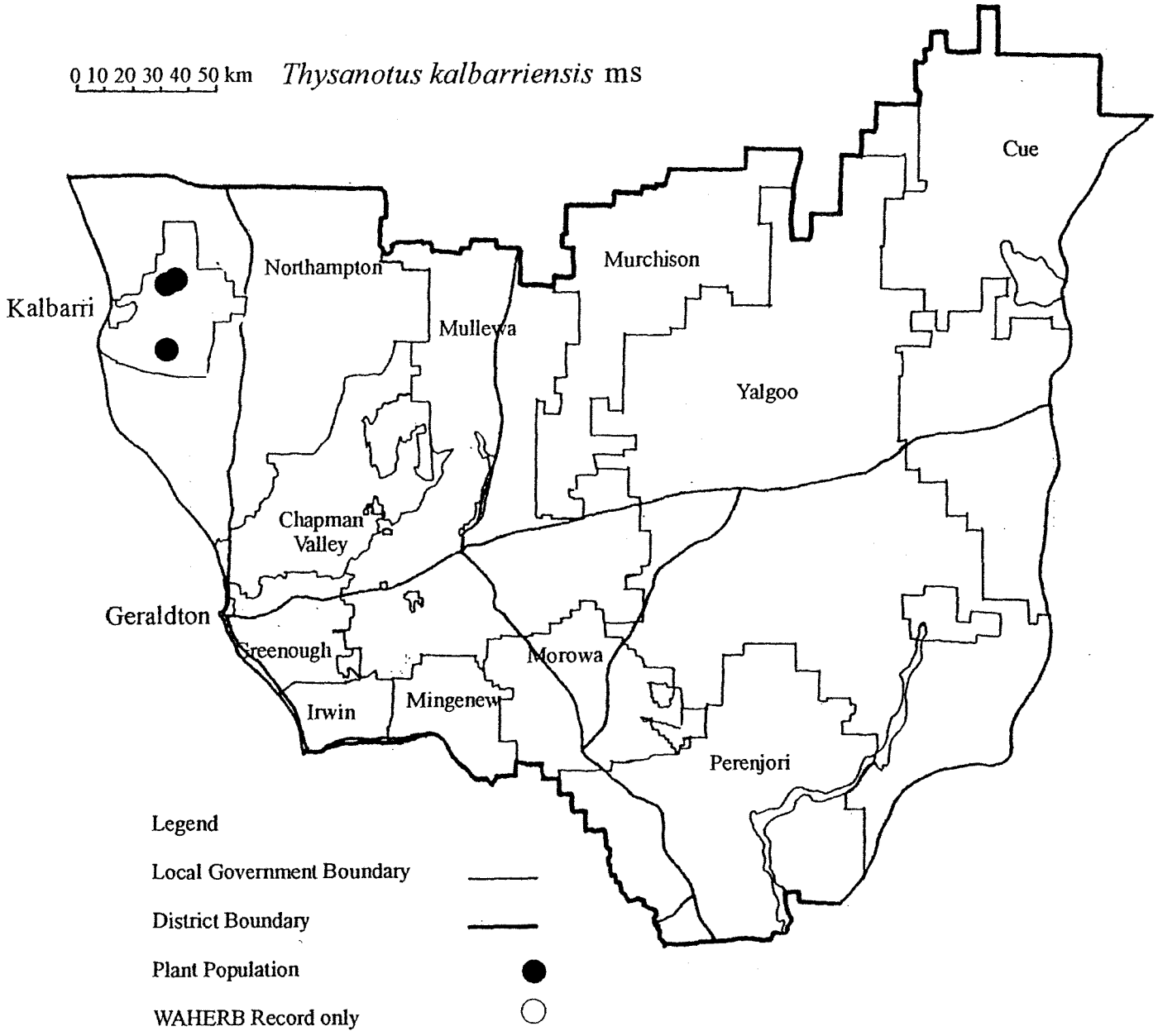
- Ensure that known populations are marked to prevent damage.

Research Requirements

- Further survey is required.

References

T. Macfarlane (personal communication).


0 10 20 30 40 50 km
Thysanotus kalbarriensis ms
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Tricoryne arenicola Keighery ms ANTHERICACEAE

A perennial multistemmed herb to 20 cm tall, 15 cm wide, with tuberous roots. The leaves are linear, to 10 cm long. The flowers are in umbels, the outer bracts lanceolate or linear. The six stamens have a tuft of clubbed hairs below the anther. The perianth is yellow in colour.

This species is closely related to *Tricoryne humilis,* which occurs from the Perth region to the south coast. *T. arenicola* ms differs in its tuberous roots and in the yellow colour of the perianth on both sides. The lower surface of the perianth of *T. humilis* is brownish in colour.

Flowering Period: August-October (also November further south)

Distribution and Habitat in the Geraldton District

This species is known from two localities in the Geraldton District, on the north-western boundary north of Kalbarri and from the Mingenew area. It also occurs south of the District, to the north-east of Eneabba, in the Wongan Hills and south-west of York.

Grows in yellow sand in *Melaleuca* shrubland near Mingenew and north of Kalbarri in yellow sand over limestone, in low scrub of *Banksia sceptrum* over low heath with *Melaleuca acerosa, Ecdeicola monostachya, Mesomelaena pseudostygia, Patersonia occidentalis* and *Conospermum* sp. In the Wongan Hills, it was found on laterite, with mallees, *Acacia, Daviesia, Casuarina* and *Grevillea* species. Near Eneabba, it was found on sand over laterite in recently burnt heathland, and near York, in open woodland on sand over laterite.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. WNW of Mingenew	Mi	Nature Reserve	26.10.1988	"Uncommon"	-
2. N of Kalbarri	N	Pastoral Lease	26.8.1994	-	-

Response to Disturbance

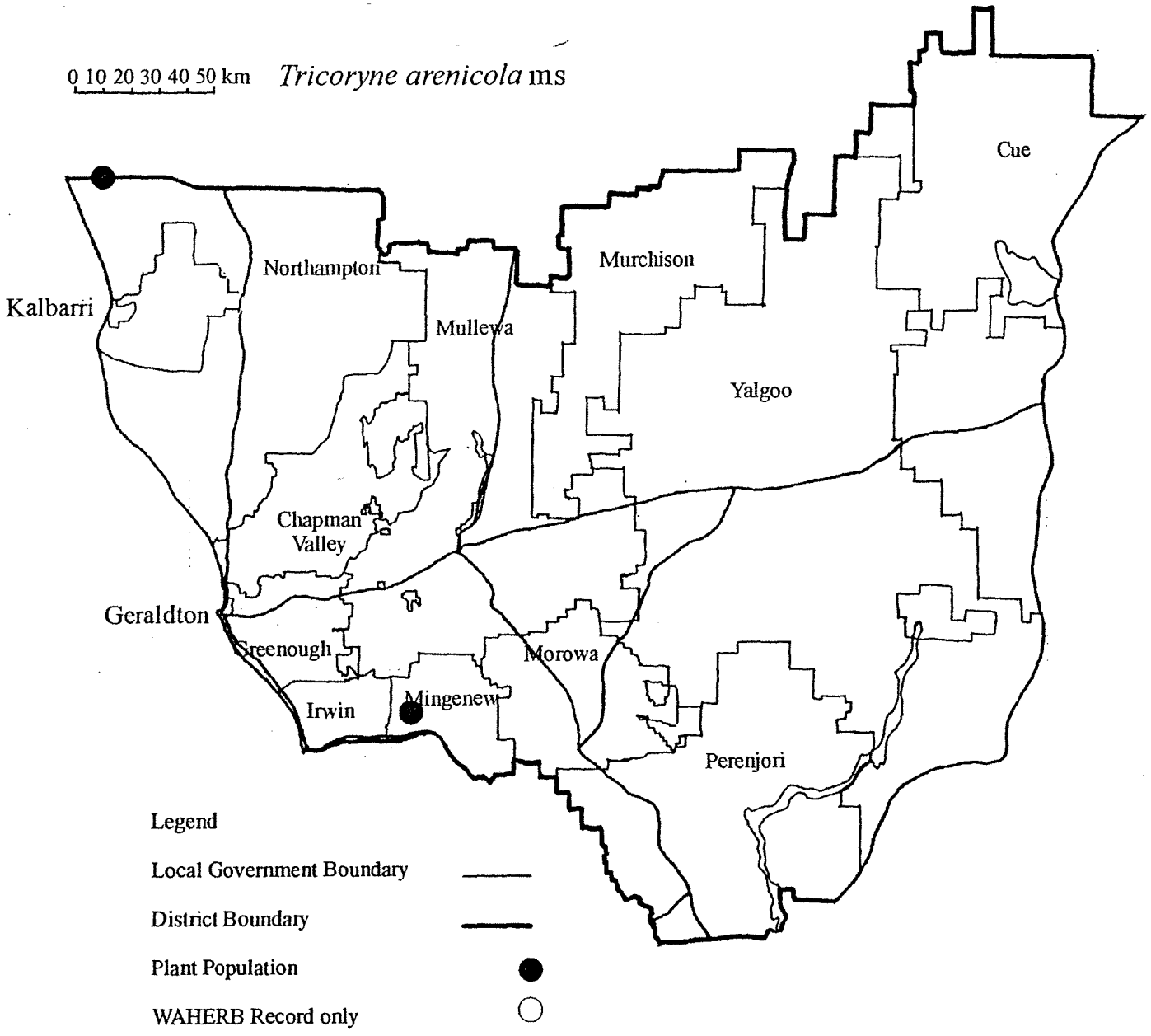
A population near Eneabba was growing in vegetation regenerating from a recent fire.

Research Requirements

- Further survey is required.

References

G. Keighery (personal communication).


0 10 20 30 40 50 km
Tricoryne arenicola ms
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Tricoryne robusta Keighery ms ANTHERICACEAE

A semi-prostrate, rhizomatous herb to 85 cm tall. The stems are robust and the lower part of the stem is densely hairy. The leaves are basal and linear, the lower part densely hairy. The flowering stems are terete and branched, with linear bracts. Each branch has a terminal umbel of flowers. These are large, with a yellow perianth of six free narrow segments c. 8 mm long which become spirally twisted when the flower withers. There are six upright stamens, the filaments c. 2.5 mm long, attached at the base of the perianth. Each has a tuft of hairs below the anther which is c. 1 mm long. The superior ovary is deeply three-lobed with three locules, breaking into three mericarps. The style is filiform, with a simple stigma.

This species differs from others in the genus in its robust habit, large flowers and woolly stem base.

Flowering Period: September-January

Distribution and Habitat in the Geraldton District

In the Geraldton District, this species has been collected once from north of Northampton. It is also known from the Moora District from near Cataby north to the Arrowsmith area.

The population in the Geraldton District was growing on yellow sand with *Banksia* and *Actinostrobus* species. Elsewhere it occurs on flat land, growing in white sand or sandy clay over clay, grey-yellow sandy gravel on flat ground or gentle slopes, sometimes on lateritic uplands or on coastal limestone, in low open heath, shrubland or banksia scrub.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* E of Binnu	N	-	26.1.1966	-	-

Response to Disturbance

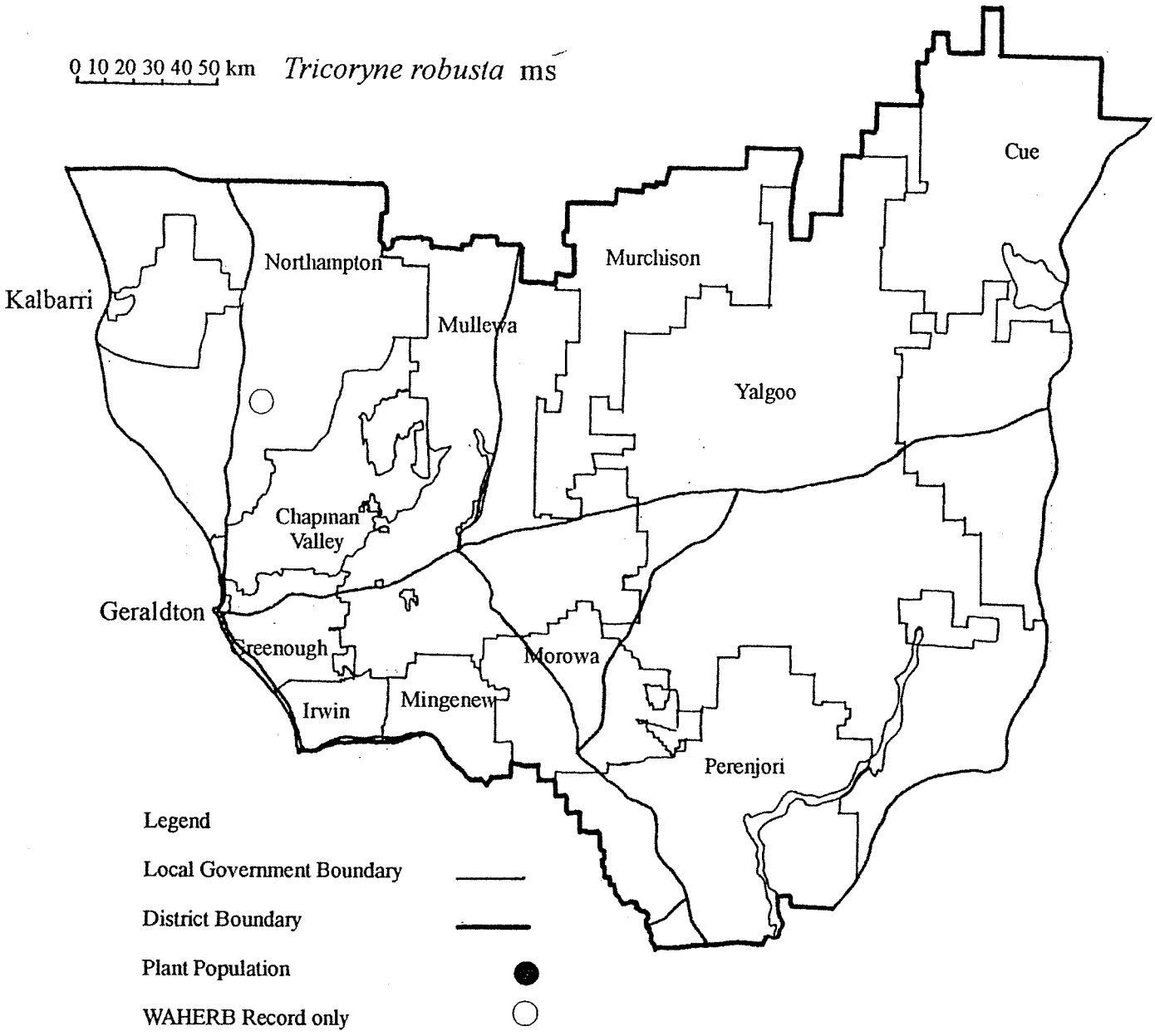
Regenerates from rootstock after fire. One population was recorded from regrowth after fire.

Research Requirements

- Further survey is required, particularly in summer.

References

G. Keighery (personal communication), Thongpukdee (1987).


0 10 20 30 40 50 km
Tricoryne robusta ms
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Verticordia aereiflora E.A.George & A.S.George MYRTACEAE

A slender shrub to 1 m, with orbicular, obtuse leaves 2-2.5 mm long. The flowers are solitary or in groups of 2-3, often several groups along one branchlet. The peduncles are 2-3 mm long. The hypanthium is broadly top-shaped, 2.5 mm long. It is five-ribbed, with thick, green, reflexed appendages 1 mm long. The sepals are 4-4.5 mm long and are greenish-yellow to yellow with a deep red or reddish-bronze fringe. The petals are yellow with red spots. They are erect and crown-like, closing around the style after flowering. They are 4.5-5 mm long, deeply fringed across the apex, with small auricles. The stamens are joined to the staminodes for half their length and are 1.8-2 mm long. The style is pink with a red apex, 6-7 mm long, S-shaped, with a beard on the outside of the curve c. 1 mm below the apex, the hairs c. 0.2 mm long.

This species is related to *Verticordia chrysostachys* and to *V. dichroma,* differing from both in the small groups of flowers and in the smaller petals. Its red and yellow colour and small leaves further distinguish it from *V. chrysostachys,* whilst its longer peduncles, shorter stamens and short hairs of the style beard differ from those of *V. dichroma.*

Flowering Period: November-December

Distribution and Habitat in the Geraldton District

Occurs to the north-east of Yuna and has been recorded in the past to the south-east of Yuna.

Grows in yellow sand on the lower slopes of sand ridges and in the swales between the ridges. Occurs in open shrubland with *Grevillea candelabroides, G. gordoniana, Hakea bucculenta, Eucalyptus, Acacia* and *Scholtzia* species.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. NE of Yuna	CV	Private	11.12.1993	c. 200	-
2.* SE of Yuna	CV	Nature Reserve	15.12.1968	-	-
3.* Near Yuna	CV	-	6.12.1959	-	-

Response to Disturbance

Unknown

Management Requirements

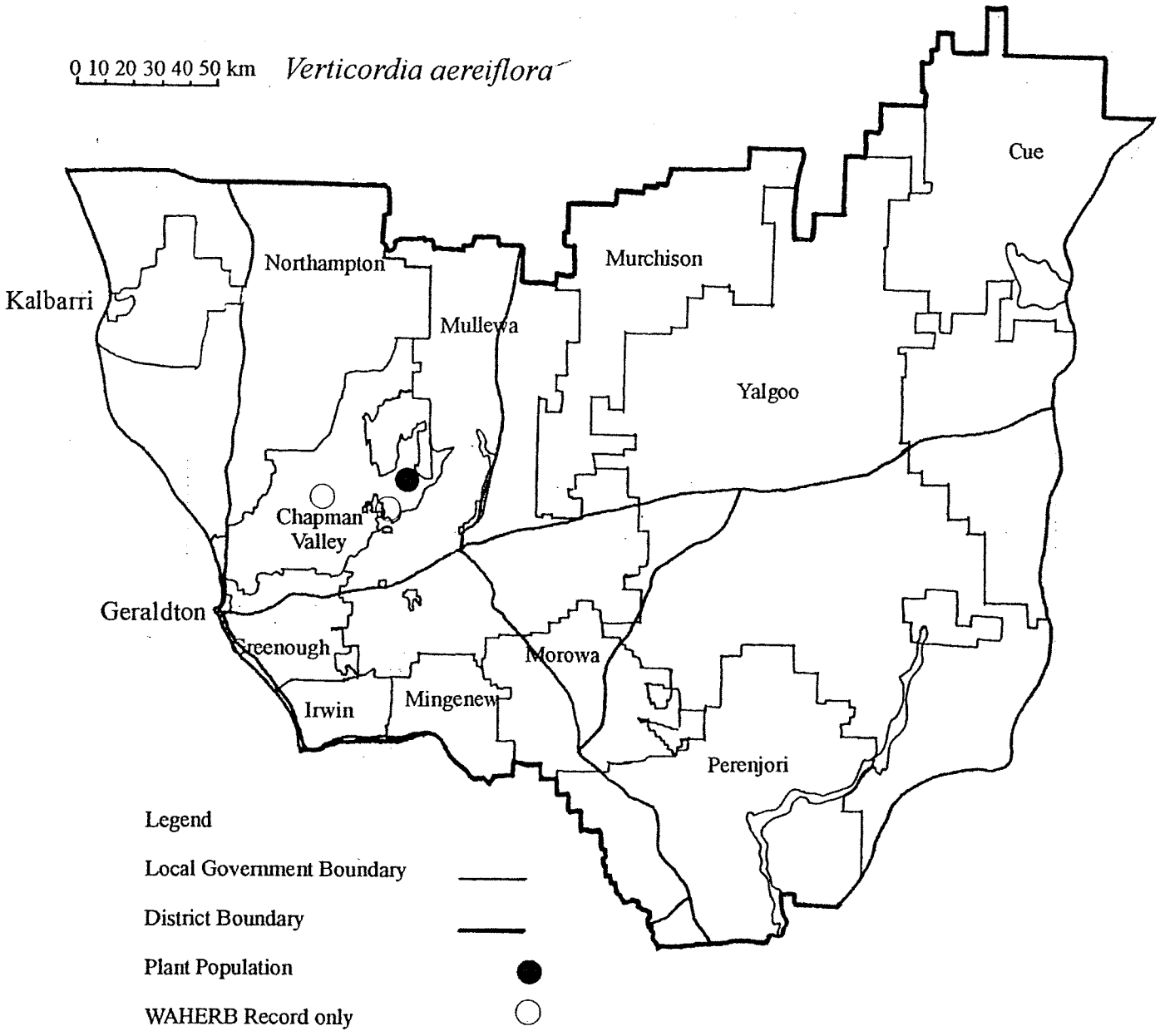
- Maintain liaison with private landowner.

Research Requirements

- Further survey is required, particularly on the nature reserve where population 2 was recorded.

References

George & George (1994).


0 10 20 30 40 50 km
Verticordia aereiflora
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Verticordia dasystylis A.S.George subsp. *kalbarriensis* A.S.George MYRTACEAE

A low shrub to 30 cm tall and 30 cm broad, with many stems but no lignotuber. The leaves are oblong to elliptic, obtuse, 1.5-4 mm long, the margins irregularly toothed. The flowers have peduncles 4-7 mm long. They are cream or pale yellow in colour, the floral crown being dense and viscid. The sepals are 5-7 lobed and deeply fringed and are 4-4.5 mm long. The petals are 3 mm long, the staminodes 2.-2.5 mm long and the style 8-9 mm long.

This species is related to *Verticordia penicillaris* from which it differs in its smaller habit, smaller flowers and shorter, more pilose style. This subspecies differs from other subspecies of *V. dasystylis* mainly in its longer staminodes, but also in the longer peduncles and petals.

Flowering Period: October-November

Distribution and Habitat in the Geraldton District

Known from three localities to the south-east of Kalbarri over a geographic range of c. 25 km.

Grows in shallow soils of winter-wet areas in red-brown sandy loam over granite, or on clay-silt in open low heath, with *Calytrix depressa, Borya nitida, Verticordia polytricha, Acacia acuminata* and ephemeral species.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SE of Kalbarri	N	Camping Reserve	10.8.1994	20	Healthy
2. SSE of Kalbarri	N	National Park	2.11.1991	1 200+	Undisturbed
3. W of Binnu	N	Private	24.10.1994	c. 100	-

Response to Disturbance

Unknown

Management Requirements

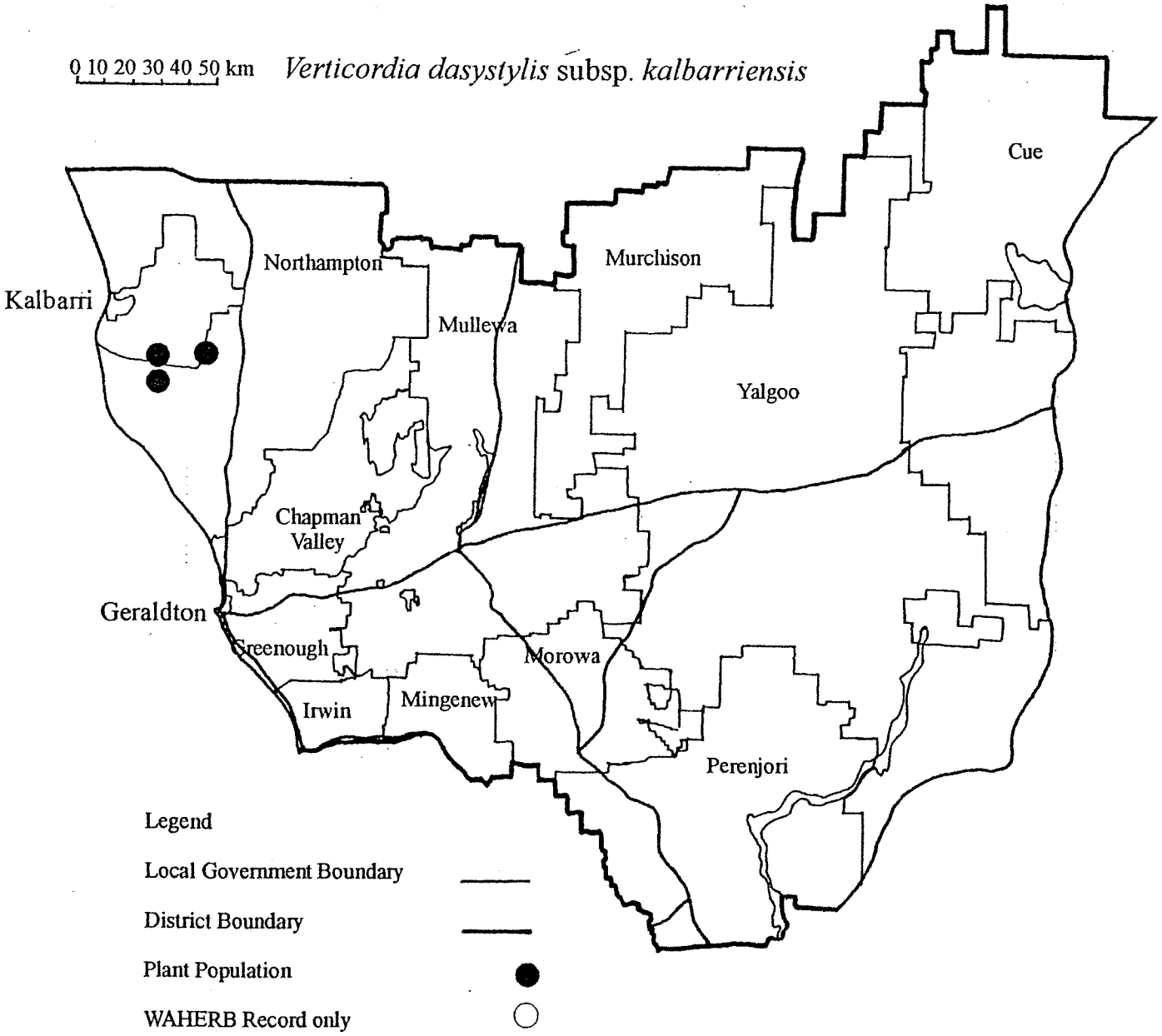
- Maintain liaison with land managers.

Research Requirements

- Further survey is required.

References

George (1991).


0 10 20 30 40 50 km
Verticordia dasystylis subsp. kalbarriensis
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Verticordia galeata A.S.George MYRTACEAE

An erect, rounded shrub to 1 m tall, with linear leaves. The flowers are in corymb-like groups and are bright yellow in colour, turning orange in the centre with age. The peduncles are 12-20 mm long. The sepals are divided into c. 7 fringed lobes and the petals are divided into unfringed lobes. The large hooded and inflated anther appendage is 0.5-0.8 mm long.

This species is closely related to *Verticordia chrysantha,* from which it is distinguished by the large inflated appendage of the anther. It also differs in its long slender peduncles, longer leaves and acute unlobed staminodes.

Flowering Period: October

Distribution and Habitat in the Geraldton District

Known only from one locality on the Murchison River in the Kalbarri National Park.

Grows in red sand over sandstone on slopes of the Murchison River Gorge in open shrubland. Associated vegetation includes species of *Acacia, Ptilotus, Calandrinia, Darwinia* and *Verticordia.*

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. NE of Kalbarri	N	National Park	9.10.1994	-	-

Response to Disturbance

Unknown

Management Requirements

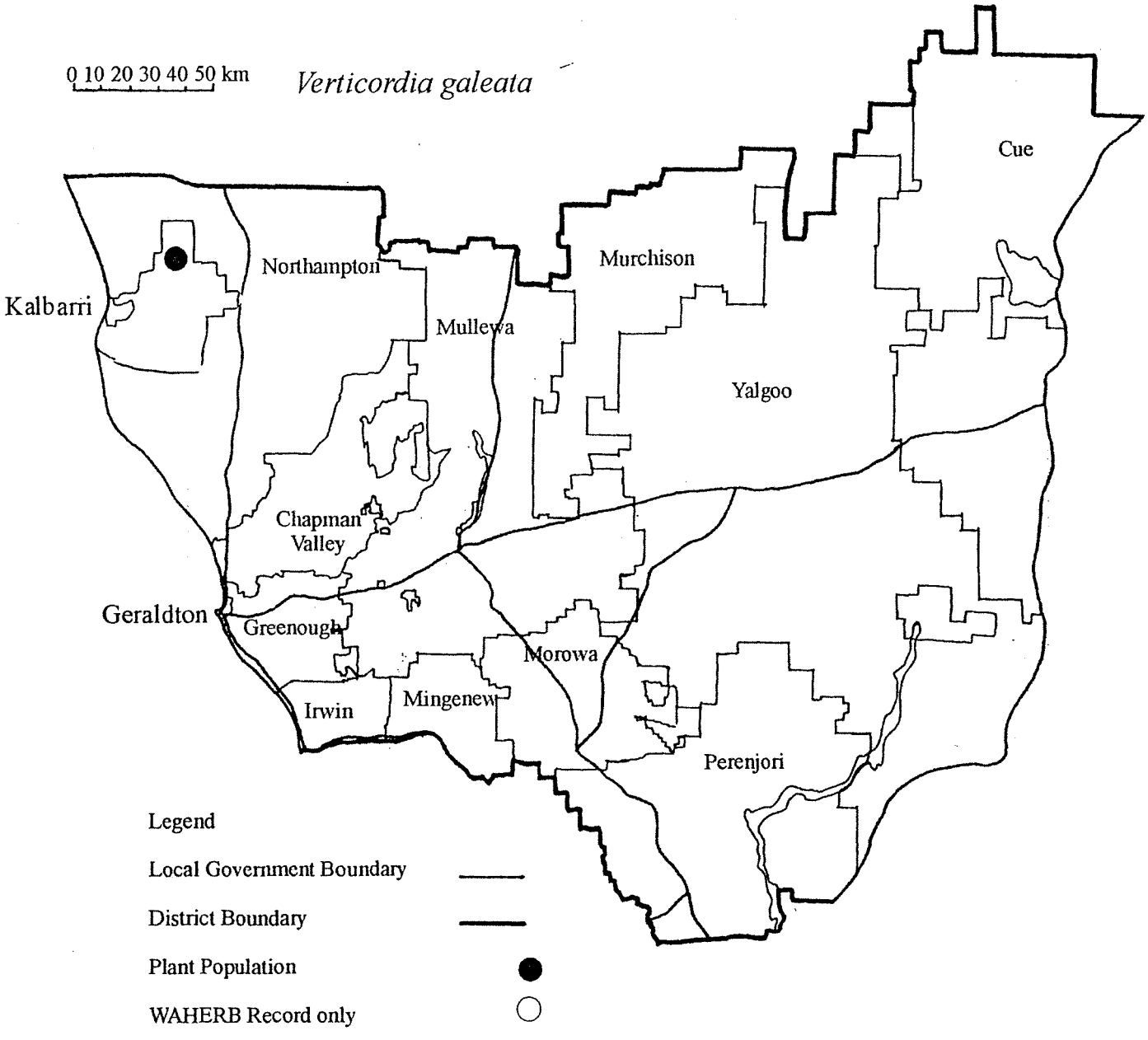
- Ensure that land managers are aware of the population.

Research Requirements

- Further survey is required.

References

George (1991).


0 10 20 30 40 50 km
Verticordia galeata
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Verticordia jamiesonii F.Muell. MYRTACEAE

Verticordia jamiesonii was named in honour of Dr James Jamieson, a lecturer on Obstetric Medicine at Melbourne University.

An open, dwarf shrub to 60 cm tall, this species has very short, oblong, semiterete leaves with rather translucent irregular margins, closely crowded on the young branchlets. The flowers are in small subterminal groups. The hypanthium is broadly top-shaped, 10-ribbed, without appendages. The sepals are divided into 7-11 fringed lobes and the petals are white or pale pink and have irregularly toothed or shortly fringed margins. The stamens and staminodes are united, the anthers with prominent slits. The style is straight, thick and hairy towards the base.

This species is distinguished by the top-shaped hypanthium without appendages, the hairy stamens and staminodes and the thick hairy base of the style.

Flowering Period: September-October

Distribution and Habitat in the Geraldton District

This species has been recorded from north of the Geraldton District at Mt Hale, which is north-west of Meekatharra, and within the District from the northern boundary north-west of Cue and further south in an area north of Pindar and Yalgoo.

Grows in pockets of whitish sandy clay on the flat surface of breakaways of laterite, sandstone or on granite. Occurs in open low shrubland. Associated vegetation includes species of *Micromyrtus, Eriostemon, Calytrix, Boronia, Eriostemon, Acacia, Petrophile* and *Grevillea.*

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SE of Kalli	C	Pastoral Lease	3.8.1995	100+	Healthy
2. N of Pindar	Mu	Pastoral Lease	4.8.1995	5+	Healthy
3. N of Yalgoo	Y	Pastoral Lease	29.9.1990	"Scattered in small populations"	-
4. N of Yalgoo	Y	Pastoral Lease	17.9.1987	"Frequent"	-

Response to Disturbance

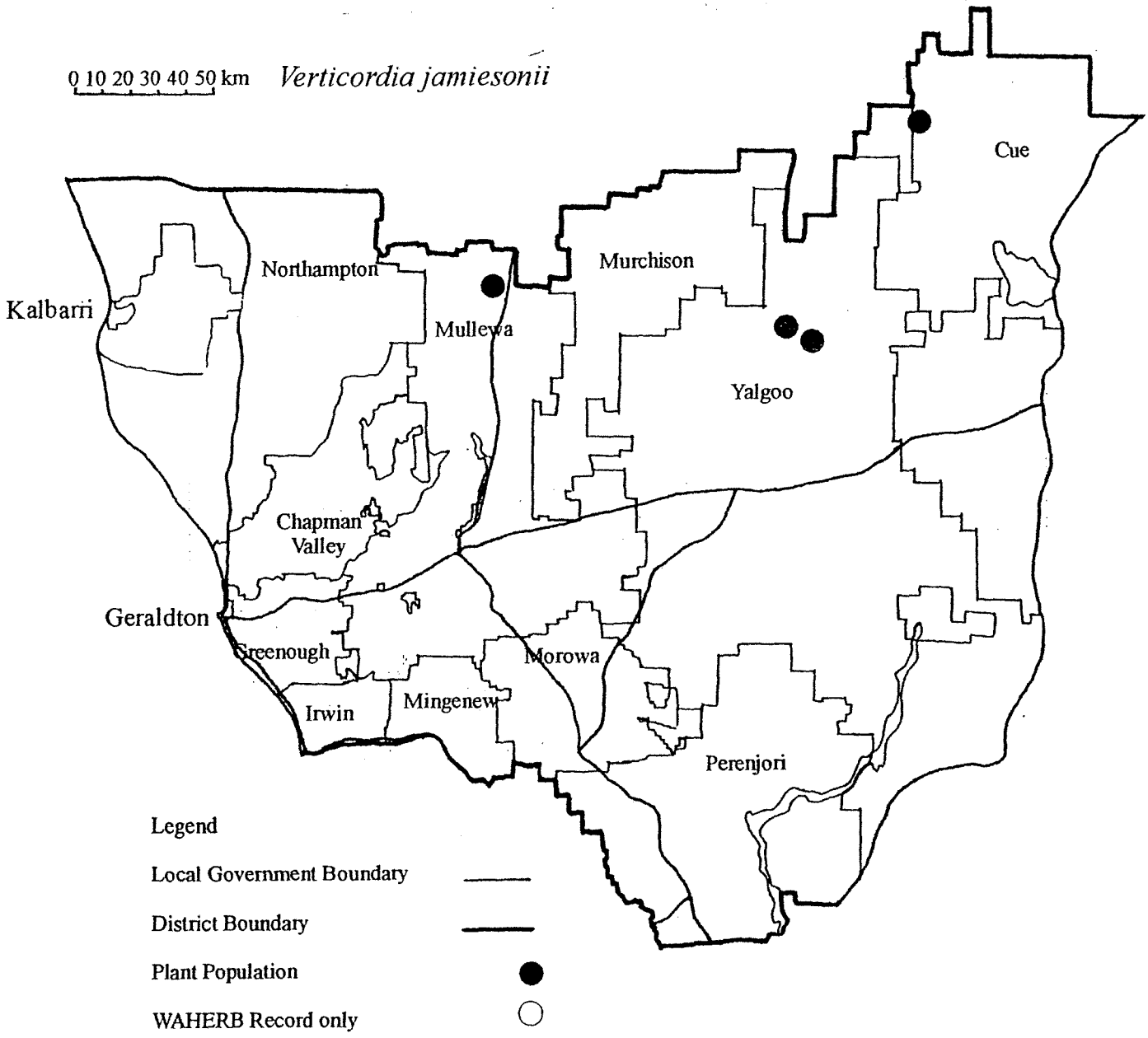
Unknown

Research Requirements

- Further survey is required in the area north of Yalgoo.

References

George (1991), Mueller (1883).


0 10 20 30 40 50 km
Verticordia jamiesonii
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Verticordia muelleriana E.Pritz. subsp. *minor* A.S.George MYRTACEAE

A shrub to 2 m tall and 1 m wide, with large rounded leaves which have a narrow white margin, to 5 mm long, 8 mm wide. The flowers are dark pink to pinkish-maroon in colour and are grouped in spikes. The hypanthium is top-shaped and five-ribbed and has rounded, fringed accessory lobes reflexed against the tube. The sepals are 3.5 mm long, divided into c. nine fringed lobes. The petals are 4 mm long, including the fringe which is 0.5 mm long, and there are auricles at the base. The staminodes are very glandular and are as long as the stamens, joined at the base. The style has a curved apex and a beard of long crowded hairs to 0.6 mm long.

Differs from the typical subspecies in the smaller flowers and shorter, less crowded hairs on the style.

Flowering Period: November-December

Distribution and Habitat in the Geraldton District

Occurs in the Wicherina area, east-north-east of Geraldton.

Grows in grey, white or yellow sand over hard gravelly sand and clay. No other details of habitat have been recorded.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Wicherina	G	-	21.11.1987	-	-
2. S of Wicherina	G	-	10.12.1988	4+	-

Response to Disturbance

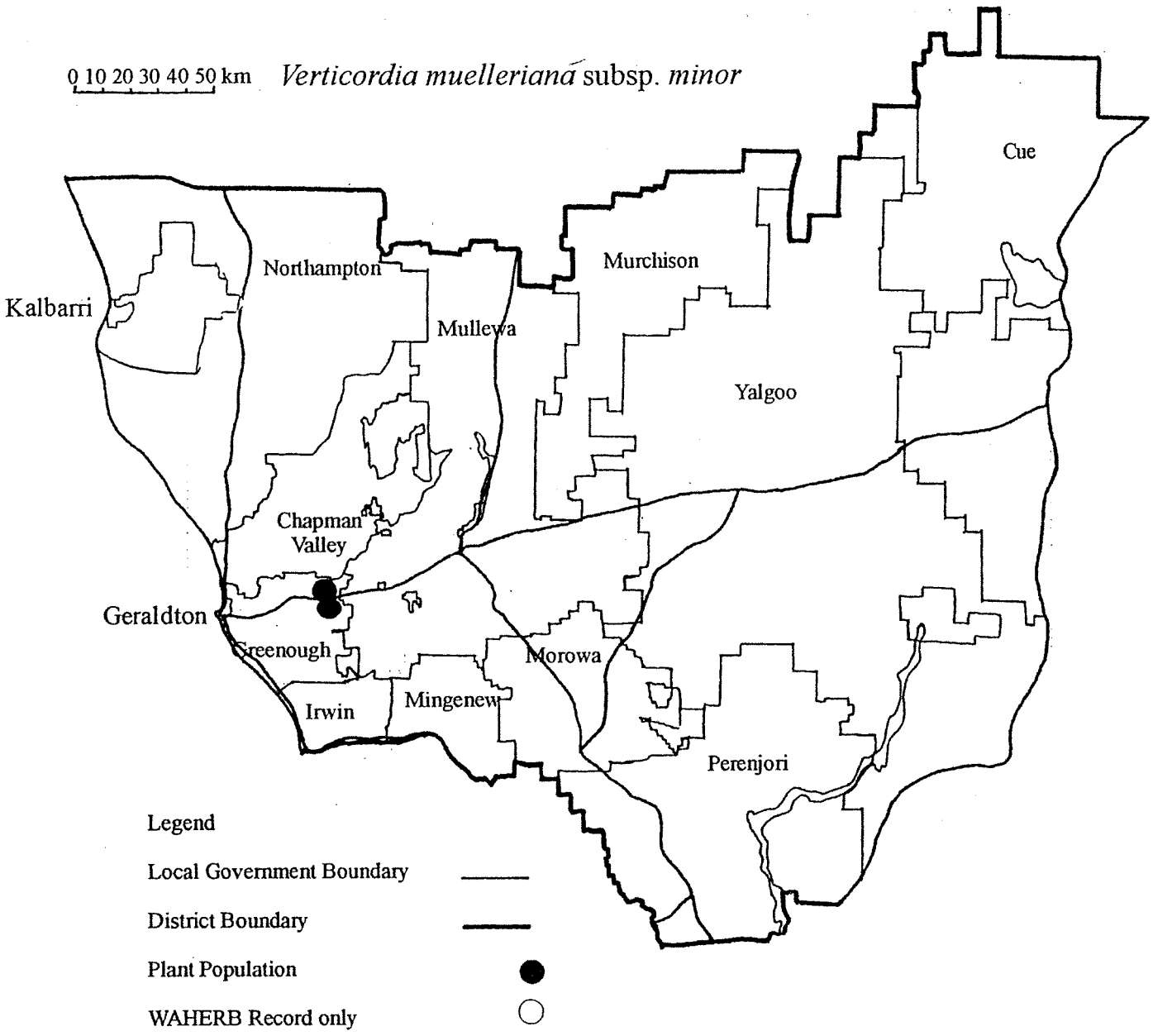
Unknown

Research Requirements

- Further survey is required.

References

Diels & Pritzel (1904-5), George (1991).


0 10 20 30 40 50 km
Verticordia muelleriana subsp. minor
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Xanthoparmelia norpraegnans Elix & Johnston PARMELIACEAE

The thallus of this lichen is crust-like, firmly attached to the substrate, 1-3 cm wide, with small, leaf-like, irregularly branched lobes 0.5-1 mm wide. It is divided in the centre into a number of sections (areolae) by a network of open cracks. The upper surface is yellow-green, darkening with age. The propagules (isidia) are in the thallus centre and are globose, becoming shortly cylindrical, the apices bursting open. The inner layer of the thallus is white and the lower surface, pale tan to light brown.

This species is distinguished by the thallus which is attached to the substrate, the lower surface pale tan to light brown in colour, and the globose propagules which burst open at the apex. It resembles *Xanthoparmelia praegnans,* which is usually larger.

Flowering Period:

Distribution and Habitat in the Geraldton District

Has been recorded once in the Geraldton District along the Murchison River Gorge, growing on exposed sandstone. It has also been found west of Coolgardie on laterite pebbles in open scrubland with dominant *Acacia* and *Eucalyptus* species.

Conservation Status

Current: Priority 2

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. ENE of Kalbarri	N	National Park	-	-	-

Response to Disturbance

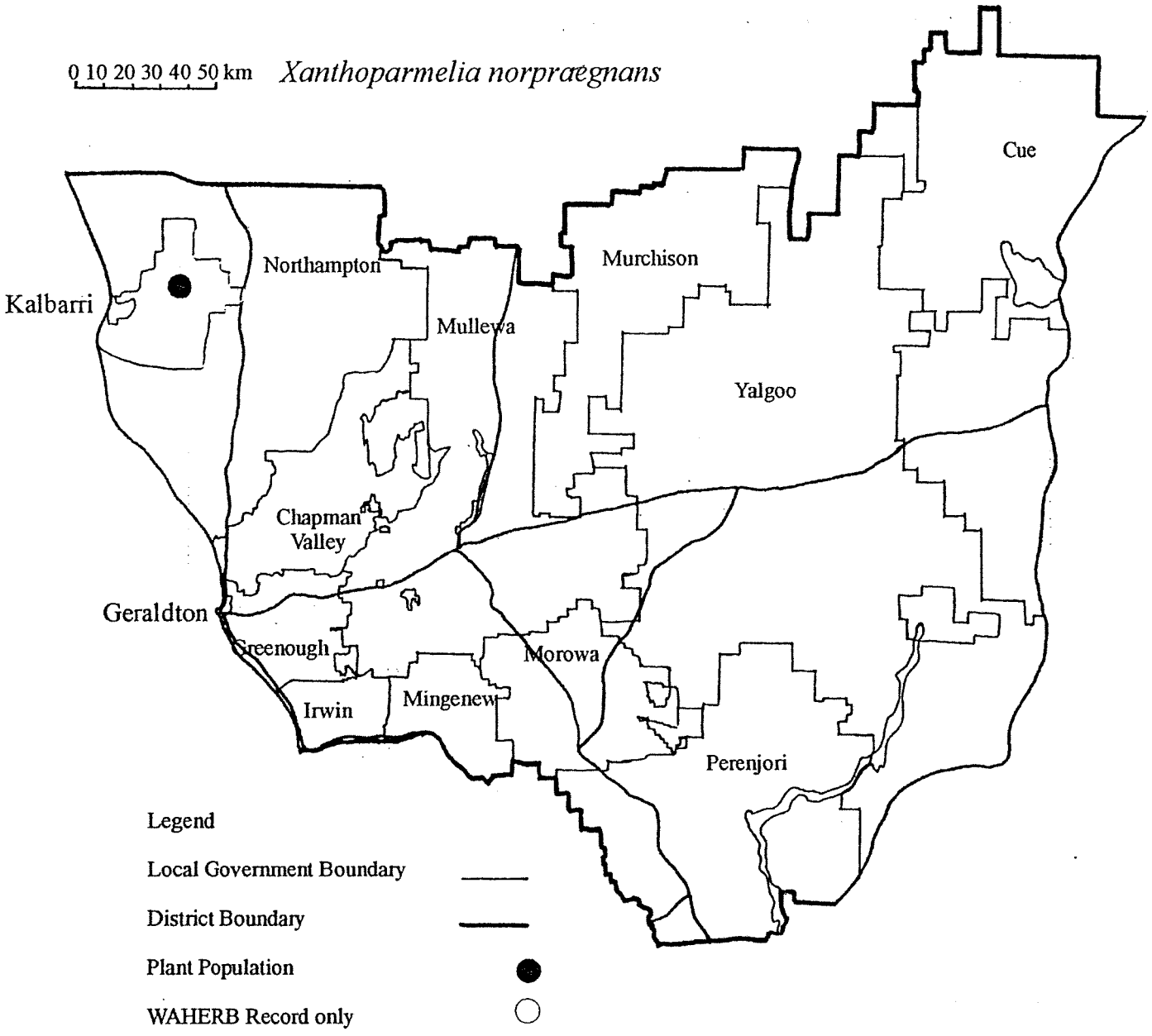
Unknown

Research Requirements

- Further survey is required.

References

Elix (1994, 1988).


0 10 20 30 40 50 km
Xanthoparmelia norpraegnans
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

C. Priority Three Taxa

Acacia acanthoclada F.Muell subsp. *glaucescens* Maslin MIMOSACEAE

Harrow Wattle

An erect shrub 0.3-1.7 m tall with glabrous branchlets, ending in hard, rigid, spinose points. The branches divide from near the base, dividing again to form a funnel-shaped shrub. The phyllodes are glaucous to sub-glaucous, the principle nerve near the lower margin and the minor nerves few and obscure. They are 3-8 mm long, 2-4 mm wide, flat, cuneate to obtriangular in shape or more or less linear. They are held fairly erect. The inflorescences are simple, on peduncles 5-15 mm long, the flower heads globular and golden in colour with 15-30 flowers. The flowers have their parts in fives, with united sepals. The pods are tightly and irregularly coiled, 10-20 mm long, 2-3 mm wide, with seeds 3-5-4 mm long.

Acacia acanthoclada subsp. *glaucescens* differs from the typical subspecies in its glaucous phyllodes and glabrous branchlets. The phyllodes may be broader and the seeds are longer and are dark, not pale brown in colour. It also resembles *A. sphenophylla,* which has green phyllodes with two or three clearly defined veins.

Flowering Period: June-September

Distribution and Habitat in the Geraldton District

Occurs in the Geraldton District between Morowa and Paynes Find, extending west into the Moora District to the south-west of Perenjori. Also occurs in the Mt Jackson to Mt Correll area in the Merredin District.

Grows in brown loam and lateritic gravel on the slopes of rocky hills in open low woodland of *Eucalyptus loxophleba* and tall shrubland. Associated species include *Acacia acuminata, A.. tetragonophylla, Allocasuarina dielsiana* and *Brachychiton gregorii.* It also grows on red clay flats in the Mt Gibson area.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. S of Ninghan	Y	MRWA Road Verge, Pastoral Lease	24.6.1995	50+	Healthy
2. E of Morowa	Mo	Shire Road Verge	20.6.1995	20	Healthy
3. NE of Koolanooka Hills	Mo	Shire Road Verge	20.6.1995	20+	Healthy
4. Koolanooka Hills	Mu	Shire Road Verge, Private	20.6.1995	13	Healthy
5. Koolanooka Hills	Mu	Shire Road Verge, Private	20.6.1995	550+	Healthy
6. E of Koolanooka Hills	Mu	Shire Road Verge	20.6.1995	10+	Moderate
7. E of Perenjori	P	-	11.1986	-	-
8. E of Jasper Hill	P	VCL	22.11.1992	-	-
9. *Mt Gibson Station	Y	-	29.8.1976	-	-
10. E of Rothsay	P	-	1.10.1990	-	-
11.*E of Wubin	P	-	15.8.1973	-	-
12. SE of Morowa	Mo	Water Reserve	24.8.1993	"Occasional"	-

Response to Disturbance

Unknown

Management Requirements

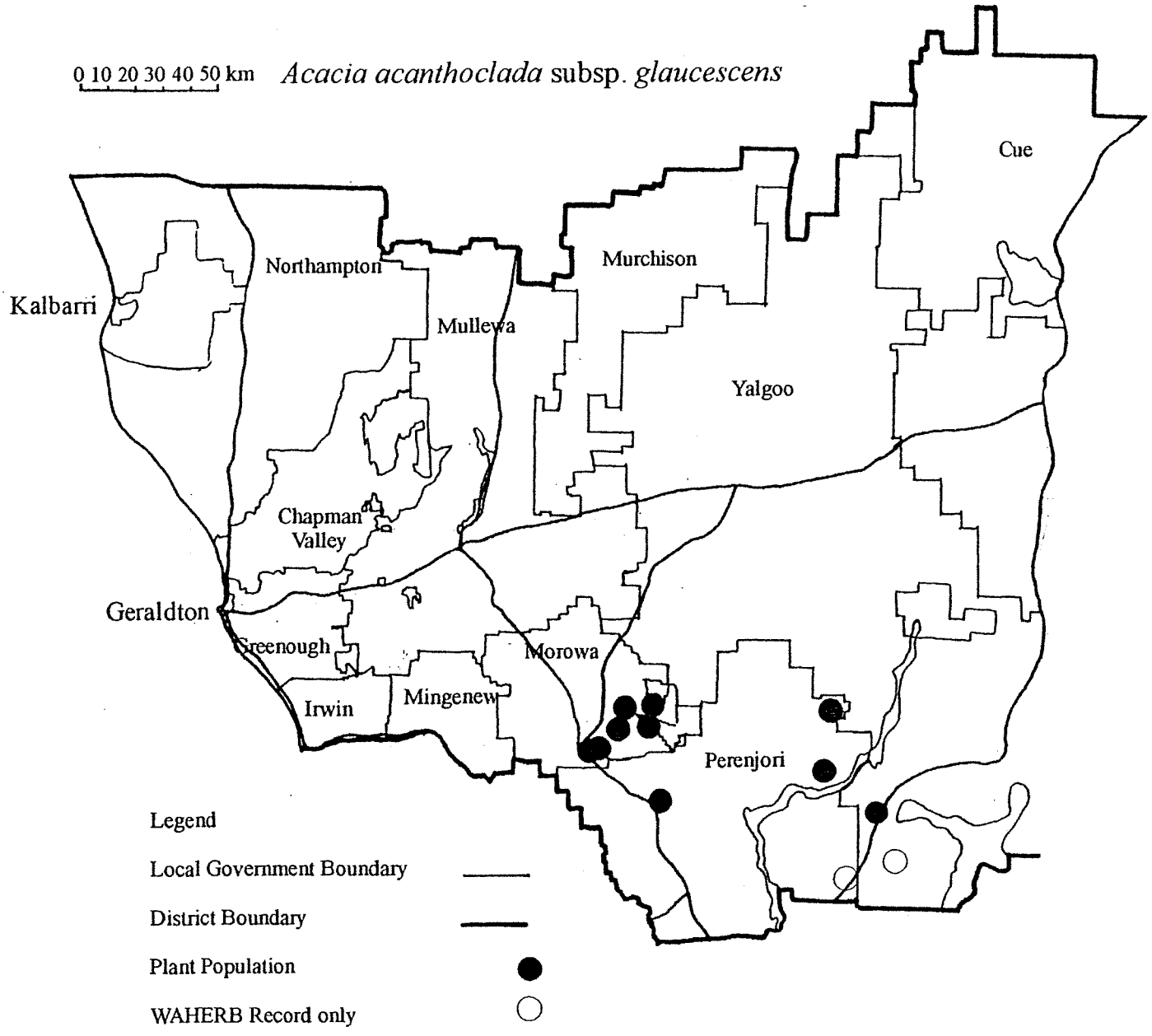
- Ensure that road verge populations are marked.
- Maintain liaison with land managers.

Research Requirements

- Further survey is required.

References

Grieve (1998), Maslin (1999).



Acacia didyma A.R.Chapman & Maslin MIMOSACEAE

A dense, rounded shrub or small tree 1.5-4 m tall, to 4 m wide, with grey bark, fissured on older trunks. The phyllodes are orbicular to broadly elliptic in shape. They have two nerves on each face, the second nerve not extending the entire length of the phyllode. They are twice as broad as long, 2-5 cm long, 1.5-4 cm wide. The inflorescence is a raceme 2-4 cm long, with 4-12 flower heads, the peduncles 5-10 mm long in pairs along the raceme axis. The flower heads are globular, golden, to 10 mm in diameter when fresh, with c. 20 flowers which have parts in fives. The legumes are strongly curved to once-coiled, glabrous, to 10 cm long, 12-15 mm wide.

Flowering Period: May, August-October

Distribution and Habitat in the Geraldton District

Occurs on East Wallabi Island in the Houtman Abrolhos Group and 200 km further to the north-east on Dirk Hartog Island. It also occurs on the mainland in the Shark Bay area.

Grows on consolidated dunes over limestone on East Wallabi Island and on limestone ridges and sandhills elsewhere, in light brown sand or grey-brown loam in tall *Acacia* shrubland or in low heath.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. East Wallabi Island	-	-	-	-	-

Response to Disturbance

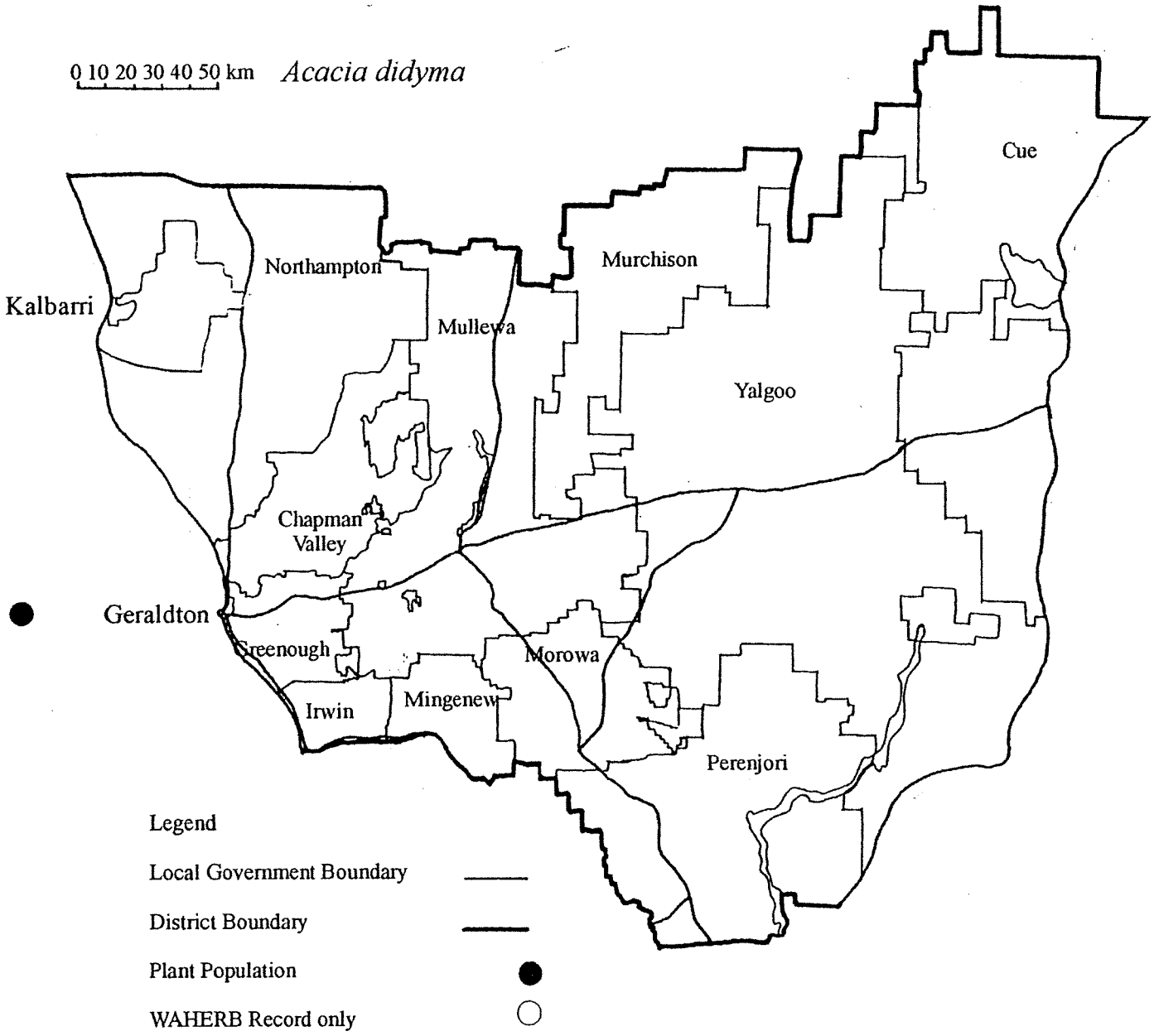
Unknown

Research Requirements

– Further survey is required.

References

Chapman & Maslin (1992).


0 10 20 30 40 50 km
Acacia didyma
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Acacia drummondii Lindl. subsp. *affinis* (Maslin) Maslin MIMOSACEAE

Drummond's Wattle

A shrub 0.3-1 m tall, with bipinnate leaves, with two pairs of pinnae 5-15 mm long. There are 2-6 pairs of pinnules which are 3-10 mm long, 1-1.5 mm wide, sparsely to densely hairy, the margins prominently recurved or rolled back. They are dark green above, subglaucous below and obscurely one-nerved below. The flowering spikes are 10-40 mm long on peduncles 10-30 mm long. The flowers are golden in colour. The pods are 15-50 mm long, 3.5-8 mm wide.

Acacia drummondii subspecies *affinis* differs from the typical subspecies in the pinnules which are longer, hairy, with revolute margins and with upper and lower surfaces differing in colour.

Flowering Period: July-September

Distribution and Habitat in the Geraldton District

This subspecies has been recorded once in the Geraldton District but it is possible that the locality is incorrect. This subspecies otherwise occurs much further south in the Bindoon-Chittering area.

No details of habitat were recorded for the collection made east of Geraldton, but in the main area of occurrence, it grows in white sand or loam over laterite in jarrah or wandoo woodland.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* E of Geraldton	Mu	-	16.8.1959	-	-

Response to Disturbance

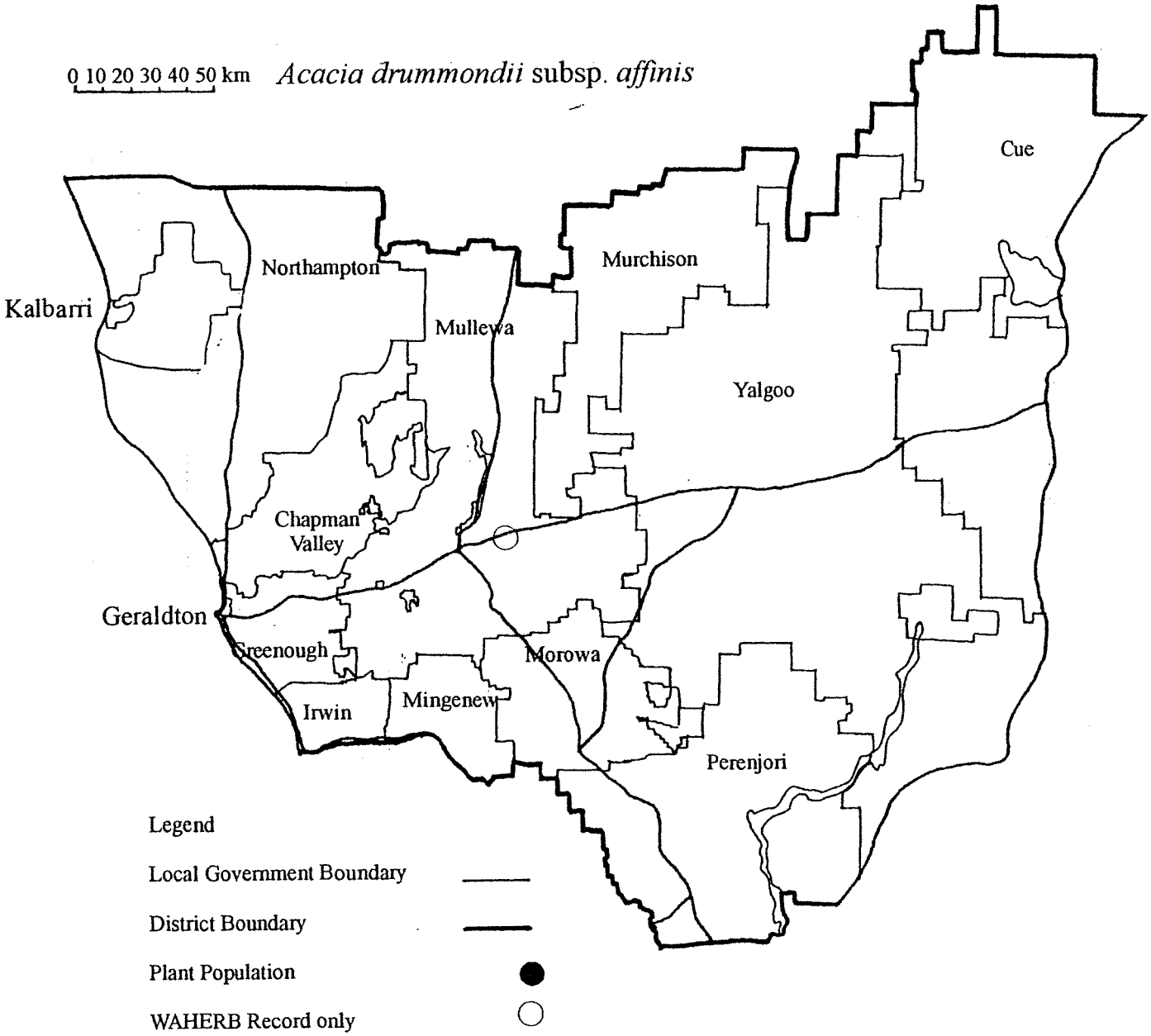
Unknown

Research Requirements

- Further survey is required to determine whether this taxon does occur in the Geraldton District or whether it has been incorrectly recorded there.

References

Grieve (1998), Maslin (1979).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Acacia drummondii subsp. affinis
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Acacia formidabilis R.S.Cowan & Maslin MIMOSACEAE

An open, low shrub to 0.6m high, with hairy branchlets. The phyllodes have a pulvinus and spinose stipules and are glabrous and flattened, with several longitudinal nerves very close together on each face. They are spreading, sword-shaped or curving back, with a sharp pungent point. They are 13-25 mm long and 2.5-4 mm wide. There are two peduncles in each axil, bearing globular flower heads pale to deep golden in colour, 30-50 flowered, the flowers with parts in fives. The pods are straight, papery, 18 mm long and 9-12 mm broad.

The phyllodes of *Acacia formidabilis* resemble those of *A. resinistipulea*, which is a taller plant with non-spiny stipules, shorter peduncles and fewer flowered heads.

Flowering Period: July-September

Distribution and Habitat in the Geraldton District

Has been found recently at one locality near Paynes Find and has been recorded in the past from the Whitewells and Wanarra area c. 80 km further to the south-west. It has also been recorded from several localities north of Southern Cross in the Merredin District.

Near Paynes Find, this species grows in reddish-yellow sand amongst spinifex and open low shrubland on a low ridge with *Allocasuarina campestris*, *Grevillea eriostachya*, *Darwinia*, *Calothamnus*, *Scaevola*, *Pultenaea* and *Keraudrenia* species. In the Merredin District, it has been found on yellow siliceous sand in tall shrubland with *Banksia elderiana* or in eucalypt woodland.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. W of Paynes Find	Y	MRWA Road Verge, Crown Reserve	16.7.1996	40+	Healthy
2.* Whitewells	P	-	10.8.1960	-	-
3.* Wanarra	P	-	10.8.1960	-	-

Response to Disturbance

The main part of population 1 was on an area of shrubland which appeared to have been burnt several years previously. Other plants were on road edges.

Management Requirements

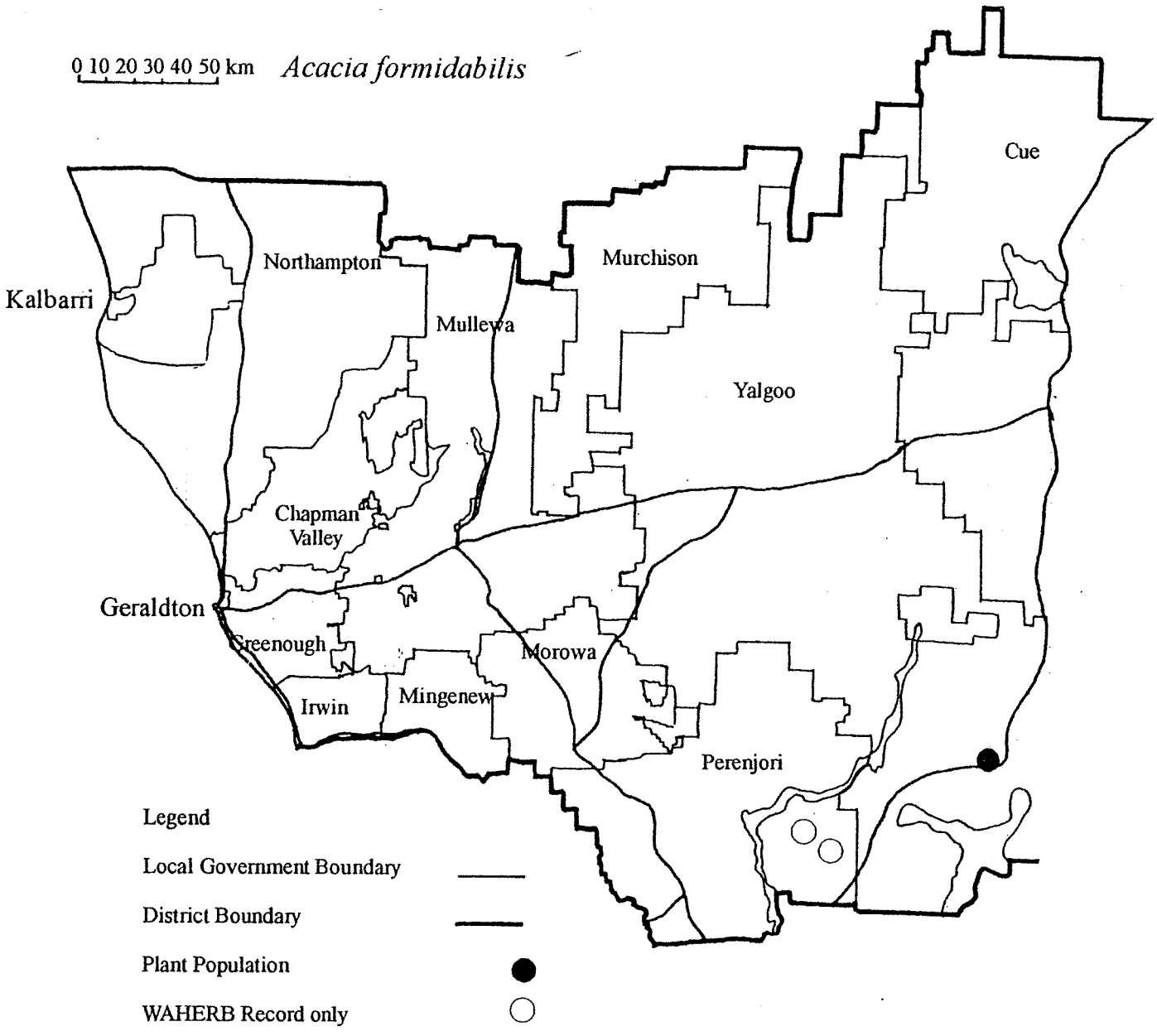
- Ensure that road verge population is marked.

Research Requirements

- Further survey is required.

References

Cowan & Maslin (1999b), Grieve (1998).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Acacia formidabilis
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Acacia isoneura A.R.Chapman & Maslin subsp. *isoneura* MIMOSACEAE

An erect, multistemmed shrub to 0.5-2 m tall, with smooth dark grey bark, fibrous at the base and with erect, red-brown branchlets. The phyllodes are erect and terete, 8-14 cm long and 0.5-0.6 mm wide. They are eight-nerved, the nerves 0.2 mm wide. They are soft, flexible and slender. There is a single gland 2-3 mm above the pulvinus. The inflorescence is cylindrical, golden, 10-15 mm long. There is usually a pair of flower spikes in each leaf axil. The flowers have their parts in fours. The legumes are straight or slightly curved, 3-6 cm long, 2-2.5 mm wide, constricted between the seeds. The seeds are shiny, grey-brown with dark speckles or light brown with yellow mottling and a white aril. They are ellipsoid in shape.

Differs from subspecies *nimia* in the slender, soft and flexible phyllodes, with nerves 0.2 mm wide, and in the flowers spikes paired in the axils of the phyllodes. Closely related to *Acacia hopperiana* which has ten-nerved phyllodes and discoid seeds.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

Occurs in the Mingenew area of the Geraldton District and the Three Springs area of the Moora District, further to the north-west than subspecies *nimia.*

Grows on yellow, white or brown sand on slopes and tops of low rises in mixed shrubland. Associated species include *A. acuminata, Allocasuarina campestris* and *Lechenaultia linearioides.*

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* W of Mingenew	Mi	MRWA Road Reserve	5.8.1994	5	Moderate, narrow, weed infested road verge
2.* W of Mingenew	Mi	MRWA Road Verge	5.8.1994	20+	Moderate, narrow, degraded road verge
3.* Mingenew	Mi	Nature Reserve	20.6.1996	100+	Healthy
4.* W of Mingenew	I	-	31.8.1973	-	-
5.* Mingenew	Mi	-	28.8.1970	-	-

Response to Disturbance

Unknown

Management Requirements

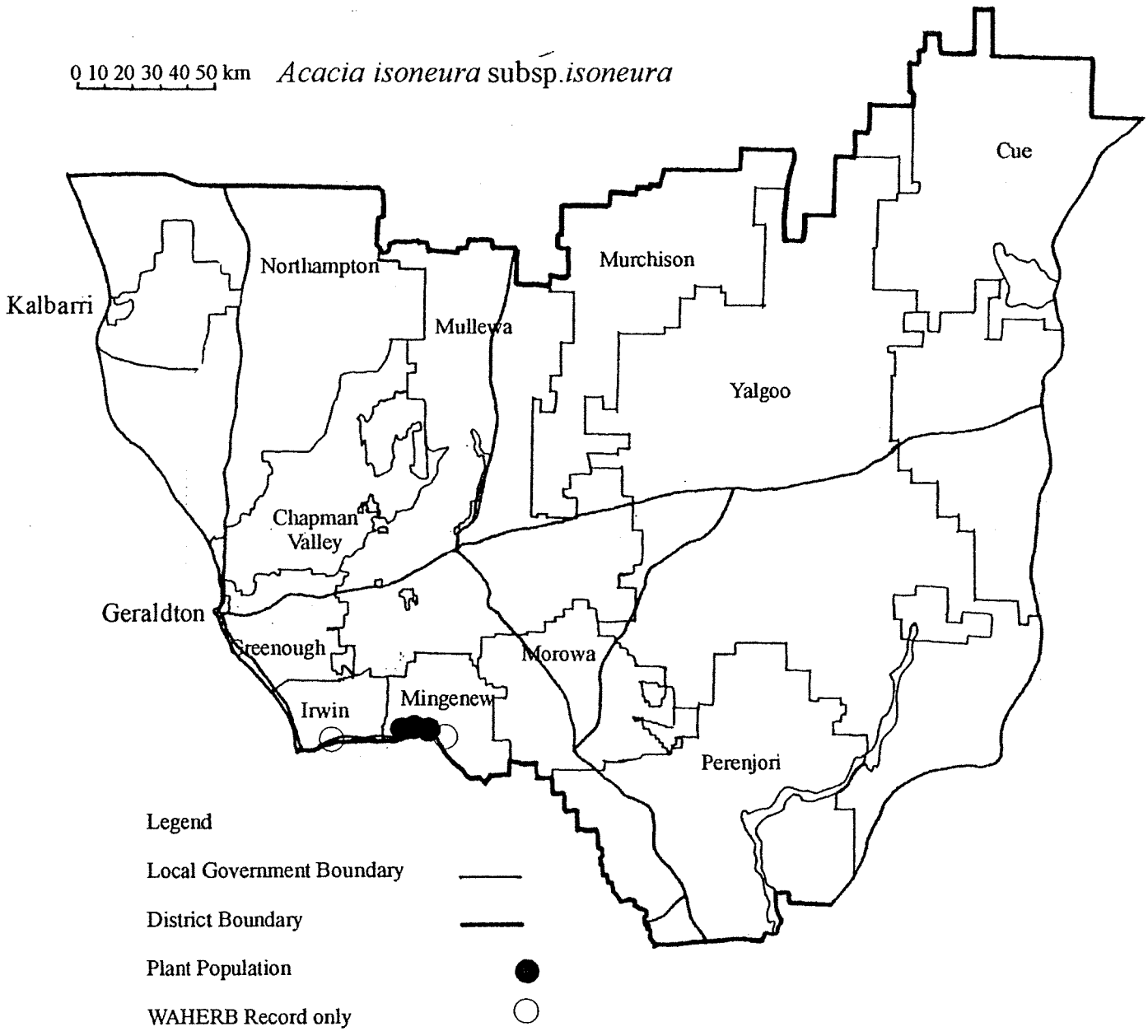
- Ensure that road verge populations are marked.

Research Requirements

- Further survey is required, particularly on conservation reserves.

References

Grieve (1998), Maslin & Chapman (1999).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Acacia isoneura subsp.isoneura
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Acacia isoneura A.R.Chapman & Maslin subsp. *nimia* A.R.Chapman & Maslin

MIMOSACEAE

An erect shrub 1.5 to 3 m tall, with terete, rigid phyllodes 6-14 cm long and 0.8-1.2 mm wide, with eight nerves 0.3 mm wide. The flower spikes are single in the axils of the phyllodes and are golden in colour. The flowers have their parts in fours. The legumes are straight, 5-9 cm long, 2-3 mm wide, constricted between the seeds. The seeds are grey-brown in colour with dark brown speckles.

Differs from subsp. *isoneura* in the thick, rigid phyllodes, with nerves 0.3 mm wide, and in the flower spikes which are single in the leaf axils, not paired. It is a taller shrub than the typical subspecies and is closely related to *Acacia hopperiana*, which has ten-nerved phyllodes and discoid seeds. It is superficially similar to *A. cylindrica*, which has 16-nerved phyllodes.

Flowering Period: August-October

Distribution and Habitat in the Geraldton District

Occurs from Perenjori south into the Moora District in the Wubin area, further south-east than the typical subspecies.

Grows in yellow sand in heath, scrub or tall shrubland.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. W of Perenjori	P	Shire Reserve	17.8.1994	"Common"	Area disturbed, rubbish tip
2. S of Latham	P	MRWA Road Reserve, Rail Reserve	14.12.1989	-	Site disturbed
3.* N of Latham	P	-	20.7.1982	"Common"	-
4.* S of Caron	P	-	8.10.1972	-	-
5.* E of Caron	P	-	9.9.1962	-	-
6.* W of Perenjori	P	-	1973	-	-
7.* N of Wubin	P	-	9.9.1972	-	-

Response to Disturbance

One population had regenerated well after fire.

Management Requirements

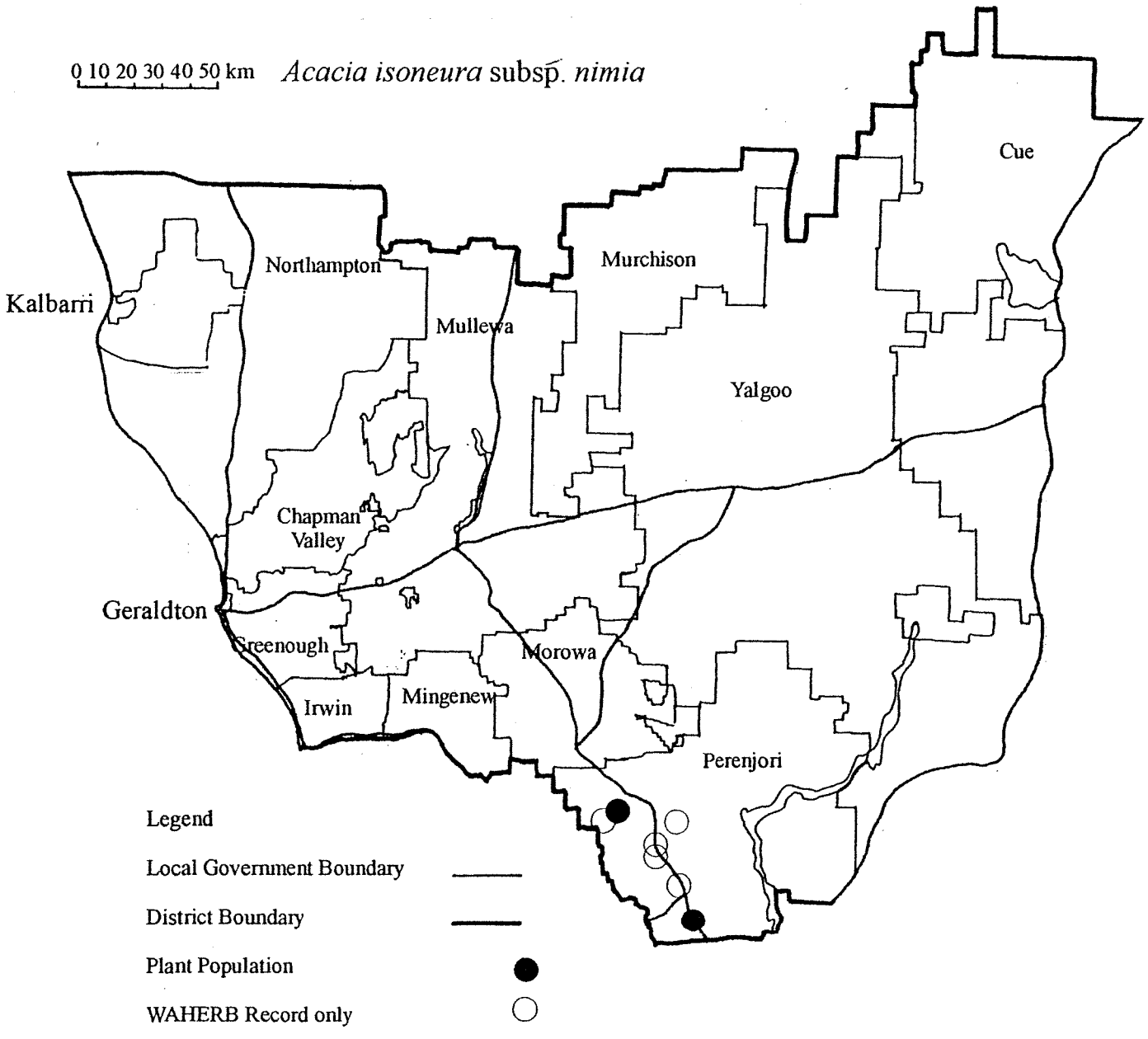
- Ensure that road verge and rail reserve population is marked.

Research Requirements

- Further survey is required, particularly to discover the full extent of population 1 and whether it extends onto the adjacent nature reserve. Populations 2-7 need to be refound and fully surveyed. Further survey is required on conservation reserves in the area of its occurrence.

References

Maslin & Chapman (1999).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Acacia isoneura subsp. nimia
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Acacia kalgoorliensis R.S.Cowan & Maslin MIMOSACEAE

A dense, rounded shrub 1.5-3 m high, with a rounded, rather dense crown and many spreading to erect dark grey branches arising from near ground level. The trunk may be twisted, with the bark either smooth or rough and longitudinally flaking. The new growth is greyish-green and hairy, the mature phyllodes olive-green and glabrous. They are rigid, straight and ascending, tapering to long, brown spinose points. The flower heads are globular to slightly obloid, bright light golden in colour. The pods are straight to shallowly curved, slightly undulate, thin and light brown.

Flowering Period: July-September

Distribution and Habitat in the Geraldton District

Acacia kalgoorliensis occurs from Yalgoo in the Geraldton District eastwards to the northern side of Lake Barlee in the south-eastern corner of the District. It also occurs south of the District to the north-east of Kalannie, and further eastwards to the south of Southern Cross and in the Kalgoorlie-Menzies area.

Grows in red or brown loam or clay loam with ironstone or greenstone on low hills in *Eucalyptus* woodland or shrubland, with *Acacia, Dodonaea, Senna* and *Triodia* species and with emergent eucalypts. It has also been recorded in woodland of *Eucalyptus salmonophloia* on red loam flats. Some populations grow on sand over clay or calcrete near salt lakes where it may grow in woodland of *Eucalyptus striaticalyx* over *Acacia* shrubland.

Conservation Status

Current: Priority 3[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SE of Sandstone	S	Pastoral Lease	31.7.1993	"frequent"	-
2. Lake Barlee	S	Pastoral Lease	12.9.1993	-	-
3. NW of Paynes Find	Y	Pastoral Lease	17.10.1993	"occasional"	-
4. NE of Paynes Find	MM	Pastoral Lease	16.5.1993	-	-
5. NNE of Paynes Find	Y	Pastoral Lease	12.5.1993	-	-
6. NNE of Yalgoo	Y	Pastoral Lease	18.8.1987	"frequent"	-
7.* E of Yuinmery	S	Pastoral Lease	17.9.1986	-	-

Response to Disturbance

Unknown

Research Requirements

– Further survey is required, particularly to refind and survey fully all known populations.

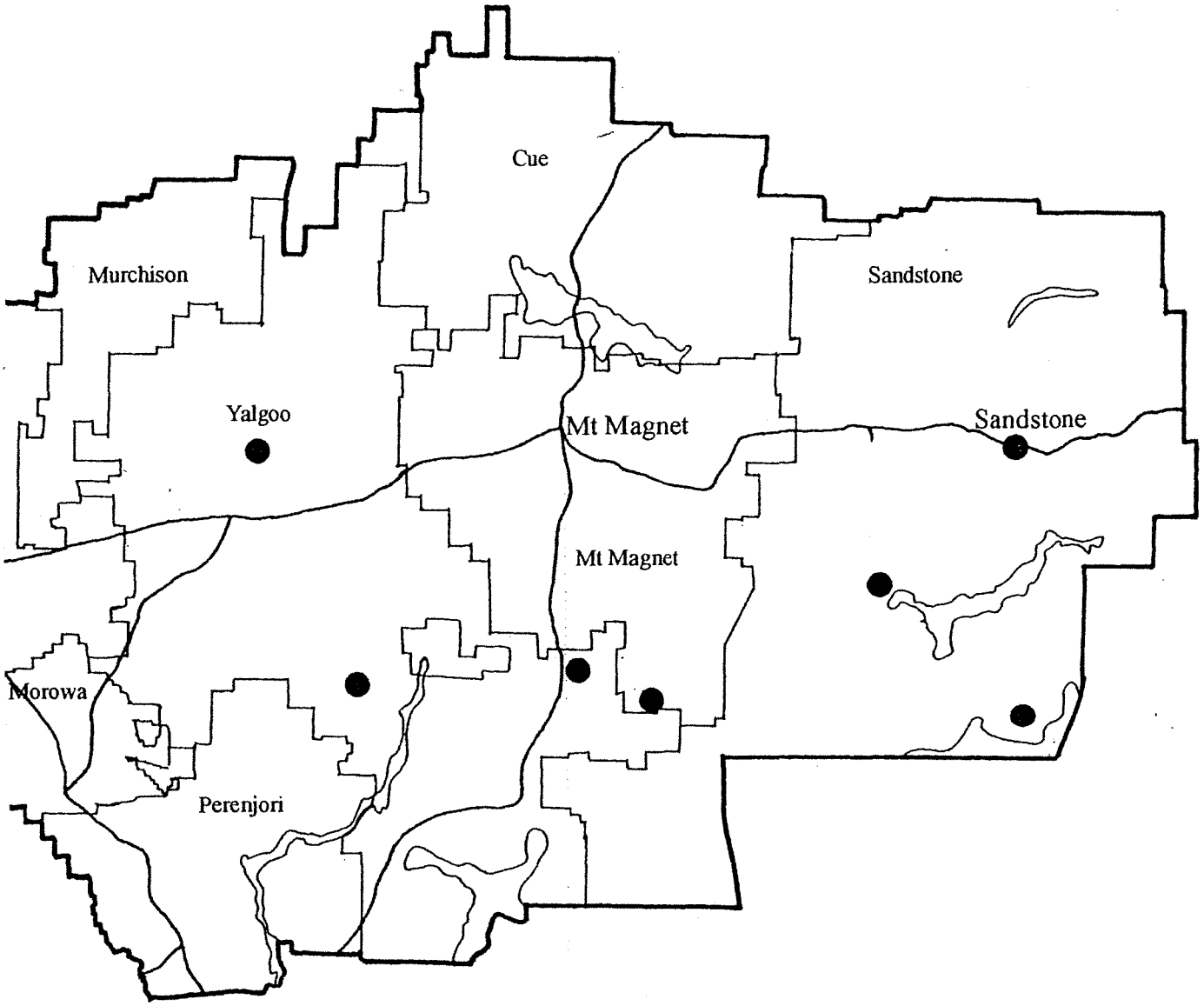
References

Cowan & Maslin (1995b).

[#] species has been taken off the Priority Flora list (updated at December 1999)

0 10 20 30 40 50 km

Acacia kalgoorliensis



Legend

Local Government Boundary

District Boundary

Plant Population

WAHERB Record only

Acacia latipes Benth. subsp. *licina* R.S.Cowan & Maslin MIMOSACEAE

An erect to spreading shrub, 0.1-0.8 m tall. The phyllodes are 24-52 mm long, 1-2 mm wide. They are linear, flattened and sessile, the apex with a pungent point. There are 3-4 nerves on each face. The stipules are shed early. There are usually two flower heads in each axil, on stalks 5-9 mm long. The flower heads are globular and yellow. The pods are 25-60 mm long, 3.5-6 mm broad, with thickened margins.

Differs from the typical subspecies in its longer, narrower phyllodes, which are normally curved upward.

Flowering Period: June-July

Distribution and Habitat in the Geraldton District

Three populations are known from east of Geraldton. It has also been recorded from the Port Gregory area and twice from south of the Geraldton District in an area north of Eneabba.

East of Geraldton, this species grows on pale yellow or white sand on low rises in tall shrubland or mallees over heath. Associated species include *Acacia leptospermoides, Xylomelum angustifolium, Conospermum stoechadis, Allocasuarina campestris, Gastrolobium spinosum, Calothamnus, Hakea* and *Grevillea* species. In the Port Gregory area, this subspecies was growing on limestone hills and in low heathland. The population north of Eneabba was recorded on flat, white to yellowish sandy winter-wet soil in *Acacia* thicket.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Erangy Springs Road	Mu	Nature Reserve	7.7.1995	70+	Healthy
2. Erangy Springs Road	Mu	Shire Road Verge	7.7.1995	30+	Moderate, weed infestation
3.* Erangy Springs Road	Mu	-	30.7.1972	-	-
4.* Casuarina Road	Mu	Shire Road Verge	7.7.1995	3+	Healthy
5.* Casuarina Road	Mu	-	24.7.1966	-	-
6.* N of Port Gregory Road	N	-	25.6.1982	"fairly uncommon"	-
7.* South Hutt	N	-	c. 1860	-	-

Response to Disturbance

The population north of Eneabba occurred in a recently burnt thicket.

Management Requirements

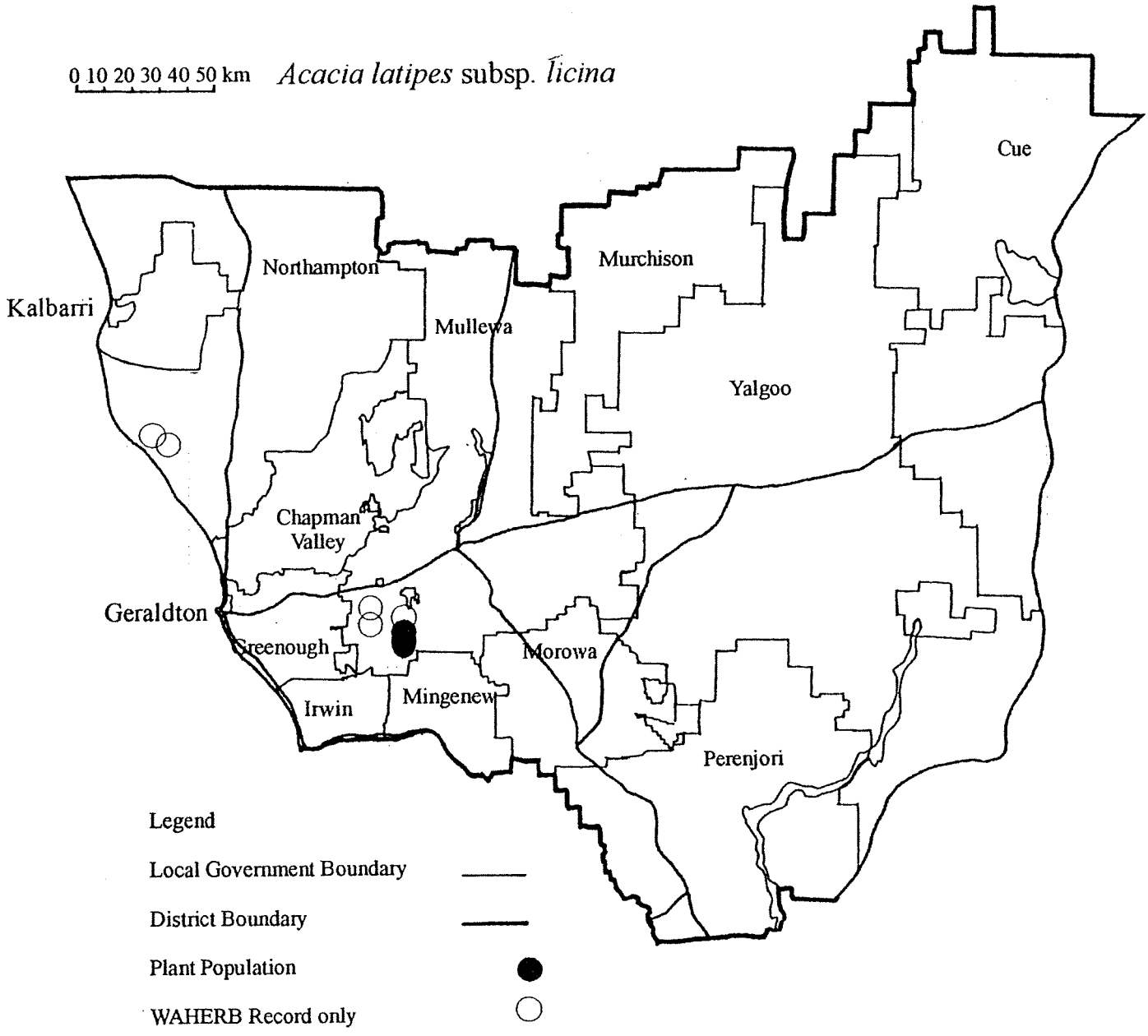
- Ensure that road verge populations are marked.

Research Requirements

- Further survey is required.

References

Cowan & Maslin (1999b), Grieve (1998).


0 10 20 30 40 50 km
Acacia latipes subsp. licina
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Acacia plautella Maslin MIMOSACEAE

An intricate, spreading shrub 0.7-1 m tall, with glabrous branchlets and linear-triangular phyllodes 8-15 mm long and 1.5-2 mm broad. The branchlets are finely ribbed and usually have a white puncticulate epidermis which falls off with age. Stipules are present only on very young shoots. The flower heads are in reduced racemes with only one head, on a peduncle c. 10 mm long. Each inflorescence has 15-20 flowers and is globular and golden. The flowers have their parts in fives. The pods are 75 mm long, 3.5-4 mm wide, terete and constricted between the seeds and are not coiled. The seeds are black with cream mottling.

Similar to *Acacia ingrata*, which has cream to white 5-7 flowered heads, pods 4-5.5 mm wide, unmottled seeds, a smooth epidermis and persistent stipules. Members of the *A. horrida* group are also superficially similar but the flowers have their parts in fours, the inflorescences are not racemose and the pods are not constricted between the seeds.

Flowering Period: August

Distribution and Habitat in the Geraldton District

Known from a few collections made over a range of c. 20 km along the Northwest Coastal Highway north of the Murchison River.

Grows on yellow or yellow-brown sand in dense shrubland with mallee eucalypts and myrtaceous species. Associated species include *A. coolgardiensis, A. longispinea* and species of *Melaleuca* and *Persoonia.*

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. N of Murchison River	N	-	3.12.1991	"common"	-
2. N of Murchison River	N	-	25.8.1984	-	-
3.* N of Ajana	N	-	28.8.1931	-	-
4.* S of Wannoo	N	-	8.1967	-	-

Response to Disturbance

Unknown

Management Requirements

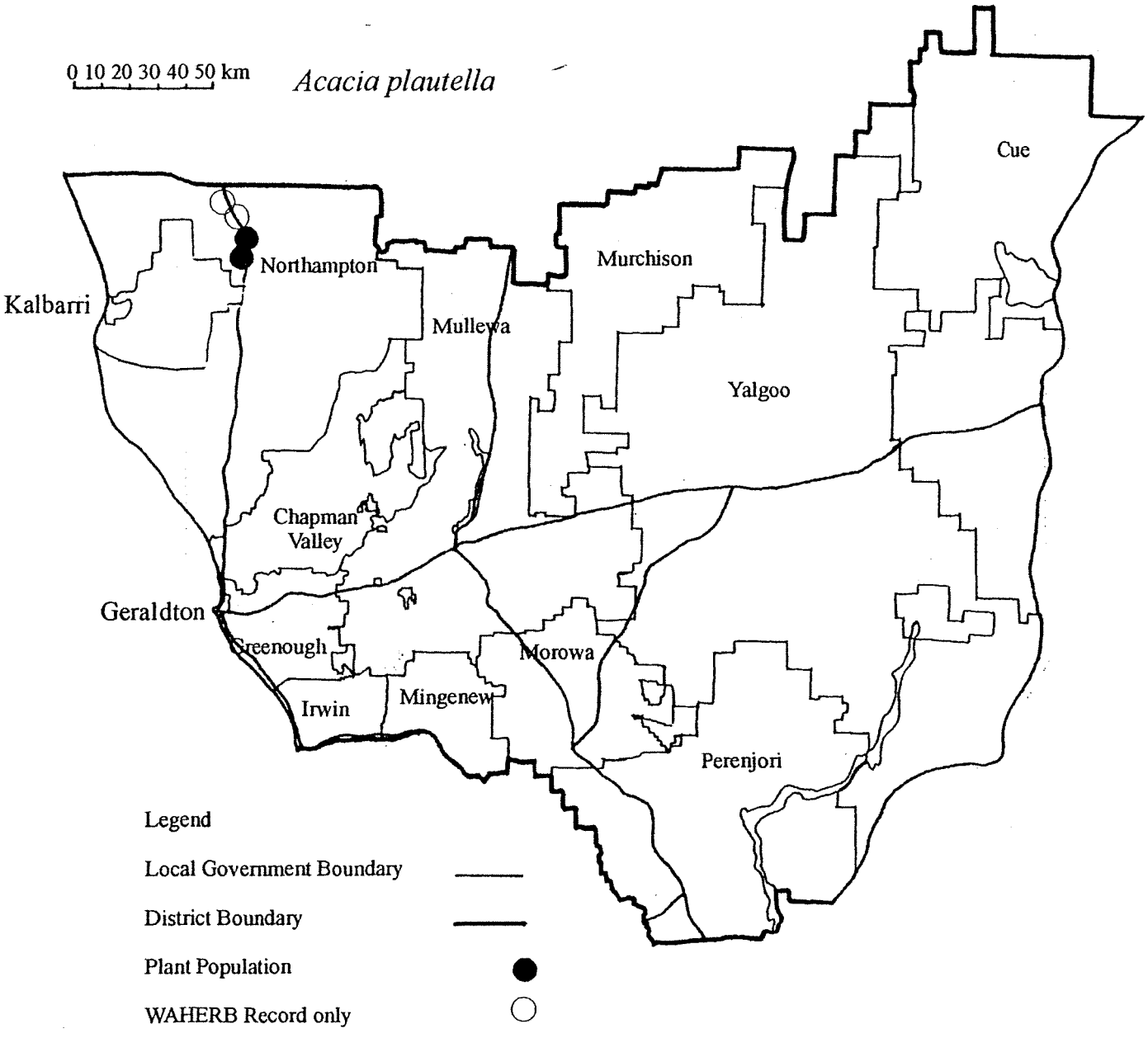
- Road verge populations should be marked.

Research Requirements

- Further survey is urgently required.

References

Grieve (1998), Maslin (1999).


0 10 20 30 40 50 km
Acacia plautella
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Acacia ridleyana W.Fitzg. MIMOSACEAE

A spreading shrub 0.3-1 m tall and up to 1.5 m in diameter. The younger branches and phyllodes have spreading white hairs. The phyllodes are flat, tapering to the base, usually with a hooked pungent tip and with three longitudinal nerves. They are up to 2 cm long and c. 2 mm broad. The inflorescences are globular, light golden in colour, on peduncles c. 1.5 cm long. The flowers have their parts in fives. The pods are narrowly cylindrical, c. 3 cm long, covered with a felty coat of hairs and not constricted between the seeds, which are brown with darker mottling and which have a pale aril.

Flowering Period: August-September, December-January, March

Distribution and Habitat in the Geraldton District

Occurs from the Murchison River south to the Northampton area in the Geraldton District, and around Mogumber in the Moora District.

Grows in pale yellow-brown sand in tall banksia shrubland in the Geraldton District, and in clay, gravelly clay, grey sand, sand over clay or granite loam in the Mogumber area, where it grows in heathland.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. N of Northampton	N	-	3.12.1991	1	-
2. NNE of Port Gregory	N	-	20.9.1987	-	-
3. Murchison River	N	-	27.8.1964	-	-

Response to Disturbance

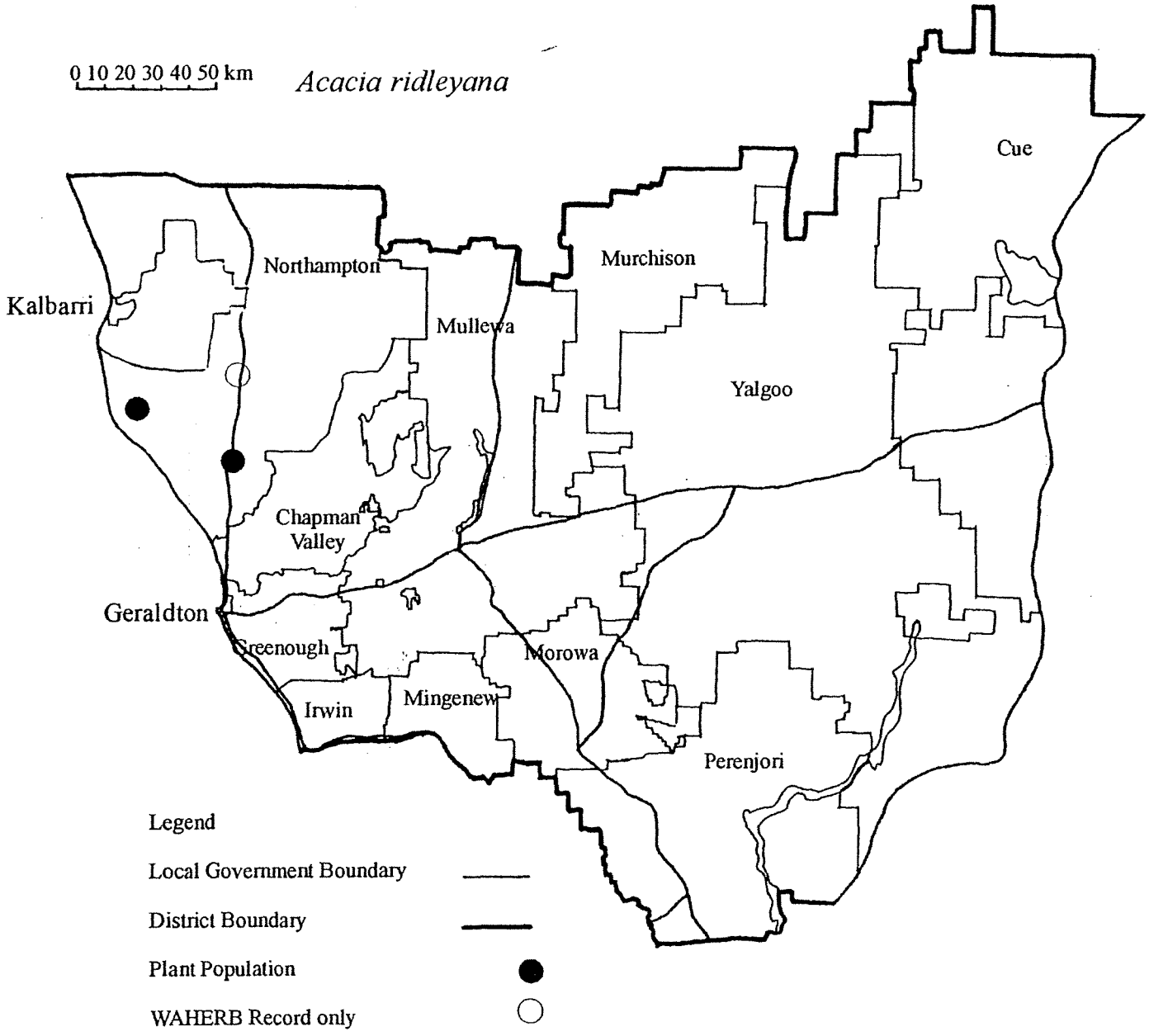
Unknown

Research Requirements

– Further survey is required.

References

Fitzgerald (1904).


0 10 20 30 40 50 km
Acacia ridleyana
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Acacia scalena Maslin MIMOSACEAE

An erect, spinescent shrub to 1.5 m tall, intricately branched, the branches glabrous. There are thin membranous stipules which mostly fall off early. The phyllodes are somewhat glaucous, 5-10 mm long, 3-10 mm broad, sessile, gradually narrowed to a straight, sharply pungent point. The main longitudinal nerve of the phyllode is situated near the lower margin. The inflorescences are minute one-headed racemes, the peduncles 4-7 mm long, the heads golden with 18-22 flowers. The pods are up to 40 mm long, 4-6 mm broad. They are not coiled, but undulate. The seeds are greyish-brown with black mottling.

This species is related to *Acacia flabellifolia,* which has hairy branchlets, green phyllodes and unmottled seeds. It also resembles *A. rendlei,* which has prominent spiny stipules.

Flowering Period: May, July-September

Distribution and Habitat in the Geraldton District

In the Geraldton District, this species has been found east of Coorow and south of Latham, but its range extends south of the District to Buntine, Wubin and Dalwallinu.

A. scalena grows on yellow sand, in open scrub with heath and with associated species including *Allocasuarina campestris* and *Gastrolobium spinosum.* It has also been recorded on light brown gravelly sand in open low heath or tall shrubland, or on light brown loam, yellow silty loam with laterite in association with mallees of *Eucalyptus ebbanoensis* and *E. loxophleba* woodland.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* S of Latham	P	-	29.8.1964	-	-
2.* E of Coorow	P	-	7.8.1977	-	-

Response to Disturbance

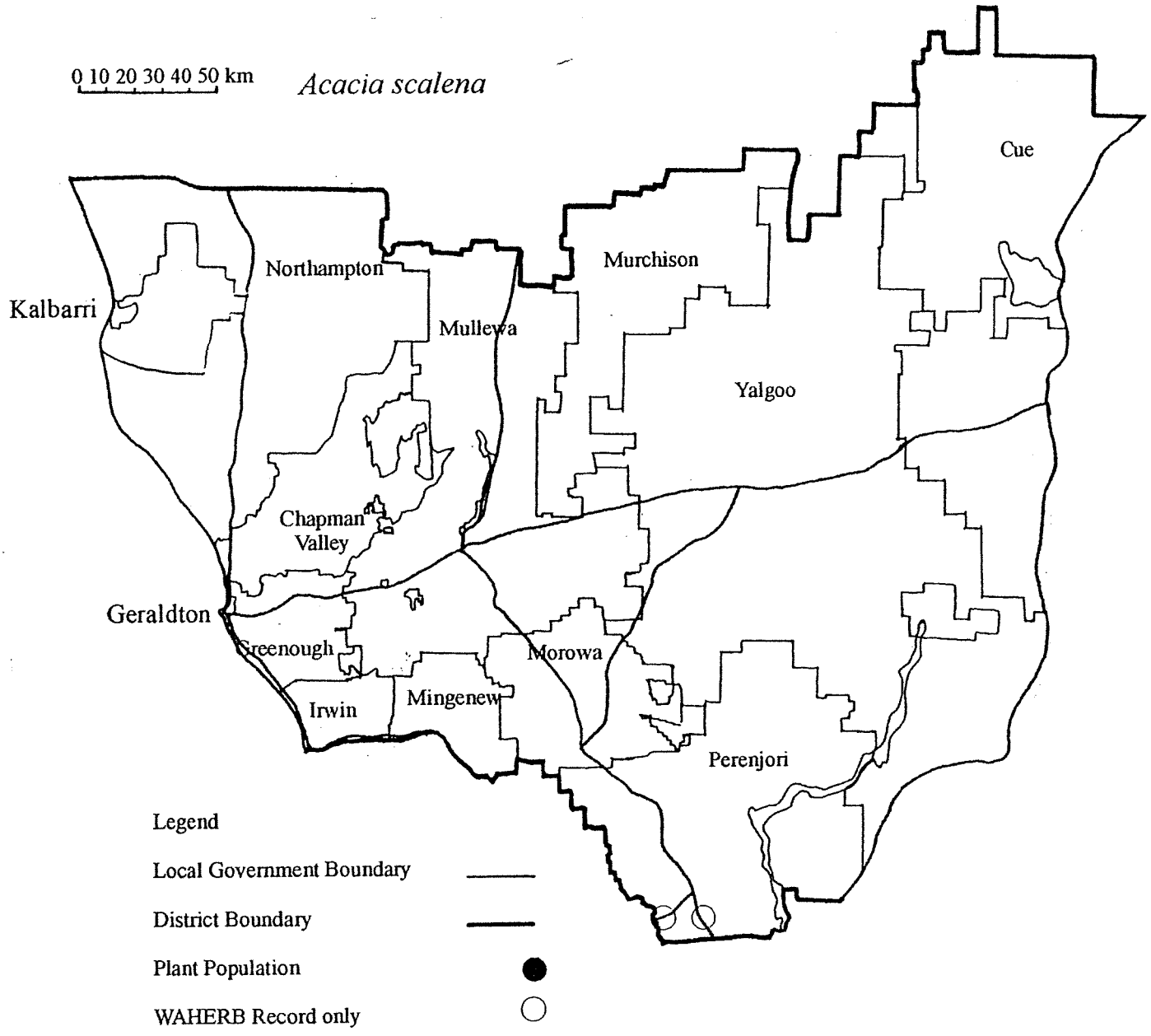
At some populations this species has been found growing in disturbed areas.

Research Requirements

– Further survey is required.

References

Grieve (1998), Maslin (1999).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Acacia scalena
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Acacia speckii R.S.Cowan & Maslin MIMOSACEAE

A shrub or tree 2-3 m tall, sometimes with several stems from ground level. The bark is grey, rough and fissured. The phyllodes are held upright and are light green in colour, terete and sharply pungent, 80-120 mm long, 1-1.5 mm broad, with eight nerves. The flowers are not known but are thought to have their parts in fours. There are one or two peduncles in each axil. The pods are curved and papery, 135 mm long, 4-6 mm broad. The seeds are globose, dull brown, with a minute aril.

This species may be related to *Acacia obtecta,* which has flat, non-pungent phyllodes 4-6 mm wide and seeds without an aril.

Flowering Period: Unknown. Pods with mature seeds have been collected in September.

Distribution and Habitat in the Geraldton District

Occurs from south-west of Yalgoo to north-west of Cue and north of the District to the Meekatharra area.

Grows on creek lines on rocky hills of dolerite or granite, or granite plains. Usually associated with *A. aneura,* growing in tall shrubland.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. N of Mt Magnet	MM	-	2.6.1994	"more or less common"	-
2. Barnong	Y	Pastoral Lease	25.6.1993	-	-
3. W of Coodardy	C	Pastoral Lease	23.1.1985	"infrequent"	-
4.* E of Yalgoo	Y	-	22.7.1982	"fairly uncommon"	-
5.* W of Yalgoo	Y	-	1.8.1974	-	-
6.* Yalgoo	Y	-	-	-	-

Response to Disturbance

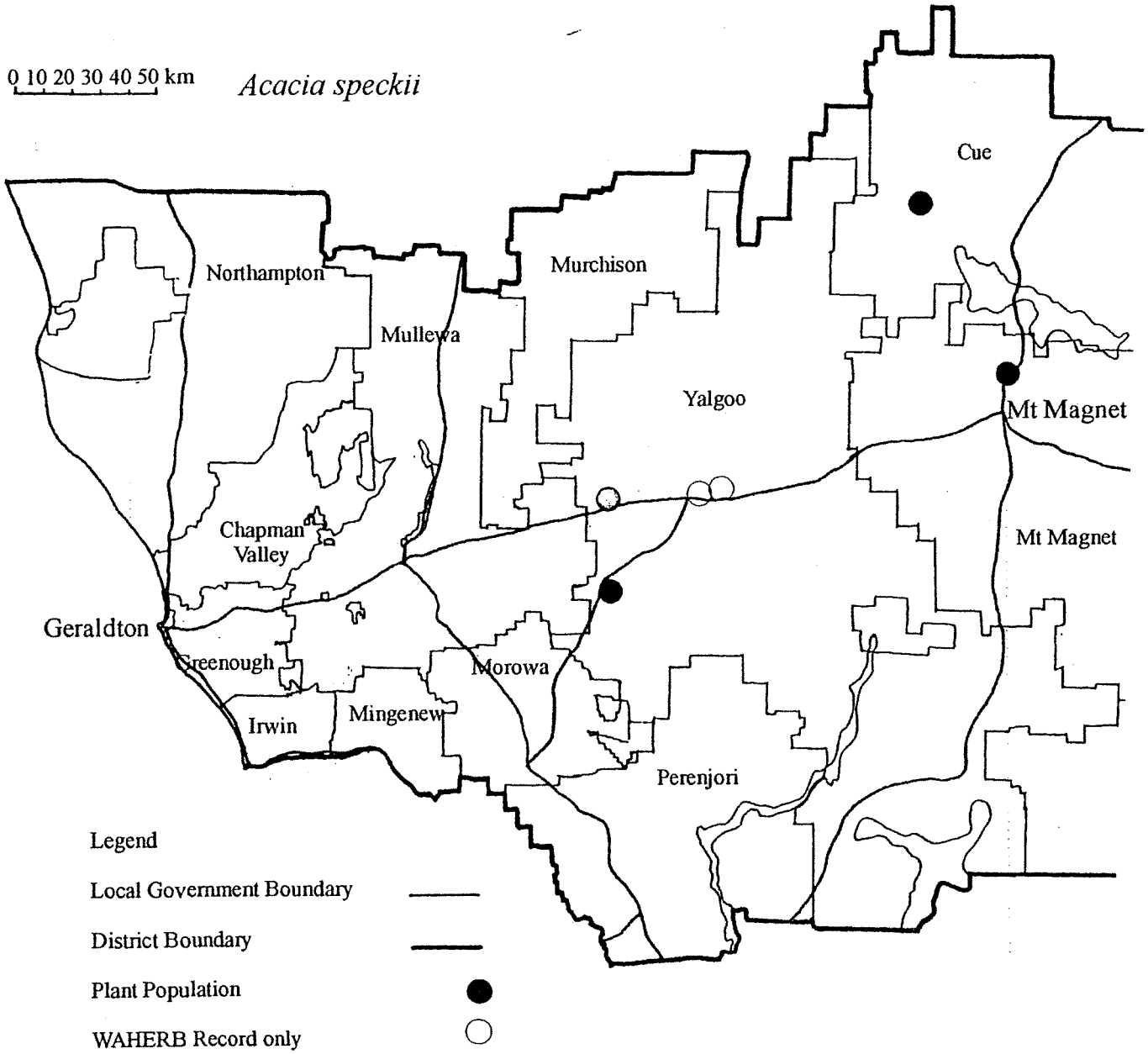
Unknown

Research Requirements

- Further survey is required.

References

Cowan & Maslin (1999b), Grieve (1998).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Acacia speckii
Cue
Murchison
Northampton
Mullewa
Yalgoo
Mt Magnet
Chapman Valley
Mt Magnet
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Angianthus micropodioides (Benth.) Benth. ASTERACEAE

A small, herbaceous, white-woolly annual, prostrate to erect, 5-15 cm high. The leaves are linear, grey to dull, light green. The flower heads are in nearly globular, woolly clusters, closely surrounded by linear leaves which are much longer than the clusters. The flowers are yellow. There are partial involucres of two concave and four flat, narrow-spathulate transparent bracts. The pappus is of five ovate jagged scales, each terminating in a simple awn not quite as long as the floret.

Flowering Period: September-November

Distribution and Habitat in the Geraldton District

In the Geraldton District, this species has been found from west of Mullewa, east to Lake Monger and south to Bunjil. It is also known from the Perth area, further east at Meckering and Mollerin and on the south coast to the south-west of Ravensthorpe.

Grows on sandy ridges in saline depressions on the edges of salt lakes and on claypans. It is recorded in association with *Gunniopsis* and *Melaleuca* species.

In the Perth area, this species is recorded from saline sandy clay in succulent shrubland on river estuary margins and elsewhere on river flats.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SE of Morowa	Mo	-	29.10.1995	-	-
2. Warriedar	Y	Pastoral Lease	26.9.1986	-	-
3.* Tenindewa	Mu	-	11.9.1984	-	-
4.* SE of Bunjil	P	-	13.11.1983	-	-

Response to Disturbance

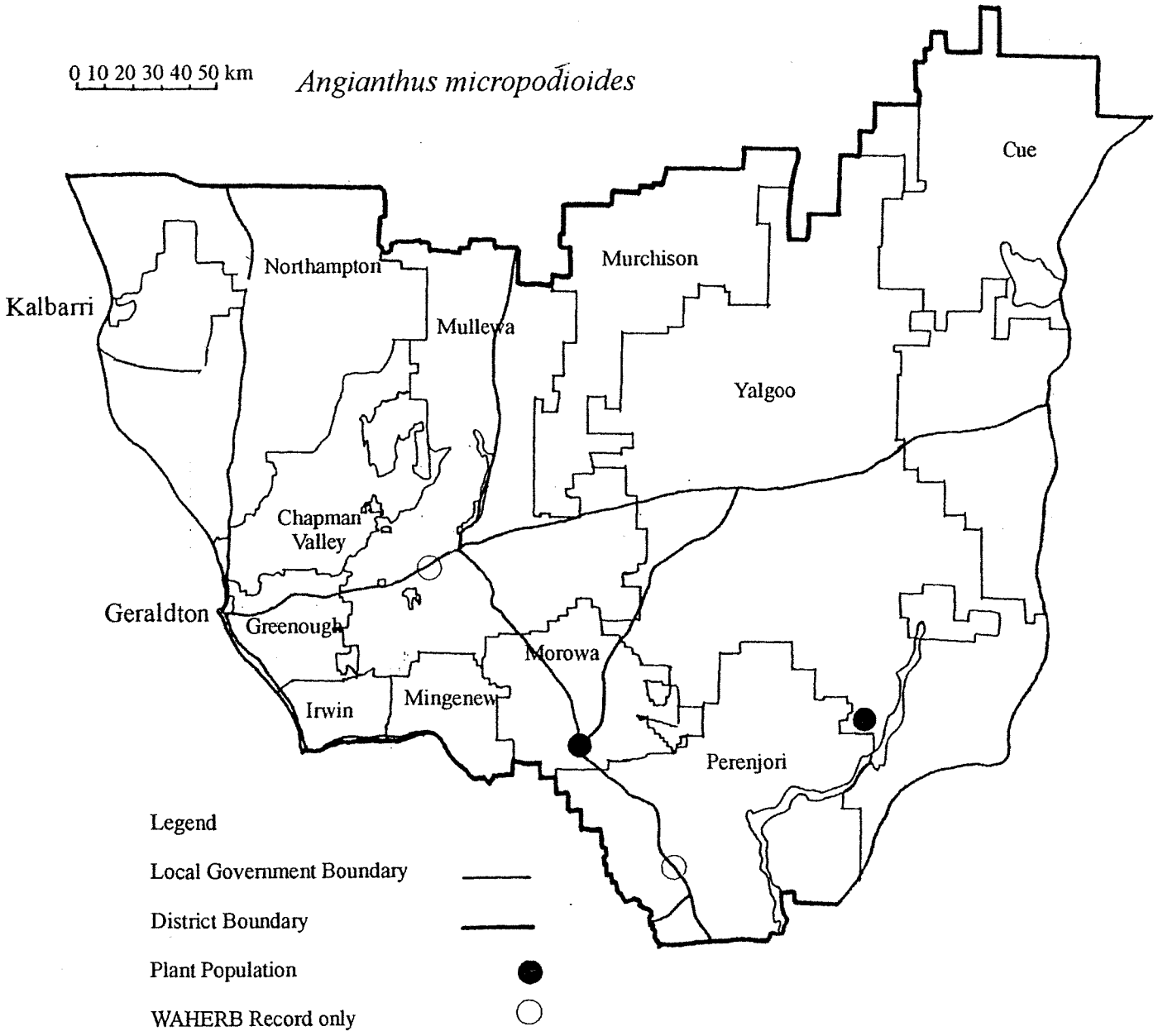
Unknown

Research Requirements

- Further survey is required.

References

Bentham (1867).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Angianthus micropodioides
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Anthocercis intricata F.Muell. SOLANACEAE

An intricate, rounded, spiny shrub to 3 m tall, sparsely hairy with some glandular hairs and also non-glandular hairs. The leaves are narrowly elliptic to obovate, almost sessile, 10-30 mm long, 1.5-5.5 mm broad. The inflorescence is a cyme and is usually branched. The flower stalks are hairy. The corolla is tubular, 15-21 mm long, with five linear lobes 10-15 mm long. It is creamy white with purple striations in the tube. The fruit is a smooth capsule 5-17 mm long.

Flowering Period: June, August-September

Distribution and Habitat in the Geraldton District

Known from south of Kalbarri and in the Port Gregory area. Earlier records from Geraldton and Dongara need to be reconfirmed. Has also been recorded further north from the Shark Bay area.

Grows on consolidated sand dunes on grey or yellow sand over limestone in shrubland with *Acacia rostellifera, Melaleuca, Lasiopetalum* and *Eucalyptus* species.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. S of Kalbarri	N	National Park	19.6.1996	1 000+	Healthy
2. S of Kalbarri	N	National Park	9.8.1994	2	Healthy
3. SE of Port Gregory	N	Shire Road Verge	9.8.1994	100+	Healthy, on disturbed road edge
4.* Geraldton	G	-	3.9.1979	"moderately common"	Disturbed and weedy
5.* Dongara	I	-	16.9.1932	-	-

Response to Disturbance

Occurs in disturbed or burnt areas.

Management Requirements

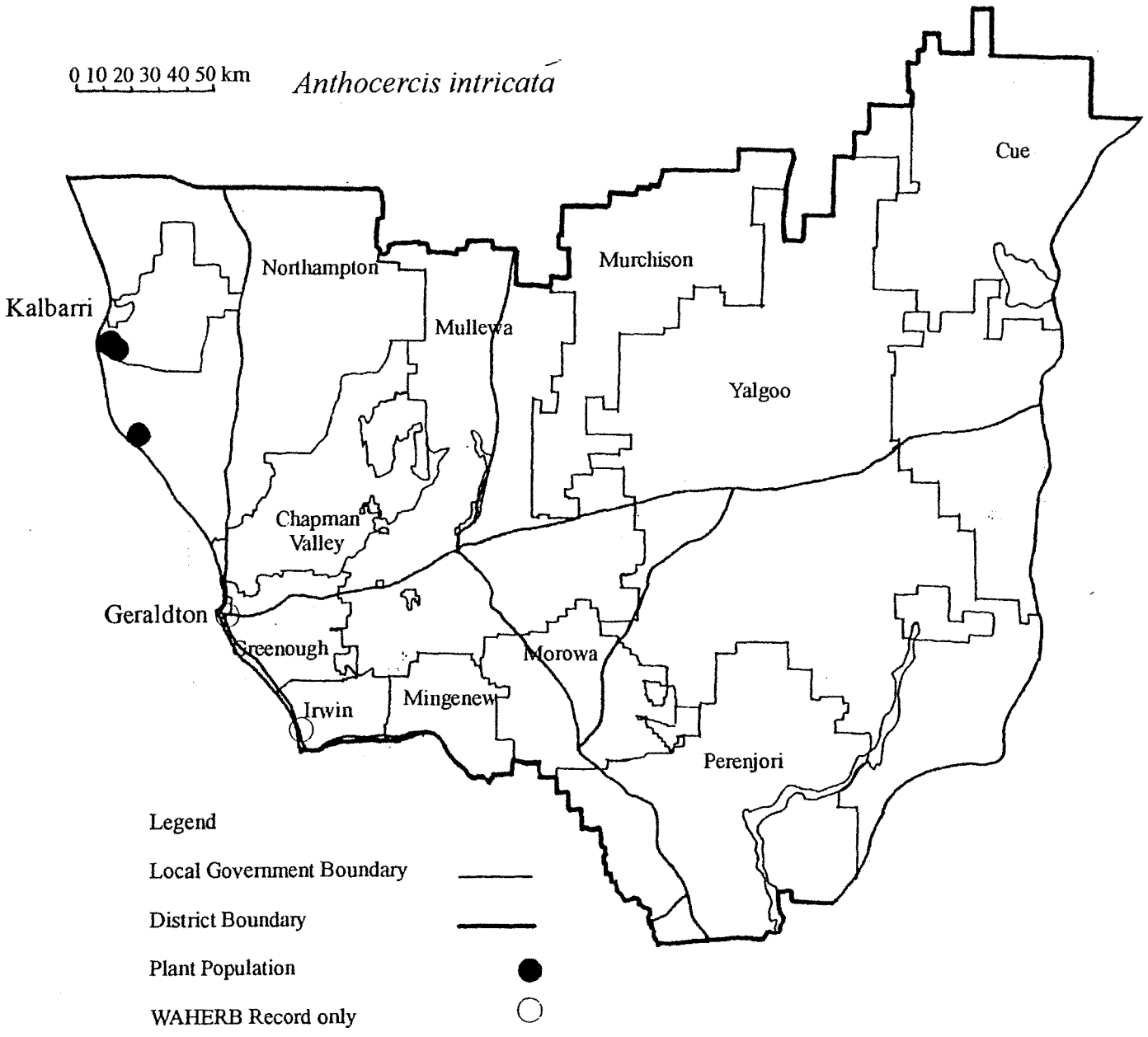
- Ensure that road verge population is marked.

Research Requirements

- Further survey is required, particularly to refind this species in the Geraldton and Dongara areas.

References

Purdie *et al.* (1982), Mueller (1859).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Anthocercis intricata
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Anthotroche walcottii F.Muell. SOLANACEAE

An erect, sprawling shrub to 2 m tall. The branches are densely covered with greyish or rusty hairs which are dendritic and branched and some glandular. The leaves are ovate, elliptic, obovate or orbicular, closely tomentose with dendritic hairs. They are up to 20 mm long, 16 mm wide, the juvenile leaves larger. The petiole is up to 20 mm long.

The flowers are axillary, solitary or in clusters of 2-3, on stalks 5-15 mm long, with glandular hairs. The calyx is five-lobed to 7 mm long. The corolla is 5-8 mm long, with a spreading tube which is greenish-yellow with purple streaks. There are five short broad lobes which are purple-black in colour, 3-5 mm long. There are five exserted stamens and a capitate stigma. The fruit is a smooth, ovoid to ellipsoid capsule, 4-8 mm long.

This species differs from other species of *Anthotroche* in the leaf shape, the dendritic leaf hairs and in the long pedicels with glandular hairs.

Flowering Period: April, May, September-January

Distribution and Habitat in the Geraldton District

This species grows between Mullewa and Kalbarri, mainly in the Geraldton District, but with one record made in 1963 indicating that it extends north of the District on the Murchison sandplains.

Grows on sandplain, on yellow or orange sand, grey sand over sandstone or yellow-brown clayey sand. Occurs in heath, sometimes with open tree mallees. Associated species include *Grevillea eriostachya, Conospermum stoechadis, Ecdeiocolea monostachya, Verticordia, Banksia, Allocasuarina* and *Calothamnus* species.

Conservation Status

Current: Priority 3[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Near Z Bend	N	National Park	3.11.1994	40+	Healthy
2. Near Z Bend	N	National Park	3.11.1994	10+	Healthy
3. Near Z Bend	N	National Park	3.11.1994	20+	Healthy
4. Wandana	CV	Nature Reserve	2.11.1994	20+	Healthy
5. E of Ogilvie	CV	Shire Road Verge	2.11.1994	5+	Healthy
6. S of Kalbarri	N	Shire Road Verge	3.11.1994	10+	Moderate
7. N of Galena	N	MRWA Road Verge, National Park	2.11.1994	30+	Moderate
8. SE of Yuna	CV	Nature Reserve	2.4.1994	1+	Healthy
9. SE of Yuna	CV	Nature Reserve	2.4.1994	1+	Healthy
10. SW of Mullewa	Mu	-	11.1991	-	-
11. SE of Kalbarri	N	-	26.10.1992	"rare"	-
12. N of Mingenew	Mu	-	23.10.1992	-	-
13. E of Yuna	CV	-	27.10.1992	-	-
14. S of Kalbarri	N	-	31.5.1995	"occasional"	-
15. SE of Coolcalalaya	N	VCL	13.10.1988	-	-
16.*NW of Ajana	N	Road Verge	26.9.1976	"common"	-
17.*W of Ajana	N	Road Verge	26.11.1974	-	-
18.*N of Ajana	N	-	15.11.1959	-	-
19.*Northern Gully	G	-	11.1962	-	-
20.*Eradu	G	-	31.10.1963	-	-
21.*N of Murchison River	N	-	5.1.1960	-	-
22.*N of Murchison River	N	-	6.11.1965	-	-
23.*Hutt River	N	-	9.1926	-	-

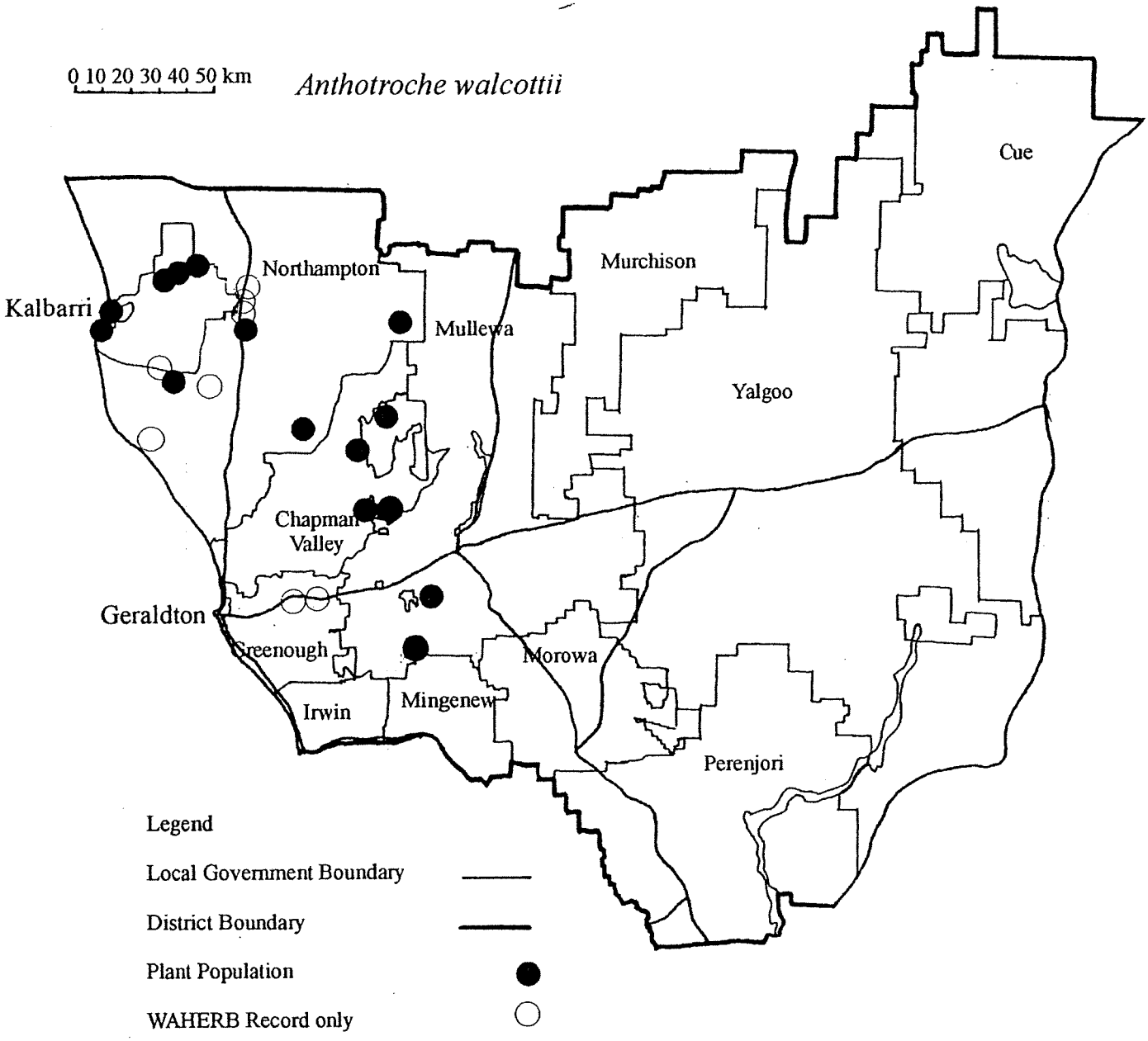
[#] species has been taken off the Priority Flora list (updated at December 1999)

Response to Disturbance

Unknown

References

Purdie *et al.* (1982), Mueller (1859).



Arnocrinum drummondii Endl. ANTHERICACEAE

This species was described by Endlicher in 1846 from specimens collected without details of locality by Drummond and Preiss. Oldfield recorded "Murchison River" as the locality for his collections.

Arnocrinum drummondii is a perennial herb with a short rhizome covered by dense woolly hairs. The leaves are linear, arising in a tuft from the root, dying down each year. The leaf blade is 16-70 mm long, with a few hairs. The inflorescence stems have few branches and are 25-54 cm tall, with tufts of hair at each branch or scale.

The inflorescence is a compressed spike with brown, papery, sparsely hairy inflorescence bracts. The flowers are sessile, with the blue perianth segments joined at base to form a tube 6 mm long and with six equal spreading lobes 7-8 mm long. They are twisted after flowering. There are six stamens and the ovary is superior.

Differs from *A. gracillimum*, which occurs in the Eneabba area, in its simple inflorescence stems without numerous short sterile branchlets, and from *A. preissii,* in the brown, papery, sparsely hairy inflorescence bracts, whereas those of *A. preissii* are green-brown, hard and densely hairy.

Flowering Period: September-January in the north of the range, December in the Moora District and March in the York area

Distribution and Habitat in the Geraldton District

Within the Geraldton District, this species has been found recently near Kalbarri and west of Mullewa, and just north of the District in the Cooloomia area. The species has also been recorded further south in the Moora District where it has been collected from two localities 15 km apart, most recently in 1962. There is also one record from east of York, c. 200 km south-east of the populations in the Moora District, extending the geographic range of the species to c. 400 km.

It occurs on slopes, dune or plateau tops or on yellow sandplain in the Geraldton District, in low shrubland with *Actinostrobus arenarius, Conospermum stoechadis, Acacia latipes, Verticordia capillaris* and *Ecdeicolea monostachya*. It has also been recorded in association with *Banksia sceptrum* and *Gyrostemon ramulosus* in a post fire thicket. At Gunyidi in the Moora District, it occurred in white or yellow sand in sand heath.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. E of Kalbarri	N	National Park	6.11.1995	37	Healthy
2. NW of Ajana	N	National Park	11.11.1995	67	Healthy
3. E of Kalbarri	N	National Park	24.11.1986	"Frequent"	-
4. W of Mullewa	Mu	-	13.1.1989	"scattered in area"	-

Response to Disturbance

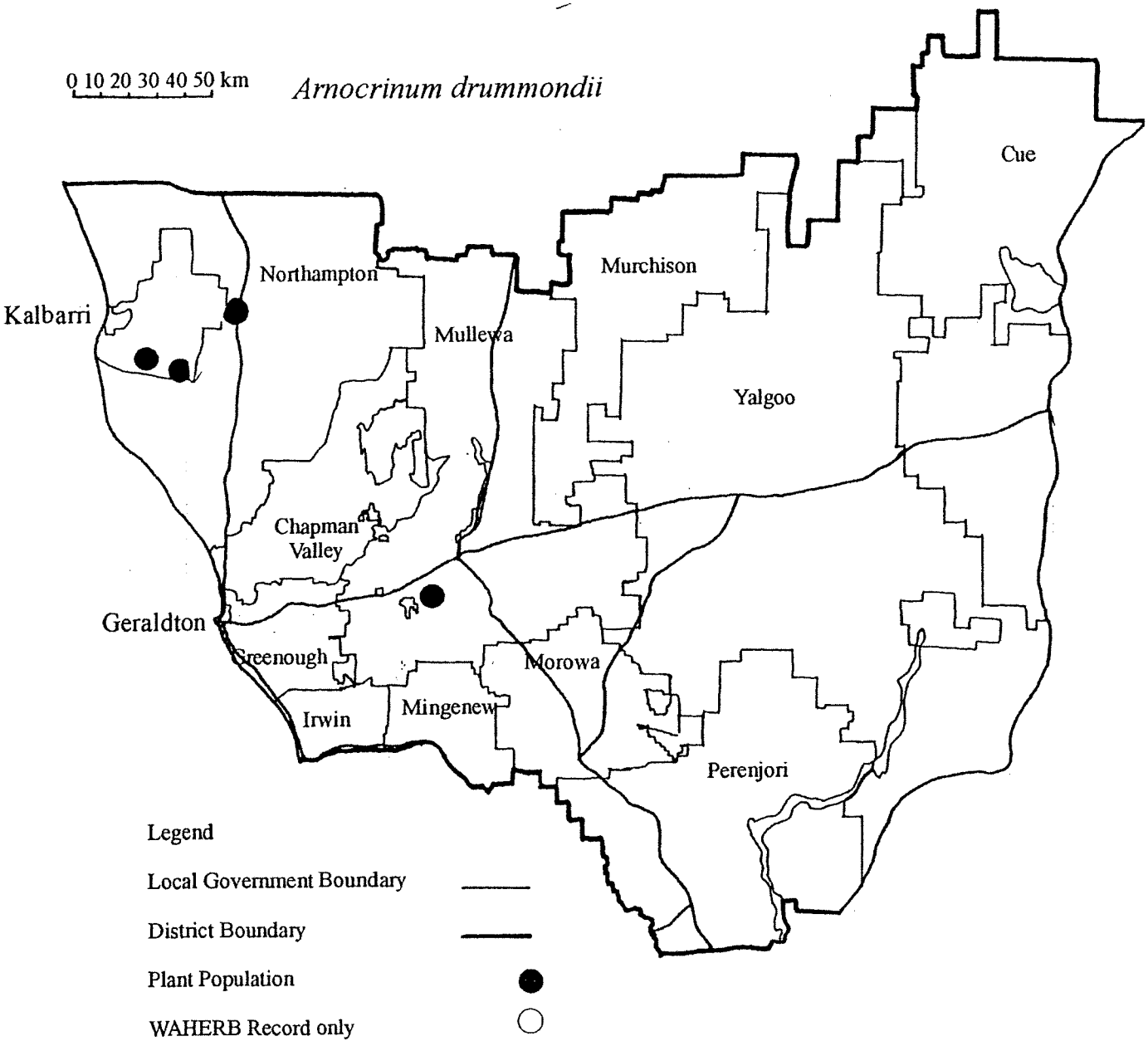
At population 1, the plants occurred on either side of a track in an area recently burnt one or two years previously. No plants could be found in the mature unburnt shrubland. Recorded from post-fire thicket in the Gascoyne District.

Research Requirements

- Further survey is required, particularly on recently burnt areas of national parks and nature reserves in the District.

References

Bentham (1878), Keighery (1987), Lehmann (1846).



Balaustion microphyllum C.A.Gardner MYRTACEAE

Bush Pomegranate

A low shrub to 0.3 m tall and 1 m in diameter, but usually shorter. The leaves are 1-2 mm long, orbicular in shape, opposite and overlapping on the branches, densely covering them. The flowers are in pairs in the upper leaf axils on very short stalks. The calyx tube is green, glandular hairy, cylindrical to bell-shaped, c. 0.5 cm long, with five short, wide, fringed lobes. The five petals are orange-red in colour, rounded in shape. The style is longer than the stamens.

This species differs from *Balaustion pulcherrimum* in its more upright habit, rounded, smaller, imbricate leaves and smaller flowers, with a glandular-hairy calyx tube.

Flowering Period: September-November

Distribution and Habitat in the Geraldton District

Occurs mainly in the Mullewa to Pindar area but extends north-west to Yuna and south-east to the Mellenbye area east of Canna.

Grows in yellow loamy soil with gravel, yellow or red sand, sandy clay or orange-brown sandy loam on laterite. Associated vegetation is *Acacia* scrub with mallee eucalypts, *Melaleuca uncinata, Grevillea, Thryptomene Eremophila* and *Casuarina* species.

Conservation Status

Current: Priority 3[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Pindar	Mu	MRWA Road Verge, Rail Reserve	6.10.1994	1 000+	Healthy
2. E of Pindar	Mu	MRWA Road Reserve	6.10.1994	30+	Moderate, area disturbed
3. Wilroy	Mu	Nature Reserve	29.9.1995	1 300+	Healthy
4. ENE of Mullewa	Mu	MRWA Road Reserve, Rail Reserve	5.10.1994	50+	Healthy
5. S of Fegan Road	Y	VCL	12.11.1996	1 000+	Healthy
6. Fegan Road	Y	VCL	12.11.1996	50+	Healthy
7. S of Tallering	Mur	Pastoral Lease, Shire Road Verge	5.8.1995	50+	Healthy
8. S of Wilroy	Mu	MRWA Road Verge	6.10.1994	100+	Healthy
9. E of Mullewa	Mu	Rail Reserve	5.8.1994	30+	Healthy
10. W of Yalgoo	Y	MRWA Road Verge, VCL	6.10.1994	5 000+	Moderate
11. SE of Mullewa	Mu	MRWA Road Verge	25.10.1992	-	-
12. E of Mullewa	Mu	MRWA Road Verge	23.9.1991	"occasional"	-
13. Mellenbye	Y	Pastoral Lease	17.8.1993	"occasional"	-
14. SE of Yuna	CV	-	19.8.1994	-	-
15.*E of Mullewa	Mu	-	13.10.1981	-	-
16.*E of Geraldton	Mu	-	7.10.1986	-	-
17.*S of Narloo	Y	-	27.10.1984	"plentiful"	-
18.*SE of Mullewa	Mu	-	9.8.1973	-	-
19.*W of Pindar	Mu	-	23.8.1957	-	-
20.*NE of Morowa	Y	-	16.9.1951	-	-

[#] now Priority 4 (updated at December 1999)

Response to Disturbance

Unknown

Management Requirements

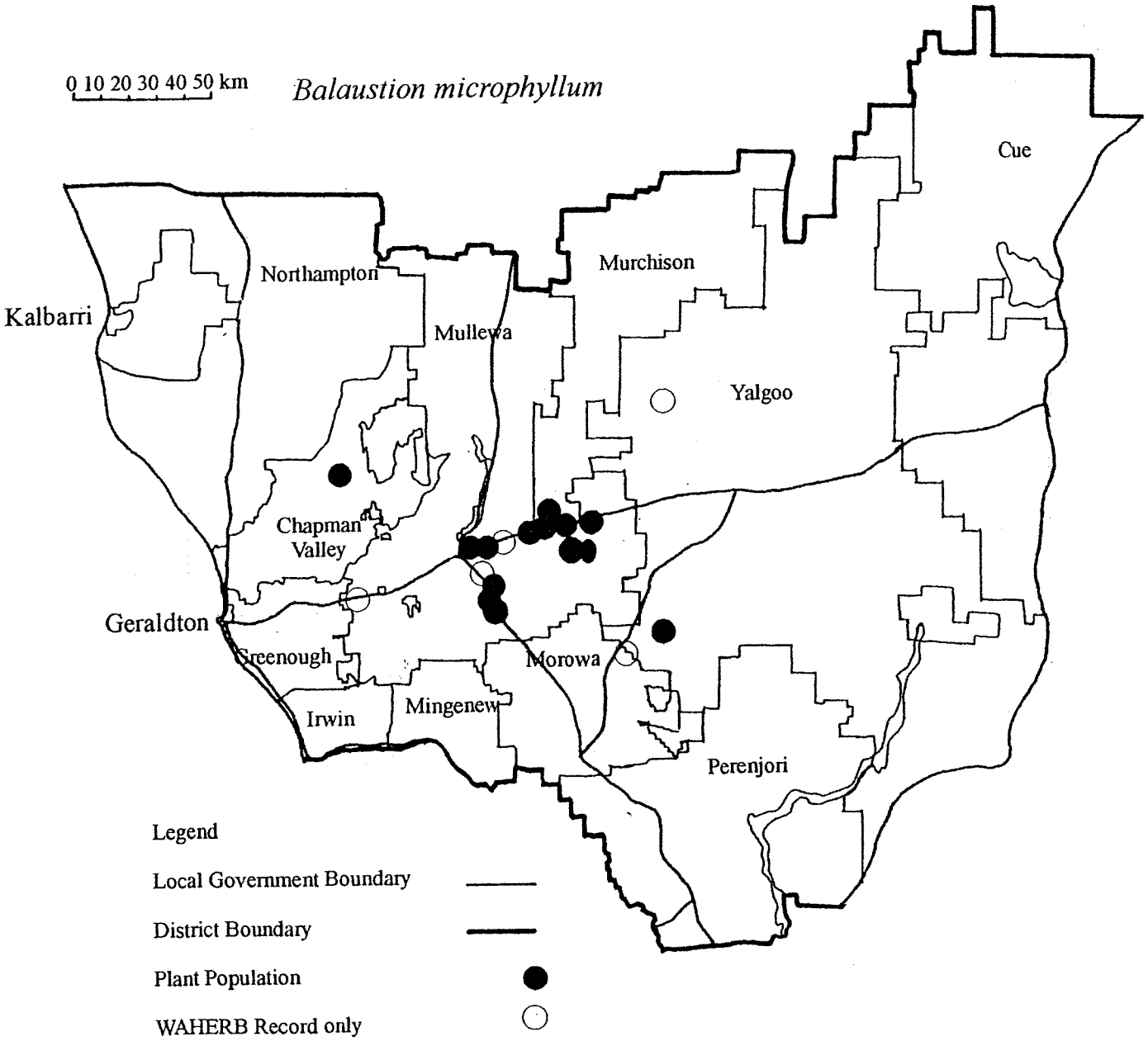
– Ensure that road verge and rail reserve populations are marked.

Research Requirements

– Further survey is required to refind and survey the populations at Yuna and east of Geraldton.

References

Blackall & Grieve (1974), Gardner (1928a).



Banksia scabrella A.S.George PROTEACEAE

Burma Road Banksia

A spreading shrub to 2 m tall and 3 m wide, without a lignotuber and with white tomentose branchlets. The leaves are scattered, linear, 8-28 mm long and 1 mm wide. They have revolute margins and are white-woolly on the lower surface, rough to the touch on the upper surface. The flower spike is erect, cylindrical-ovoid, 3-6 cm long and 7-9 cm wide, with many tomentose bracts at the base. The flowers are mainly cream to pale yellow, the upper ones and the styles purple. The perianth is pubescent inside and outside and is 27-35 mm long. The pistil is 34-45 mm long with a narrowly ovoid pollen presenter, the style end is hooked. There are up to 80 narrowly elliptic follicles on the fruit, usually opening with fire.

Flowering Period: September-January

Distribution and Habitat in the Geraldton District

In the Geraldton District, this species occurs between Walkaway and Mingenew. It also occurs further south in the Moora District from Mt Adams to the Arrowsmith River, where it occurs in large populations.

Grows in deep white or yellow sand in heath, sometimes with *Eucalyptus todtiana.*

Conservation Status

Current: Priority 3[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Burma Road	G	Nature Reserve	20.6.1996	10+	Healthy
2. Burma Road	G	Nature Reserve	16.8.1996	50+	Moderate, area recently burnt
3. Burma Road	G	Nature Reserve	16.8.1996	20+	Moderate, area recently burnt
4. Walkaway-Nangetty Rd	G	Shire Road Verge	16.8.1996	1+	Healthy
5. Burma Road	G	Shire Road Verge	16.8.1996	5+	Healthy
6. Burma Road	G	Nature Reserve	16.8.1996	10+	Healthy
7. Burma Road	G	Shire Road Verge	20.6.1996	100+	Healthy
8. Burma Road	G	Nature Reserve	20.6.1996	20+	Healthy-moderate
9. Burma Road	G	Nature Reserve	20.6.1996	500+	Healthy
10. W of Casuarina	Mu	Shire Road Verge	7.9.1986	"a large number of plants"	In good condition
11. W of Casuarina	G	Shire Road Verge	7.9.1986	-	Some destroyed by clearing
12.*W of Casuarina	Mu	-	5.8.1976	-	-
13.*N of Strawberry	I	-	5.8.1976	-	-
14.*E of Walkaway	G	-	3.1.1972	-	-
15.*Walkaway	G	-	11.1963	-	-

[#] now Priority 4 (updated at December 1999)

Response to Disturbance

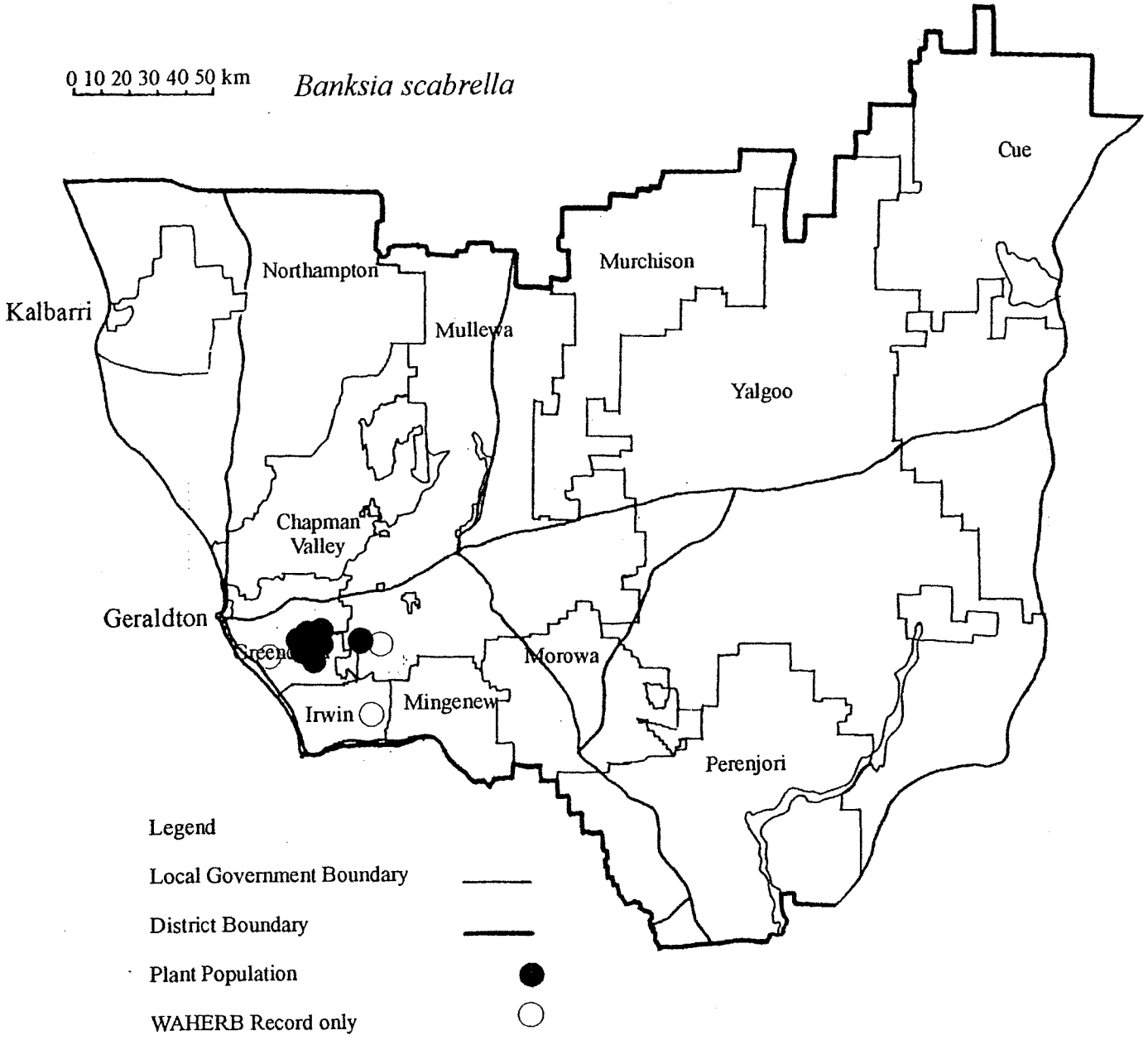
Killed by fire, regenerating from seed.

Management Requirements

– Ensure that road verge populations are marked.

References

George (1981, 1984b), Griffin *et al.* (1982), Taylor & Hopper (1988).



Calocephalus aervoides (F.Muell.) Benth. ASTERACEAE

Woolly Beauty-heads

An annual plant 15-30 cm tall, with ovate or rhomboidal stem leaves to 2 cm long on long petioles. The loose short-stalked clusters of flower heads are ovoid or globular in shape, densely white-woolly and are grouped irregularly on the branches of the panicle. The flower heads are yellow in colour. There are 10-15 flowers in the partial heads. The involucral bracts are papery, the outer ones woolly with a persistent midrib. The pappus is represented by several long woolly-plumose bristles.

Flowering Period: September-October

Distribution and Habitat in the Geraldton District

This species was originally recorded by Oldfield from the Port Gregory area and it has been recorded more recently on one island in the Wallabi Group of the Abrolhos Islands. It has also been recorded from further north on a nature reserve in the Shark Bay area in 1977.

Oldfield recorded this species growing in moist places at Port Gregory. On the Abrolhos Islands, it was found growing in brown loam and sand over limestone on undulating country. Associated vegetation was recorded as shrubland.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Abrolhos	-	Crown Reserve	3.10.1987	-	-
2.* Port Gregory	N	-	c. 1860	-	-

Response to Disturbance

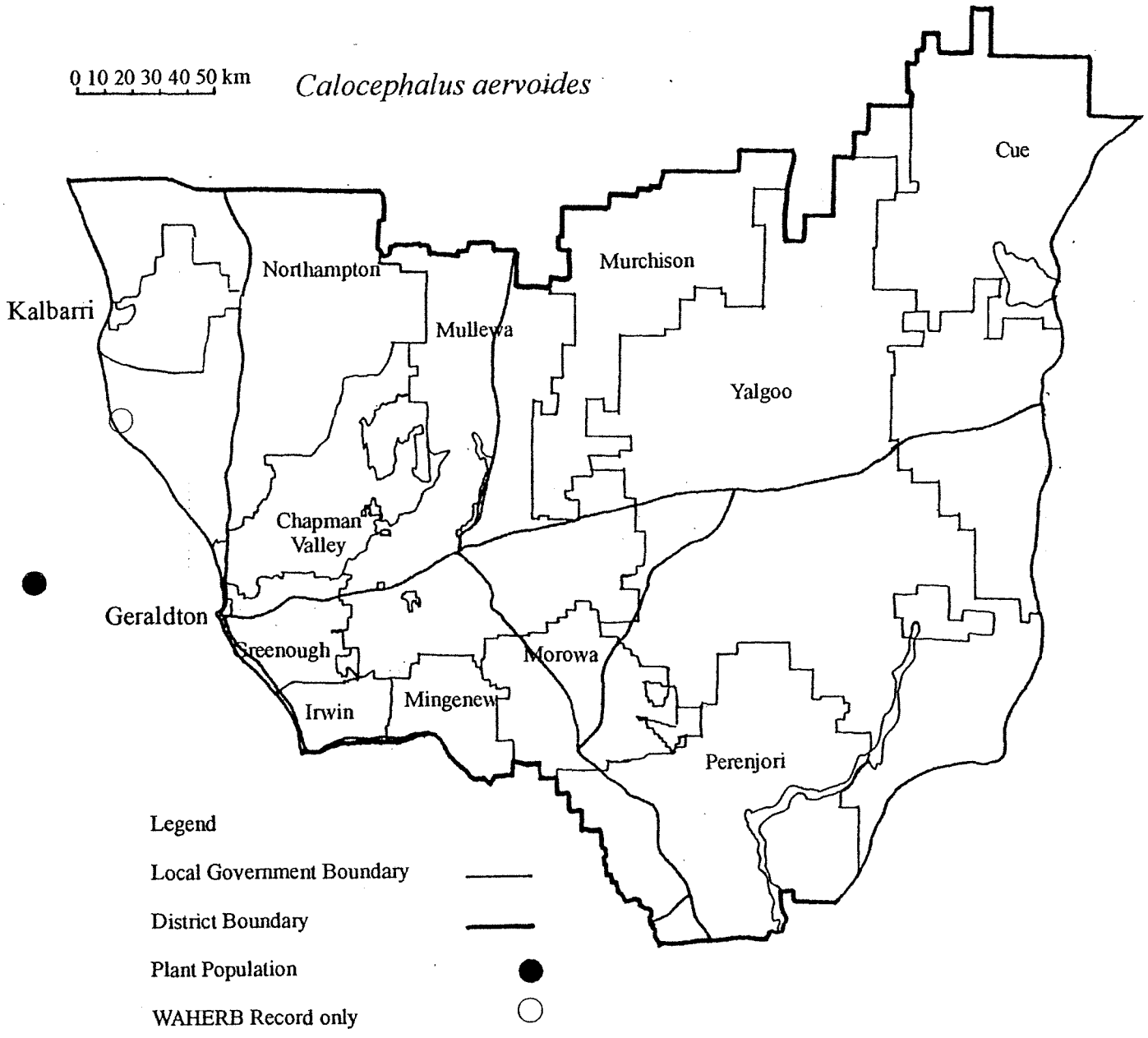
Unknown

Research Requirements

- Further survey is required.

References

Bentham (1867), Grieve & Blackall (1975), Mueller (1862).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Calocephalus aervoides
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Calytrix plumulosa (F.Muell.) B.D.Jacks. MYRTACEAE

A low shrub 15-40 cm tall and up to 90 cm across, bushy or almost prostrate, the apices of the flowering stems continuing the growth. The leaves are alternate, linear to linear-obovate, 3-11 mm long. The leaf blade in cross-section is orbicular to suborbicular. The inflorescences are scattered. Each flower has a hairy funnel-shaped cheiridium to 8 mm long. The hypanthium is short, 6-8 mm long and is joined to the style. It is 10-ribbed and has hairs between the ribs in the ovarian region, sometimes extending further upwards. The calyx is pubescent and the segments have pubescent awns to 9 mm long. The five petals are rose to violet in colour, yellow at the base, which becomes darker with age. They are lanceolate to elliptic, 7.5-9 mm long. There are 35-75 stamens in three rows, with yellow filaments up to 6 mm long. The style is 5-6.5 mm long.

This species is distinguished from others with pubescent calyces by the leaves, which are orbicular or almost so in cross-section. It is thought to be most closely related to *Calytrix simplex*.

Flowering Period: October-November

Distribution and Habitat in the Geraldton District

In the Geraldton District, this species occurs in the Bunjil area and to the east near Mt Gibson. It also occurs south of the District in the Pithara to Miling area and east to the Bencubbin, Mollerin, Mt Churchman and Chiddarcooping areas.

Grows in yellow clayey sand in open shrubland or in grey over yellow sandy loam in the Geraldton District. Elsewhere it has been recorded growing on red loam, yellow sand, sometimes with lateritic gravel or on yellow clayey sand. Associated vegetation is heath or scrub heath, sometimes with mallees and species of *Acacia, Allocasuarina, Callitris, Verticordia, Petrophile, Hakea, Melaleuca* and *Grevillea*.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SSW of Mt Gibson	Y	Pastoral Lease	21.11.1992	"occasional"	-
2.* S of Bunjil	P	-	28.10.1984	"moderately frequent"	-
3.* W of Bunjil	P	-	31.10.1978	-	-

Response to Disturbance

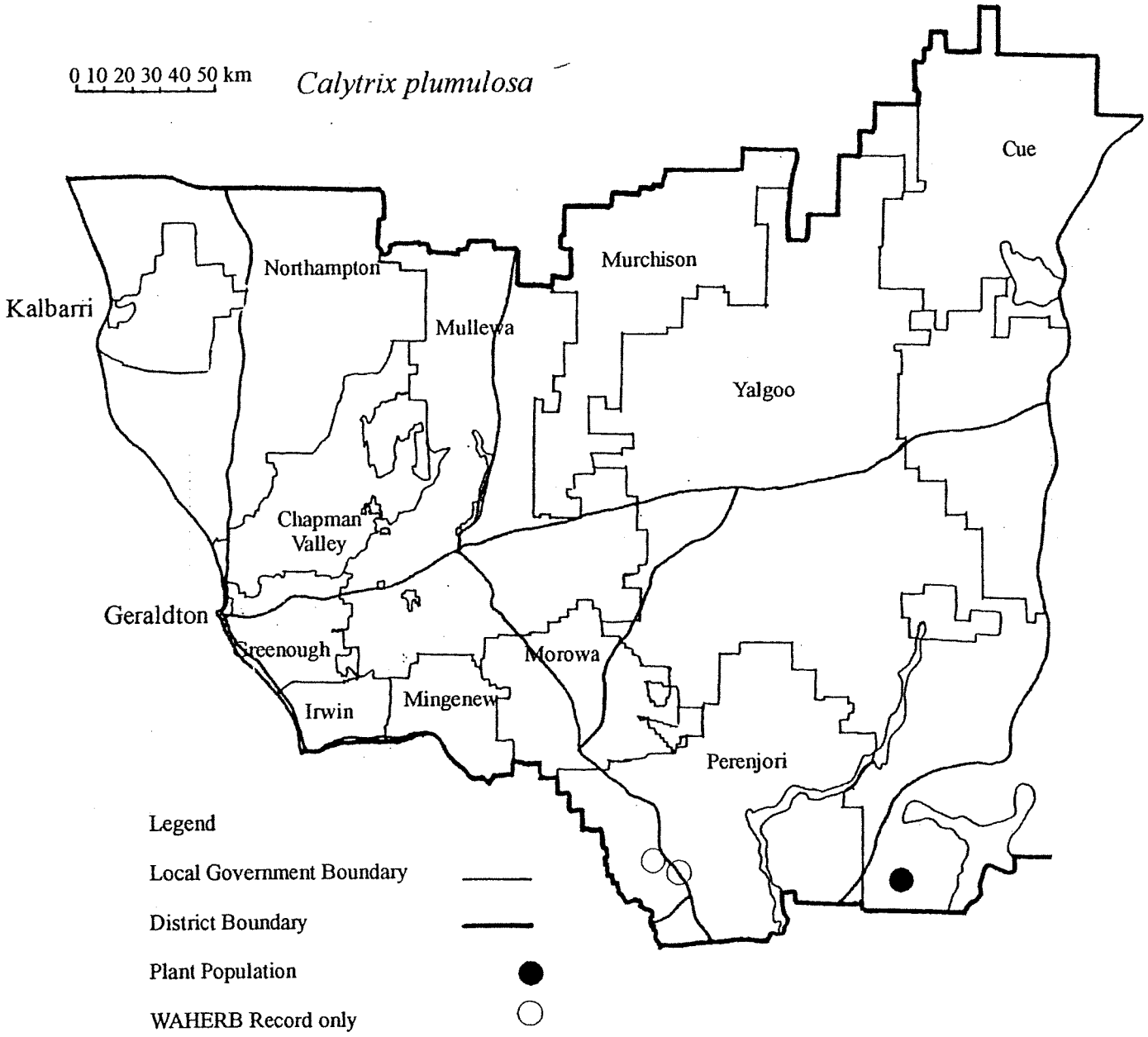
Unknown

Research Requirements

- Further survey is required.

References

Craven (1987b).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Calytrix plumulosa
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Centrolepis cephaloformis Reader subsp. *murrayi* (J.M.Black) D.A.Cooke

CENTROLEPIDACEAE

This taxon was originally described as *Centrolepis murrayi* by J.M. Black in 1923. It was subsequently reduced to a subspecies of *C. cephaloformis* by D.A. Cooke in 1980.

C. cephaloformis subsp. *murrayi* is a small, hairless, annual herb 5-8 mm high, which forms dense rounded tufts or cushions 4-25 mm in diameter. The leaves are 3-9 mm long, with a sheathing base and a recurved linear blade which has a short horny point. The flowers are usually solitary or sometimes two per head. They are sessile and each flower is enclosed within two sessile floral bracts 3-4 mm long, the lower one with an awn as long as the blade. Each flower has one stamen 2-4 mm long or this may be absent. There are 4-8 carpels and the styles are 1-2 mm long, joined for up to half their length. The seed is ovoid, smooth, pale brown, c. 0.5 mm long.

This subspecies differ from the typical subspecies in that there are usually one or two flowers per head, not three.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

This subspecies is known from three localities in the Geraldton District, to the north-east and south-east of Kalbarri. It has also been recorded from an island in the Recherche Archipelago off the south coast of Western Australia and from Mt Cooper north-east of Albany. It has also been collected from the Pearson Islands in South Australia.

Grows in damp places near rivers and water courses on sand amongst open shrubs and other low herbs.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* Geraldine Mine	N	-	14.8.1983	-	-
2.* W of Eurardy	N	Pastoral Lease	24.8.1969	-	-
3.* NW of Ajana	N	-	23.8.1965	-	-

Response to Disturbance

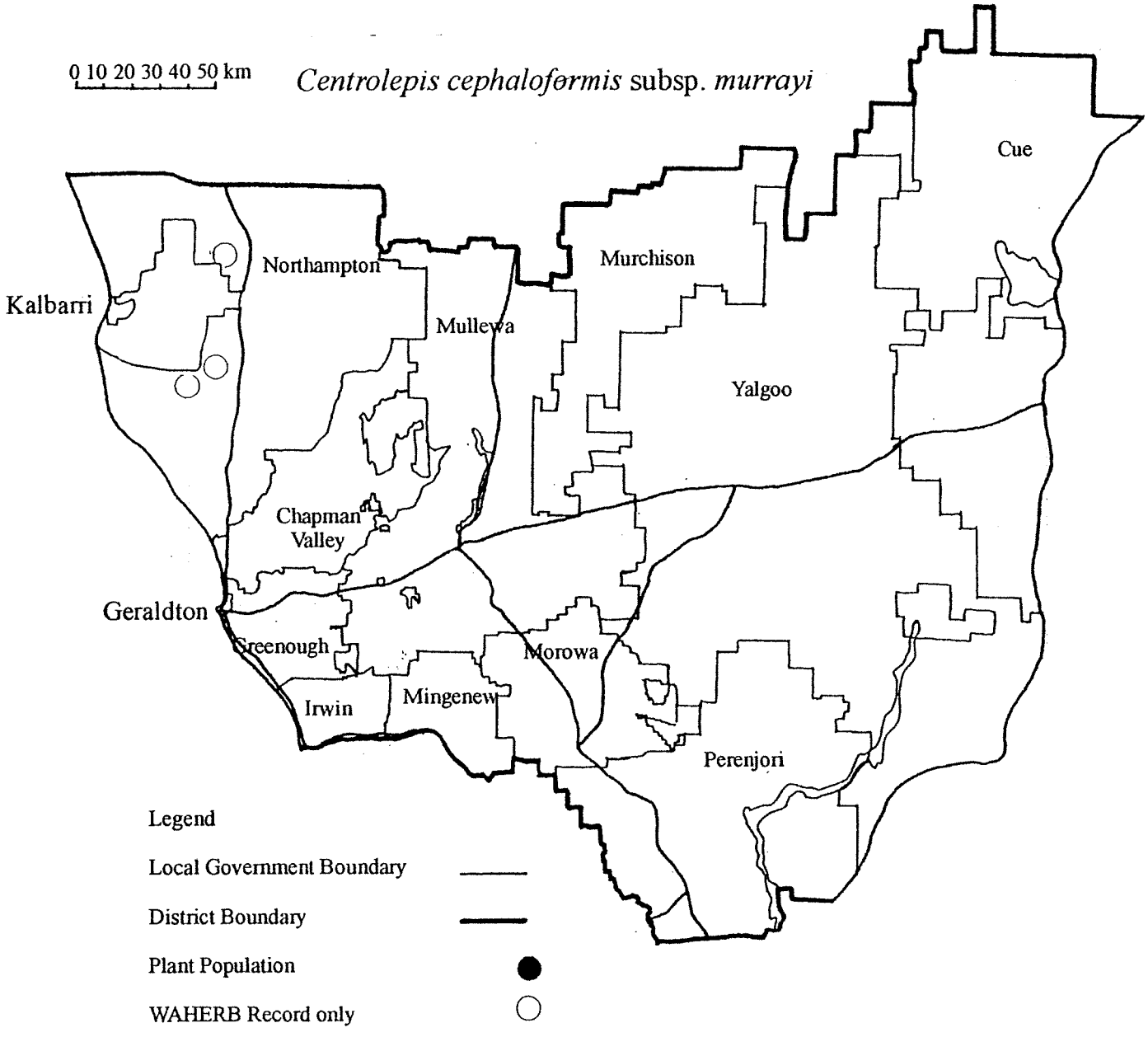
Unknown

Research Requirements

– Further survey is required, particularly to refind and survey all populations.

References

Black (1923, 1943), Cooke (1980).


0 10 20 30 40 50 km
Centrolepis cephaloformis subsp. murrayi
Cue
Murchison
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Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Chamelaucium conostigmum N.G.Marchant & Keighery ms MYRTACEAE

A low, spreading shrub, often compact, sometimes erect and 0.2 to 0.7 m tall and to 1 m in diameter. The leaves are linear, 3-6 mm long. The flowers are small, c. 5 mm long, with a deeply-ridged floral tube. They are dark maroon or magenta-purple-mauve in colour. The stigma is exserted, exceeding the length of the petals and is capitate, with a papillate surface.

Flowering Period: October-November in the Moora District, August-September in the Geraldton District

Distribution and Habitat in the Geraldton District

Chamelaucium conostigmum ms was collected in 1931 from south of Hamelin Pool in an area not far north of the north-western boundary of the Geraldton District. It is also found on the southern boundary of the District, where several populations are known near Coorow, and to the north-east in the Moora District, where one population was found in 1976 just 3 km outside the Geraldton District boundary. Similar habitat extends into the District to the west of Latham. Also occurs near Wongan Hills and Meckering in the Merredin District.

Grows near the edges of saline lakes, creeks or on salt flats, in white, yellow or grey sand or sandy clay. Associated vegetation is usually low open scrub, with species of *Verticordia, Frankenia* and *Darwinia,* but at the most southerly population, it occurs in low open woodland of *Eucalyptus rudis* with scrub.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

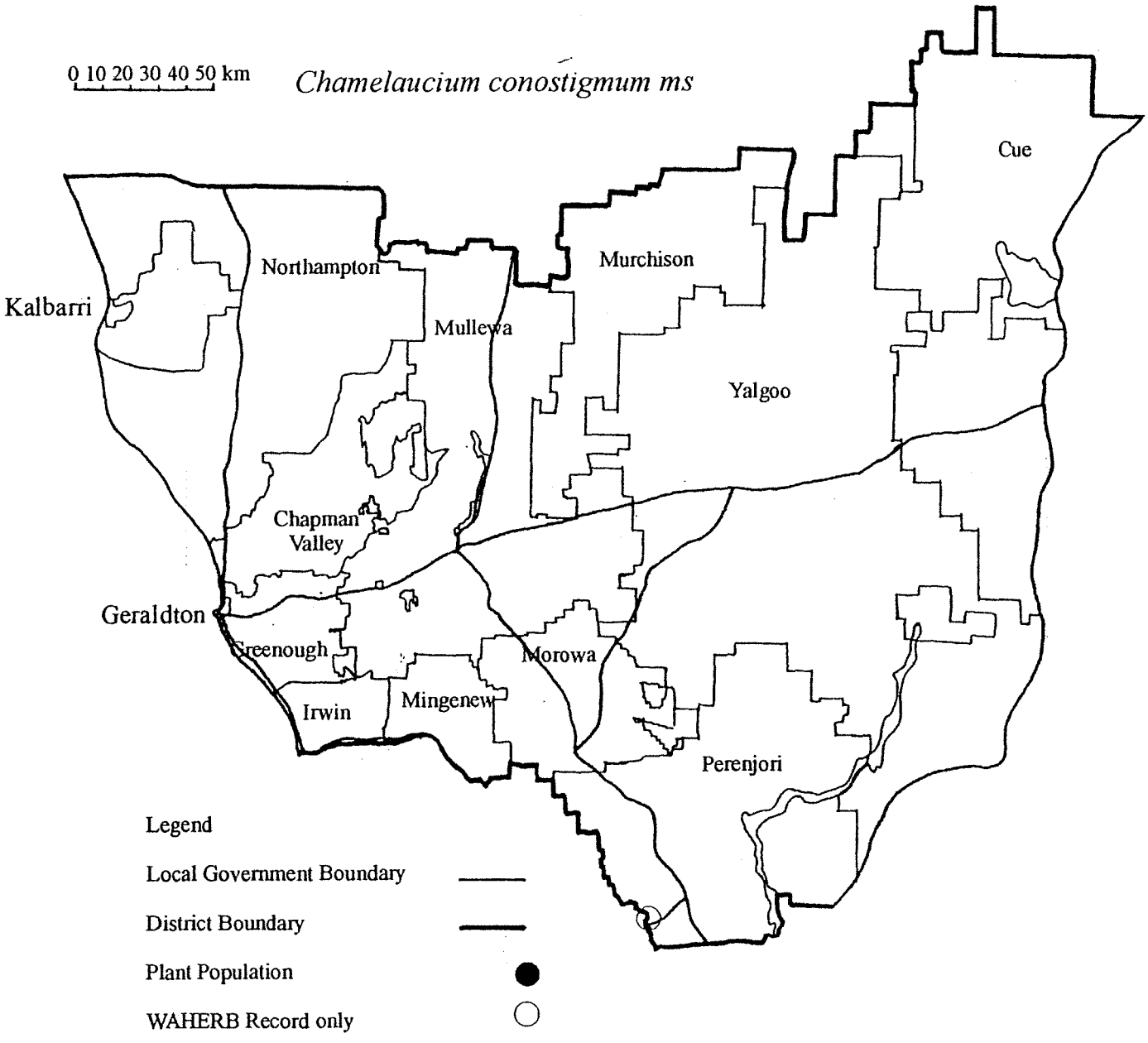
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* NE of Coorow	Co	-	4.11.1976	-	-

Response to Disturbance

Unknown

Research Requirements

- Further survey is required, particularly on suitable habitat in the Latham area and in the north-western part of the District.


0 10 20 30 40 50 km
Chamelaucium conostigmum ms
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Comesperma acerosum Steetz POLYGALACEAE

An erect, leafy shrub, little-branched, 0.3 to 0.8 m high. The leaves are linear, pungent and keeled, c. 10 mm long. The flowers are arranged in dense racemes to 5 cm long and each flower has free outer sepals which are much shorter than the wings. The standard and keel petals are mauve-purple, the wings yellow and mauve-purple. The keel petal is horned. The fruit is a capsule c. 6 mm long, broad at the top with a blunt or three-toothed apex, narrowing to a stipe as long as the broad part. The seeds have a tuft of hairs.

Flowering Period: September-December

Distribution and Habitat in the Geraldton District

This species has been recorded from south-east of Geraldton in the Geraldton District It is known mainly between Eneabba and Badgingarra in the Moora District, with an easterly occurrence at Watheroo. A taxon with an affinity to this species occurs on the south coast in the Cape Arid area.

Grows in grey or white sand with lateritic gravel or clay in low heath and open shrubland. Associated species at population 1 were *Calothamnus sanguineus, Hibbertia hypericoides* and *Dryandra shuttleworthiana.*

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Burma Road	G	Nature Reserve	24.10.1992	-	-
2.* S of Geraldton	I	-	23.10.1967	-	-
3.* Burma Road	-	-	29.9.1962	-	-

Response to Disturbance

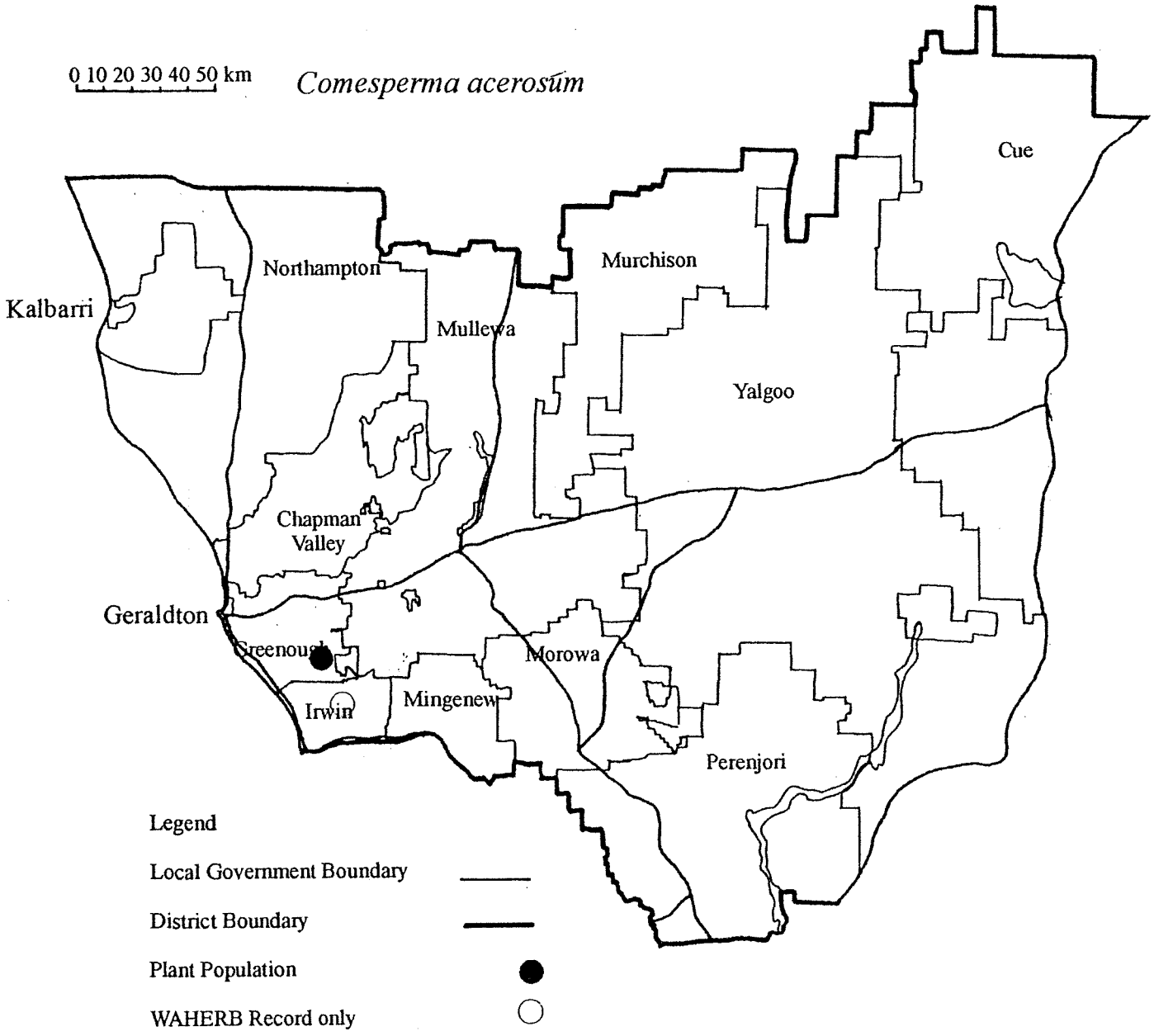
A population in the Moora District was recorded in an area burnt two years previously.

Research Requirements

– Further survey is required.

References

Bentham (1863), Blackall & Grieve (1985).


0 10 20 30 40 50 km
Comesperma acerosum
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Cryptandra imbricata Rye ms

RHAMNACEAE

A dense, rigid shrub which may be almost prostrate or to 1.5 m tall, rounded in shape with wide-spreading intricate branches. The branchlets are spinescent, 5-20 mm long with several clusters of leaves. The leaves are narrow, to 3.5 mm long, to 0.6 mm wide, with recurved or closely rolled back margins. There is one spike-like cluster of 1-7 flowers on each branchlet. The flowers are white, with 11-14 closely overlapping brown bracts at the base which are hairy on the outside. The floral tube is 2.5-3.1 mm long, slightly longer than the whorl of bracts and stellate-hairy, enlarging in fruit. The sepals are 2-3 mm long, densely stellate-hairy and often widely spreading. The hooded petal claws are 0.5 mm long. The ovary is three-celled and the fruit is densely hairy, with the base concealed within the petal tube and bracts. The seeds are dark brown.

Cryptandra imbricata is closely related to *C. connata,* which has bracts glabrous on the outside, and the outside of the flowers glabrous except for a tuft of hairs near the apex of each sepal. It has a longer floral tube with erect sepals and the floral tube is almost twice as long as the whorl of bracts and is strongly contracted at the summit. A greater proportion of the fruit is hidden within the floral tube, with the sepals extending beyond the apex of the fruit.

Flowering Period: June-July

Distribution and Habitat in the Geraldton District

Occurs in the District from north of Mullewa, and Morowa east to the Paynes Find area, and south-east of the District between Paynes Find and Cleary in the Merredin District. It also extends north of the District on the western side to the Toolonga area.

Grows on red sand, red-brown sandy clay or sandy loam in tall shrubland or low *Acacia* woodland, sometimes with mallees, and outside the District, in York gum woodland. Associated species include *Eucalyptus websteriana, E. oldfieldii, Calycopeplus ephedroides, Thryptomene mucronulata, Acacia aneura* and *A. grasbyi.*

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. N of Paynes Find	Y	MRWA Road Verge, Pastoral Lease	18.7.1994	100+	Healthy to moderate
2. N of Paynes Find	Y	MRWA Road Verge, Pastoral Lease	18.7.1994	20+	Healthy
3. NNE of Morowa	Y	Shire Road Verge	20.6.1995	30+	Healthy
4. NNE of Morowa	Y	Shire Road Verge	20.6.1995	3+	Healthy
5. E of Mount Gibson	Y	Pastoral Lease	16.7.1996	1+	Healthy
6. NW of Paynes Find	Y	Pastoral Lease CALM	12.9.1996	2	Healthy
7. NNE of Morowa	Y	Pastoral Lease	20.2.1997	5+	Healthy
8. NNE of Morowa	Y	Pastoral Lease	20.2.1997	20+	Healthy
9. NW of Paynes Find	Y	Pastoral Lease CA:<	17.8.1997	10+	Healthy
10. NW of Paynes Find	Y	Pastoral Lease CALM	21.8.1997	20	Healthy
11. NW of Paynes Find	Y	Pastoral Lease CALM	18.3.1999	100+	Healthy
12.*N of Paynes Find	Y	-	1968	-	-
13.*SW of Paynes Find	Y	-	8.9.1938	-	-
14.*N of Mullewa	Mu	-	8.7.1969	-	-

Response to Disturbance

Unknown

Management Requirements

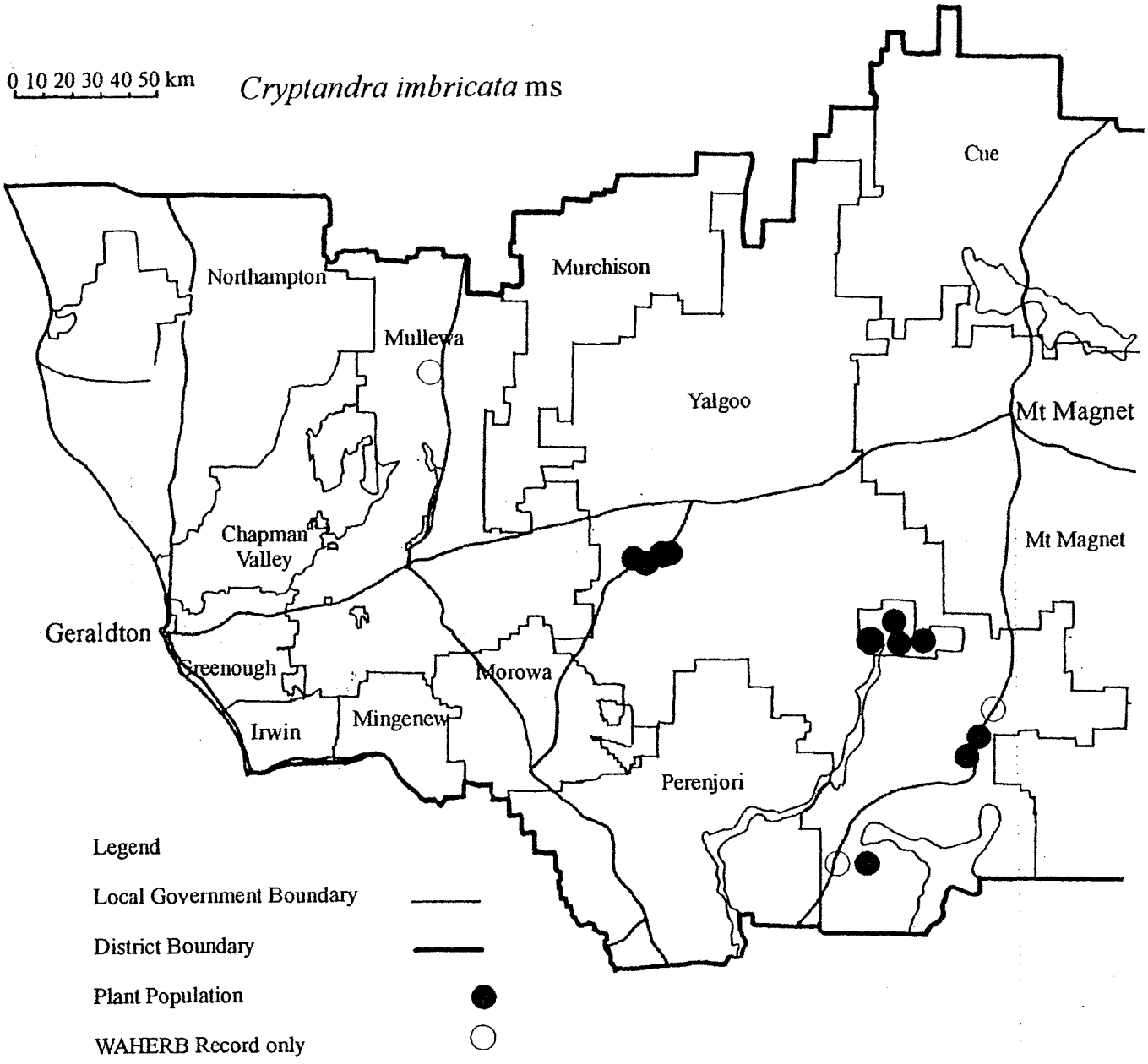
- Ensure that road verge populations are marked.

Research Requirements

- Further survey is required, particularly to refind this species north of Mullewa.

References

B. Rye (personal communication).



Cryptandra nudiflora F.Muell. RHAMNACEAE

Wedge-leaved Cryptandra

A low shrub about 30 cm tall with spreading branches which are rigid and with short branchlets which sometimes end in spines. The leaves are linear-cuneate with a broad apex, sometimes bilobed, and tapering towards the base. They are up to 12 mm long. The flowers are clustered along the branches on pedicels c. 3 mm long. The calyx is tubular, the short lobes and tube glabrous, c. 4 mm long. It is deep pink in colour, bell-shaped, as long as the five hooded petals. The disc and ovary are glabrous.

Flowering Period: July-September

Distribution and Habitat in the Geraldton District

This species was originally collected from Port Gregory and the Murchison River and is known from several populations in the Geraldton District in the Northampton to Port Gregory area. However, the species has also been collected twice much further south from the Moora District in the Koojan area, south of Moora.

Near Northampton, it grows in shallow clay loams or sandy clay, often associated with sheet granite, in winter-wet areas, growing amongst low heath. Associated species include *Thryptomene saxicola, Hakea preissii, Melaleuca uncinata, Scaevola spinescens, Opercularia vaginata, Grevillea thelemanniana* and species of *Acacia* and *Dampiera.*

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. W of Ogilvy	N	Shire Road Reserve	7.8.1994	10+	Moderate
2. N of Northampton	N	MRWA Road Reserve, VCL	7.8.1994 13.8.1996	{500+ {	Healthy
3. SE of Port Gregory	N	Shire Road Reserve, Private	8.8.1994	20+	Moderate
4. WNW of Northampton	N	Shire Road Reserve	7.8.1994	200+	Healthy, some weed infestation
5. Rob Road	N	Private	8.8.1994	200+	Healthy, narrow road verge
6. Yerina Springs Road	N	Shire Road Reserve, Private	9.8.1994	1 000+	Healthy
7. SW of Ogilvy	N	VCL	13.8.1996	10+	Healthy
8. N of Northampton	N	-	2.9.1985	-	-
9. *E of Ogilvy	N	-	28.7.1968	-	-
10.*Port Gregory	N	-	1850-60	-	-

Response to Disturbance

Unknown

Management Requirements

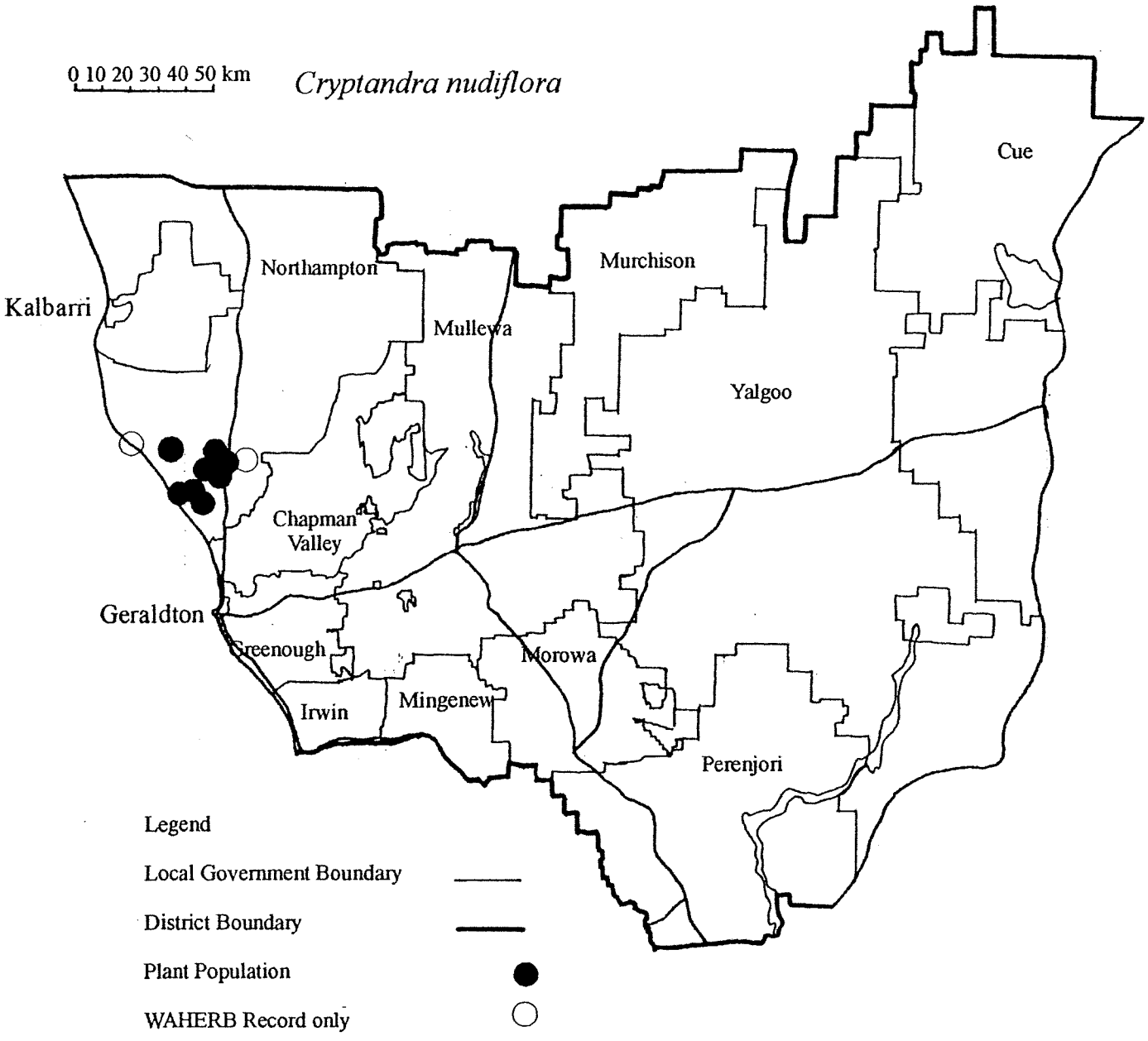
- Ensure that road verge populations are marked.
- Maintain liaison with land managers.

Research Requirements

- Further survey is required on conservation reserves in the District for this species.

References

Bentham (1863), Blackall & Grieve (1985).



Darwinia sp. Morawa (C.A.Gardner 2662) MYRTACEAE

[*Darwinia* sp. Nov.6 "pom pom"]

A low, spreading shrub to 0.3 m tall and 1 m wide, with leaves which are crowded, linear, slightly keeled and with denticulate margins. They are grey-green in colour. The inflorescences are upright, many-flowered, c. 1 cm in diameter, without an involucre of broad coloured bracts. The flowers are crimson, the calyx tube with rings of papillae, the styles c. 2.5 mm long.

This taxon has been confused with *Darwinia purpurea* in the past, but differs in its upright inflorescences which do not have an involucre of broad coloured bracts.

Flowering Period: August-October

Distribution and Habitat in the Geraldton District

Occurs between Mullewa and Morowa, extending east to the Pindar area.

Grows on sandy gravel, red sandy loam, red-brown clay over granite, in open scrub over heath. Associated species include *Melaleuca uncinata, Acacia acuminata, Malleostemon roseus* and species of *Hemigenia, Scholtzia* and *Borya.*

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. E of Pindar	Mu	MRWA Road Verge, Rail Reserve, Townsite Reserve	12.11.1996	100+	Healthy-moderate, some disturbance
2. S of Wilroy	Mu	Shire Road Verge	7.10.1994	54	Moderate, weed infestation, disturbance
3. S of Wilroy	Mu	Shire Road Verge	7.10.1994	1	Moderate
4. SE of Pindar	Mu	VCL	12.11.1996	100+	Healthy
5.* E of Pindar	Mu	-	23.8.1985	"Rare"	-
6.* S of Pindar	Mu	-	20.9.1968	-	-
7.* SW of Mullewa	Mu	-	1.10.1960	-	-
8.* Near Morowa	Mo	-	9.1963	-	-
9.* Canna	Mo	-	18.9.1931	-	-

Response to Disturbance

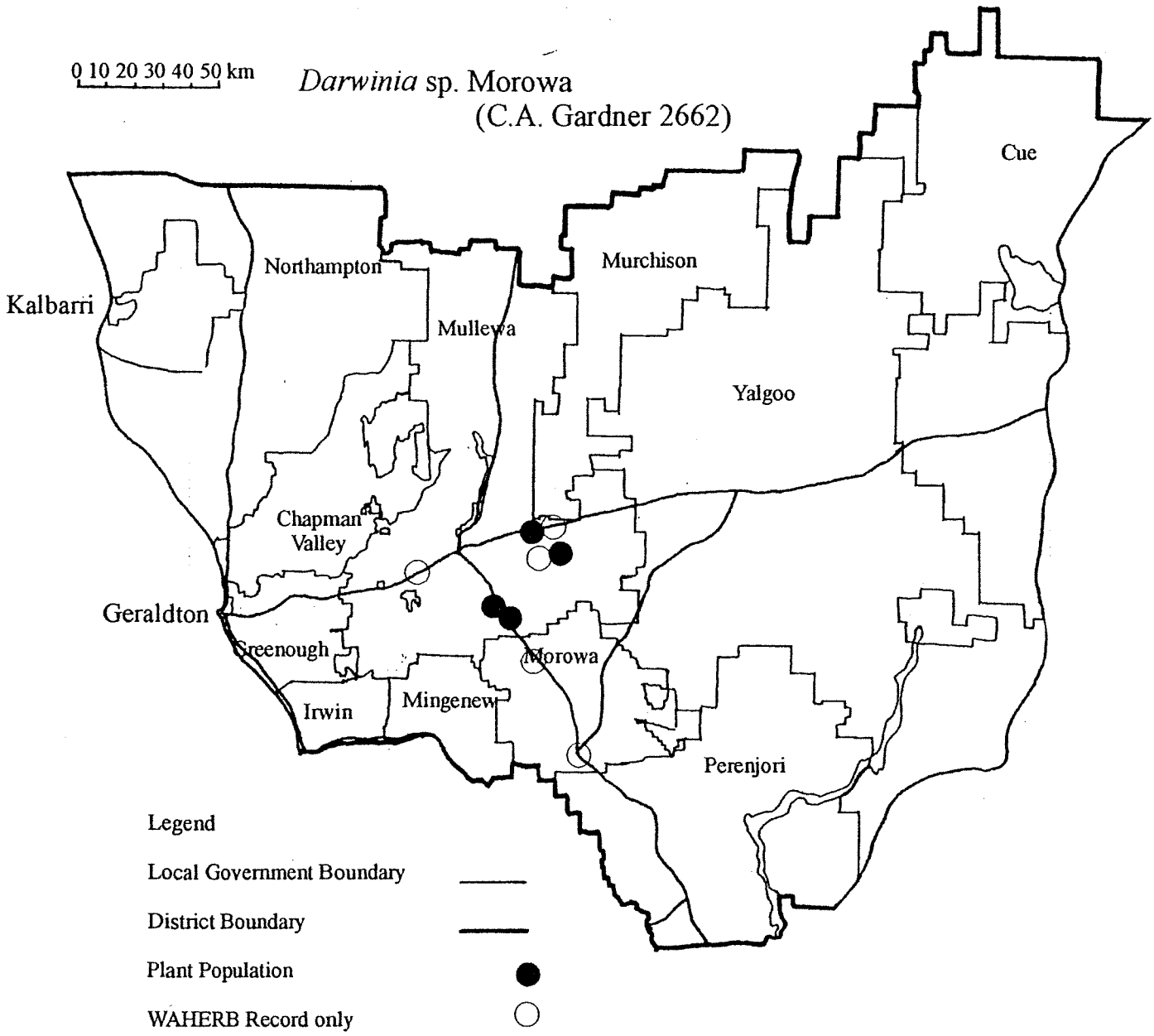
Unknown

Management Requirements

- Ensure that road verge and rail reserve populations are marked.

Research Requirements

- Further survey is required, particularly at flowering time on vacant crown land in the vicinity of population 4, to discover the full extent of the distribution of this taxon in the area.


0 10 20 30 40 50 km
Darwinia sp. Morowa
(C.A. Gardner 2662)
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Dicrastylis linearifolia Munir CHLOANTHACEAE

A shrub 1.5-3 m tall and to 3 m broad, with a dense, appressed covering of scale-like hairs on the young stems and flower heads. The young stems are bright orange or dark orange-brown. The leaves are opposite, almost linear to narrowly obovate, on stalks 1-4.5 mm long. The leaf blades are 16-45 mm long and 3-6 mm wide. The upper surface of the leaves is medium to dark green, covered with shallow blisters with stellate hairs between them. The lower leaf surface is densely covered with white appressed hairs. The flowers are white and are grouped in panicles, usually many-flowered but may be few-flowered. Each flower usually has the parts in fives but sometimes in fours. The corolla has a tube to 2.3 mm long and obovate lobes to 4 mm long. There are usually five stamens, the filaments 2.5-3.7 mm long. The anthers are pale coloured or red-brown. The fruit is up to 2.4 mm long, 1.8 mm wide and is hairy.

Flowering Period: November-December

Distribution and Habitat in the Geraldton District

Has been recorded on the western side of the District from Binnu northwards beyond the District boundary to the Wannoo area. There are also three records further inland, one north-east of Mt Magnet and two between Mt Magnet and Paynes Find.

No details of habitat, apart from red sand and sand heath, have been recorded for the westerly populations. Two of the easterly populations occur on sand ridges and at Meka, the species grows with *Acacia linophylla*. Population 1 grows on a wide ridge of red sand in tall open shrubland with *Grevillea excelsior, Acacia murrayana, Scaevola spinescens, Duboisia hopwoodi, Cryptandra imbricata* and *Bursaria occidentalis* over bunch grasses and ephemeral herbs.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. NW of Paynes Find	Y	Pastoral Lease CALM	18.3.1999	1 000+	Healthy
2.* Meka	Y	Pastoral Lease	10.12.1980	-	-
3.* SE of Mt Magnet	MM	Pastoral Lease	25.9.1973	-	-
4.* N of Murchison River	N	-	21.1.1976	-	-
5.* N of Murchison River	N	-	14.12.1964	-	-
6.* Binnu	N	-	18.12.1962	-	-
7.* N of Murchison River	N	-	20.12.1962	-	-
8. NE of Mt Magnet	MM	-	?1997	"small population"	-

Response to Disturbance

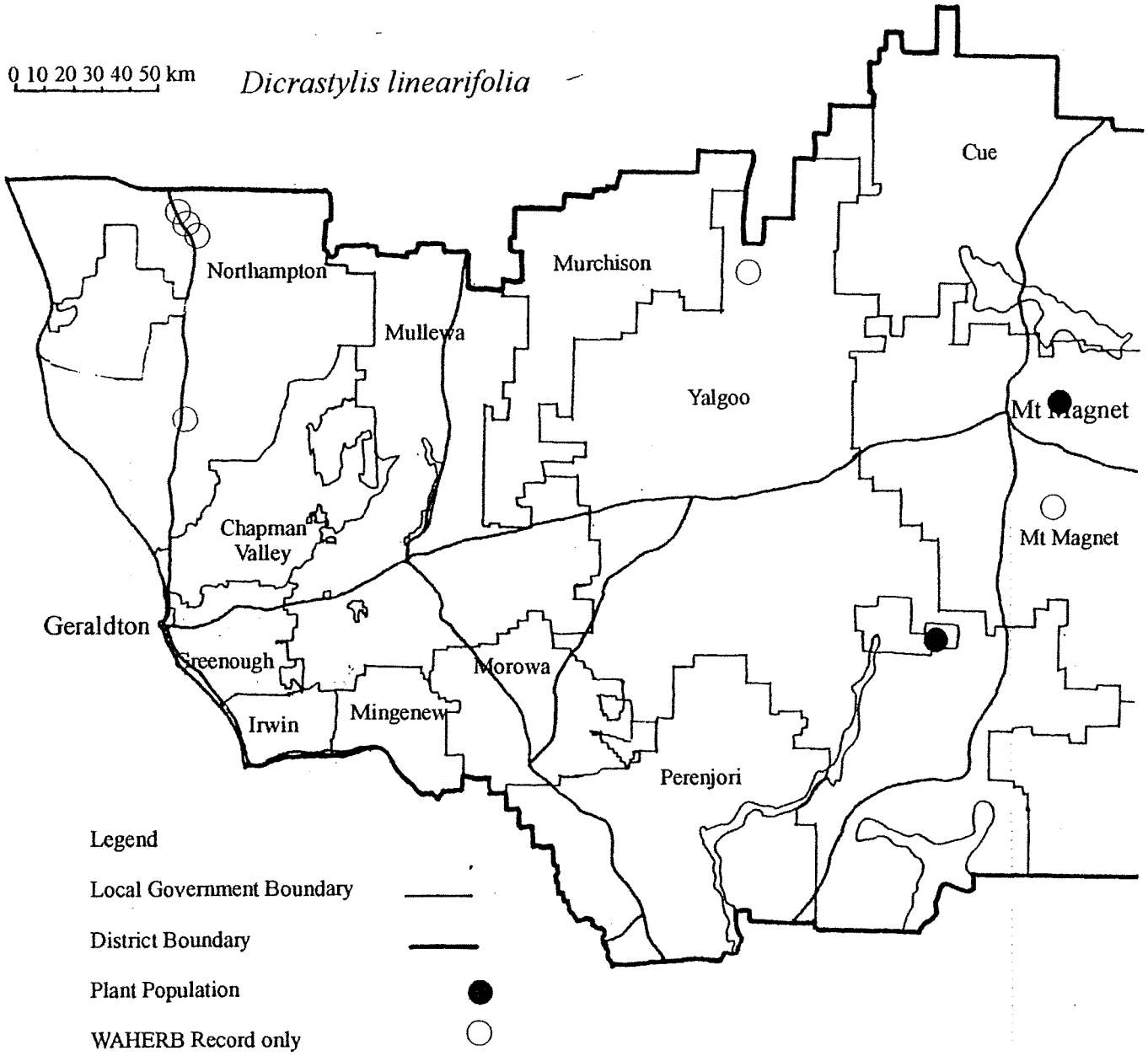
Unknown

Research Requirements

- Further survey is required.

References

Munir (1978), Rye & Trudgen (1998).


0 10 20 30 40 50 km
Dicrastylis linearifolia
Cue
Murchison
Northampton
Mullewa
Yalgoo
Mt Magnet
Mt Magnet
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Drummondita miniata (C.A.Gardner) Paul G.Wilson RUTACEAE

Described in 1928 as *Philotheca miniata,* this species is a robust, much-branched shrub c. 1 m tall, with club-shaped leaves 10-15 mm long which are held erect and have minute woolly hairs when young. They are dark at the apex. The flowers are terminal on the branchlets, either solitary or in groups of up to three. They are tubular, with five red petals and grey staminal filaments. The calyx is made up of five unequal sepals, broader than long, which are hairy on the outside. There are five stamens alternating with five staminodes, two-thirds united into a tube which is red at the base becoming violet upwards and densely hairy on the outside, but the base is glabrous on the inside.

Flowering Period: July-August, November

Distribution and Habitat in the Geraldton District

Occurs in the District over a range of c. 50 km to the east of Cue. Has also been collected from north of the District from five localities east of Meekatharra, the species having a total geographic range of c. 100 km.

Grows on flat lateritic or granitic surfaces above breakaways in pockets of yellow-brown sandy loam. Occurs in very open low shrubland. Associated species include *Eremophila latrobei* and species of *Acacia, Eriostemon* and *Thryptomene.*

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. E of Cue	C	Pastoral Lease	20.7.1994	30+	Healthy
2. E of Cue	C	Pastoral Lease	20.7.1994	500+	Healthy
3. SE of Cue	C	Pastoral Lease	2.8.1995	200+	Moderate, some grazing
4. NE of Cue	C	Shire Reserve	20.7.1994	500+	Healthy
5. E of Cue	C	Pastoral Lease	21.7.1994	50+	Healthy

Response to Disturbance

Unknown

Research Requirements

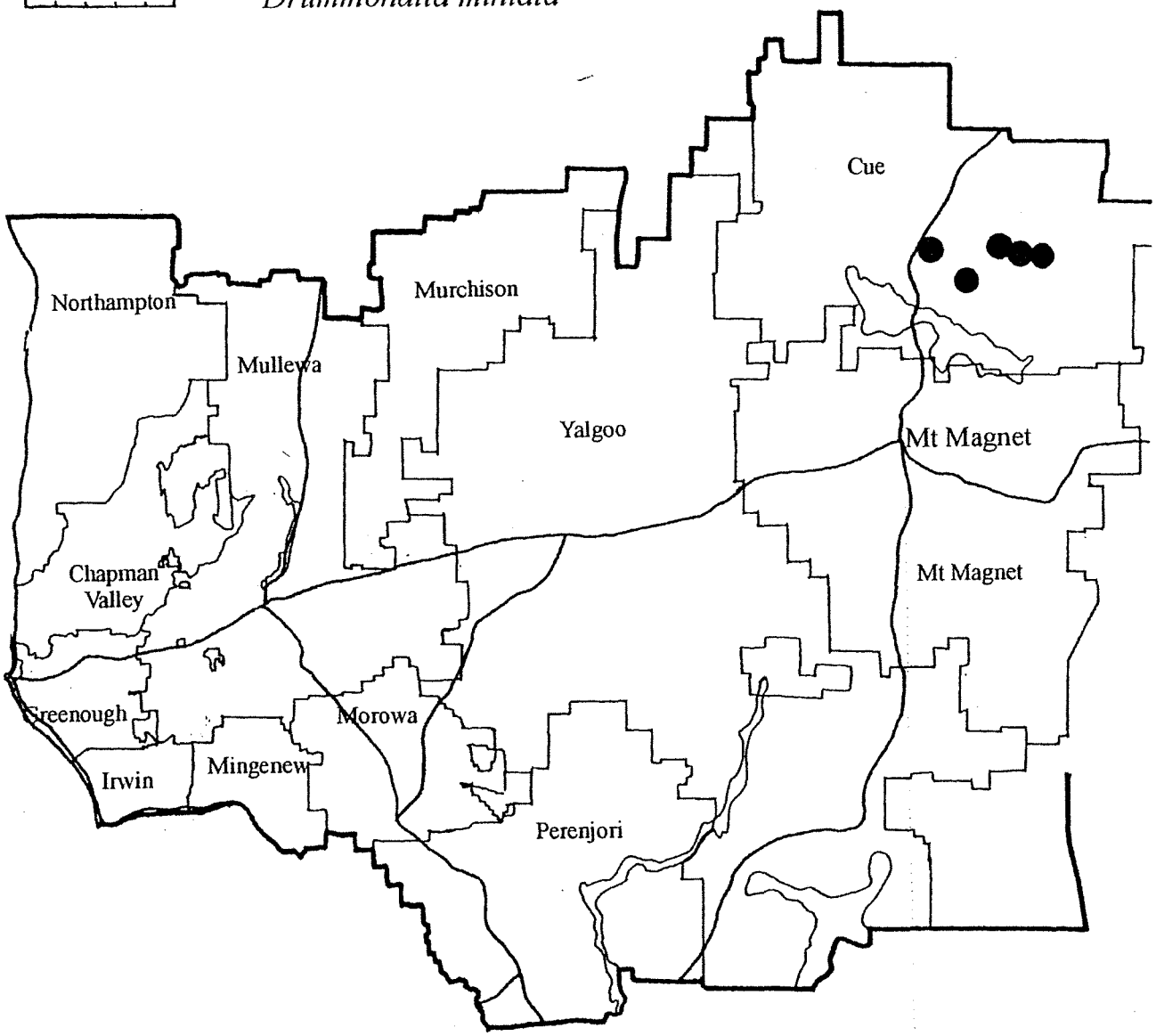
- Further survey is required.

References

Gardner (1928b), Grieve (1998).

0 10 20 30 40 50 km

Drummondita miniata



Legend

Local Government Boundary

District Boundary

Plant Population

WAHERB Record only

Eremophila brevifolia (A.DC.) F.Muell. MYOPORACEAE

Spotted Eremophila

An erect, diffuse shrub 1.5-4 m tall, with glabrous branches. The leaves are alternate, sessile and almost stem-clasping. They are glabrous and broadly ovate, orbicular or obovate in shape, with glandular spots. They are obtuse, with serrate margins, 4-8 mm long. The flowers are solitary on short axillary pedicels. They have five narrow, acute sepals and are white or pale lavender in colour. The corolla is c. 8 mm long, hairy on the inside, with the stamens included within the tube. The corolla lobes are short, the middle lower one is broader than the others. The fruit are oblong, strongly compressed, with two compartments.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

Known from two populations to the north and north-east of Geraldton. Two earlier records from the Chapman River made in 1931 may be from the same locality as population 1. It has also been recorded recently from south-south-west of Kellerberrin.

Grows in yellow or red clayey sand, in shrubland on hill slopes or valley sides. Associated species include *Melaleuca megacephala, Alyxia buxifolia* and species of *Eucalyptus, Acacia* and *Astroloma.*

Conservation Status

Current: Priority 3[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. N of Geraldton	G	Shire Reserve	28.9.1996	100+	Healthy
2.* NE of Geraldton	CV	Shire Reserve	24.8.1983	"occasional"	-

Response to Disturbance

The plants at population 1 were regenerating after a fire in summer 1995, when surveyed in September 1996.

Management Requirements

- Maintain liaison with land managers.

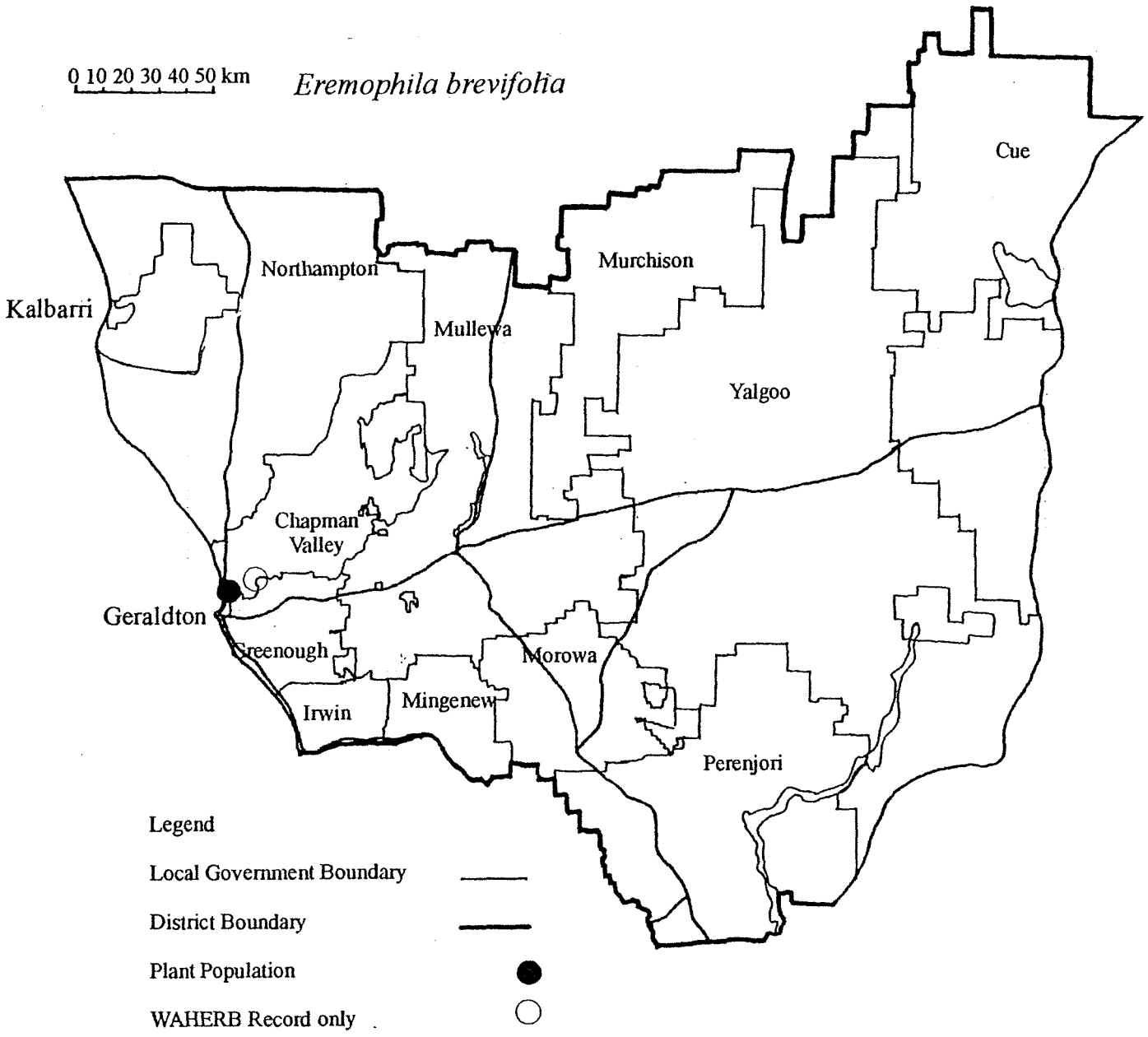
Research Requirements

- Further survey is required.

References

Bentham (1870), Grieve & Blackall (1975), Mueller (1859).

[#] now Priority 1 (updated at December 1999)


0 10 20 30 40 50 km
Eremophila brevifolia
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Eucalyptus arachnaea Brooker & Hopper subsp. *arrecta* Brooker & Hopper

MYRTACEAE

Black-stemmed Mallee

A tree to 10 m tall, with dark rough bark, deltoid to ovate, dull blue-green juvenile leaves, the adult leaves very glossy. The inflorescences have up to 13 flowers. The buds have a narrow horn-shaped operculum, often hooked at the tip. The fruits are obconical or shortly cylindrical, to 0.7 cm long.

Occurs to the east of the range of the typical subspecies and differs from it in its tree, not mallee, habit and glossier leaves.

Flowering Period: Unknown

Distribution and Habitat in the Geraldton District

Occurs to the north and east of Mingenew and has also been reported from further to the north-west in the Yuna area, where it grows on a nature reserve and on private property.

Grows on the lower slopes of breakaways, on stony sites in gravelly loam, pale brown sandy loam or brown clay loam in open low woodland with open shrubland. Associated vegetation includes *Eucalyptus subangusta* subsp. *pusilla, E. oldfieldii, E. stowardii, E. obtusiflora, E. horistes, Melaleuca uncinata* and species of *Hakea* and *Dodonaea.*

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. N of Mingenew	Mi	Conservation Park	18.5.1994	30+	Healthy
2. E of Yandanooka	Mi	Private	2.9.1992	"occasional"	-
3. SE of Yuna	CV	Nature Reserve	17.9.1992	100+	Many dead
4. W of Morowa	Mo	Private	3.2.1988	-	-
5. W of Morowa	Mo	Private	9.9.1987	-	-

Response to Disturbance

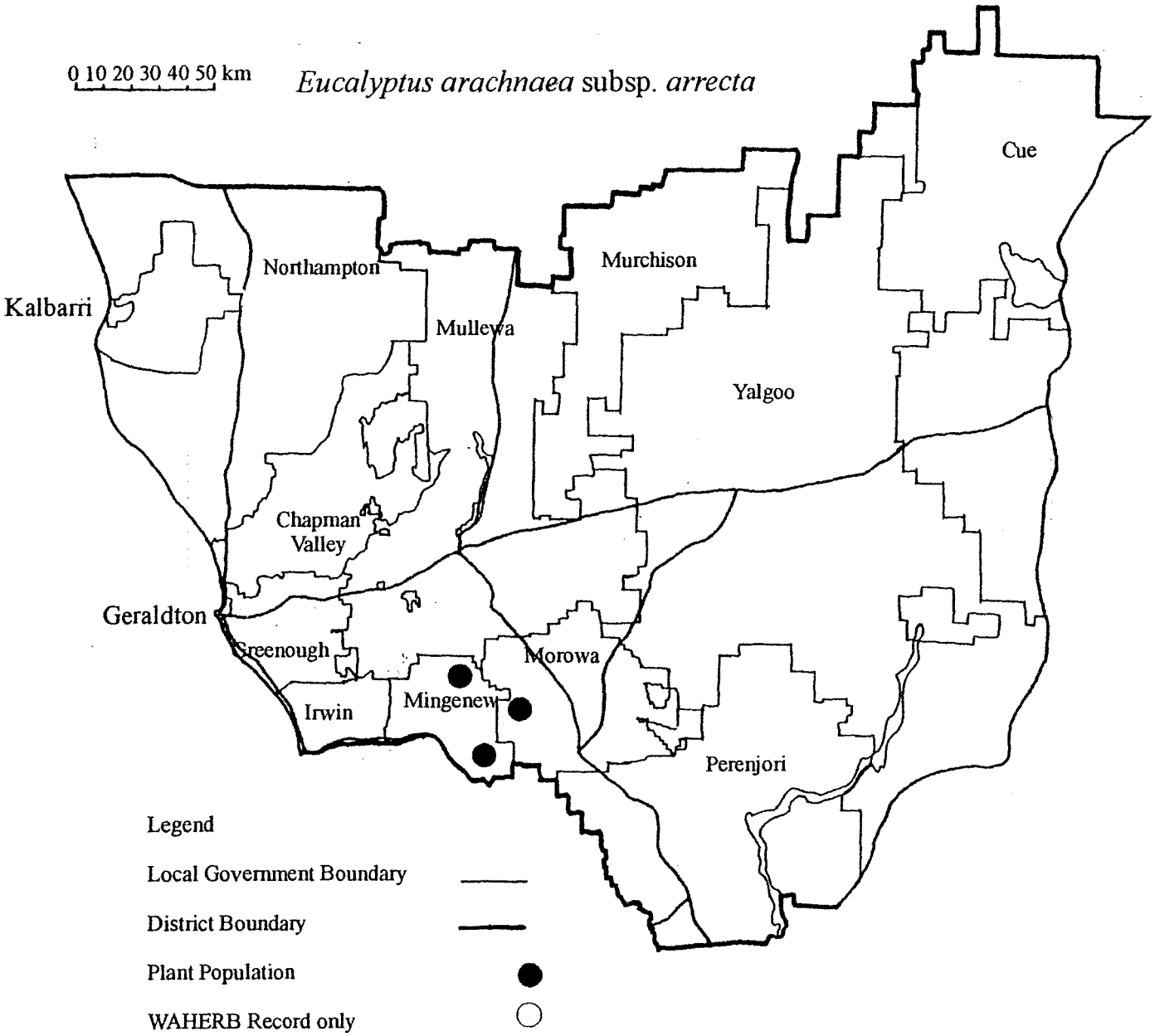
Unknown

Research Requirements

- Further survey is required, particularly on nature reserves south-east of Yuna, to confirm the presence of further populations reported from the area.

References

Brooker & Hopper (1991).


0 10 20 30 40 50 km
Eucalyptus arachnaea subsp. arrecta
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Mingenew
Irwin
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Eucalyptus foecunda Schauer in Lehm. subsp. Coolimba (M.I.H.Brooker 9556)

MYRTACEAE

A mallee to 4 m tall, with smooth grey bark, ribboning for 2 m from the base, with pale yellow-brown bark beneath. The leaves are shining, to 10 x 1.2 cm, with a dense fine vein network. There are up to 11 buds in each inflorescence, the stamens strongly inflexed within the bud. The bud caps are distinctly beaked. The fruits are barrel-shaped with a short stalk, a thick rim and a whitish disc, which is level to descending. The fruits are 0.6 cm long and 0.4-0.5 cm wide.

Similar to *Eucalyptus foecunda*, which differs in its conical to slightly beaked opercula and thin rough bark. It is recognised as a local variant of *E. foecunda.*

Flowering Period: Unknown

Distribution and Habitat in the Geraldton District

In the Geraldton District, this taxon has been found south of Kalbarri, where it occurs on an undulating limestone ridge in shrubland with other species of *Eucalyptus* and *Acacia.* It is also known from four populations on the coastal dunes north of Coolimba in the Moora District, where it grows in white sand over limestone in low heath with *E. zopherophloia* and *Melaleuca huegelii.* It also occurs on a nature reserve north of Jurien Bay.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. S of Kalbarri	N	National Park	19.6.1996	10+	Healthy

Response to Disturbance

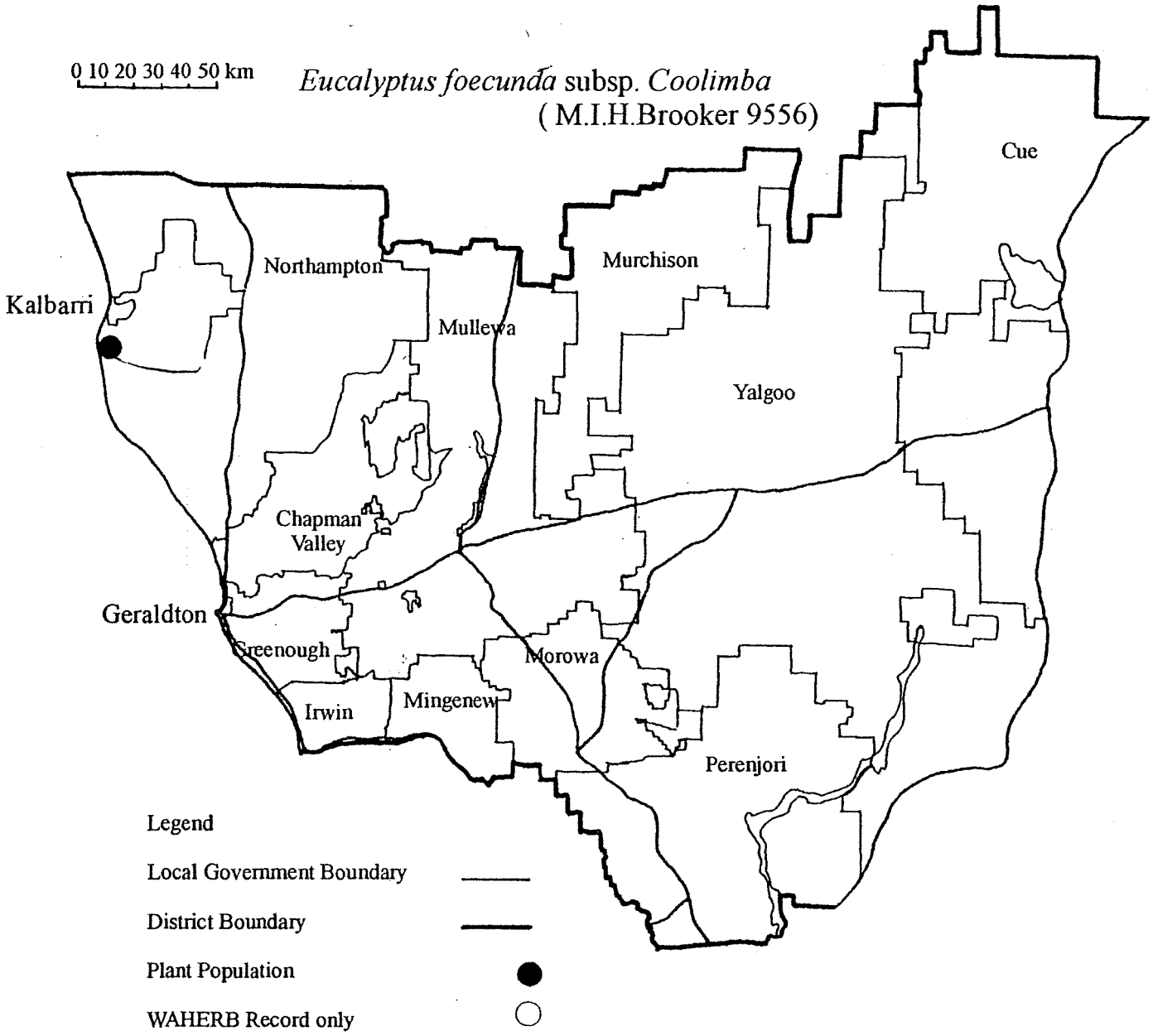
Resprouts after fire.

Research Requirements

- Further survey is required to record the full extent of the taxon, which is thought to occur only locally at the northern end of the range of *E. foecunda.*

References

Kelly *et al.* (1995), Napier *et al.* (1988).


0 10 20 30 40 50 km
Eucalyptus foecunda subsp. Coolimba
(M.I.H.Brooker 9556)
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Geleznowia verrucosa Turcz. RUTACEAE

Yellow Bells

Geleznowia verrucosa is a woody shrub 0.1-1.5 m high, with small, alternate, overlapping leaves. They are obovate-oblong, 3-10 mm long, leathery with warty glands. The flowers are grouped 1-3 in terminal clusters, surrounded and hidden by large yellow petal-like bracts and sepals. There are five oblong, smaller yellow petals, ten stamens and five distinct carpels. The sepals and petals are glandular-warty on the outside and the floral bracts turn orange with age. The fruits are two-valved unbeaked cocci.

G. verrucosa was originally described by Turczaninow in 1849. Bentham divided the species into *G. verrucosa, G. macrocarpa* and *G. calcina* in 1863. A recent revision found no clear distinction between the species and a monospecific status was adopted.

Field observations suggest that three forms exist, one relatively tall, 1-2 m with large abundant flowers and large leaves, a smaller form, 0.5-1 m with smaller, often solitary flowers and smaller leaves and an intermediate form with mixed characters (Broadhurst 1998).

Recent morphological and allozyme analyses have identified two dissimilar groups within *G. verrucosa*, which suggest that two distinct taxa exist within the species.

Flowering Period: July-October

Distribution and Habitat in the Geraldton District

Occurs on the sandplains of the Carnarvon, Irwin and Avon Regions, from the Shark Bay area south to the Perth Region and inland. Although this species is well represented in the collections of the Western Australian Herbarium, giving numerous locations, it was found by L. Broadhurst during field work in 1994 that relatively few populations could be located. About 70% of the specimens at the Western Australian Herbarium were collected before 1980 and it is possible that many populations have been lost as a result of land clearance and other habitat decline. The species is also harvested for the cut flower industry as an attractive species both as live flowers and as dried specimens. For this reason it was included on the Priority Flora List and work is continuing on the taxonomy of the species.

Grows in sandy and gravelly soils. All populations occur on sandy soil, usually white or grey in colour, but sometimes on yellow sand. It is found on sandplains and also on hilltops, slopes and at the foot of breakaways.

It occurs in a range of vegetation types, from low heath to low forest, usually in mid-dense thickets and heath. Associated tree species include *Xylomelum angustifolium* and species of *Banksia, Acacia, Eucalyptus, Allocasuarina* and *Grevillea.* Species of shrub most commonly occurring in association are those of *Hibbertia, Verticordia, Petrophile, Isopogon* and *Conospermum.* Most of the natural populations are small, usually between 15-30 plants.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. S of Kalbarri	N	National Park	29.11.1995	30	Disturbed, damage by recreational activities
2. Near Kalbarri	N	National Park	29.11.1995	-	Healthy
3. NW of Ajana	N	National Park	29.11.1995	25	Undisturbed
4. NW of Ajana	N	National Park	29.11.1995	30	Undisturbed

Populations Known in the Geraldton District (Cont'd)

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
5. NE of Kalbarri	N	National Park	11.1996	25	Undisturbed
6. NE of Kalbarri	N	National Park	29.11.1996	40-50	Undisturbed
7. Hawks Head	N	National Park	29.11.1996	30	Undisturbed
8. Geraldton	G	Shire Reserve	8.1995	Many seedlings	Burnt 1994
9. Yerina Springs Road	N	Shire Road Verge	1995	15	Recently disturbed
10. Yerina Springs Road	N	Shire Road Verge	28.6.1995	3	Relatively healthy
11. W of Binnu	N	Shire Road Verge	27.7.1995	25	Undisturbed
12. W of Binnu	N	Shire Road Verge, Private	28.6.1995	55	Some disturbance
13. West Ogilvie Road	N	Shire Road Verge	9.1995	10	Undisturbed
14. Indarra	Mu	Nature Reserve	9.1995	25	Undisturbed
15. N of Geraldton	G	-	7.1995	20	Some disturbance, sand pit
16. W of Binnu	N	Private	27.6.1995	-	Healthy
17. Hutt River	N	Private	9.1995	-	Healthy
18. Near Hutt River	N	Private	7.1995	-	Moderate
19. W of Morowa	Mo	Private	20.8.1997	-	-
20. NE of Maya	P	Private	5.5.1997	-	-
21. N of Geraldton	CV	Water Reserve	8.1997	-	-
22. NW of Northampton	N	-	8.7.1997	Frequent	-
23. E of Ajana	N	VCL	29.10.1991	Locally common	-
24. N of Kalbarri	N	Pastoral Lease	26.8.1994	-	-
25. E of Ajana	N	VCL	28.8.1990	-	-

Response to Disturbance

Research conducted by Kings Park and Botanic Garden showed that the seed is very responsive to treatment with smoke, which overcomes the dormancy mechanisms in the seed (Crawford 1998).

Field observations also suggest that the species is a disturbance opportunist, many populations occurring on road verges, possibly as a result of disturbance by road works. Natural populations are usually small. Generally the larger populations are those harvested on private land, with at some, over 200 plants being present. Burning and chaining is sometimes undertaken to stimulate seedling growth at these populations (Broadhurst 1995).

Management Requirements

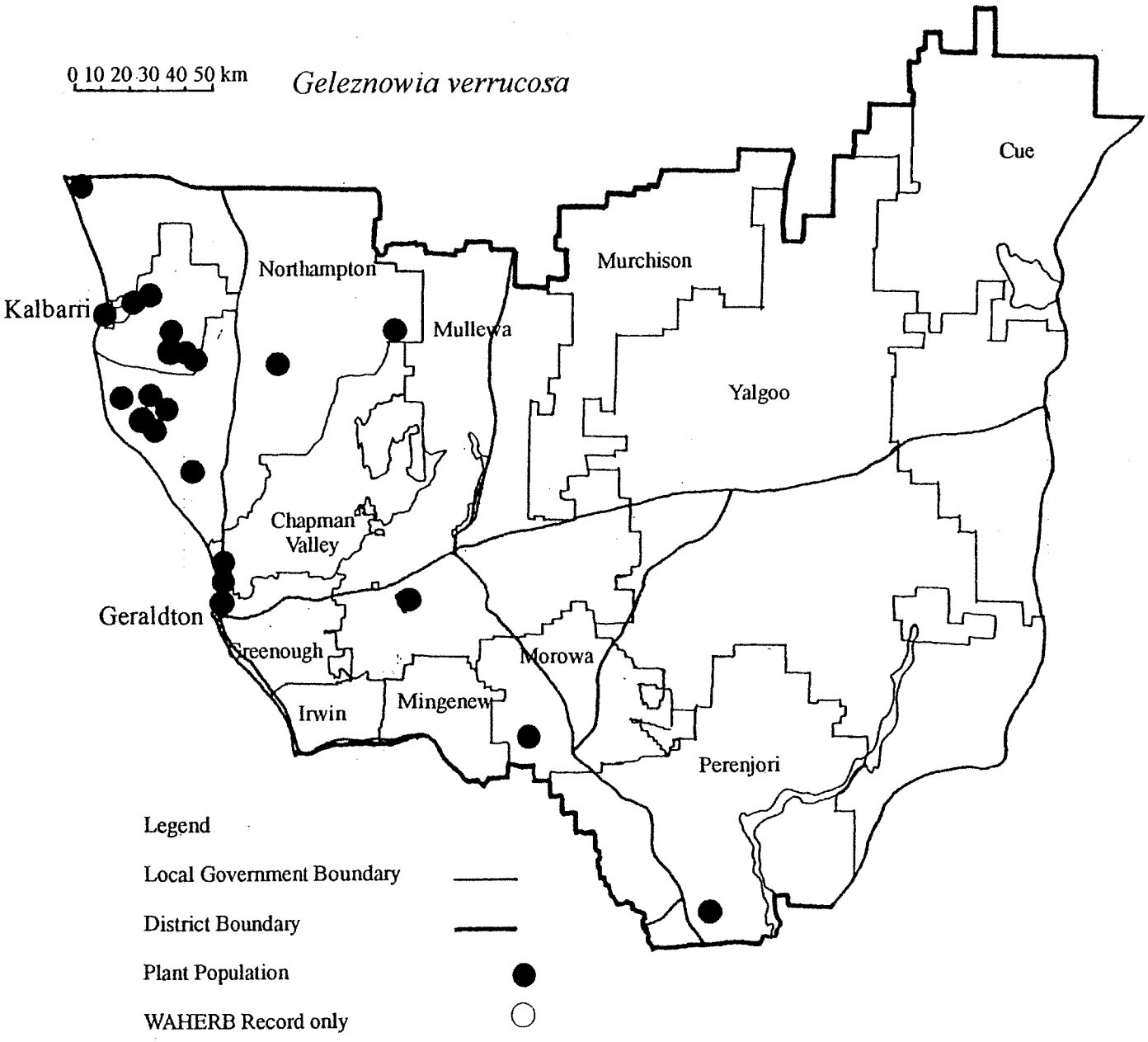
- Liaison with local authorities to protect road verge populations.
- Ensure that road verge populations are marked.

Research Requirements

- Further survey, particularly on conservation reserves.
- Further taxonomic study.

References

Bentham (1863), Broadhurst (1995, 1998), Broadhurst & Tan (1995), Crawford (1998), Mueller (1858-9), Turcznaninow (1849).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Geleznowia verrucosa
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Goodenia sericostachya C.A.Gardner GOODENIACEAE

Silky-spiked Goodenia

An erect plant to 50 cm tall, silvery-hairy, the leaves mostly basal, woolly-hairy. They are obovate to lanceolate, 5-10 cm long. The flowers are in a compact spike, to 15 cm long, with linear bracteoles to 6 mm long. The flowers have linear sepals and the corolla is up to c. 15 mm long with stiff hairs inside towards the base. The corolla lobes are almost equal and the corolla is blue to pinkish-mauve in colour, with a yellow spot at the top of the throat.

Flowering Period: October-January

Distribution and Habitat in the Geraldton District

This species has been collected several times from north of the Murchison River near the Northwest Coastal Highway, at three localities. It has also been found east of Yuna and north of the District to the south of Denham.

Grows in red sand, red sandy loam or gravelly sand. Associated vegetation is recorded as open thickets, tall shrubland and mallees, or acacias, but this species is found on open disturbed areas or after fire.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Eurardy	N	Pastoral Lease	24.10.1992	Numerous	Healthy
2. N of Murchison River	N	MRWA Road Verge	16.10.1990	-	-
3.* E of Yuna	CV	Shire Road Verge	19.10.1984	-	On disturbed road verge
4.* N of Murchison River	N	-	1.10.1967	-	-

Response to Disturbance

A disturbance opportunist, population 1 occurred in large numbers the year after a fire. The following year there were few plants and none the year after that (M. Quicke, personal communication). Population 2 was recorded as a roadside coloniser and population 3 was growing on a disturbed road verge. A population found north of the District in 1964 was growing in a gravel pit.

Management Requirements

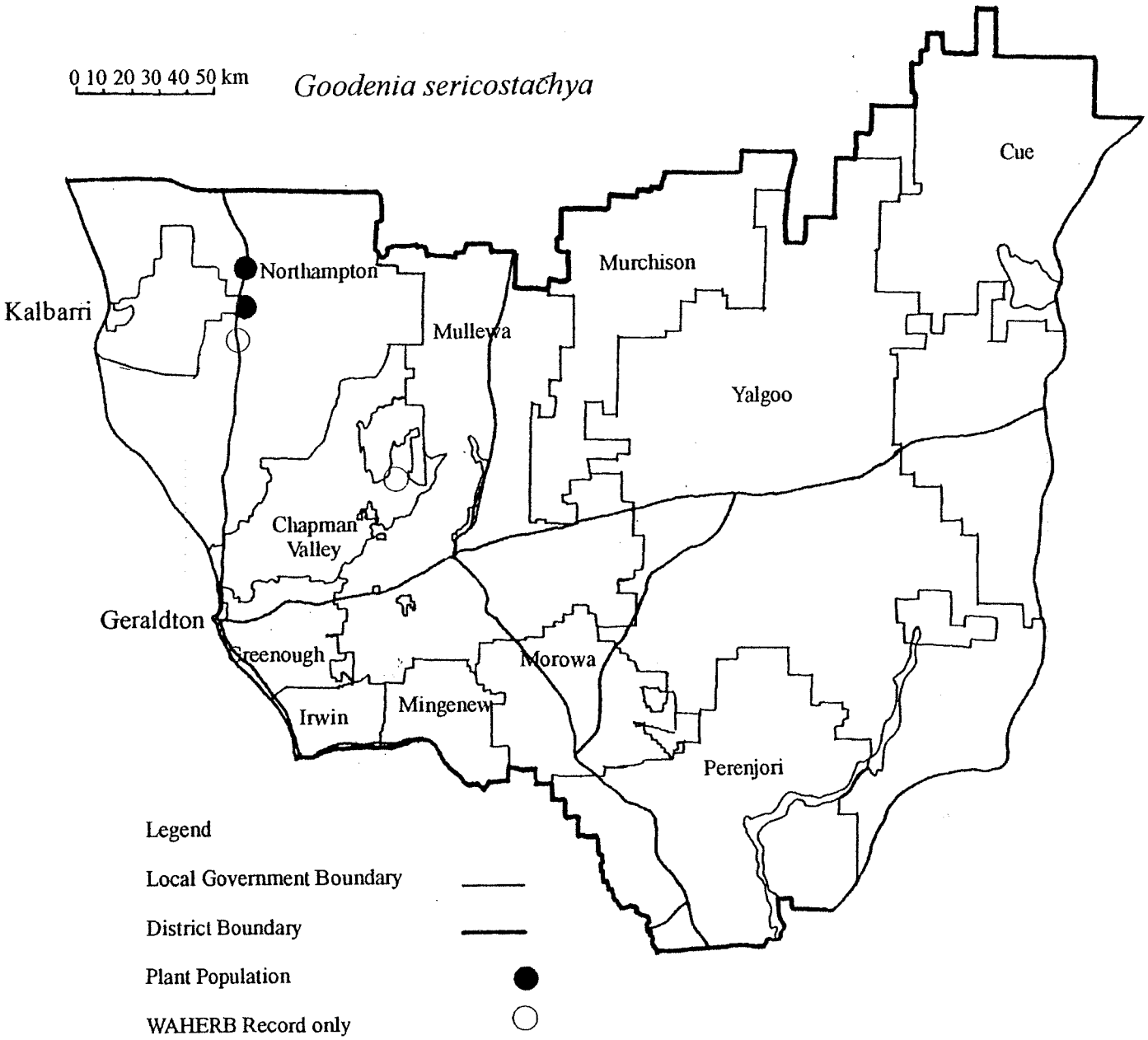
- Ensure that road verge populations are marked.

Research Requirements

- Further survey is required, particularly in recently burnt areas within the known range of the species.

References

Carolin (1992), Gardner (1964).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Goodenia sericostachya
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Grevillea asparagoides Meisn. MYRTACEAE

An intricately-branched, lignotuberous shrub, prostrate or erect, 0.5 to 2 m tall. The leaves are up to 3.5 cm long and have short petioles. They are two or three times divided into narrow-linear, pungent segments. The margins are revolute so that the lower surface has two grooves. Both leaves and flowers are glandular hairy. The inflorescences are pendulous and terminal, with brownish floral bracts. The flowers have pedicels 5-14 mm long. Each flower is pink to red in colour and the torus is straight. The style is glandular hairy and the ovary is pubescent. The pollen presenter is oblique and rounded. The fruit has reddish markings.

This species is similar to *Grevillea batrachioides,* which has sessile leaves.

Flowering Period: July-September

Distribution and Habitat in the Geraldton District

This species is known in the Geraldton District from five populations, two to the west of Morawa, the others at Perenjori, west of Coorow and east of Latham. It also occurs in the Wubin and Wongan Hills areas in the Merredin District. One population of 900 plants is known from east of Bindi Bindi and the species has also been recorded in the past from south of Bindi Bindi and east of Piawaning in the Moora District.

Grows in yellow-brown or white sandy loam and lateritic gravel or in heavy clay in heath and low shrubland with scattered eucalypts. Associated species include *Allocasuarina campestris, G. paradoxa, G. teretifolia, Eucalyptus oldfieldii, E. ebbanoensis, Melaleuca uncinata* and *Ecdeicolea monostachya.*

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. W of Maya	P	Shire Road Reserve	31.8.1996	Occasional	Degraded road verge
2. W of Perenjori	P	Nature Reserve, Shire Reserve	21.2.1997	17+	Shire Reserve disturbed
3. W of Morowa	Mo	Shire Road Verge	8.7.1995	1+	In gravel pit
4. W of Morowa	Mo	Private	18.8.1997	-	-
5. E of Latham	P	-	15.8.1997	-	-

Response to Disturbance

At some populations, plants grow on disturbed areas.

Management Requirements

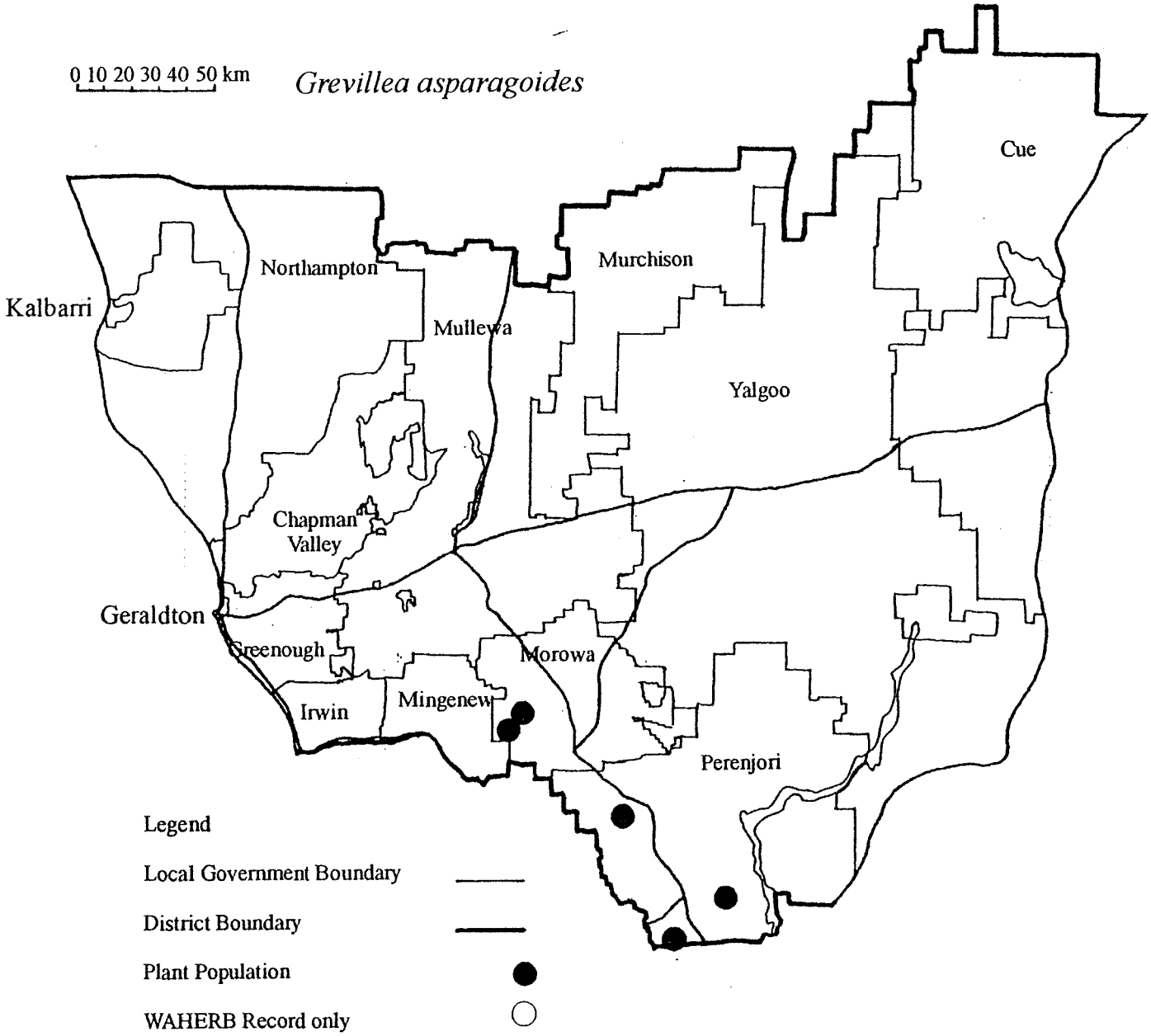
- Ensure that road verge populations are marked.

Research Requirements

- Further survey is required and population 2 requires a full survey in the flowering season, particularly on the nature reserve.

References

Blackall & Grieve (1988), McGillivray & Makinson (1993), Meisner (1857), Mollemans *et al.* (1993), Olde & Marriott (1994-5).



Grevillea candicans C.A.Gardner PROTEACEAE

An erect, much-branched shrub to 2-3 m tall. The leaves are erect and are divided pinnately. They are 8-24 cm long. The lobes are narrow-linear, convex above and 2-grooved and glabrous below. The flowers are white and sticky and are grouped in simple, erect, cylindrical racemes which are terminal or axillary in the upper axils, 14-21 cm long, 5-8 cm wide. The perianth is shortly-hairy on the outside and has a narrow, slender tube, recurved at the top. The torus is straight, the ovary glabrous with a stipe, and the pollen presenter is disc-shaped and oblique. The fruit is a pitted, thick-walled ball, c. 25 mm in diameter, which falls but does not open when ripe.

Flowering Period: September-November

Distribution and Habitat in the Geraldton District

Populations have been recorded most recently from west and north-west of Mullewa, but it has been recorded from north of Mingenew north-west to the Murchison River. There is also a disjunct population east of Dalwallinu in the Merredin District.

Grows on deep yellow or white sand in open shrubland or open mallee woodland. Associated species include *Allocasuarina campestris, Eucalyptus eudesmoides, Acacia stereophylla* and *Melaleuca pentagona.*

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Indarra	Mu	MRWA Road Verge, Rail Reserve	5.10.1994	4	Healthy
2. S of Indarra	Mu	Nature Reserve	4.10.1994	5	Healthy
3. SE of Indarra	Mu	Shire Road Verge	4.10.1994	10+	Healthy
4. NE of Tenindewa	Mu	MRWA Road Verge, Rail Reserve	5.10.1994	2	Healthy
5. *N of Mingenew	Mu	-	23.9.1980	"apparently uncommon"	-
6. *NW of Yuna	N	-	19.10.1973	-	-
7. *E of Yuna	CV	-	8.1.1970	-	-
8. *SE of Yuna	CV	Nature Reserve	17.9.1967	-	-
9. *Tenindewa	Mu	-	9.1960	-	-
10.*Between Eradu & Indarra	Mu	-	9.10.1945	-	-
11. N of Galena	N	-	15.9.1994	-	-
12. NW of Mullewa	Mu	Shire Road Verge	16.3.1999	15	Moderate, some plants damaged by grading

Response to Disturbance

Regenerates from seed after fire.

Management Requirements

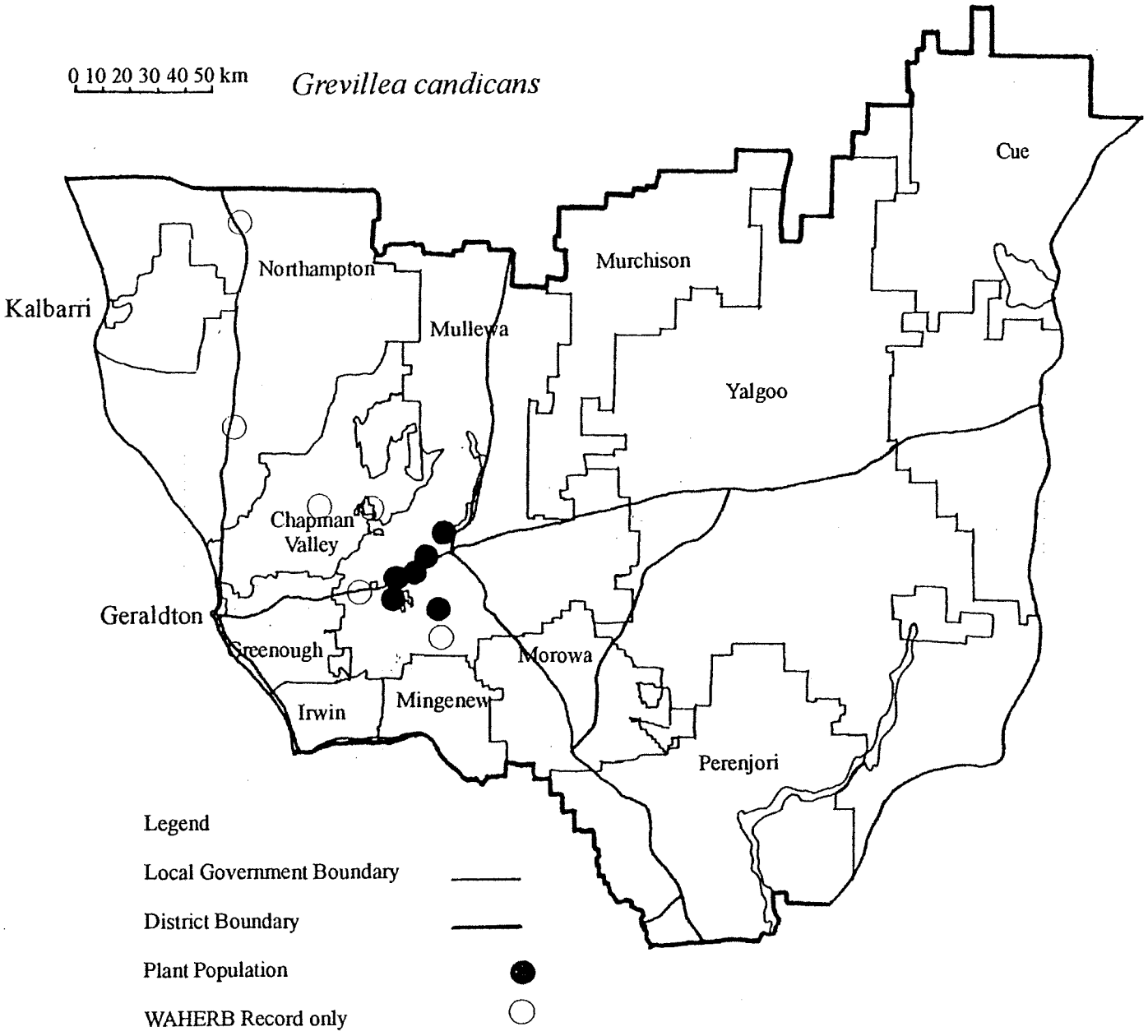
- Ensure that road verge populations are marked.

Research Requirements

- Further survey is required, particularly on conservation reserves.

References

Gardner (1942a), McGillivray & Makinson (1993), Olde & Marriott (1994-5).



Grevillea erinacea Meisn. PROTEACEAE

Hedgehog Grevillea, Standback

A shrub to 1-1.5 m tall, the arching branches spreading to 1.5 m wide, the young branches hoary-tomentose. The leaves are 1-3.5 cm long, divided into three narrow segments which are further pinnately divided once or twice. The segments are rigid with pungent points and are one- or two-grooved below. The flowers are in many-flowered sub-globose erect clusters, which are 1-1.5 cm long. The perianth is hairy on the outside, cream to creamy white in colour. The perianth tube is straight, the limb erect. The style is constricted above the ovary, widening at the middle, then constricted again below the cone-like pollen presenter. The fruits are smooth.

Flowering Period: April, July-December

Distribution and Habitat in the Geraldton District

Occurs in the Ellendale to Burma Road area of the Geraldton District, but is also found further south in the Moora District in the Eneabba to Three Springs area.

Grows in yellow or white sand over laterite or in gravel in low heath or tall shrubland. Associated vegetation includes *Banksia sceptrum, Jacksonia sternbergiana* and species of *Grevillea* and *Verticordia*.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Burma Road	G	Nature Reserve	12.3.1997	"scattered distribution"	-
2. Burma Road	G	-	26.11.1988	"locally uncommon"	-
3.* W of Ellendale	G	-	5.7.1971	-	-
4.* N of Strawberry	I	-	5.8.1976	-	-
5.* W of Burma Road	G	-	30.8.1963	-	-

Response to Disturbance

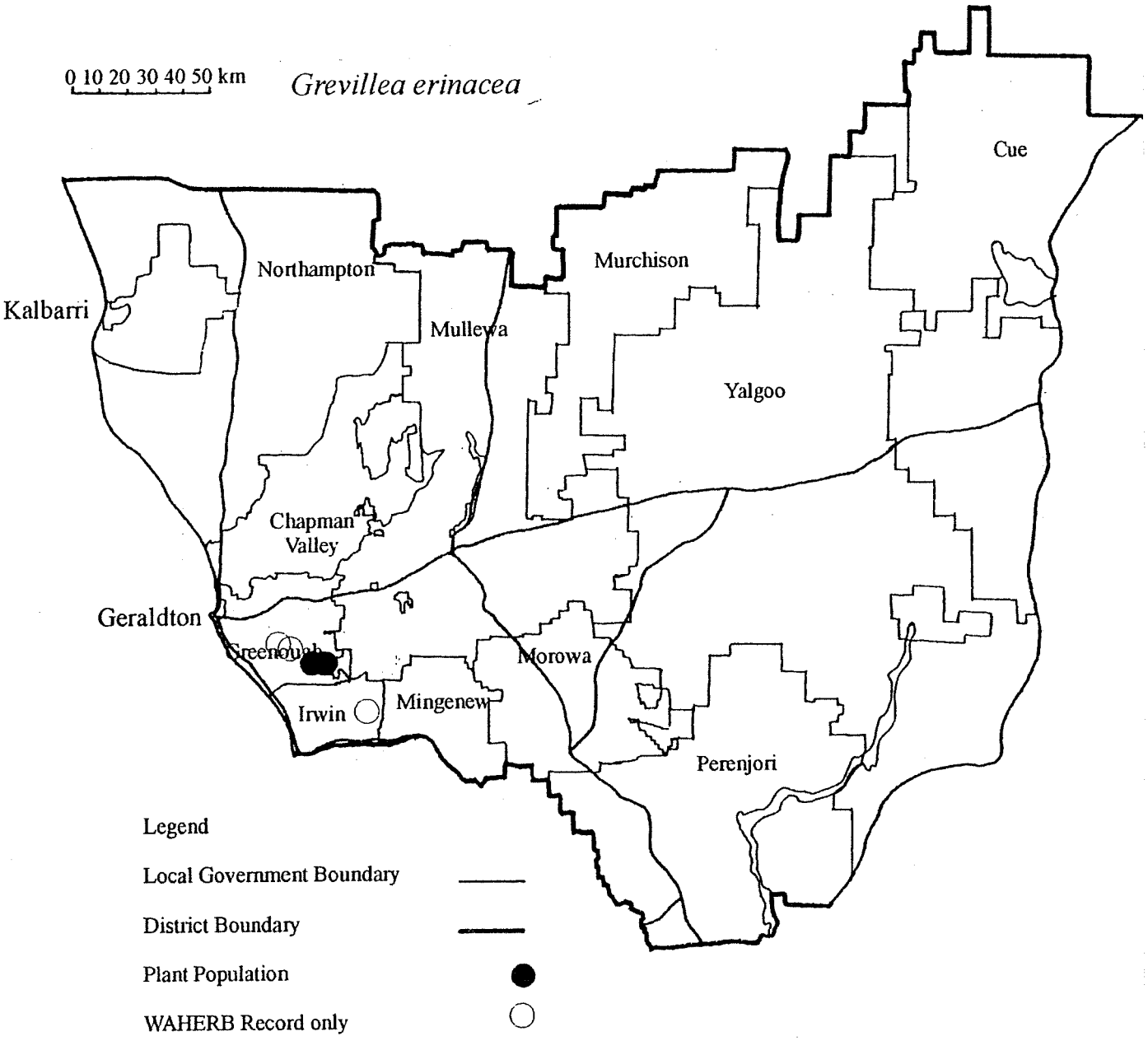
Regenerates from seed after fire.

Research Requirements

- Further survey is required.

References

McGillivray & Makinson (1993), Olde & Marriott (1994-5).


0 10 20 30 40 50 km
Grevillea erinacea
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Grevillea eriobotrya F.Muell. PROTEACEAE

Woolly Cluster Grevillea

An erect, dense shrub 2-5 m tall, with hairy branchlets and leaves which are simple and entire or divided into two or three long linear lobes. They are striate on the upper surface and two-grooved on the lower surface, densely woolly in the grooves. Their length varies from 8 to 18 cm long and they are 2 mm wide. The flowers are in terminal, elongated, cylindrical racemes 6-8 cm long, c. 2 cm wide, with the flowers densely arranged. The bracts are conspicuous, 5-6 mm long, overlapping in bud. The flowers are white to creamy white and are held at right angles to the stem. The perianth is white-woolly on the outside, glabrous inside, 3-4 mm long. The torus is straight, the ovary is almost sessile and hairy. The style is hairy and the pollen presenter is oblique and conical. The fruit is round to ellipsoid, 20-23 mm long, densely hairy and with a thick wall.

Flowering Period: September, October, December

Distribution and Habitat in the Geraldton District

This species occurs in the Koorda to Muckinbudin and Beacon area, mainly in the Merredin District. However, there is one record from Lake Moore with no exact locality details, which may have been found within the Geraldton District.

Grows in yellow sand over sandy loam and gravelly clay on the crest of low hills. Occurs in heath or open tall shrubland, with associated species including *Eucalyptus burracoppinensis, E. rigida, Grevillea eriostachya, Callitris, Allocasuarina* and *Senna* species.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* Lake Moore	-	-	27.10.1966	-	-

Response to Disturbance

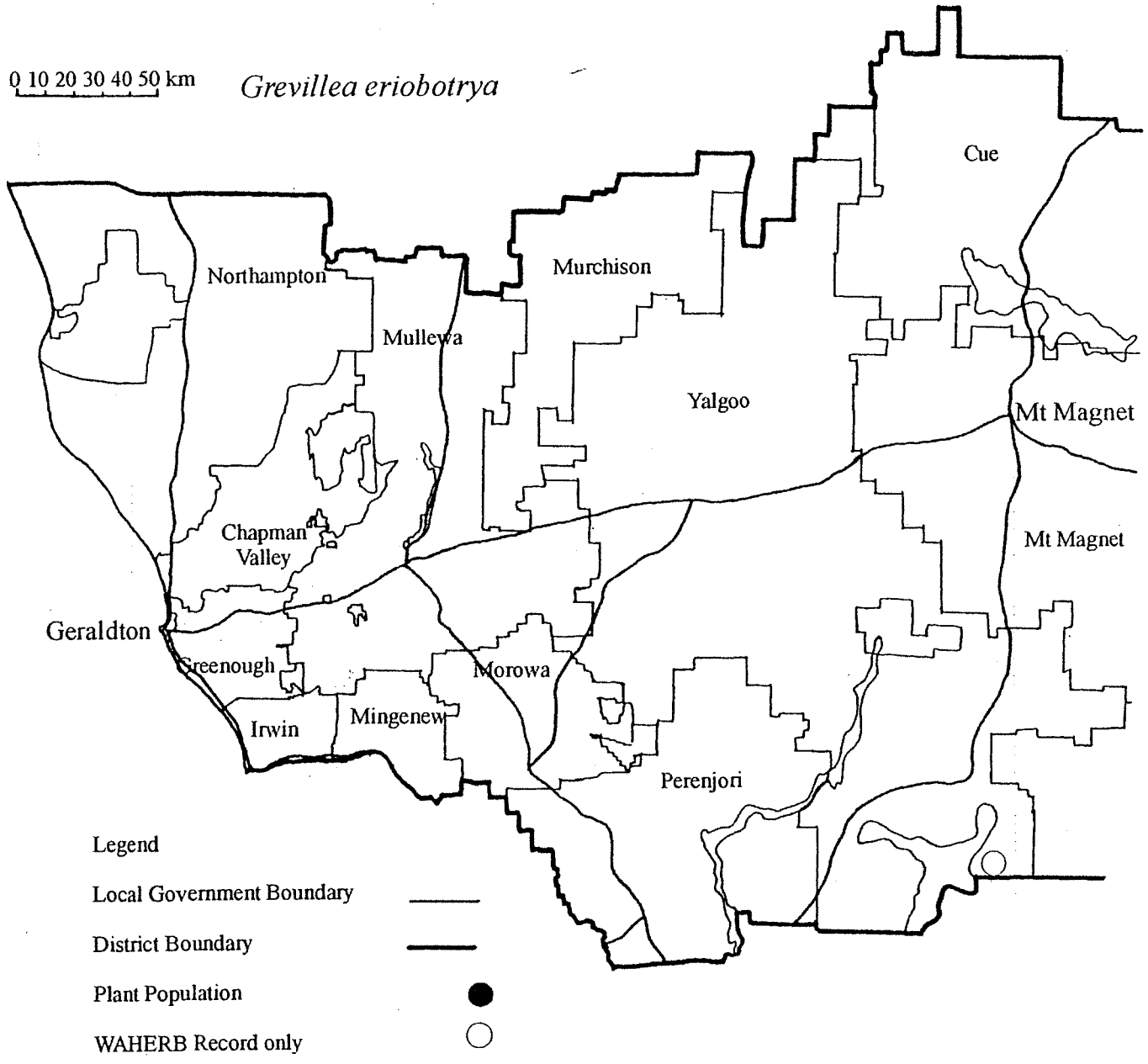
Regenerates from seed after fire.

Research Requirements

- Further survey is required in suitable habitat around Lake Moore.

References

McGillivray & Makinson (1993), Olde & Marriott (1994-5).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Grevillea eriobotrya
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Yalgoo
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Chapman Valley
Mt Magnet
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Grevillea globosa C.A.Gardner PROTEACEAE

A spreading shrub to 3 m tall and 6 m wide, with the leaves 4-18 cm long, pinnately divided into long narrow-linear lobes. The flowers are in globular racemes, c. 2 cm long and 2-3 cm broad. They are terminal or axillary, on peduncles 2.5-8 cm long. The perianth is silky-hairy on the outside, the limb white-hairy. It is green beneath the white hairs, thus appearing white in colour but becoming glossy black. The style is green. The torus is oblique, the ovary hairy, the style glabrous, c. 17 mm long. The pollen presenter is disc-shaped. The fruit is 9-12.5 mm long, to 8 mm wide, erect and faintly ribbed. The seed is winged all round.

Flowering Period: June, November-February

Distribution and Habitat in the Geraldton District

Occurs in the Pindar to Paynes Find area.

Grows in red loam, red sand or yellow clayey sand, sometimes near laterite, in tall *Acacia* shrubland sometimes with mallees. Associated species include *Acacia aneura, A. ramulosa, A. sabina, Bursaria occidentalis, Scaevola spinescens* and *Ricinocarpus velutinus.*

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. S of Wuraga	Y	Pastoral Lease	20.2.1997	20+	Healthy
2. S of Wuraga	Y	Pastoral Lease	20.2.1997	40+	Healthy
3. S of Yuin	Mur	Pastoral Lease	5.8.1995	50+	Healthy
4. SW of Paynes Find	Y	MRWA Road Verge, Pastoral Lease	24.6.1995	20+	Healthy
5. SE of Yalgoo	Y	Pastoral Lease (Mining Lease)	16.10.1997	29	Healthy
6. SE of Yalgoo	Y	Pastoral Lease (Mining Lease)	14.10.1997	2 000+	Healthy
7. SE of Yalgoo	Y	Pastoral Lease (Mining Lease)	16.10.1996	1 500	Healthy
8. SE of Yalgoo	Y	Pastoral Lease (Mining Lease)	16.10.1997	1 500 & 150 seedlings	Healthy
9. SE of Yalgoo	Y	Pastoral Lease (Mining Lease)	1997	2 350	Healthy
10. SSE of Rothsay	P	Pastoral Lease	22.11.1992	"abundant"	-

Response to Disturbance

Regenerates from seed after fire and appears to regenerate from seed in disturbed areas, seedlings being found on track edges, a disused gravel pit, topsoil storage areas and on the side of a tailings dam.

Management Requirements

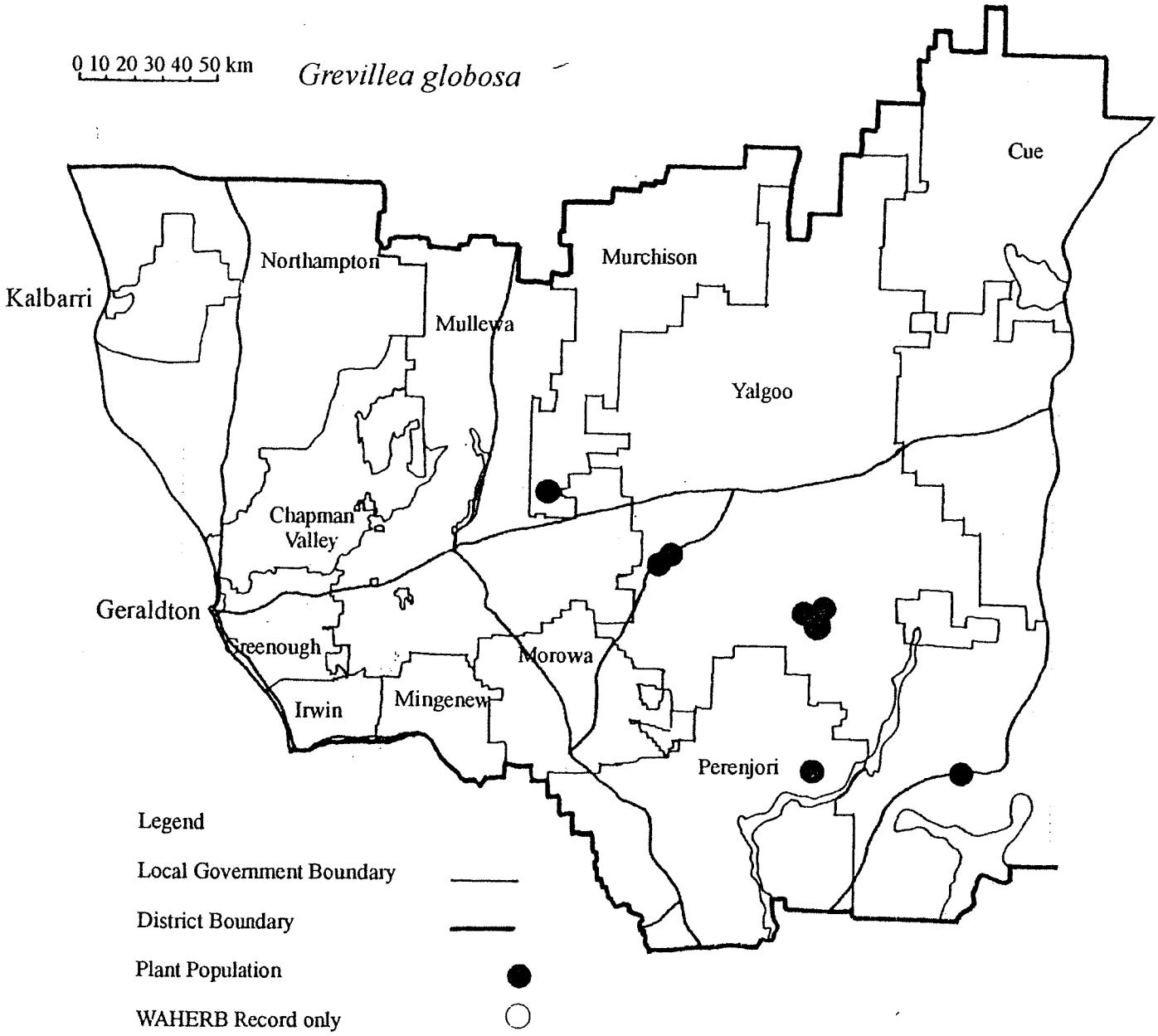
- Ensure that road verge population is marked.

Research Requirements

- Further survey is required.

References

Gardner (1964), McGillivray & Makinson (1993), Olde & Marriott (1994-5).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Grevillea globosa
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Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Grevillea granulosa McGill. PROTEACEAE

A compact shrub to 1.5 m high, with numerous erect branches arising from near the base. The leaves are simple, linear, 5-16 cm long, 1.2-2.5 mm wide. The margin is curled back, concealing most of the lower surface. The upper surface of mature leaves is granulose, with the nerves obscure. The leaves have three nerves which are prominent on the lower surface. The flowers are grouped in umbel-like inflorescences which are in the leaf axils or on the stems. They are sessile or short-stalked and are c. 2 cm long. The floral bracts are deciduous at the young bud stage. They are 0.2-0.4 mm wide. The perianth has an open covering of hairs on both surfaces. At flowering, the tepals curl back as two pairs, the lower pair curling back further than the upper pair, and the style is exserted beyond the perianth which is not everted, the inner surface remains hidden. The perianth and style are red to orange, the limb green. The pistil is 20-22 mm long with hairs only on the dorsal side above the base. The ovary is hairy and is stalked. The pollen presenter is lateral to very oblique and is convex. The fruit is 10.5-14 mm long, ridged mainly on the dorsal side, the style persistent.

This species can be confused with *Grevillea sarissa,* which has glabrous pistils, also with *G. pityophylla,* which has a densely hairy outer perianth surface and hairy style, and with *G. extorris,* which has conspicuous longitudinal veins on both surfaces of the leaves, the perianth not curling back at flowering, and a longer pistil 28-38 mm long.

Flowering Period: July-October

Distribution and Habitat in the Geraldton District

Occurs from Yuna and Yuin south and east to Lake Monger and south of the District to Wubin.

Grows in shallow sandy, clayey or loamy soils over granite, laterite or sandstone, or in red loamy soils on flats. Associated vegetation may be open *Acacia* shrubland or low woodlands of *Eucalyptus loxophleba* or *E. salmonophloia,* with *Hakea recurva, H. trifurcata, Acacia acuminata,* and *Allocasuarina campestris.*

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. S of Yuin	Mu	Shire Road Verge, Pastoral Lease	5.8.1995	1 000+	Healthy
2. Coalseam	Mi	Conservation Park	16.8.1996	1+	Healthy
3. W of Pindar	Mu	Shire Road Verge	7.7.1995	2	Moderate
4. Bowgada	P	Nature Reserve	19.6.1995	50+	Healthy
5. Canna	Mo	Nature Reserve	7.10.1994	10+	Healthy
6. SW of Wilroy	Mu	MRWA Road Reserve, Rail Reserve	22.7.1994	20+	Healthy
7. WNW of Tardun	Mu	MRWA Road Verge	22.7.1994	10+	Healthy
8. Wilroy	Mu	Nature Reserve	22.7.1994	50+	Healthy
9. SE of Tardun	Mu	MRWA Road Verge	22.7.1994	15+	Moderate
10. SE of Tardun	Mo	MRWA Road Verge	22.7.1994	15+	Moderate
11. E of Perenjori	P	Shire Road Verge	18.8.1994	"Infrequent"	Disturbed
12. SE of Mullewa	Mu	Rail Reserve	19.8.1994	"Infrequent"	Disturbed
13. E of Canna	Mo	-	27.7.1996	-	-
14. E of Canna	Mo	Water Reserve	15.2.1995	10+	Healthy
15.*Bunjil	P	-	15.10.1981	"Common"	-
16.*Latham	P	Shire Reserve	18.9.1979	-	-

Populations Known in the Geraldton District (Cont'd)

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
17.*E of Mullewa	Mu	-	14.6.1976	"Occasional"	-
18.*E of Mullewa	Mu	-	10.9.1966	-	-
19.*Near Gutha	Mo	-	29.8.1945	-	-
20.*Ninghan	Y	-	-	-	-
21.*Eradu	G	-	12.7.1965	-	-
22.*N of Tardun	Mu	-	23.8.1957	-	-
23.*S of Mullewa	Mu	-	20.7.1971	-	-
24.*E of Yuna	CV	Nature Reserve	13.8.1967	-	-

Response to Disturbance

Unknown

Management Requirements

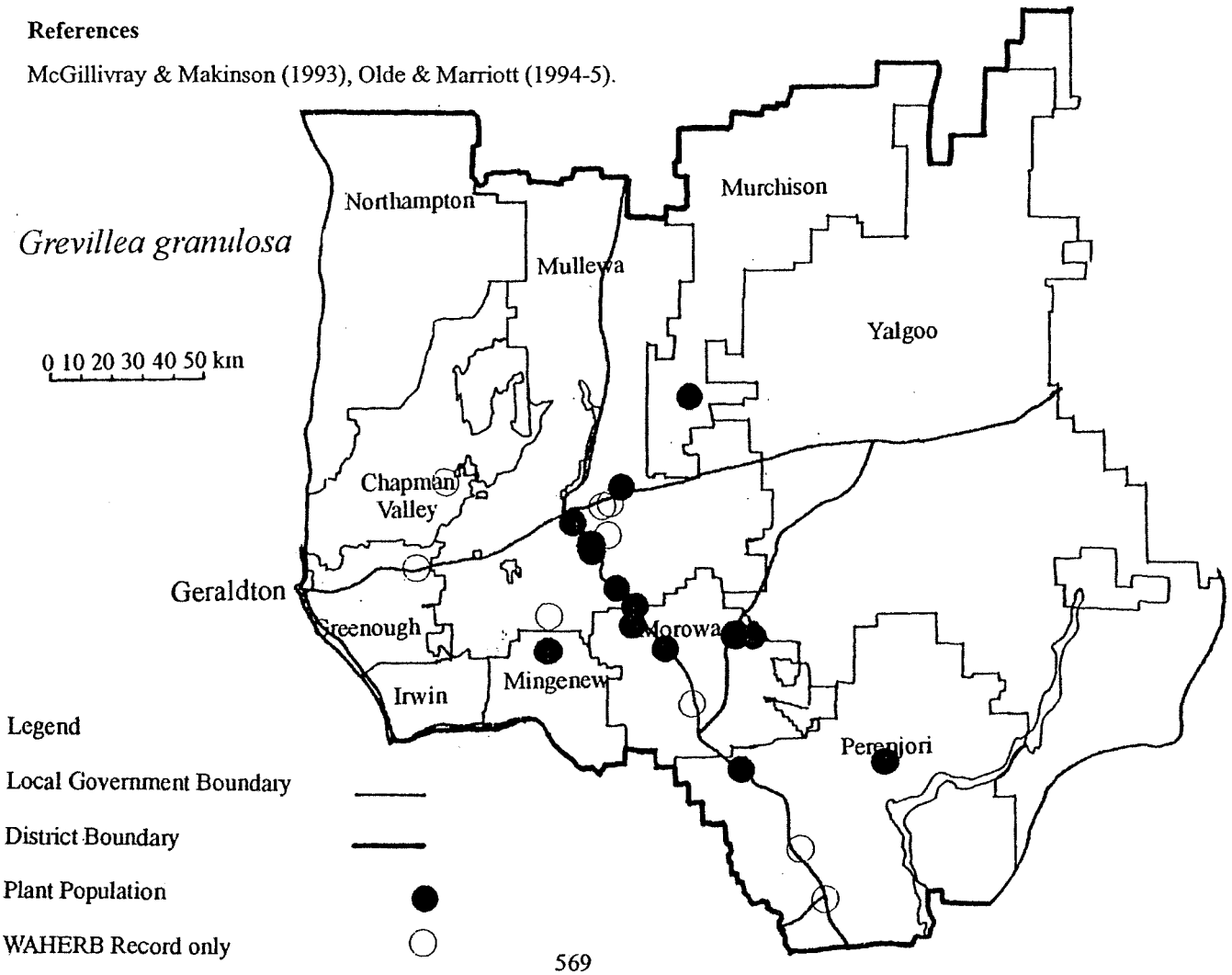
- Ensure that road verge populations are marked.

Research Requirements

- Further survey is required to refind populations of this species in the south and west of its range.

References

McGillivray & Makinson (1993), Olde & Marriott (1994-5).



Grevillea leptopoda McGill. PROTEACEAE

A dense, spreading, prickly shrub to 1.5 m tall, with spreading branches. The leaves are 4-8 cm long, divided into three leaflets which are divided again into three. The lobes are narrowly linear, 1-3.5 cm long and c. 1 mm wide. The flowers are grouped in terminal, branched inflorescences, 4-6 cm long. The perianth is creamy-white with some pink on young buds. It is c. 3 mm long, glabrous on the outside and hairy at the base on the inner surface. The pistil is 7.5-9 mm long and is glabrous. The pollen presenter is oblique, convex to obliquely conical. The fruit is 9-10.5 mm long, slightly wrinkled.

Similar to *Grevillea teretifolia,* which has a shorter flower spike c. 2 cm long, longer pistil 10-17 mm long and a beard on the inner perianth surface, which is more prominent in the upper half. Also confused with *G. intricata,* which has a prominent erect stigmatic cone.

Flowering Period: June-October

Distribution and Habitat in the Geraldton District

Occurs at Kalbarri, north of Northampton and north-east of Mingenew in the Geraldton District, with early records from Yuna and near Morowa. It also occurs from Coorow to Arrino in the Moora District.

Grows in grey to brown clayey sand, gravelly sandy loam or grey sand with laterite in low heath or scrub. Associated species include *Melaleuca uncinata, Hakea auriculata* and *Conostylis robusta.*

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SE of Kalbarri	N	National Park	8.10.1996	Frequent	-
2. E of Ogilvie	N	-	23.6.1997	Occasional	-
3. ESE of Kalbarri	N	National Park	5.9.1990	Locally common	-
4. NE of Mingenew	Mi	-	2.10.1992	Abundant	-
5. E of Yandanooka	Mi	Shire Road Verge	15.2.1995	20+	Moderate
6.* Near Yuna	CV	-	20.9.1940	-	-
7.* Koolanooka	Mo	-	23.9.1931	-	-
8. W of Morowa	Mo	Private	19.8.1997	-	-

Response to Disturbance

Regenerates from seed after fire.

Management Requirements

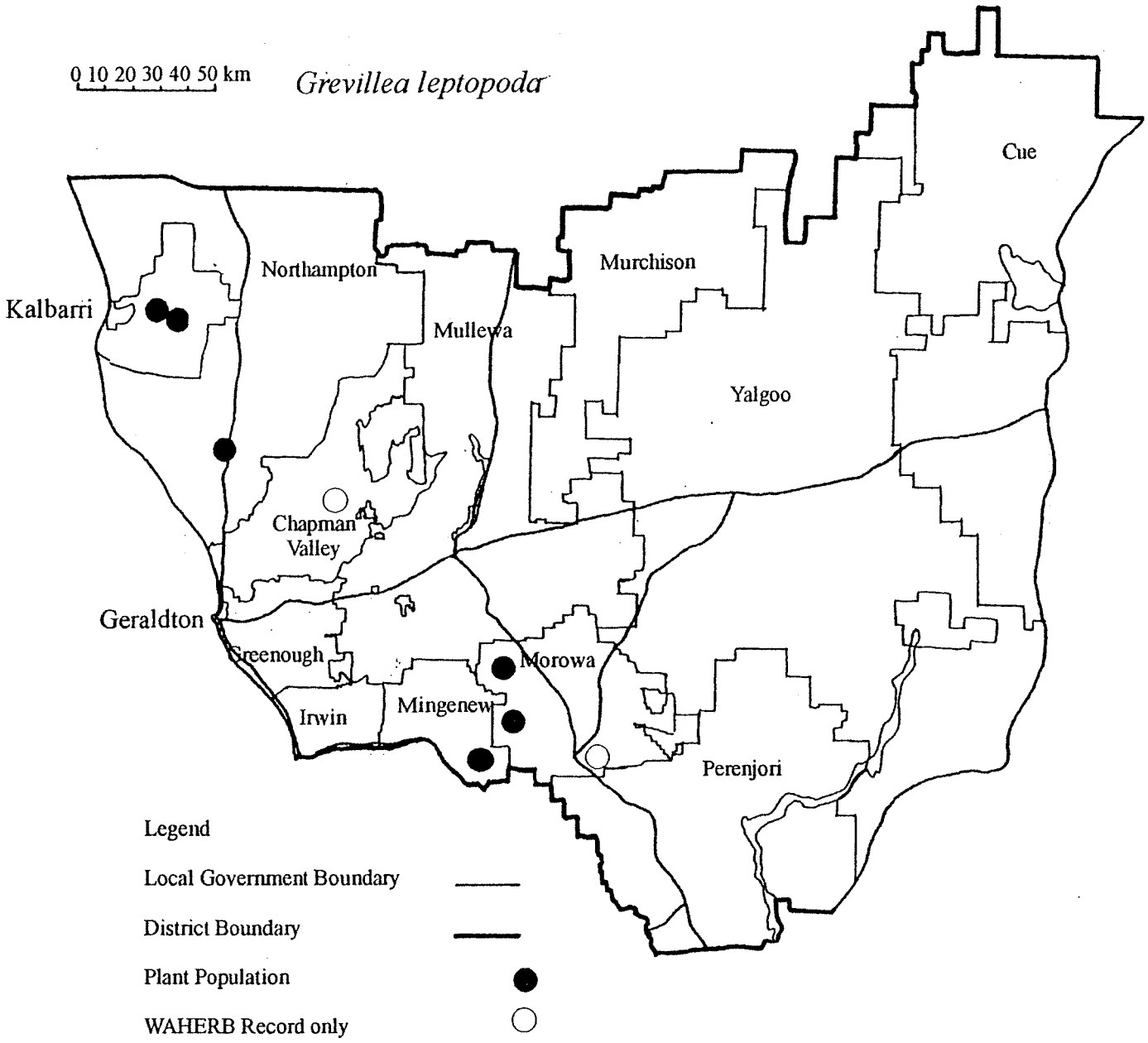
– Ensure that road verge population is marked.

Research Requirements

– Further survey is required, particularly in the Yuna and Koolanooka areas.

References

McGillivray & Makinson (1993), Olde & Marriott (1994-5).


0 10 20 30 40 50 km
Grevillea leptopoda
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Grevillea stenostachya C.A.Gardner PROTEACEAE

An erect, compact shrub 1-1.5 m tall. The leaves are 1.5-5 cm long, divided into widely diverging, terete lobes with pungent points, which may be further divided. The leaf axis is bent backwards at each node. The flowers are grouped in clusters which are mostly branched. Each flower cluster is 2.5-4 cm long, 1.5 cm wide, cylindrical and loose. The flowers are yellow, the perianth greenish-white on the outside, white on the inside, the style yellow. The perianth is regular, the pistil 3.8-5.2 mm long. The ovary is hairy at anthesis. The fruit is 5-8 mm long, obovoid in shape and sparsely hairy when young.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

Occurs between Shark Bay, the Murchison and Meekatharra, mainly north of the Geraldton District, with at least one population recorded from a nature reserve. Within the District, it has been recorded recently from three populations north of Mullewa and in 1958 from north-west of Cue.

Grows in red sand or sandy loam in open mallee or scrub.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Woolgorong	Mu	MRWA Road Verge, Pastoral Lease	4.8.1995	20+	Healthy
2. Tallering	Mu	Pastoral Lease (Mining Lease)	6.10.1994	2	-
3. Tallering	Mur	-	31.10.1992	Occasional	-
4. W of Tallering Well	Mu	Pastoral Lease (Mining Lease)	6.10.1994	60	Undisturbed
5. Tallering Peak	Mu	Pastoral Lease (Mining Lease)	6.10.1994	20+	Disturbed
6. N of Tallering Peak	Mu	Pastoral Lease (Mining Lease)	6.10.1994	30-100	Undisturbed
7. Tallering Hill	Mu	Pastoral Lease (Mining Lease)	6.10.1994	20+	Disturbed
8.*E of Kalli	C	-	22.7.1958	-	-

Response to Disturbance

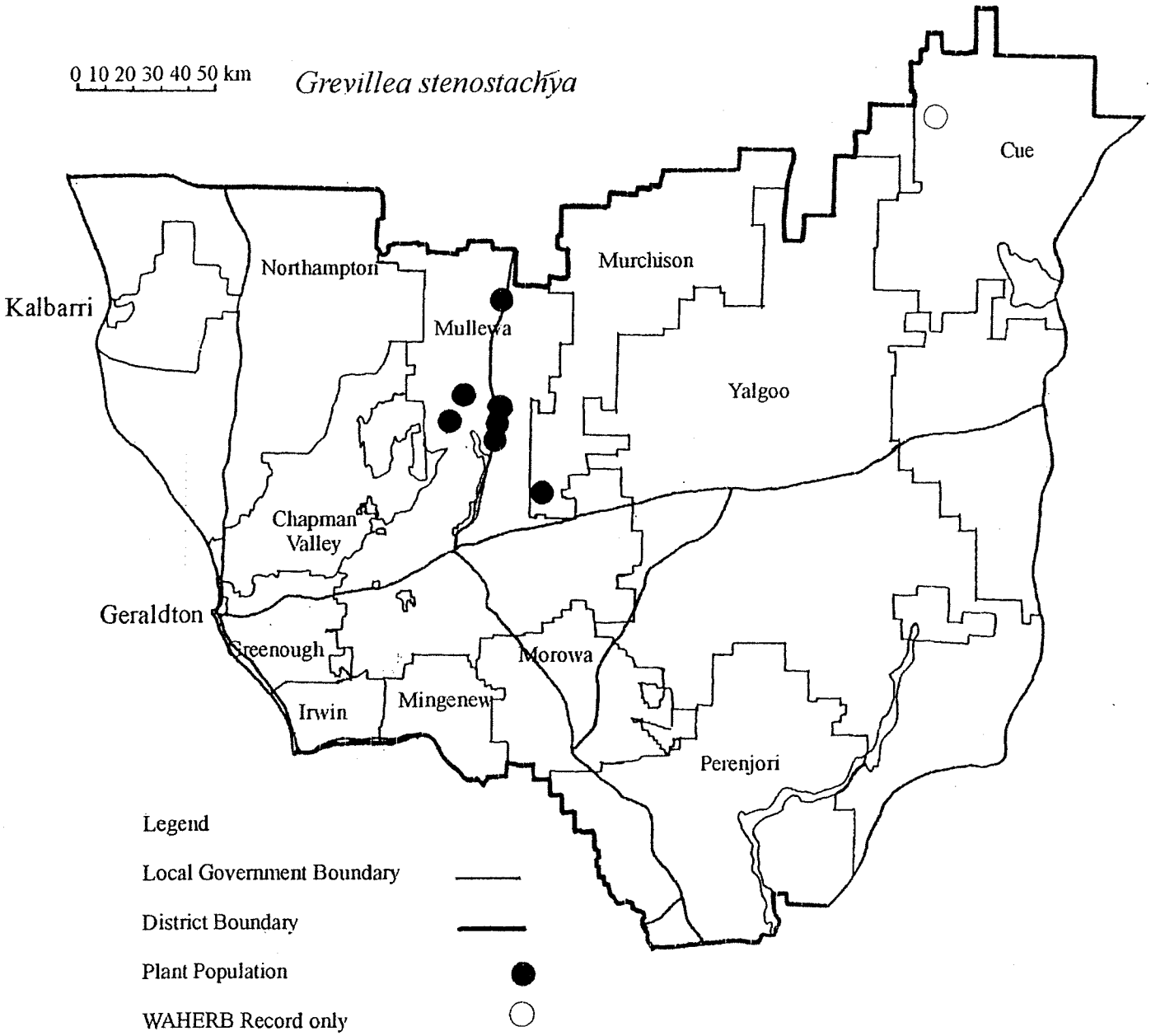
Regenerates from seed.

Research Requirements

- Further survey is required, particularly in the Cue area.

References

Gardner (1936), McGillivray & Makinson (1993), Olde & Marriott (1994-5).


0 10 20 30 40 50 km
Grevillea stenostachya
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Hemigenia pimelifolia F.Muell. LAMIACEAE

A shrub with slender, divaricate branches, the young branches and foliage with long spreading hairs and opposite rows of shorter hairs on the branches. The leaves are opposite, sessile, obovate or oblong, obtuse and rather thick, 4-6 mm long. The flowers are solitary in the axils and nearly sessile, with linear or linear-lanceolate bracts. The calyx is hairy with long spreading hairs, the teeth are nearly equal, obtuse and longer than the tube. The corolla is scarcely longer than the calyx, with lobes almost equal. The connective of the upper anthers has the lower end dilated and bearded and that of the lower anthers is elongated and ends in a second cell nearly as large as the perfect one.

This species is similar to *Hemigenia scabra* but differs in presence of lines of hairs on the stems and in the distribution of long hairs on the calyx tube rather than on the lobes.

Flowering Period: Unknown (var. *major* from the Morowa area flowers in September)

Distribution and Habitat in the Geraldton District

Recent work on the genus by B.L. Rye has indicated that a single specimen from Hutt River apparently matches the type description, which is based on material reportedly from the Murchison River. Thus this species is currently known only from the Geraldton District. Specimens from Kadje Kadje and the Koolanooka Hills, both east of Morowa in the Geraldton District, have been labelled var. *major* C.A.Gardner ms. Gardner noted that they had larger, more acute, less coriaceous leaves than the type and that they had sparse hairs between densely hairy rows on the stems.

No details of habitat are known.

Conservation Status

Current: Priority 3[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Hutt River	-	-	-	-	-
2. Koolanooka Hills	Mo	-	19.7.1931	-	-
3. Kadji Kadji	Mo	-	23.9.1931	-	-

Response to Disturbance

Unknown

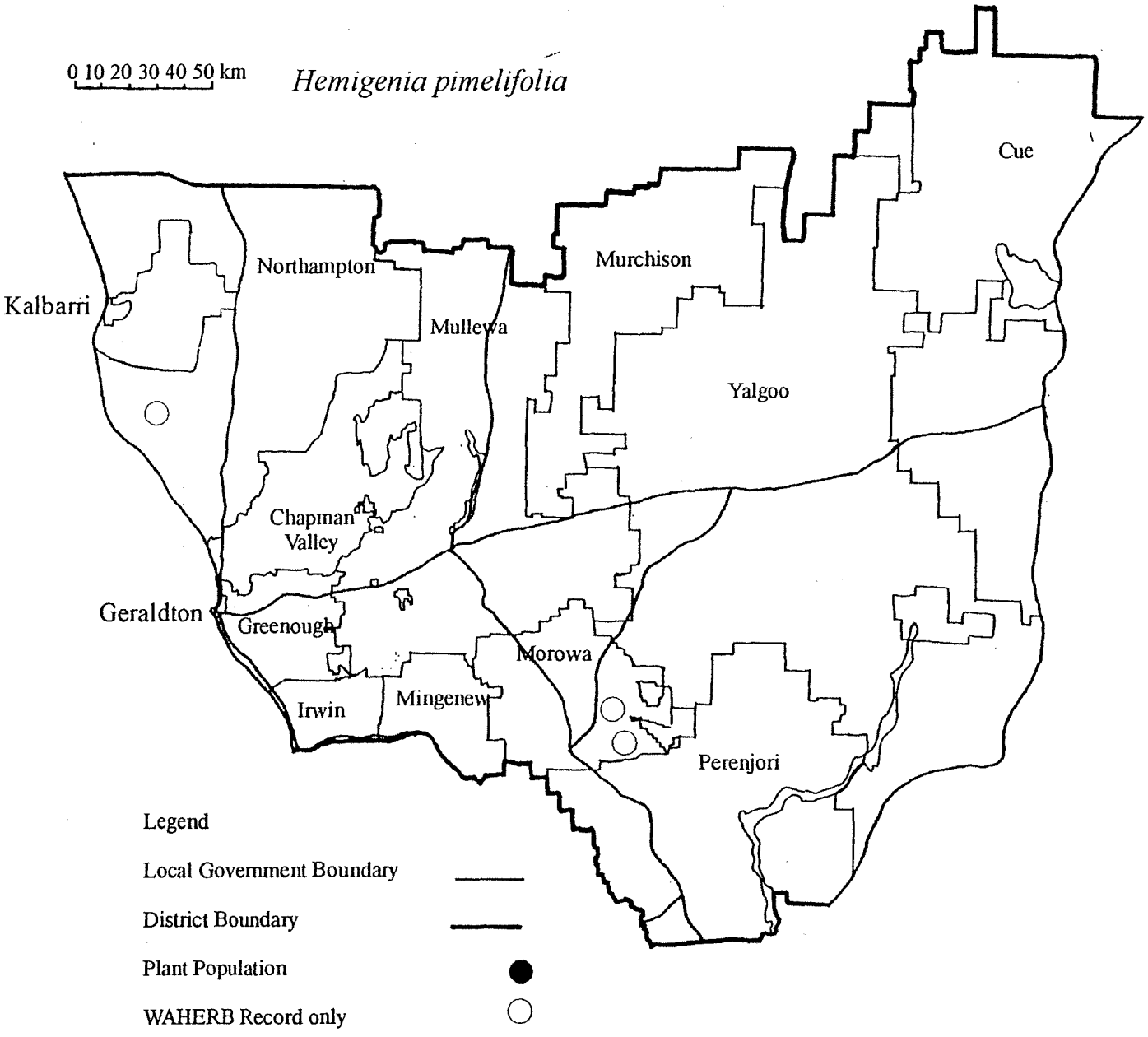
Research Requirements

– Further survey is required in the Geraldton District for this species, particularly in the Hutt River area.

References

Bentham (1870), Mueller (1868), B. Rye (personal communication).

[#] now Priority 1 (updated at December 1999)


0 10 20 30 40 50 km
Hemigenia pimelifolia
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Hemigenia saligna Diels LAMIACEAE

An erect shrub 1.5-2 m tall, with opposite, narrowly ovate or linear oblong leaves, which are almost sessile, 2-3.5 cm long, 3-6 mm broad, with acute tips. They are silky-hairy when young. The flowers are sessile in the leaf axils, pale mauve in colour. The calyx is regular with five nearly equal teeth. The calyx tube is c. 2.5 mm long and is glabrous, the lobes are hairy and are 2-2.5 mm long. The corolla is c. 9 mm long, tubular with a short tube, two-lipped, the upper lip two-lobed, the lower lip three-lobed.

This species is similar to *Hemigenia barbata* in its ovate leaves but has less prominently hairy leaf bases and occurs much further north. There may also be differences in the anthers.

Flowering Period: June-October

Distribution and Habitat in the Geraldton District

Occurs to the south-east of Geraldton, where it has been recorded twice recently and at least twice in the mid 1960's. There are also two earlier records (populations 3 and 4), which may be from the same locality but for which there is no precise locality information.

Grows in brown clayey sand or pale yellow sand with gravel, on plains in tall shrubland with mallees over low scrub and low heath. Associated species include *Eucalyptus arachnea, Calothamnus quadrifidus, Allocasuarina campestris, Callitris, Acacia* and *Hakea* species.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Casuarina Road	Mu	Shire Road Verge	7.7.1995	4	Healthy
2. Unmade Road	Mu	-	24.10.1992	-	-
3.* S of Eradu	Mu	-	14.8.1966	-	-
4.* Near Champion Bay	-	-	27.6.1902	-	-

Response to Disturbance

Unknown

Management Requirements

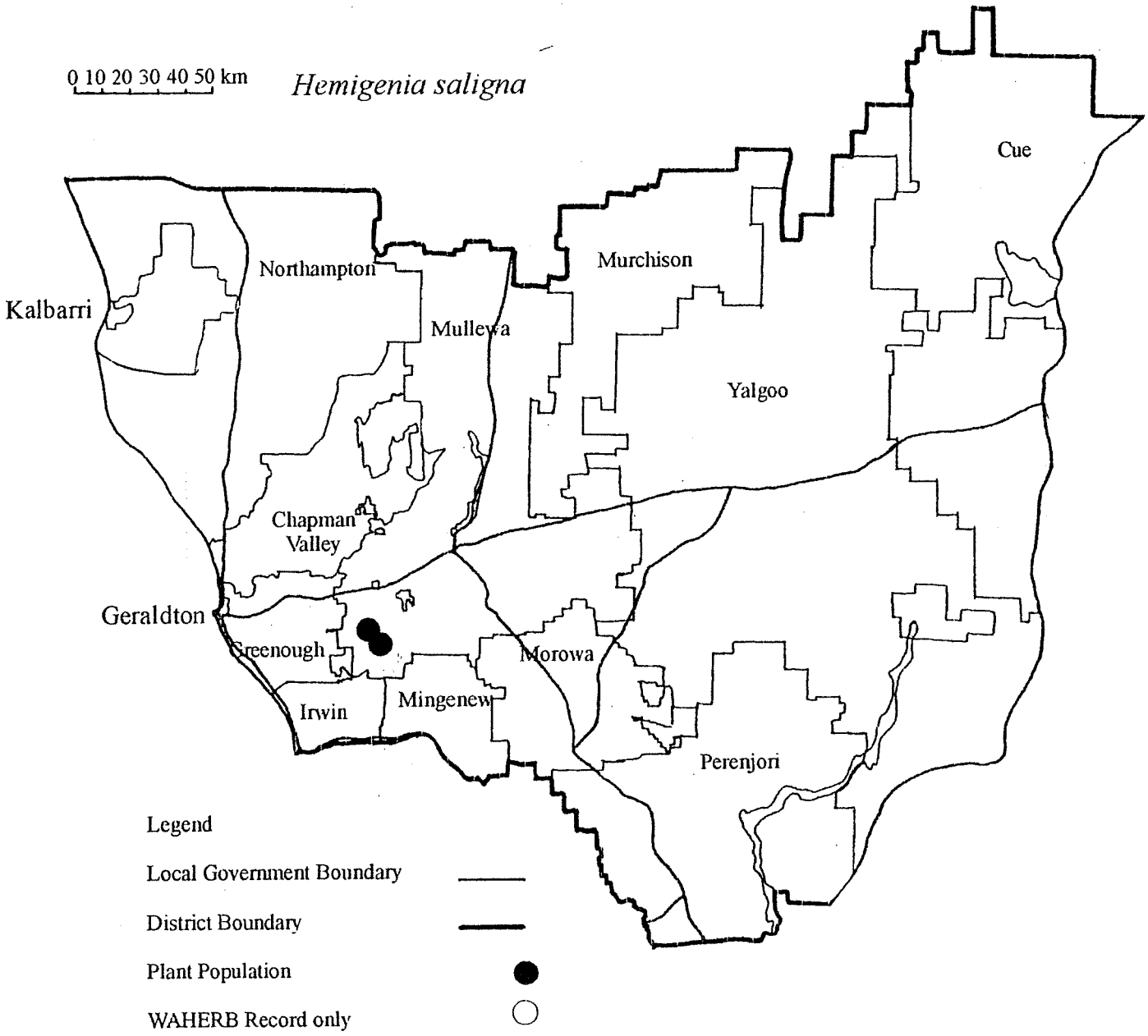
- Ensure that road verge population is marked.

Research Requirements

- Urgent further survey is required.
- Further taxonomic work is required.

References

Blackall & Grieve (1981), Diels & Pritzel (1904-5).


0 10 20 30 40 50 km
Hemigenia saligna
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Hemigenia tysonii F.Muell. LAMIACEAE

Hemigenia tysonii was found by Isaac Tyson on hills near Mt Narryer in 1893 and was not recollected until 1981 when it was found by Andrew Mitchell near Cue.

An erect, compact shrub to 60 cm tall, intricately branched, the leaves, branches and flowers with compound stellate hairs. The leaves are short, 4-7 mm long, linear lanceolate, folded or concave, the tip pointed and recurved. They are opposite or sometimes grouped and are grey-green in colour. The flowers are solitary, nearly sessile, the calyx ribbed, with the lobes half as long as the slender tube. The corolla is blue, purple, light pink or white. The lower lobe is large, the lateral lobes half its length and the upper lobe shorter than the lateral lobes. The anthers all have an elongated connective, which has stiff hairs at one end on the upper anthers and is hairless on the lower anthers.

Flowering Period: May, July-September, December

Distribution and Habitat in the Geraldton District

Occurs mainly to the north of the Geraldton District from east of Shark Bay inland to north of Meekatharra. However, one population has been found in the Geraldton District in 1981, to the north-west of Cue.

Grows on sand, brown red lateritic clayey sand, red sand, yellow red sandy clay or shallow loam in open scrub or mulga shrubland, with Wilcox bush *Eremophila forrestii* and wind grass *Aristida contorta*.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.*NW of Cue	C	-	28.7.1981	-	-

Response to Disturbance

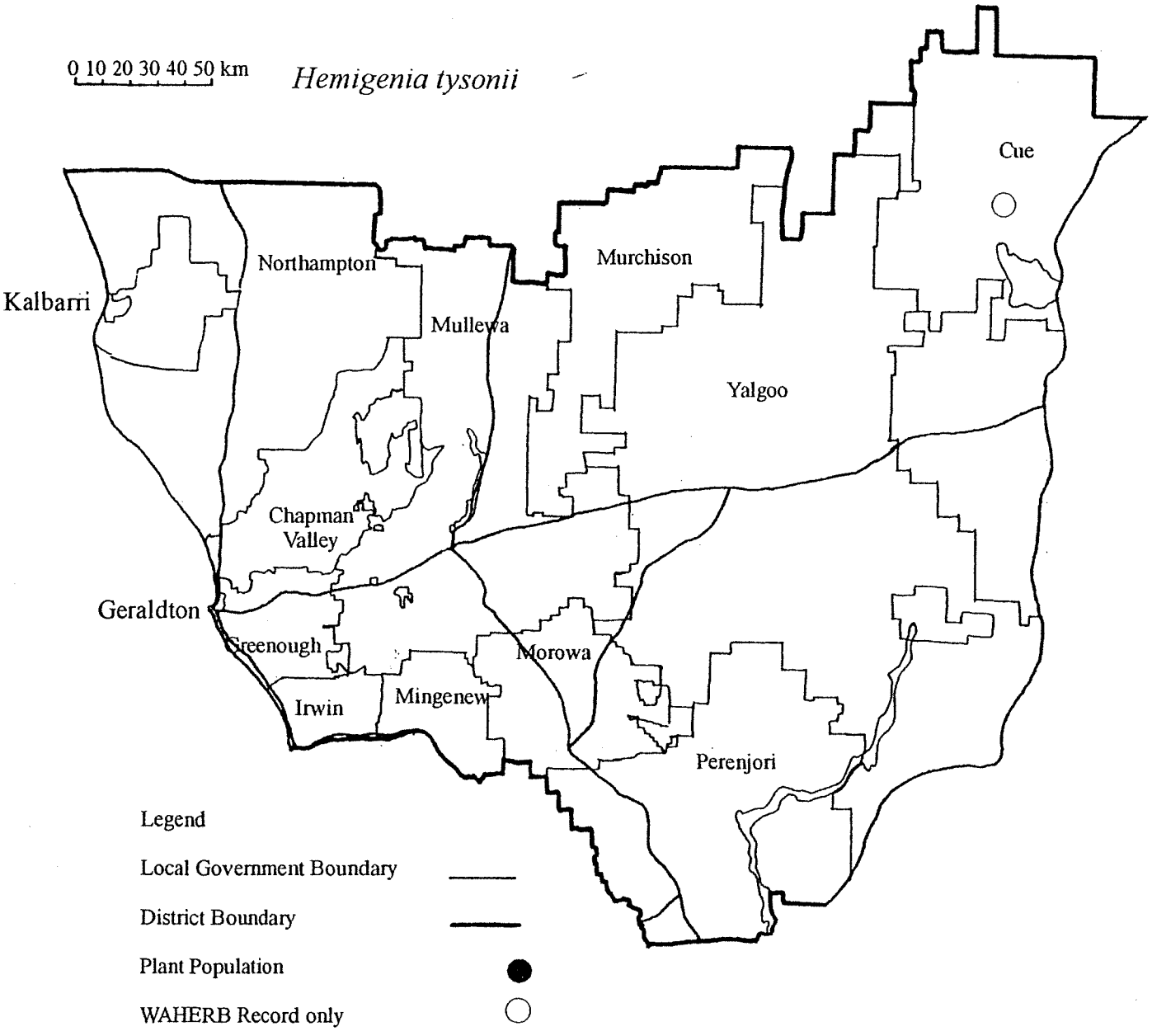
Unknown

Research Requirements

- Further survey is required.

References

Blackall & Grieve (1981), Mueller (1893).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Hemigenia tysonii
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Lasiopetalum oldfieldii F.Muell. subsp. *oldfieldii* STERCULIACEAE

An erect, multi-stemmed shrub 0.2-0.8 m tall with alternate, leathery, ovate leaves, 2-5 cm long, 1-2.5 cm broad, with recurved margins. The petioles are c. 10 mm long and like the stems and lower leaf surfaces, are clothed in rusty stellate hairs. The flowers are arranged in cymes on stems c. 2 cm long. There are three bracteoles at the base of each flower which are terete and filiform, about as long as the calyx. This is divided to the base into five lobes which are pink and hirsute on the inside, becoming green at the base, without prominent ribs and densely hairy on the outside. The petals are very small and are densely stellate-hairy. The five anthers open in terminal pores extending down the inner side of the anthers as slits. They are cherry-pink in colour, ageing to maroon. The style is glabrous and the ovary is densely stellate-hairy.

This subspecies occurs further north than *Lasiopetalum oldfieldii* subsp. *biloculatum* ms (formerly given the phrase name *L.* sp. Coorow (E.Ried 101)) which grows in the Eneabba area and further south. The latter is a taller shrub, growing to 1.5 m tall, flowering April and September to November. It has slightly hastate, flat leaves and bracteoles longer than the calyx. Its flowers are pink to white in colour.

Flowering Period: August-October

Distribution and Habitat in the Geraldton District

Occurs east of Kalbarri and east of Geraldton, with earlier records from the Port Gregory and Kalbarri areas.

Grows on sandplain in yellow sand or white clayey sand, sometimes with lateritic gravel. Occurs in tall shrubland or scrub and *Gastrolobium spinosum, Eucalyptus todtiana, Acacia* and *Grevillea* species have been recorded growing in association.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Casuarina Road	Mu	Shire Road Verge	22.8.1995	2-3	Few plants on roadside verge
2. Kalbarri	N	National Park	18.8.1993	Occasional	-
3.* Kalbarri	N	-	10.8.1977	-	-
4.* NE of Port Gregory	N	-	6.10.1972	Common in a restricted area	-
5.* Kalbarri	N	-	19.9.1968	-	-
6.* N of Hutt Lagoon	N	-	20.11.1901	-	-
7.* Port Gregory	N	-	11.1901	-	-

Response to Disturbance

Population 2 was growing in burnt shrubland.

Management Requirements

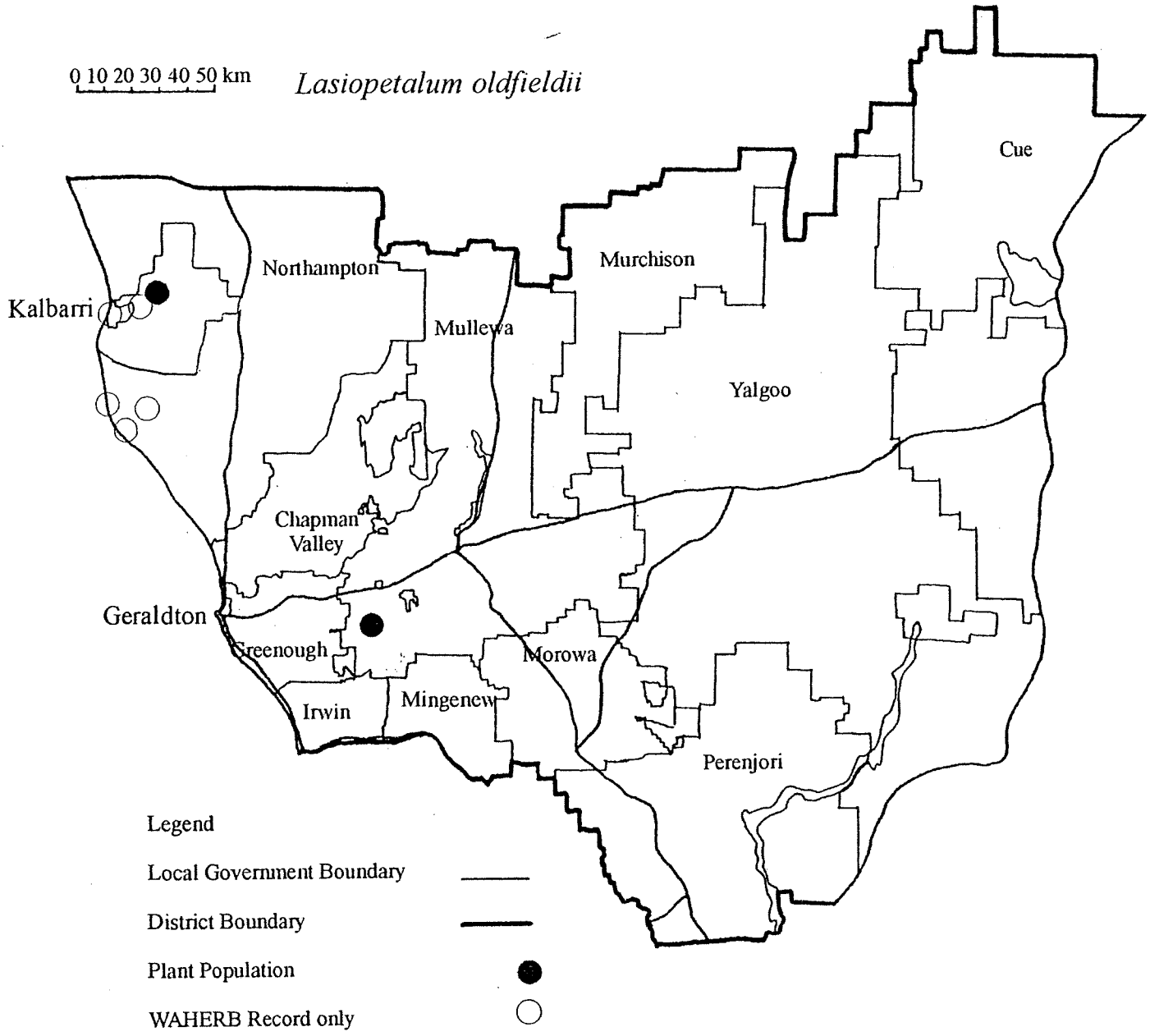
- Ensure that road verge population is marked.

Research Requirements

- Further survey is required, to refind and fully survey populations 1 and 2 and to find other populations particularly in the Port Gregory area.

References

Bentham (1863), Mueller (1860).



Lasiopetalum oppositifolium F.Muell. STERCULIACEAE

A many-stemmed shrub c. 50 cm tall, with narrow, opposite leaves which have short stalks and are up to 10 cm long, lanceolate or oblong-linear in shape. They have minute hairs on the lower surfaces. The flowers are grouped in stalked cymes with up to ten flowers. There are linear bracteoles which are longer than the calyx. The calyx is divided into five lobes which are 4-6 mm long and have dense, purple glandular hairs on the outside. The small petals are hairy. The anthers open in terminal pores which split further. The style is glabrous. In some populations the glandular hairs on the calyx are absent and the style has reflexed hairs.

This species is similar to *Lasiopetalum angustifolium,* which has larger flowers, a hairy style and grows on limestone.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

Occurs in the Kalbarri area and eastward, over a geographical range of c. 50 km.

Grows in rocky areas, on sandstone cliffs and in crevices in sandstone. Grows in shallow yellow sandy loam or grey or white sand over sandstone. Occurs in open scrub to 2 m with *Melaleuca megacephala, M. filifolia, Darwinia oldfieldii, Lepidosperma rupestre, Acacia tetragonophylla, Aphanopetalum clematidium, Callitris canescens, Scholtzia capitata, Plectracne drummondii, Ecdeiocolea monostachya* and *Chamelaucium marchantii.*

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Kalbarri	N	Shire Gravel Reserve	27.9.1995	5+	Healthy
2. ENE of Kalbarri	N	National Park	28.9.1995	1	Healthy
3. SE of Kalbarri	N	National Park	28.9.1995	15	Healthy
4. Hardabutt	N	National Park	10.10.1995	15	Healthy
5.* Murchison Gorge	N	-	5.9.1963	Frequent	-
6.* Near Mt View	N	-	21.8.1961	-	-

Response to Disturbance

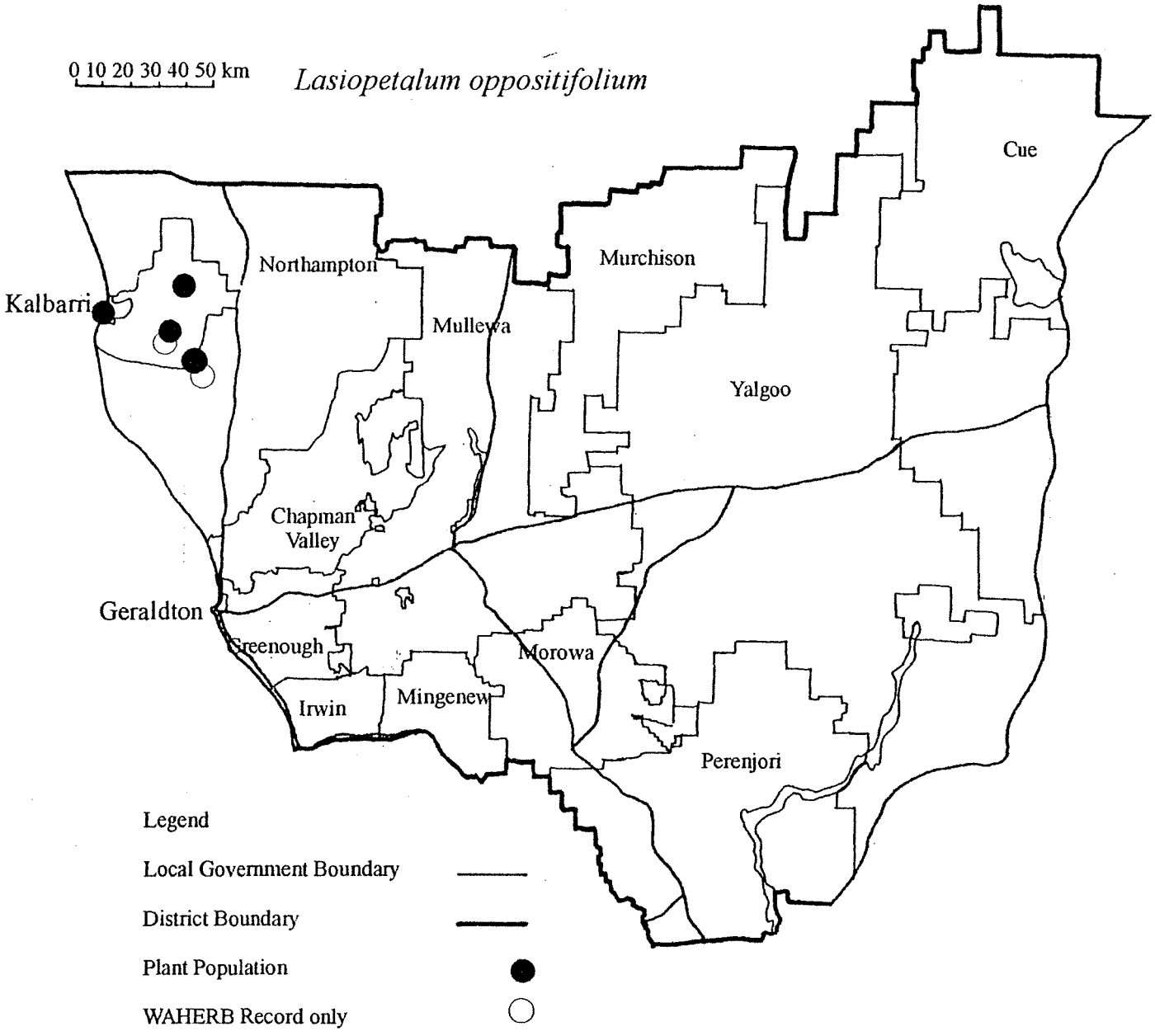
Unknown

Research Requirements

- Further survey is required.

References

Bentham (1863), Mueller (1860), K. Shepherd (personal communication).


0 10 20 30 40 50 km
Lasiopetalum oppositifolium
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Lepidobolus densus L.A.S.Johnson & B.G.Briggs ms RESTIONACEAE

[*Lepidobolus* sp. (B.Briggs 7770)]

A large, many-stemmed plant with rhizomes, forming a dense tussock, to 40 cm high. The stems are yellow-green, glabrous and terete. Each stem has pale chestnut sheathing bracts each with a pungent point. The glumes of the female flower heads are broad and pale chestnut in colour with a darker pungent point and are edged with white hairs. Those of the male inflorescence are narrower, with a conspicuous pale margin.

Flowering Period: September-November

Distribution and Habitat in the Geraldton District

The species is reported to occur at Kalbarri in the Geraldton District. It has recently been found further south-east in the District to the west of Morowa. North of the District, it has been found at Shark Bay. It also occurs further south in the Moora District in the Coorow area.

No details of the population at Kalbarri are known. East of Morowa, it grows in deep sand in open tree mallee over open scrub with open low sedges and grasses. Associated species include *Eucalyptus jucunda, E. eudesmoides, Grevillea biformis, Allocasuarina campestris, Beaufortia squarrosa, Petrophile ericifolia* and *Calytrix* sp. In the Moora District, it grows on yellow or grey sand with lateritic gravel or white-grey sandy clay near lakes. It occurs in open shrubland or sand heath with *Lepidobolus preissianus, L. chaetocephalus* and species of *Grevillea, Melaleuca, Banksia, Acacia* and *Verticordia.*

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

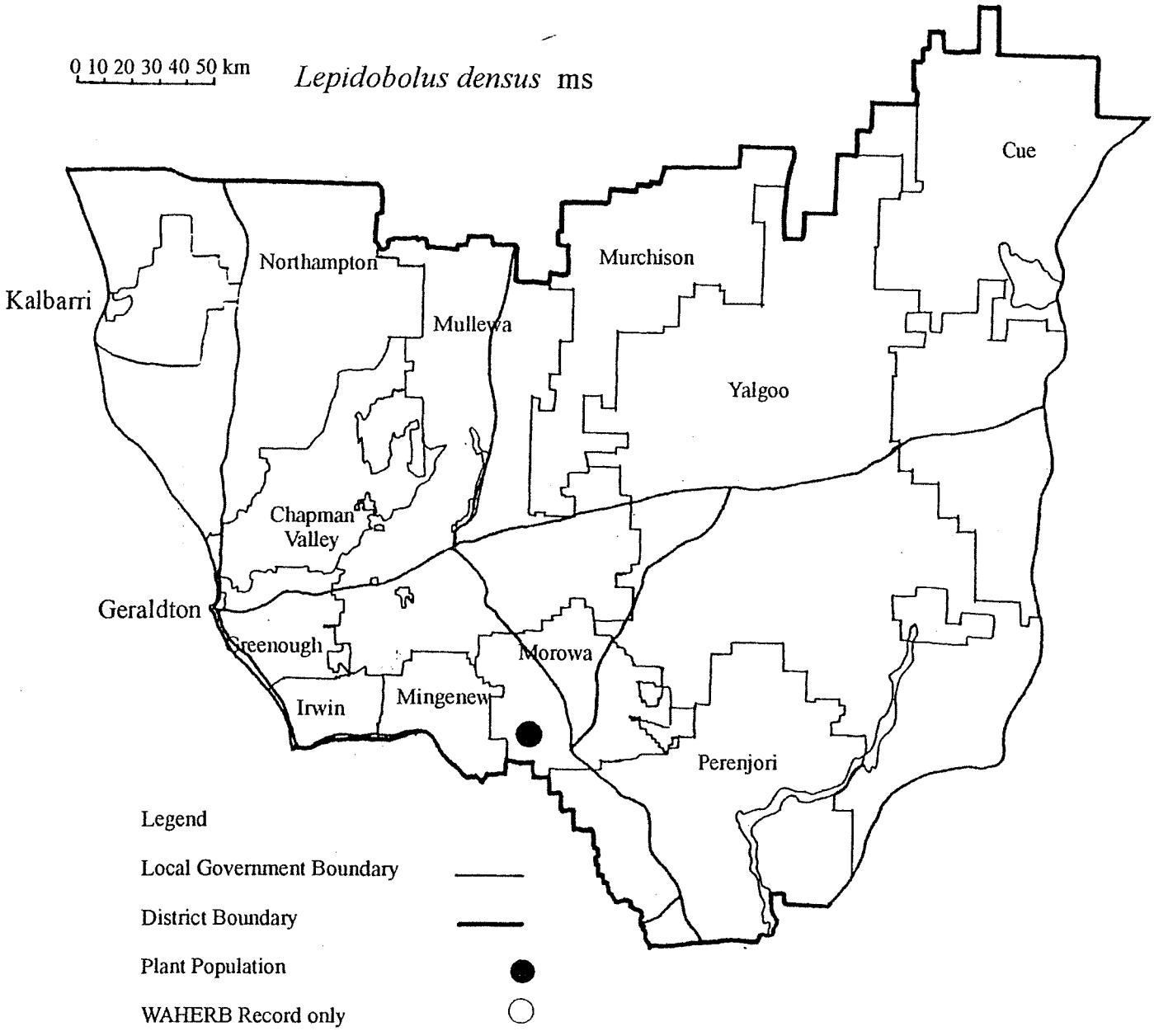
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. W of Morowa	Mo	-	20.8.1997	-	-
2. Kalbarri	N	National Park	-	-	-

Response to Disturbance

Unknown

Research Requirements

- Further survey is required.


0 10 20 30 40 50 km
Lepidobolus densus ms
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Macarthuria intricata Keighery MOLLUGINACEAE

An intricately-branched, glabrous shrub 0.5-1 m tall, the stems terete and green and the leaves reduced to appressed, triangular scales to 1 mm long. The flowers are borne in lateral or terminal cymes of 2-6 flowers on pedicels 1-2 mm long. The sepals are broadly elliptic to ovate, to 2 mm long. The outer three sepals are herbaceous, the inner two less so. There are no petals. The eight stamens are inserted on a staminal ring about half as long as the ovary. The fruit is ovoid to globular, c. 3 mm long.

Flowering Period: July-April

Distribution and Habitat in the Geraldton District

Known from two localities near Kalbarri, but the main range of occurrence is in the southern Shark Bay area, c. 120 km further north.

In the Geraldton District near Kalbarri, this species grows on black sand or on grey sand over sandstone in shrubland with *Lechenaultia linarioides, Acacia scirpifolia, Grevillea leucopteris, Hemiandra leiantha, Calothamnus chrysantherus, Labichea lanceolata, Gyrostemon ramulosus* and *Anthocercis littorea.* In the Shark Bay area, it occurs in open shrubland on red sand over limestone and has been recorded once from red sandy clay.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. S of Kalbarri	N	Shire Road Verge	25.3.1995	12	Moderate
2. Kalbarri	N	Private	28.3.1995	100+	Healthy

Response to Disturbance

Population 2 had been burnt three years previously.

Management Requirements

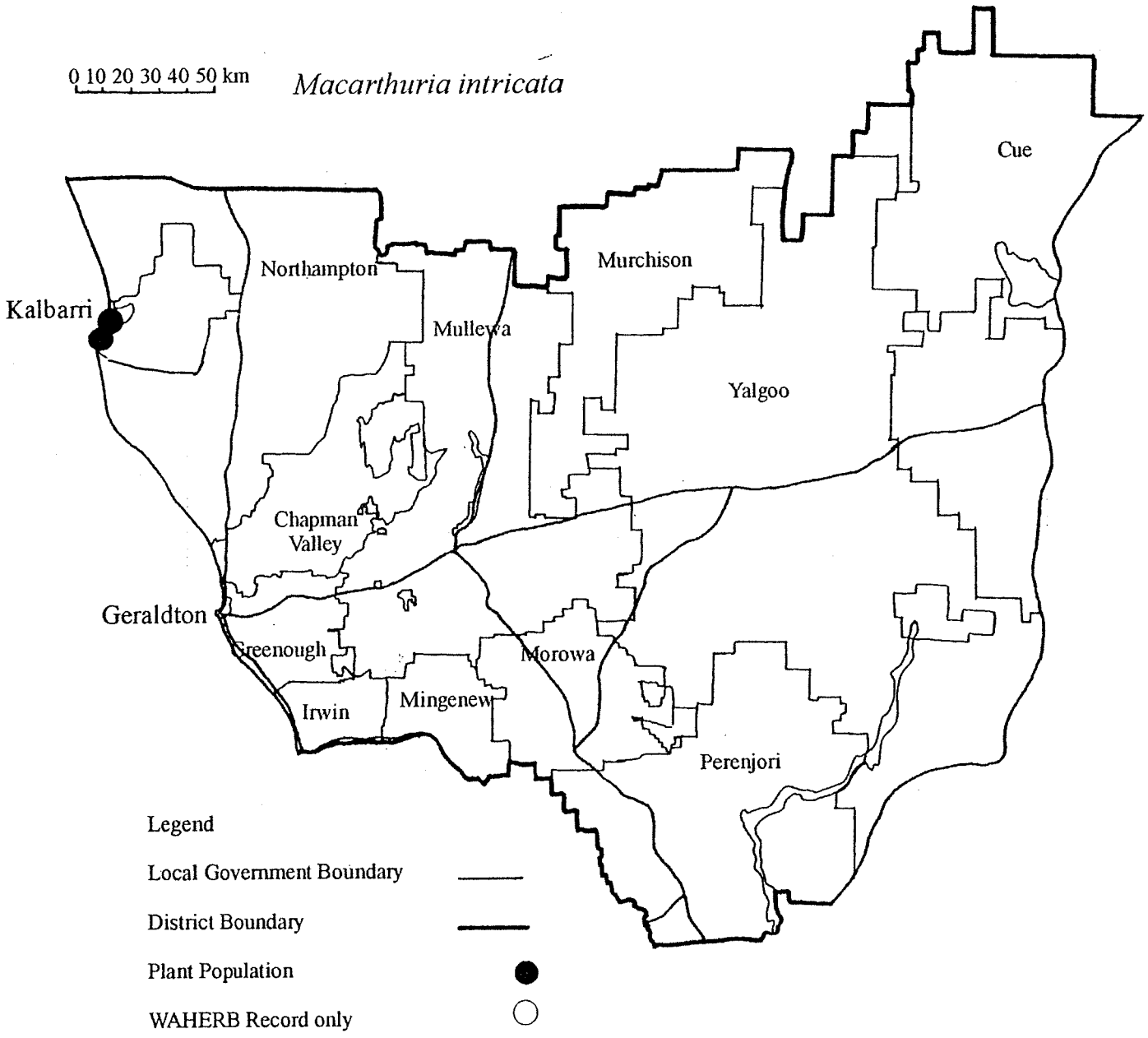
- Ensure that population 1 is marked.

Research Requirements

- Further survey is required.

References

Keighery (1982), Lepschi (1996).


0 10 20 30 40 50 km
Macarthuria intricata
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Maireana prosthecochaeta (F.Muell.) Paul G.Wilson CHENOPODIACEAE

Killara Cactus

An open shrub to 60 cm tall, with erect, somewhat fleshy branches which are densely leaved, the leaves glabrous and narrow with acute tips. They are fleshy, semi-terete, to 40 mm long, 2-3 mm wide and bright green in colour. The flowers are solitary and crowded towards the apices of the branches. The fruits are glabrous, the perianth tube is top-shaped, c. 4 mm in diameter at the apex, with a single wing c. 15 mm in diameter surrounding the upper perianth and with no horizontal wing at the base of the tube and no vertical wings on the tube. The upper perianth is flat, five-lobed, with four erect, linear processes at the base of the lobes.

Flowering Period: July

Distribution and Habitat in the Geraldton District

Has been recorded from Cue and further west in the Geraldton District and north of the District to the headwaters of the Ashburton River, in inland areas. It has been collected only three times in the last 27 years and although widespread, has been collected from only six localities. At a recently recorded locality near Marymia, north of the Geraldton District, it was estimated that in excess of 4 150 plants occurred at 13 locations.

Grows on saline breakaway footslopes on fine sedimentary rocks and on kopi dunes adjacent to salt lakes.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* Cue	C	-	7.1903	-	-
2.* Between Yuin and Murchison River	-	-	c. 1875	-	-

Response to Disturbance

Reported to be a sensitive decreaser species which may be removed from areas under heavy grazing pressure. It is rarely abundant (Pringle & Cranfield).

Management Requirements

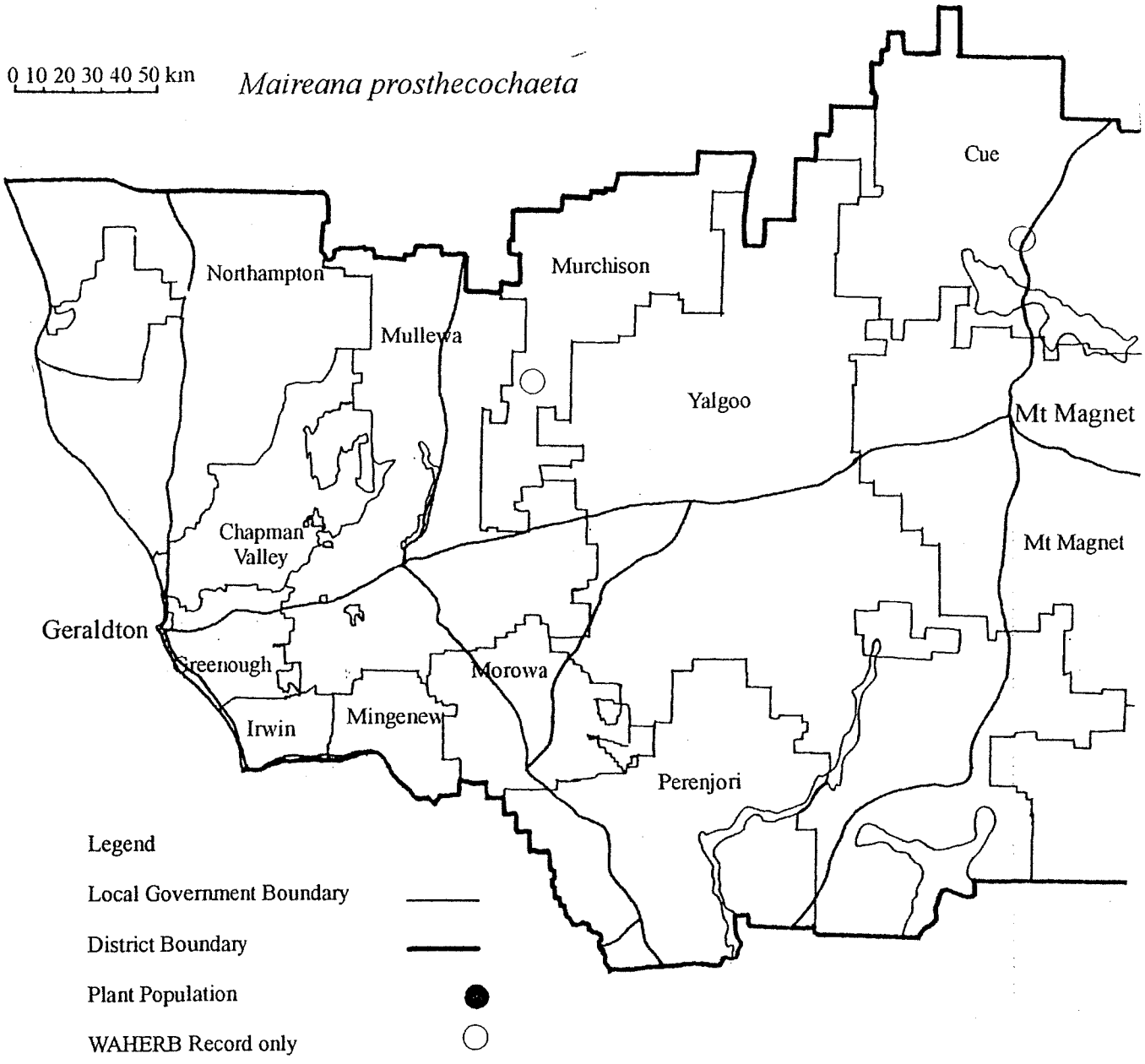
- Voucher specimens for the Marymia population should be lodged at the Western Australian Herbarium.

Research Requirements

- Further survey is required to re-find this species, both in the Geraldton District and further north.

References

Pringle & Cranfield (1995), Wilson (1975, 1984).


0 10 20 30 40 50 km
Maireana prosthecochaeta
Cue
Murchison
Northampton
Mullewa
Yalgoo
Mt Magnet
Chapman Valley
Mt Magnet
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Mirbelia sp. Kalbarri (M.D.Crisp 6261) FABACEAE

A small shrub 20-60 cm tall, the leaves reduced to small triangular scales c. 1 mm long. The flowers have short pedicels and occur singly in the scale leaf axils on the upper branchlets. The calyx has short appressed hairs on the outer surface and five narrow acuminate lobes slightly longer than the calyx tube. The flowers are described as yellow and pink, light pink or apricot in colour.

This taxon is similar to *Mirbelia viminalis,* which is a taller shrub, to 2 m, with yellow flowers which have broader calyx lobes. It occurs further to the north-east than *M.* sp. Kalbarri and grows on more rocky soils of sandstone outcrops, screes, plateaux and hills.

Flowering Period: August-October

Distribution and Habitat in the Geraldton District

Occurs in the Kalbarri area over a geographic range of c. 40 km to the east and south-east of Kalbarri.

Grows on flat sandplain, often in winter-wet areas, on white or grey sand or brown clayey sand, sometimes over laterite in shrubland or low regenerating heathland. Associated species include *Verticordia picta, V. grandiflora, Anigozanthos kalbarriensis, Conospermum stoechadis, Stenanthemum pomaderroides* and species of *Geleznowia, Scholtzia* and *Grevillea.*

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

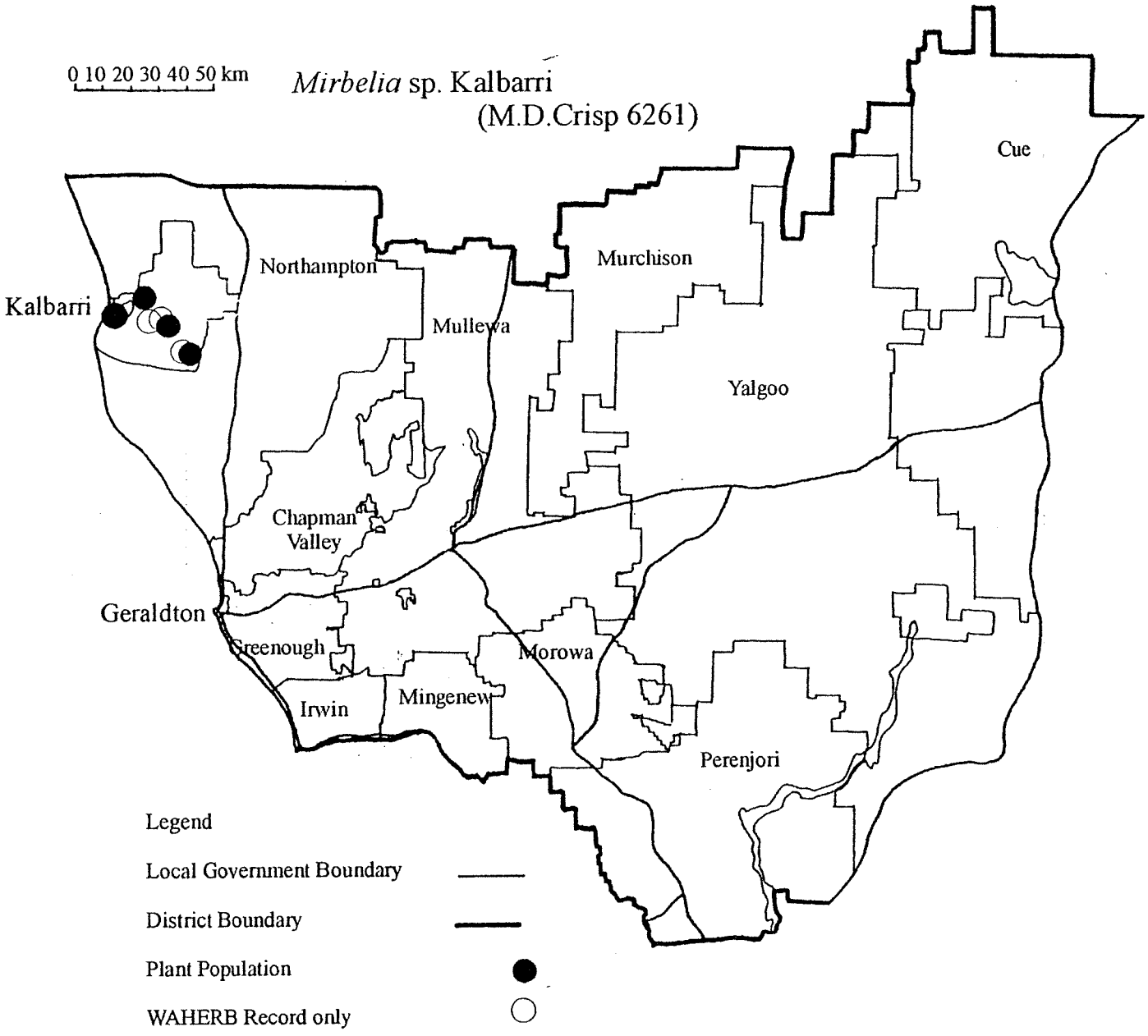
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. NE of Kalbarri	N	National Park	27.9.1995	10+	Healthy
2. NW of Ajana	N	National Park	26.9.1995	10+	Healthy
3. E of Kalbarri	N	National Park	8.10.1996	Frequent	-
4. Kalbarri	N	-	5.9.1988	Occasional	-
5.* E of Hawkshead	N	-	23.8.1983	A few plants	-
6.* E of Kalbarri	N	-	9.9.1980	Frequent	-
7.* ENE of Kalbarri	N	-	3.9.1963	-	-

Response to Disturbance

Populations 1 and 2 were in areas burnt a few years previously.

Research Requirements

- Further survey is required.
- Taxonomic research is required.


0 10 20 30 40 50 km
Mirbelia sp. Kalbarri
(M.D.Crisp 6261)
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman
Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Myriocephalus appendiculatus Benth. ASTERACEAE

White-tip Myriocephalus

An erect annual herb to 20 cm tall, with few branches and both woolly and glandular hairs. The leaves are linear to narrowly ovate, to 35 mm long, 5 mm wide. The flowers are in a compound terminal head, up to 1.5 cm in diameter. There are several rows of white involucral bracts forming a ray around the yellow flower cluster. Each partial head has 4-6 flowers. The fruits have small hairs.

Flowering Period: September-November

Distribution and Habitat in the Geraldton District

In the Geraldton District, this species has been recorded twice from north of Cue. It is also known from the Moora District in the Eneabba area, with an early record from Gillingarra, further south. It also occurs in the metropolitan area at Upper Swan.

Near Cue, this species was found growing in red sandy loam soil in open *Acacia* woodland in an area which had previously been wet, and on the margins of water pans. In the Moora District, it has been recorded growing in deep coarse sand on a slope at one locality and in sandy clay in low lying areas. In the metropolitan area, it grows on the clay soil of a winter swamp.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. N of Cue	C	Pastoral Lease	12.9.1992	-	-
2. S of Meekatharra	C	-	7.10.1989	-	-

Response to Disturbance

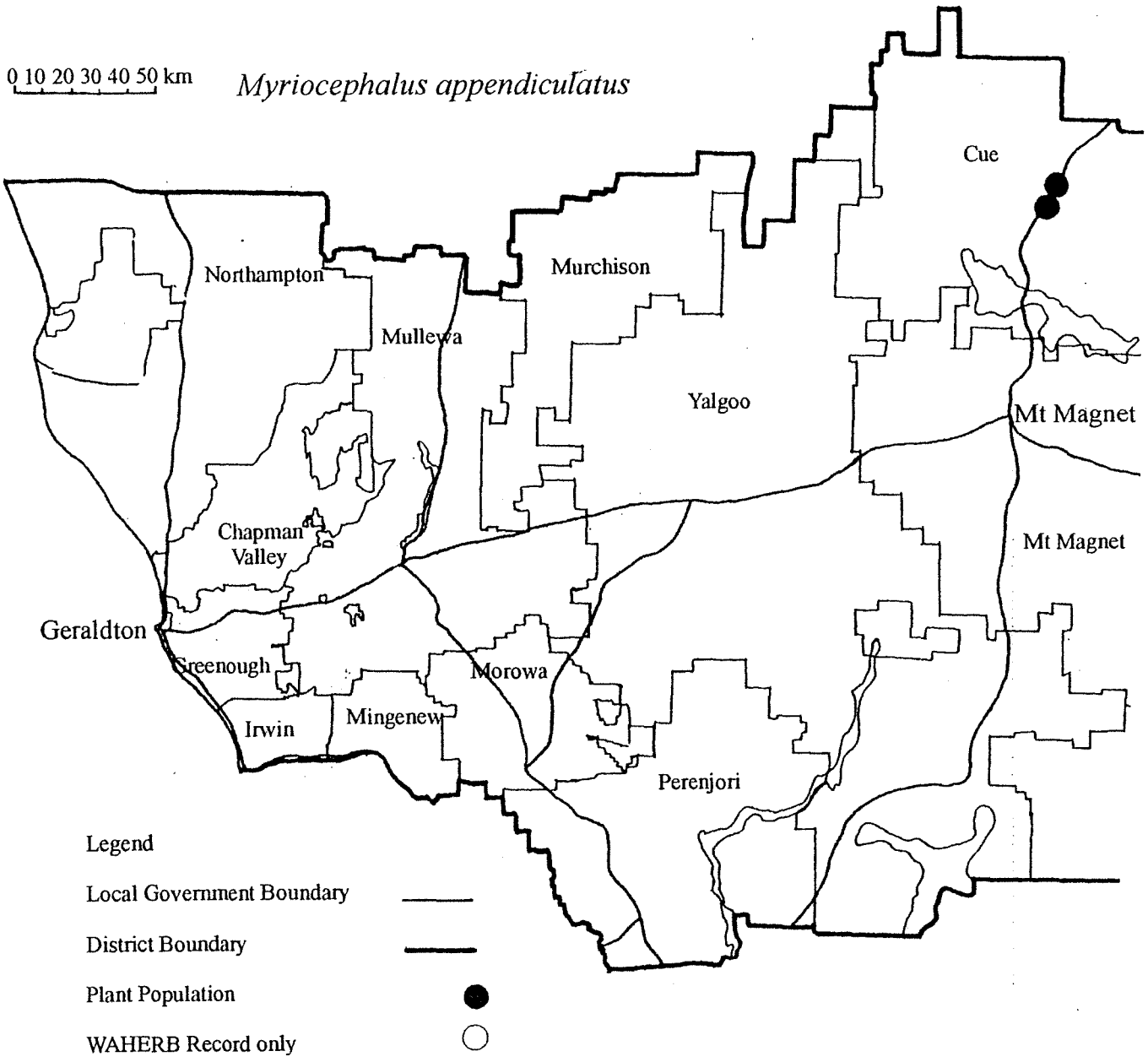
Unknown

Research Requirements

- Further survey is required.

References

Bentham, (1867), Kelly *et al.* (1993), Marchant *et al.* (1987).


0 10 20 30 40 50 km
Myriocephalus appendiculatus
Cue
Murchison
Northampton
Mullewa
Yalgoo
Mt Magnet
Chapman Valley
Mt Magnet
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Physopsis chrysophylla (C.A.Gardner) Rye CHLOANTHACEAE

This species was described by C.A.Gardner in 1964 as *Newcastelia chrysophylla.*

A tall shrub or small tree, 2-4 m tall, the stem to 7 cm in diameter. The leaves are decussate with very short stalks, obovate in shape, to c. 3 cm long, olive-green above and with a yellow indumentum on the undersurface. The flower spikes are terminal on the branches and are elongated and cylindrical, 3-5.5 cm long. They are densely hairy with golden yellow hairs. The flowers usually have their parts in fives, rarely fours. The calyx is densely hairy on the outside, the lobes are slightly shorter than the tube, which is c. 2 mm long, and the lobes have long, simple, non-glandular hairs inside towards the base. The corolla is apparently yellow, glabrous on the outside, the lobes with prominent reticulate veins and with sparse hairs on the inside at the base. The stamens are inserted inside the corolla, the ovary is globular and tomentose, with four compartments and a short included style.

This species is related to *Physopsis chrysotricha,* which has sessile leaves and occurs much further east. It is also related to *P. spicata,* which has a white indumentum and occurs further south.

Flowering Period: October-January

Distribution and Habitat in the Geraldton District

P. chrysophylla occurs mainly in the Shark Bay area, extending south to the northern boundary of the Geraldton District.

In the southern part of its range, this species grows on sandplain on yellow sand or orange yellow clayey sand in low forest of *Actinostrobus arenarius* and *Banksia sceptrum,* or in dense thickets with *Grevillea excelsior, Banksia sceptrum, Eucalyptus roycei* and *Adenanthos acanthophyllus.* Further north it has also been recorded on red sandy soil and on sand over limestone.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Emu Fence	N	Pastoral Lease	18.10.1997	Occasional	-

Response to Disturbance

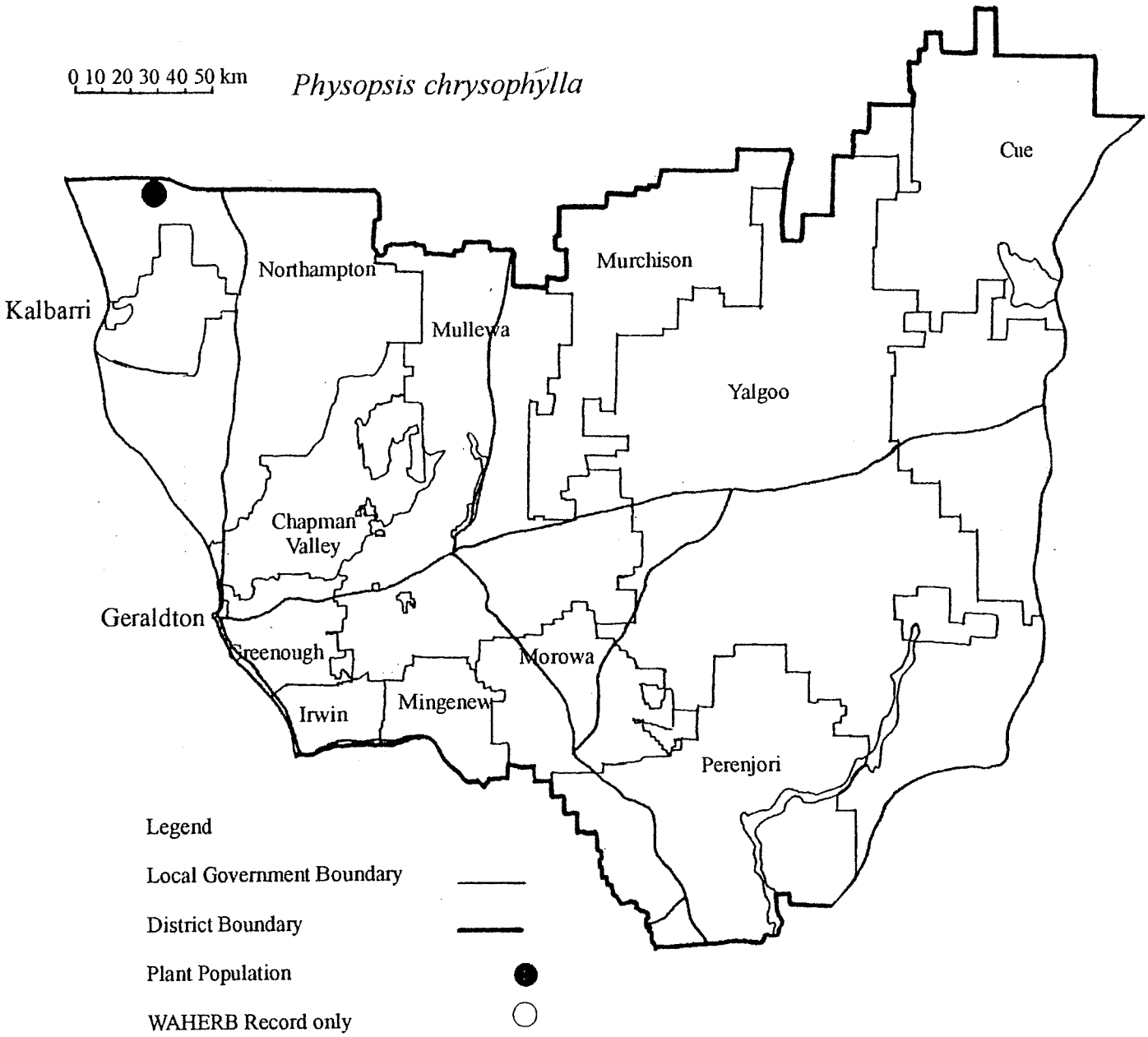
Unknown

Research Requirements

- Further survey is required.

References

Gardner (1964), Munir (1978), Rye (1996).


0 10 20 30 40 50 km
Physopsis chrysophylla
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Scaevola globosa (Carolin) Carolin GOODENIACEAE

[*Nigromnia globosa*]

A prostrate shrub to 70 cm high and 1 m in diameter, covered with a felt-like pubescence of yellowish-white hairs, maturing to grey. The leaves are scattered along the stems. They are obovate to elliptic, 3-6 cm long. The inflorescence is a sessile globular head in the axil of the leaf, to 15 mm in diameter, with the flowers buried in the mass of soft hairs. Each flower is c. 3 mm long, the corolla yellow. The fruit is up to 2 mm long, ribbed and hairless.

Flowering Period: October-December

Distribution and Habitat in the Geraldton District

This species is known from south-west of Mullewa and between Geraldton and Mullewa in the Geraldton District and was described from the original collection made between Yuna and Dartmoor where it has recently been refound. It also occurs further south in the Moora District between Carnamah and Watheroo.

Grows in white-grey sand, sandy loam or clay in open shrubland.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. SW of Mullewa	Mu	Shire Road Reserve	4.10.1994	c. 500	Moderate. Some weed infestation
2. NE of Yuna	CV	Nature Reserve	1.11.1994	1	Healthy, area burnt c. one year previously
3.* E of Geraldton	G	-	12.12.1973	-	-
4.* N of Mingenew	Mu	-	17.10.1967	-	-
5.* N of Mingenew	Mu	-	29.10.1967	-	-

Response to Disturbance

Growth of new plants is stimulated by fire and by soil disturbance.

Management Requirements

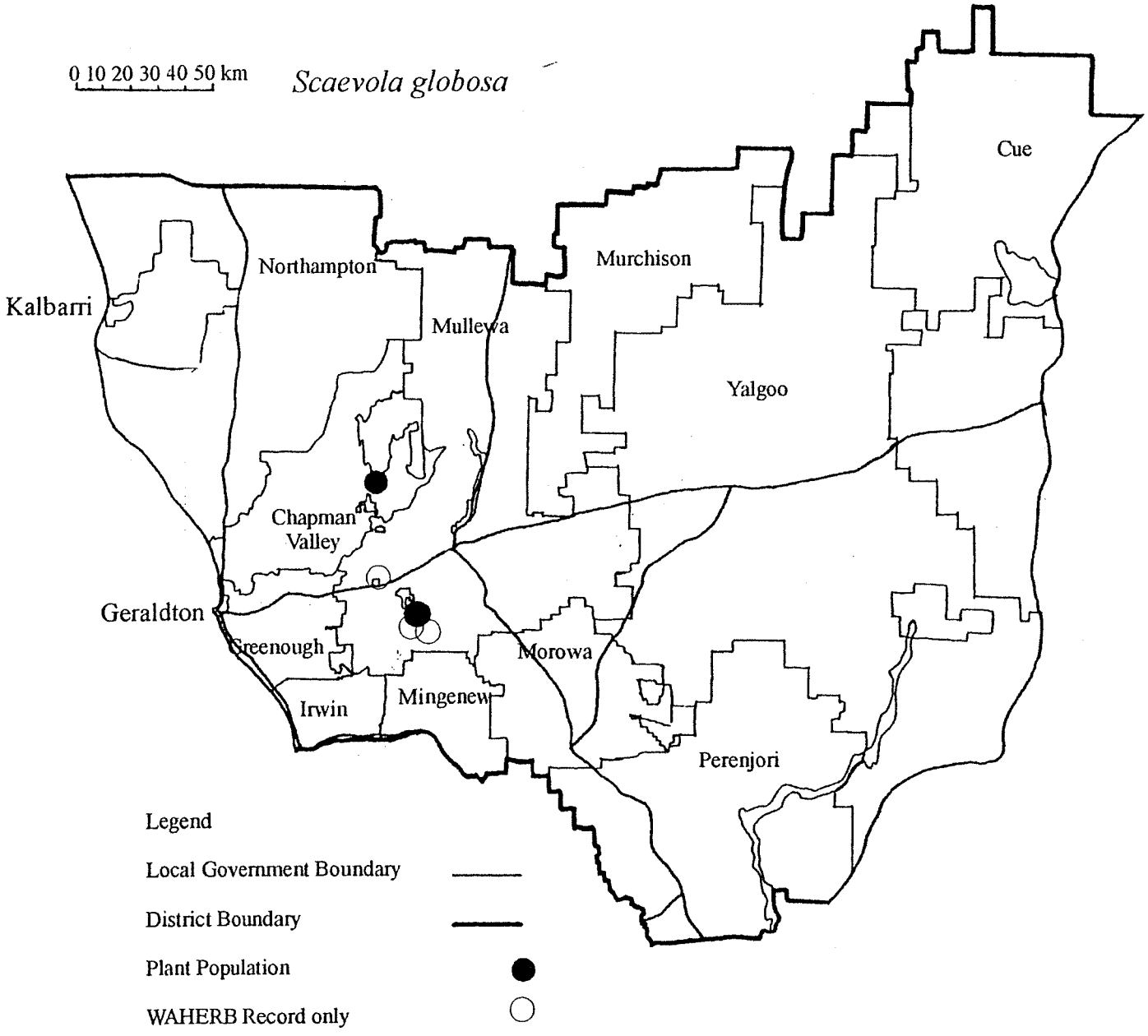
- Monitor known populations.

Research Requirements

- Further survey is required on conservation reserves. Population 2 should be resurveyed.

References

Carolin (1974, 1990a, 1992).


0 10 20 30 40 50 km
Scaevola globosa
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Scaevola oldfieldii F.Muell. GOODENIACEAE

A shrub to 2. 3 m tall, with glabrous branches. The leaves may be restricted to the branch tips in older plants. They are glabrous, lanceolate to oblanceolate, the base tapering to the petiole, the apex tapering to a sharp tip. They are 7.5-9.2 cm long, 12-19.7 cm broad, sometimes with a few marginal teeth. The flowers are sessile, occurring singly in the leaf axils or crowded on short axillary spikes 3-8 cm long. The bracteoles are three-quarters the length of the corolla, which is 11-21 mm long, 10-15 mm wide, white in colour, streaked with maroon along the veins. The corolla wings are often folded or incompletely developed. The indusium is 1.4-2.1 mm wide. The ovary has one compartment with two ovules. The fruit is c. 3 mm long, oblong and slightly wrinkled.

This species is similar to *Scaevola kallophylla,* which has hairy branches and sessile, minutely hairy leaves. It is also similar to upright variants of *S. repens,* but is much taller.

Flowering Period: August-December

Distribution and Habitat in the Geraldton District

This species occurs between Kalbarri and Geraldton.

Has been recorded growing in grey to yellow sand over sandstone with *Jacksonia, Thryptomene* and *Verticordia* species or in low coastal heath with *Acacia, Conospermum* and *Calothamnus* species or in brown gravelly sandy clay or loam, in shrubland with *Hakea trifurcata, Verticordia monadelpha, Grevillea thelemanniana* and *Dampiera* sp.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Near Ross Graham	N	National Park	11.11.1995	59	Healthy
2. S of Kalbarri	N	National Park	3.11.1994	500+	Healthy
3. Near Z Bend	N	National Park	30.7.1994	173+	Undisturbed
4. NW of Northampton	N	-	24.6.1997	Locally frequent	-
5. S of Northampton	CV	-	9.1991	-	-
6.* W of Casuarina	Mu	-	5.8.1976	-	-
7.* N of Northampton	N	-	2.9.1970	-	-
8.* Hutt River	N	-	11.11.1972	-	-

Response to Disturbance

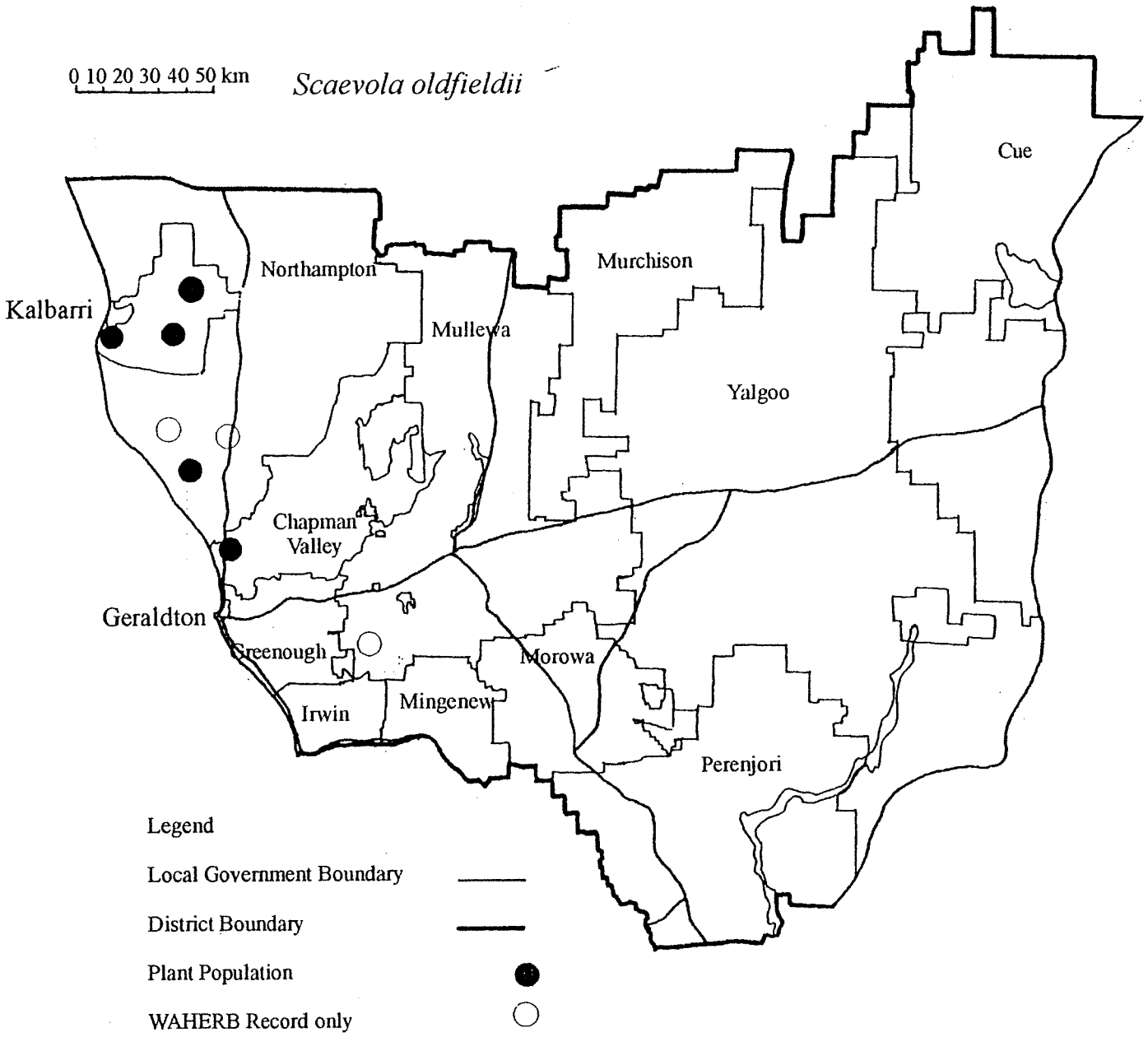
Population 2 was in an area that had been burnt about two years previously.

Research Requirements

- Further survey is required, particularly to determine the full extent of population 2, which is reported to extend for 20 km southwards, and to refind and survey fully populations 4-8.

References

Carolin (1990a, 1992), Howell (1996), Mueller (1860).


0 10 20 30 40 50 km
Scaevola oldfieldii
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Scholtzia sp. Ajana (T.A.Halliday 137) MYRTACEAE

A slender, open shrub 1-3 m tall, with drooping branchlets. The leaves are ovate, decussate, c. 4 mm long. The flowers are white or pale pink. They are short-stalked and are clustered in the leaf axils towards the ends of the branchlets.

Flowering Period: September-January

Distribution and Habitat in the Geraldton District

Known from the south-eastern part of the Kalbarri National Park.

Grows on sandplain in yellow sand, sometimes over sandstone, or in grey sandy clay over laterite. Occurs in low shrubland on yellow-brown sand with emergent *Banksia* and *Xylomelum* species over *Conospermum stoechadis, Ecdeicolea monostachya, Calothamnus* and *Melaleuca* species. Also occurs on grey sandy clay with *Banksia sceptrum, Calytrix formosa, Grevillea annulifera* and *G. biformis,* or on grey sandy clay with *Melaleuca urceolaris, Calytrix purpurea, Hakea pycnoneura, Patersonia occidentalis, Grevillea* and *Petrophile* species.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

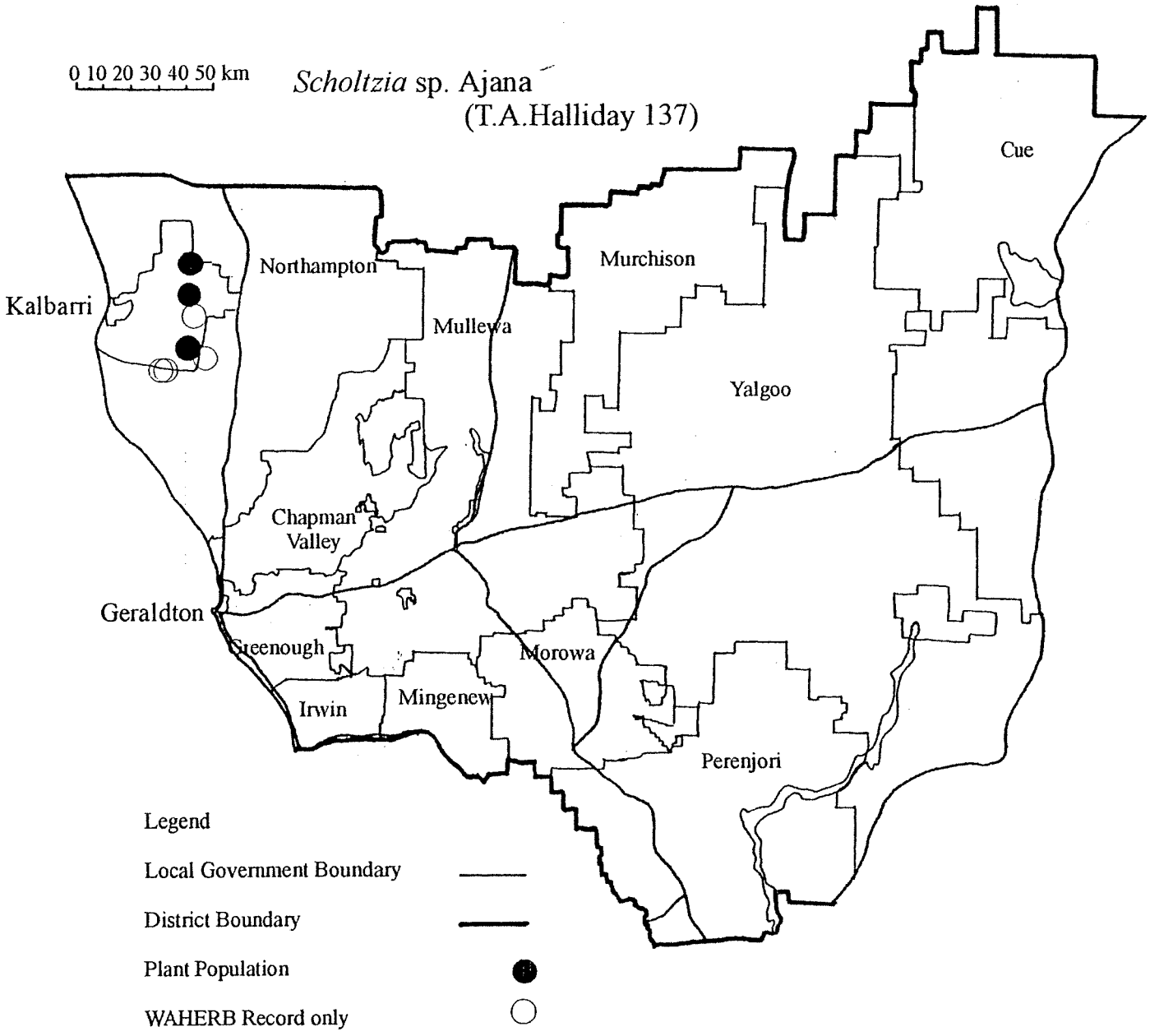
Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Near Z Bend	N	National Park	28.9.1995	9	Healthy
2. SE of Kalbarri	N	National Park	10.10.1995	1 000+	Healthy
3. NW of Ajana	N	National Park	24.10.1995	-	-
4.* SE of Kalbarri	N	-	31.10.1979	-	-
5.* SE of Kalbarri	N	-	10.11.1978	-	-
6.* Ajana Road	N	-	26.9.1974	"dominant"	-
7.* Hawkshead	N	National Park	19.12.1968	-	-

Response to Disturbance

Unknown

Research Requirements

- Further survey is required.
- Taxonomic research is required.


0 10 20 30 40 50 km
Scholtzia sp. Ajana
(T.A.Halliday 137)
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Stenanthemum divaricatum (Benth.) Rye RHAMNACEAE

A low shrub to 0.5 m tall, with slender, often spinescent branches which are divaricately branched. The leaves are grouped in small clusters. They are blunt or two-lobed, 2-4 mm long, narrow at the base, with revolute margins, glabrous above, white on the lower surface. The flowers are minute, in clusters of two or three in the leaf clusters. The calyx is c. 1 mm long, with a hairy tube and hairless lobes.

Flowering Period: August-September

Distribution and Habitat in the Geraldton District

Known from two coastal populations near Kalbarri. Also occurs north of the Geraldton District where five populations have been recorded in the Shark Bay area.

In the Kalbarri area, this species grows in yellow sand over sandstone in open low heath, with a range of shrub species, including *Allocasuarina humilis, Acacia, Cryptandra* and *Thryptomene* species. Further north it grows on red sand over limestone or white sand, sometimes with *Triodia* sp.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. S of Kalbarri	N	National Park	2.6.1994	1+	Healthy
2. E of Kalbarri	N	National Park	2.6.1994	1	Healthy

Response to Disturbance

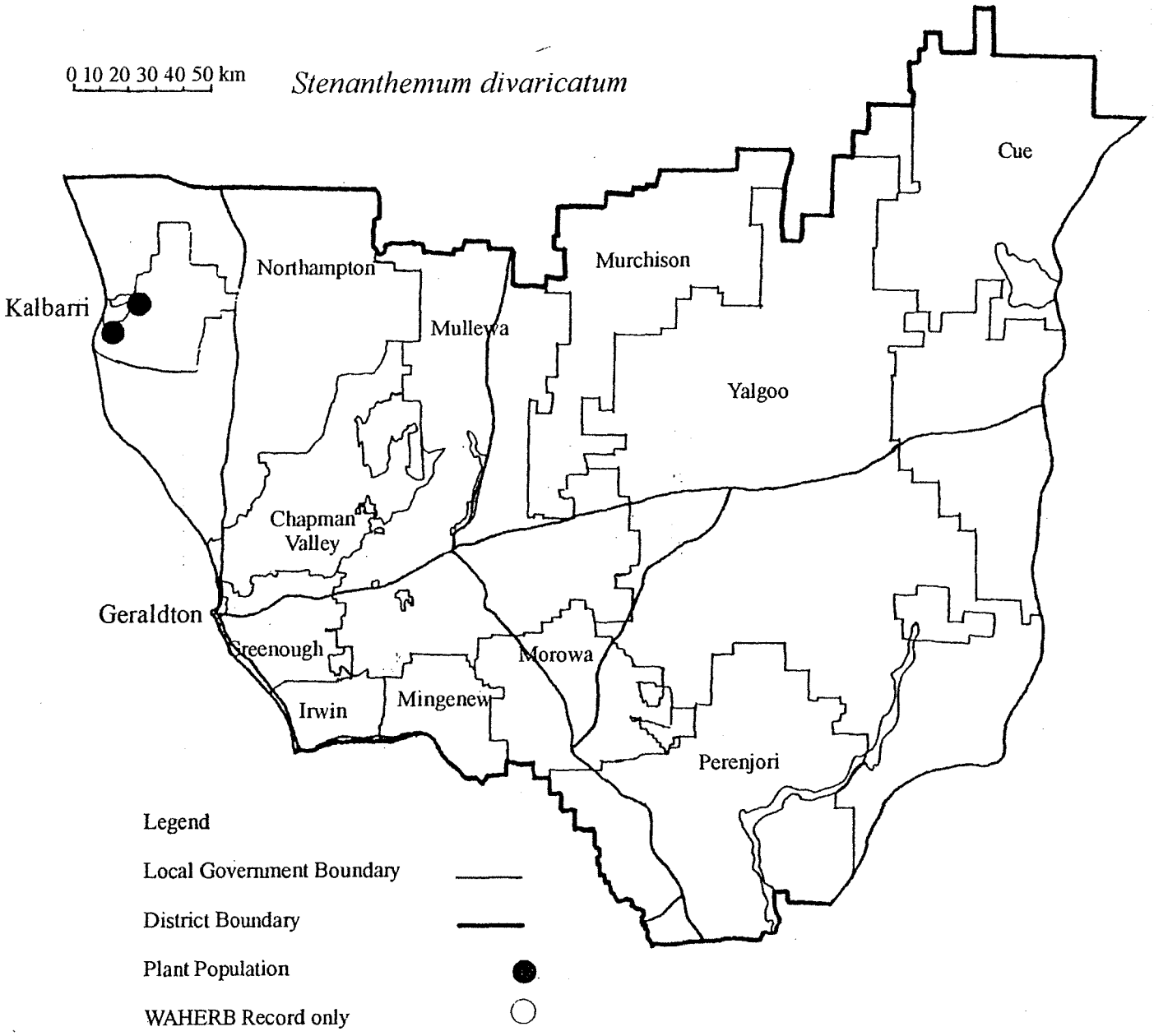
Unknown

Research Requirements

- Further survey is required.

References

Bentham (1863), Rye (1995).


0 10 20 30 40 50 km
Stenanthemum divaricatum
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Stylidium xanthopis F.L.Erickson & J.H.Willis STYLIDIACEAE

Yellow Eyed Triggerplant

A small plant, 4-10 cm tall, often branching, red and green in colour, with sparse glandular hairs. The leaves are glabrous, densely crowded in a basal rosette. They are linear, fleshy, 3-5 mm long. The flowering stem is usually branched, with up to 10 stalked flowers in an irregular corymb. The calyx is linear, the lobes shorter than the tube. The flowers are c. 1 cm across, with four bright pink rounded petals, and the corolla tube is shorter than the calyx lobes. The throat is bright yellow and there are dark red marks near the base of two of the petals and white bands at the base of the other two. There are six blunt throat appendages and the column is slender, longer than the petals. The pollen is bright blue.

This small species has a similarity to *Levenhookia leptantha* with which it grows. *L. leptantha*, however, has ovate leaves, a few of which may be grouped basally, and the corolla tube is at least three times longer than the calyx lobes.

Flowering Period: September

Distribution and Habitat in the Geraldton District

This species has been collected from only two localities, between Mullewa and Morowa. It is reported that one large population was found in 1998, growing on private land (A. Lowrie, personal communication) in open shrubland on a damp drainage area in red loam with granite.

It has been found growing in pockets of damp soil at the base of a large rock outcrop and in a flat soak area on clayey soil with lateritic gravel. At population 2 it was growing with *L. leptantha, L. pusilla, Stylidium petiolare* and *S. calcaratum.*

Conservation Status

Current: Priority 3[#]

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. N of Morowa	Mo	Private	9.1998	1 000+	Healthy
2.* S of Mullewa	Mu	-	9.1974	-	-
3.* N of Morowa	Mo	-	10.9.1953	-	-

Response to Disturbance

Unknown

Management Requirements

- Liaison is required with the landowner on whose property the only known population occurs.

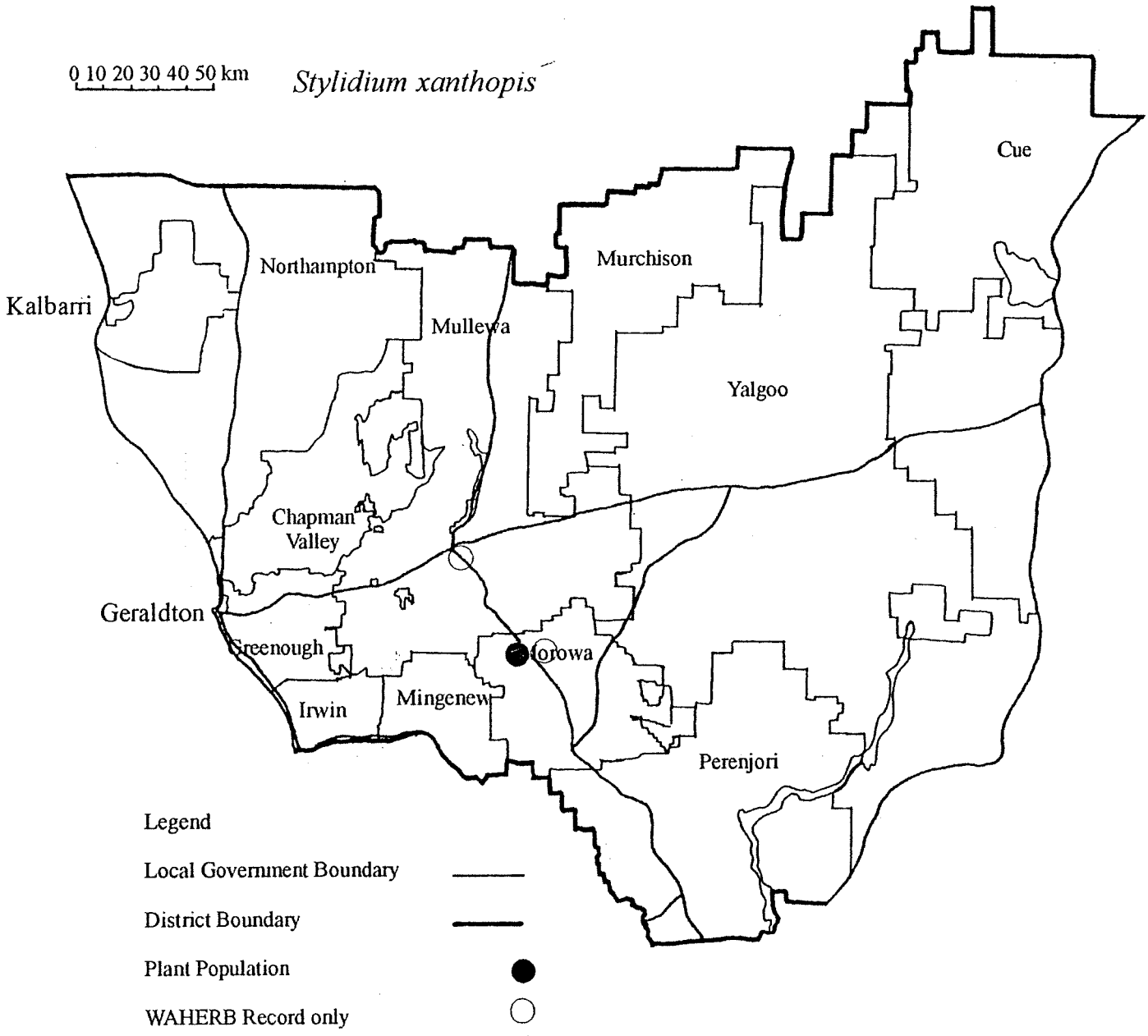
Research Requirements

- Although poorly collected, this small species is similar to *L. leptantha* with which it grows, and may have been overlooked. Further survey is urgently required in suitable habitat in the Morowa-Mullewa area.

[#] now Priority 1 (updated at December 1999)

References

Erickson (1981), Erickson & Willis (1956a).



Verticordia chrysostachys Meisn. var. *pallida* A.S.George MYRTACEAE

An open shrub 1-1.5 m tall, 1-1.5 m wide, with leaves which are usually recurved. The flowers are pale yellow on peduncles 2-2.5 mm long. There are prominent reflexed appendages on the hypanthium. The sepals are 4-6 mm long with 7-12 lobes. The petals are 5-6 mm long, including an acute fringe 1.5-2 mm long. The staminodes are about as long as the stamens. The style is exserted, 5-7 mm long, with an S-shaped apex and a beard of hairs 0.3-0.5 mm long.

This variety differs from the typical variety in a number of ways. The leaves are usually recurved, not straight. The flowers are pale, not deep yellow. The peduncles and petals are shorter, as is the petal fringe, which has acute, not obtuse segments. The hairs of the style beard are shorter.

Flowering Period: October-January

Distribution and Habitat in the Geraldton District

Occurs in the Northampton to Mullewa area.

Grows in deep yellow sand in heath beneath open low mallee woodland, with *Actinostrobus arenarius* and with species of *Banksia, Thryptomene, Hakea, Calytrix, Grevillea, Calothamnus* and *Acacia.*

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Peter Road	Mu	Shire Road Verge	4.4.1994	2	Undisturbed
2. Colgate Road	Mi	Shire Road Verge	3.10.1994	1 (Occasional)	Moderate, road edge
3. E of Eradu	Mu	MRWA Road Verge, Rail Reserve, Nature Reserve	1.11.1994	100+	Healthy
4. Valentine Road	CV	Shire Road Verge	1.11.1994	20+	Healthy
5. SE of Yuna	CV	Nature Reserve	1.11.1994	10+	Healthy
6. W of Tenindewa	Mu	-	20.11.1987	"a small number"	-
7. Near Northampton	N	-	13.12.1987	-	-
8. *Wicherina	G	-	19.10.1980	1+	Recovering from drought
9. *Eradu	G	-	11.1934	-	-
10.*W of Pindar	Mu	-	26.10.1974	-	-
11.*E of Ambania	Mu	-	10.1961	-	-
12.*Near Mullewa	Mu	-	8.12.1958	-	-
13. Near Peter Road	Mu	Railway Reserve	23.5.1997	-	-

Response to Disturbance

Unknown

Management Requirements

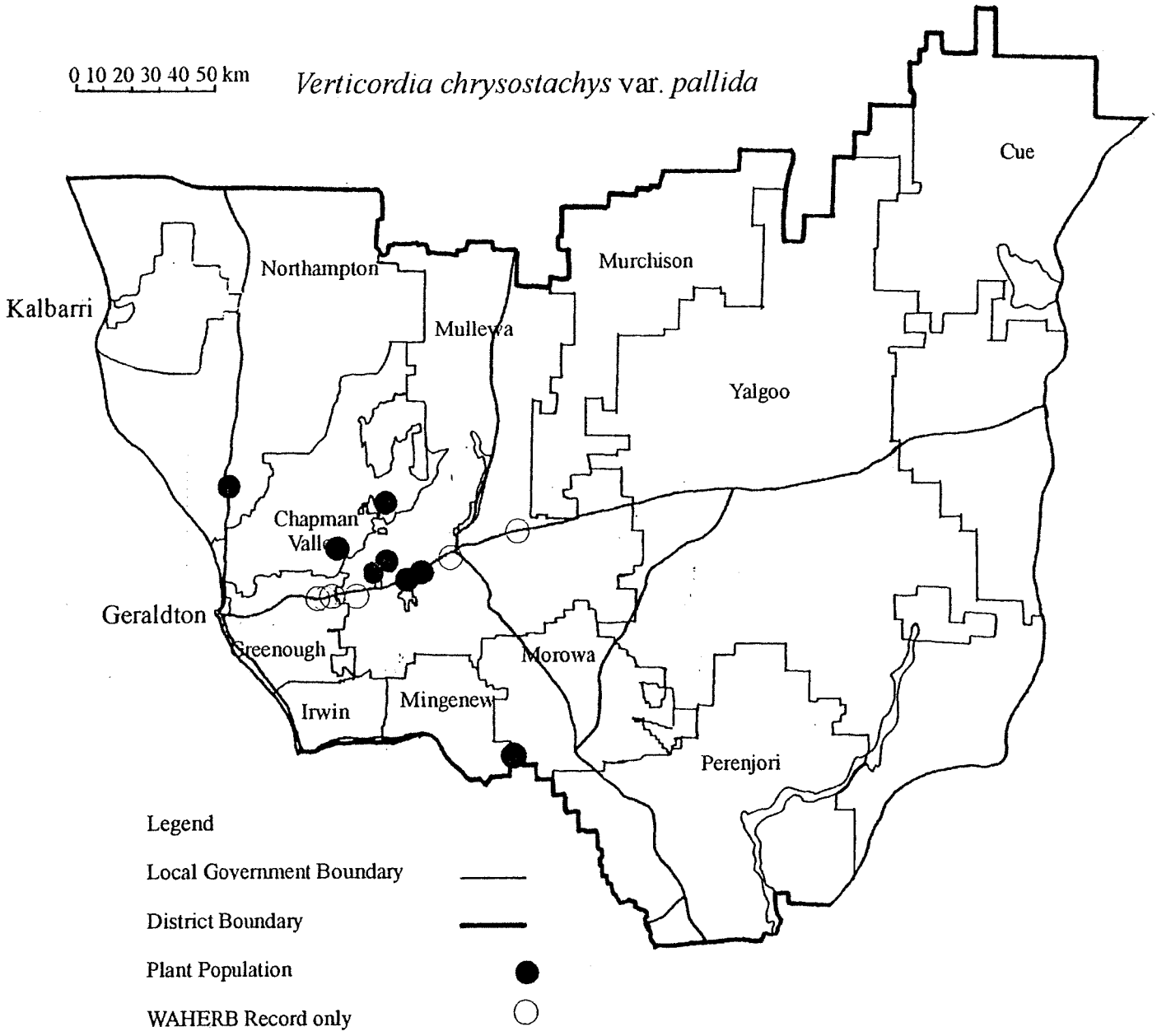
- Ensure that road verge and rail reserve populations are marked.

Research Requirements

– Further survey is required, particularly around Mullewa and to the east.

References

George (1991).



Verticordia cooloomia A.S.George MYRTACEAE

An erect, spindly shrub, 1.5- 3 m tall, which has three leaf forms. The lowest leaves are linear, semi-terete and crowded. The stem leaves are narrowly lanceolate and concave. The floral leaves are orbicular and concave. The flowers are yellow, grouped in flat-topped inflorescences, the peduncles 10-18 mm long. The hypanthium is broadly top-shaped, hairless, with 10 faint ribs. The sepals are 2 mm long, with short fringes, and the petals are orbicular, 3-4 mm long, with irregularly toothed margins. The stamens are of equal length, 2-2.3 mm long. The staminodes are linear and entire, 1.5-1.8 mm long. The style is glabrous, 3-5 mm long.

The flowers have an unusual perfume, which has been described as fungal-like or as a strong nectar odour.

Flowering Period: October-November

Distribution and Habitat in the Geraldton District

Occurs in the north-west corner of the Geraldton District, north of Kalbarri and extending just north of the District boundary on a pastoral lease and a nature reserve.

Grows in yellow sand, sometimes over limestone, usually on the summits of sand rises and ridges in undulating country. Occurs as an emergent in tall open shrubland over heath with *Banksia sceptrum, B. lindleyana, Acacia blakelyi, Calothamnus blepharospermus* and *Actinostrobus arenarius*.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Murchison Station	N	Pastoral Lease, Crown Reserve	11.8.1994	2 000+	Healthy

Response to Disturbance

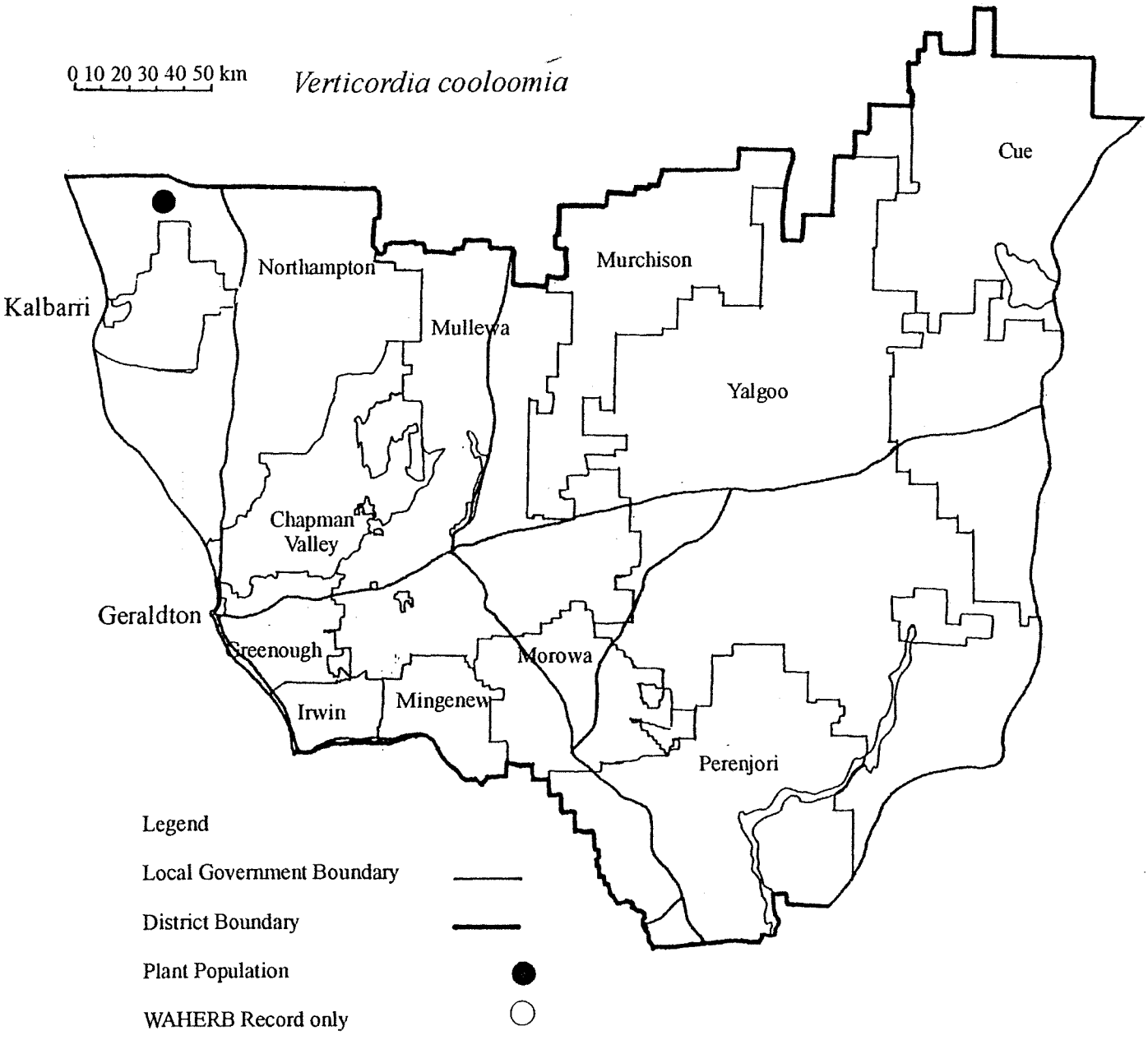
Unknown

Research Requirements

- Further survey is required.

References

George (1991).


0 10 20 30 40 50 km
Verticordia cooloomia
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Verticordia densiflora Lindl. var. *roseostella* A.S.George MYRTACEAE

Compacted Featherflower

Verticordia densiflora var. *roseostella* is an openly-branched shrub to 1.3 m tall with narrowly ovate floral leaves 1.5-2 mm wide. The groups of flowers are small and rounded on stalks 2-4 mm long. The flowers are pink or pink and cream in colour, with sepals which are 2.3-2.6 mm long.

V. densiflora var. *roseostella* is distinguished from other varieties of *V. densiflora* by several characters. The pink or pink and cream flowers distinguish it from the most closely related variety, *stelluligera*, which has yellow or cream flowers and occurs in the same area. Its openly-branched habit and broad floral leaves distinguish it from var. *densiflora* and var. *caespitosa* which both have pink flowers and occur further south.

The varietal name refers to the rose-pink flower colour and to its similarity to var. *stelluligera.*

Flowering Period: October-December

Distribution and Habitat in the Geraldton District

This variety extends north through the Geraldton District from the Mingenew area to Kalbarri. It also occurs further south in the northern part of the Moora District from Three Springs to Mingenew.

It grows in deep grey, white or yellow sand or loamy sand and sand over gravel or sandstone in tall shrubland or heath. Associated species include *V. monadelpha, Hakea trifurcata, Calytrix purpurea, Dryandra sessilis* and *V. densiflora* var. *densiflora.*

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Wicherina	G	Railway Reserve	1.11.1994	c. 4	Moderate, area disturbed
2. SE of Kalbarri	N	National Park	25.11.1995	5	Healthy
3. *E of Kalbarri	N	-	18.10.1984	-	-
4. *ENE of Kalbarri	N	National Park	1.10.1979	Occasional	-
5. *NE of Port Gregory	N	-	20.9.1974	-	-
6. *Howatharra	CV	Nature Reserve	15.11.1977	-	-
7. *E of Ambania	Mu	-	17.10.1967	-	-
8. *N of Strawberry	-	-	28.10.1986	-	-
9. *W of Mingenew	Mi	-	30.10.1974	-	-
10. N of Geraldton	CV	-	5.12.1993	A few plants	-
11. W of Mingenew	Mi	Nature Reserve	22.10.1992	-	-
12. SE of Kalbarri	N	National Park	1.12.1994	Frequent	-
13. SE of Yuna	CV	Nature Reserve	1997	Abundant	-
14. Kojarena	G	Railway Reserve	18.10.1998	-	Weed infestation & rubbish present

Response to Disturbance

Unknown

Management Requirements

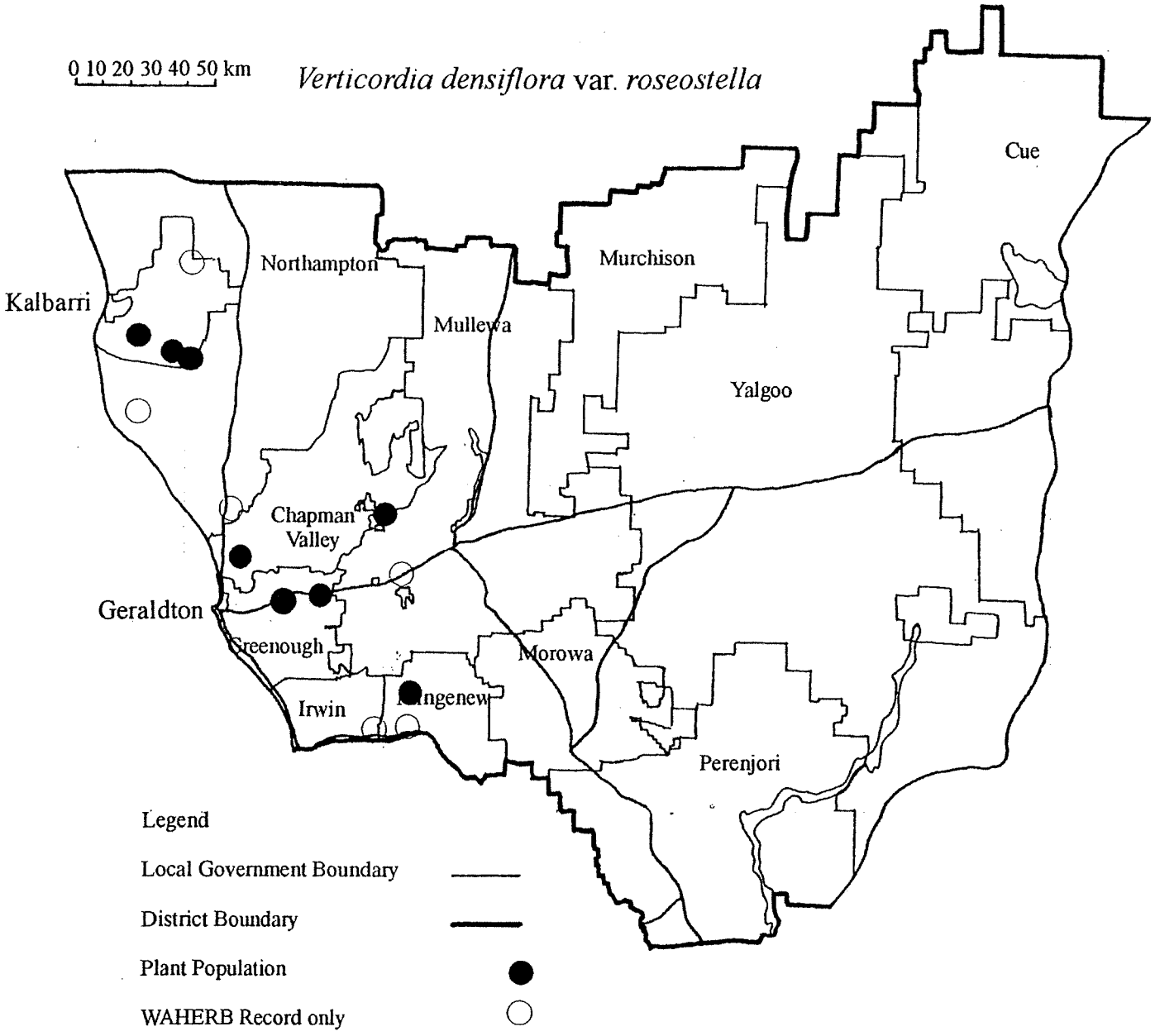
– Ensure that rail reserve populations are marked.

Research Requirements

– Further survey is required.

References

George (1991).



Verticordia dichroma A.S.George var. *dichroma* MYRTACEAE

A shrub 0.4-1.5 m tall, either low and spreading with arching branches, or taller, upright and single-stemmed with open branching. The leaves are ovate or orbicular, 3-4 mm long, strongly curved backwards. The flowers are large, arranged in long spike-like groups of 12 or more on peduncles 1.5-2 mm long towards the ends of the branches. The sepals are 5-6 mm long, the petals 6-7 mm long, the fringe 2-2.5 mm long. The flowers are dark red and gold in colour, the sepals red with greenish-yellow bases, the petals gold with red spots. The colours darken with age. The style is sparsely bearded below the stigma with hairs 0.7-0.9 mm long.

Differs from var. *syntoma* in its longer leaves, which are strongly recurved, longer sepals and petals and longer flower groups of 12 or more flowers.

This species is related to *Verticordia chrysostachys* which differs in its yellow flowers, longer peduncles and shorter style hairs.

Flowering Period: October-December

Distribution and Habitat in the Geraldton District

Occurs in the Kalbarri area, extending to east of Galena and north to the northern boundary of the Geraldton District and beyond to the Shark Bay area.

Grows in yellow sand on flat or undulating sandplain in shrubland and heath. Associated species include *Actinostrobus arenarius, Banksia sceptrum, B. attenuata, B. victoriae, Grevillea gordoniana, G. candelabroides, V. spicata* subsp. *spicata, V. capillaris, V. oculata, V. monadelpha, Conospermum stoechadis* and *Ecdeicolea monostachya.* It has also been recorded on red sand and on yellow sand over clay over rock, or on yellow loam.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Near Z Bend	N	National Park	3.11.1994	1	Healthy
2. Near Z Bend	N	National Park	3.11.1994	c. 20	Healthy
3. N of Murchison River	N	MRWA Road Verge, Pastoral Lease	2.11.1994	4	Healthy
4. N of Murchison River	N	VCL	2.11.1994	10+	Healthy
5. N of Kalbarri	N	Pastoral Lease	2.11.1995	40	Healthy
6. ENE of Kalbarri	N	National Park	28.10.1991	"occasional"	-
7. N of Galena	N	Pastoral Lease	22.11.1992	"occasional"	-
8. E of Little Z Bend	N	National Park	6.11.1995	100+	Undisturbed
9. E of Galena	N	VCL	29.10.1991		
10.*Kalbarri	N	-	4.11.1978	-	-
11.*N of Geraldton	N	-	13.10.1982	-	-
12.*N of Geraldton	N	-	13.11.1982	-	-
13. N of Eurardy	N	-	25.11.1988	"locally common"	-
14. W of NW Coastal Hwy	N	VCL	29.10.1986	-	-
15.*N of Yandi	N	-	26.10.1980	-	-
16.*NW of Ajana	N	-	2.12.1978	-	-
17.*N of Ajana	N	-	10.1947	-	-
18.*Near No 1 Tank	N	-	3.11.1965	-	-

Response to Disturbance

Part of population 4 was growing on a firebreak.

Management Requirements

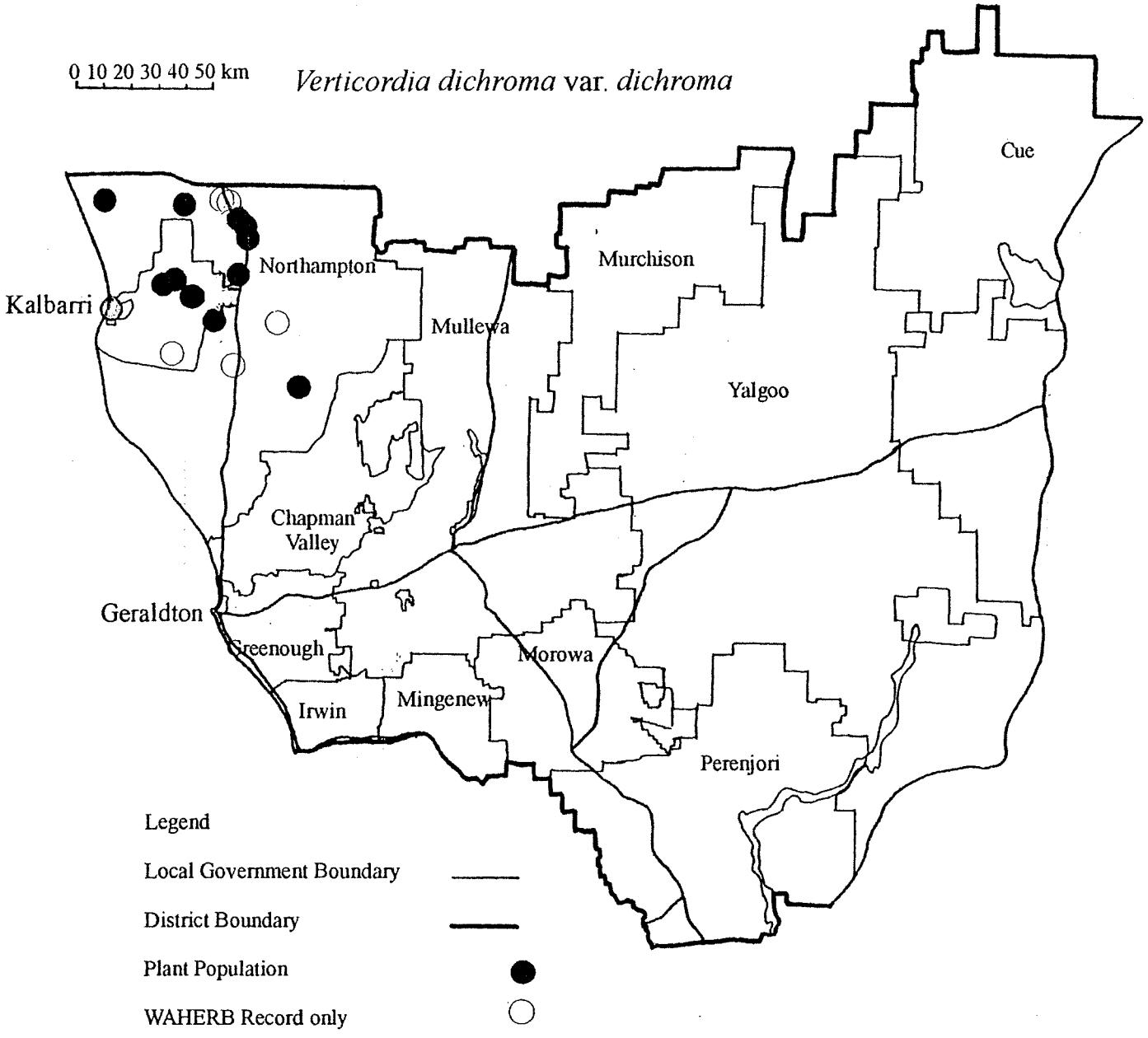
- Ensure that road verge population is marked.

Research Requirements

- Further survey is required.

References

George (1991).



Verticordia dichroma A.S.George var. *syntoma* A.S.George MYRTACEAE

An erect shrub 1-1.7 m tall, open to dense in habit. The leaves are orbicular to obovate, 2-3 mm long, moderately curved back. The flowers are arranged in spike-like groups, usually of fewer than 10 flowers which are crimson and gold in colour, yellow-green at the base, maroon above, filaments and style reddish-pink, anthers deep red. The colour varies from plant to plant, from light, medium to dark red. The sepals are c. 4 mm long, the petals 5-6 mm long and the fringe 1.5-2 mm long.

Differs from the typical variety in the smaller, less reflexed leaves and smaller groups of smaller flowers.

Flowering Period: October-November

Distribution and Habitat in the Geraldton District

Occurs in the north of the range of the typical variety north-east of Kalbarri in the Geraldton District, extending north to the Shark Bay area. There is also one record from further south to the north of Northampton.

Grows in yellow, grey, white and red sand on dunes and ridges in shrubland. Associated species include *Actinostrobus arenarius, Banksia sceptrum, V. spicata* subsp. *spicata, V. capillaris* and *Grevillea* species.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Emu Fence	N	VCL	18.10.1997	"Occasional"	-
2. ESE of Hump Hill	N	VCL	21.10.1995	-	-
3. Murchison House Station	N	Pastoral Lease	29.10.1986	"several plants"	-
4. E of Zuytdorp Cliffs	N	Pastoral Lease	28.10.1986	"Groups of plants"	-
5. Near Emu Fence	N	VCL	22.11.1992	"Occasional and scattered in small groups"	-
6. N of Northampton	N	-	26.11.1984	-	-

Response to Disturbance

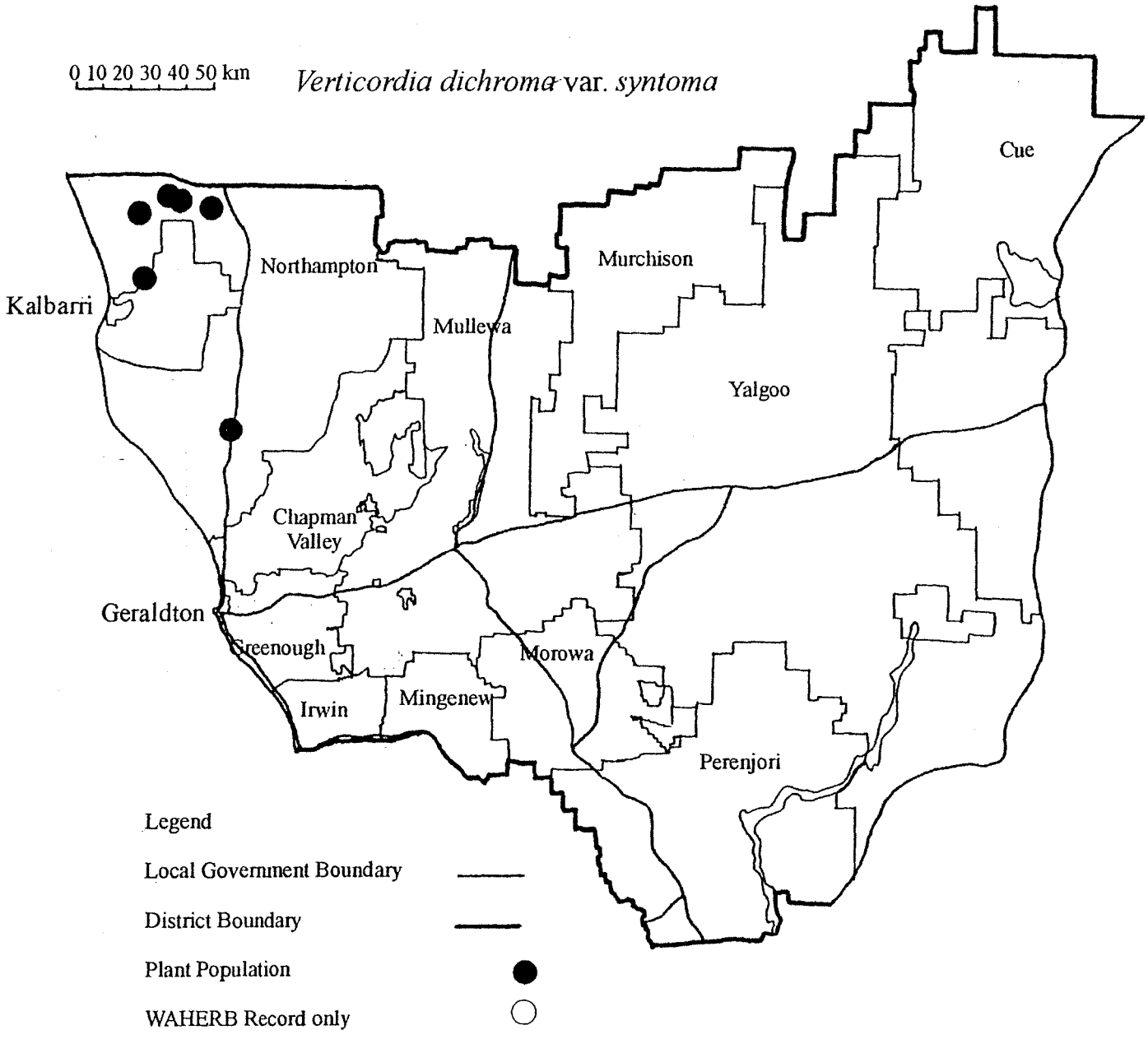
Unknown

Research Requirements

- Further survey is required.

References

George (1991).


0 10 20 30 40 50 km
Verticordia dichroma var. syntoma
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Verticordia luteola A.S.George var. *luteola* MYRTACEAE

This an erect, open shrub to 1 m tall, without a lignotuber. The leaves are elliptic-obovate and concave, with a ciliate margin, and are up to 3.5 mm long. The flowers are grouped in spikes and are sulphur yellow or yellow with cream centres, and those in the most northerly population are described as greenish-white. The hypanthium has five green reflexed appendages. The sepals are 5-6 mm long, with 7-9 fimbriate lobes and no basal auricles. The petals are 5-6.5 mm long without basal auricles and the petal fringe is fimbriate. The stamens and staminodes are glabrous, the stamens are 1.5 mm long, the staminodes are narrow, not clubbed. The anthers are oblong, attached basally and opening by slits. The style is bearded below the apex.

Related to *Verticordia bifimbriata* from which it differs in the flower colour, the sepals, which have more numerous lobes but lack auricles, the shorter stamens and the more swollen reflexed appendages on the hypanthium.

Flowering Period: November-December (June in Geraldton District)

Distribution and Habitat in the Geraldton District

This taxon occurs mainly in the Moora District from south of Dongara to west of Three Springs, but has been recorded once in the Geraldton District in 1975 from east-south-east of Geraldton. This was in June, all other records of flowering are in November or December.

Grows in grey sand over gravel, or sandy clay, in open low woodland of *Eucalyptus todtiana* or open shrubland with *Banksia attenuata,* mallees and heath.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1.* W of Casuarinas	Mu	-	14.6.1975	-	-

Response to Disturbance

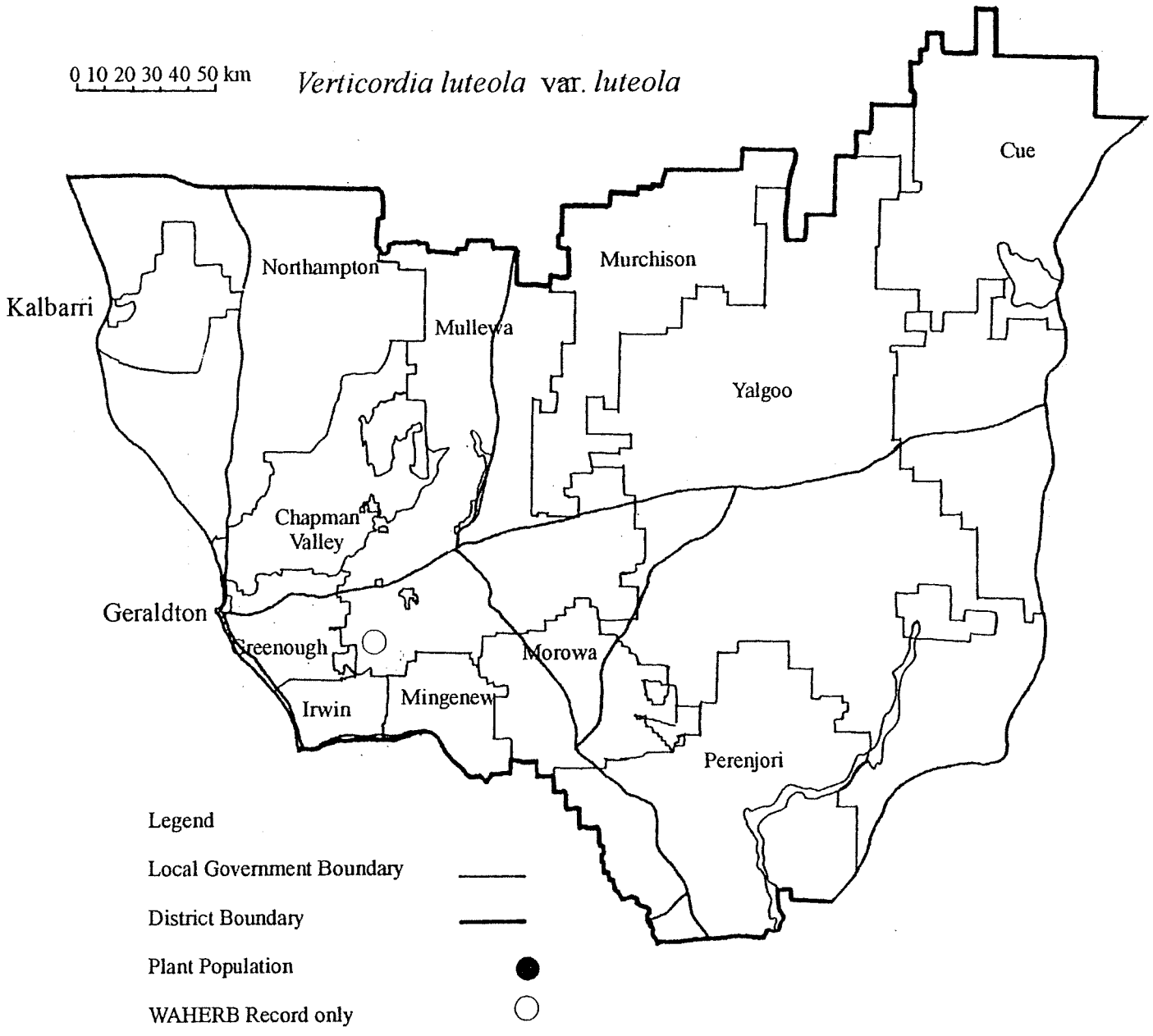
In the Moora District, young plants have been found growing on scraped road edges.

Research Requirements

- Further survey is required to refind the population recorded in the Geraldton District and particularly on conservation reserves in that area.

References

George (1991).


0 10 20 30 40 50 km
Verticordia luteola var. luteola
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Verticordia venusta A.S.George MYRTACEAE

An erect to spreading, open shrub 0.2- 2 m tall, with obovate-elliptic, grey-green leaves, 2-4 mm long, 1.5-3.5 mm wide. The flowers are grouped in elongated terminal spikes and are deep pink in colour, becoming paler with age. Each flower has a calyx with accessory lobes reflexed on the calyx tube. The sepals are divided into plumose segments and the petals have short teeth. The style is 5 mm long, with hairs 0.2-0.3 mm long.

This species is related to *Verticordia muellereana,* differing in its smaller leaves and less curved style, which has a beard with shorter hairs. The flowers are rose-pink in colour rather than maroon.

Flowering Period: October-January

Distribution and Habitat in the Geraldton District

Occurs in the southern part of the Geraldton District in the Perenjori, Maya to Mt Gibson area, extending south into the eastern part of the Moora District and western side of the Merredin District in the Wongan Hills area and south to Dowerin.

Grows in yellow sand, sometimes in gravelly sand, in sandplain communities of heath and shrubland. Grows with *V. monadelpha, V. helmsii, V. rennieana, Grevillea paradoxa, Acacia, Callitris, Casuarina* and *Hakea* species.

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
1. Whitewells	Y	Pastoral Lease, Shire Road Verge	28.10.1994	3	Healthy
2. N of Maya	P	MRWA Road Verge	11.1995	10+	Undisturbed
3. N of Maya	P	Railway Reserve	29.11.1994	"Locally frequent"	Some disturbance
4. SSW of Mt Gibson	P	-	21.11.1992	"Occasional"	-
5. *W of Perenjori	-	Road Verge	11.1986	1	-
6. *NNW of Wubin	P	-	20.10.1984	-	-
7. *S of Maya	-	-	1.11.1974	-	-
8. Bunjil	P	MRWA Road Verge	13.11.1996	5+	Healthy
9. *Caron	P	Water Reserve	1.1964	-	-
10.*SE of Perenjori	P	-	23.11.1953	-	-

Response to Disturbance

Population 1 was growing in shrubland regenerating from fire. A population south of the Geraldton District was growing in sandplain, previously rolled and ploughed.

Management Requirements

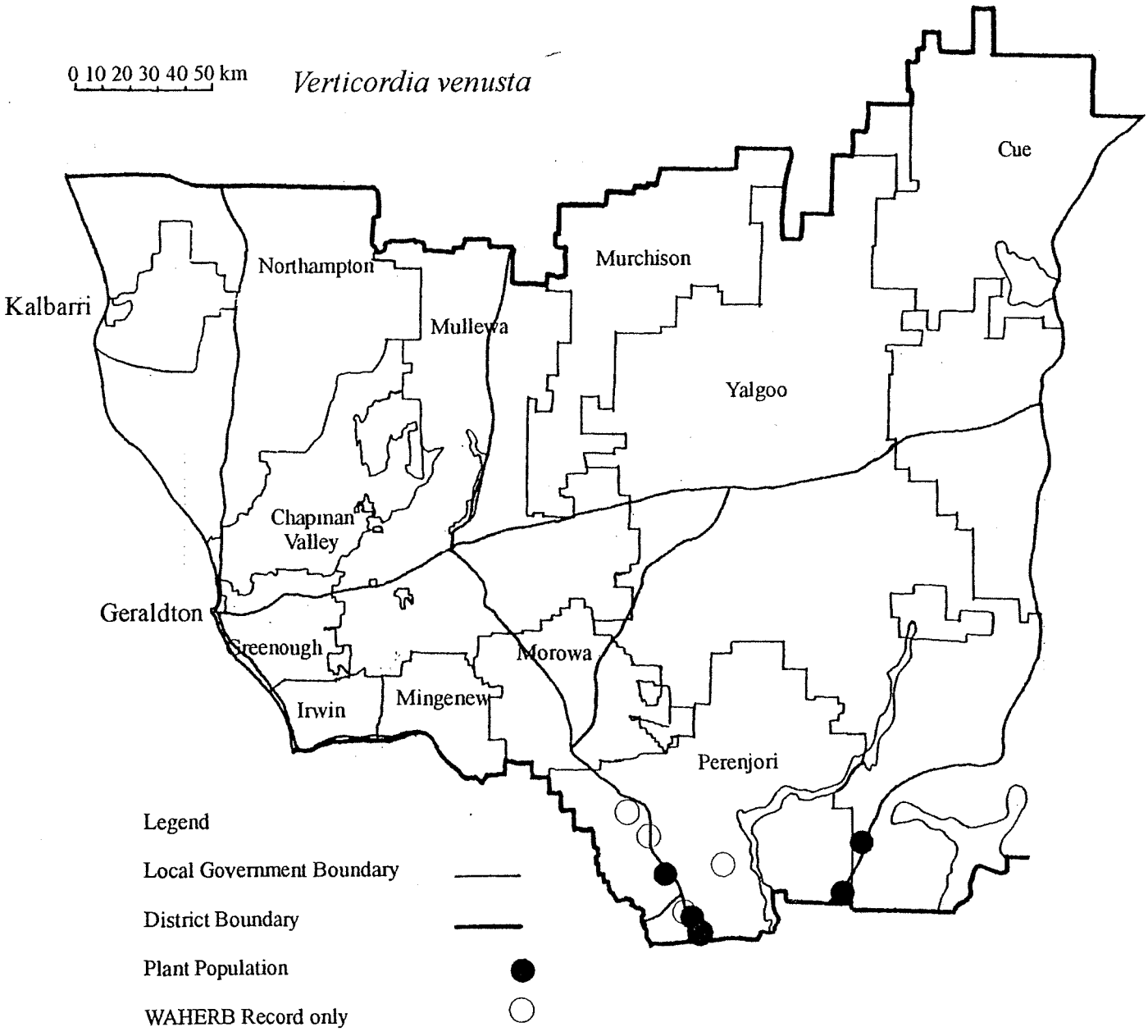
- Ensure that road verge and rail reserve populations are marked.

Research Requirements

- Further survey is required.

References

George (1991).


0 10 20 30 40 50 km
Verticordia venusta
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

Villarsia congestiflora F.Muell. MENYANTHACEAE

An annual herb 10-40 cm tall, erect and tufted. The radical leaves are on petioles to 11 cm long, the blades 1-4 cm long and broad, ovate to rounded or reniform in shape, with an entire, crenate or toothed margin. There are a few or several flowering stems with 2-4 stem leaves, similar to the basal leaves. There are clusters of few to several sessile flowers, forming heads, subtended by broad involucral bracts. The calyx lobes are 4-5 mm long, acute and glabrous. The petals are yellow and the flowers have long or short styles. The fruit is a capsule splitting into four recurved valves. The seeds are black, dull, with a strongly granular surface and a protuberance with pale cells at the base.

Villarsia congestiflora is closely related to *V. capitata,* which has long fine hairs on the calyx, a capsule which splits irregularly and smooth shining seeds without a protuberance at the base.

Flowering Period: September-November

Distribution and Habitat in the Geraldton District

Known from the Kalbarri area and south-east of Mingenew in the Geraldton District, with earlier records from the Hutt River and Dongara areas. Also occurs south of the Geraldton District west of Eneabba in the Moora District.

Grows in moist areas. In the Kalbarri area, it is found in gullies on grey sand over sandstone in shrubland or heath with *Trachymene ornata, Jacksonia cupulifera, Scholtzia capitata, Melaleuca calothamnoides* and sometimes *Eucalyptus camaldulensis.* In this area, it also occurs in a winter-wet swamp on grey sandy clay in dense thickets of *Acacia saligna* with *Stylobasium australe* and *Melaleuca* sp. Further south, it has been found in a sandy creekbed with *A. cyanophylla.*

Conservation Status

Current: Priority 3

Populations Known in the Geraldton District

Population	Shire	Land Status	Last Survey	No. of Plants	Condition
. SE of Kalbarri	N	National Park	30.9.1996	1 000+	Healthy
2. Kalbarri	N	Water Reserve	30.9.1996	500+	Healthy
3. E of Kalbarri	N	National Park	1.10.1998	1 000+	Healthy
4. S of Kalbarri	N	Crown Reserve	3.11.1994	1 000+	Healthy
5. SE of Mingenew	Mi	-	21.11.1993	-	-
6. E of Dongara	I	-	18.10.1967	-	-
7.* Hutt River	N	-	-	-	-

Response to Disturbance

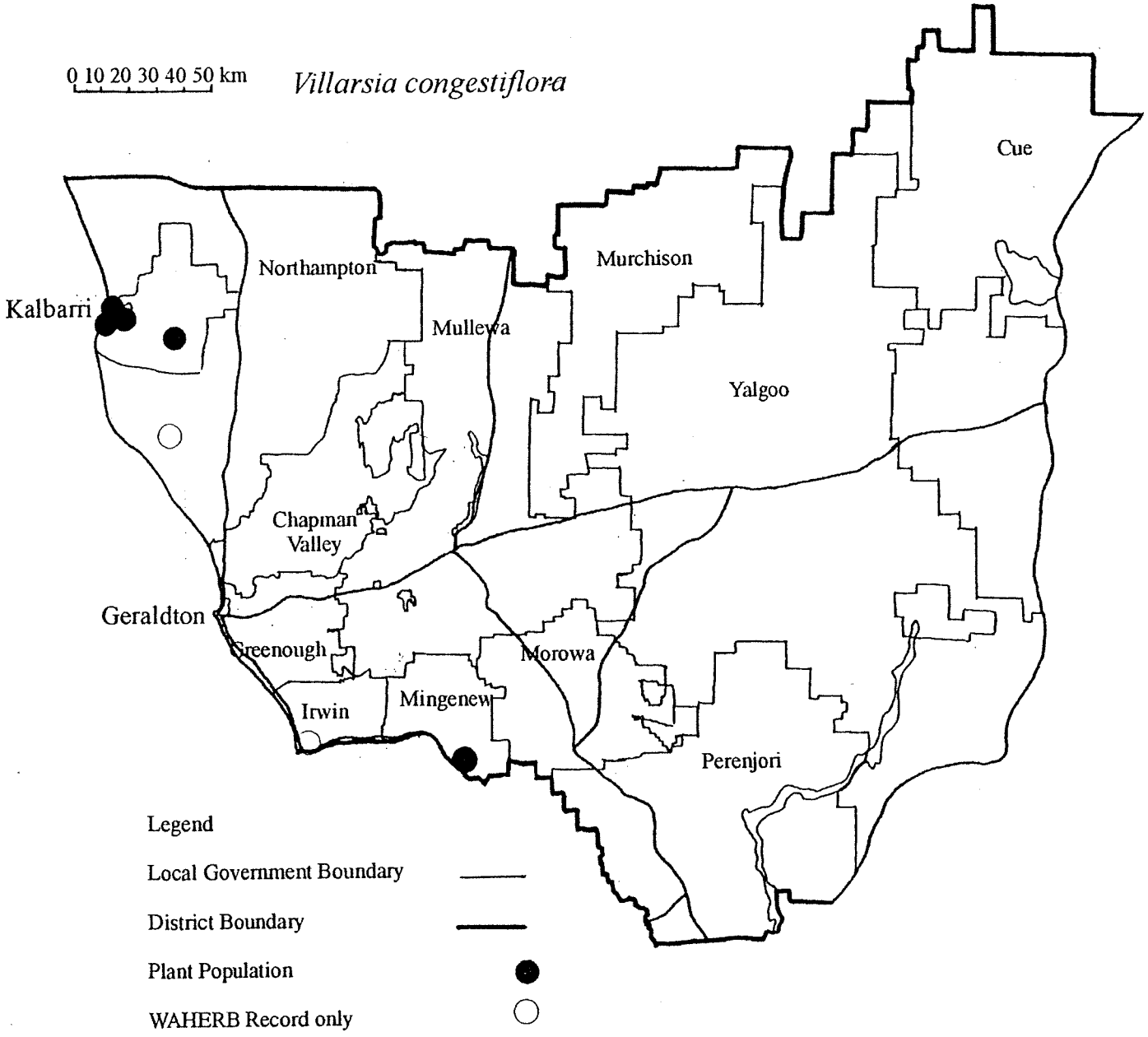
Unknown

Research Requirements

- Further survey is required.

References

Aston (1969), Mueller (1868), Orndduff (1988).


0 10 20 30 40 50 km
Villarsia congestiflora
Cue
Murchison
Northampton
Kalbarri
Mullewa
Yalgoo
Chapman Valley
Geraldton
Greenough
Morowa
Irwin
Mingenew
Perenjori
Legend
Local Government Boundary
District Boundary
Plant Population
WAHERB Record only

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

Part Two assesses the abundance and conservation status of each Declared Rare Flora taxon within the Geraldton District and makes recommendations for protection, research and management. On the basis of these recommendations, each taxon was ranked on a scale of 0 to 3 under 17 categories recognised as potential threats or management and research requirements (Table 1). Taxa with no threat or urgency for management and research action were given a score of 0. Those with a high degree of threat were allocated a score of 3. The scores were summed for each of the 35 taxa and for each threat/requirement category. Table 1 summarises the perceived threats, and management and research requirements for each Declared Rare Flora in the District.

Table 2 lists the 35 Declared Rare Flora in priority order according to the urgency of their requirement for protection and management action. Taxa with a high ranking score are most threatened and/or most in need of action. It is intended that all requirements for each taxon, as outlined in the previous species treatments, will be implemented. Work will be conducted, programmed or deferred according to priority, available funds and existing resources and workloads. Attention is directed to Table 2 to determine with which taxon action should commence. This will enable resources and staff within the Geraldton District to be allocated where most urgently required.

Taxa most in need of attention for a particular management or research requirement can be determined from Table 1.

Ranking the categories illustrates which threats/requirements are the most critical in the Geraldton District. The table indicates those taxa that are (or may be) threatened by particular activities, in addition to providing for continued research and management once requirements listed for the critically threatened taxa are fulfilled.

2. Management and Research Actions

Overall rankings of threatened taxa based on the 17 categories of threat, management requirements and research requirements (Table 1) are shown in Table 2. These data suggest that the following taxa warrant immediate management and research action:

Beyeria lepidopetala
Caladenia elegans
Caladenia wanosa
Conostylis dielsii subsp. *teres*
Conostylis micrantha
Darwinia masonii
Eremophila nivea
Eucalyptus synandra
Glyceria drummondii
Grevillea christineae
Halosarcia bulbosa
Pterostylis sp. Northampton (S.D.Hopper 3349)
Verticordia spicata subsp. *squamosa*

Specific management or research actions for all threatened flora in the Geraldton District are outlined below.

(i) Survey

Further survey of suitable habitat for new populations is a requirement for many of the Declared Rare Flora in the Geraldton District. Some taxa are in need of urgent attention, either because of the small number or size of known populations, or their poor representation in conservation reserves. Some are in need of resurvey of known populations which have not been visited within the last ten years, or where insufficient data are available. In the more easterly part of the District, there are few conservation reserves and for this reason, *Grevillea inconspicua* has remained declared as Rare Flora, although it is known from many populations with a large total number of plants.

Taxa in most urgent need of further survey are:

Beyeria lepidopetala
Chorizema humile
Leucopogon marginatus
Menkea draboides

(ii) Population Size and Few Populations

A number of Declared Rare Flora are known from few populations or have very small population sizes, making them particularly vulnerable to localised disturbance. The total number of populations for each taxon, including those occurring outside the District, was taken into consideration.

Taxa at risk through low numbers in some or all of their known populations, or which are known from one population only are:

Caladenia bryceana subsp. *cracens* ms
Conostylis dielsii subsp. *teres*
Darwinia masonii
Drummondita ericoides
Eremophila viscida
Eucalyptus crucis subsp. *praecipua*
Eucalyptus cuprea
Glyceria drummondii
Halosarcia bulbosa
Hypocalymma longifolium
Lechenaultia chlorantha
Pterostylis sp. Northampton (S.D.Hopper 3349)
Verticordia spicata subsp. *squamosa*

In addition, three taxa have been recorded from the District in recent times but their populations have not yet been refound. These are:

Beyeria lepidopetala
Chorizema humile
Leucopogon marginatus

(iii) Transport Corridors

Populations located near roads, railways and firebreaks are vulnerable to damage or destruction by maintenance operations. Such activities in the vicinity of Rare Flora populations require careful monitoring. 29 populations, a quarter of the total number of populations of Declared Rare Flora in the Geraldton District, occur on or partly on road, and in one species, rail reserves. Most of these reserves are narrow and can be affected, both directly and indirectly, by the use and nature of adjoining lands. Threats include weed invasion, periodic grazing, drift of chemical sprays and fertilisers, fenceline maintenance and periodic burning. The vegetation on road reserves can also be affected by rubbish dumping, uncontrolled vehicle access, wildflower picking and camping.

The majority of road reserves are vested in local authorities or Main Roads W.A., and rail reserves in Westrail. Accidental damage can occur during road works such as maintenance operations, (grading, weed control), drainage works, road/rail upgrading, metal dumps and sand/gravel extraction.

Other utilities such as power-lines, water pipelines and Telstra lines generally follow road and rail reserves, so that any maintenance, upgrading or management of these utilities close to known populations can damage plants. This can be in the form of mechanical damage by machinery and equipment, or by chemicals used to control weeds around poles or along pipelines.

Management and field personnel within Shires and the Government departments need to know where the populations of Declared Rare and Priority Flora occur to avoid accidental destruction of plants. This is carried out currently by notification letters from CALM and the use of linear markers in the field.

The following taxa are most threatened:

Caladenia elegans ms
Conostylis dielsii subsp. *teres*
Conostylis micrantha
Eremophila nivea
Eucalyptus synandra
Grevillea christineae
Halosarcia bulbosa
Leucopogon marginatus
Pterostylis sp. Northampton (S.D.Hopper 3349)
Stylidium coroniforme
Verticordia spicata subsp. *squamosa*

(iv) Short-lived Disturbance Opportunists

Some taxa are favoured by disturbance, either because they cannot compete with associated species in undisturbed vegetation or disturbance is essential for recruitment. Included in this category are taxa favoured both by fire and by physical disturbance of the soil such as occurs when road edges are graded or firebreaks are ploughed. A population which no longer exists as adult plants is considered to be present in the soil as a seed bank, awaiting suitable disturbance to promote seedling growth, unless the population site has become degraded and is now unlikely to support the population.

Taxa in this category, which present special management difficulties, are:

Beyeria lepidopetala
Conostylis dielsii subsp. *teres*
Conostylis micrantha
Daviesia speciosa
Stylidium coroniforme

(v) Land Acquisition

Acquisition of land by the Department, either by donation, exchange or purchase, is required for those taxa not well represented on conservation reserves. This would enable appropriate management and protection practices to be implemented on land maintained, as much as possible, in a natural state. Plants occurring on land reserved for nature conservation are generally considered to be less threatened than those on land designated for other purposes. It should be noted, however, that presence on a reserve contributes to, but does not guarantee, population survival. Reserves are subject to threats such as weed invasion, disease infection, drought, altered drainage and water tables, uncontrolled fires and where approved, mining activities.

The following are priority taxa for land acquisition:

Darwinia masonii
Eucalyptus cuprea
Glyceria drummondii
Grevillea christineae
Halosarcia bulbosa
Hypocalymma longifolium
Pterostylis sp. Northampton (S.D.Hopper 3349)

(vi) Fencing

Declared Rare Flora populations on private property are sometimes on farmland where they require protection from grazing by domestic stock. In some situations landholders themselves have excluded stock, and in others CALM has provided fencing materials as part of formal agreements. Other populations on pastoral leases may also require fencing to prevent grazing, usually by sheep and/or goats.

Rabbits are also a widespread problem, particularly on sandy soils and granite outcrop areas.

The following taxa require protection from grazing, either by fence construction or agreement with landowners to exclude stock from population localities:

Caladenia elegans ms
Eremophila viscida
Halosarcia bulbosa
Pterostylis sp. Northampton (S.D.Hopper 3349)
Verticordia spicata subsp. *squamosa*

(vii) Mining

Mining, particularly for gold, occurs throughout many parts of the pastoral area of the District. Mining activities which may affect Declared Rare Flora include exploration (clearing of survey lines and drilling operations), actual mine site establishment, provision of services (road-making, power) and increased recreation activity by mine workers. Close liaison between companies, CALM, the Department of Minerals and Energy and the Department of Environmental Protection is essential.

Other forms of mining in the District include gravel/sand mining by local authorities and the extraction of nickel, copper and iron ore. Oil is extracted from an area in the south of the District.

Taxa most at risk are:

Darwinia masonii *Daviesia speciosa*

(viii) Recreation

Many of the Declared Rare Flora in the District occur in remote areas and are therefore at no risk from recreational activities. However, a few occur at or near heavily used sites where they are actually or potentially at risk from recreational activities. These sites include well known lookout areas in the Kalbarri National Park, the more accessible nature reserves and the verges of the more major roads, where there is attractive natural vegetation. These activities may include bushwalking, camping and off-road vehicle use. Risk may be from trampling, picking or the spread of disease. Recreation should be controlled or excluded from sensitive sites depending on the degree of threat. Provision of fencing may be necessary.

The following taxa need to be monitored to ensure that they will not need protection from some aspect of recreational damage:

Caladenia wanosa *Drakaea concolor*

(ix) Habitat Degradation

There are a number of threats that may cause habitat degradation to populations of Declared Rare Flora both on conservation reserves and on other lands. Water erosion can be caused by activities at some distance from a population. The digging and trampling of feral pigs can also cause much damage. Other causes of habitat degradation are the rise in water table and salinity.

Taxa which appear to be at risk due to habitat degradation in these categories are:

Caladenia elegans ms
Caladenia wanosa
Drakaea concolor ms
Eremophila nivea
Pterostylis sp. Northampton (S.D.Hopper 3349)

(x) *Ex situ* Germ-Plasm Collections

Collection and long term storage of germ-plasm (seed or tissues) from wild populations of Declared Rare Flora provides a source of propagation material for future re-establishment, in addition to ensuring protection of populations, or more importantly, taxa, from extinction. Collection should be carried out according to the protocols provided by the Threatened Flora Seed Centre at the Western Australian Herbarium.

Priority for collection of this material will depend upon the degree of threat to the taxon. The majority of species in the District are not represented in *ex situ* germ-plasm collections.

Those taxa which are represented by few populations and/or low individual numbers are of highest priority:

Beyeria lepidopetala
Darwinia masonii
Drummondita ericoides
Eremophila viscida
Eucalyptus crucis subsp. *praecipua*
Glyceria drummondii
Grevillea christineae
Halosarcia bulbosa
Hypocalymma longifolium
Leucopogon marginatus
Menkea draboides

(xi) Re-introduction

Taxa poorly represented on conservation reserves may need to be considered for re-establishment in suitable, less vulnerable habitats on land designated for nature conservation.

Taxa most urgently requiring re-establishment into the wild by CALM staff under approved Wildlife Management Programs or Interim Management Guidelines as outlined in CALM Policy Statement No. 29 are:

Darwinia masonii
Eremophila nivea
Eucalyptus cuprea
Glyceria drummondii
Halosarcia bulbosa
Verticordia spicata subsp. *squamosa*

(xii) Liaison

Many Declared Rare Flora populations occur on or adjacent to land not managed by CALM. This requires close association and cooperation with private landowners, local authorities, land managers and government agencies (e.g. Western Power, Westrail and Main Roads W.A.) to ensure their continued survival. Departmental staff are required to provide advice and assistance, regarding conservation and management, to landholders and other agencies with Declared Rare Flora populations on land under their control. Landowners are requested to arrange their operations so that the area will not be destroyed or damaged in any way.

Critical taxa for staff liaison with landowners are:

Caladenia elegans ms
Darwinia masonii
Daviesia speciosa
Eremophila nivea
Eucalyptus crucis subsp. *praecipua*
Eucalyptus cuprea
Eucalyptus synandra
Glyceria drummondii
Halosarcia bulbosa
Hypocalymma longifolium
Pterostylis sp. Northampton (S.D.Hopper 3349)
Stylidium coroniforme
Verticordia spicata subsp. *squamosa*

(xiii) Monitoring

Where possible, all populations in the Geraldton District should be inspected annually as a requirement under CALM's Policy Statement No. 9 to observe fluctuations in population numbers and to monitor changes in the habitat. Where detrimental changes are seen, this should be followed by appropriate management actions. Species which require most frequent monitoring are those likely to be affected by factors such as weed invasion, accidental damage, drought, fungal disease and those disturbance opportunists which decline rapidly after the initial disturbance event.

A network of permanent monitoring quadrats should be established on populations of the most threatened taxa of Declared Rare Flora within the District. Through the detailed mapping of individual plants in small populations, and permanent sample plots for smaller species and larger populations, subsequent surveys can provide information on population dynamics, plant longevity and regeneration. Monitoring quadrats require annual inspection.

The following taxa are the highest priority for annual monitoring:

Caladenia elegans ms
Conostylis dielsii subsp. *teres*
Eremophila nivea
Pterostylis sp. Northampton (S.D.Hopper 3349)
Stylidium coroniforme
Verticordia spicata subsp. *squamosa*

(xiv) Research

Only a few of the Declared Rare Flora within the Geraldton District have been subject to detailed studies. Research into the taxonomy, genetic systems, population biology and ecology of the other taxa is needed to determine the best means of protecting and managing populations and particularly if re-introduction is considered necessary. Response to fire, drought tolerance and impact of exotic bees on native pollinators (particularly of members of the Orchidaceae) require special attention.

The following taxa are most urgently in need of research:

Population Biology and Breeding Systems

Beyeria lepidopetala
Caladenia bryceana subsp. *cracens* ms
Caladenia elegans ms
Daviesia speciosa
Drummondita ericoides
Eremophila microtheca
Pterostylis sp. Northampton (S.D.Hopper 3349)
Verticordia spicata subsp. *squamosa*

Fire Response

Beyeria lepidopetala
Caladenia bryceana subsp. *cracens* ms
Caladenia elegans ms
Conostylis dielsii subsp. *teres*
Conostylis micrantha
Darwinia masonii
Drummondita ericoides
Grevillea christineae
Pterostylis sp. Northampton (S.D.Hopper 3349)
Verticordia spicata subsp. squamosa

Taxonomic

Eremophila microtheca
Hydatella leptogyne

(xv) Linear Marking

Populations in need of linear marking are generally located along linear reserves (road and rail reserves) and firebreaks and are often associated with utilities such as powerlines, water pipelines and Telstra lines. In all these situations they are vulnerable to damage or destruction by maintenance operations. Permanent, but discreet, marker pegs need to be installed at all Declared Rare Flora populations occurring along linear routes within CALM land. Main Roads W.A. has developed a field marking system for demarcating environmentally significant areas on road reserves. CALM uses this system to mark DRF and Priority Flora populations along linear routes both on CALM land and on other areas. Local Shires have been encouraged to adopt such a system.

Taxa with populations on CALM and other lands most urgently in need of linear marking are:

Conostylis dielsii subsp. *teres*
Conostylis micrantha
Eucalyptus synandra

(xvi) Environmental Weeds

Control of weeds in and near Rare Flora populations on CALM land should be conducted by District staff. The following taxa most urgently require weed control or eradication in some or all of their populations.

Caladenia elegans ms
Conostylis dielsii subsp. *teres*
Conostylis micrantha
Pterostylis sp. Northampton (S.D.Hopper 3349)
Wurmbea tubulosa

(xvii) Fire Regimes

All populations of Declared Rare Flora should be excluded from prescribed burns on CALM and other lands until appropriate research has been carried out, and then only be burnt in accordance with specific fire regimes developed by both research and regional staff. These taxa will also need to be protected (by construction of protective breaks or by reduction of fuels in surrounding areas) where possible from potential uncontrolled fires unless such fires fit the conditions determined for the particular fire regime developed for that taxon. Those taxa which are obligate seeders should not be burnt on a frequency less than that required for the plants to produce adequate post-fire seed for successful recruitment events and sustainable regeneration of the population. Species which are lignotuberous and resprout after fire may be reduced in their capacity for regeneration after frequent fires.

Taxa considered to be at greatest risk from frequent fire or requiring protection/exclusion from fire until specific fire regimes are developed are:

Beyeria lepidopetala
Caladenia bryceana subsp. *cracens* ms
Conostylis dielsii subsp. *teres*
Conostylis micrantha
Drakonorchis barbarella ms
Eremophila viscida
Eucalyptus blaxellii
Grevillea christineae
Leucopogon marginatus

3. Priority Flora in the Geraldton District

The conservation status of the Priority Flora (poorly known but thought to be rare) in the Geraldton 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 the low numbers of populations and small population sizes.

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 1. Geraldton District Declared Rare Flora scored (1-3) according to the degree of threat or urgency for management and research action

	Total	Survey populations	Small/few populations	Transport corridors	Disturbance opportunists	Land acquisition	Fencing	Mining	Recreation	Habitat degradation	Germ-plasm collection	Re-establishment	Liaison	Monitoring	Research	Linear marking	Environmental weeds	Inappropriate fire regime
Beyeria lepidopetala	**19**	3	3	0	2	0	0	0	0	0	3	1	0	1	3	1	0	2
Caladenia bryceana subsp. *cracens* ms	**17**	2	2	0	1	1	1	0	0	0	2	0	2	2	2	0	0	2
Caladenia elegans ms	**26**	1	0	2	1	1	2	0	1	3	2	1	3	3	2	1	2	1
Caladenia hoffmanii ms	**13**	2	0	1	1	0	0	1	1	0	2	0	1	1	1	0	1	1
Caladenia wanosa	**19**	2	1	1	1	0	1	0	2	2	2	0	2	2	1	0	1	1
Chorizema humile	**10**	3	3	0	1	0	0	1	0	0	1	0	0	0	1	0	0	0
Conostylis dielsii subsp. *teres*	**26**	2	2	2	2	0	1	1	1	0	1	1	2	3	2	2	2	2
Conostylis micrantha	**23**	1	1	2	2	0	1	1	1	0	1	1	2	2	2	2	2	2
Darwinia masonii	**25**	2	2	0	1	3	1	2	1	0	3	2	3	2	2	0	0	1
Daviesia speciosa	**17**	1	0	1	3	0	0	2	0	0	1	0	3	2	2	1	0	1
Drakaea concolor ms	**15**	1	1	0	1	0	1	0	2	2	2	0	0	2	1	0	1	1
Drakonorchis barbarella ms	**14**	1	1	0	1	0	1	0	0	0	2	0	2	2	1	1	1	1
Drummondita ericoides	**13**	1	2	0	1	0	0	0	0	1	3	0	1	1	2	0	0	1
Eremophila microtheca	**9**	1	1	0	1	0	0	0	0	0	2	0	0	1	2	0	0	1
Eremophila nivea	**21**	1	1	2	1	1	1	0	0	2	0	2	3	3	1	1	1	1
Eremophila viscida	**18**	2	3	0	1	1	2	0	0	1	3	1	1	2	1	0	0	2
Eucalyptus beardiana	**12**	2	1	0	1	0	1	0	0	0	2	0	2	1	1	0	0	1
Eucalyptus blaxellii	**13**	2	0	1	1	0	1	0	0	1	1	0	2	1	1	0	0	2
Eucalyptus crucis subsp. *praecipua*	**16**	1	2	0	1	1	1	0	0	0	3	1	3	2	1	0	0	0
Eucalyptus cuprea	**18**	2	2	1	1	2	1	0	0	0	0	2	3	2	1	0	0	1
Eucalyptus synandra	**20**	2	1	2	1	1	1	1	0	0	0	1	3	2	1	2	1	1
Glyceria drummondii	**20**	1	2	0	1	2	1	0	0	0	3	3	3	2	1	0	0	1
Grevillea christineae	**20**	1	1	1	2	2	1	0	1	1	3	1	1	2	1	0	0	2
Grevillea inconspicua	**10**	2	0	0	1	0	1	1	0	0	0	1	2	1	1	0	0	0

	Total	Survey populations	Small/few populations	Transport corridors	Disturbance opportunists	Land acquisition	Fencing	Mining	Recreation	Habitat degradation	Germ-plasm collection	Re-establishment	Liaison	Monitoring	Research	Linear marking	Environmental weeds	Inappropriate fire regime
Halosarcia bulbosa	**23**	1	2	2	1	2	2	0	0	0	3	2	3	2	1	0	1	0
Hypocalymma longifolium	**18**	1	2	1	1	2	1	0	0	0	3	1	3	2	1	0	0	0
Lechenaultia chlorantha	**11**	1	2	0	1	0	0	0	1	0	2	0	1	2	1	0	0	0
Leucopogon marginatus	**16**	3	3	2	1	0	0	0	1	0	3	0	0	0	1	0	0	2
Menkea draboides	**12**	3	3	0	1	0	0	0	0	0	3	0	0	0	1	0	0	1
Phlegmatospermum drummondii	**7**	1	0	0	1	0	0	0	0	0	2	0	1	1	1	0	0	0
Plectrachne bromoides	**7**	1	0	0	1	0	0	0	0	0	2	0	2	1	1	0	0	0
Pterostylis sp. Northampton (S.D. Hopper 3349)	**28**	2	2	2	1	2	2	0	1	2	2	1	3	3	2	0	2	1
Stylidium coroniforme	**17**	1	1	2	2	1	0	0	0	0	0	1	3	3	2	0	0	1
Verticordia spicata subsp. *squamosa*	**23**	2	2	2	1	1	2	0	1	1	0	2	3	3	2	0	0	1
Wurmbea tubulosa	**13**	1	0	1	1	0	0	0	0	0	2	0	2	1	1	1	3	0
Total		**56**	**49**	**29**	**41**	**23**	**27**	**10**	**14**	**16**	**64**	**25**	**65**	**60**	**48**	**12**	**18**	**34**

TABLE 2. Geraldton District Declared Rare Flora ranked in priority order for management and research action. Rank totals are derived from the 17 categories of threats, management and research requirements given in Table 1.

Taxon	Rank	Threat Category
Pterostylis sp. Northampton	28	CR
Caladenia elegans	26	CR
Conostylis dielsii subsp. *teres*	26	EN
Darwinia masonii	25	VU
Conostylis micrantha	23	CR
Verticordia spicata subsp. *squamosa*	23	CR
Caladenia wanosa	23	VU
Halosarcia bulbosa	23	VU
Eremophila nivea	21	CR
Glyceria drummondii	20	EN
Grevillea christineae	20	EN
Eucalyptus synandra	20	VU
Beyeria lepidopetala	19	CR
Eremophila viscida	18	CR
Eucalyptus cuprea	18	CR
Hypocalymma longifolium	18	EN
Caladenia bryceana subsp. *cracens*	17	CR
Daviesia speciosa	17	EN
Stylidium coroniforme	17	VU
Eucalyptus crucis subsp. *praecipua*	16	EN
Leucopogon marginatus	16	EN
Drakaea concolor ms	15	VU
Drakonorchis barbarella ms	14	VU
Caladenia hoffmanii	13	EN
Drummondita ericoides	13	EN
Wurmbea tubulosa	13	EN
Eucalyptus blaxellii	13	VU
Eucalyptus beardiana	12	EN
Menkea draboides	12	P3
Lechenaultia chlorantha	11	VU
Chorizema humile	10	CR
Grevillea inconspicua	10	P4
Eremophila microtheca	9	VU
Phlegmatospermum drummondii	7	P3
Plectrachne bromoides	7	Deleted

CR = Critically Endangered Flora
EN = Endangered Flora
VU = Vulnerable Flora
P3 = Priority 3
P4 = Priority 4
Classification by WATSCU as at October 1998

TABLE 3. Priority One, Two and Three Species Lists with recommended status indicated

SPECIES	RECOMMENDED STATUS
Priority One Species	
Acacia ampliata	1
Acacia cerastes	1
Acacia congesta subsp. *cliftoniana* ms	1*
Acacia flabellifolia	2
Acacia imitans ms	1
Acacia inceana subsp. *conformis*	3
Acacia lanceolata ms	2
Acacia lineolata subsp. *multilineata*	1*
Acacia megacephala	2
Acacia nigripilosa subsp. *latifolia* ms	1*
Acacia nodiflora	3
Acacia pelophila ms	1*
Acacia pterocaulon	1*
Acacia unguicula	1*
Allocasuarina tessellata	1
Alyxia tetanifolia	3
Angianthus uniflorus	1*
Atriplex muelleri	1
Baeckea sp. Billeranga Hills (M.E.Trudgen 2206)	1*
Baeckea sp. Bunjil (B.R.Maslin 5067)	1*
Baeckea sp. East Yuna (R.Spjut & C.Edson 7077)	1*
Baeckea sp. London Bridge (M.E.Trudgen 5393)	3
Baeckea sp. Mount Barloweerie (J.Z.Weber 5079)	1
Baeckea sp. Paynes Find (S.Patrick 1095)	1
Baeckea sp. Perenjori (J.W.Green 1516)	2
Baeckea sp. Sandstone (C.A.Gardner s.n. 26.Oct.1963)	1
Baeckea sp. Walkaway (A.S.George 11249)	3
Banksia elegans Fraser Road variant (A.C.Burns 27)	1*
Calytrix verruculosa	1
Chamelaucium oenanthum ms	1
Chamelaucium repens ms	1*
Chamelaucium sp. Yalgoo (Y.Chadwick 1816)	1
Dithyrostegia gracilis	1
Eremophila rostrata ms	1*
Eriostemon nutans	1
Erymophyllum hemisphaericum	DRF-X
Eucalyptus macrocarpa x *pyriformis*	3
Eucalyptus sargentii subsp. *fallens*	1*
Frankenia bracteata	1*
Gastrolobium propinquum	1*
Gastrolobium rotundifolium	1*
Gnephosis cassiniana	1
Gnephosis setifera	1*
Gompholobium asperulum	2
Goodenia perryi	1
Goodenia pusilliflora	3
Grevillea fililoba	1*
Grevillea murex	1*
Grevillea phanerophlebia	1*

* With highest priority for further survey and consideration for gazettal as DRF

Grevillea scabrida	3
Grevillea subtiliflora	1
Gunniopsis rubra	2
Homalocalyx chapmanii	1
Homalocalyx inerrabundus	2
Hyalosperma stoveae	2
Hybanthus cymulosus	1*
Hydrocotyle sp. Warriedar (P.G.Wilson 12267)	1
Jacksonia sp. Cundeelee (B.Severne 74146)	1
Korthalsella leucothrix	1
Labichea eremaea	1
Labichea obtrullata	1
Lepidium merrallii	2
Lepidium sagittulatum	1
Lepidium scandens	1
Leptospermum exsertum	1*
Leucopogon oblongus ms	2*
Leucopogon teretostylus ms	1
Levenhookia octomaculata	3
Macarthuria georgeana	1*
Malleostemon sp. Bulga Downs (S.van Vreeswyk 3138)	1
Malleostemon sp. Erangy Springs (M.E.Trudgen 12030)	1*
Malleostemon sp. Hardabutt Rapids (D.Bellairs 1654A)	1
Malleostemon sp. Mullewa (B.Winson B7365)	1
Malleostemon sp. Unmade Road (E.A.Griffin 7537)	1*
Malleostemon sp. Woolgorong Station (M. Officer 100)	1
Malleostemon sp. Yalgoo Road Morawa Tree Committee 329)	1
Micromyrtus cuensis ms	1
Micromyrtus racemosa var. *mucronata* ms	1
Micromyrtus sp. Warriedar (S. Patrick 1879A)	1
Persoonia brachystylis	2
Persoonia kararae	1
Persoonia papillosa	1*
Persoonia pentasticha	3
Pityrodia axillaris	1*
Pityrodia canaliculata	1
Pityrodia viscida	3
Prostanthera pedicellata	1
Prostanthera scutata	1*
Ptilotus beardii	3
Ptilotus chortophytum	1*
Rhodanthe collina	1
Sauropus sp. Woolgorong (M. Officer s.n. 10.8.1994)	1
Schoenia filifolia subsp. *arenicola*	1
Schoenia filifolia subsp.*subulifolia*	1*
Scholtzia cordata ms	2
Scholtzia sp. Binnu (M.E.Trudgen 2218)	1
Scholtzia sp. Binnu East Road (M.E.Trudgen 12013)	1
Scholtzia sp. Eurardy (J.S.Beard 6886)	2
Scholtzia sp. Folly Hill (M.E.Trudgen 12097)	2
Scholtzia sp. Geraldton (F.Lullfitz 3216)	2
Scholtzia sp. Kojarena (A.M.Ashby 1904)	1*
Scholtzia sp. Murchison River (A.S.George 7098)	2
Scholtzia sp. Nolba (E.Place s.n. Jan.1964)	1*
Scholtzia sp. Valentine Road (S.Patrick 2142)	1*
Scholtzia sp. Whelarra (M.E.Trudgen 12018)	1*

* With highest priority for further survey and consideration for gazettal as DRF

Stenanthemum bilobum	1*
Stenanthemum gracilipes	1
Stenanthemum mediale	1
Stylidium pseudocaespitosum	1*
Thomasia tenuivestita	3
Thryptomene ninghanensis ms	1
Thryptomene sp. Binnu East Road (M.E.Trudgen 12012)	1*
Thryptomene sp. Mingenew (Diels & Pritzel 332)	1
Verticordia comosa	1*
Verticordia dasystylis subsp. *oestopoia*	1*
Verticordia x *eurardyensis*	1
Verticordia fragrans	3
Verticordia lepidophylla var. *quantula*	1
Vittadinia cervicularis var. *occidentalis*	1*

Priority Two Species

Acacia gelasina	2
Acacia leptospermoides subsp. *obovata*	3
Acacia leptospermoides subsp. *psammophila*	3
Acacia stereophylla var. *cylindrata*	2
Acacia subsessilis ms	3
Acanthocarpus parviflorus	3
Angianthus microcephalus	2
Anthotroche myoporoides	3
Astartea clavifolia	2
Astroloma pedicellatum ms	Delete
Baeckea subcuneata	2
Baeckea sp. Whelarra (A.C.Burns 7)	2*
Baeckea sp. Yuna (M.E.Trudgen 2224)	2
Bergia auriculata.	2
Beyeria cygnorum	2
Calytrix drummondii	3
Calytrix formosa	3
Calytrix harvestiana	2
Calytrix paucicostata	2
Calytrix purpurea	2
Chamelaucium marchantii	3
Comesperma griffinii ms	2*
Comesperma rhadinocarpum	2
Cryptandra glabriflora	2
Cryptandra nola	3
Cryptandra scoparia var. *microcephala*	2
Dampiera krauseana	2
Dicrastylis incana	2
Epitriche demissus	2
Eremaea acutifolia	2
Eremophila mirabilis ms	2
Eucalyptus diminuta ms	3
Frankenia confusa	2
Grevillea annulifera	3
Grevillea bracteosa	2*
Grevillea costata	3
Grevillea hirtella	3
Grevillea stenomera	2
Grevillea tenuiloba	2
Grevillea triloba	3

* With highest priority for further survey and consideration for gazettal as DRF

Guichenotia quasicalva ms	2*
Hakea oldfieldii	2
Hemiandra bellairsiana ms	2*
Jacksonia dendrospinosa ms	3
Leucopogon glaucifolius	3
Malleostemon sp. Cooloomia (S.D.Hopper 1353)	2
Malleostemon sp. Kalbarri (L.A.Craven 7083)	2*
Malleostemon sp. Moonyoonooka (R.J.Cranfield 2947)	2
Microcorys tenuifolia	2
Millotia jacksonii	2
Murchisonia fragrans	3
Persoonia chapmaniana	3
Pityrodia glutinosa	3
Platysace sp. Kalbarri (D.& B.Bellairs 1383)	2
Podotheca uniseta	3
Schoenus badius	2
Schoenus sp. Kalbarri (K.R.Newbey 9352)	2
Scholtzia sp. East Yuna (A.C.Burns 6)	2
Scholtzia sp. Eradu (R.D.Royce 8016)	2
Scholtzia sp. Galena (W.E.Blackall 4728)	2
Scholtzia sp. Ross Graham Lookout (S.Maley 6)	2
Scholtzia sp. Z-Bend (Bellairs-Kalflora 912A)	2
Stenanthemum poicilum	2
Stylidium diuroides subsp. *paucifoliatum*	3
Stylidium wilroyense	2*
Thryptomene stenophylla	2
Thryptomene sp. Eagle Gorge (A.G.Gunness 2360)	2
Thryptomene sp. East Yuna (J.W.Green 4639)	2
Thryptomene sp. Eurardy (Bellairs 1649)	2
Thryptomene sp. Junga Dam (A.G.Gunness 2383A)	2
Thryptomene sp. Yuna Reserve (A.C.Burns 100)	2
Thysanotus kalbarriensis ms	2
Tricoryne arenicola ms	2
Tricoryne robusta ms	2
Verticordia aereiflora	2
Verticordia dasystylis subsp. *kalbarriensis*	2
Verticordia galeata	2*
Verticordia jamiesonii	2
Verticordia muelleriana subsp. *minor*	2
Xanthoparmelia norpraegnans	2

Priority Three Species

Acacia acanthoclada subsp. *glaucescens* ms	3
Acacia didyma	3
Acacia drummondii subsp. *affinis*	3
Acacia formidabilis ms	3
Acacia isoneura subsp. *isoneura* ms	3
Acacia isoneura subsp. *nimia* ms	3
Acacia kalgoorliensis.	3
Acacia latipes subsp. *licina* ms	3
Acacia plautella ms	1*
Acacia ridleyana	3
Acacia scalena ms	3
Acacia speckii ms	3
Angianthus micropodioides	3
Anthocercis intricata	3

* With highest priority for further survey and consideration for gazettal as DRF

Anthotroche walcottii	Delete
Arnocrinum drummondii	3
Balaustion microphyllum	4
Banksia scabrella	4
Calocephalus aervoides	3
Calytrix plumulosa	3
Centrolepis cephaloformis subsp. *murrayi*	3
Chamelaucium conostigmum ms	3
Comesperma acerosum	3
Cryptandra imbricata ms	3
Cryptandra nudiflora	3
Darwinia sp. Morawa (C.A.Gardner 2662)	3
Dicrastylis linearifolia	3
Drummondita miniata	3
Eremophila brevifolia	1*
Eucalyptus arachnaea subsp. *arrecta*	3
Eucalyptus foecunda subsp. Coolimba (M.I.H.Brooker 9556)	3
Geleznowia verrucosa	3
Goodenia sericostachya	3
Grevillea asparagoides	3
Grevillea candicans	3
Grevillea erinacea	3
Grevillea eriobotrya	3
Grevillea globosa	3
Grevillea granulosa	3
Grevillea leptopoda	3
Grevillea stenostachya	3
Hemigenia pimelifolia	1
Hemigenia saligna	1*
Hemigenia tysonii	3
*Lasiopetalum oldfieldi*i subsp. *oldfieldii*	3
Lasiopetalum oppositifolium	3
Lepidobolus densus ms	3
Macarthuria intricata	3
Maireana prosthecochaeta	3
Mirbelia sp. Kalbarri (M.D.Crisp 6261)	3
Myriocephalus appendiculatus	3
Physopsis chrysophylla	3
Scaevola globosa	3
Scaevola oldfieldii	3
Scholtzia sp. Ajana (T.A.Halliday 137)	3
Stenanthemum divaricatum	3
Stylidium xanthopis	1*
Verticordia chrysostachys var. *pallida*	3
Verticordia cooloomia	3
Verticordia densiflora var. *roseostella*	3
Verticordia dichroma var. *dichroma*	3
Verticordia dichroma var. *syntoma*	3
Verticordia luteola var. *luteola*	3
Verticordia venusta	3
Villarsia congestiflora	3

* With highest priority for further survey and consideration for gazettal as DRF

Table 4. Priority Four Taxa in the Geraldton District - July 1998

Acacia guinettii
Diuris recurva
Eucalyptus ebbanoensis subsp. *photina*
Eucalyptus zopherophloia
Goodenia neogoodenia
Grevillea inconspicua
Jacksonia velutina
Lechenaultia longiloba
Lepidium puberulum
Lepidosperma rupestre
Scaevola kallophylla
Triodia bromoides
Verticordia capillaris
Verticordia polytricha
Wurmbea murchisoniana

TABLE 5. Declared Rare and Poorly Known Flora in the Geraldton District as at 1998 Conservation status updated to December 1999

DECLARED RARE FLORA

Conservation code

A. Extant Taxa

Beyeria lepidopetala ..... R
Caladenia bryceana subsp. *cracens* ms ..... R
Caladenia elegans ms ..... R
Caladenia hoffmanii ms ..... R
Caladenia wanosa ..... R
Chorizema humile ..... R
Conostylis dielsii subsp. *teres* ..... R
Conostylis micrantha ..... R
Darwinia masonii ..... R
Daviesia speciosa ..... R
Drakaea concolor ms ..... R
Drakonorchis barbarella ms ..... R
Drummondita ericoides ..... R
Eremophila microtheca ..... R
Eremophila nivea ..... R
Eremophila viscida ..... R
Eucalyptus beardiana ..... R
Eucalyptus blaxellii ..... R
Eucalyptus crucis subsp. *praecipua* ..... R
Eucalyptus cuprea ..... R
Eucalyptus synandra ..... R
Glyceria drummondii ..... R
Grevillea christineae ..... R
Grevillea inconspicua P4
Halosarcia bulbosa ..... R
Hypocalymma longifolium ..... R
Lechenaultia chlorantha ..... R
Leucopogon marginatus ..... R
Menkea draboides P3
Phlegmatospermum drummondii P3
Plectrachne bromoides (now *Triodia bromoides*) P4
Pterostylis sp. Northampton (S.D.Hopper 3349) ..... R
Stylidium coroniforme ..... R
Verticordia spicata subsp. *squamosa* ..... R
Wurmbea tubulosa ..... R

B. Presumed Extinct Taxa

Hydatella leptogyne ..... R
Pseudanthus nematophorus X

A. Priority One Taxa

Acacia ampliata P1
Acacia cerastes P1
Acacia congesta subsp. *cliftoniana* P1
Acacia flabellifolia P2
Acacia imitans P1
Acacia inceana subsp. *conformis* ..... delete
Acacia lanceolata P2
Acacia lineolata subsp. *multilineata* P1
Acacia megacephala P2
Acacia nigripilosa subsp. *latifolia* P1
Acacia nodiflora P3
Acacia pelophila P1
Acacia pterocaulon P1
Acacia unguicula P1
Allocasuarina tessellata P1
Alyxia tetanifolia P3
Angianthus uniflorus P1
Atriplex muelleri P1
Baeckea sp. Billeranga Hills (M.E.Trudgen 2206) P1
Baeckea sp. Bunjil (B.R.Maslin 5067) P1
Baeckea sp. East Yuna (R.Spjut & C.Edson 7077) P1
Baeckea sp. London Bridge (M.E.Trudgen 5393) P3
Baeckea sp. Mount Barloweerie (J.Z.Weber 5079) P1
Baeckea sp. Paynes Find (S.Patrick 1095) P1
Baeckea sp. Perenjori (J.W.Green 1516) P2
Baeckea sp. Sandstone (C.A.Gardner s.n. 26.Oct.1963) P1
Baeckea sp. Walkaway (A.S.George 11249) ... P3
Banksia elegans Fraser Road variant (A.C.Burns 27) P1
Calytrix verruculosa P1
Chamelaucium oenanthum ms P1
Chamelaucium repens ms P1
Chamelaucium sp. Yalgoo (Y.Chadwick 1816) P1
Dithyrostegia gracilis P1
Eremophila rostrata ms P1
Eriostemon nutans (now *Philotheca nutans*) ... P1
Erymophyllum hemisphaericum P1
Eucalyptus macrocarpa x *pyriformis* P3
Eucalyptus sargentii subsp. *fallens* P1
Frankenia bracteata P1
Gastrolobium propinquum P1
Gastrolobium rotundifolium P1
Gnephosis cassiniana P1
Gnephosis setifera P1
Gompholobium asperulum P3
Goodenia perryi P3
Goodenia pusilliflora ..... Delete
Grevillea fililoba P1
Grevillea murex ..... R
Grevillea phanerophlebia ..... R
Grevillea scabrida P3
Grevillea subtiliflora P1
Gunniopsis rubra P3
Homalocalyx chapmanii P1
Homalocalyx inerrabundus P2
Hyalosperma stoveae P2
Hybanthus cymulosus P1
Hydrocotyle sp. Warriedar (P.G.Wilson 12267) P1

Jacksonia sp. Cundeelee (B.Severne 74146) P1
Korthalsella leucothrix P1
Labichea eremaea P1
Labichea obtrullata P1
Lepidium merrallii P2
Lepidium sagittulatum P1
Lepidium scandens P1
Leptospermum exsertum P1
Leucopogon oblongus ms P2
Leucopogon teretostylus ms P1
Levenhookia octomaculata P3
Macarthuria georgeana P1
Malleostemon sp. Bulga Downs (S.vanVreeswyk 3138) P1
Malleostemon sp. Erangy Springs (M.E.Trudgen 12030) P1
Malleostemon sp. Hardabutt Rapids (D.Bellairs 1654A) P1
Malleostemon sp. Mullewa (B.Winson B7365) P1
Malleostemon sp. Unmade Road (E.A.Griffin 7537) P1
Malleostemon sp. Woolgorong Station (M. Officer 100) P1
Malleostemon sp. Yalgoo Road (Morawa Tree Committee 329) P1
Micromyrtus cuensis ms P1
Micromyrtus racemosa var. *mucronata* ms P1
Micromyrtus sp. Warriedar (S. Patrick 1879A) P1
Persoonia brachystylis P2
Persoonia kararae P1
Persoonia papillosa. P1
Persoonia pentasticha P2
Pityrodia axillaris P1
Pityrodia canaliculata P1
Pityrodia viscida P3
Prostanthera pedicellata P1
Prostanthera scutata P1
Ptilotus beardii P3
Ptilotus chortophytum P1
Rhodanthe collina P1
Sauropus sp. Woolgorong (M. Officer s.n. 10.8.1994) P1
Schoenia filifolia subsp. *arenicola* P1
Schoenia filifolia subsp. *subulifolia* P1
Scholtzia cordata ms P1
Scholtzia sp. Binnu (M.E.Trudgen 2218) P1
Scholtzia sp. Binnu East Road (M.E.Trudgen 12013) P1
Scholtzia sp. Eurardy (J.S.Beard 6886) P1
Scholtzia sp. Folly Hill (M.E.Trudgen 12097) P2
Scholtzia sp. Geraldton (F.Lullfitz 3216) P2
Scholtzia sp. Kojarena (A.M.Ashby 1904) P1
Scholtzia sp. Murchison River (A.S.George 7098) P2
Scholtzia sp. Nolba (E.Place s.n. Jan.1964) P1
Scholtzia sp. Valentine Road (S.Patrick 2142) P1
Scholtzia sp. Whelarra (M.E.Trudgen 12018) P1
Stenanthemum bilobum P1
Stenanthemum gracilipes P1
Stenanthemum mediale P1
Stylidium pseudocaespitosum P1
Thomasia tenuivestita P3
Thryptomene ninghanensis ms P1
Thryptomene sp. Binnu East Road (M.E.Trudgen 12012) P1
Thryptomene sp. Mingenew (Diels & Pritzel 332) P1
Verticordia comosa P1
Verticordia dasystylis subsp. *oestopoia* P1
Verticordia x *eurardyensis* P1
Verticordia fragrans P3
Verticordia lepidophylla var. *quantula* P1
Vittadinia cervicularis var. *occidentalis* P1

B. Priority Two Taxa

Acacia gelasina P2
Acacia leptospermoides subsp. *obovata* P2
Acacia leptospermoides subsp. *psammophila* P3
Acacia stereophylla var. *cylindrata* P2
Acacia subsessilis P3
Acanthocarpus parviflorus P3
Angianthus microcephalus P2
Anthotroche myoporoides P2
Astartea clavifolia P2
Astroloma pedicellatum ms ..... Delete
Baeckea subcuneata P2
Baeckea sp. Whelarra (A.C.Burns 7) P2
Baeckea sp. Yuna (M.E.Trudgen 2224) P2
Bergia auriculata. P2
Beyeria cygnorum P2
Calytrix drummondii P3
Calytrix formosa P3
Calytrix harvestiana P2
Calytrix paucicostata P2
Calytrix purpurea P2
Chamelaucium marchantii P3
Comesperma griffinii ms P2
Comesperma rhadinocarpum P2
Cryptandra glabriflora P2
Cryptandra nola P2
Cryptandra scoparia var. *microcephala* P2
Dampiera krauseana P2
Dicrastylis incana P2
Epitriche demissus P2
Eremaea acutifolia P2
Eremophila mirabilis ms P2
Eucalyptus diminuta ms P3
Frankenia confusa P2
Grevillea annulifera P3
Grevillea bracteosa P2
Grevillea costata P3

Grevillea hirtella P3
Grevillea stenomera P2
Grevillea tenuiloba P3
Grevillea triloba P3
Guichenotia quasicalva ms P2
Hakea oldfieldii P3
Hemiandra bellairsiana ms P2
Jacksonia dendrospinosa ms P2
Leucopogon glaucifolius P3
Malleostemon sp. Cooloomia (S.D.Hopper 1353) P2
Malleostemon sp. Kalbarri (L.A.Craven 7083) P2
Malleostemon sp. Moonyoonooka (R.J.Cranfield 2947) P2
Microcorys tenuifolia P2
Millotia jacksonii P2
Murchisonia fragrans P2
Persoonia chapmaniana P3
Pityrodia glutinosa P3
Platysace sp. Kalbarri (D.& B.Bellairs 1383) P2
Podotheca uniseta P3
Schoenus badius P2
Schoenus sp. Kalbarri (K.R.Newbey 9352) P2
Scholtzia sp. East Yuna (A.C.Burns 6) P2
Scholtzia sp. Eradu (R.D.Royce 8016) P2
Scholtzia sp. Galena (W.E.Blackall 4728) P2
Scholtzia sp. Ross Graham Lookout (S.Maley 6) P2
Scholtzia sp. Z-Bend (Bellairs-Kalflora 912A) P2
Stenanthemum poicilum P2
Stylidium diuroides subsp. *paucifoliatum* P3
Stylidium wilroyense P2
Thryptomene stenophylla P2
Thryptomene sp. Eagle Gorge (A.G.Gunness 2360) P2
Thryptomene sp. East Yuna (J.W.Green 4639) P2
Thryptomene sp. Eurardy (Bellairs 1649) P2
Thryptomene sp. Junga Dam (A.G.Gunness 2383A) P2
Thryptomene sp. Yuna Reserve (A.C.Burns 100) P2
Thysanotus kalbarriensis ms P2
Tricoryne arenicola ms P2
Tricoryne robusta ms P2
Verticordia aereiflora P2
Verticordia dasystylis subsp. *kalbarriensis* P2
Verticordia galeata P2
Verticordia jamiesonii P2
Verticordia muelleriana subsp. *minor* P2
Xanthoparmelia norpraegnans P2

C. Priority Three Taxa

Acacia acanthoclada subsp. *glaucescens* P3
Acacia didyma P3
Acacia drummondii subsp. *affinis* P3
Acacia formidabilis P3
Acacia isoneura subsp. *isoneura* P3
Acacia isoneura subsp. *nimia* P3
Acacia kalgoorliensis ..... Delete
Acacia latipes subsp. *licina* P3
Acacia plautella P3
Acacia ridleyana P3
Acacia scalena P3
Acacia speckii P3
Angianthus micropodioides P3
Anthocercis intricata P3
Anthotroche walcottii ..... Delete
Arnocrinum drummondii P3
Balaustion microphyllum P4
Banksia scabrella P4
Calocephalus aervoides P3
Calytrix plumulosa P3
Centrolepis cephaloformis subsp. *murrayi* P3
Chamelaucium conostigmum ms P3
Comesperma acerosum P3
Cryptandra imbricata ms P3
Cryptandra nudiflora P3
Darwinia sp. Morawa (C.A.Gardner 2662) P3
Dicrastylis linearifolia P3
Drummondita miniata P3
Eremophila brevifolia P1
Eucalyptus arachnaea subsp. *arrecta* P3
Eucalyptus foecunda subsp. Coolimba (M.I.H.Brooker 9556) P3
Geleznowia verrucosa P3
Goodenia sericostachya P3
Grevillea asparagoides P3
Grevillea candicans P3
Grevillea erinacea P3
Grevillea eriobotrya P3
Grevillea globosa P3
Grevillea granulosa P3
Grevillea leptopoda P3
Grevillea stenostachya P3
Hemigenia pimelifolia P1
Hemigenia saligna P3
Hemigenia tysonii P3
Lasiopetalum oldfieldii subsp. *oldfieldii* P3
Lasiopetalum oppositifolium P3
Lepidobolus densus ms P3
Macarthuria intricata P3
Maireana prosthecochaeta P3
Mirbelia sp. Kalbarri (M.D.Crisp 6261) P3
Myriocephalus appendiculatus P3
Physopsis chrysophylla P3
Scaevola globosa P3
Scaevola oldfieldii P3
Scholtzia sp. Ajana (T.A.Halliday 137) P3
Stenanthemum divaricatum P3
Stylidium xanthopis P1
Verticordia chrysostachys var. *pallida* P3
Verticordia cooloomia P3
Verticordia densiflora var. *roseostella* P3
Verticordia dichroma var. *dichroma* P3

Verticordia dichroma var. *syntoma*..... P3
Verticordia luteola var. *luteola*..... P3
Verticordia venusta..... P3
Villarsia congestiflora..... P3

R Declared Rare Flora - Extant Taxa
Taxa which have been adequately searched for and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such.
X Declared Rare Flora - Presumed Extinct Taxa
P1 Priority One - Poorly known Taxa
Taxa which are known from one or a few (generally <5) populations which are under threat
P2 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
P3 Priority Three - Poorly Known Taxa
Taxa which are known from several populations, and the taxa are not believed to be under immediate threat
P4 Priority Four - Rare Taxa
Taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors.

deleted species has been taken off the Priority Flora list

GLOSSARY

abaxial — the side away from the axis (compare **adaxial**)

achene — a small, dry indehiscent fruit with a single locule and a single seed (ovule), and with the seed attached to the ovary wall at a single point

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

adaxial — the side toward the axis (compare **abaxial**)

adnate — fusion of unlike parts, as the stamens to the corolla (compare **connate**)

alternate — *of leaves or other lateral organs*, borne singly at different heights on the axis; *of floral parts*, on a different radius, e.g. describing the position of stamens with respect to petals. cf. **opposite**

annual — a plant whose life span ends within one year after germination

annular — in the form of a ring

anther — the expanded, apical, pollen bearing portion of the stamen

anthesis — the flowering period, when the flower is fully expanded and functioning

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

aril — an appendage growing at or near the hilum of the seed; fleshy thickening of the seed coat

article — a segment of a jointed stem or of a fruit with constrictions between the seeds

ascending — growing erect after an oblique or semi-horizontal beginning

attenuate — tapering gradually

auricle — a small ear-shaped appendage

awl-shaped — short, narrowly triangular, and sharply pointed like an awl

awn — a bristle-like appendage, e.g. on the tip or back of the lemma of a grass floret

axil — the angle between a leaf or bract and the axis bearing it. adj. **axillary**

axis — a stem, (commonly used for the main stem of a whole plant or of an inflorescence)

beak — a prominent terminal projection, especially of a carpel or fruit

bifurcate two-forked; divided into two branches

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

branchlet a small branch

bulb an underground bud with thickened fleshy scales, as in the onion

calli small outgrowths in the throat of the corolla

callosity a hardened or thickened area

calyx the sepals of one flower collectively

calyx-tube a tube formed by fusion or cohesion of sepals. cf. **hypanthium**

campanulate bell-shaped

capitate head-like, or in a head-shaped cluster

capitulum a racemose inflorescence 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

carpel a simple pistil formed from one modified leaf, or that part of a compound pistil formed from one modified leaf

cheiridium the joined bracts beneath the flower in *Calytrix,* which form a sleeve-like structure

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

clone a group of individuals originating from a single parent plant by vegetative reproduction

column a structure extending above the ovary and incorporating stigma, style and stamens

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

connective the part of an anther that connects the lobes

conspecific of the same species

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

corm a fleshy, swollen stem base, usually underground, in which food reserves are stored between growing seasons

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

crisped curled

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

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

decumbent spreading horizontally but then growing upwards

decurrent extending downwards beyond the point of insertion, e.g. of a lamina extending downwards to form a flange along the petiole

decussate in pairs, with successive pairs borne at right angles to each other

dehiscent breaking open at maturity to release the contents

deltoid triangular, with the sides of about equal length

dentate toothed

denticulate finely toothed

dichotomous forking into two equal branches resulting from the division of the growing point

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

dorsal relating to the back or outward surface of an organ in relation to the axis, as in the lower surface of a leaf

dorsiventral having structurally different upper and lower surfaces

double-conic relating to the shape of eucalypt buds, when the hypanthium and operculum are of the same size and cone shape

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)

ellipsoid a solid body elliptic in long section and circular in cross section

elliptic oval in outline, widest at the centre

endemic having a natural distribution confined to a particular geographical region

entire having a smooth margin, not dissected or toothed

ephemeral short-lived

epidermis the outermost cellular layer of a non-woody plant or organ

exserted protruding, e.g. of stamens with respect to a corolla tube

falcate sickle-shaped

family a group of one to many genera believed to be related phylogenetically, usually clearly separable from other such groups

filament the stalk of a stamen; a thread one or more cells thick; *in blue-green Algae*, a trichome enclosed in a mucilaginous sheath. cf. **anther**

filiform thread-like

flexuose with curves or bends; sinuous; somewhat zigzagged

floral belonging to or associated with a flower

floret a grass flower, together with the lemma and palea that enclose it (often applied to flowers in Cyperaceae and Asteraceae)

follicle a dry, dehiscent fruit formed from one carpel and dehiscing along the line of fusion of its edges

free not fused or united (with other organs)

fruit the seed-bearing structure in angiosperms formed from the ovary after flowering

fusiform spindle-shaped, broadest near the middle and tapering toward both ends

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**

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)

glume one of the paired bracts at the base of a grass spikelet; a chaffy bract in the grasses or sedges

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

hastate arrowhead-shaped but with the basal lobes turned outward rather than downward

herb any vascular plant that never produces a woody stem. cf. **forb**

herbaceous not woody; soft in texture

hilum a scar on the seed indicating its point of attachment

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)

hypanthium a cup or tube bearing floral parts above the base, and often above the top, of the ovary of a flower

imbricate of perianth parts, having the edges overlapping in the bud. Fig. 25

incurved bent or curved inwards or upwards; *of leaf margins*, curved towards the adaxial surface

indumentum the epidermal coverings of a plants, collectively.

indusium tissue covering the sorus of a fern; the pollen cup of Goodeniaceae.

inferior *of an ovary,* at least partly below the level of attachment of the other flora parts. cf. **superior**

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)

involucre a whorl of bracts subtending a flower or flower cluster

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

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)

ligule a tongue-shaped or strap-shaped organ; the flattened part of the ray corolla in the Asteraceae; the membranous appendage arising from the inner surface of the leaf at the junction with the leaf sheath in many grasses and some sedges

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

lunate crescent-shaped

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

mericarp a section of a schizocarp; one of the two halves of the fruit in the Apiaceae

midrib the central, and usually the most prominent, vein of a leaf or leaf-like organ

mucro a sharp, abrupt terminal point. adj. **mucronate**

nerve a vein

node the level (transverse plane) of a stem at which one or more leaves arise

obconical cone-shaped but attached at the narrower end

obcordate *of a leaf blade*, broad and notched at the tip; heart-shaped but attached at the pointed end

oblanceolate similar in shape to **lanceolate** but attached at the narrower end

oblique *of a leaf or leaflet*, larger on one side of the midrib than on the other, i.e. asymmetrical. 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. 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

ovoid egg-shaped (in three dimensions)

ovule an immature seed

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

pedicel the stalk of a flower. adj. **pedicellate**

peduncle the stalk of an inflorescence; *in ferns*, the stalk of a sporocarp. adj. **pedunculate**

peltate *of a leaf*, having the stalk attached to the lower surface of the blade, not the margin (also applied in the same sense to other stalked structures)

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**

phylloclade — a very leaf-like, photosynthetic stem of a plant whose true leaves are much reduced. cf. **cladophyll**

pinna — one of the primary divisions or leaflets of a pinnate leaf

pinnule — a leaflet of a bipinnate leaf

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

pistil — a free carpel or a group of fused carpels

placenta — a region, within an ovary, to which ovules are attached

plumose — like a feather; with fine hairs branching from a central axis

pod — a leguminous fruit

pollen presenter — the modified style end in *Banksia*

pollination — the transfer of pollen from the male organ, where it is formed, to the receptive region of a female organ, e.g. from anther to stigma

procumbent — trailing or spreading along the ground but not rooting at the nodes

prostrate — lying flat on the ground

pruinose — having a whitish, waxy, powdery bloom on the surface

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
rhizome	a horizontal underground stem
rhomboid	quadrangular, with the lateral angles obtuse
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
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 bristle 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
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**
sinus	a notch or depression in the margin of an organ
solitary	*of flowers*, borne singly, not grouped in an inflorescence
spathe	a large bract ensheathing an inflorescence
spathulate (= spatulate)	spoon-shaped; broad at the tip and narrowed towards the base
species	a taxon comprising individuals, or populations of individuals, capable of interbreeding to produce fertile offspring; the largest group of individuals between which there are no distinguishable, consistent differences in form or reproductive mechanisms
spike	an unbranched, indeterminate inflorescence in which the flowers are without stalks. adj. **spicate**
spikelet	a unit of the inflorescence in grasses, sedges and some other monocotyledons, consisting of one to many flowers and associated glumes

spine	a stiff, sharp-pointed structure, formed by modification of a plant organ, e.g. a lateral branch or a stipule
spindle-shaped	broadest near the middle and tapering toward both ends
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**
stamen	the male reproductive organ of a flower, consisting of an anther and a filament
staminode	a modified stamen which is sterile, producing no pollen, often rudimentary
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
stigma	the pollen-receptive surface of a carpel or group of fused carpels, usually sticky
stipe	a small stalk
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
style	the usually narrowed portion of the pistil connecting the stigma to the ovary
subshrub	a small shrub
subulate	narrow and tapering gradually to a fine point
subterete	almost terete
sucker	a shoot originating from below ground
sulcate	grooved; furrowed
superior	attached above, as an ovary that is attached above the point of attachment of the other floral whorls
taxon	a group or category, at any level, in a system for classifying plants or animals
tepal	a perianth segment in a flower in which all the perianth segments are similar in appearance
terete	cylindrical or nearly so; circular in cross-section
terminal	at the apex or distal end

tessellate with a chequered pattern

throat of a corolla tube, the top, where the tube joins the lobes

tomentum a covering of dense, matted, woolly hairs. adj. **tomentose**

tortuous twisted or bent

torus see **receptacle**

trifoliate having three leaves

trigonous three-angled

triquetrous three-edged; with three protruding angles

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

turgid swollen; expanded or inflated

umbel a racemose inflorescence in which all the individual flower stalks arise in a cluster at the top of the peduncle and are of about equal length

undulate wavy, i.e. not flat. cf. **sinuate**

unisexual bearing only male or only female reproductive organs

united fused together

urceolate urn-shaped

valve one of the segments of a dehiscent fruit, separating from other such segments at maturity

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

References

Harris & Harris (1994), McCusker (1981).

REFERENCES

Aplin, T.E.H. (1969). Poison plants of Western Australia. *Journal of Agriculture of Western Australia* 10, 248-522.

Aplin, T.E.H. (1973). *Poison plants of Western Australia. The toxic species of the genera Gastrolobium and Oxylobium.* Bulletin 3772. Western Australian Department of Agriculture, South Perth, W.A.

Aston, H.I. (1969). The genus *Villarsia* (Menyanthaceae) in Australia. *Muelleria* 2(1), 3-61.

Barlow, B.A. (1983). A revision of the Viscaceae of Australia. *Brunonia* 6, 48-49.

Barlow, B.A. (1984). Viscaceae. In: George, A.S. (ed.), *Flora of Australia*, Vol. 22. Australian Government Publishing Service, Canberra, p. 143.

Barnsley, B. (1982). Frankeniaceae. In: George, A.S. (ed.), *Flora of Australia*, Vol. 8. Australian Government Publishing Service, Canberra, pp. 143-144.

Beard, J.S. (1976a). *The vegetation of the Dongara area, W.A.* Vegmap Publications, Perth.

Beard, J.S. (1976b). *The vegetation of the Ajana area, W.A.* Vegmap Publications, Perth.

Beard, J.S. (1976c). *The vegetation of the Murchison Region.* University of Western Australia Press, Nedlands.

Benl, G. (1971). A key for the determination of the genus *Ptilotus* R. Br. (Amarantaceae). *Mitteilungen der Botanischen Staatssammlung Munchen* 9, 135-176.

Benl, G. (1979). Three new species of *Ptilotus* (Amaranthaceae) from Western Australia. *Nuytsia* 2(6), 345-349.

Bennett, E.M. (1972). A revision of the Australian species of *Hybanthus* Jacquin (Violaceae). *Nuytsia* 1(3), 218-241.

Bennett, E.M. (1982). A guide to the Western Australian She-oaks (*Allocasuarina* and *Casuarina* species). *Western Australian Naturalist* 15(4), 77-105.

Bentham, G. (1855). Plantae Mullerianae. Mimoseae. *Linnaea* 26, 621.

Bentham, G. (1863-1878). *Flora Australiensis*, Vols. 1-7. Lovell Reeve & Co., London.

Black, J.M. (1923). Additions to the flora of South Australia, No. 21. *Transactions and Proceedings of the Royal Society of South Australia* 47, 367-370.

Black, J.M. (1943). Centrolepidaceae. *Flora of South Australia*, Part 1, 2nd edn. Government Printer, Adelaide, pp. 178-179.

Blackall, W.E. and Grieve, B.J. (1974, 1980, 1981, 1985, 1988). *How to know Western Australian wildflowers.* Parts I, II, IIIA, IIIB, I (2nd edn). University of Western Australia Press, Perth.

Blake, T.L. (1981). *A guide to Darwinia and Homoranthus.* Society for Growing Australian Plants, Maroondah Group, Ringwood, Victoria.

Briggs, J.D. & Leigh, J.H. (1996). *Rare or threatened Australian plants,* 1995 rev. edn. CSIRO, Canberra.

Brittan, N.H. (1971). *Murchisonia*, a new monotypic genus of Liliaceae from Western Australia. *Journal of the Royal Society of Western Australia* 54(4), 95-98.

Hooker, W.J. (ed.) (1851). *Hooker's journal of botany and Kew Garden miscellany* 3, 142.

Hooker, W.J. (ed.) (1855). *The journal of botany and Kew Garden miscellany* 7, pp. 74, 121.

Hopper, S.D. (1979). Biogeographical aspects of speciation in the southwest Australian flora. *Annual review of ecology and systematics* 10, 399-422.

Hopper, S.D. (1987). Haemodoraceae. In: George, A.S. (ed.), *Flora of Australia*, Vol. 45. Australian Government Publishing Service, Canberra, pp. 57-110, 112-126.

Howell, G.J. (1996). Reappraisal of *Scaevola oldfieldii* (Goodeniaceae) and recognition of a new species *S. kallophylla* from south-west Western Australia. *Nuytsia* 11(1), 25-31.

Hubbard, C.E. (1934). Gramineae Australienses 2. *Bulletin of Miscellaneous Information* 10, 444-451.

Hubbard, C.E. (1939). *Plectrachne pungens*. In: *Hooker's Icones Plantarum*, Tab 3385.

Johnson, L.A.S. (1982). Notes on Casuarinaceae II. *Journal of the Adelaide Botanic Gardens* 6(1), 73-87.

Johnson, L.A.S. & Hill, K.D. (1992). Systematic studies in the eucalypts. 5. New taxa and combinations in *Eucalyptus* (Myrtaceae) in Western Australia. *Telopea* 4, 574.

Keighery, G.J. (1982). *Macarthuria intricata* sp. nov. (Aizoaceae), a new species from South Western Australia. *Nordic Journal of Botany* 2, 5-6.

Keighery, G.J. (1983). *Macarthuria georgeana* (Aizoaceae), a new species from South Western Australia. *Willdenowia* 13, 387-388.

Keighery, G.J. (1987). *Arnocrinum, Hensmania* and *Stawellia*. In: George, A.S. (ed.), *Flora of Australia*, Vol. 45. Australian Government Publishing Service, Canberra, pp. 249-254.

Kelly, A.E., Taylor, A., Langley, M.A., Spooner, A. & Coates, D.J. (1993). *Declared rare flora and other plants in need of special protection in the metropolitan area.* Western Australian Wildlife Management Program No. 10. Australian National Parks and Wildlife Service, Canberra and Department of Conservation and Land Management, Como, W.A.

Kelly, A.E., Napier, A. & Hopper, S. (1995). *Survey of rare and poorly known eucalypts of Western Australia.* CALMScience Supplement 2. Department of Conservation and Land Management, Como, W.A.

Kenneally, K.F. (1968). An annotated list of Angiosperms of Lakeside Station, Cue, Western Australia. *Western Australian Naturalist* 10, 182-9.

Kenneally, K.F. (1971). Some additions to the annotated list of Angiosperms of Lakeside Station, Cue, Western Australia. *Western Australian Naturalist* 12, 20.

Leach, G.J. (1989). Taxonomic revision of *Bergia* (Elatinaceae) in Australia. *Journal of the Adelaide Botanic Gardens* 11(2), 75-100.

Lehmann, J.G.C. (ed.) (1844-1848). *Plantae Preissianae sive Enumeratio Plantarum, quas in Australasia Occidentalie et Meridionali - occidentali annis 1838-41 Collegit Ludwig Preiss*, Vols 1 & 2. Meissner, Hamburg.

Leigh, J., Boden R. & Briggs, J. (1984). *Extinct and endangered plants of Australia.* Macmillan Company of Australia Pty. Ltd., Melbourne.

Lepschi, B.J. (1996). A taxonomic revision of *Macarthuria* (Molluginaceae) in Western Australia. *Nuytsia* 11(1), 37-54.

Lowrie A. & Carlquist, S. (1991). Studies in *Stylidium* from Western Australia: new taxa; rediscoveries and range extensions. *Phytologia* 71(1), 5-28.

Lowrie, A., Coates, D.J. & Kenneally, K.F. (1998). A taxonomic review of the *Stylidium caricifolium* complex (Stylidiaceae), from south-west Western Australia. *Nuytsia* 12(1), 43-57.

Macfarlane, T.D. (1980). A revision of *Wurmbea* (Liliaceae) in Australia. *Brunonia* 3(2), 145-208.

Macfarlane, T.D. (1987). *Haemodorum, Phlebocarya* and *Wurmbea.* In: George, A.S. (ed.), *Flora of Australia*, Vol. 45. Australian Government Publishing Service, Canberra.

Marchant, N.G., Wheeler, J.R., Rye, B.L., Bennett, E.M., Lander, N.S. & Macfarlane, T.D. (1987). *Flora of the Perth Region*, Vols 1 & 2. Western Australian Herbarium, Department of Agriculture, South Perth.

Maslin, B.R. (1972). Studies in the genus *Acacia* - 1. *Nuytsia* 1(3), 254-260.

Maslin, B.R. (1975). Studies in the genus *Acacia* (Mimosaceae). 4. A revision of the series Pulchellae. *Nuytsia* 1(5), 388-494.

Maslin, B.R. (1978). Studies in the genus *Acacia* (Mimosaceae). 7. The taxonomy of some diaphyllodinous species. *Nuytsia* 2(4), 200-219.

Maslin, B.R. (1979). Studies in the genus *Acacia* (Mimosaceae). 9. Additional notes on the Series Pulchellae Benth. *Nuytsia* 2(6), 354-367.

Maslin, B.R. (1995a). *Acacia* miscellany 13. Taxonomy of some Western Australian phyllocladinous and aphyllodinous taxa (Leguminosae: Mimosoideae). *Nuytsia* 10(2), 151-179.

Maslin, B.R. (1995b). *Acacia* miscellany 14. Taxonomy of some Western Australian "Uninerves-Racemosae" species (Leguminosae: Mimosoideae: section *Phyllodineae*). *Nuytsia* 10(2), 181-203.

Maslin, B.R. (1999). *Acacia* miscellany 16. The taxonomy of fifty-five species of *Acacia,* primarily Western Australian, in section *Phyllodineae* (Leguminosae: Mimosoideae). *Nuytsia* 12(3), 311-411.

Maslin, B.R. & Chapman, A.R. (1999). *Acacia* miscellany 19. The taxonomy of some Western Australian species of *Acacia* section *Juliflorae* with 4-merous flowers (Leguminosae: Mimosoideae). *Nuytsia* 12(3), 469-486.

McCusker, A. (1981). Glossary. In: George, A.G. (ed.), *Flora of Australia*, Vol. 1. Australian Government Publishing Service, Canberra.

McGillivray, D.J. (1986). *New names in Grevillea (Proteaceae).* The Author, Castle Hill, New South Wales.

McGillivray, D.J. & Makinson, R.O. (1993). *Grevillea. Proteaceae. A taxonomic revision.* Melbourne University Press.

Meisner, C.F. (1857). In: Candolle, Alphonse de (ed.), *Prodromus systematis naturalis regni vegetabilis*, Vol. 14. V. Masson, Paris, p. 373.

Melville, G.F. (1947). An investigation of the drought pastures of the Murchison District of Western Australia. *Journal of the Department of Agriculture, Western Australia* 24, 1-29.

Mildbraed, J. (1908). Stylidiaceae. In: Engler, A. (ed.). *Das Pflanzenreich.* IV. 278 (Heft 35). H.R. Engelmann, Weinheim.

Mitchell, A.A. & Wilcox, D.G. (1994). *Arid shrubland plants of Western Australia.* Second and enlarged edition. University of Western Australia Press in association with Department of Agriculture, Western Australia.

Short, P.S. (1990). New taxa and new combinations in Australian Gnaphaliinae (Inuleae: Asteraceae). *Muelleria* 7(2), 239-252.

Short, P.S. (1995). A revision of *Millotia* (Asteraceae-Gnaphalieae). *Australian Systematic Botany* 8(1), 1-47.

Speck, N.H. (1958). The vegetation of the Darling Irwin Botanical Districts, Ph.D. thesis (Botany), University of Western Australia.

Stace, H.M. & Coates, D.J. (1995). *Wongan Hills triggerplant recovery plan.* Western Australian Wildlife Management Program No. 15. Department of Conservation and Land Management, Como, W.A.

Steudel, E.G. (1855). *Synopsis plantarum glumacearum*, Part 1. J.B. Metzler, Stuttgart, p. 287.

Strid, A. (1987). New species of *Beaufortia* and *Chamelaucium* (Myrtaceae), *Drosera* (Droseraceae) and *Pultenaea* (Fabaceae) from SW Australia. *Plant Systematics and Evolution* 155, 339-347.

Summerhayes, V.S. (1930). A revision of the Australian species of *Frankenia. The Journal of the Linnean Society of London. Botany* 48, 363-364.

Taunton, H. (1903). *Australind.* London.

Taylor, J.M. & Crisp, M.D. (1992). A revision of *Chorizema* (Leguminosae: Mirbeliaceae). *Australian Systematic Botany* 5, 249-335.

Taylor A. & Hopper, S. (1988). *The Banksia atlas.* Australian Flora and Fauna Series No. 8. Bureau of Flora and Fauna, Canberra and Department of Conservation and Land Management, Western Australia. Australian Government Publishing Service, Canberra.

Thompson, J. (1989). A revision of the genus *Leptospermum* (Myrtaceae). *Telopea* 3(3), 301-448.

Thongpukdee, A. (1987). *Tricoryne.* In: George, A.S. (ed.), *Flora of Australia*, Vol. 45. Australian Government Publishing Service, Canberra, pp. 292-299.

Turczaninow, N. (1849). Decas Sexta. Generum hicusque non descriptorum adjectis descriptionibus specierum nonnullarum. *Bulletin de la Societe Imperiale des Naturalistes de Moscou* 22(2), 13.

Weston, P. (1994). The Western Australian species of subtribe Persooniinae (Proteaceae: Persoonioideae: Persoonieae). *Telopea* 6(1), 51-165.

Weston, P. (1995). Persoonioideae. In: Orchard, A.E. (ed.), *Flora of Australia*, Vol. 16. Australian Government Publishing Service, Canberra, pp. 47-125.

Wilson, K.L. & Johnson, L.A.S. (1989). Casuarinaceae. In: George, A.S. (ed.), *Flora of Australia*, Vol. 3. Australian Government Publishing Service, Canberra, pp. 100-189.

Wilson, P.G. (1970). A taxonomic revision of the genera *Crowea*, *Eriostemon* and *Phebalium* (Rutaceae). *Nuytsia* 1, 28.

Wilson, P.G. (1971). Taxonomic notes on the family Rutaceae, principally of Western Australia. *Nuytsia* 1, 197-207.

Wilson, P.G. (1975). A taxonomic revision of the genus *Maireana* (Chenopodiaceae). *Nuytsia* 2(1), 2-83.

Wilson, P.G. (1980). A revision of the Australian species of Salicornieae (Chenopodiaceae). *Nuytsia* 3, 3-154.

Wilson, P.G. (1984). Chenopodiaceae. In: George, A.S. (ed.), *Flora of Australia*, Vol. 4. Australian Government Publishing Service, Canberra, pp. 81-317.

Wilson, P.G. (1989). *Erymophyllum* (Asteraceae: Inuleae: Gnaphaliinae), a new Australian genus in the *Helipterum* complex. *Nuytsia* 7(1), 113-114.

Wilson, P.G. (1992a). The *Lawrencella* complex (Asteraceae: Gnaphalieae: Angianthinae) of Australia. *Nuytsia* 8(3), 361-377.

Wilson, P.G. (1992b). The classification of Australian species currently included in *Helipterum* and related genera (Asteraceae: Gnaphalieae), Part 1. *Nuytsia* 8(3), 379-438.