A Survey of Declared Rare Flora and Other Plants in Need of Special Protection of the Scott Plains

by

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A report to the Australian National Parks and Wildlife Service.
Endangered Species Programme.

EXECUTIVE SUMMARY

This report details information on the conservation status of 47 taxa, 40 from the Scott Plain and 7 from the Swan Coastal Plain.

Eleven taxa (*Darwinia "ferricola"*, *Conospermum* sp. nov. (Wittwer 1242), *Actinodium cunninghamii* var. nov., *Adenanthos detmoldii*, *Adenanthos* x *pamela*, *Aotus carinata*, *Boronia* sp. (Keighery 12087), *Calothamnus* aff. *crassus*, *Grevillea brachystylis* ssp. *australis*, *Grevillea* aff. *manglesioides* (GK 4070) and *Loxocarya* sp. nov. Meney 109) appear truly confined to the Scott Coastal Plain. One of these is already declared rare (*Darwinia ferricola*) flora.

Two of these taxa (*Conospermum* sp. nov. and *Grevillea brachystylis* ssp. *australis*) are confined to clay soils on the western side of the plain near the Blackwood River. Very few populations of these taxa were located in this largely cleared area.

Two taxa (*Adenanthos detmoldii* and *Aotus carinata*) occur on the sandy winter-wet flats and probably extend to the Black Point area. These are both locally common, but still require acquisition of reserves on the plain to ensure the survival of a range of populations.

Six taxa (*Actinodium cunninghamii* var. nov., *Boronia* sp. nov., *Calothamus* aff. *crassus*, *Darwinia "ferricola"*, *Grevillea* aff. *manglesioides* and *Loxocarya* sp. nov.) appear confined to the shallow ironstone soils scattered across the plain. In all cases their conservation status is reliant on the eventual acquisition of BHP land which the company is currently managing as a reserve and the addition of the shire recreation reserve into Scott National Park.

During the course of this survey ironstone outcrops (and adjacent areas) were examined on the Swan Coastal Plain near Busselton. Six previously unknown taxa were located during this brief survey. Several appear to be at risk and two Dryandra sp. 30 and *Petrophile "latericola"*) are proposed to be gazetted as rare flora. The plant community (in which these species occurs) is also extremely rare. It is recommended that a detailed survey be undertaken of this community and it's species. These discoveries are even more remarkable considering they were made within 200 km of the capital city, Perth.

PART ONE: INTRODUCTION

1. The Need for Management

Western Australia has a unique flora world renowned for its diversity and high level of endemism. The vascular flora contains over 7000 described taxa (Green 1985), with the total likely to exceed 10,000 once botanists have completed surveying, researching and describing the flora (Hopper *et al.* 1990). More than 2000 taxa have been recognised as rare,

geographically restricted or poorly collected (Marchant and Keighery 1979). According to Briggs and Leigh (1988) the State has 43 percent of the Australian total of rare or threatened plant species, 82 percent of these being restricted to the south-west.

Although some plants are rare because of their requirement for a specific restricted habitat, the majority have become rare because of the activities of European settlers. Extensive clearing and modification of the environment has resulted in the extinction of some species and placed the survival of many others is jeopardy. Continued land clearing, inappropriate fire regimes, exotic weeds, pests and diseases, road-works and indiscriminate herbicide use continue to threaten the flora.

The State Conservation Strategy, Wildlife Conservation Act (1950-1985), and Conservation and Land Management Act (1984-1987) provide the guidelines and legislative basis for the conservation of the State's indigenous plant and animal species. Under the Wildlife Conservation Act, the Department of Conservation and Land Management (CALM) is responsible for the protection of flora and fauna on all lands and waters throughout the State. Section 23F of the Act gives the Minister for CALM statutory responsibility for the protection of those classes of flora declared to be rare.

In 1991, 254 taxa were classified as Declared Rare Flora. A further 53 species were listed on the schedule as presumed extinct. In addition to those formally protected, some 1200+ taxa are listed in CALM's priority flora list. These taxa require further survey so that their conservation status can be accurately assessed. Hopper *et al.* (1990) provides illustrations of the Declared Rare Flora, discusses the conservation of Western Australia's endangered species and reviews the relevant legislation, policy, research and management activities of CALM.

2. Objective of the Survey

The Scott Plain is the westward extension of the Warren Coastal Flats which extend from Albany to Augusta. The Plain is demarked on its western side by the Blackwood River and on its eastern side by Black Point, to the north it is bounded by the Nillup Plain. For the purpose of this survey the eastern boundary of the Central Forest Region and the Brockman Highway to the north were used as convenient boundaries.

At the commencement of the study it was proposed to survey those eight species (*Adenanthos detmoldii, Actinodum cunninghamii* var. nov., *Darwinia "ferricola", Grevillea brachystylis* ssp. *australis, Hypocalymma* sp., *Lambertia orbifolia, Melaleuca basicephala* and *Aotus carinata*) which were either considered endemic to or largely confined to the Scott Plain, and could be under threat from land clearance or mining. However, upon discussions with CALM regional staff, taxonomic botanists, rare flora management staff and BHP environmental consultants, it was decided to survey all declared rare and priority species, as well as those known to

taxonomists and consultants to be centred or listed in the region.

3. The Revised List

At the commencement of the survey two species of Declared Rare Flora and 17 priority species could have been expected to occur within the study region (Table A). The survey recorded populations of an additional species of rare flora and 15 additional priority species. This raised the number of species considered in this report to 35.

Table A Declared Rare and Priority Species Listed for the Region in 1990

Taxon	Priority
Adenanthos detmoldii	4
A. detmoldii X A. obovatus	8
Aotus carinata	3
Astartea sp. (Backshall 88233)	2
Banksia meisneri var. *ascendens*	4
Darwinia "ferricola"	R
Calothamnus ?crassus	3
Drosera omissa	3
Grevillea manglesioides ssp *papillosa*	2
Hypocalymma sp. (A.S. George 11773)	3
Jansonia formosa	2
Lambertia orbifolia	R
Loxocarya sp. (K. Meney 109)	1
Melaleuca basicephala	1
Restio gracilior	2
R. ustulatus	4
Tripterococcus sp.	2
Vertcordia lehmannii	2
Villarsia lasiosperma	3

Table B Additional Priority Taxa Recorded by 1991

Taxon	Priority
Acacia tayloriana	2
Actinotus laxus	1
Ampera protensa	1
Ampera volubilis	2
Anthotium ?junciforme	3
Cassytha micrantha	3
Grevillea brachystylis ssp. *australis*	1
Hybanthus volubilis	2
Lepyrodia heleocharoides	1
Loxocarya sp.(Royce 2465)	1
Stylidium barleei	2
Caladenia huegelii	R
Leucopogon alternifolius	1
Pithocarpa melanostigma	2
Sphenotoma parviflorum	2
	15

Discussions with other botanists added a further five taxa (*Actinodium cunninghamii* var. nov., *Conospermum* sp. nov. (Wittwer 1242), *Leucopogon* aff. *gilbertii*, *Boronia* sp. nov. and *Grevillea* sp. aff. *manglesioides* (GK 4070)), which were considered to be confined to or centred in the Scott Plains.

Finally it was noted by Peter Tille (pers. comm., and in Tille and Lantzke, 1991) that shallow clays over ironstone pans occurred on the Swan Coastal Plain and these may contain the same species as were recorded on the Scott Coastal Plain.

A brief survey of the few remaining vegetated remnants of these ironstone heaths produced no overlapping taxa but the following new taxa were located (*Astartea* sp. nov. (GK 9556), *Brachysema* sp. nov. (GK 12715), *Actinotus* sp. nov. (GK 12413), *Darwinia* aff. *apiculata* (GK 12472), *Loxocarya* sp. nov. (GK 11769) and *Petrophile* sp. nov (GK 11790). These 6 taxa are dealt with in a separate section as most appear likely to need declaration as rare flora. Also confined to these outcrops was Dryandra sp. 30, which had not previously been surveyed and this species is also detailed in part four of this report.

Hence 47 taxa are dealt with in this report.

REFERENCES

Briggs, J. and Leigh, J. (1988). Rare or Threatened *Australian Plants*. *Australian National Parks and Wildlife Service*. *Special Publication No. 14*:Canberra.

Green,, J.W. (1985). *Census of the Vascular Plants of Western Australia*. 2nd Edn. Western Australian Herbarium, Department of Agriculture, Perth.

Hopper, S.D., van Leeuwen, S., Brown, A. and Patrick, S. (1900). *Western Australia's Endangered Flora*. Department of Conservation and Land Management, Perth.

Marchant, N.G., and Keighery, G.J. (1979). Poorly Collected and Presumably Rare Vascular Plants in Western Australia. *Kings Park Research Notes No. 5.*

Tille, P.J. and Lantzke, N.C. (1991) Land Resources of Busselton-Margaret River-Augusta Busselton Map. Western Australian Department of Agriculture, Perth.

PART TWO: DECLARED RARE FLORA IN THE SCOTT PLAINS AREA

In 1990, two taxa of Declared Rare Flora were known to be extant within the boundaries of the Scott Coastal Plain. An additional species (*Kennedia macrophylla*) occurs on Cape Leeuwin, just west of the area's boundary. This species was searched for during the survey but no populations were located. A second species (*Chamelaucium "erythrochlora"*) occurs to the north of the study area, on the Blackwood Plateau, and was also searched for but no populations of this species were located in the study area either.

A third species of declared rare flora (*Caladenia huegelii*) was located in the region during the survey, in Scott National Park.

Hence, three species of Declared Rare Flora were extant within the boundaries of the study area in 1991.

A brief description of the morphology, distribution, habitat and conservation status is provided for each of the taxa.

The impact of certain management techniques (fire, mechanical disturbance, weed invasion and dieback) is noted and recommendations made for management and protection action necessary to ensure their continued survival. The Declared Rare Flora are illustrated in a book on Western Australia's Endangered Flora (Hopper *et al.* 1990).

Descriptions of species were compiled by consulting references and discussion with botanists. Distribution and habitat were recorded from Departmental Rare Flora files. Emphasis was placed on the particular habitat characteristics of locations in the Metropolitan Region. Only extant populations surveyed by officers of the Department in recent years are included. Herbarium records may indicate a wider range and larger numbers of populations, some of which are known to have been destroyed since the time of collection.

Conservation status was determined from field observations and populations and location data on Departmental files. It is a brief summary of the number and condition of Rare Flora populations throughout the species' range and the threats to their survival. Success with propagation and the extent of general cultivation is also noted. A table for each species lists the location, size, condition, land status and local government authority for populations in the Scott Coastal Plain. Precise locality details are contained on Departmental files and a computerised database.

Impact of fire, soil disturbance, weed invasion and dieback was noted (where known) from observations made in the field during routine monitoring and from discussion with research personnel. Management and research requirements were determined on the basis of conservation status and from general location data on the Rare Flora files.

CALADENIA HUEGELII H.G. Reichb. Orchidaceae

Grand Spider Orchid

Caladenia huegelii is a slender orchid, usually growing to 30-70 cm high but occasionally up to 1 m. It has one or two striking flowers characterised by a greenish-cream labellum with a recurved, maroon tip and a long, often terminally branched fringe that extends well above the column. The sepals and petals are cream with red or pink suffusions. The sepals narrow to slender, brown, terminal 'clubs'. The hairy, linear leaf may be up to 40 cm long. It differs from other members of the *C. huegelii* complex in its generally larger flowers with a comparatively large labellum and long fringe. The most magnificent examples of this species occur in the Perth area. Flowering is from September-October with above ground portions of the plant dying back to underground tubers over summer.

The name *C. huegelii* has been misapplied to a closely related species (*C. 'arenicola'* Hopper and Brown, ined.) for some time due to confusion resulting from a mixed collection on the type sheet.

DISTRIBUTION AND HABITAT IN THE SCOTT PLAIN

Caladenia huegelii occurs in the Swan, Central and Southern Forest Regions, a range of over 300 km from Wanneroo to Northcliffe. In the region it occurs on low sandy rises in low woodlands of *Banksia attenuata* and *Eucalyptus marginata*. The species is probably more widespread in the region, but it requires intensive survey to locate the small populations.

CONSERVATION STATUS

Endangered	Rare	In Need of Special Protection
		X

A widespread species, usually in small populations, throughout its range (Kelly *et al.* 1991). The sole recorded population is contained in Scott National Park.

POPULATIONS KNOWN IN THE SCOTT PLAIN

KNOWN POPULATIONS (Map 1)

Pop No	Shire	District	Population	Land Status	No	Condition
?	A/MR		Scott (1)	national park	20(+)	good

A/MR - Augusta - Margaret River Shire

Response to fire - killed if burnt when leaves are above ground.

Response to Soil Disturbance - not known.

Susceptibility to Weed Invasion - not known.

Susceptibility to *Phytophthora* species - healthy plants are in an old dieback site.

MANAGEMENT REQUIREMENTS

Do not burn during flowering/vegetative phase.

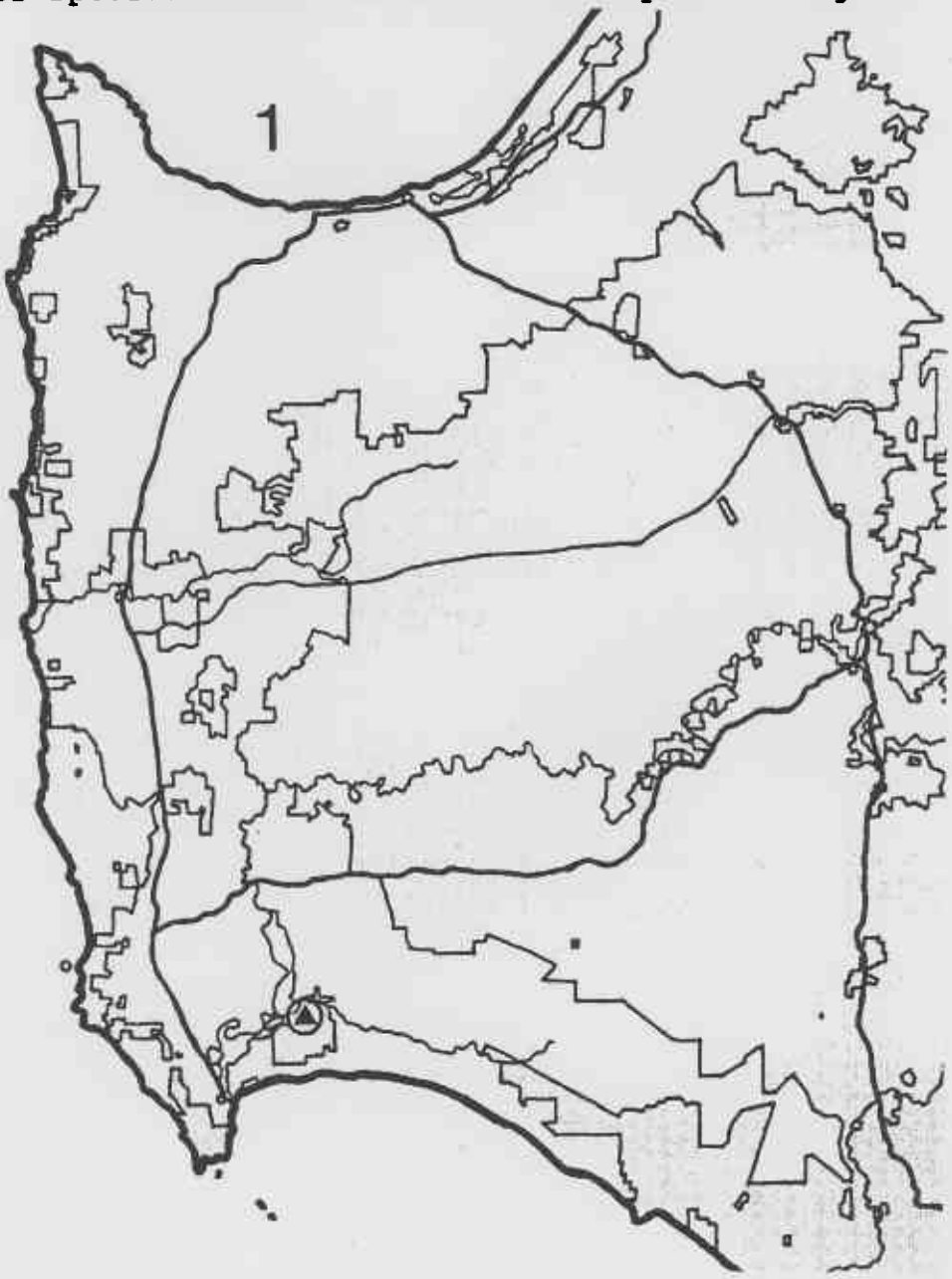
RESEARCH REQUIREMENTS

Further survey of likely habitats within the region.

REFERENCES

Hopper, S.D., van Leeuwen, S., Brown, A. and Patrick, S. (1990). Western Australia's Endangered Flora. Department of Conservation and Land Management, Perth.

Kelly *et al*. (1991). Declared Rare Flora and Other Plants in Need of Special Protection in the Metropolitan Region.



DARWINIA "FERRICOLA" Myrtaceae

Ironstone or Scott Plains Darwinia

Darwinia "ferricola" is a densely branched rounded shrub to 1 m x 1 m wide, although single-stemmed at the base. Young branches have prominent leaf bases. The leaves are scattered on the branches, spreading to recurved, linear, with entire margins, 5-9 mm long. Inflorescences are terminal, but not pendulous, surrounded by an involucre of narrow ovate, long acuminate, green bracts and contain 14-25 flowers. The flowers are green to greenish red, with a long slightly curved style 12-15 mm long. Flowering occurs from October to December.

DISTRIBUTION AND HABITAT IN THE SCOTT PLAIN

Darwinia "ferricola" is endemic to the Scott Plain. In this region it occurs in heath of shrublands of *Melaleuca/Calothamnus* species on red clay over ironstone. In one case it occurs in heath on sand over ironstone edging a winter-wet flat.

CONSERVATION STATUS

Endangered	Rare	In Need of Special Protection
	X	

A very localized species, though common within this area, it is currently not recorded from any conservation reserves. Currently the Department of Conservation and Land Management is purchasing some 40 ha of private land to ensure the conservation of this species (Atkins, pers. comm. 1992).

POPULATIONS KNOWN IN THE SCOTT PLAIN

KNOWN POPULATIONS (Map 2)

Pop No	Shire	District	Population	Land Status	No	Condition
1	A/MR	CF	Scott, P	private	>1000	good
2	A/MR	CF	Chester	State Forest	1	dead
3	A/MR	CF	road verge	Gov. Broome 1	>200	good
4	A/MR	CF	road verge	Gov. Broome 2	>100	good
5	A/MR	CF	Scott, M	private	>100	good
6	A/MR	CF	Scott, J	private	>100	good
7	A/MR	CF	Scott, W	private	>1000	good
8	A/MR	CF	Scott, R	private	>10000	good

RESPONSE TO DISTURBANCE

Response to Fire - killed if burnt.

Response to Soil Disturbance - killed.

Susceptibility to Weed Invasion - not known.

Susceptibility to *Phytophthora* species - not known.

MANAGEMENT REQUIREMENTS

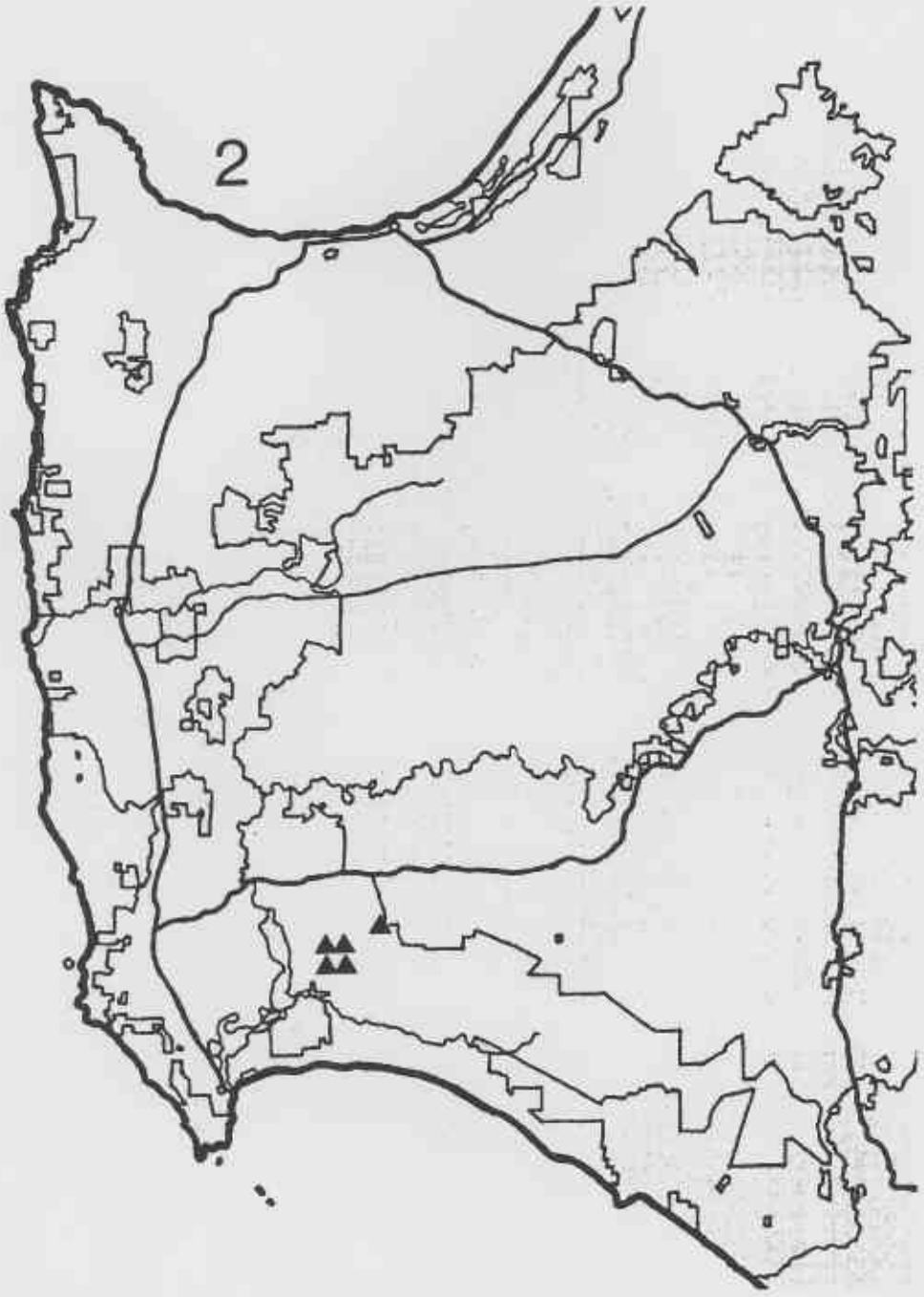
Continue acquisition of land for a nature reserve.

Liaise with BHP re their land containing this species.

Ascertain if this species is susceptible to *Phytophthora*.

Monitor road verge populations annually.

Liaise with private landowners re land containing this species.



LAMBERTIA ORBIFOLIA C.A. Gardn. Proteaceae

"Round-leaf Honeysuckle"

Lambertia orbifolia is a slender open erect shrub to 5 m x 2.5 m wide, the young branches are densely pubescent. Leaves are opposite, spreading, orbicular, slightly concave, 3-6 cm long and wide. Flowers are red, slightly hairy, borne at the ends of branches in inflorescences of 4-6 flowers. Flowers are tubular and approximately 5 cm long, split into two lips at the end with a protruding style. Plants can be found in flower almost all year, but peak flowering occurs in summer (December to March).

DISTRIBUTION AND HABITAT

Lambertia orbifolia is disjunct between Narrikup (north of Albany) and the Scott Plain. At Narrikup it occurs in low *Eucalyptus staeri* open woodland on lateritic loam. On the Scott Plain the species is normally found in dense scrub of Agonis or heath on sandy loam over laterite. Close to the coast *Lambertia orbifolia* forms the dominant component of the scrub.

CONSERVATION STATUS

Endangered	Rare	In Need of Special Protection
	X	

A widespread species of very disjunct occurrences, mostly in small populations. Many populations are threatened by the presence of dieback disease.

POPULATIONS KNOWN IN THE SCOTT PLAIN

KNOWN POPULATIONS (Map 3)

Pop No	Shire	District	Population	Land Status	No	Condition
1	A/MR	CF	Dennis	road reserve	30	poor
2	A/MR	CF	Adelaide 1	private	>1000	good
3	A/MR	CF	Adelaide 2	private	30/40	poor
4	A/MR	CF	Scott 1	Unvested water reserve	3	?good
5	A/MR	CF	Scott 2	private	>100	?good

RESPONSE TO DISTURBANCE

Response to Fire - killed.

Response to Soil Disturbance - killed.

Susceptibility to Weed Invasion - not known.

Susceptibility to *Phytophthora* species - highly susceptible.

MANAGEMENT REQUIREMENTS

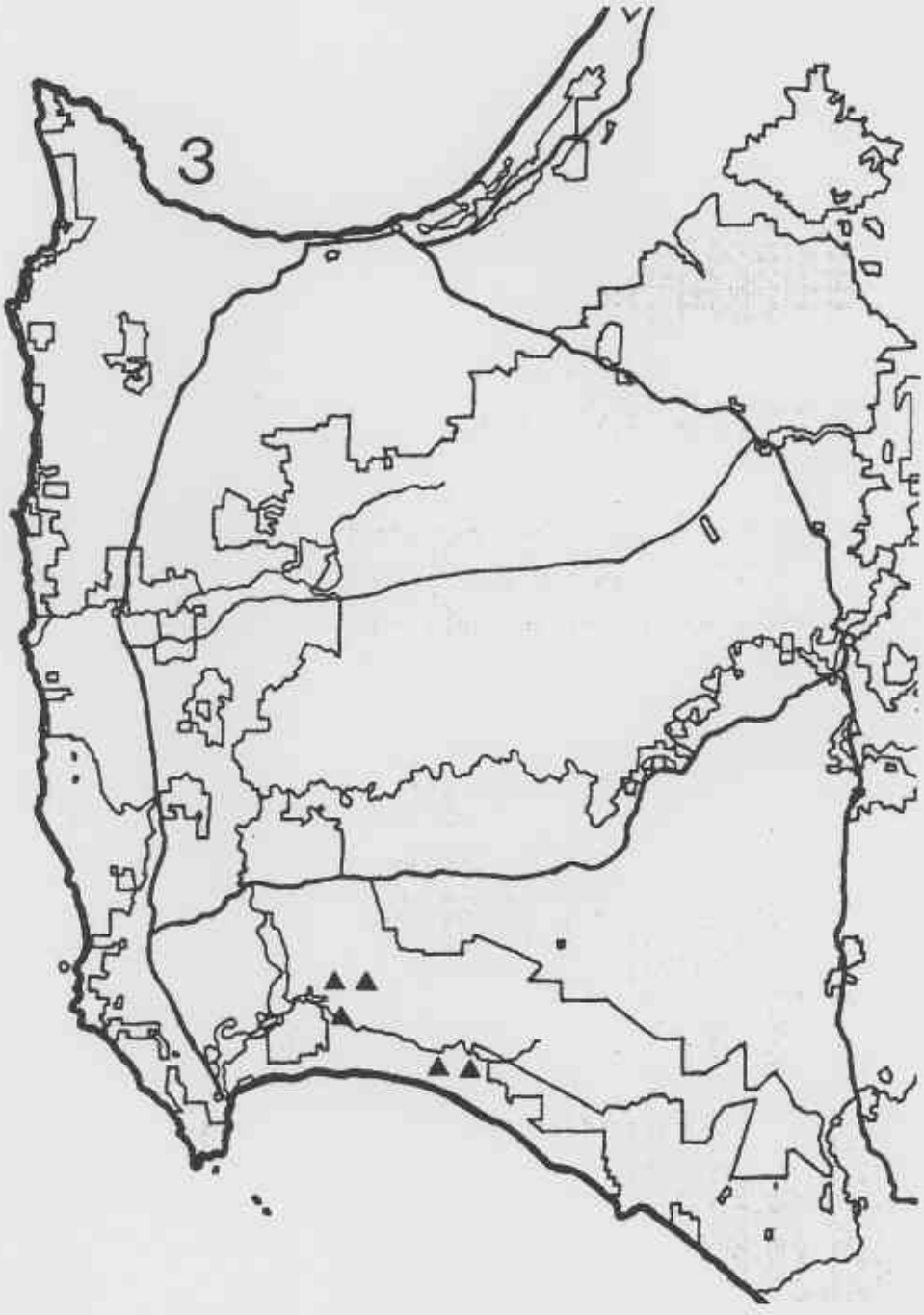
Continue acquisition of land for a nature reserve.

Liaise with BHP and other land owners re land containing this species.

Undertake phosphorous acid trials on this species.

Obtain germplasm material from a selection of populations.

Undertake surveys for these species between Black Point and the Scott Plains.



PART THREE: PRIORITY LISTED AND OTHER SPECIES OF IMPORTANCE OF THE SCOTT PLAINS

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ACACIA TAYLORIANA F. Muell. Mimosaceae

Acacia tayloriana is a prostrate shrub, with branches to 50 cm long, branches are pilose, axillary spines present. Leaves bipinnate, pilose. Inflorescences globular, singular in axils towards ends of branches, flowers yellow.

Flowering occurs between December and March.

DISTRIBUTION AND HABITAT

Acacia tayloriana occurs on the Nillup Plain and Blackwood Plateau, between Busselton and Nannup. The species occurs in low open Jarrah woodland over heath on lateritic sand over clay or sand over clay.

G.S. McCutcheon (pers. comm., 1991) has located 23 populations on this species in State Forest on the Blackwood Plateau.

CONSERVATION STATUS

Current Status: P2 Recommended: P3

KNOWN POPULATIONS (Map 4)

Pop No	Shire	District	Population	Land Status	No	Condition
1	A/MR	CF	Chester 1	State Forest	31	good
2	A/MR	CF	Chester 2	State Forest	27	good

A/MR - Augusta - Margaret River Shire

RESPONSE TO DISTURBANCE

Response to soil disturbance, weed invasion, fire and *Phytophthora* is unknown.

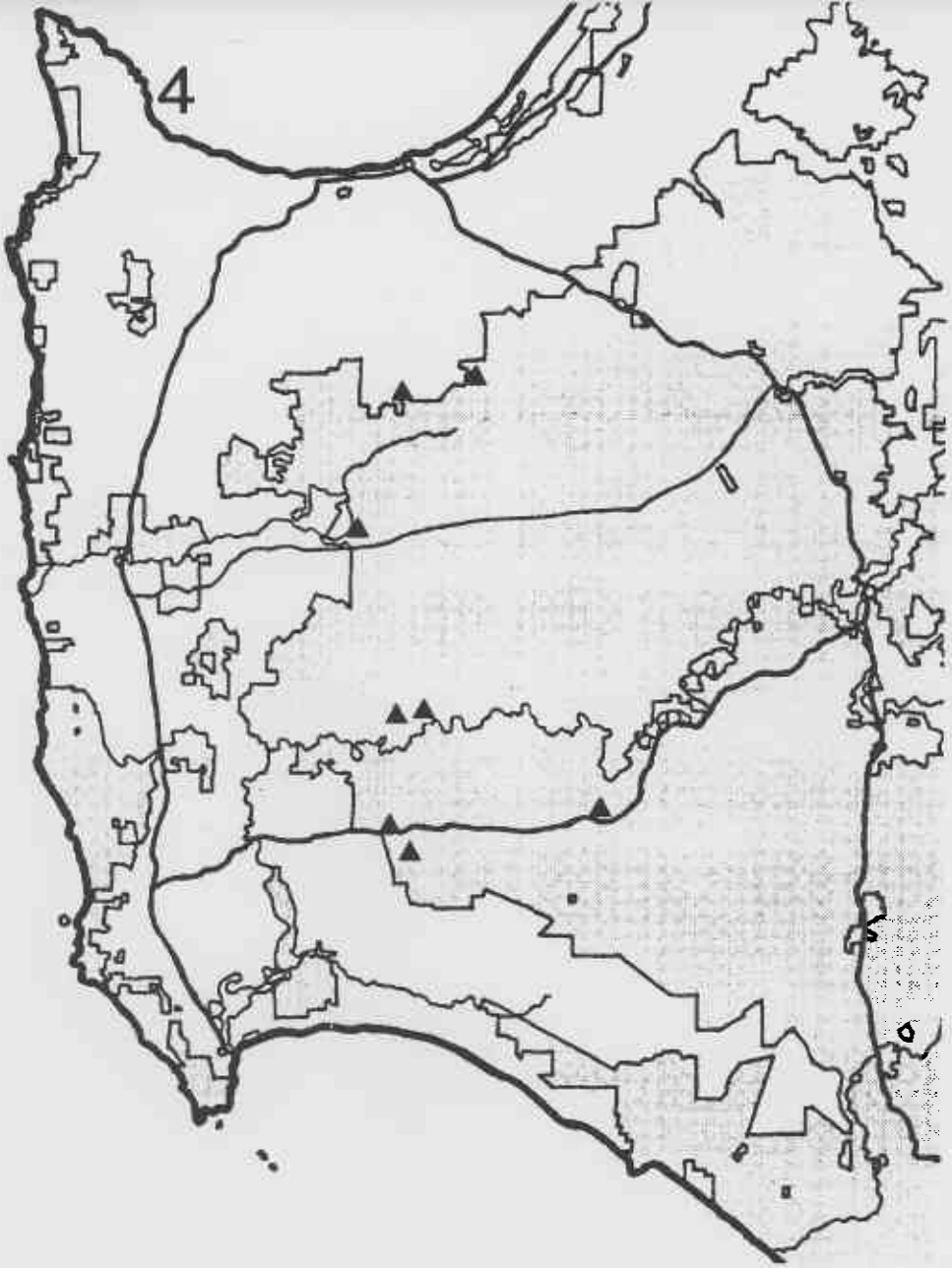
RECOMMENDATIONS

This species appears common, but with a restricted range. Currently numerous populations are known from State Forest land, including several in the proposed Whicher Nature Reserve.

The species appears to be under no immediate risk and should be downgraded to P3.

REFERENCES

McCutcheon, G.S. (1992 - personal communication, file reports).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ACTINODOUM CUNNINGHAMII Schau. Myrtaceae

"Scott River Form"

Actinodium cunninghamii "Scott River" is a low densely branched erect shrub to 20 cm tall x 20 cm wide. It bears terminal saucer shaped flower heads with conspicuous ray florets. Both the flowers and ray florets are blood red in colour, compared to the normal white or pale pink flowered forms found elsewhere throughout the species' range. The form is found in pure populations and is of considerable horticultural significance. A cultivar name will be given to this colour form. Flowering occurs between September to December.

DISTRIBUTION AND HABITAT

Actinodium cunninghamii occurs between Albany and Serpentine, although all known Swan Coastal Plain populations north of Capel appear to be extinct. The Scott River form occurs on and around the western half of the Scott Coastal Plain, where it occurs in heath and sedgeland in red clay over ironstone or rarely, sand over ironstone.

CONSERVATION STATUS

Current Status: not listed Recommended: P3

KNOWN POPULATIONS (Map 5)

Pop No	Shire	District	Population	Land Status	No	Condition
1	A/MR	CF	McGregors	private	>1000	good
2	A/MR	CF	Poole	private	>500	good
3	A/MR	CF	BHP	private	>500	good*
4	A/MR	CF	Gov. Broome	road reserve	200	good
5	A/MR	CF	Scott NP	10	poor	

*Mattiske *et al.* (1990)

RESPONSE TO DISTURBANCE

Response to soil disturbance, weed invasion and *Phytophthora* is unknown.

The species is killed by fire and regenerates from seed.

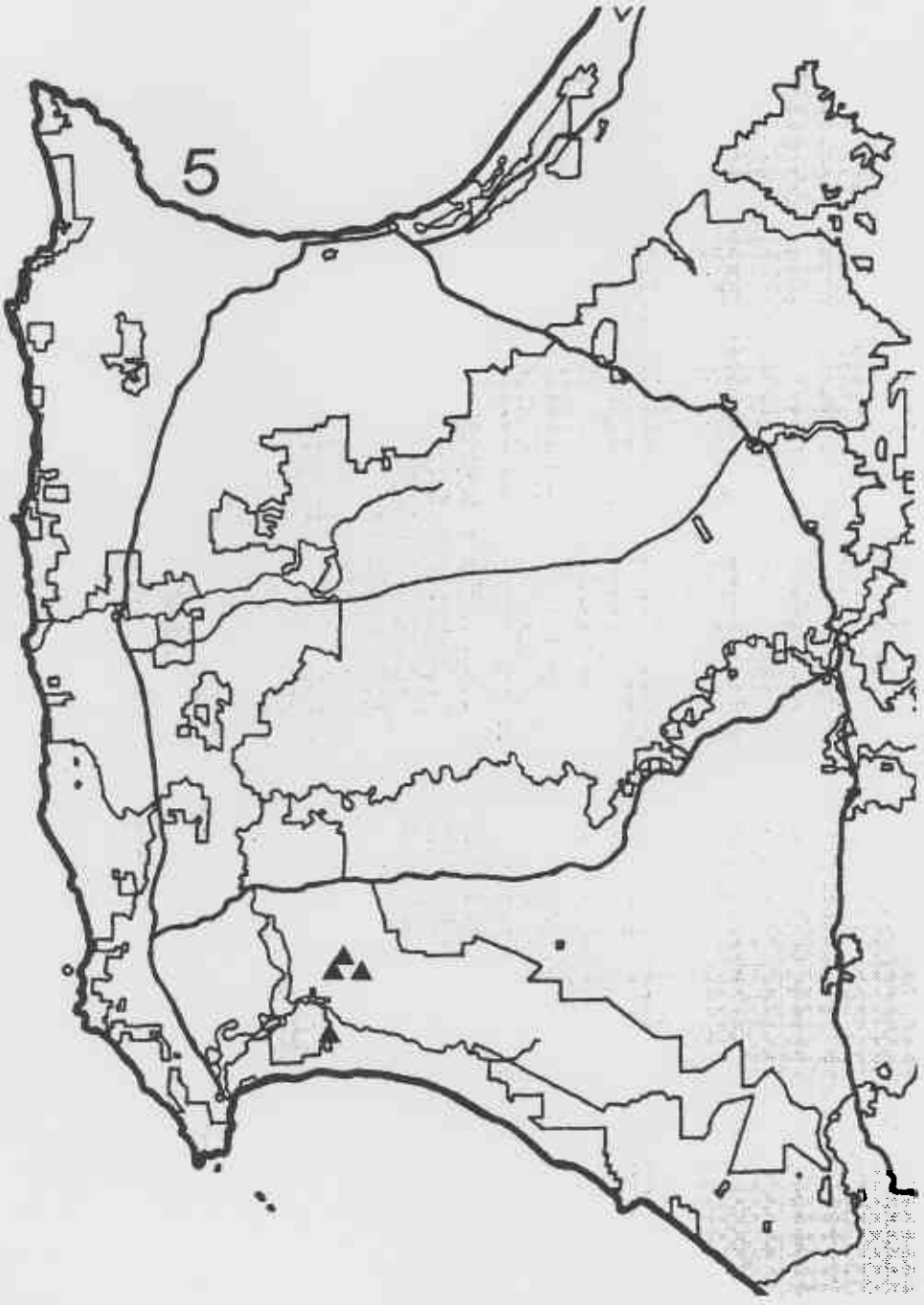
RECOMMENDATIONS

This is a highly attractive horticultural form of a widespread species. The wild population needs protecting. A substantial proportion of this form occurs on land owned by BHP who are not proposing to mine the area and are managing the region as a private nature reserve.

The Department of Conservation and Land Management is currently acquiring areas of *Lambertia orbifolia* and *Darwinia "ferricola"* habitat which would also protect this form.

REFERENCES

Mattiske, E.M. and Associates (1990). Flora and Vegetation. Appendix VII. Beenup Heavy Minerals Mine. ERMP.



ACTINOTUS "LAXUS" Keighery m/s Apiaceae

Actinotus "laxus" is a rhizomatous clumped perennial herb to 50 cm wide and 1 m tall (when in flower). Leaves are felty-hairy, trilobed or with an irregularly lobed margin to 10 cm long. Inflorescences are on long slender, lax peduncles (use dense vegetation for support) to 1 m, bearing small white terminal inflorescences of 10-20 densely woolly white flowers. Flowering occurs between December and February.

DISTRIBUTION AND HABITAT

Actinotus "laxus" occurs between Walpole and Yallingup. The species occurs in closed heath or shrubland (normally *Homalospermum firmum*) on black peaty sandy clay over clay. Swamps where the species occurs are generally wet for most of the year.

CONSERVATION STATUS

Current Status: P1 Recommended: P3

KNOWN POPULATIONS (Map 6)

Pop No	Shire	District	Population	Land Status	No	Condition
1	Buss	CF	Yelverton	State Forest	>100	good
2	A/MR	CF	Spearwood	State Forest	>200	good
3	A/MR	CF	Scott 1	local govt.	>200	good
4	A/MR	CF	Scott 2	national park	>200	good
5	Nannup	CF	Gingilup 1	nature reserve	>200	good
6	Nannup	CF	Gingilup 2	nature reserve	>200	good

Buss:Busselton Shire

RESPONSE TO DISTURBANCE

Soil Disturbance - unknown.

Weed Invasion - unknown.

Fire - regenerates from rootstock.

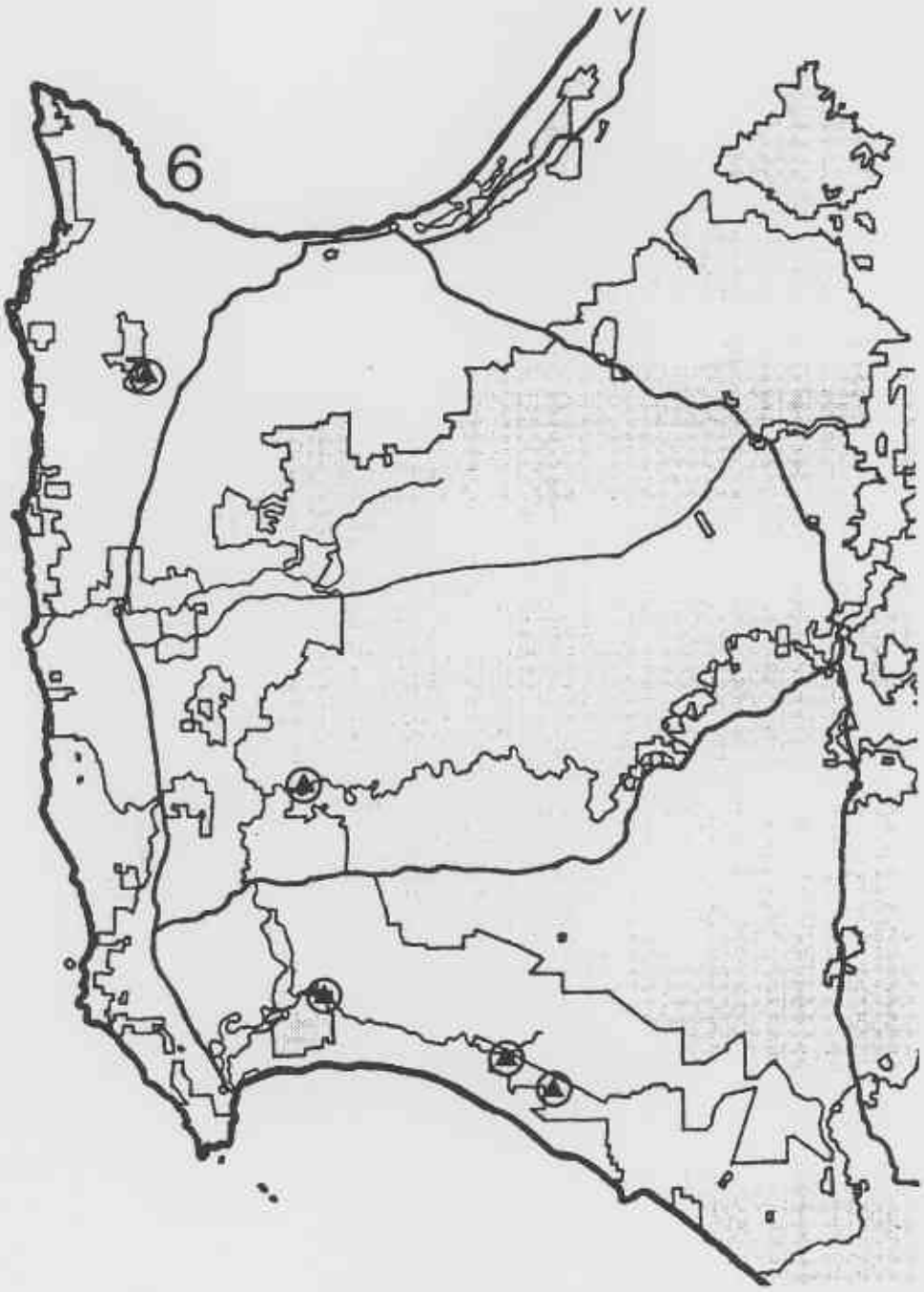
Phytophthora - resistant.

RECOMMENDATIONS

This species is more common and widespread than previously known and should be considered for deletion from the Priority List.

The Yelverton Forest Block, where the northern most population occurs, should be re-classified as a nature reserve.

The Shire Reserve abutting Scott National Park should either be added to the Park or be changed to a flora and fauna reserve.



ADENANTHOS DETMOLDII F. Muell. Proteaceae

Adenanthos detmoldii is an erect or (on road verges especially) spreading shrub to 4 m. Branches and leaves are covered by hairs. Leaves are spirally arranged, linear-obovate, to entire, to 8 cm long. Flowers are yellow, with an orange lip, borne in the axils of leaves on the upper part of the branches, usually singular.

Flowering occurs sporadically throughout the year, with a peak between September and December.

DISTRIBUTION AND HABITAT

Adenanthos detmoldii is confined to the Scott Plain and one area of the Nillup Plain. Populations are scattered throughout the entire region. The species occurs in heath or sedgelands on winter-wet flats. Soils are normally grey sands over clays.

CONSERVATION STATUS

Current Status: P4 Recommended: P1

KNOWN POPULATIONS (map 7)

Pop No	Shire	District	Population	Land Status	No	Condition
1	A/MR	CF	Chester	State Forest	5000	good
2	A/MR	CF	Dennis	road reserve	500	good
3	N	CF	Fouracres	road reserve	300?	good
4	N	CF	Mileyannup	road reserve	>1000	good
5	N	CF	Gingilup	nature reserve	>1000	good
6	N	CF	Scott 1a	water reserve	300	good
7	A/MR	CF	Gov. Broome	road reserve	>600?	good
8	A/MR	CF	Scott Rd	road reserve	>600?	good
9	A/MR	CF	Payne Rd	road reserve	>0100?	good
10	A/MR	CF	Scott 1B	private	1000	good
11	A/MR	CF	Scott 2	private	4000	good
12	A/MR	CF	Scott 3	private	3000	good
13	A/MR	CF	Scott 4	private	3000	good
14	A/MR	CF	Scott 5	private	5000	good
15	A/MR	CF	Scott 6	private	500	good
16	A/MR	CF	Scott 7	private	800	good
17	A/MR	CF	Scott 8	private	20	good
18	A/MR	CF	Scott River	water reserve	13	good

N: Nannup Shire

RESPONSE TO DISTURBANCE

Soil Disturbance - killed.

Weed Invasion - unknown.

Fire - killed.

Phytophthora - unknown.

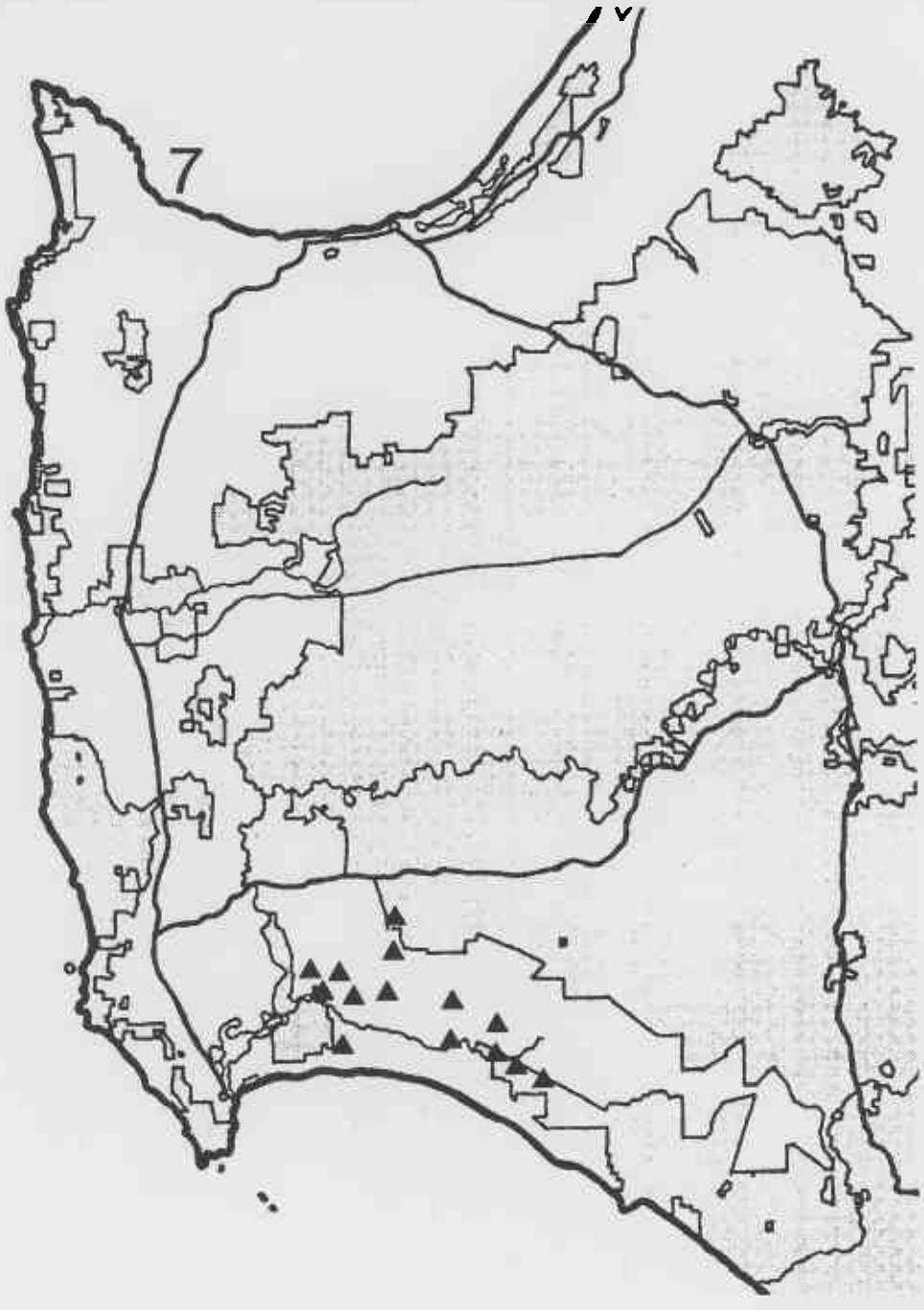
RECOMMENDATIONS

The road verge populations require monitoring.

The presence of this species reported as occurring north of Black Point requires confirmation.

This species' susceptibility to dieback requires research.

The conservation status of this species on the Scott Plain is still relatively uncertain. Only two substantial populations on reserved land (Chester Forest Block and Gingilup Swamp Nature Reserve) occur. Both of these are on the eastern side of the species' range. An attempt to obtain secure reservation of an area of this species' western range should be considered.



ADENANTHOS DETMOLDII X OBOVATA Proteaceae

(also named as *A.* x *pamela* by Nelson 1986)

TAXONOMY

A hybrid between *Adenanthos detmoldii* and *A. obovata*.

DESCRIPTION

Open erect shrub to 1.5 m x 1.5 m, single stemmed at base, but much branched above. Flowers double in leaf axils, but clustered towards the end of the branchlets. Flowers are orange-red, similar in size to *A. detmoldii*. Leaves linear-obovate, entire. Flowering is sporadic throughout the year, but peaks in spring and summer.

DISTRIBUTION AND HABITAT

This hybrid is only found within the range of *A. detmoldii*, on the Scott and Nillup Plains. All plants are only found along the edges of roads, usually singular in occurrence. Occurs with heath on sand over clay. Plants have been located along Milyeannup Coast Rd, Dennis Rd, Governor Broome Rd and Scott Rd. Seventeen plants were recorded during the survey.

CONSERVATION STATUS (Map 8)

Current Status: P8 Recommended: P8

This hybrid does not form populations, it only occurs sporadically in disturbed sites on the Scott Plains, usually on road verges or firebreaks.

RESPONSE TO DISTURBANCE

Response to Fire - killed (1 record).

Physical Disturbance - only occurs in disturbed sites.

Weed invasion - unkown.

Phytophthora - parents killed.

RECOMMENDATIONS

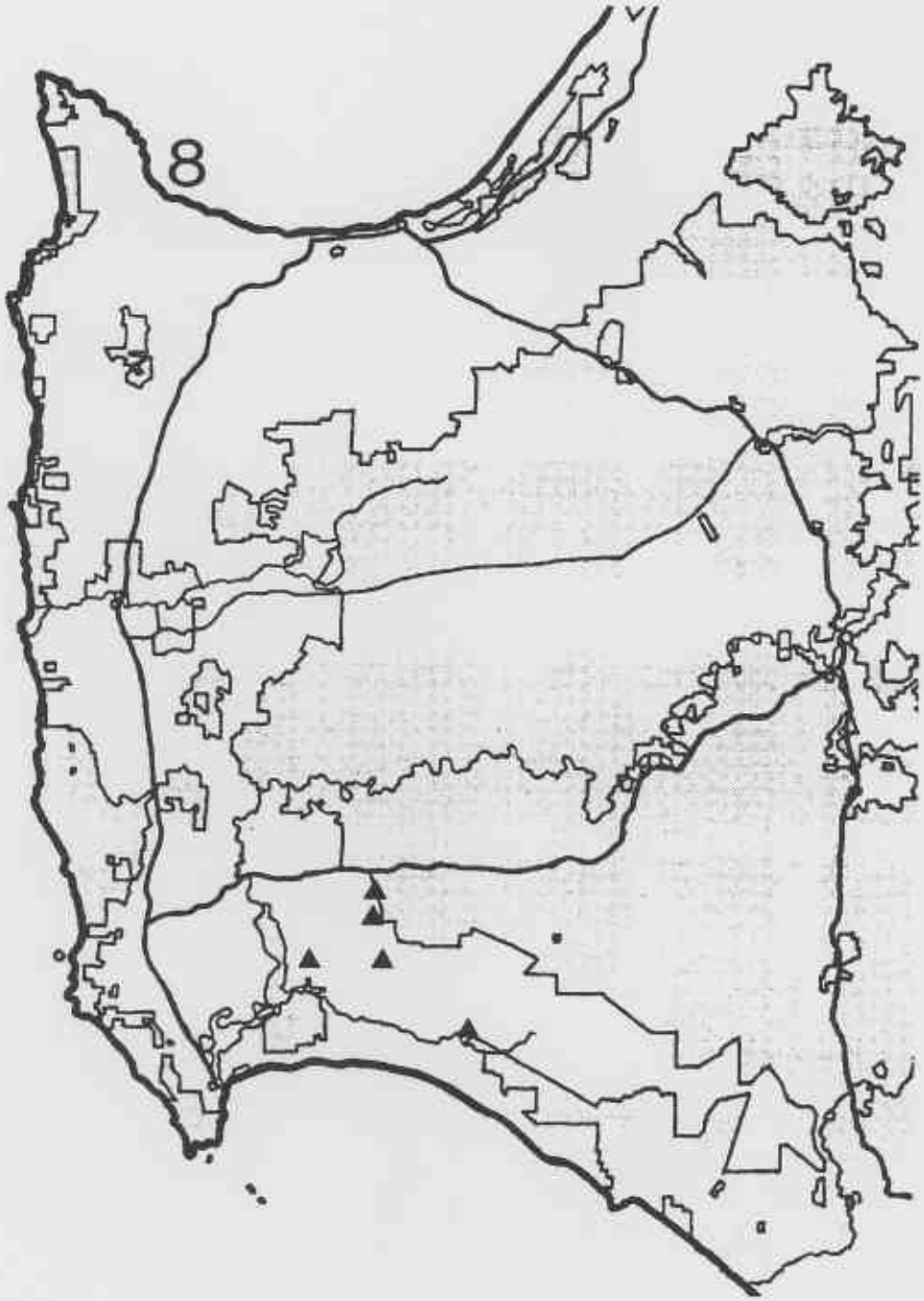
Since this hybrid is generated wherever the two species co-occur and disturbance happens, it is difficult to contemplate declaring this hybrid as rare.

The maintenance of road verge populations of the parental plants should maintain this hybrid.

REFERENCES

Keighery (1979). Two Native Hybrids. West. Aust. Gardener (10) 4 pages 26-29.

Nelson, E.C. (1986). *Adenanthos* x *pamela* (Proteaceae); a hybrid from south-western Australia. Glasra 9 : 1-6.



AMPERA PROTENSA Nees Euphorbiaceae

Ampera protensa is a multi-stemmed low sprawling shrub to 30 cm tall. Unlike *A. volubilis* it does not appear to twine around adjacent vegetation. Stems are rarely branched, green and glabrous, with linear-obovate leaves to 2 cm long. Flowers are inconspicuous, male or female, yellow-brown in colour. Flowering occurs from November to January.

DISTRIBUTION AND HABITAT

Ampera protensa has been recorded from the Scott Plains and near Walpole. Near Walpole the species has been recorded from sedgeland swampy flats. On the Scott Plain the species occurs under Melaleuca/Banksia low open woodland over shrubs along a creekline on black peaty sand.

CONSERVATION STATUS

Current Status: P1 Recommended: P3

KNOWN POPULATIONS (Map 9)

Pop No	Shire	District	Population	Land Status	No	Condition
1	A/MR	CF	Scott	?national park	27	partly distorted

RESPONSE TO DISTURBANCE

Soil Disturbance - a bulldozer scrape through this population killed several plants.

Weed Invasion - unknown.

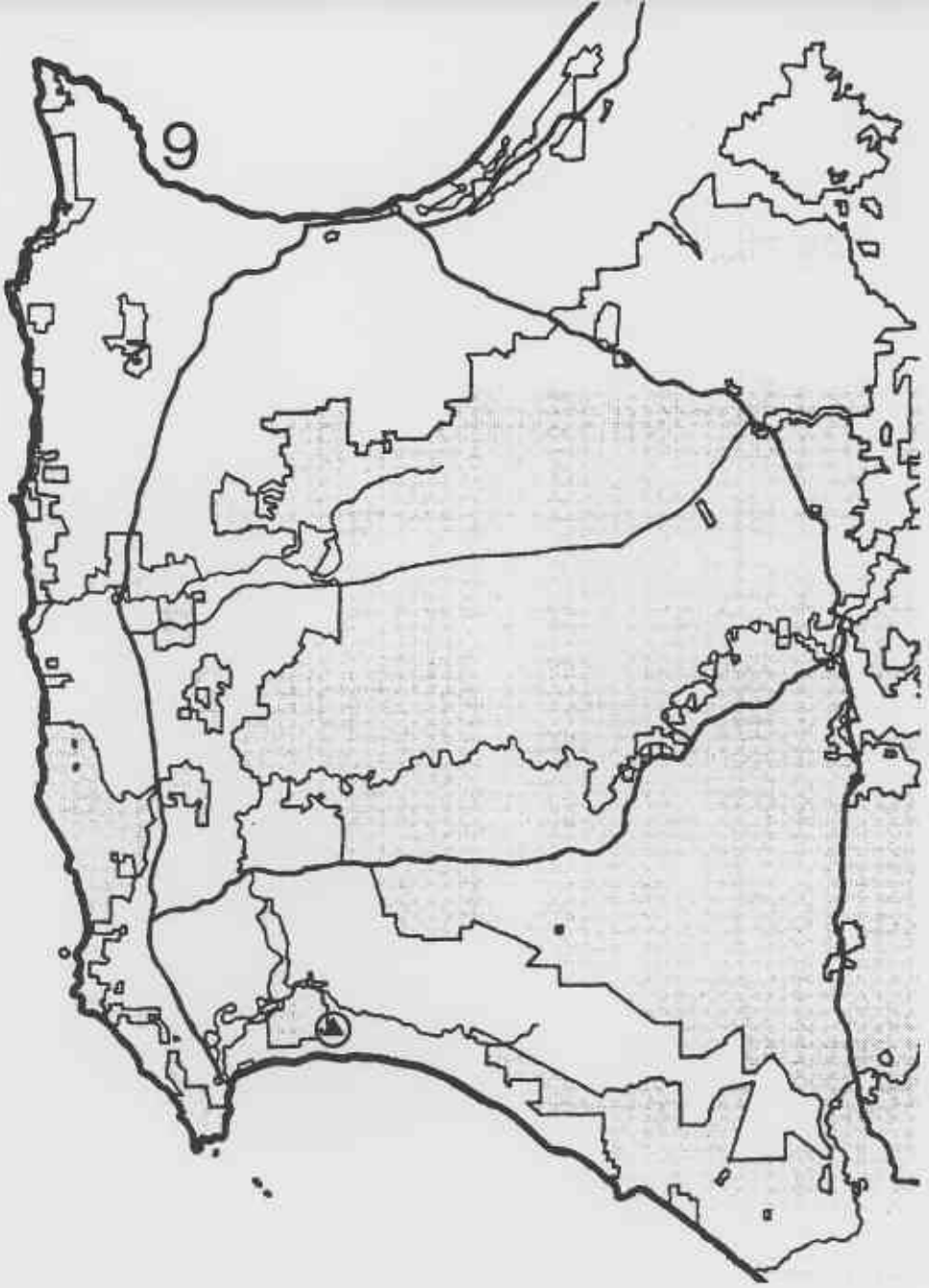
Fire - unknown.

Phytophthora - resistant

RECOMMENDATIONS

The area where this population is located has been added to Scott National Park after this species was recorded.

Further surveys of this poorly known species are desirable.


9

AMPERA VOLUBILIS R.Br. Euphorbiaceae

Ampera volubilis is a slender twining shrub to 70 cm tall, from a slowly spreading woody rootstock. Stems are rarely branched, green, glabrous, with small linear-obovate leaves. Flowers are inconspicuous, male or female, yellow or red-brown in colour. Flowering occurs from December to February.

DISTRIBUTION AND HABITAT

Ampera volubilis occurs between Albany and Augusta on the coastal plain between the inland forested plateau and the sea. Within this area the species occurs in heath, shrubland or sedgelands on winter-wet flats or creeklines. Soils are generally sand over clay.

CONSERVATION STATUS

Current Status: P2 Recommended: Delete

KNOWN POPULATIONS (Map 10)

Pop No	Shire	District	Population	Land Status	No	Condition
1	A/MR	CF	Chester	State Forest	273	good
2	Nannup	CF	Gingilup	nature reserve	>500	good
3	A/MR	CF	Scott	national park	>500	good
4	A/MR	CF	Alex Bridge	road verge	31	good
5	A/MR	CF	Molloy	private	12	good

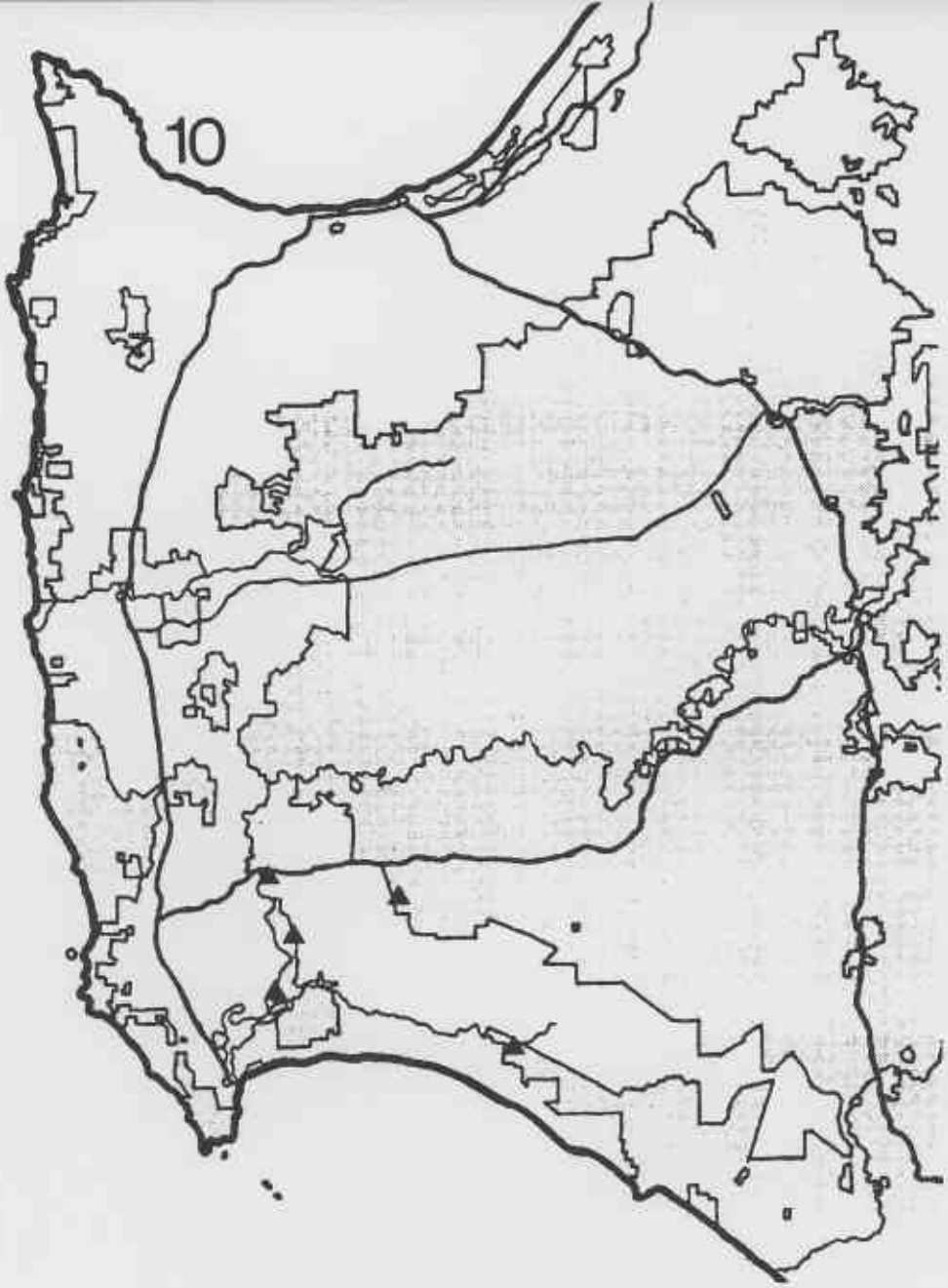
RESPONSE TO DISTURBANCE

Response to soil disturbance, weed invasion, *Phytophthora* is unknown.

The species regenerates from the rhizome after fire.

RECOMMENDATIONS

This survey increased the species' known range from Walpole to Augusta. It now has a range of over 300 km and has been recorded from 5 national parks, 2 nature reserves and two state forest blocks. The species appears secure and under no threat, it should be deleted from the Priority List.


10

ASTARTEA SP. (BACKSHALL 88233) Myrtaceae

Astartea sp. "Scott River" is a low spreading slender much branched shrub to 70 cm tall and 60 cm wide. Leaves are erect, rarely clustered, 4-10 mm long, 0.5 mm wide. Flowers along entire leafy portion of the stem, erect, solitary, axillary, pink. Calyx lobes produced with a thickened terete apical point. Petals orbicular 1-1.7 mm diameter. Ovary 3 locular. Flowering from December to January.

Distinguished by the slender stems, fine short leaves and long terete calyx lobes.

DISTRIBUTION AND HABITAT

Astartea sp. "Scott River" occurs between Black Point and the Blackwood River, largely on the Scott Plains. The species occurs on winter-wet flats, normally under shrubland or heath rarely with emergent Paperbark (*Melaleuca*) species, on sandy soils over clay.

CONSERVATION STATUS

Current Status: P2 Recommended: P3

KNOWN POPULATIONS (Map 11)

Pop No	Shire	District	Population	Land Status	No	Condition
1	N	CF	Gingilup	nature reserve	>200	good
2	A/MR	CF	Chester	State Forest	>200	good
3	A/MR	CF	McGregor	road reserve	30	good
4	N	CF	Scott 1	water reserve	>100	good
5	A/MR	CF	Scott 2	national park	>200	good
6	A/MR	CF	Scott 3	national park	>100	good
7	A/MR	CF	Scott 4	national park	>100	good
8	A/MR	CF	Scott 5	shire reserve	50	good

RESPONSE TO DISTURBANCE

Soil Disturbance - unknown.

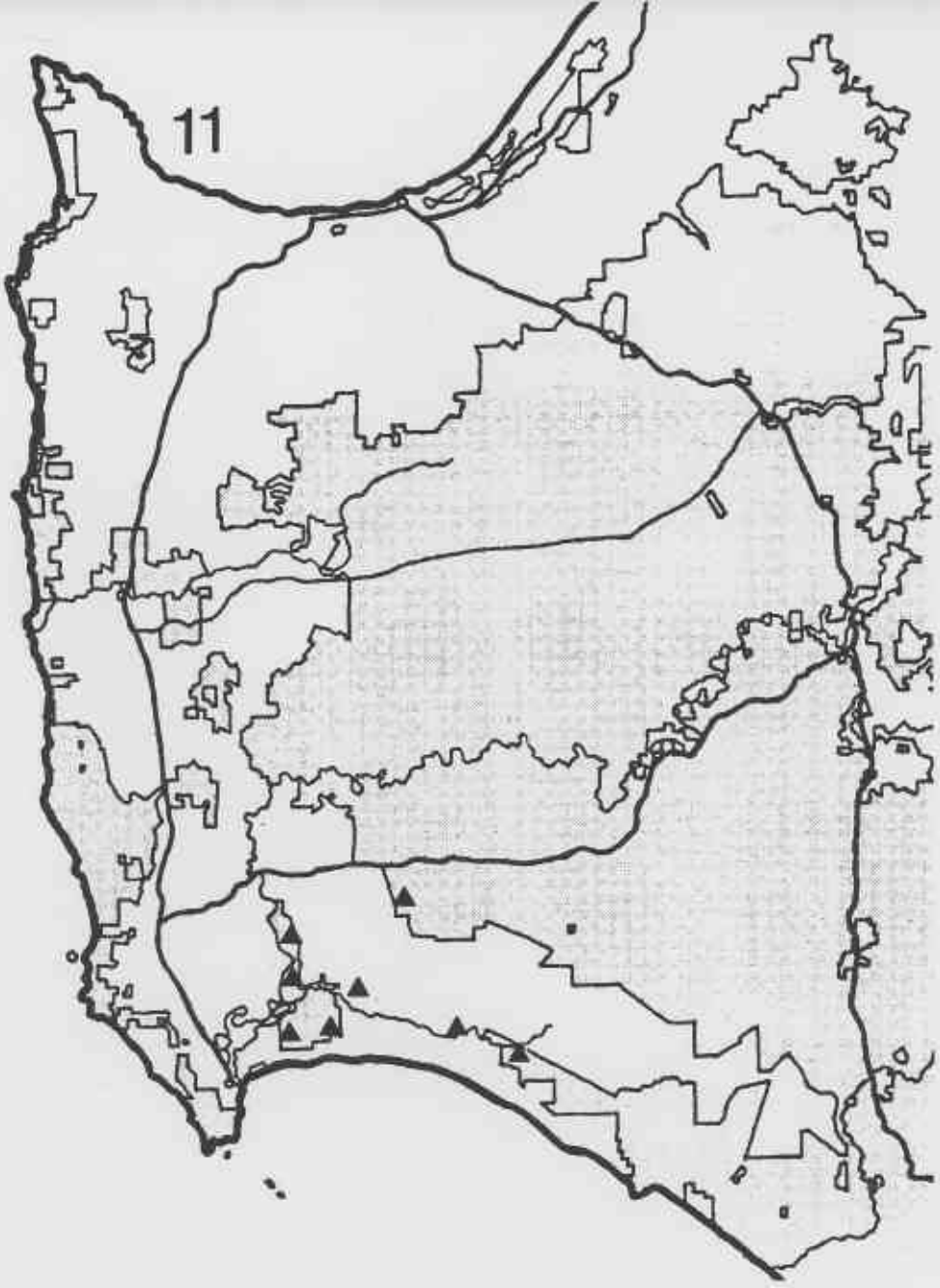
Weed Invasion - unknown.

Fire - killed by fire.

Phytophthora - unknown.

RECOMMENDATIONS

This taxon although restricted in range has now been recorded from 2 State Forest Blocks (Keighery, pers. comm.), 1 proposed nature reserve, 1 nature reserve and 1 national park. It is probably adequately reserved and can now be given a priority level 3 rating.


11

AOTUS CARINATA Meisn. Fabaceae

Related to *A. passerinoides*, which lacks the folded, keeled leaves. The species is a slender erect shrub to 1.5 m tall. The young stems are densely curved in erect/spreading keeled grey tomentose leaves. The leaves are arranged in whorls of three, forming 6 longitudinal lines along the stem. Flowers are bright, yellow and red, borne in small groups of 2-3 in the upper axils. Flowering occurs between September and December, with occasional flowers present in January.

DISTRIBUTION AND HABITAT

Aotus carinata is confined to the Scott Plain from Black Point to the Blackwood River. Within this area the species occurs in low to tall heath over sedges in or around winter-wet flats. Soils are generally peaty sandy clay over clay.

CONSERVATION STATUS

Current Status: P3 Recommended: P3

KNOWN POPULATIONS (Map 12)

Pop No	Shire	District	Population	Land Status	No	Condition
1	N	CF	*Storry	State Forest	>500	good
2	N	CF	*Gingilup	nature reserve	>500	good
3	A/MR	CF	*Chester	State Forest	>1000	good
4	N	CF	Milyeannup	road reserve	>100	good
5	A/MR	CF	Scott Rd	road verge	5	good
6	A/MR	CF	Dennis Rd	road verge	35	good
7	A/MR	CF	Gov. Broome	road verge	78	good
8	A/MR	CF	McGregor	private	many	good
9	A/MR	CF	Scott R	private	50	good
10	A/MR	CF	Milyeannup Rd	road verge	>100	good
11	A/MR	CF		private	>100	good
12	A/MR	CF	*Scott NP	national park	>2000	good

*Numerous populations in this area.

RESPONSE TO DISTURBANCE

Soil Disturbance - unknown.

Weed Invasion - unknown.

Fire - killed by fire.

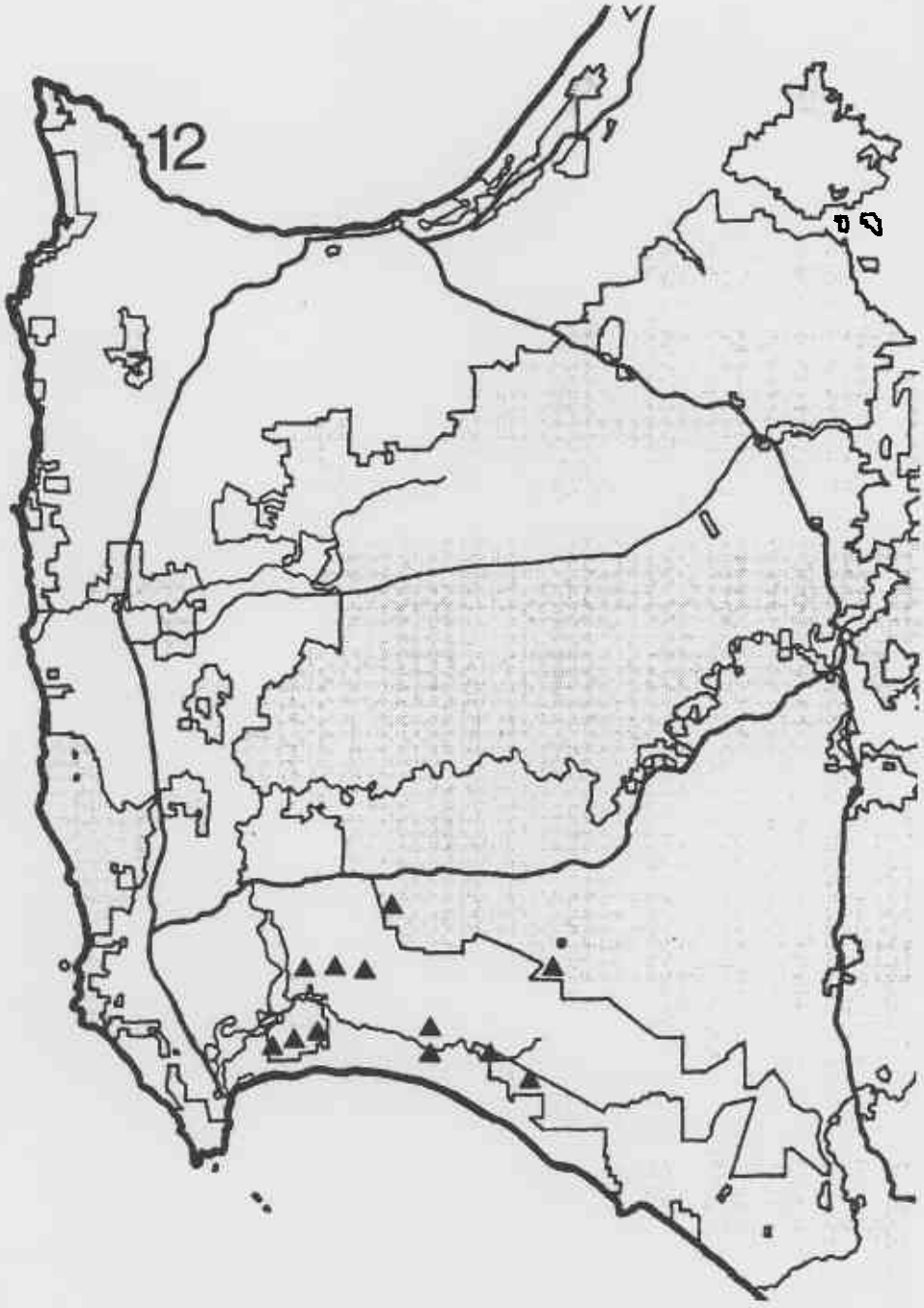
Phytophthora - unknown.

RECOMMENDATIONS

This species appears well conserved with numerous populations recorded from Scott National Park and Gingilup Nature Reserve.

Another large series of populations are located on Chester and Storry forest blocks.

Further surveys are needed between the Scott Plains and Black Point.



ANTHOTIUM ?JUNCIFORME (Robinson 494) Goodeniaceae

"Southern Form"

Tufted herb, not clonal but from a single rootstock, to 40 cm tall and 20 cm diameter, often prostrate. Leaves fleshy, linear, terete, 9-15? cm long. Flowering stalks 10-50 cm long, bearing loose heads of flowers. Flowers are purple.

Flowering occurs from December to March.

COMMENTS:

Morrison (1989) restricts this species to those populations found on the Swan Coastal Plain and south to Yallingup. However, the plants found from the Scott River to Albany are not rhizomatous, they have linear almost terete leaves and purple flowers. Populations of *A. lineare* from the wheatbelt are rhizomatous, with flat linear-lanceolate leaves and white flowers. The populations from the Scott Plain are generally smaller in all dimensions with a more compact inflorescence. We consider the northern and southern populations are forms of the same species, although they may be separable as subspecies.

DISTRIBUTION AND HABITAT

Anthotium junciforme is distributed from Perth to Albany, with a distinct gap on the Blackwood Plateau. The southern form is found between the Scott River and Albany in heath or low woodland usually on winter-wet sites with red clay over ironstone or sand over clay.

CONSERVATION STATUS

Current Status: P3 Recommended: *Delete

*If the southern populations are the same species.

KNOWN POPULATIONS (Map 13)

Pop No	Shire	District	Population	Land Status	No	Condition
1	Capel	CF	Wonnerup	rail verge	35	good
2	Buss	CF	Williamson	State Forest	59	good
3	Buss	CF	Fish Rd	nature reserve	31	good
4	A/MR	CF	Scott	shire reserve	27	good
5	A/MR	CF	Gov. Broome	road reserve	31	good

RESPONSE TO DISTURBANCE

Soil Disturbance - unknown.

Weed Invasion - unknown.

Fire - killed by fire.

Phytophthora - unknown.

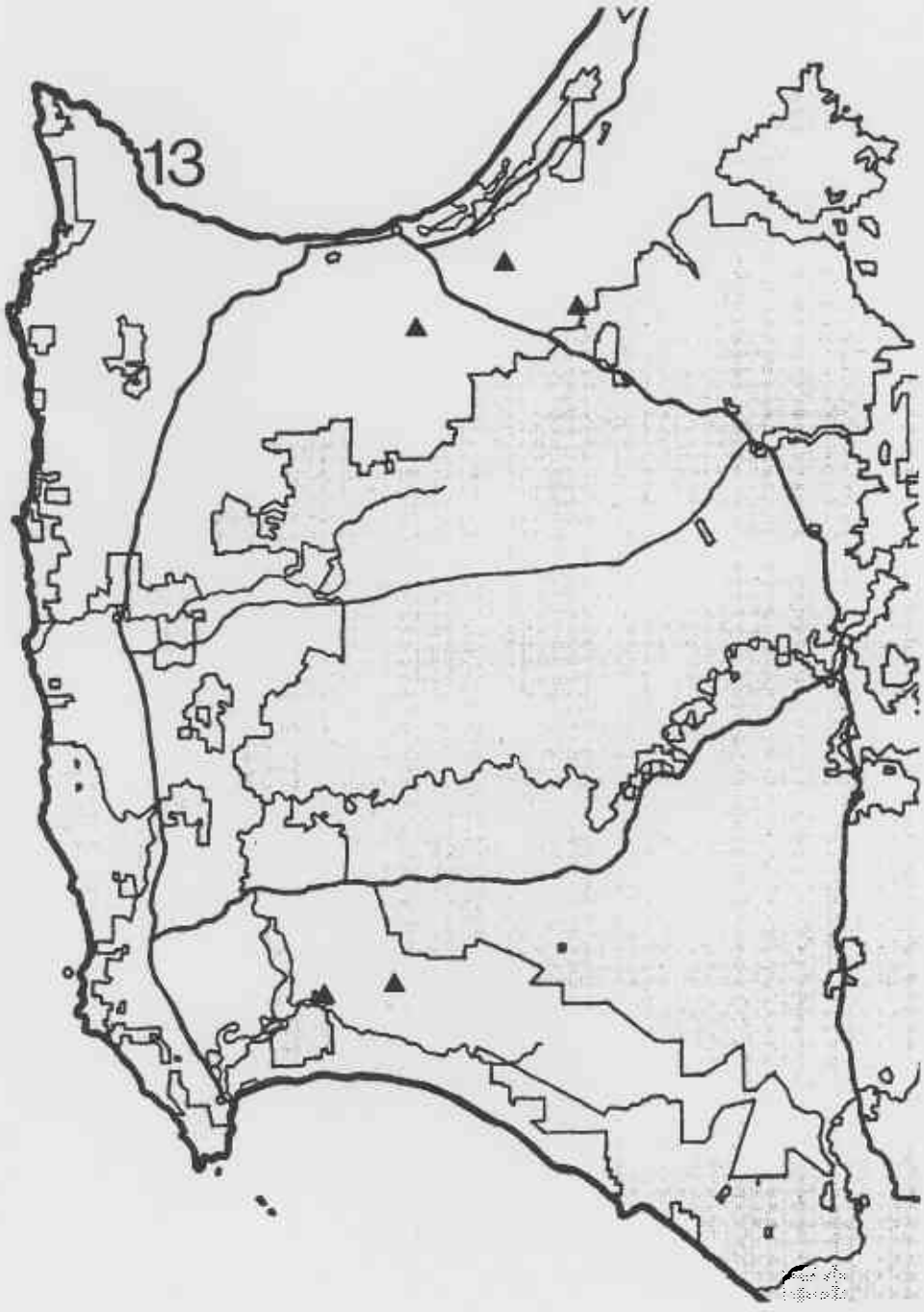
RECOMMENDATIONS

The taxonomy of *Anthotium junciforme* and *A. humile* requires clarification.

Surveys for *Anthotium junciforme* need to be undertaken on the Blackwood Plateau.

REFERENCES

Morrison, D.A. (1989). The genus *Anthotium* (Goodeniaceae). Nuytsia 7 : 49-58.



BANKSIA MEISNERI VAR. ASCENDENS A.S. George Proteaceae

Scott River Banksia

Banksia meisneri var. *ascendens* is a low densely branched spreading shrub to 1.5 m tall x 1.0 m wide. Leaves are linear with inrolled margins, erect or rarely spreading, 8-15 mm long. Inflorescences are small, squat, less than 4 cm in diameter. Flowers are yellow with long hooked styles. Flowering occurs from March to August.

DISTRIBUTION AND HABITAT

The variety occurs between Ruabon and north west of Black Point, a range of 90 kilometres. Within this area it occurs largely in *Banksia ilicifolia* low woodland, but also in Jarrah (*Eucalyptus marginata*) low woodland, heath, sedgeland and heath over sedges. Soils are normally grey or white sands often over clay.

CONSERVATION STATUS

Current Status: P5 Recommended: P5

KNOWN POPULATIONS (Map 14)

Pop No	Shire	District	Population	Land Status	No	Condition
1	N	CF	Gingilup	nature reserve	17	poor
2	A/MR	CF	Gov. Broome 1	road reserve	10	good
3	A/MR	CF	Gov. Broome 2	road reserve	5	poor
4	A/MR	CF	Scott 1	road reserve	11	poor
5	A/MR	CF	Scott 2	private	30	?
6	A/MR	CF	Scott 3	townsite	>3000	good
7	A/MR	CF	Scott 4	townsite	30	good
8	A/MR	CF	*Scott 5	national park	>2000	variable

*At least 15 separate populations recorded in Scott National Park.

RESPONSE TO DISTURBANCE

Soil Disturbance - killed.

Weed Invasion - unknown.

Fire - killed by fire.

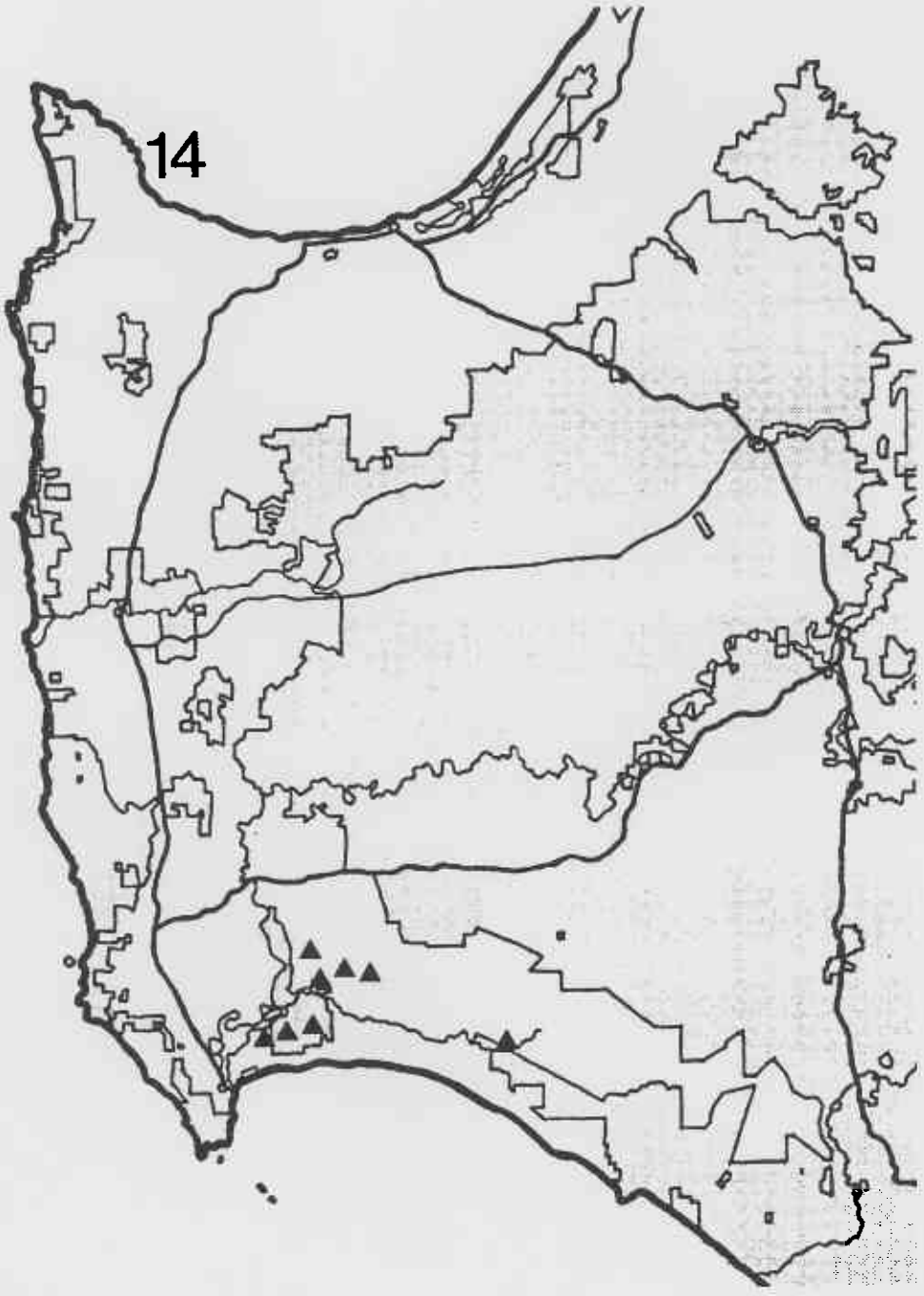
Phytophthora - highly susceptible.

RECOMMENDATIONS

This taxon has previously been gazetted as declared rare flora, until 1989 when it was downgraded to Priority 5. In 1989 at least 1200 plants were recorded from national parks,

nature reserves and State Forest, in 20 populations (18 in national parks, 2 in nature reserves). A further 4000 plants were recorded from State Forest (5 populations) and vacant Crown land (8 populations). Another 3000 plants were recorded from townsite reserves (1), private property (5) and road reserves (3). Some of the above areas were being processed into conservation reserves.

The major threat facing this geographically restricted species is dieback disease, which is present in many populations and causing numerous deaths. The extent and nature of this threat should be ascertained for the long-term survival of this taxon.



BORONIA SP. NOV. (Keighery 12087 Mattisk 370) Rutaceae

Scott Plains Boronia

First collected by Mattiske *et al.* (1990). This species is part of the *Boronia juncea* complex, but is a much taller more slender plant, with pale pink almost white flowers (P.G. Wilson, pers. comm.).

DISTRIBUTION AND HABITAT

Apparently confined to the Scott Plain, where it occurs in heath or sedgelands on sands over ironstone.

CONSERVATION STATUS

Current Status: not listed Recommended: P1

KNOWN POPULATIONS (Map 15)

Pop No	Shire	District	Population	Land Status	No	Condition
1	CF	A/MR	Chester	State Forest	20	good
2	CF	A/MR	BHP	private	>500	good
3	CF	A/MR	Scott	shire reserve	>100	good
4	CF	A/MR	McGregor	private	100	good
5	CF	A/MR	Gov. Broome	road reserve	10	poor

RESPONSE TO DISTURBANCE

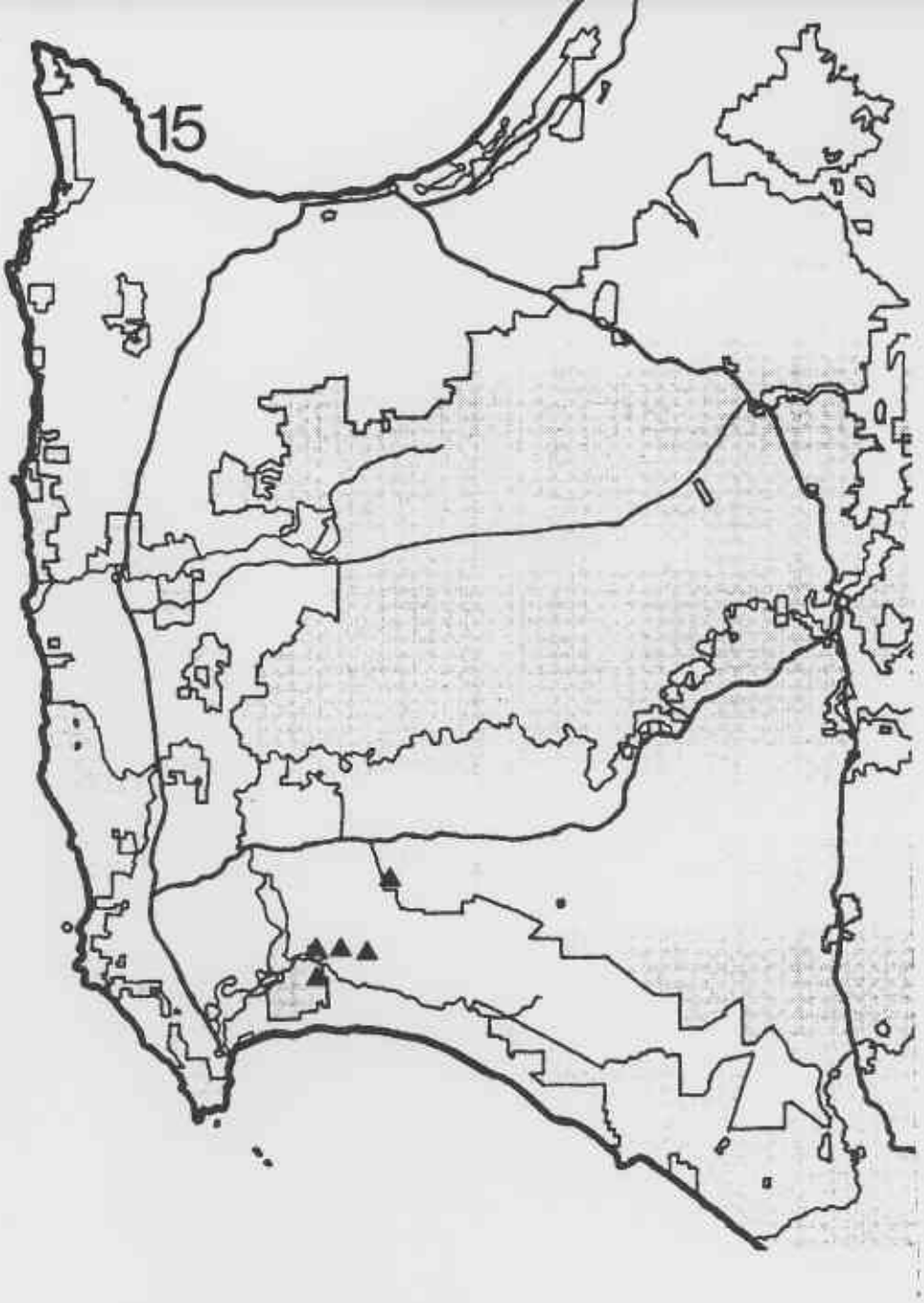
Response to soil disturbance, weed invasion, fire and *Phytophthora* is unknown.

RECOMMENDATIONS

Apparently confined to the Scott Plains, this taxon appears to be an undescribed species. This is a poorly known species that requires further survey between the Scott Plain and Black Point. Currently the species occurs in a shire recreation reserve and one State Forest Block. A priority status (P1) should be allocated.

REFERENCES

Mattiske E.M. and Associates (1990). Flora and Vegetation. Appendix VII. Beenup Heavy Minerals Mine. E.R.M.P.


15

CALOTHAMNUS AFF. CRASSUS (Royce 84) Myrtaceae

DESCRIPTION

Calothamnus aff. *crassus* is an erect densely branched, compact shrub to 1.5 m, usually with thick corky branches, with prominent leaf scars on old branches. Leaves are crowded on the ends of the branches, sessile, terete, rigid and erect, 5-15 cm long. Flowers are borne in dense clusters on areas of the stem where the leaves have fallen. They are dark crimson-red. The calyx tube and then the fruit is embedded in a swollen corky stem.

Comments - This taxon along with *Calothamnus lateralis* and *C. crassus* form a poorly defined species complex. *Calothamnus crassus* is a compact, thick stemmed, short leaved form found only in the Stirling Range. *Calothamnus lateralis* found from Perth to Albany is a slender open shrub, with long slender relatively soft leaves and flowers in open unilateral spikes. *Calothamnus ?crassus* is a compact, thick stemmed, densely flowered shrub, with the longer leaves of *C. lateralis* confined to the ironstones of the Scott Plain.

Previous publications on this species have referred populations to *C. crassus* (Hawkeswood, 1987, Mattiske *et al.* 1990).

DISTRIBUTION AND HABITAT

Calothamnus ?crassus (Royce 84) has only been recorded from the Scott Plain area. Here the species occurs in dense heath on red clay over ironstone.

CONSERVATION STATUS

Current Status: not listed Recommended: P1

KNOWN POPULATIONS (Map 16)

Pop No	Shire	District	Population	Land Status	No	Condition
1	A/MR	CF	Chester	State Forest	56	all dead
2	A/MR	CF	Gov. Broome	road reserve	>500	good
3	A/MR	CF	Dennis	road reserve	>50	good
4	A/MR	CF	McGregor	private	>100	good
5	A/MR	CF	Poole	private	>100	good
6	A/MR	CF	Scott	shire reserve	>500	good

RESPONSE TO DISTURBANCE

Soil Disturbance - killed by grading of road verge.

Weed Invasion - unknown.

Fire - killed, has failed to regenerate after an early summer fire on Chester Block.

Phytophthora - resistant.

RECOMMENDATIONS

This taxon should be listed as Priority One.

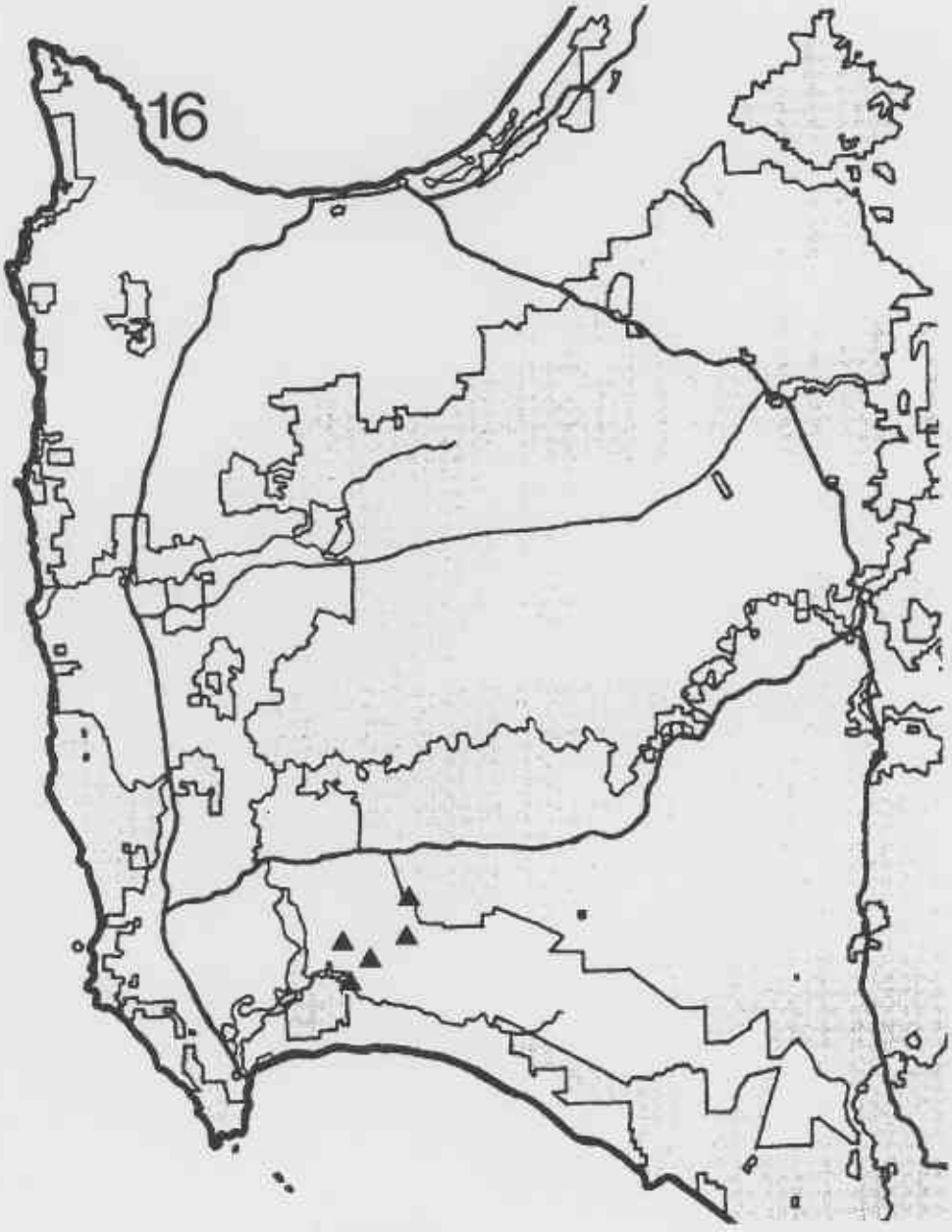
The acquisition of the camping reserve adjacent to Scott National Park as a Flora and Fauna Reserve would place the largest known population in a protected area and should be actively pursued.

Clarification of the taxonomic status of these species should be undertaken.

REFERENCES

Hawkeswood, T.J. (1987). "A Revision of the genus *Calothamnus* part one - the four merous species". Nuytsia.

Mattiske, E.M. and Associates (1990. Flora and Vegetation. Appendix VII. Beenup Heavy Minerals Mine. E.R.M.P.



CASSYTHA MICRANTHA Meisn. Lauraceae

DESCRIPTION

Twining slender greenish parasitic vine, stems 0.4 mm thick, glabrous, to 2 m long. Inflorescence a single erect loose spike, 10-20 flowered. Flowers globular, sessile, petals white, 0.6 mm long and wide. Flowering period is from December to April.

DISTRIBUTION AND HABITAT

The species occurs between Thistle Cove (east of Esperance) and Augusta, either in heath on winter-wet flats or granitic slopes.

CONSERVATION STATUS

Current Status: P3 Recommended: P4

KNOWN POPULATIONS (Map 17)

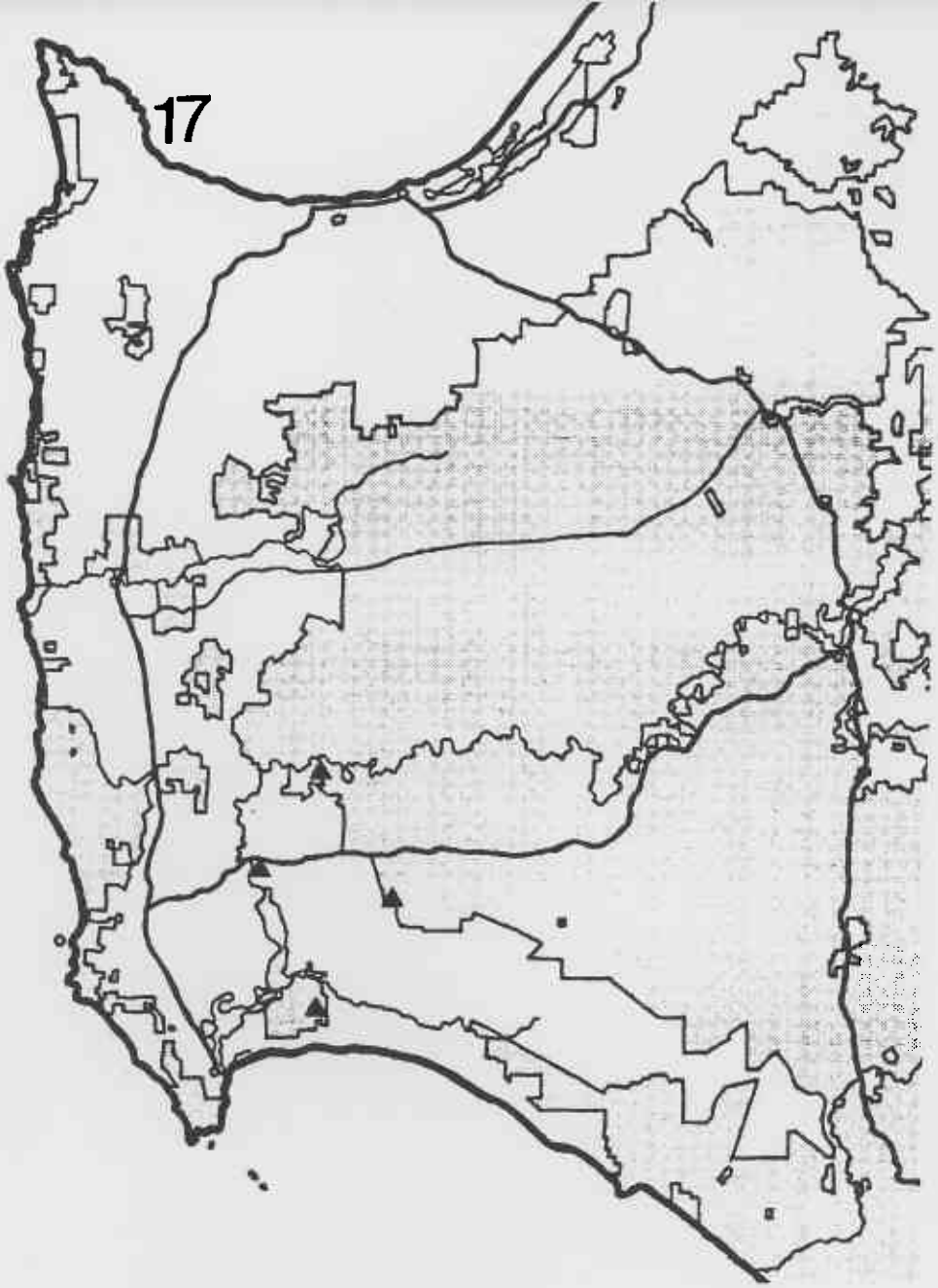
Pop No	Shire	District	Population	Land Status	No	Condition
1	A/MR	CF	Chester	State Forest	many	good
2	A/MR	CF	Spearwood	State Forest	many	good
3	A/MR	CF	Alex Bridge	road verge	many	good
4	A/MR	CF	Scott	national park	many	good

RESPONSE TO DISTURBANCE

Response to soil disturbance, weed invasion, fire and *Phytophthora* is unknown.

RECOMMENDATIONS

The species is an inconspicuous summer flowering member of the genus and hence has been poorly collected. The very large range that we have now recorded for this species (previous records were from Esperance to Albany) suggests it should be removed from the priority list. Currently the species is known from 3 national parks, 1 nature reserve and 2 State Forest blocks and can be expected to be recorded from many more. The species should perhaps be deleted from the priority list as it is widespread and well protected, but it has only been rarely recorded in an intensive survey of the D'Entrecasteaux National Park so a priority level of P4 is recommended.


17

CONOSPERMUM SP (Wittwer 1242) Proteaceae

Scott River Conospermum

Multi-stemmed, from a single rootstock, open spreading shrub to 1 m x 60 cm wide. Leaves ± terete, erect, 10-35 cm long, longest at base of plant. Flowers in open terminal branched clusters of 4-10 umbels of flowers. Each umbel partially enclosed by several ovate bracts, consisting of 6-11 flowers. Flowers are small, pale blue or white, with 4 regular lobes to 2 mm long. Flowering occurs in summer.

A poorly known species allied to another undescribed *Conospermum* in the *C. flexuosum* group. It differs in having ± terete leaves and very small flowers (Bennett, pers. comm.).

DISTRIBUTION AND HABITAT

Conospermum sp. is only known from the western side of the Scott Plain, around the floodplain of the Blackwood River. Here it occurs under Marri (*E. calophylla*) woodland on clay flats or edging ephemeral creeklines.

CONSERVATION STATUS

Current Status: not listed Recommended: P1

KNOWN POPULATIONS (Map 18)

Pop No	Shire	District	Population	Land Status	No	Condition
1	A/MR	CF	Scott 1	road verge/ private	5	good
2	A/MR	CF	Scott 2	national park	5	good

RESPONSE TO DISTURBANCE

Soil Disturbance - killed.

Weed Invasion - unknown.

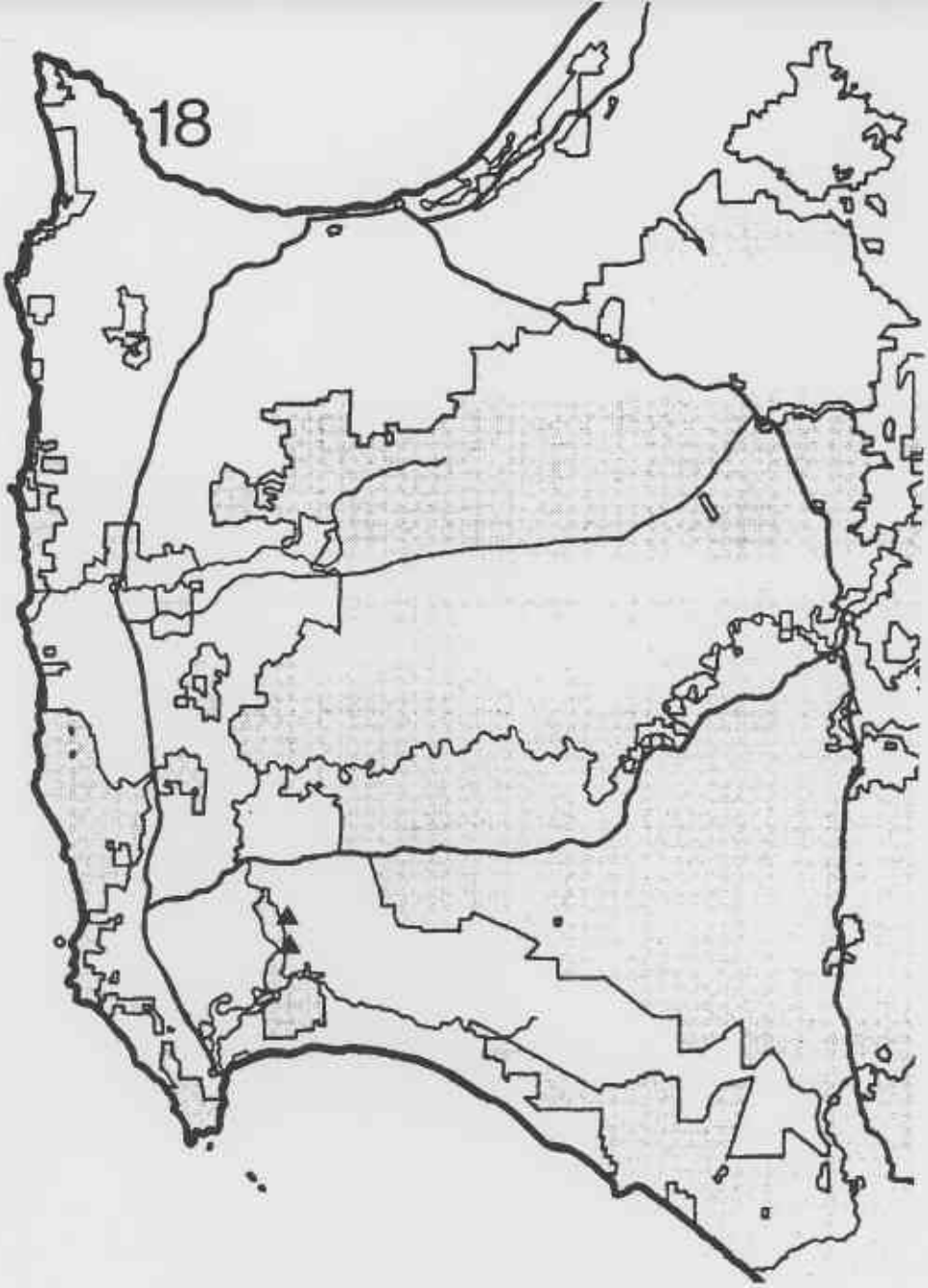
Fire - killed by fire.

Phytophthora - unknown.

RECOMMENDATIONS

This species apparently has a very restricted distribution on the Scott River Plain. It is only known from 2 small populations at present. However, the species is very difficult to locate especially since two superficially similar species co-occur on the plain.

Further intensive surveys of this species are required.


18

DROSERA OMISSA Diels Droseraceae

DESCRIPTION

Compact fibrous rooted herb to 2-5 cm diameter and 5 mm tall. Flowers borne on an inflorescence to 5 cm tall, 1-4 per plant, white. Stigmas large, reniform, dark red. Flowering from December to February.

Comments - Lowrie (1989) foreshadows this species being reduced to subspecific rank under *Drosera nitidula*. This complex contains 4 subspecies and 3 interspecific hybrids. According to Lowrie only *Drosera nitidula* ssp. *nitidula* has been recorded from the Scott River area. However, Mattiske *et al.* (1990) record *D. omissa* as common in the Beenup Mine study area. We also recorded plants that appeared to be this taxon in Scott National Park. Lowrie (1989, page 16) states that most previous records of *D. omissa* from this region are in fact populations of an undescribed species to be named *D. "enodes"*, which extends from Busselton to Windy Harbour.
The *Drosera* populations from the Scott Plain Ironstone areas are very similar to *D. omissa*, and require further taxonomic study before they can be assigned correctly under the *D. nitidula* complex (Lowrie; pers. comm.)

DISTRIBUTION AND HABITAT

True *Drosera omissa* is apparently confined to the Swan Coastal Plain from Busselton to Perth. Here it grows under heath on winter-wet flats of sand over clay. The Scott River plants occur in heath over sedgeland on sand over clay and ironstone.

CONSERVATION STATUS

Current Status: P3 Recommended: P3

KNOWN POPULATIONS (Map 19)

Pop No	Shire	District	Population	Land Status	No	Condition
1	CF	A/MR	Beenup	private	>500	good
2	CF	A/MR	Scott	national park	1500	good

RESPONSE TO DISTURBANCE

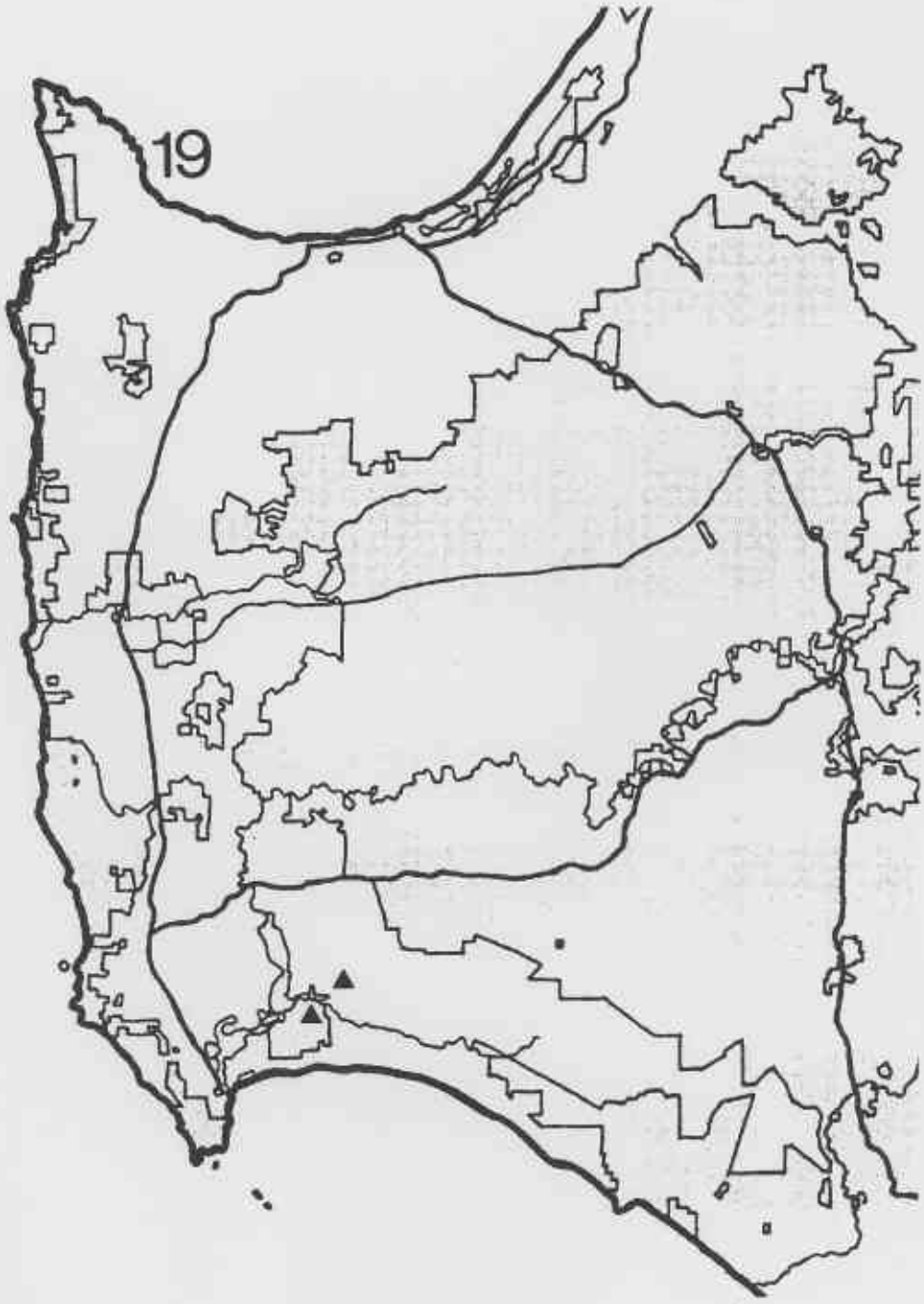
Response to soil disturbance, weed invasion, fire and *Phytophthora* is unknown.

RECOMMENDATIONS

Unable to make recommendations about the status of this taxon until the taxonomy has been clarified.

REFERENCES

Lowrie, A. (1989). Carnivorous Plants of Australia. Vol. 2. Uni. W.A. Press, Nedlands.



GREVILLEA BRACHYSTYLIS MEISN. SSP. AUSTRALIS Keighery
Proteaceae

TAXONOMY

Closely related to *G. brachystylis*, a species confined to the Swan Coastal Plain (Keighery, 1990).

DESCRIPTION

G. brachystylis ssp. *australis* has prostrate vegetative branches and erect flowering branches to 1.5 m tall and 1 m wide. The flowers are borne in small axillary inflorescences of 2-7 flowers. The flowers are red with a purple pollen presenter. Leaves are long, linear to 20 cm. Flowering period is sporadic throughout the year, but with a late spring-summer peak.

DISTRIBUTION AND HABITAT

This species occurs only along the floodplain of the Blackwood River on the Scott Plain, where it occurs under *Eucalyptus calophylla* along ephemeral creeklines on clay soils.

CONSERVATION STATUS

Current Status: P1 Recommended: P1

KNOWN POPULATIONS (Map 20)

Pop No	Shire	District	Population	Land Status	No	Condition
1	CF	A/MR	Scott 1	road verge private	15	disturbed
2	CF	A/MR	Scott 2	national park	>100	good
3	CF	A/MR	Scott 3	national park	70	good

RESPONSE TO DISTURBANCE

Soil Disturbance - unknown.

Weed Invasion - unknown.

Fire - killed by fire.

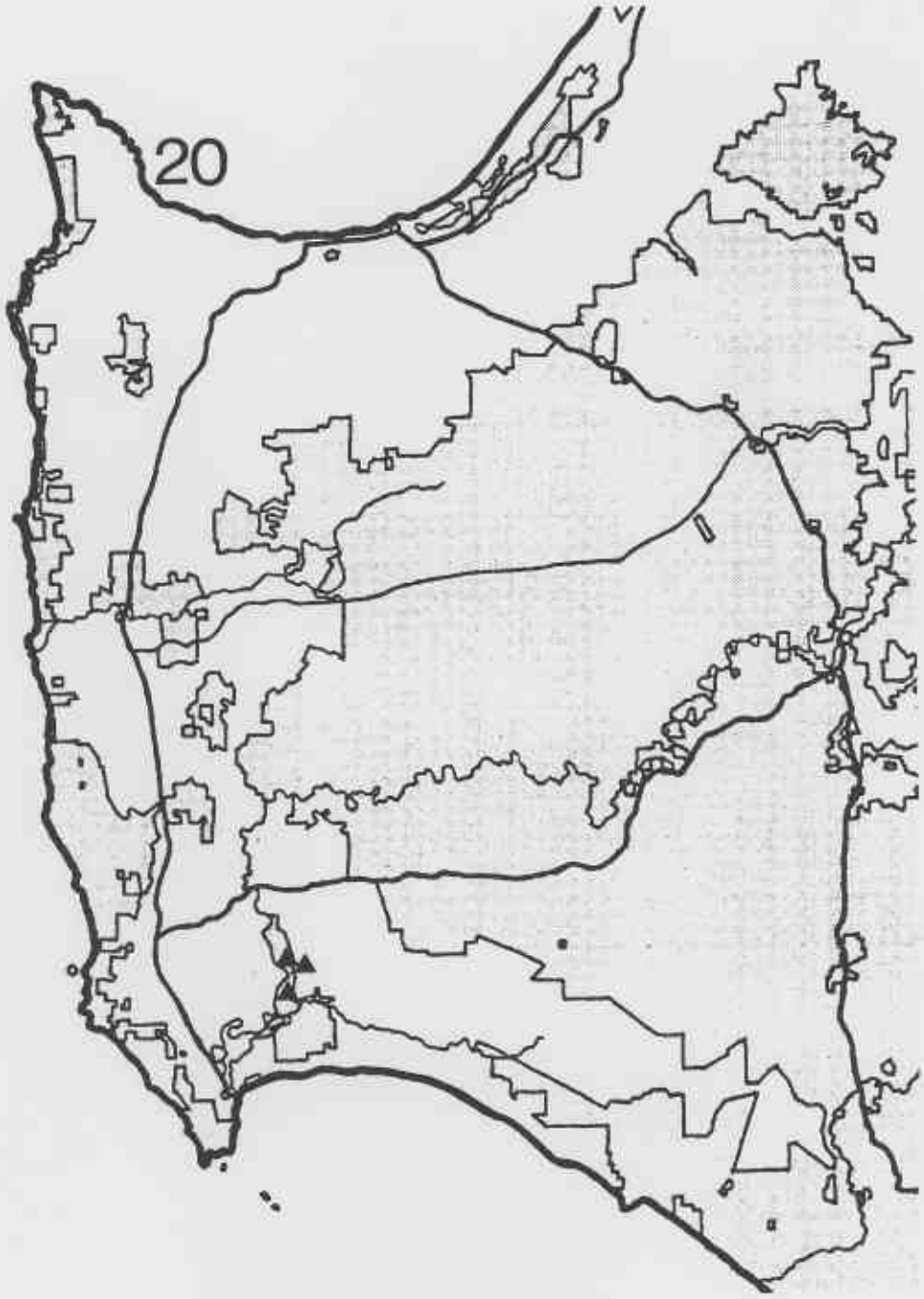
Phytophthora - unknown.

RECOMMENDATIONS

This subspecies has a very restricted distribution around the floodplain of the Blackwood and Scott Rivers. It has several populations in Scott National Park, but requires urgent further survey on adjacent uncleared bushland to determine if this taxon should be declared as rare.

REFERENCES

Keighery, G.J. (1990). Taxonomy of the *Grevillea brachystylis* species complex (Proteaceae). Nuytsia 7 : 125-132.



GREVILLEA MANGLESIOIDES MEISN. SSP. PAPILLOSA McGILLIVRAY Proteaceae

DESCRIPTION

Erect slender shrub to 3 m, glabrous except for the undersurface of the leaves. Leaves simple, to 6 cm long, narrowly elliptic with 2-3 short lobes at apex, green-grey, glabrous above, silky hairy below, pungent tipped. Flowers cream in terminal, axillary short racemes (superficially like an umbel). Perianth hairy on the outside and glabrous inside. Flowering occurs from July to December.

DISTRIBUTION AND HABITAT

Grevillea manglesioides ssp. *papillosa* occurs between Black Point and the Blackwood River. Within this area it occurs under or in tall shrubland or heath on sandy soils over ironstone.

CONSERVATION STATUS

Current Status: P2 Recommended: P2

KNOWN POPULATIONS (Map 21)

Pop No	Shire	District	Population	Land Status	No	Condition
1	N	CF	Gingilup	nature reserve	50	good
2	A/MR	CF	Scott River	?water reserve	20	good
3	A/MR	CF	McGregor	private	>100	good
4	A/MR	CF	Scott 1	shire reserve	>50	good
5	A/MR	CF	Scott 2	national park	>50	good

RESPONSE TO DISTURBANCE

Soil Disturbance - unknown.

Weed Invasion - unknown.

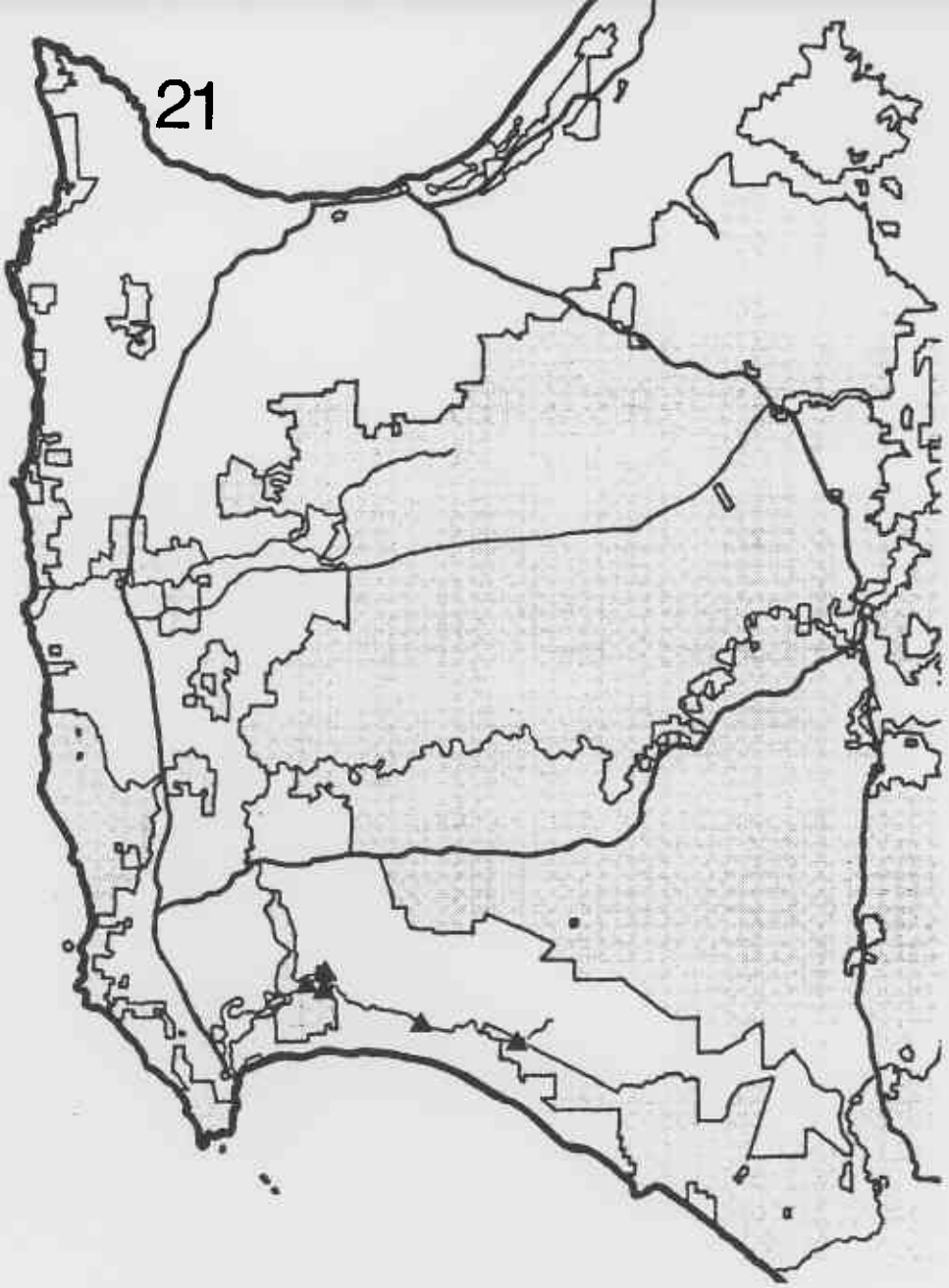
Fire - killed by fire.

Phytophthora - unknown.

RECOMMENDATIONS

Further surveys of this taxon are required to the east of the Scott Plains.

Previously confused with *G. diversifolia* at PERTH and during the early part of this survey. The *Grevillea diversifolia/manglesioides* species complex is being reviewed by one (GJK) of the authors.


21

GREVILLEA AFF. MANGLESIOIDES (GK4070) Proteaceae

DESCRIPTION

Erect open spreading shrub to 1.5 m x 1.5 m, branchlets densely hairy. Leaves to 6 cm x 5 cm, wedge-shaped, green, apex with 5-12 pungent points, upper surface becoming glabrous with age, under densely hairy. Inflorescence a toothbrush like raceme to 4 cm long. Flowers green-red, bearded inside. Flowering occurs from July to December.

Differs from *G. manglesioides* in the wedge-shaped leaves, toothbrush shaped inflorescence, flowers green-red and bearded inside.

DISTRIBUTION AND HABITAT

Apparently confined to the Scott Plain, where it occurs in dense heath on clay over ironstone.

CONSERVATION STATUS

Current Status: not listed Recommended: P1

KNOWN POPULATIONS (Map 22)

Pop No	Shire	District	Population	Land Status	No	Condition
1	A/MR	CF	Scott 1	shire reserve	>100	good
2	A/MR	CF	Beenup	private	>100	good
3	A/MR	CF	Gov. Broome	road reserve	>50	good
4	A/MR	CF	Dennis	road reserve	27	good

RESPONSE TO DISTURBANCE

Soil Disturbance - unknown.

Weed Invasion - unknown.

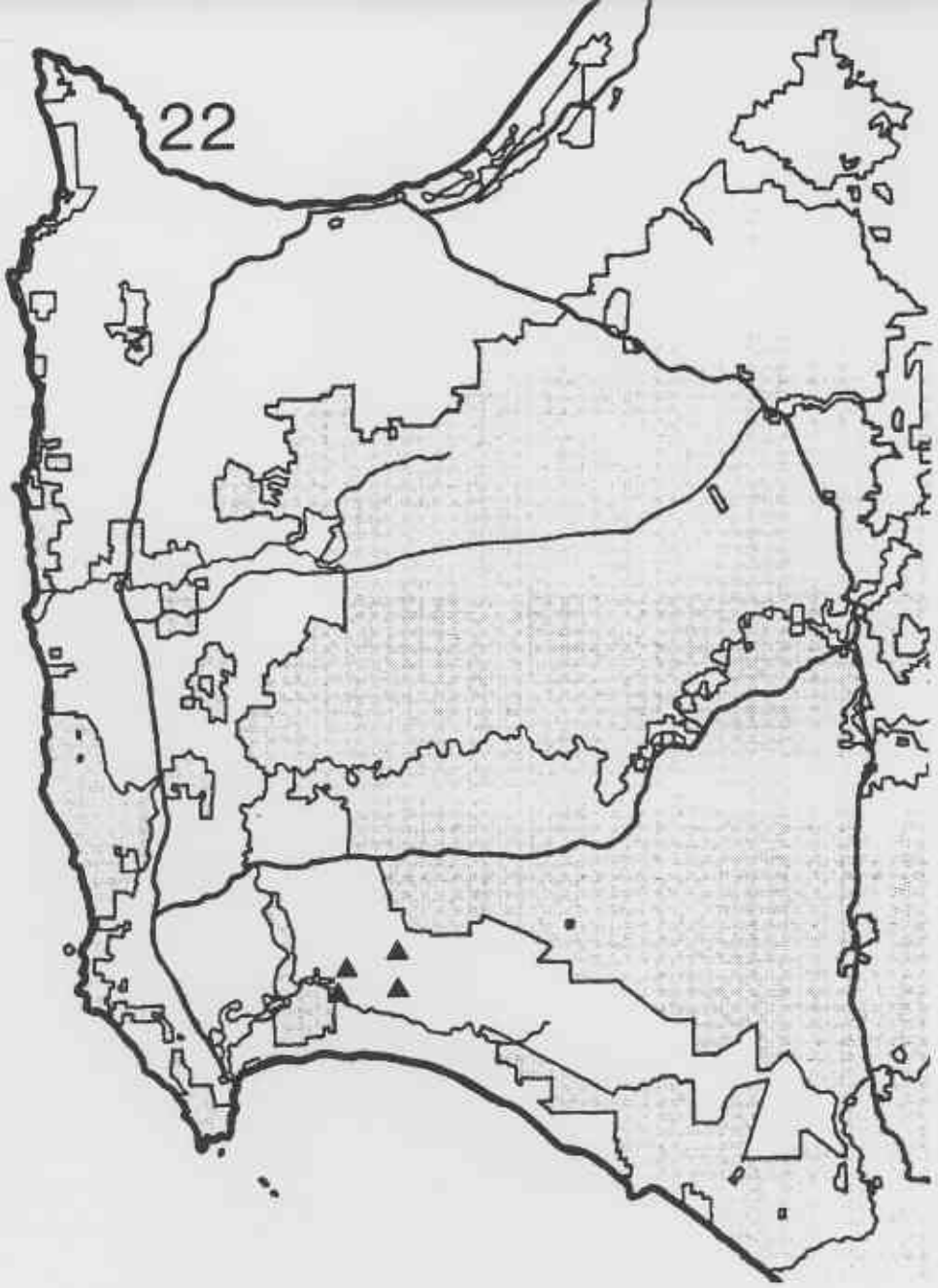
Fire - killed by fire.

Phytophthora - unknown.

RECOMMENDATIONS

A secure reserve needs to be obtained for this taxon. An ideal area is the recreation reserve abutting Scott National Park.

This species should be considered for declaration as rare, unless secure reserves are obtained.


22

HYBANTHUS VOLUBILIS E.M. Bennett Violaceae
"Climbing Native Violet"

DESCRIPTION

Scandent twining perennial soft shrub to 5 m. Leaves alternate, sessile, linear-lanceolate, 8-18 mm long, 2-4 mm wide, glabrous. Flowers numerous, axillary, solitary, white with mauve veins on lip petal, side petals blue-mauve. Flowering occurs from September to November.

DISTRIBUTION AND HABITAT

Hybanthus volubilis occurs between Margaret River and Scott River, a range of 50 kilometres. In this area it occurs in low woodland of Jarrah (*Eucalyptus marginata*) over shrubs along creeklines on loam or sandy loam soils.

CONSERVATION STATUS

Current Status: P1 Recommended: P2

KNOWN POPULATIONS (Map 23)

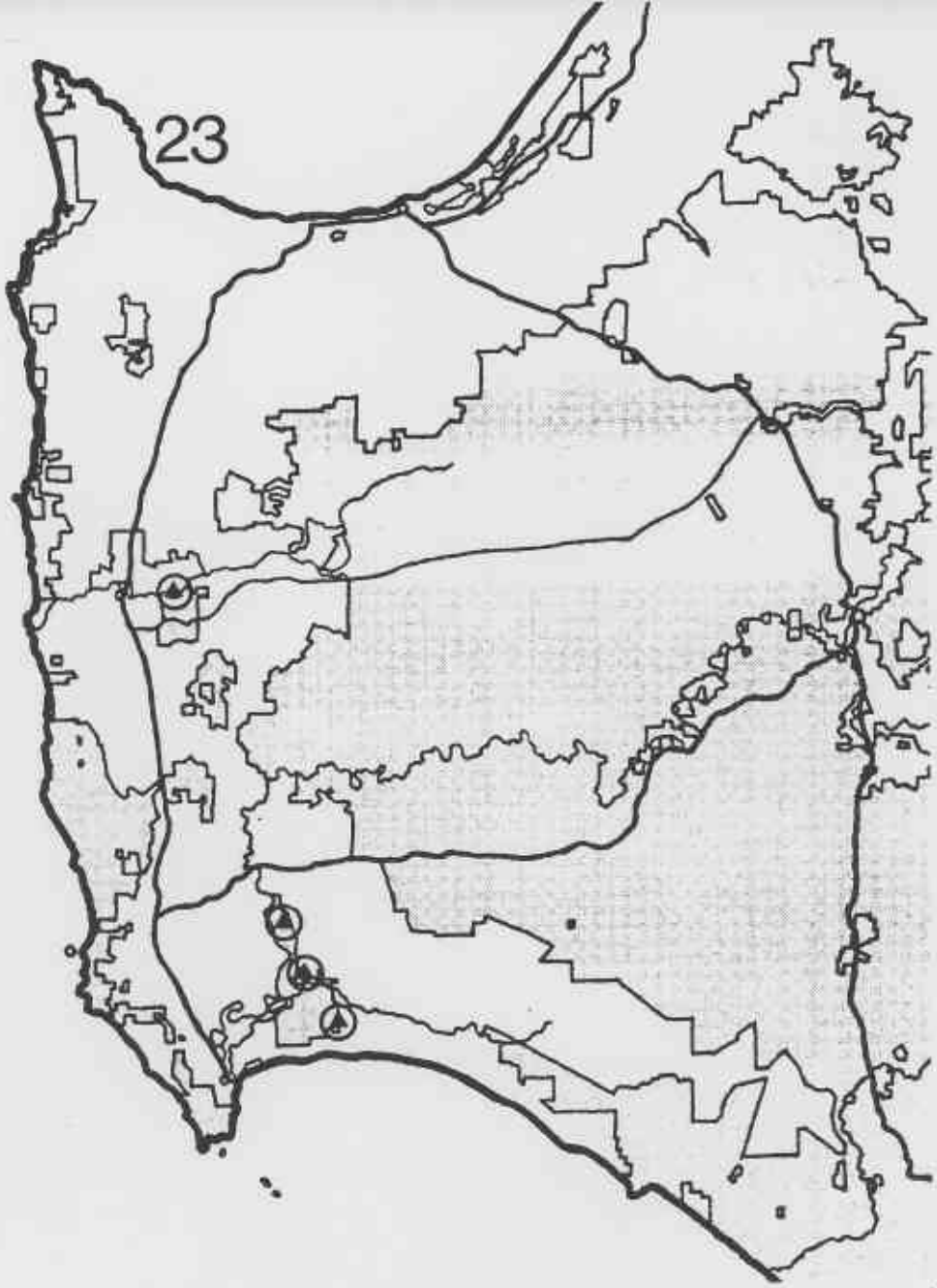
Pop No	Shire	District	Population	Land Status	No	Condition
1	CF	A/MR	Scott 1	national park	50	good
2	CF	A/MR	Scott 2	national park	50	good
3	CF	A/MR	Scott 3	national park	1	good

RESPONSE TO DISTURBANCE

Response to soil disturbance, weed invasion, fire and *Phytophthora* is unknown.

RECOMMENDATIONS

This species was located on all minor creeklines searched in Scott National Park, suggesting that it should occur in many sites in the State Forest between Margaret River and the Scott Plain on the Blackwood Plateau. Further surveys should be undertaken in this area. The species was previously only known from the Margaret River area.


23

HYPOCALYMMA SP. (A.S. George 11773) Myrtaceae

DESCRIPTION

Prostrate mounded shrub to 10 cm x 30 cm diameter. Numerous slender stems from a woody rootstock, young stems distinctly red. Leaves sessile, ovate-cordate, 3-6? mm long. Flowers white on long peduncles, usually exceeding the leaves, petals *c.* 0.5 mm long.

NOTES

This species differs from *Hypocalymma cordifolium* in the prostrate habit, very slender stems, small flowers, slender long peduncles and small leaves.

DISTRIBUTION AND HABITAT

Hypocalymma sp. (A.S. George 11773) occurs between Northcliffe and the Blackwood River, growing in Melaleuca low woodland, heath over sedges, sedgeland or rarely shrubland on sand over clay but also sand over ironstone. Normally sites are winter-wet.

CONSERVATION STATUS

Current Status: P3 Recommended: P3 or delete

KNOWN POPULATIONS (Map 24)

Pop No	Shire	District	Population	Land Status	No	Condition
1	N	CF	*Gingilup	nature reserve	>1000	good
2	N	CF	Scott 1	water reserve	50	good
3	N	CF	Scott 2	?water reserve	20	good
4	A/MR	CF	Chester	State Forest	>500	good
5	A/MR	CF	McGregor 1	road reserve	>50	good
6	A/MR	CF	McGregor 2	private	>200	good
7	A/MR	CF	Scott 3	shire reserve	>100?	good
8	A/MR	CF	*Scott 4	national park	>2000	good
9	A/MR	CF	Scott 5	road reserve	10	good
10	A/MR	CF	Molloy	private	>100	good

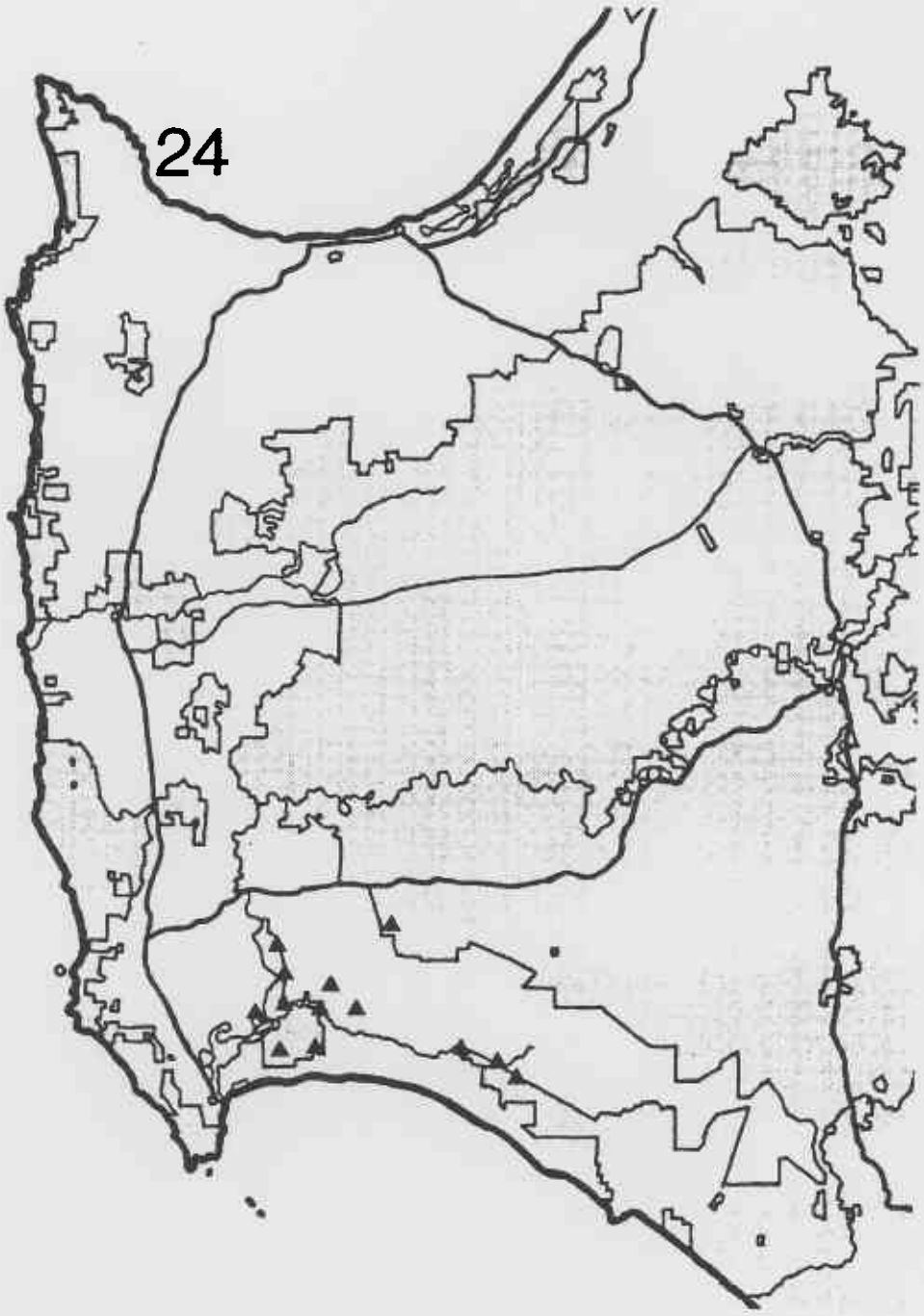
RESPONSE TO DISTURBANCE

Response to soil disturbance, weed invasion, fire and *Phytophthora* is unknown.

RECOMMENDATIONS

This species is known from numerous populations on 1 nature reserve, 1 national park, 1 State Forest block, 2 water reserves and 1 shire reserve. This taxon is under no danger.

A survey of populations between Northcliffe and Scott Plains should also reveal numerous populations. If this is the case this species should be deleted from the priority list.



JANSONIA FORMOSA Kipp.. Fabaceae

A tall open spreading shrub to 3 m x 2 m. Leaves are ovate to lanceolate, usually obtuse with a short mucrone, 10-15 mm long. Flower heads axillary in upper axils, recurved consisting of 4 flowers enclosed in several orbicular brown, pubescent bracts. Flowers bright red. Flowering occurs between September and November.

DISTRIBUTION AND HABITAT

Jansonia formosa occurs between Margaret River and Walpole, normally under tall woodland of *Eucalyptus rudis, E. calophylla* and *Agonis parviceps* edging creeks or rivers. The species is also rarely recorded in dense heath. Both are on lateritic or ironstone soils.

CONSERVATION STATUS

Current Status: P2 Recommended: P3 or delete

KNOWN POPULATIONS (Map 25)

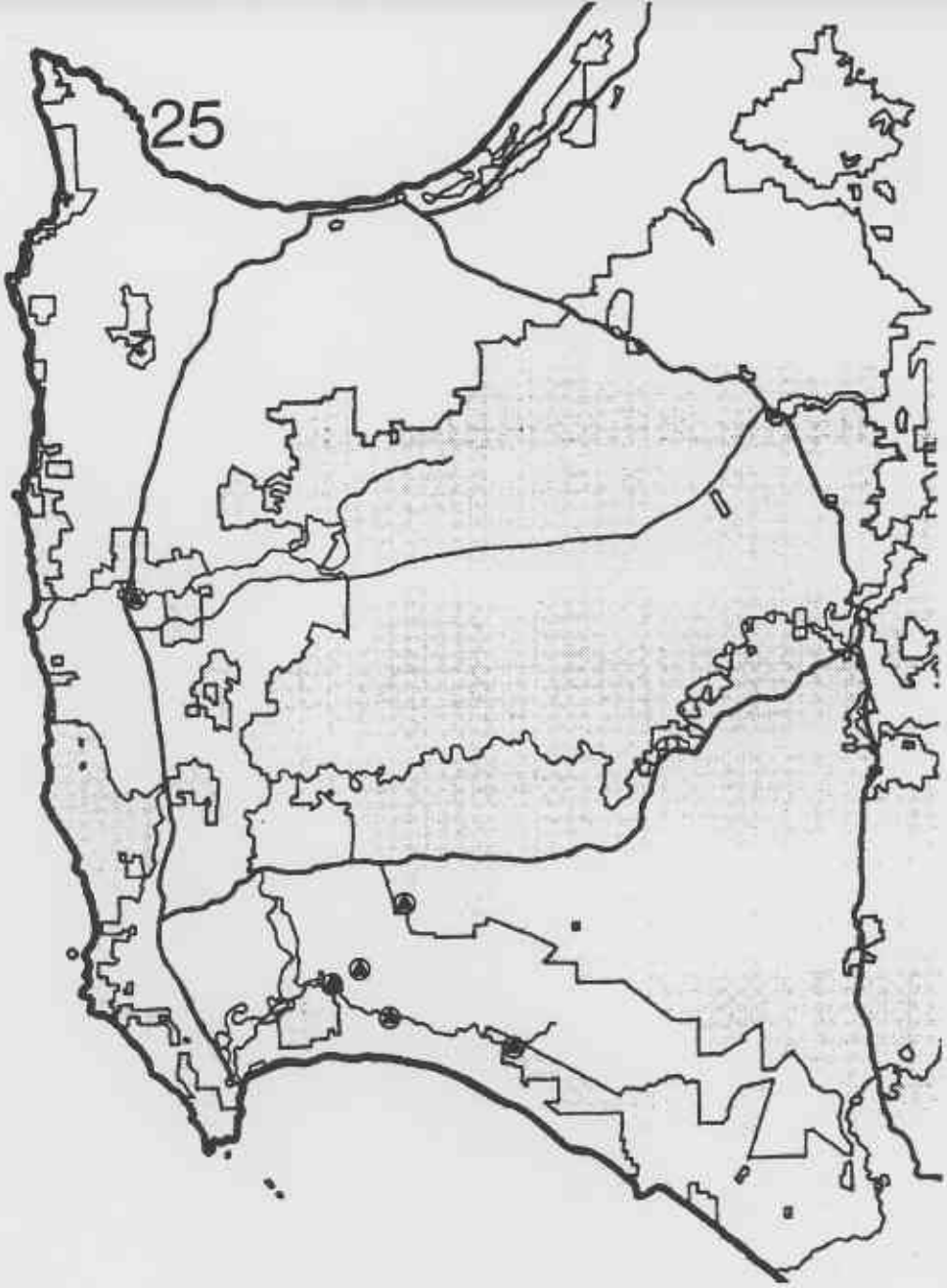
Pop No	Shire	District	Population	Land Status	No	Condition
1	A/MR	CF	Margaret	shire reserve	>100	good
2	N	CF	Gingilup	nature reserve	>200	good
3	N	CF	Milyeanup	water reserve	20	good
4	A/MR	CF	Chester	State Forest	>100	good
5	A/MR	CF	Scott River	?Unvested water reserve	>20	good
6	A/MR	CF	Gov. Broome	road reserve	17	good
7	A/MR	CF	Scott 1	shire reserve	>200	good
8	A/MR	CF	Scott 2	national park	>100	good

RESPONSE TO DISTURBANCE

Response to soil disturbance, weed invasion, fire and *Phytophthora* is unknown.

RECOMMENDATIONS

The species is present on at least 2 State Forest blocks, 1 nature reserve, 1 water reserve, 1 unvested water reserve, 1 shire reserve and 1 national park. All populations appear healthy and since the species is obviously in no immediate danger it should be listed as priority 3, not priority 2. Further surveys between Gingilup Swamp and Walpole are desirable.


25

LEPYRODIA HELEOCHAROIDES Gilg. Restionaceae

Slender compact rhizomatous herb to 20 cm x 20 cm. Culms slender, grey, usually 5-15 per clump. Male and female plants with erect brown or red flowers. Distinguished from other species by its small stature, slender grey culms and long mucronate sheathing stem scales. Flowering is from December to January.

DISTRIBUTION AND HABITAT

Lepyrodia heleocharoides was previously known from two sites, Parkerville (near Perth) and Alexander Bridge (north-east of Augusta). At the Chester Block locality it was growing in heath over sedges on a winter-wet flat. soils were peaty sand over clay.

CONSERVATION STATUS

Current Status: P1 Recommended: P3

KNOWN POPULATIONS (Map 26)

Pop No	Shire	District	Population	Land Status	No	Condition
1	A/MR	CF	Chester	State Forest	30	good

RESPONSE TO DISTURBANCE

Soil Disturbance - unknown.

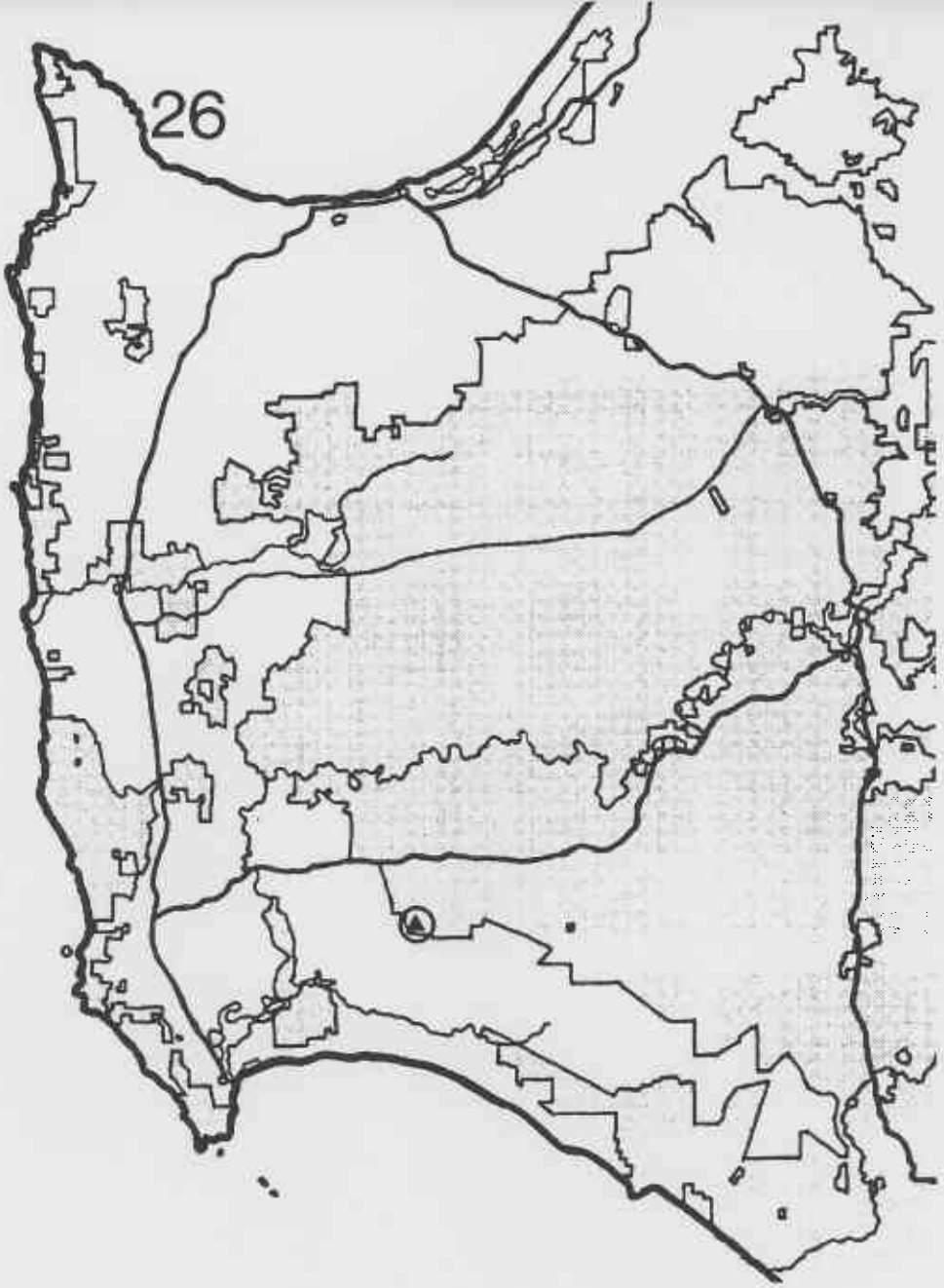
Weed Invasion - unknown.

Fire - unknown.

Phytophthora - unknown.

RECOMMENDATIONS

This is a very inconspicuous species, which is exceedingly difficult to survey until plants are correctly identified. It is probably much more common than current data indicates, being sporadically collected over a 300 km long range.


26

LEUCOPOGON ALTERNIFOLIUS R. Br. Epacridaceae

DESCRIPTION

Leucopogon alternifolius is a slender finely branched shrub to 50 cm tall. Leaves are sessile, ovate-obovate with an acute tip, to 10 mm. Inflorescences are axillary, composed of 2-5 flowers on the terminal sections of the branches. Buds are bright pink, flowers white.

DISTRIBUTION AND HABITAT

Leucopogon alternifolius occurs between Albany and the Blackwood River. Within this area it occurs in heath and sedgeland on sand over clay.

CONSERVATION STATUS

Current Status: P3 Recommended: delete

KNOWN POPULATIONS (Map 27)

Pop No	Shire	District	Population	Land Status	No	Condition
1	N	CF	Gingilup	nature reserve	>100	good
2	A/MR	CF	Chester	State forest	>100	good
3	A/MR	CF	McGregor	private	>100	good
4	A/MR	CF	*Scott 1	national park	>1000	good
5	A/MR	CF	Scott 2	road reserve	50	good
6	A/MR	CF	Scott 3	shire reserve	100	good
7	A/MR	CF	Alex. Bridge	private	100	good
8	A/MR	CF	Scott 4	shire reserve	50	good

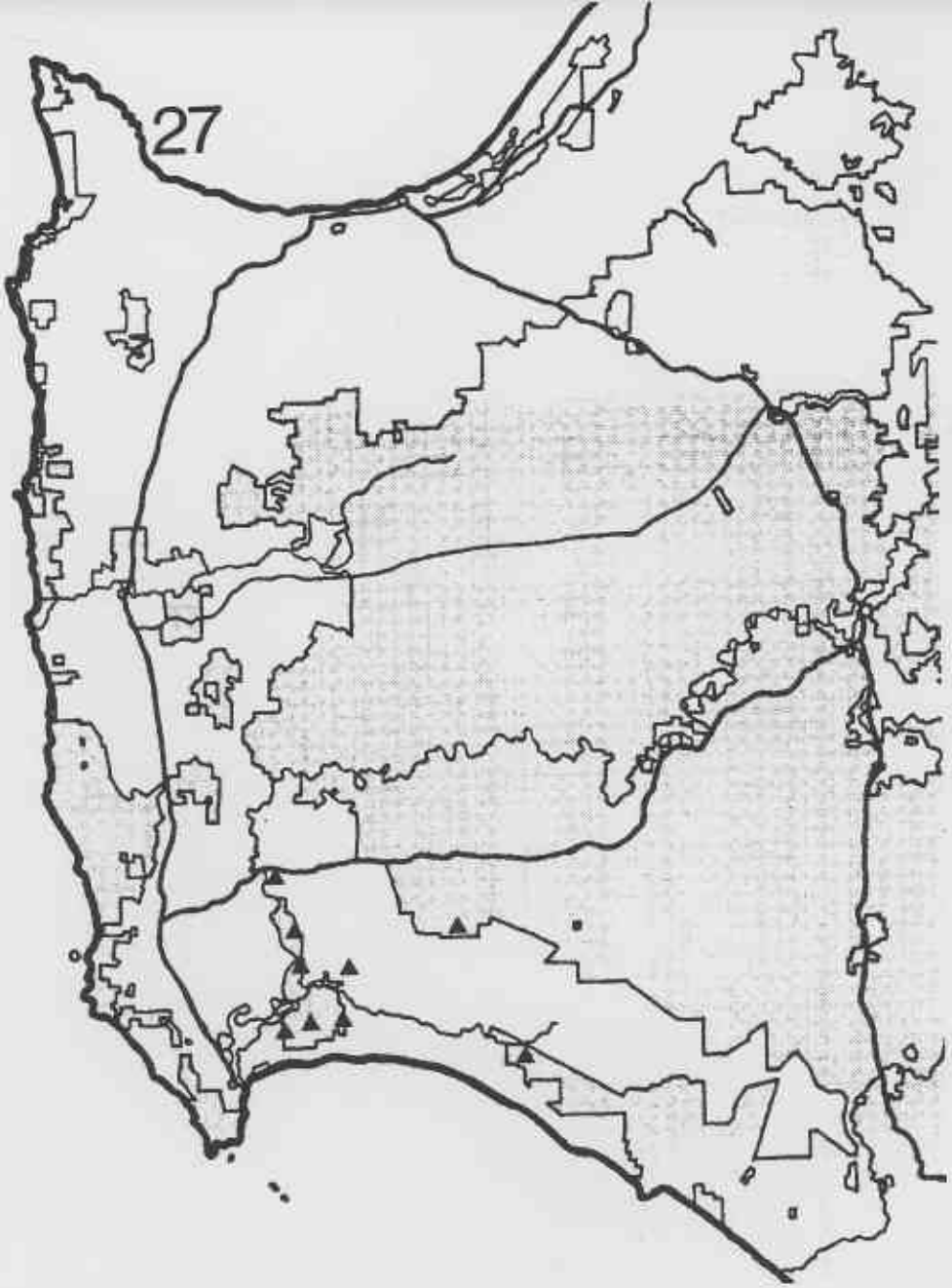
*numerous scattered populations

RESPONSE TO DISTURBANCE

Response to soil disturbance, weed invasion, fire and *Phytophthora* is unknown.

RECOMMENDATIONS

This species is widespread, common, in numerous reserves and State Forest blocks it should be deleted from the priority list.


27

LEUCOPOGON GILBERTII Stschegl. Epacridaceae

DESCRIPTION

Leucopogon gilbertii is a slender erect shrub to 60 cm, few branched from a woody base above the ground. Leaves are linear, with an acute apex, 4-10 mm long. Flowers are borne in dense terminal heads, with large subtending bracts. These dense heads of white flowers give the plant the superficial appearance of a daisy at a distance. Flowering is from September to November.

DISTRIBUTION AND HABITAT

Leucopogon gilbertii occurs between Bow Bridge and the Blackwood River in heath over sedges or sedgeland on sand over clay in winter-wet flats.

CONSERVATION STATUS

Current Status: P3 Recommended: P3

KNOWN POPULATIONS (Map 28)

Pop No	Shire	District	Population	Land Status	No	Condition
1	N	CF	Gingilup	nature reserve	>500	good
2	A/MR	CF	*Scott	national park	>2000	good

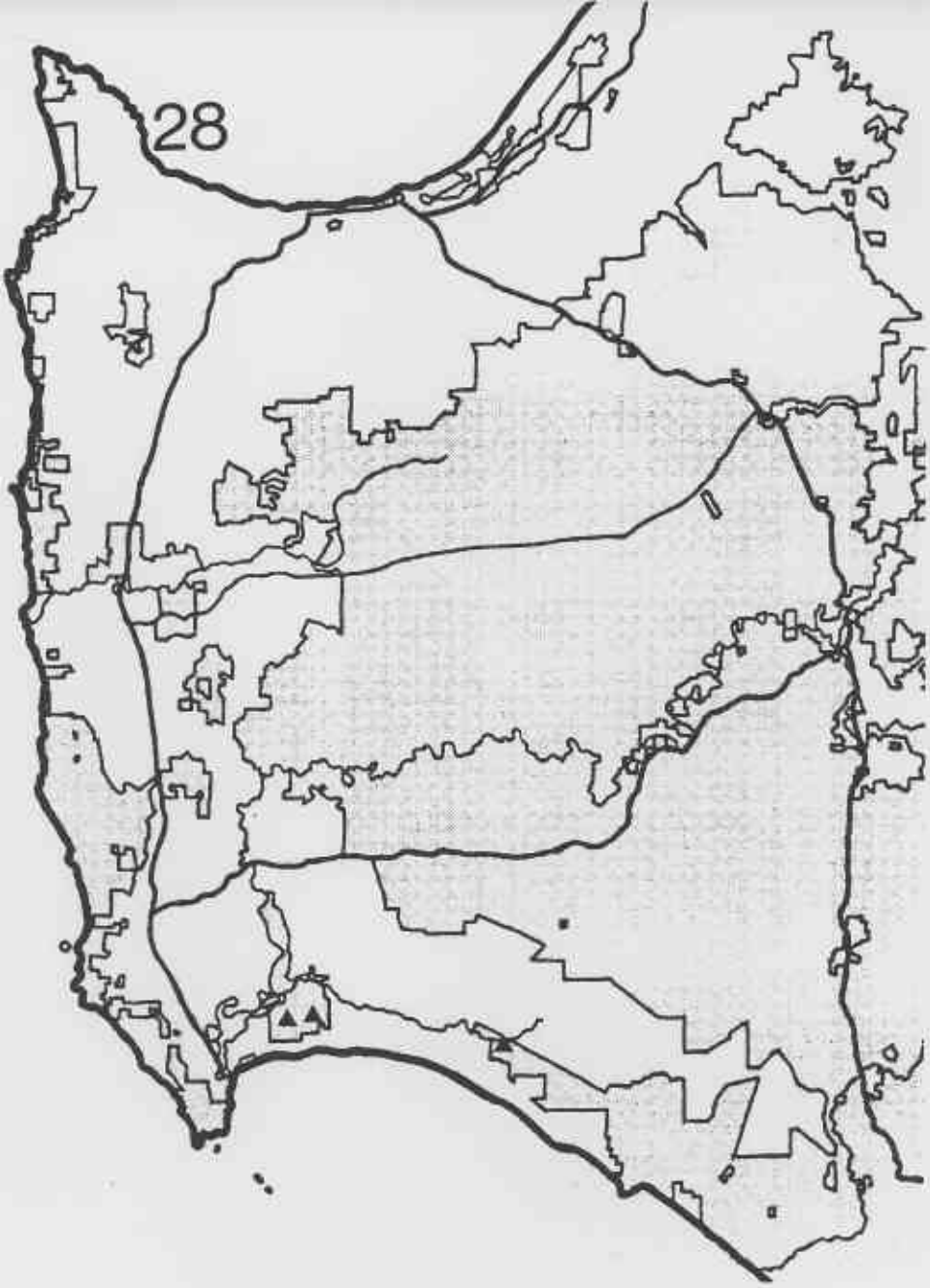
*Numerous populations

RESPONSE TO DISTURBANCE

This species is killed by fire. Response to soil disturbance, weed invasion and *Phytophthora* is unknown.

RECOMMENDATIONS

This species is very common in Scott National Park. Further surveys are needed between Walpole and Black Point, if this species is commonly encountered it could be deleted from the priority list.


28

LEUCOPOGON SP. AFF. GILBERTII (Strid 21460) Epacridaceae

DESCRIPTION

Leucopogon aff. *gilbertii* is a very slender erect few-branched shrub to 50 cm. Leaves are linear, with an acute apex, 4-10 mm long. Flowers are borne in small terminal elongate heads of 4-12 flowers, without the large basal bract present in *L. gilbertii*. Flowering occurs from November to January.

DISTRIBUTION AND HABITAT

Leucopogon sp. aff. *gilbertii* occurs between Walpole and Scott River in heath over sedges or sedgelands on sand over clay or clay. Sites are usually inundated in winter.

CONSERVATION STATUS

Current Status: not listed Recommended: P3

KNOWN POPULATIONS (Map 29)

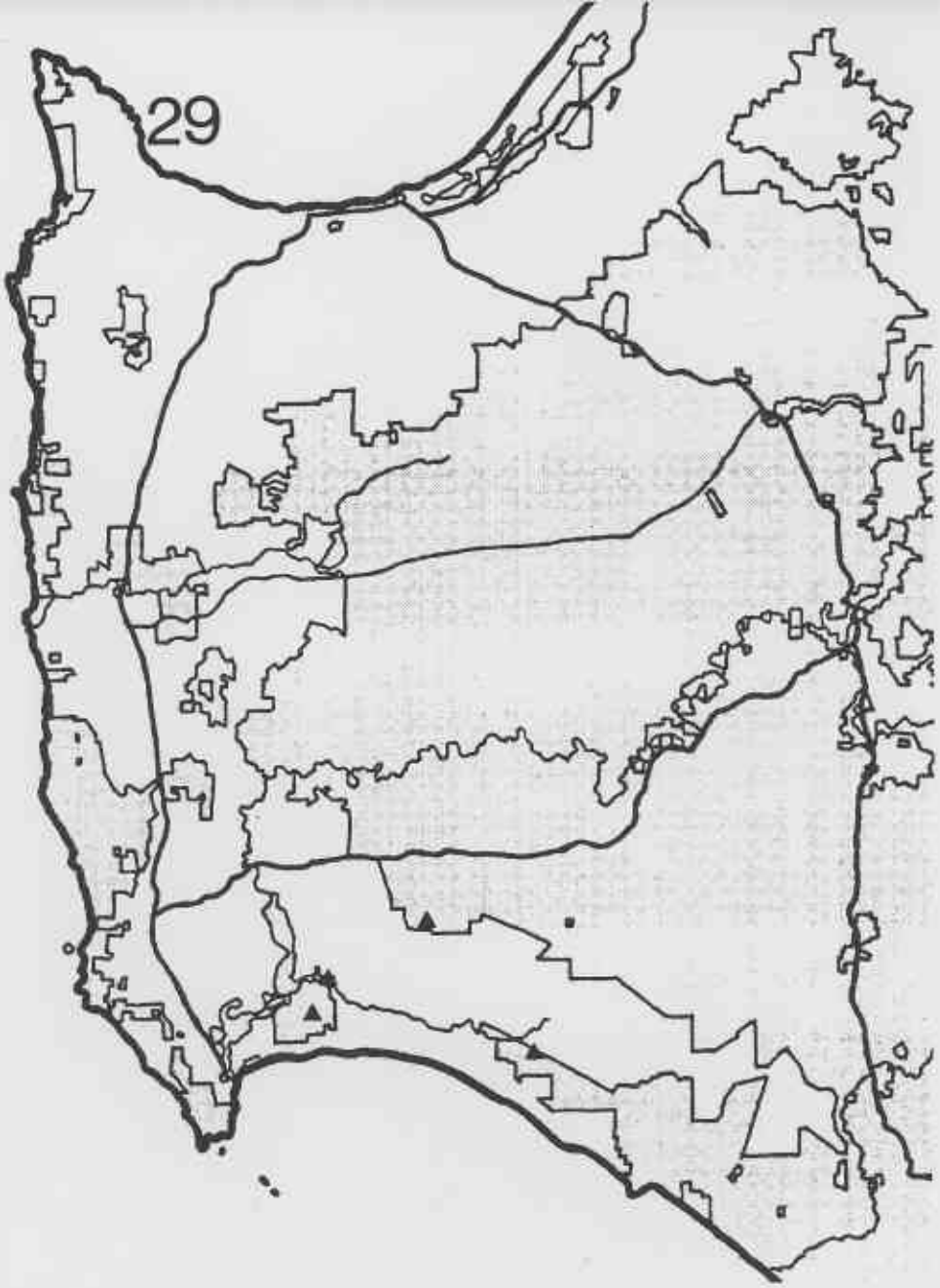
Pop No	Shire	District	Population	Land Status	No	Condition
1	N	CF	Chester	State Forest	200	good
2	N	CF	Gingilup	nature reserve	200	good
3	A/MR	CF	Scott 1	shire reserve	100	good
4	A/MR	CF	Scott 2	national park	>1000	good

RESPONSE TO DISTURBANCE

Response to soil disturbance, weed invasion, fire and *Phytophthora* is unknown.

RECOMMENDATIONS

This species requires surveys between Walpole and Black Point. It is apparently not confined to the Scott Coastal Plain and could be deleted from the priority list if numerous populations are found between the Plain and Walpole.


29

LOXOCARYA SP. Q (Royce 2465) Restionaceae

DESCRIPTION

Clonal rhizomatous herb to 2 m x 10 m wide. Culms glabrous, bright green. Male and female flowers brown-green, erect.

NOTES

Differs from other *Loxocarya* species in forming large clones, the bright green glabrous culms and seed characters.

DISTRIBUTION AND HABITAT

Loxocarya sp. Q was only known from two collections, one from near Margaret River (collected in 1947), the other from the Scott Plains (collected in 1948). One collection is labelled as occurring on creek banks. The Chester population is found under *Melaleuca* low open woodland, on peaty black sand over clay. Water is *ca*. 1 m deep in winter.

CONSERVATION STATUS

Current Status: P1 Recommended: P1

KNOWN POPULATIONS (Map 30)

Pop No	Shire	District	Population	Land Status	No	Condition
1	A/MR	CF	Chester	State Forest	*many	good

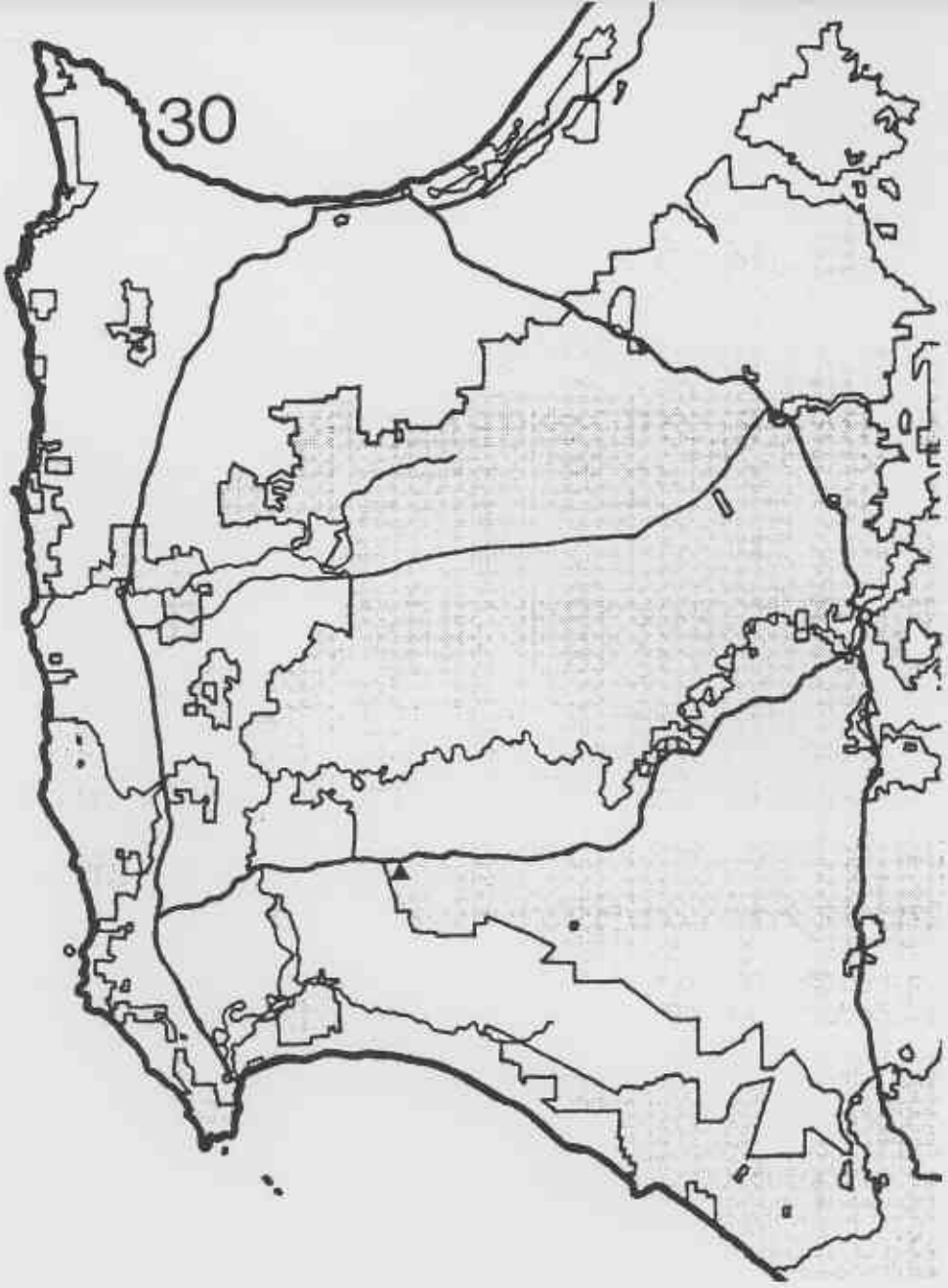
*clonal plants covering *ca*. 100 m^2

RESPONSE TO DISTURBANCE

Response to soil disturbance, weed invasion, fire and *Phytophthora* is unknown.

RECOMMENDATIONS

This species requires further survey between the original collection at Margaret River and the Scott Plain. Currently only one population was located during the survey of the Scott Plain and unless further are located it should be considered for gazettal as rare flora. However, the habitat where the species occurs is common on the plain and adjacent regions, therefore, it should also be searched for in the area between the Plain and Northcliffe.


30

LOXOCARYA SP. (Meney 109) Restionaceae

DESCRIPTION

Tufted robust rhizomatous herb to 1.5 m x 40 cm diameter. Culms dense, erect, grey, slightly twisted when in flower (especially if male). Male flowers dense, erect, brown. Female flowers erect reddish. Flowering occurs from September to November.

DISTRIBUTION AND HABITAT

Loxocarya sp. (Meney 109) is confined to the Scott Plain, where it grows in heath over sedges on red clay-loam over ironstone.

CONSERVATION STATUS

Current Status: P1 Recommended: P1

KNOWN POPULATIONS (Map 31)

Pop No	Shire	District	Population	Land Status	No	Condition
1	N	CF	Dennis	road reserve	30	poor
2	A/MR	CF	McGregor	road reserve	100	good/poor
3	A/MR	CF	McGregor	private	>500	good
4	A/MR	CF	Gov. Broome	road reserve	50	good
5	A/MR	CF	Scott 1	shire reserve	>1000	good
6	A/MR	CF	Scott 2	shire reserve	>500	good
7	A/MR	CF	Scott 3	national park	20	good

RESPONSE TO DISTURBANCE

Soil Disturbance - killed by road grading.

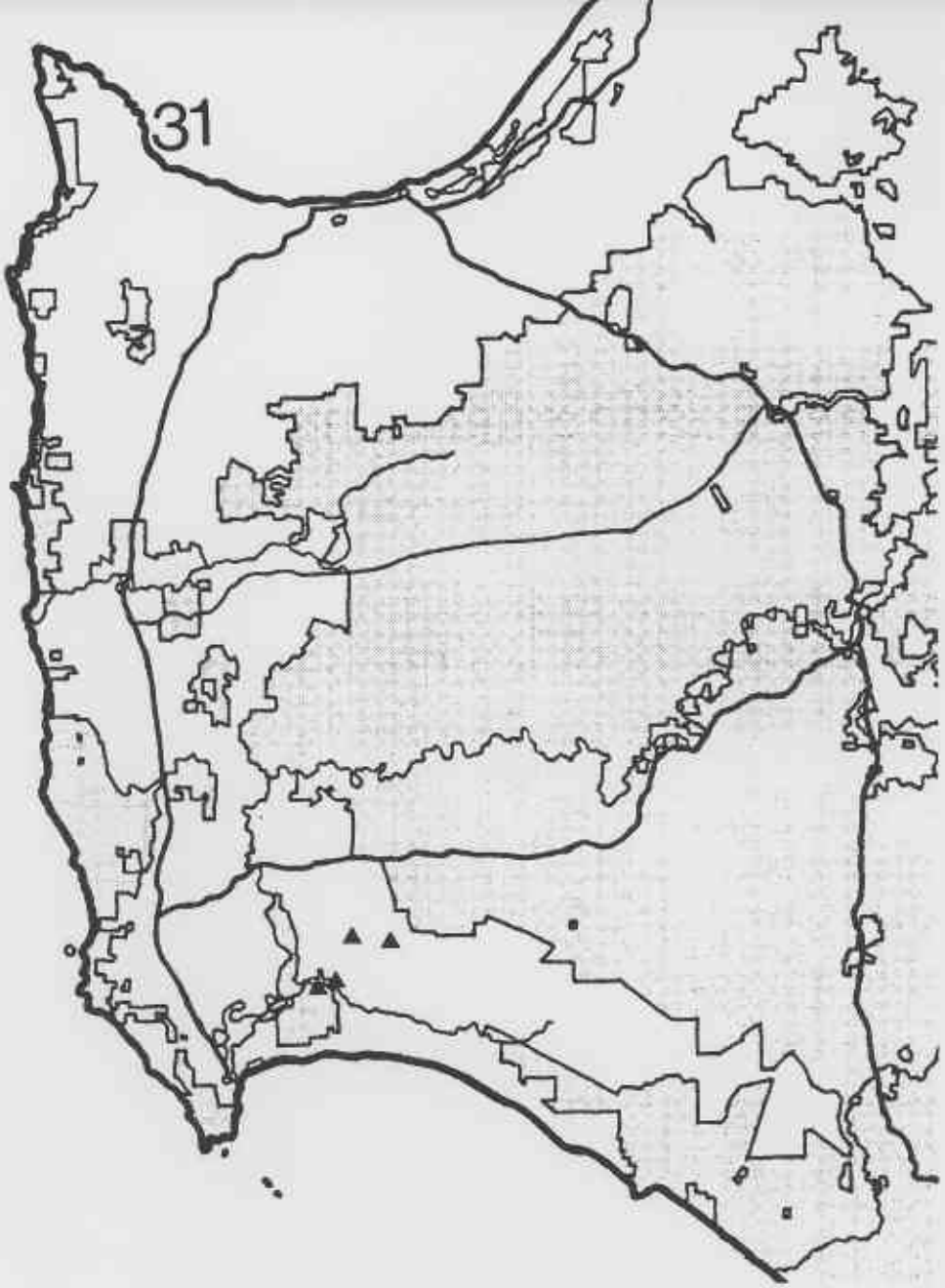
Weed Invasion - unknown.

Fire - killed by fire.

Phytophthora - resistant.

RECOMMENDATIONS

There is a very large population of this species in the recreation reserve adjoining Scott National Park. If this reserve can be successfully added to Scott National Park then this species will be securely reserved. If this area cannot be added to the park this species should be gazetted as rare.


31

MELALEUCA BASICEPHALA Benth. Myrtaceae

DESCRIPTION

Low open spreading (almost decumbent stems) shrub to 50 cm x 30 cm with slender twiggy branches from a single basal stem. Inflorescences sessile in small globular heads at the base of the leaves or along the bare stem. Flowers bright purple. Flowering occurs from December to February.

DISTRIBUTION AND HABITAT

Melaleuca basicephala occurs between Black Point and the Blackwood River. The species occurs in heath over sedges or *Melaleuca/Agonis* low open shrubland on sand over clay. The species occurs on winter-wet flats.

CONSERVATION STATUS

Current Status: P1 Recommended: P2

KNOWN POPULATIONS (Map 32)

Pop No	Shire	District	Population	Land Status	No	Condition
1	N	CF	Chester	State Forest	>500	good
2	N	CF	Gingilup	nature reserve	>500	good
3	N	CF	Milyeanup Rd	road reserve	100	good
4	A/MR	CF	Gov. Broome	road reserve	50	good
5	A/MR	CF	*Scott	national park	>1000	good

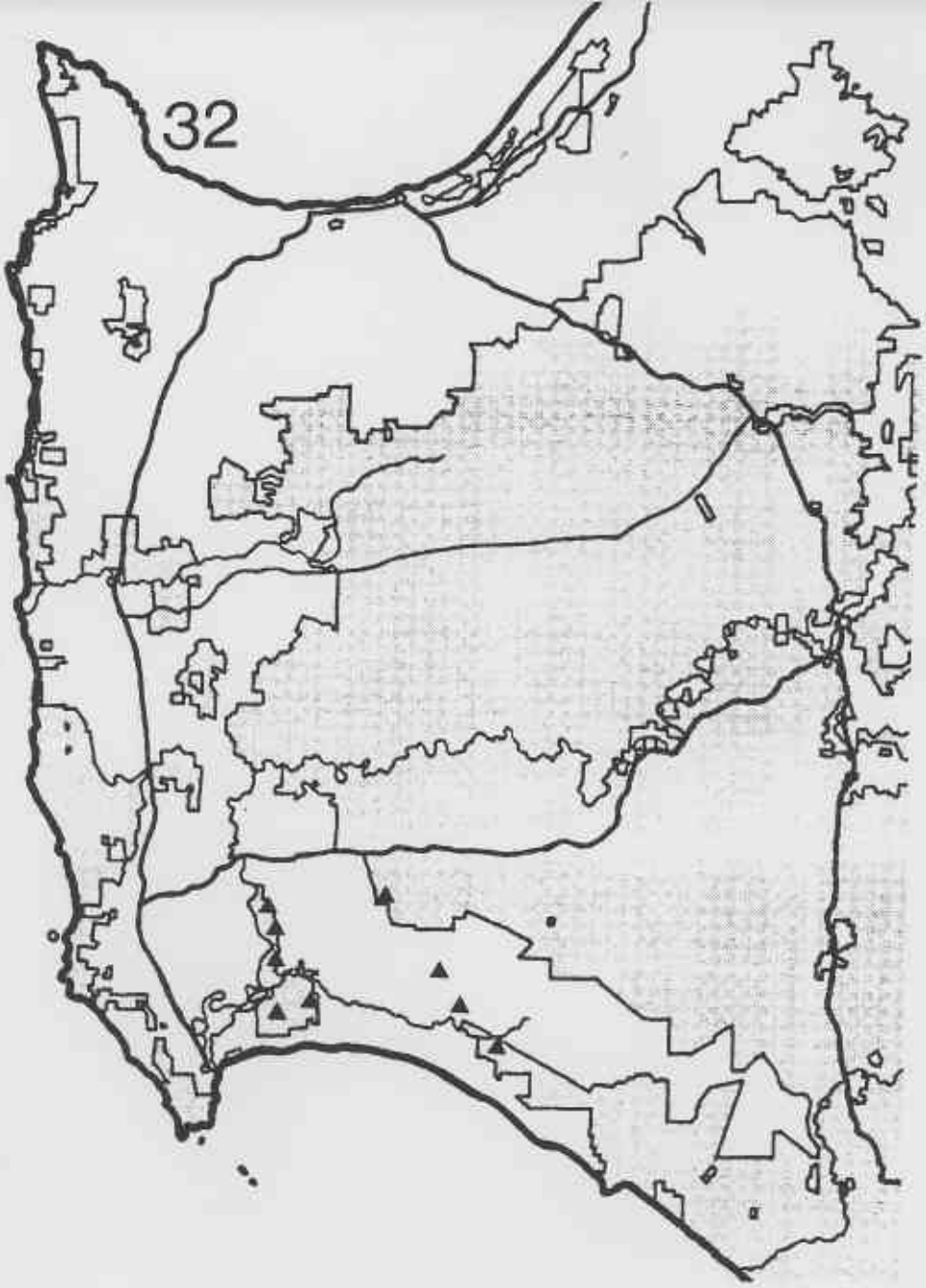
*numerous populations

RESPONSE TO DISTURBANCE

This species is killed by grading and fire. Its response to *Phytophthora* is unknown.

RECOMMENDATIONS

This species is well reserved on the Scott Plain, being present in large numbers in 1 State Forest block, 1 nature reserve and 1 national park. Further surveys are needed in the Black Point to Northcliffe area.


32

PITHOCARPA MELANOSTIGMA P. Lewis et Summerhayes Asteraceae

DESCRIPTION

Slender spreading perennial herb, 1-4 stems from a woody base, to 30 cm tall. Stems and leaves covered by white cobwebby hairs. Inflorescence bracts reddish-brown on outside, inside creamish-white. Stigma with darkly pigmented papillae on outer surface and lip. Flowering occurs between January and March.

DISTRIBUTION AND HABITAT

Pithocarpa melanostigma has been sporadically recorded from the Albany to Walpole region in *Eucalyptus* woodland. In Scott National Park the species occurs in *Eucalyptus calophylla* open woodland on sandy clay over clay, in winter-wet flats.

CONSERVATION STATUS

Current Status: P2 Recommended: delete

KNOWN POPULATIONS (Map 33)

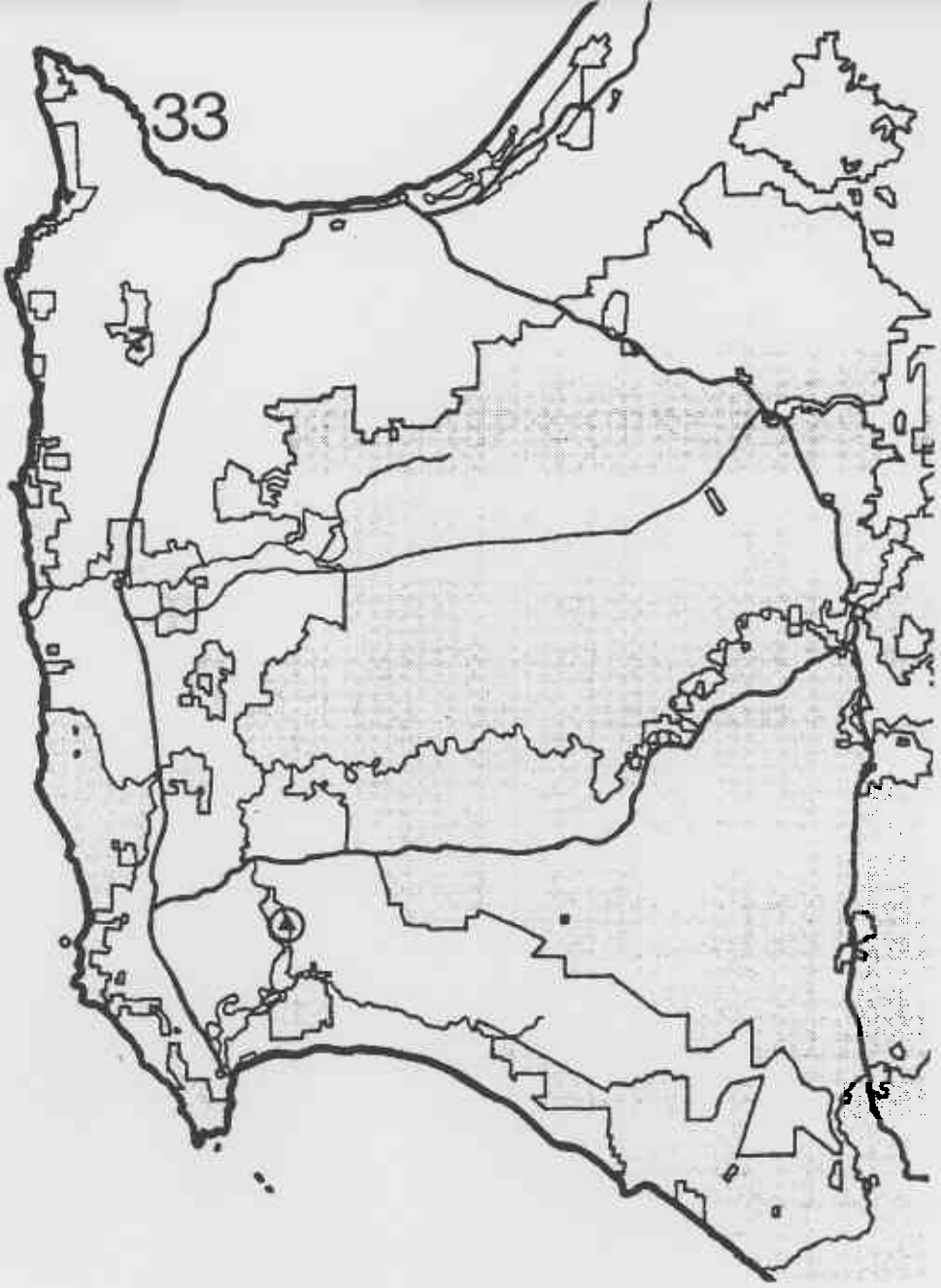
Pop No	Shire	District	Population	Land Status	No	Condition
1	A/MR	CF	Scott	national park	64	good

RESPONSE TO DISTURBANCE

Response to soil disturbance, weed invasion, fire and *Phytophthora* is unknown.

RECOMMENDATIONS

This species is poorly known but probably not uncommon. It is difficult to distinguish from other *Pithocarpa* species, but its discovery in Scott National Park suggests an extensive range, as this is over a 200 km extension of its known range.


33

RESTIO GRACILIOR F. Muell ex Benth. Restionaceae

Graceful Cord Rush

DESCRIPTION

Restio gracilior is a clumped rhizomatous herb to 60 cm x 30 cm wide. The plant has slender erect green glabrous culms. The flowers are brown, both male and female inflorescences are erect and sessile and terminal. Flowering occurs between November and January.

DISTRIBUTION AND HABITAT

Restio gracilior occurs between Ruabon and the Scott Plains. The species occurs in heath over sedges or sedgeland on usually flat or depressed winter-wet sites with sand over clay or clay soils.

CONSERVATION STATUS

Current Status: P1 Recommended: P3

KNOWN POPULATIONS (Map 34)

Pop No	Shire	District	Population	Land Status	No	Condition
1	Buss	CF	Yoongarillup	townsite	50	good
2	A/MR	CF	Scott 1	national park	200	good
3	A/MR	CF	Scott 2	national park	100	good
4	A/MR	CF	Scott 3	national park	300	good
5	A/MR	CF	Scott 4	shire reserve	20	good
6	A/MR	CF	Scott 5	road reserve	10	good
7	A/MR	CF	Scott 6	shire reserve	10	good

RESPONSE TO DISTURBANCE

Soil Disturbance - unknown.

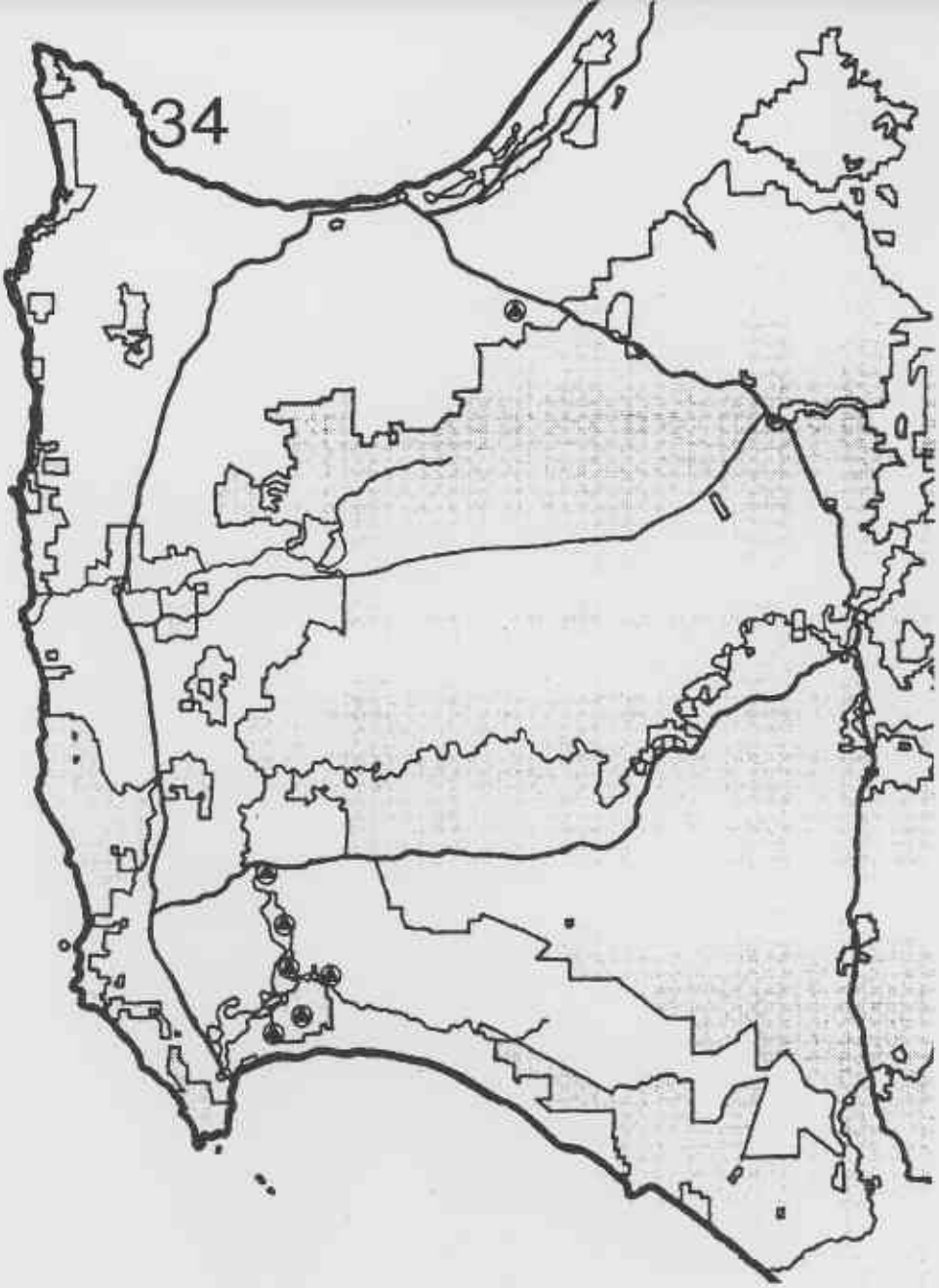
Weed Invasion - unknown.

Fire - unknown.

Phytophthora - unknown.

RECOMMENDATIONS

This species is well reserved for its southern populations with over 1000 plants being present in Scott National Park. However, the Swan Coastal Plain populations are currently not known from any conservation reserve. Further survey of this region should be undertaken.


34

RESTIO USTULATUS F. Muell. Restionaceae

TAXONOMY

Not closely related to any other species of *Restio*.

DESCRIPTION

Restio ustulatus is a dioecious rhizomatous herb to 1 m tall. The inflorescence is surrounded by numerous obtuse brown imbricate bracts, which gives the plants a very distinct appearance like a sedge rather than a Restio. Flowering period is from September to October.

DISTRIBUTION AND HABITAT

The species occurs between Walpole and Busselton in sedgelands of Cyperaceae and Restionaceae, usually on sand over clay on the Scott Plain. On the Swan Coastal Plain the species also occurs along creeklines under *Eucalyptus patens* on lateritic clay loam soils. All sites are seasonally wet.

CONSERVATION STATUS

Current Status: P5 Recommended: delete

KNOWN POPULATIONS (Map 35)

Pop No	Shire	District	Population	Land Status	No	Condition
1	CF	Capel	Capel NR	nature reserve	>200	good
2	CF	Busselton	Williamson	State Forest	>1000	good
3	CF	Busselton	Fish Rd	nature reserve	>200	good
4	CF	Busselton	Yelverton	State Forest	>200	good
5	CF	A/MR	Chester	State Forest	>100	good
6	CF	A/MR	McGregor	private	>500	some disturbance
7	CF	A/MR	Gov. Broome	road verge	30	good
8	CF	A/MR	Gov. Broome	road verge	50	good
9	CF	Nannup	Coast Rd	road verge	50	good
10	CF	Nannup	Gingilup	nature reserve	>100	good
11	CF	A/MR	Scott 1	national park	>1000	good
12	CF	A/MR	Scott 2	local govt	>500	good

RESPONSE TO DISTURBANCE

Soil Disturbance - unknown.

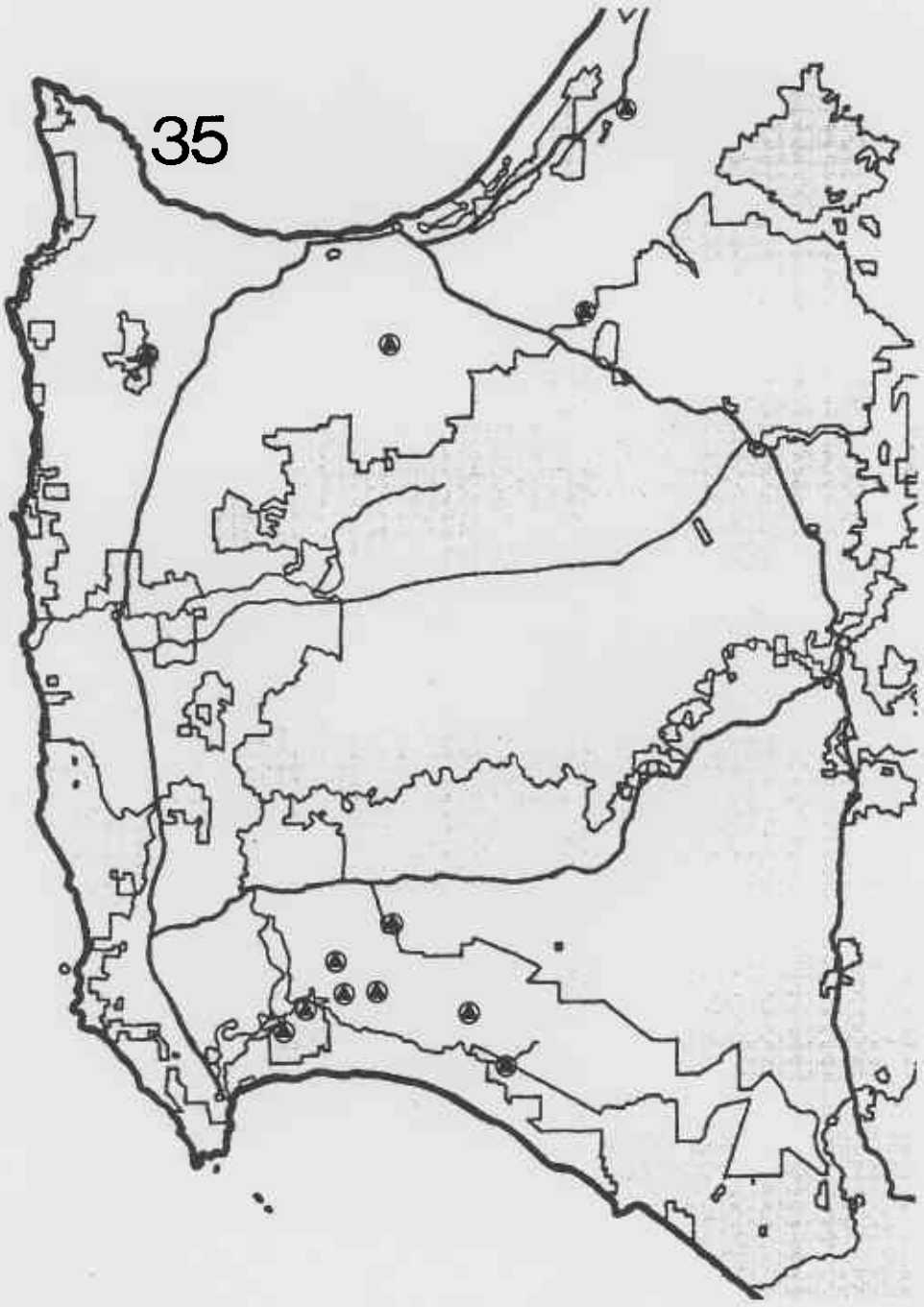
Weed Invasion - unknown.

Fire - unknown.

Phytophthora - unknown.

RECOMMENDATIONS

This species is a very distinctive member of the genus and has a high conservation priority. It is, however, widespread and common in a variety of reserves. Herbarium collections have recorded this species from Shannon-D'Entrecasteaux National Park and we have sight records from State Forest areas to the north of this Park. Within the study area *Restio ustulatus* is known from State Forest (3 areas), Scott National Park, shire reserves and nature reserves (3). The species is well protected and should be removed from the priority list.



SPHENOTOMA PARVIFLORUM F. Muell Epacridaceae

DESCRIPTION

Slender erect shrub to 30 cm. Leaves densely clustered appressed along stem, long spreading at base to 5 cm. Flowers in dense, ovate head of 5-10 flowers. Flowers white, with long corolla tube and short lobes. Flowering occurs between October and November.

DISTRIBUTION AND HABITAT

Sphenotoma parviflorum has been sporadically recorded from east of Esperance to Albany where it grows in winter-wet flats under heath over sedges or sedgeland on sandy clay over clay.

CONSERVATION STATUS

Current Status: P2 Recommended: P3

KNOWN POPULATIONS (Map 36)

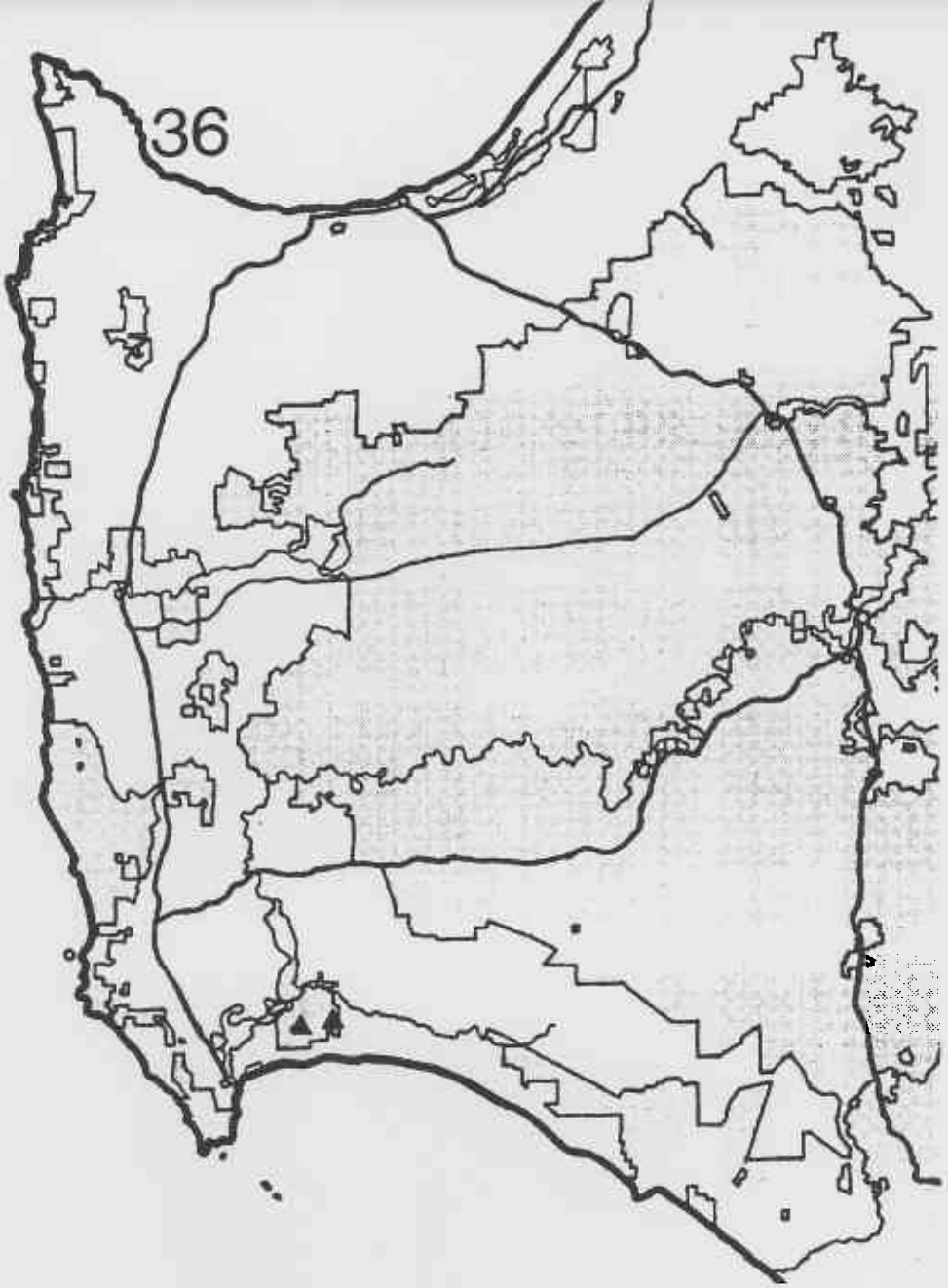
Pop No	Shire	District	Population	Land Status	No	Condition
1	A/MR	CF	Scott 1	national park	50	good
2	A/MR	CF	Scott 2	national park	150	good

RESPONSE TO DISTURBANCE

Response to soil disturbance, weed invasion, fire and *Phytophthora* is unknown.

RECOMMENDATIONS

This species should be searched for between the Scott Plains and Albany.


36

STYLIDIUM BARLEEI F. Muell. Stylidiaceae

DESCRIPTION

Stylidium barleei is a rosetted perennial herb with a few offshoots. Leaves are ovate or spathulate, prominently irregularly toothed, glandular-pubescent on both sides. Inflorescence slender, glandular to 30 cm tall. Flowers, borne on a loose elongate raceme, are pale cream to pale yellow in colour. Flowering occurs between October and November.

DISTRIBUTION AND HABITAT

Stylidium barleei has been recorded from near Busselton to the Nillup Plain, south-west of Nannup. Within this area the species has been recorded in low open woodlands of Jarrah (*Eucalyptus marginata*), Jarrah and *Banksia* and rarely Mountain Marri (*Eucalyptus haematoxylon*) on white sand or lateritic sand.

CONSERVATION STATUS

Current Status: P2 Recommended: P3

KNOWN POPULATIONS (Map 37)

Pop No	Shire	District	Population	Land Status	No	Condition
1	Buss	CF	Swan	Shire	51	good
2	Buss	CF	Whicher 1	State Forest	>100	good
3	Buss	CF	Whicher 2	State Forest	>100	good
4	Buss	CF	Whicher 3	State Forest	>200	good
5	N	CF	Chester	State Forest	53	good
6	A/MR	CF	Milyeanup	State Forest	>100	good

RESPONSE TO DISTURBANCE

Soil Disturbance - unknown.

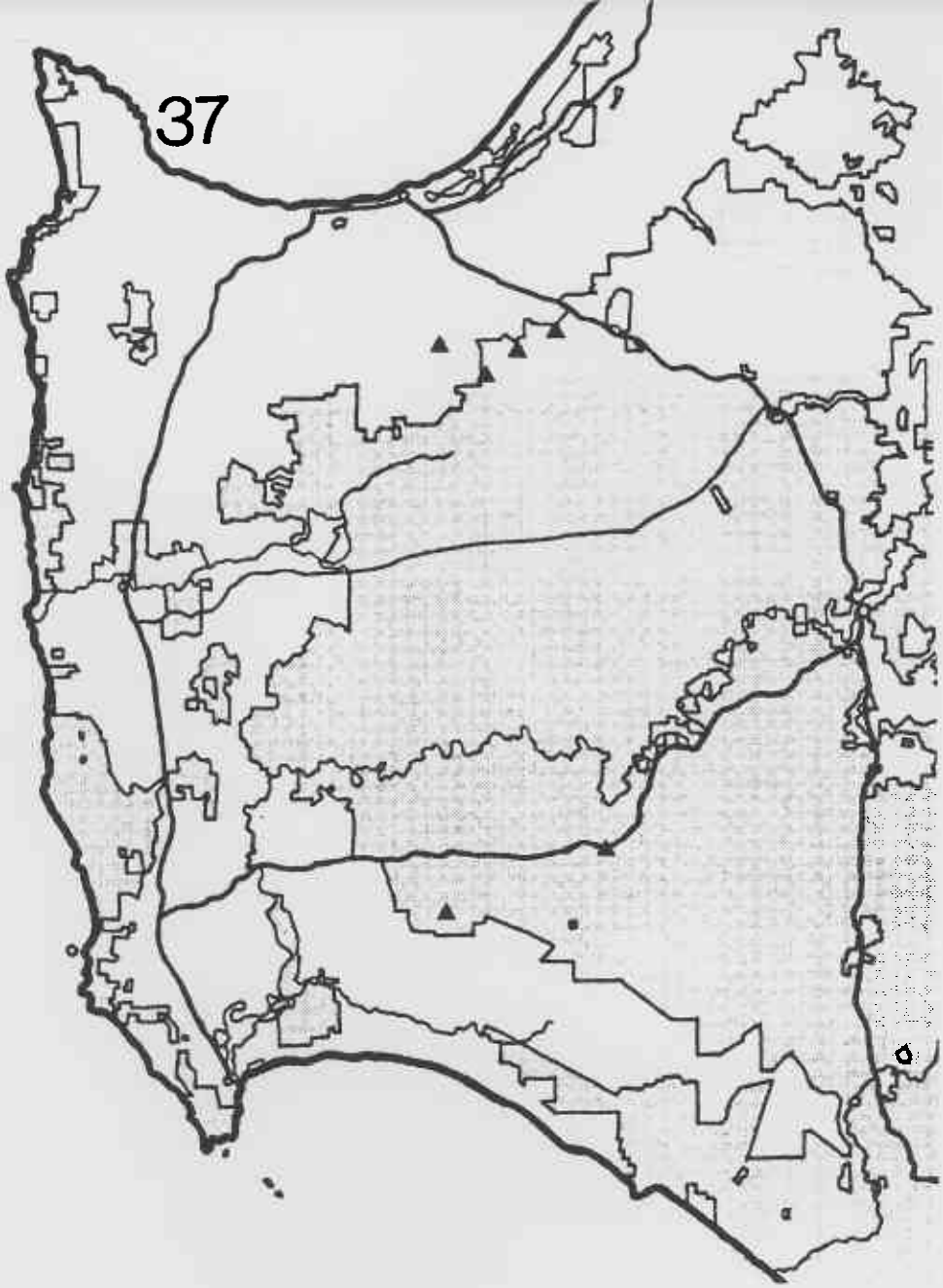
Weed Invasion - unknown.

Fire - killed by fire.

Phytophthora - unknown.

RECOMMENDATIONS

This species is probably widespread through the forest lands on the Blackwood Plateau. Surveys should be undertaken in this region. If the species is found throughout the region it should be removed from the priority list.


37

TRIPTEROCOCCUS "PANICULATUS" (Robinson 414) Stackhousiaceae

DESCRIPTION

Tripterococcus paniculatus is a slender erect shrub to 1.2 m with few stems and scale like leaves. Flowers are in paniculate terminal inflorescences, on long pedicels usually in groups of 2-4. Flowers are yellow-orange with short obtuse corolla-lobes. Flowering occurs between December and March.

DISTRIBUTION AND HABITAT

Tripterococcus paniculatus occurs between Yelverton and Walpole. On the Scott Plain the species occurs in depressions in low open woodland usually dominated by sedges on sand over clay or clay.

CONSERVATION STATUS

Current Status: P2 Recommended: P4

KNOWN POPULATIONS (Map 38)

Pop No	Shire	District	Population	Land Status	No	Condition
1	N	CF	Gingilup	nature reserve	2	good
2	A/MR	CF	Chester 1	State Forest	1	good
3	A/MR	CF	Chester 2	State Forest	1	good
4	A/MR	CF	Scott 1	national park	5	good
5	A/MR	CF	Scott 2	national park	1	good
6	A/MR	CF	Scott 3	national park	1	good
7	A/MR	CF	Alex Bridge	?road reserve	1	good

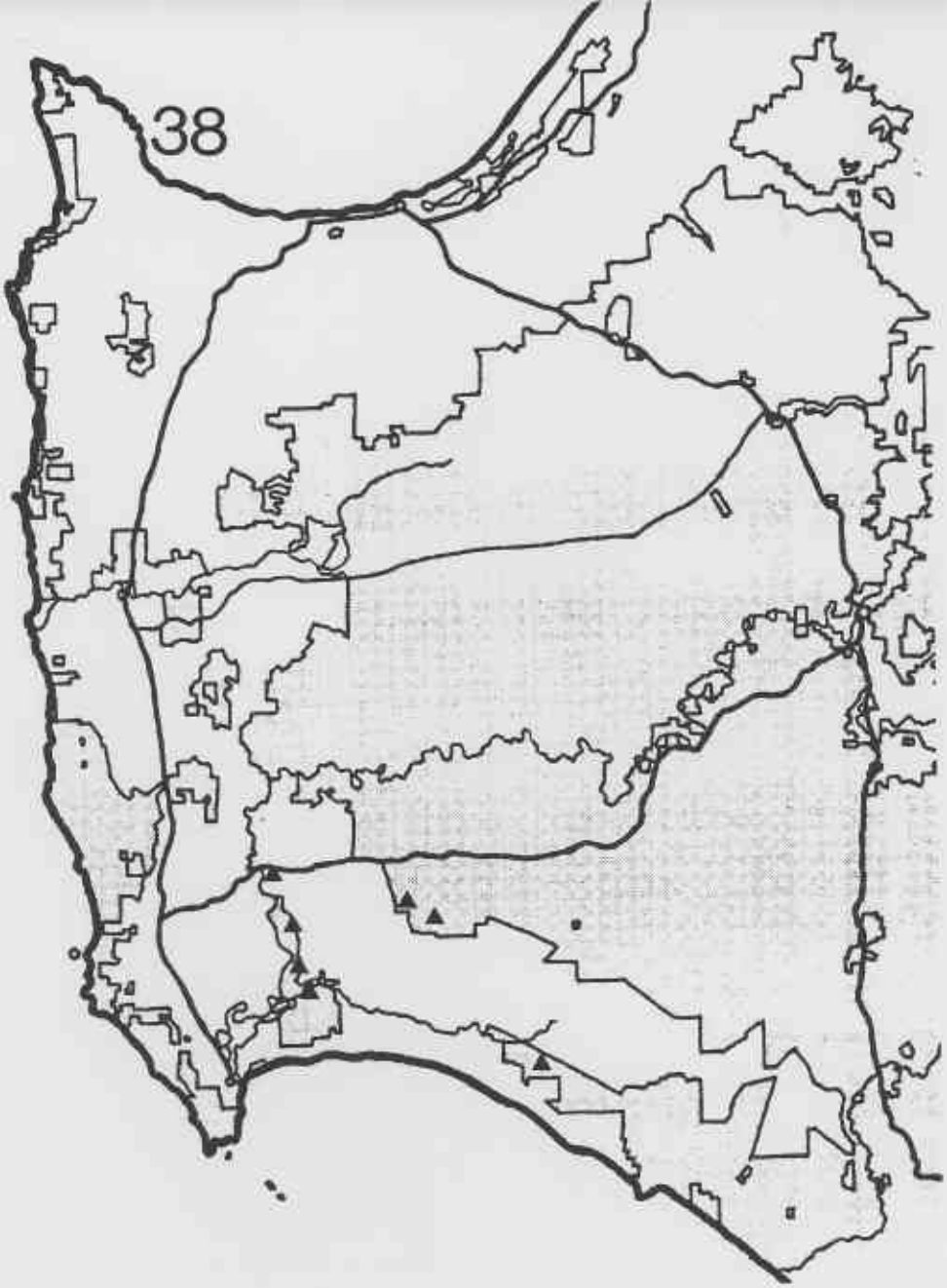
RESPONSE TO DISTURBANCE

This species is killed by fire but appears to regenerate vigorously after fire. The very low population counts are probably explained by time since the last fire.

Response to soil disturbance, weed invasion and *Phytophthora* is unknown.

RECOMMENDATIONS

This species appears to be a post-fire short-lived shrub which is difficult to survey except when it is common after fire. With a range from near Busselton to Walpole, the species is known from several areas of State Forest, 1 nature reserve and 1 national park. The species appears to be under no immediate risk and should be downgraded to P4.


38

VERTICORDIA LEHMANNII Schau. Myrtaceae

DESCRIPTION

Slender erect shrub, densely branched at base with erect flowering branches to 40 cm. Flowers few in upper axils, pink. The style is distinctly incurved. Flowering occurs between December and February.

DISTRIBUTION AND HABITAT

Verticordia lehmannii occurs between Busselton and Walpole. The species occurs in heath or sedgeland on sand over clay on winter-wet flats.

CONSERVATION STATUS

Current Status: P2 Recommended: P3

KNOWN POPULATIONS (Map 39)

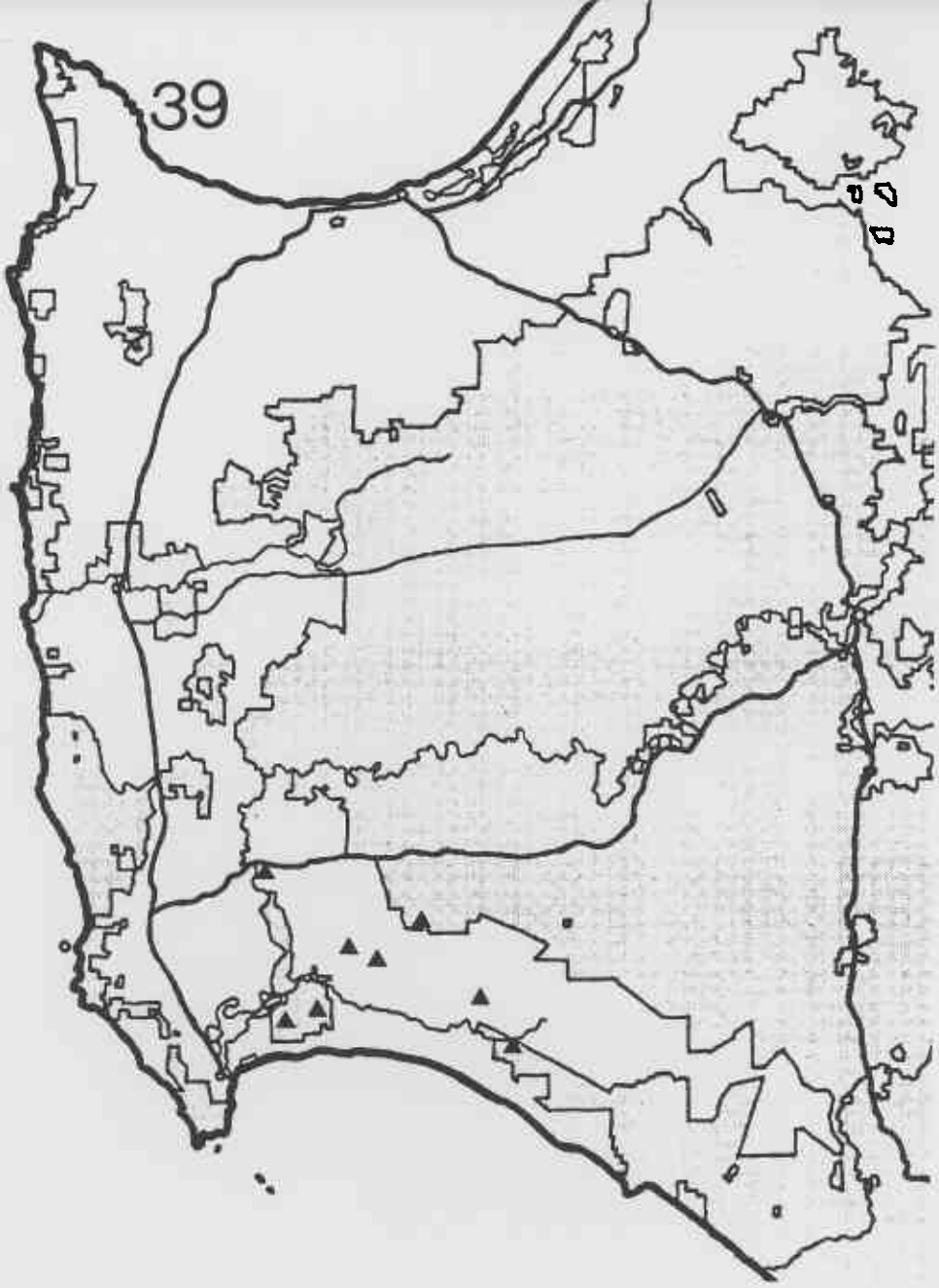
Pop No	Shire	District	Population	Land Status	No	Condition
1	N	CF	Chester	State Forest	>100	good
2	N	CF	Mileyamp	road reserve	25	good
3	N	CF	Gingilup	nature reserve	>100	good
4	A/MR	CF	Gov. Broome	road reserve	73	good
5	A/MR	CF	McGregor	private	>100	good
6	A/MR	CF	Alex. Bridge	road reserve	>100	good
7	A/MR	CF	Scott 1	national park	>100	good
8	A/MR	CF	Scott 2	national park	>100	good

RESPONSE TO DISTURBANCE

Response to soil disturbance, weed invasion, and *Phytophthora* is unknown. The species is killed by fire.

RECOMMENDATIONS

This is a cryptic species not readily observed. However populations on the Scott Plain have been found in 1 State Forest block, 1 nature reserve and 1 national park. The species can now be listed as priority three, not priority two.


39

VILLARSIA LASIOSPERMA F. Muell. Menyanthaceae

DESCRIPTION

Caespitose tufted tuberous emergent aquatic herb. Basal rosette of leaves, green, glabrous, to 30 cm long, leaf blade 2.5-9 cm long, ovate-lanceolate, acute. Inflorescence to 90 cm tall, flowers white. Flowering occurs between November and January.

DISTRIBUTION AND HABITAT

Villarsia lasiosperma has been sporadically recorded from Busselton to Albany with an outlier at Esperance. The species occurs in winter-wet depressions, usually under *Melaleuca* low open woodland or shrubland on clay soils.

CONSERVATION STATUS

Current Status: P3 Recommended: ?delete

KNOWN POPULATIONS (Map 40)

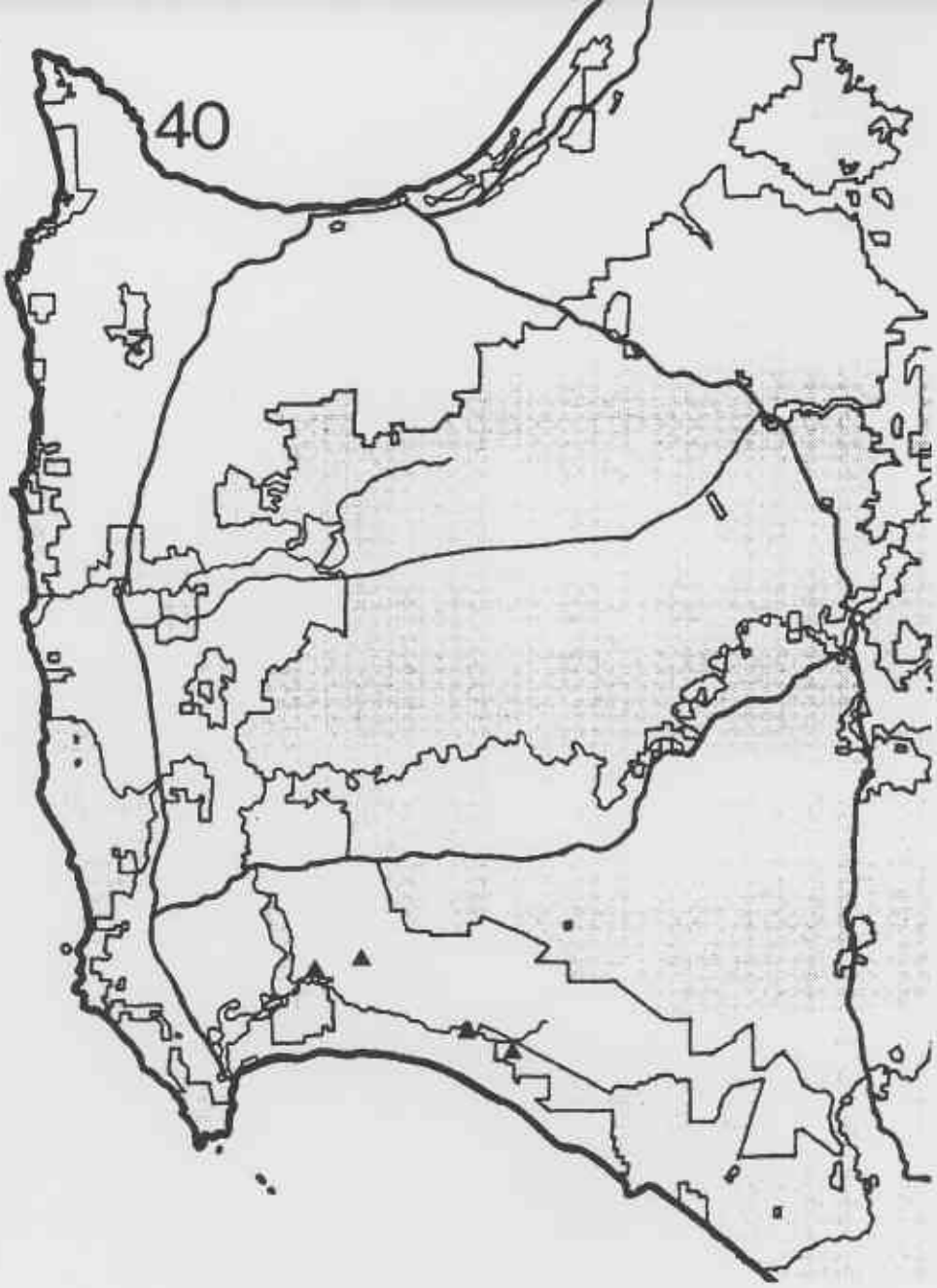
Pop No	Shire	District	Population	Land Status	No	Condition
1	N	CF	Gingilup	nature reserve	>200	good
2	N	CF	Mileyanup	water reserve	100	good
3	A/MR	CF	McGregor	private	>200	good
4	A/MR	CF	Scott	national park	>500	good

RESPONSE TO DISTURBANCE

Response to soil disturbance, weed invasion, fire and *Phytophthora* is unknown.

RECOMMENDATIONS

This species has a range of over 800 km. It appears common within the only area of its range surveyed in detail. It should be equally common between Black Point and Albany. If this proves to be the case it should be deleted from the priority list.


40

PART FOUR: RARE OR FLORA IN NEED OF SPECIAL PROTECTION OF THE BUSSELTON AREA

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ACTINOTUS SP. NOV. (G. Keighery 12,413) Apiaceae

DESCRIPTION

This species was first collected by Greg Keighery in 1990 in the proposed Whicher Range Nature Reserve.

Actinotus sp. is an erect many stemmed but few branched shrub from a corky rootstock to 0.5 m in height. Flowers are in dense white woolly heads to 3-5 cm diameter. The slender flowering branches have a few scattered trifurcated leaves. More numerous and larger leaves usually trifurcated and clothed with downy hairs are located at the base of the flowering stems.

DISTRIBUTION AND HABITAT

Actinotus sp. is confined to the Whicher Range, where it is found on white leached sands. It grows with *Banksia attenuata* low open woodland over heath or in the second population *Beaufortia squarrosa* shrubland.

CONSERVATION STATUS

Endangered	Rare	In Need of Special Protection
		X

This highly restricted species, endemic to the Whicher Range is known from two populations of 200 plants. It is well represented in the proposed Whicher Range Nature Reserve.

KNOWN POPULATIONS (Map 41)

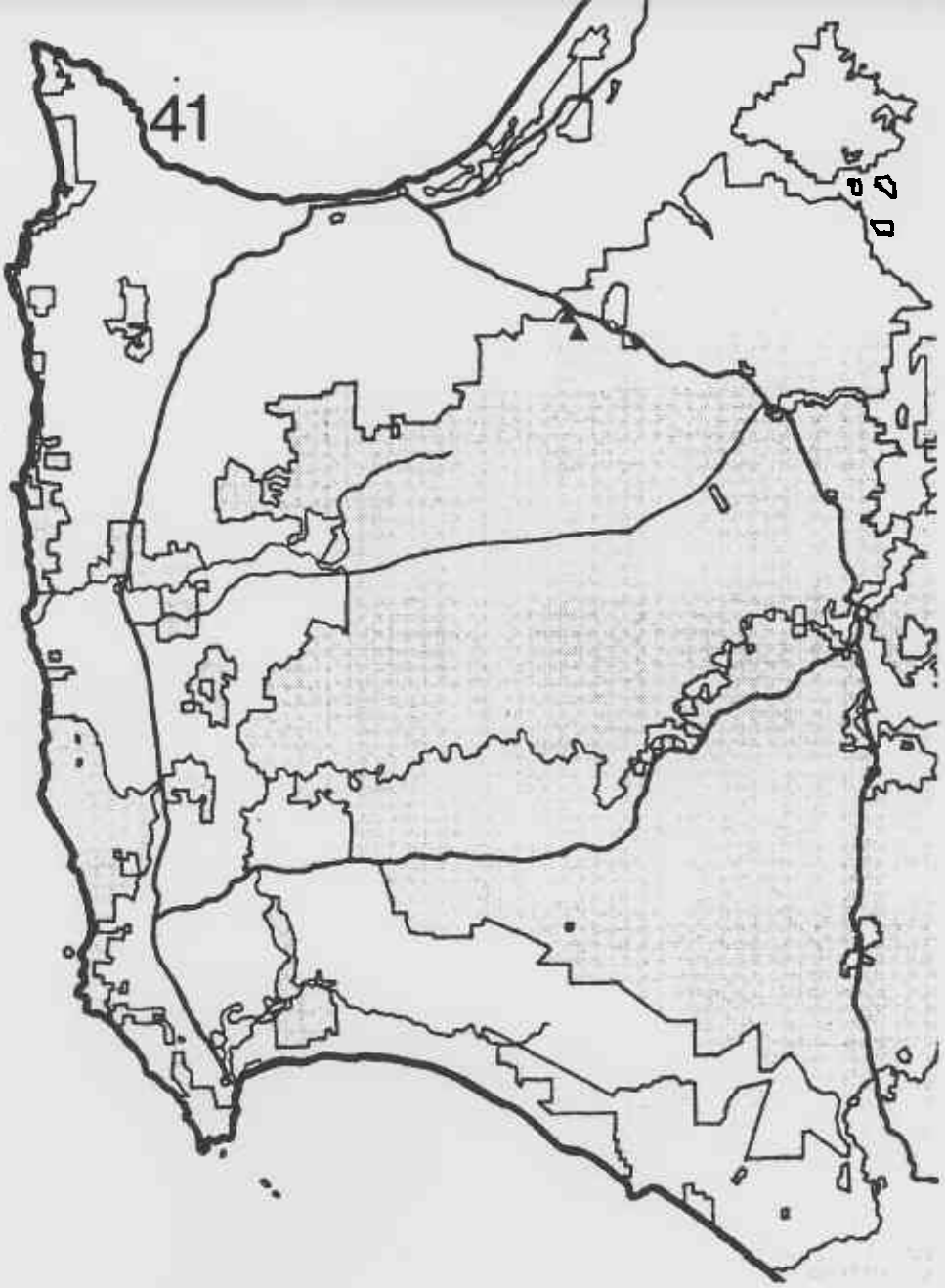
Pop No	Shire	District	Population	Land Status	No	Condition
1	Buss	CF	Whicher 1	State Forest	270	good
2	Buss	CF	Whicher 2	State Forest	120	good

RESPONSE TO DISTURBANCE

Response to soil disturbance, weed invasion, fire and *Phytophthora* is unknown.

RECOMMENDATIONS

This is a very distinct species with no close relatives in Western Australia. The wild populations are contained within the proposed Whicher Range Nature Reserve. Further surveys of the distribution of this species are needed to ascertain if it should be declared as endangered.


41

ASTARTEA SP. 2 (GK 9556) Myrtaceae

Ironstone Astartea

DESCRIPTION

Astartea sp. 2 is a slender erect shrub with non-drooping branches, 1-2 m in height with a single basal stem. The leaves are linear, triangular in cross section, entire and up to 7 mm long. The flowers are borne singly or paired in the upper leaf axils on short peduncles not exceeding the leaves. Flowers have white petals and are very small and inconspicuous. Flowering occurs from November to January.

NOTES

M.E. Trudgen, who is revising this genus, regards this taxon as a member of a species complex, the other member of which occurs on clay soils on the Swan Coastal Plain from Muchea to Boyanup thence inland to Manjimup. The ironstone plants have the smallest flowers of this complex.

DISTRIBUTION AND HABITAT

Astartea sp. 2 is confined to the Swan Coastal Plain, south-west and east of Busselton. Within this area the species grows in tall heath on red sandy clay over shallow ironstone.

CONSERVATION STATUS

Current Status: not listed Recommended: P1

KNOWN POPULATIONS (Map 42)

Pop No	Shire	District	Population	Land Status	No	Condition
1	Buss	CF	Ruabon	rail reserve	103	good
2	Buss	CF	Fish Rd	nature reserve	157	good

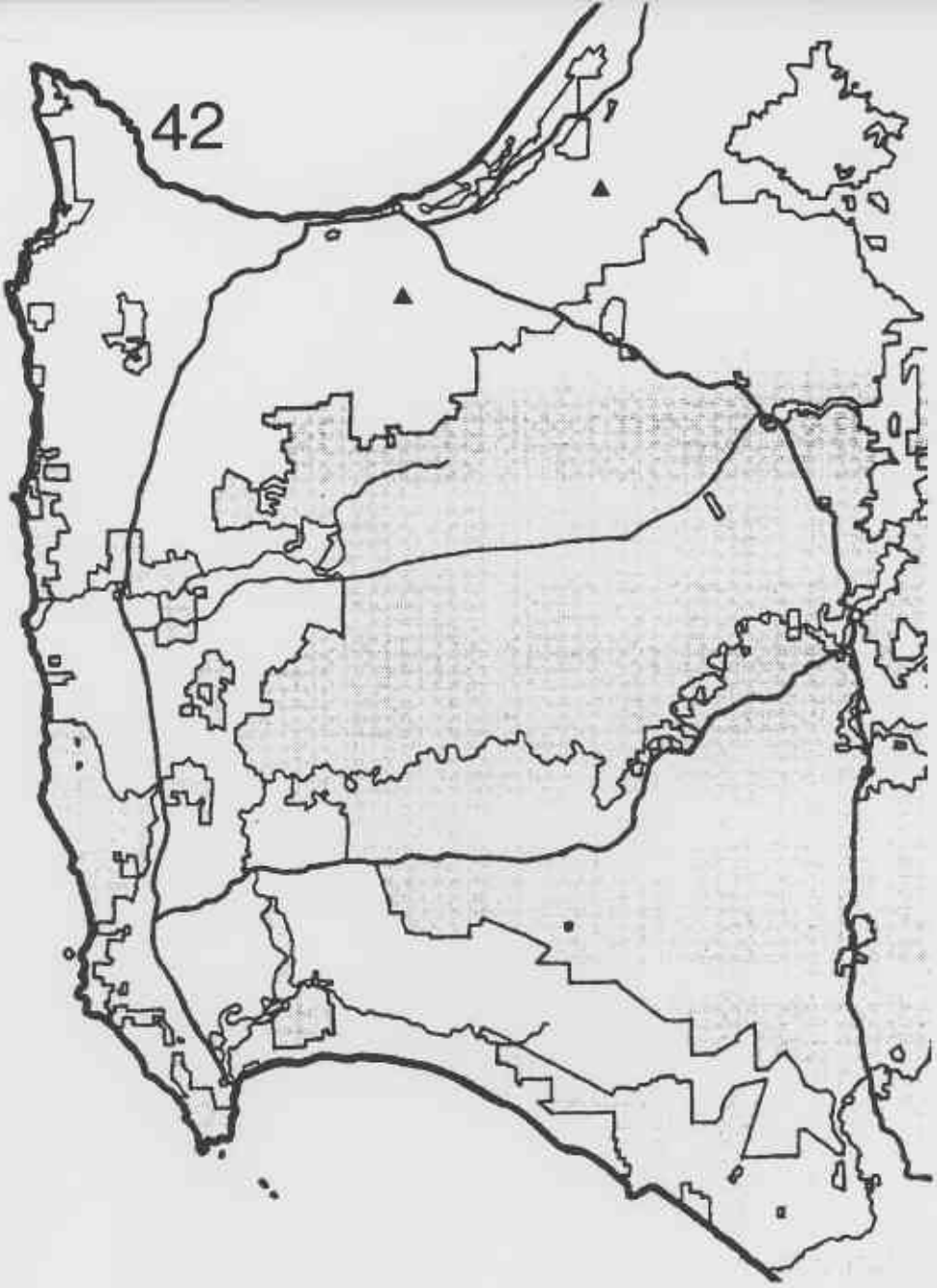
RESPONSE TO DISTURBANCE

This species is killed by road grading and fire. It appears resistant to *Phytophthora* on field observations.

RECOMMENDATIONS

A potentially rare species only recognized near the completion of the survey when it first flowered. Currently known from two populations, the largest being from a nature reserve.

Further surveys of this species are urgently required, however, the degree of clearing within its preferred habitat suggests major new populations are unlikely to be found.


42

BRACHYSEMA SP. NOV. (GK 12719) Fabaceae

Ironstone Brachysema

DESCRIPTION

Brachysema sp. nov. is a sprawling mound forming shrub to 1.5 m x 1.5 m in width. Leaves are a truncated wing shape with a pungent point, to 2 cm long. Flowers are red in loose inflorescences.

NOTE

Differs from *Brachysema praemorsa* in flowering time (September - October) vs February - March, leaf shape, flower shape and number in the inflorescence.

DISTRIBUTION AND HABITAT

This is a poorly known, but presumably rare species, which was unknown before its collection during the ironstone survey. Currently it is known from only a single site on State Forest land below the Whicher Range south-west of Busselton. Here it grows on red sandy-clay over ironstone as a major component of dense heath vegetation.

CONSERVATION STATUS

Current Status: not listed Recommended: P1

KNOWN POPULATIONS (Map 43)

Pop No	Shire	District	Population	Land Status	No	Condition
1	Buss	CF	Williamson	State Forest	*>100	good

*population burnt summer 1991

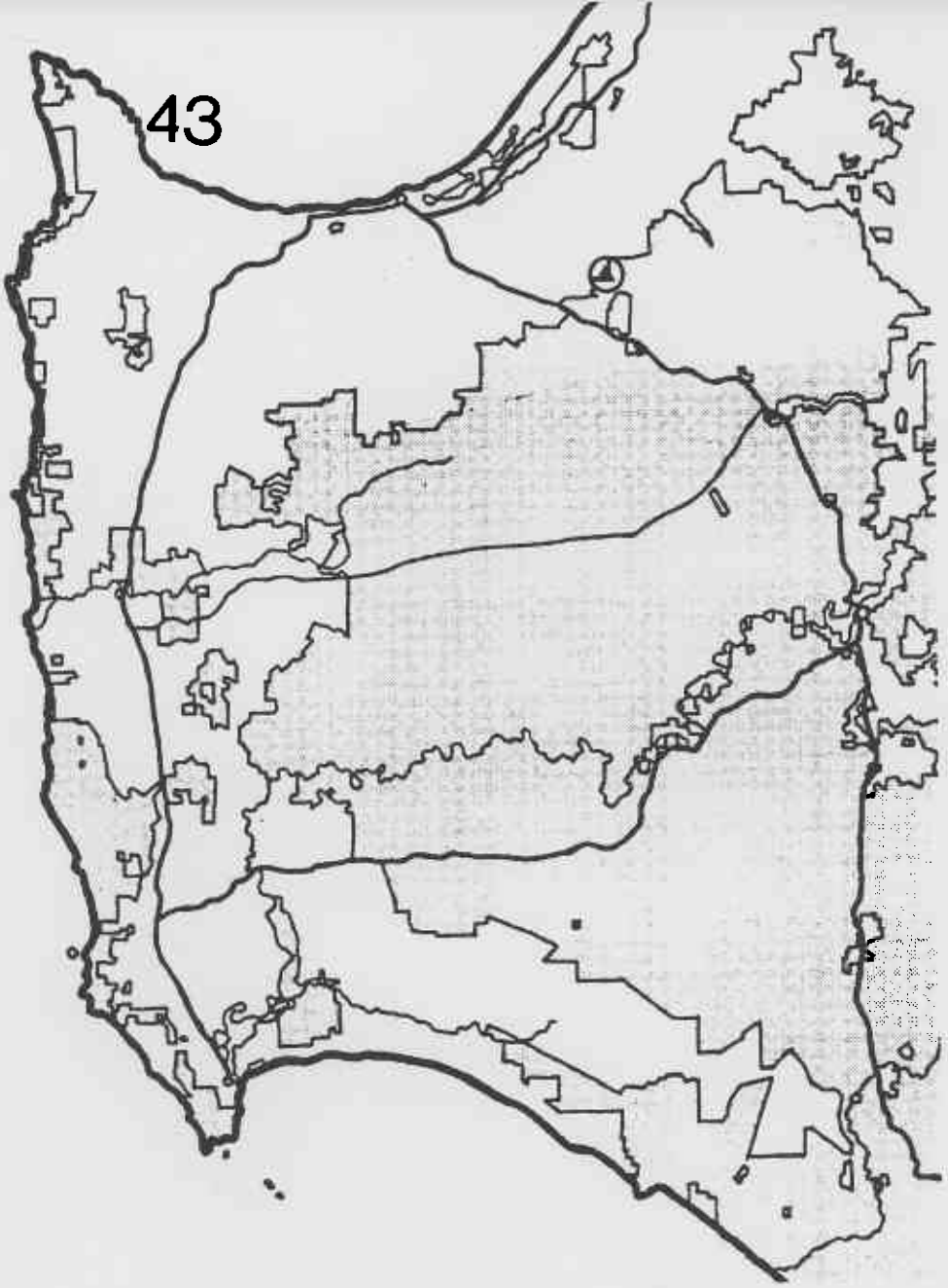
RESPONSE TO DISTURBANCE

Response to soil disturbance, weed invasion, fire and *Phytophthora* is unknown.

RECOMMENDATIONS

A poorly known but presumably rare species, recorded from one locality where 100+ plants were located. The State Forest block where it is found is included in mineral sands mining claims which may seriously affect this species' survival if mining occurs.

The population was partially burnt in the summer of 1991/92. Recovery of plants will be monitored. Further surveys of this area are desirable.


43

DARWINIA ?APICULATA (GK 12,717) Myrtaceae

DESCRIPTION

Darwinia aff. *apiculata* is a low mound forming shrub to 50 cm x 50 cm. Leaves are recurved on the stem, linear, triquebrous in outline, 5-7 mm long, with sparse hairs. They are clustered at the ends of branches, the older branches retaining the prominent leaf bases. Inflorescences consist of 20-30 flowers, with long tapering acute bracts surrounding the flowers. Flowering occurs in December.

NOTES

This population was burnt after it had been discovered when the plants were in post-flowering state during early winter. However, remnant floral heads revealed that it is not *D. "ferricola"* (this species lacks the long acuminate floral bracts) nor *D. oederoides* (which has erect leaves and small floral heads). This population is apparently closely related to *Darwinia apiculata*, a gazetted rare species, only known from the Swan region in the Darling Range.

CONSERVATION STATUS

Current Status: Recommended: cannot allocate until taxonomy is resolved

KNOWN POPULATIONS (Map 44)

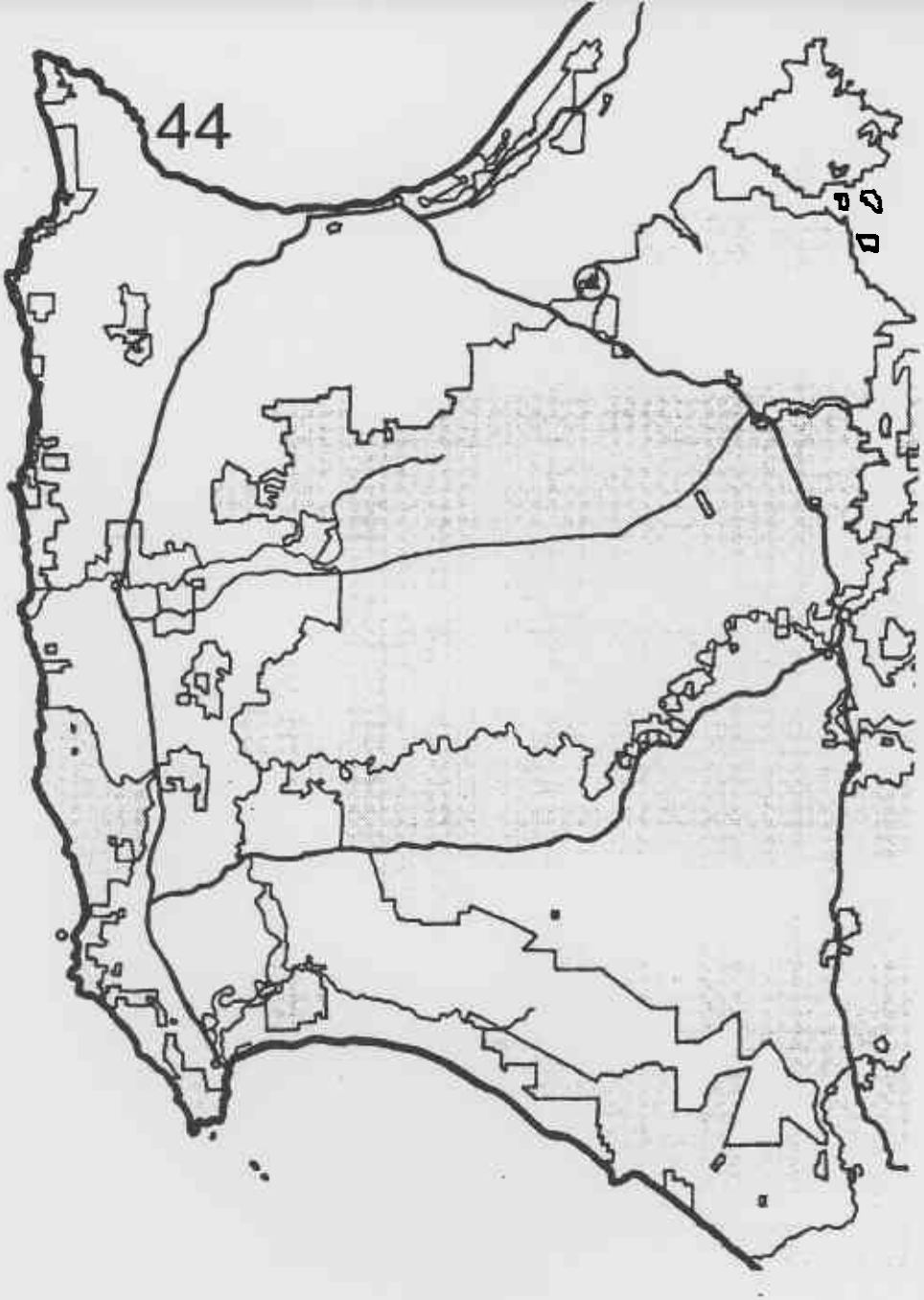
Pop No	Shire	District	Population	Land Status	No	Condition
1	Buss	CF	Williamson	State Forest	27	good

RESPONSE TO DISTURBANCE

Response to soil disturbance, weeds and *Phytophthora* is unknown, but the species is killed by fire.

RECOMMENDATIONS

The recovery of this population following the fire must be closely monitored. The status of this population must be determined when flowering material becomes available.


44

DRYANDRA SP. 30 (A.S. George 11657) Proteaceae

TAXONOMY

Closely related to *Dryandra squarrosa*.

DESCRIPTION

Dryandra sp. is a tall densely branched slender shrub to 4 m tall and almost glabrous. Leaves are linear-lanceolate, stiff, with toothed notches, 4-8 cm long. Flower heads are small, ca. 2 cm wide and yellow, surrounded by numerous lanceolate or linear bracts with recurved tips. Flowering occurs between July and November.

DISTRIBUTION AND HABITAT

The species occurs on the southern margin of the Swan Coastal Plain, south of Busselton. Here it occurs in Dryandra heath over sedges on winter-wet red clay over ironstone.

CONSERVATION STATUS

Current Status: P1 Recommended: DRF

KNOWN POPULATIONS (Map 45)

Pop No	Shire	District	Population	Land Status	No	Condition
1	CF	Capel	Tutunup	rail reserve	45	disturbed declining
2	CF	Buss	Treeton	private	150	disturbed
3	CF	A/MR	Whicher	State Forest	500	disturbed
4	CF	A/MR	Whicher	State Forest	?	burnt

RESPONSE TO DISTURBANCE

Soil Disturbance - killed by illegal bulldozer activity in population 1.

Weed Invasion - unknown.

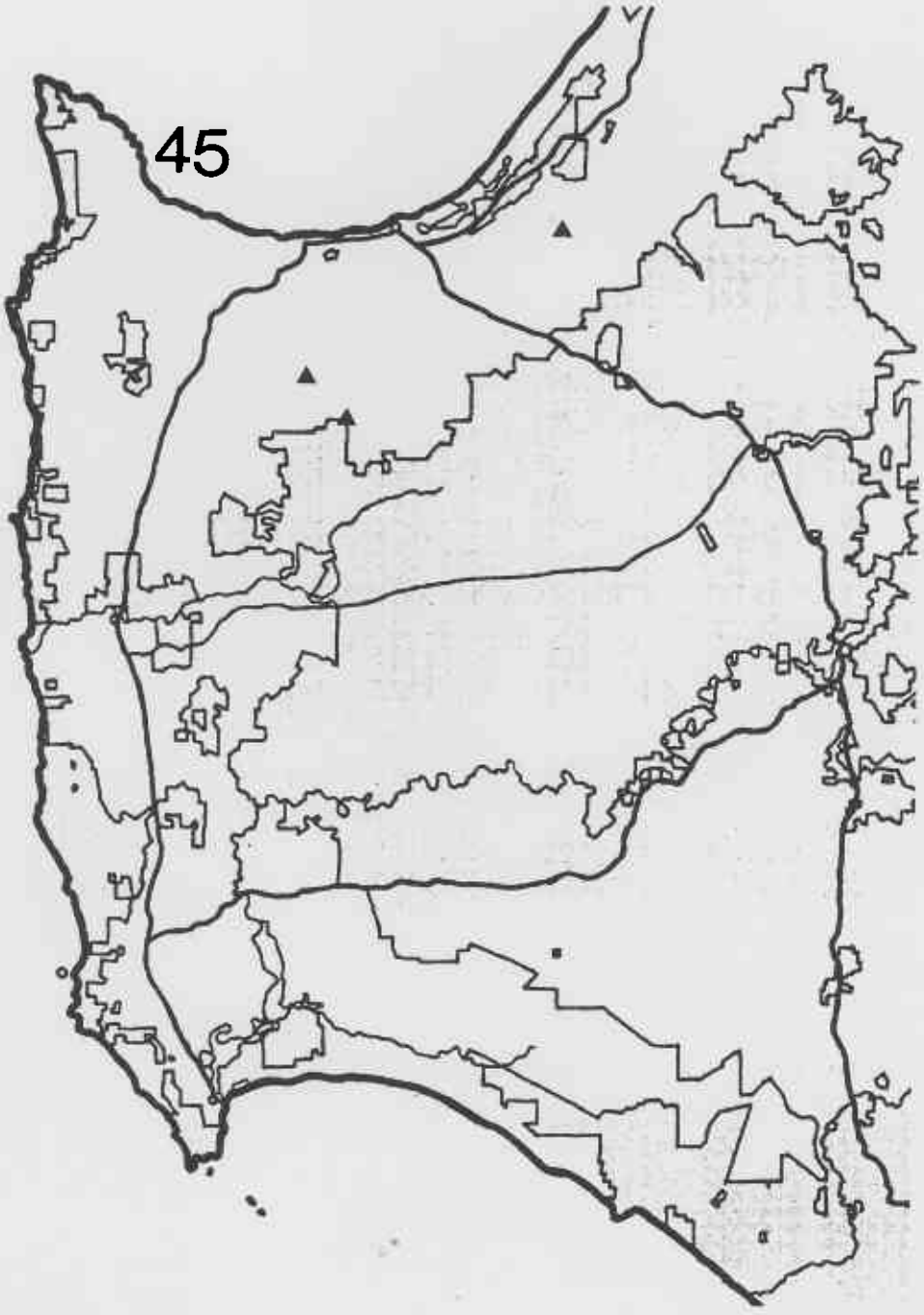
Fire - killed by fire.

Phytophthora - susceptible, plants dying in all populations.

RECOMMENDATIONS

Acquisition of the private land around the Treeton/Jindong road intersection would protect this and other potentially rare species. The species should be declared as rare. Urgent survey for further populations along the base of the Whicher Range should be undertaken. Material of this species needs to be brought into cultivation and the existing populations actively managed to ensure their continuity.

This species sets copious amounts of seed and is readily grown by cuttings (I.R. Dixon, pers. comm.). It should be brought into cultivation.



LOXOCARYA SP. (GK 11769) Restionaceae

"Swan Ironstone Loxocarya"

DESCRIPTION

Robust rhizomatous tufted perennial herb to 1.5 m tall x 40 cm wide. Culms numerous, erect, grey-green, slightly twisted. Male inflorescences brown, dense, twisted, erect. Female inflorescences reddish, erect, 1-2 flowers. Flowering occurs between September and October.

NOTES

Very similar to the Scott Plain *Loxocarya*, essentially differs in fruit and seed characters (K. Dixon, pers. comm.).

DISTRIBUTION AND HABITAT

Loxocarya sp. (GK 11769) is confined to the Swan Coastal Plain, south-west and south-east of Busselton. Here it grows in mid-dense heath or open heath on winter-wet flats on shallow red sandy clay over ironstone.

CONSERVATION STATUS

Current Status: not listed Recommended: P1

KNOWN POPULATIONS (Map 46)

Pop No	Shire	District	Population	Land Status	No	Condition
1	Buss	CF	*Ruabon	rail/road reserve	104	good/poor
2	Buss	CF	Fish Rd	nature reserve	11	good
3	Buss	CF	Fish Rd	road reserve	5	good
4	Buss	CF	Price	road reserve	7	poor
5	Buss	CF	Carbunup	road reserve	5	poor
6	Buss	CF	Treeton	private	>500	good
7	A/MR		Whicher 1	State Forest	>100	good
8	A/MR		Whicher 2	State Forest	6?	burnt

*1992 survey suggests >500 plants in several areas

RESPONSE TO DISTURBANCE

Soil Disturbance - killed by road verge grading

Weed Invasion - unknown.

Fire - killed by fire.

Phytophthora - unknown.

RECOMMENDATIONS

The Ruabon rail verge population should be monitored annually.

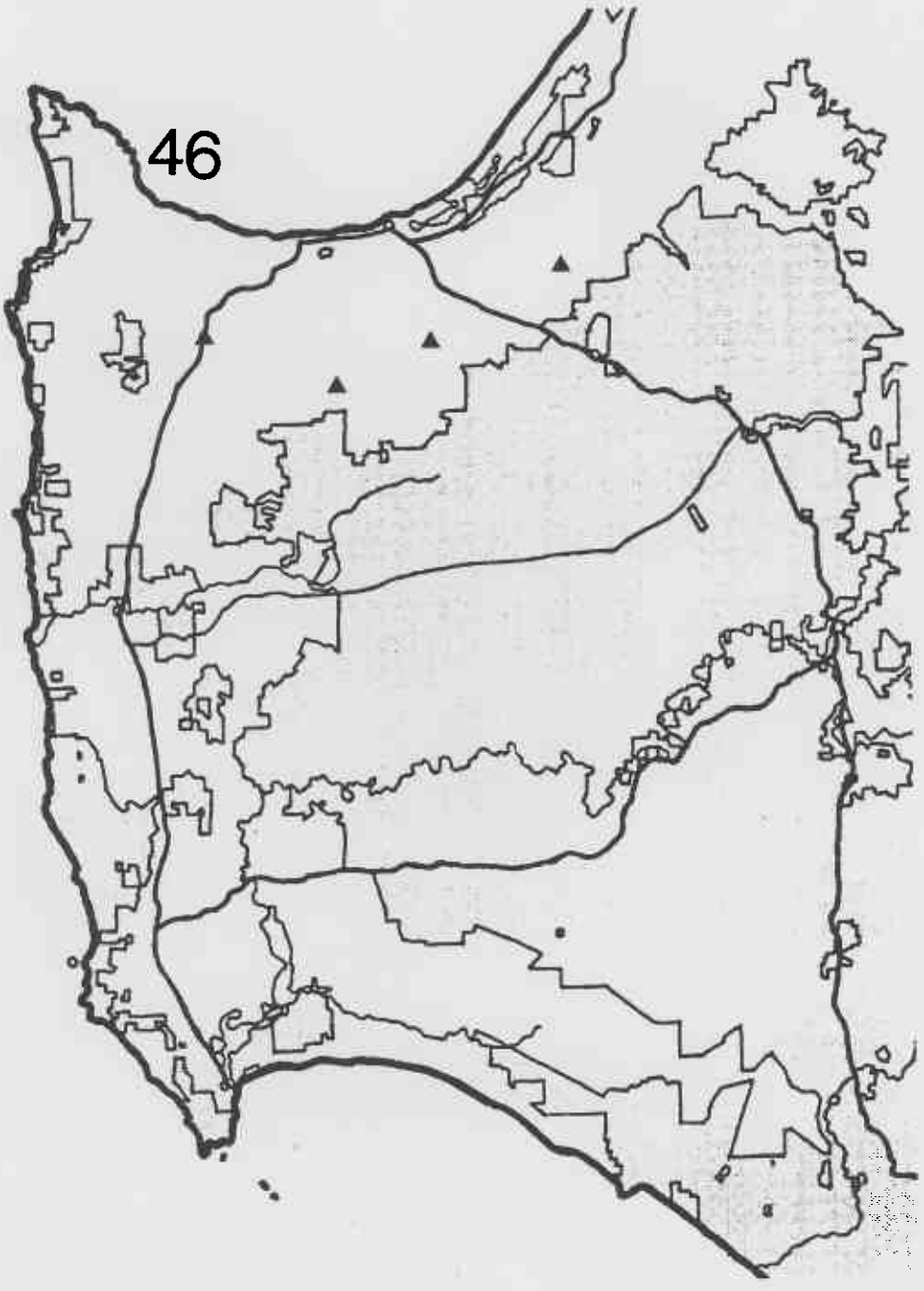
Westrail should be notified of the occurrence of this species on their land and the population clearly marked.

Further surveys of this taxon are required.

This species should be brought into cultivation.

The area on Treeton Road should be acquired as a reserve.

Consideration should be given for gazettal as rare flora.



PETROPHILE "LATERICOLA" (GK 11790) Proteaceae

"Ironstone Pixie Mop"

DESCRIPTION

Slender erect few branched shrub to 2 m, 4-5 stems from a woody rootstock. Leaves erect-spreading, terete, pungent, 10-30 mm long. Inflorescences terminal, usually 2-4 clustered together, small. Flowers bright yellow. Flowering occurs in October and November.

NOTES

Part of the *P. brevifolia* complex from which it differs in the tall slender habit, short leaves and small clustered flower heads.

DISTRIBUTION AND HABITAT

Previously unknown before this survey. *Petrophile "latericola"* is confined to the Swan Coastal Plain, south-east of Busselton. Within this area it occurs in tall or low heath on winter-wet flats of red sandy clay over ironstone.

CONSERVATION STATUS

Current Status: not listed Recommended: declare as rare

KNOWN POPULATIONS (Map 47)

Pop No	Shire	District	Population	Land Status	No	Condition
1	Buss	CF	Ruabon	rail/road reserve	1	poor
2	Buss	CF	Williamson	State Forest	137	*good

*burnt summer 1991

RESPONSE TO DISTURBANCE

This species is killed by road verge grading. Field observations suggest it is highly susceptible to *Phytophthora*. Plants were apparently killed in the 1991 fire.

RECOMMENDATIONS

The only large population of this taxon known is on a mineral sands mining claim. It must be ascertained if and when mining is likely to occur and if this population will be affected.

The post-fire recovery of the large population must be monitored.

Urgent further surveys of this species are required. If no further populations are located, it should be gazetted as rare flora.

The effects of *Phytophthora* on the remaining population require study.

This species must be brought into cultivation.