

Declared Rare and Poorly Known Flora in the Esperance District

by Gillian F Craig and David J Coates



2001

Wildlife Management Program No 21



DEPARTMENT OF 
Conservation
AND LAND MANAGEMENT
Conserving the nature of WA


Natural Heritage Trust
Helping Communities Help Australia

WESTERN AUSTRALIAN WILDLIFE MANAGEMENT PROGRAM NO. 21

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David J. Coates

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FOREWORD

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

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

Priority Flora that are under consideration for declaration as rare are also dealt with, but in less detail than the Declared Rare Flora. However, the information contained in this Program should assist in the ongoing work of assessing their conservation status.

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

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

Information in this Plan was accurate at 1992.

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Of particular assistance to this project was the Western Australian Herbarium database under the supervision of A.R. Chapman. This system allows scrutiny of rare flora collections held in PERTH, and hard-copy printouts for field and other use.

ABBREVIATIONS

| | |
|--------------|--|
| Alb | Albany |
| AR | Aboriginal Reserve |
| Aug | Augusta |
| Bldr | Boulder |
| BR | Bruce Rock |
| Brktn | Brookton |
| Bsltn | Busselton |
| CALM | Department of Conservation and Land Management |
| Car | Carnamah |
| Cbk | Cranbrook |
| Cool | Coolgardie |
| Cor | Corrigin |
| Crw | Coorow |
| Degen. | Degenerated |
| Dnmk | Denmark |
| DRF | Declared Rare Flora |
| Dum | Dumbleyung |
| Dund | Dundas |
| Dwel | Dwellingup |
| Esp | Esperance |
| Ger | Geraldton |
| Gno | Gnowangerup |
| Gold | Goldfields |
| Jer | Jerramungup |
| Kal | Kalgoorlie |
| Kat | Katanning |
| Kon | Kondinin |
| LG | Lake Grace |
| Manj | Manjimup |
| Mdg | Mundaring |
| Men | Menzies |
| Mer | Merredin |
| Metro | Metropolitan |
| MRWA | Main Roads W.A. |
| MRWA Rd Res. | Main Roads W.A. Road Reserve |
| MtM | Mt Marshall |
| Mur | Murray |
| Nar | Narrogin |
| Nor | Northam |
| NP | National Park |
| NR | Nature Reserve |
| Nthn | Northampton |
| Nun | Nungarin |
| Part-dist. | Part-disturbed |
| Per | Perenjori |
| Pilb | Pilbara |
| Pigt | Plantagenet |
| Post-dist. | Post-disturbance |
| Private | Private Property |
| Rail Res. | Rail Reserve |
| Rav | Ravensthorpe |
| Rav Range | Ravensthorpe Range |
| Rd Res. | Road Reserve |
| Rd Verge | Road Verge |
| Regen. | Regenerated |
| Research Stn | Research Station |

| | |
|------------------|----------------------------|
| Seedl. | Seedlings |
| Shire Recr. Res. | Shire Recreational Reserve |
| Shire Res. | Shire Reserve |
| Shire Rd Res. | Shire Road Reserve |
| Shire Water Res. | Shire Water Reserve |
| Tam | Tammin |
| Timber Res. | Timber Reserve |
| Tra | Trayning |
| Unvested Res. | Unvested Reserve |
| VCL | Vacant Crown Land |
| VP | Victoria Plains |
| VPF | Vermin Proof Fence |
| Wal | Walpole |
| Water Res. | Water Reserve |
| West | Westonia |
| Yil | Yilgarn |

TABLE OF CONTENTS

| Page | | Page |
|---|---|-----------|
| Foreword..... | | iii |
| Acknowledgements..... | | iv |
| Abbreviations..... | | v |
| PART ONE: INTRODUCTION..... | | 1 |
| 1. The Need for Management..... | | 1 |
| 2. Objective of the Program..... | | 1 |
| 3. Rare Flora Legislation and Guidelines for Gazettal..... | | 3 |
| 4. CALM's Priority Flora List..... | | 5 |
| 5. Responsibilities within the Department..... | | 6 |
| 6. The Esperance District..... | | 6 |
| 7. Botanical History of the Esperance District..... | | 8 |
| PART TWO: DECLARED RARE FLORA IN THE ESPERANCE DISTRICT..... | | 10 |
| Extant Taxa..... | | 11 |
| <i>Adenanthos eyrei</i> | | 11 |
| <i>Adenanthos ileticos</i> | | 13 |
| <i>Anigozanthos bicolor</i> subsp. <i>minor</i> | | 16 |
| <i>Billardiera mollis</i> | | 18 |
| <i>Boronia revoluta</i> | | 20 |
| <i>Caladenia exstans</i> ms..... | | 22 |
| <i>Caladenia voigtii</i> ms..... | | 24 |
| <i>Conostylis lepidospermoides</i> | | 26 |
| <i>Daviesia microcarpa</i> | | 28 |
| <i>Drummondita hassellii</i> var. <i>longifolia</i> | | 30 |
| <i>Eremophila denticulata</i> subsp. <i>denticulata</i> | | 32 |
| <i>Eremophila denticulata</i> subsp. <i>trisulcata</i> ms..... | | 34 |
| <i>Eucalyptus cerasiformis</i> | | 36 |
| <i>Eucalyptus insularis</i> | | 38 |
| <i>Eucalyptus merrickiae</i> | | 40 |
| <i>Eucalyptus platydisca</i> ms..... | | 43 |
| <i>Kennedia beckxiana</i> | | 45 |
| <i>Lambertia echinata</i> subsp. <i>echinata</i> | | 47 |
| <i>Myoporum turbinatum</i> | | 49 |
| <i>Myriophyllum petraeum</i> | | 51 |
| <i>Prostanthera carrickiana</i> | | 53 |
| <i>Rhizanthella gardneri</i> | | 55 |
| <i>Ricinocarpos trichophorus</i> | | 57 |
| Presumed Extinct Taxa..... | | 59 |
| <i>Opercularia acolytantha</i> | | 59 |
| <i>Taraxacum cygnorum</i> | | 61 |
| PART THREE: PRIORITY FLORA IN THE ESPERANCE DISTRICT..... | | 63 |
| A. Priority One taxa..... | | 64 |
| <i>Acacia diaphana</i> ms..... | | 66 |
| | <i>Acacia diminuta</i> ms..... | 68 |
| | <i>Acacia dorsenna</i> | 70 |
| | <i>Acacia mutabilis</i> subsp. <i>incurva</i> ms..... | 72 |
| | <i>Acacia</i> sp. Esperance (M.A.Burgman 1833b)..... | 74 |
| | <i>Allocasuarina globosa</i> | 76 |
| | <i>Baeckea crassifolia</i> var. <i>icosandra</i> | 78 |
| | <i>Caladenia tentaculata</i> | 80 |
| | <i>Chorizema circinale</i> | 82 |
| | <i>Chorizema nervosum</i> | 84 |
| | <i>Coleanthera coelophylla</i> | 86 |
| | <i>Conostephium marchantiorum</i> | 88 |
| | <i>Conostephium uncinatum</i> | 90 |
| | <i>Dampiera sericantha</i> | 92 |
| | <i>Darwinia calothamnoides</i> ms..... | 94 |
| | <i>Darwinia</i> sp. Mt Baring (K.R.Newbey 9775)..... | 96 |
| | <i>Darwinia</i> sp. Mt Ney (M.A.Burgman & S.McNee 1274)..... | 98 |
| | <i>Dicrastylis archeri</i> | 100 |
| | <i>Dicrastylis capitellata</i> | 102 |
| | <i>Diuris concinna</i> | 104 |
| | <i>Dodonaea hexandra</i> | 106 |
| | <i>Drosera salina</i> | 108 |
| | <i>Drosera</i> sp. Hatter Hill (G.J.Barrett 15.9.89)..... | 110 |
| | <i>Eremophila chamaephila</i> | 112 |
| | <i>Eremophila compressa</i> | 114 |
| | <i>Eremophila oblonga</i> ms..... | 116 |
| | <i>Eriostemon</i> sp. Cascades (M.A.Burgman 1535)..... | 118 |
| | <i>Eucalyptus burgmantiana</i> ms..... | 120 |
| | <i>Eucalyptus delicata</i> | 122 |
| | <i>Eucalyptus jimberlanica</i> | 124 |
| | <i>Eucalyptus varia</i> subsp. <i>salsuginosa</i> | 126 |
| | <i>Eucalyptus</i> sp. B Ravensthorpe (K.R.Newbey 9715)..... | 128 |
| | <i>Eutaxia</i> sp. Hatter Hill (K.R.Newbey 6532)..... | 130 |
| | <i>Gonocarpus pycnostachyus</i> | 132 |
| | <i>Gonocarpus simplex</i> | 134 |
| | <i>Gratiola pedunculata</i> | 136 |
| | <i>Grevillea phillipsiana</i> | 138 |
| | <i>Gyrostemon ditrigynus</i> | 140 |
| | <i>Halgania tomentosa</i> | 142 |
| | <i>Haloragis</i> sp. Ravensthorpe (K.R.Newbey 8269)..... | 144 |
| | <i>Hydatella australis</i> | 146 |
| | <i>Hydrocotyle hispidula</i> | 148 |
| | <i>Hydrocotyle</i> sp. Truslove (M.A.Burgman 4419)..... | 150 |
| | <i>Leucopogon blepharolepis</i> | 152 |
| | <i>Leucopogon florulentus</i> | 154 |
| | <i>Leucopogon</i> sp. Bonnie Hill (K.R.Newbey 9831)..... | 155 |
| | <i>Leucopogon</i> sp. Clyde Hill (M.A.Burgman 1207)..... | 157 |
| | <i>Leucopogon</i> sp. Condingup (M.A.Burgman 1377)..... | 159 |

| | | | |
|--|-----|--|-----|
| <i>Leucopogon</i> sp. Coujinup (M.A.Burgman 1085)..... | 161 | <i>Caesia viscida</i> | 251 |
| <i>Leucopogon</i> sp. Kau Rock (M.A.Burgman 1126)..... | 163 | <i>Calandrinia porifera</i> | 253 |
| <i>Leucopogon</i> sp. Mount Heywood (M.A.Burgman 1211)..... | 165 | <i>Calochilus</i> sp. Hopetoun (H.Taylor s.n.) | 255 |
| <i>Leucopogon</i> sp. Munglinup (K.R.Newbey 8123)..... | 167 | <i>Chthonocephalus multiceps</i> | 257 |
| <i>Leucopogon</i> sp. Roberts Swamp (K.R.Newbey 8173)..... | 169 | <i>Comesperma lanceolatum</i> | 259 |
| <i>Leucopogon</i> sp. South Coast (K.R.Newbey 8213)..... | 171 | <i>Conospermum filifolium</i> subsp. <i>sigmoideum</i> ms.. | 261 |
| <i>Melaleuca agathosmoides</i> | 173 | <i>Dampiera decurrens</i> | 263 |
| <i>Melaleuca calycina</i> subsp. <i>dempta</i> | 175 | <i>Dampiera orchardii</i> | 265 |
| <i>Melaleuca coccinea</i> subsp. <i>eximia</i> | 177 | <i>Darwinia luehmanii</i> | 267 |
| <i>Mesomelaena</i> sp. Munglinup (M.A.Burgman 3898)..... | 179 | <i>Darwinia</i> sp. Peak Charles (A.S.George 10627) | 269 |
| <i>Microcybe</i> sp. Hatter Hill (K.R.Newbey 6546) | 181 | <i>Daviesia campephylla</i> | 271 |
| <i>Mirbelia densiflora</i> | 183 | <i>Daviesia pauciflora</i> | 273 |
| <i>Myoporum velutinum</i> ms..... | 185 | <i>Dillwynia acerosa</i> | 275 |
| <i>Otton rigidum</i> ms..... | 187 | <i>Elachanthus pusillus</i> | 276 |
| <i>Persoonia baeckeoides</i> | 189 | <i>Eremophila lactea</i> | 278 |
| <i>Phebalium rude</i> subsp. <i>lineare</i> | 191 | <i>Eriostemon apiculatus</i> | 280 |
| <i>Phlegmatospermum richardsii</i> | 193 | <i>Eucalyptus fraseri</i> subsp. <i>melanobasis</i> ms..... | 282 |
| <i>Pimelea halophila</i> | 195 | <i>Eucalyptus litorea</i> | 284 |
| <i>Pimelea pelinos</i> | 197 | <i>Eucalyptus misella</i> | 286 |
| <i>Pultenaea</i> sp. Mt Beaumont (K.R.Newbey 7928) | 199 | <i>Eucalyptus pterocarpa</i> | 288 |
| <i>Rulingia tratmannii</i> | 201 | <i>Eucalyptus spreta</i> ms | 290 |
| <i>Scaevola</i> sp. Swallow Rock (K.R.Newbey 9677) | 202 | <i>Gastrolobium heterophyllum</i> | 292 |
| <i>Spyridium minutum</i> | 204 | <i>Gastrolobium rigidum</i> | 294 |
| <i>Stachystemon</i> sp. Mt Baring (K.R.Newbey 9773) | 206 | <i>Goodenia quadrilocularis</i> | 296 |
| <i>Styphelia pulchella</i> | 208 | <i>Goodenia trichophylla</i> | 298 |
| <i>Thysanotus baueri</i> | 210 | <i>Grevillea superba</i> | 300 |
| <i>Verticordia sieberi</i> var. <i>pachyphylla</i> | 212 | <i>Haegiela tatei</i> | 302 |
| B. Priority Two Taxa | 214 | <i>Isolepis</i> sp. Kau Rock (M.A.Burgman 1515)..... | 304 |
| <i>Acacia amyctica</i> | 215 | <i>Isopogon alcicornis</i> | 306 |
| <i>Acacia asepala</i> ms | 217 | <i>Lasiopetalum maxwellii</i> | 308 |
| <i>Acacia carnosula</i> ms..... | 219 | <i>Lepyrodia fortunata</i> ms..... | 310 |
| <i>Acacia castanostegia</i> ms..... | 221 | <i>Leucopogon breviflorus</i> (Israelite Bay)..... | 312 |
| <i>Acacia incanicarpa</i> ms | 223 | <i>Leucopogon interruptus</i> | 314 |
| <i>Acacia kerryana</i> | 225 | <i>Leucopogon multiflorus</i> | 316 |
| <i>Acacia nitidula</i> | 227 | <i>Leucopogon pleurandroides</i> | 318 |
| <i>Acacia ophiolithica</i> | 229 | <i>Leucopogon rotundifolius</i> | 320 |
| <i>Acacia profusa</i> ms..... | 231 | <i>Levenhookia pulcherrima</i> | 322 |
| <i>Acacia tetraptera</i> ms..... | 233 | <i>Melaleuca fissurata</i> | 324 |
| <i>Acrotiche patula</i> | 235 | <i>Melaleuca viminea</i> subsp. <i>appressa</i> | 326 |
| <i>Andersonia macranthera</i> | 237 | <i>Melaleuca</i> sp. Ravensthorpe (M.A.Burgman 4018)..... | 328 |
| <i>Angasomyrtus salina</i> | 239 | <i>Microcorys virgata</i> | 329 |
| <i>Astroloma</i> sp. Fitzgerald (G.J.Keighery 8376) | 241 | <i>Monotaxis</i> sp. Ravensthorpe (M.A.Burgman 2154)..... | 331 |
| <i>Astroloma</i> sp. Grass Patch (A.J.G.Wilson 110) | 243 | <i>Olearia laciniifolia</i> | 333 |
| <i>Banksia epica</i> | 245 | <i>Opercularia hirsuta</i> | 335 |
| <i>Bentleya diminuta</i> | 247 | <i>Opercularia rubioides</i> | 337 |
| <i>Boronia coriacea</i> | 249 | <i>Paracaleana</i> sp. Nuytsland (A.P.Brown s.n.)..... | 339 |
| | | <i>Patersonia inaequalis</i> | 341 |
| | | <i>Persoonia</i> sp. Scaddan (M.A.Burgman 4424) | 343 |
| | | <i>Phlegmatospermum eremaeum</i> | 345 |
| | | <i>Pimelea graniticola</i> | 347 |
| | | <i>Scaevola brookeana</i> | 349 |
| | | <i>Spyridium mucronatum</i> subsp. <i>mucronatum</i> | 351 |
| | | <i>Stipa exilis</i> | 353 |
| | | <i>Thysanotus brachyantherus</i> | 355 |
| | | <i>Thysanotus parviflorus</i> | 357 |
| | | <i>Trachymene croniniana</i> | 359 |

| | |
|--|-----|
| C. Priority Three Taxa | 361 |
| <i>Acacia eremophila</i> var. <i>variabilis</i> | 362 |
| <i>Acacia euthyphylla</i> ms..... | 364 |
| <i>Acacia moirii</i> subsp. <i>dasycarpa</i> | 366 |
| <i>Acacia octonervia</i> | 368 |
| <i>Acacia pritzeliana</i> | 370 |
| <i>Acacia singula</i> | 373 |
| <i>Adenanthos gracilipes</i> | 375 |
| <i>Allocasuarina eriochlamys</i> subsp. <i>grossa</i> | 377 |
| <i>Banksia lullfitzii</i> | 379 |
| <i>Boronia fabianoides</i> | 381 |
| <i>Caladenia longicauda</i> subsp. <i>rigidula</i> ms..... | 383 |
| <i>Centrolepis cephaliformis</i> subsp. <i>murrayi</i> | 385 |
| <i>Chorizema ulotropis</i> | 387 |
| <i>Cypselocarpus haloragoides</i> | 389 |
| <i>Dicrastylis obovata</i> | 391 |
| <i>Dodonaea trifida</i> | 393 |
| <i>Dryandra viscida</i> | 395 |
| <i>Eremophila purpurascens</i> | 397 |
| <i>Eucalyptus brockwayi</i> | 399 |
| <i>Eucalyptus creta</i> | 401 |
| <i>Eucalyptus exigua</i> | 403 |
| <i>Eucalyptus famelica</i> | 405 |
| <i>Eucalyptus histophylla</i> | 407 |
| <i>Eucalyptus ovularis</i> | 409 |
| <i>Eucalyptus semiglobosa</i> | 411 |
| <i>Gahnia</i> sp. Grass Patch (M.A.Burgman 4431).... | 413 |
| <i>Grevillea aneura</i> | 415 |
| <i>Hakea bicornata</i> | 417 |
| <i>Hopkinsia adscendens</i> ms..... | 419 |
| <i>Lasiopetalum parvuliflorum</i> | 421 |
| <i>Leucopogon apiculatus</i> | 423 |
| <i>Leucopogon brevicuspis</i> | 425 |
| <i>Melaleuca incana</i> subsp. <i>tenella</i> | 427 |
| <i>Melaleuca macronychia</i> subsp. <i>trygonoides</i> | 429 |
| <i>Myriocephalus appendiculatus</i> | 431 |
| <i>Persoonia scabra</i> | 433 |
| <i>Pityrodia chrysocalyx</i> | 435 |
| <i>Platysace haplosciadia</i> | 437 |
| <i>Pomaderris intangenda</i> | 439 |
| <i>Siegfriedia darwinioides</i> | 441 |
| <i>Sphenotoma parviflorum</i> | 443 |
| <i>Verticordia verticordina</i> | 445 |

PART FOUR: THE PLAN FOR MANAGEMENT 447

| | |
|--|-----|
| 1. Determining Priorities..... | 447 |
| 2. Management and Research Actions..... | 447 |
| (i) Small declining populations..... | 447 |
| (ii) Accidental destruction during road/ rail/public utility maintenance..... | 447 |
| (iii) Invasive weeds..... | 448 |
| (iv) Grazing..... | 448 |
| (v) Mining activities..... | 449 |
| (vi) <i>Phytophthora</i> dieback..... | 449 |
| (vii) Land clearing and associated agricultural activities..... | 449 |
| (viii) Liaison with landholders..... | 449 |

| | |
|--|-----|
| (ix) Land acquisition..... | 450 |
| (x) Survey taxa..... | 450 |
| (xi) Resurvey and mapping of known populations..... | 450 |
| (xii) Monitoring of populations..... | 451 |
| (xiii) Research in particular fire and disturbance ecology..... | 451 |
| (xiv) Seed collection, storage and propagation..... | 452 |
| (xv) Re-establishment in suitable habitats in the wild..... | 452 |
| 3. Priority Flora in the Esperance District..... | 452 |
| 4. Assistance from Volunteers and Information Systems..... | 452 |
| (i) Rare flora volunteers..... | 452 |
| (ii) District recording systems..... | 453 |
| (iii) Herbarium specimens..... | 453 |
| 5. Conservation and Management of Special Areas..... | 453 |
| 6. Implementation and Term of the Management Program..... | 453 |

REFERENCES..... 464

GLOSSARY..... 471

TABLES

| | |
|--|-----|
| 1. CALM Managed Public Lands in the Esperance District..... | 6 |
| 2. Esperance District Declared Rare Flora Scored (1-3) According to the Degree of Threat or Urgency for Management and Research Action..... | 454 |
| 3. Esperance District Declared Rare Flora Ranked in Priority Order for Protection and Management Action..... | 456 |
| 4. Priority One, Two and Three Species Lists with Recommended Status Indicated..... | 457 |
| 5. Declared rare and Poorly Known Flora in the Esperance District as at 1992. Conservation Status updated to December 1999..... | 461 |

FIGURES

| | |
|--|---|
| 1. Location of the Esperance District in relation to other CALM Management Regions of the State..... | 2 |
| 2. The Esperance District covered by this Program..... | 4 |

PART ONE: INTRODUCTION

1. The Need for Management

Western Australia has a unique flora, world renowned for its diversity and high level of endemism. WACENSUS, the database of plant names for the State, lists 12 442 current taxa (species, subspecies, varieties and phrase names) (July 1997) with the total likely to exceed 13 000 once botanists have completed surveying, searching and describing the flora. A significant proportion of the Western Australian total is concentrated in the south-west of the State, where there is also a large number of endemics due to a long history of isolation and climatic and geological stability (Hopper 1979). According to Briggs and Leigh (1996) the State has 45.9 percent of the Australian total of threatened, rare or poorly known plant taxa, with 79 percent of these restricted to the south-west. Nearly 2 000 Western Australian taxa are currently listed as threatened or have been placed on the Department of Conservation and Land Management's (CALM) Flora Priority List because they are rare or poorly known (K. Atkins, personal communication).

Although some plants are rare because of their requirement for a specific restricted habitat, the majority have become rare or threatened because of the activities of humans. Extensive land clearing and modification of the environment have resulted in the extinction of some species and threaten the survival of many others. Continued land clearing, plant diseases (particularly due to *Phytophthora* species), exotic weeds and pests, road works, urbanisation, grazing by domestic stock and increasing salinity continue to threaten the flora.

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

This Wildlife Management Program collates the available biological and management information on the Declared Rare Flora, and Priority One, Two and Three (poorly known) taxa of CALM's Esperance District, as at October 1992. In 1992, 271 extant taxa were listed as Declared Rare Flora and a further 43 species were listed on the Schedule as presumed extinct. In addition to those taxa declared to be rare, some 1 408 taxa were listed on CALM's Priority Flora List as at October 1992. The majority of these taxa require further detailed survey to accurately assess their conservation status. Brown *et al.* (1998) provide illustrations of declared rare (threatened) flora as at 1998.

This District has been relatively poorly surveyed botanically, particularly for rare and threatened taxa. Figure 1 shows the location of the Esperance District in relation to the CALM management regions of the State.

2. Objective of the Program

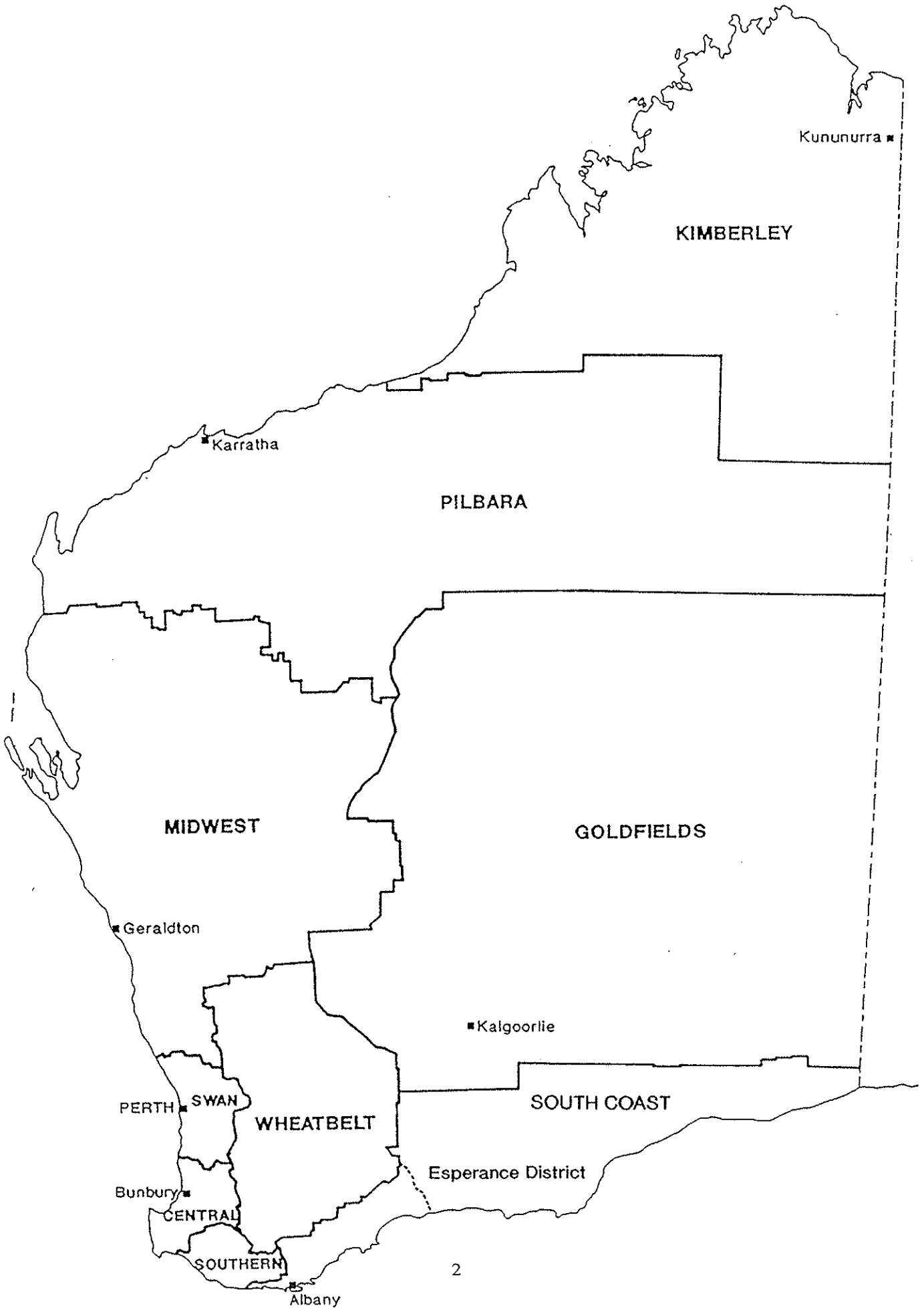
The objective of this Program for the Esperance District is:

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

It aims to achieve this by:

- * providing a useful reference for CALM staff and other land managers for the day-to-day management and protection of Declared Rare Flora populations and populations of other taxa which are poorly known and may be at risk;
- * directing Departmental resources within the Region to those taxa most urgently in need of attention;
- * assisting in the identification of Declared Rare taxa and other taxa potentially at risk, and their likely habitats;
- * fostering an appreciation and increased awareness of the importance of protecting and conserving Declared Rare Flora and other taxa potentially at risk or in need of special protection.

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



3. Rare Flora Legislation and Guidelines for Gazettal

The *Wildlife Conservation Act 1950* protects all classes of indigenous flora throughout the State. Protected flora includes:

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

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

- * In danger of extinction - the taxon is in serious risk of disappearing from the wild state within one or two decades if present land use and other causal factors continue to operate;
 - * Rare - less than a few thousand adult plants of the taxon existing in the wild;
 - * Deemed to be threatened and in need of special protection - the taxon is not presently in danger of extinction but is at risk over a longer period through continued depletion, or occurs largely on sites likely to experience changes in land use which could threaten its survival in the wild;
- or
- * Presumed Extinct - taxa which have not been collected, or otherwise verified over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently.

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

- * a distinct entity, that is, the progeny are consistent with the agreed taxonomic limits for that taxon group;
- * capable of being self perpetuating, that is, not reliant on the parental taxa for replacement; and
- * the product of a natural event, that is, both parents are naturally occurring and cross fertilisation was by natural means.

Protection under section 23F is achieved by declaring them to be 'rare' by notice published in the *Government Gazette*. CALM's Policy Statement No. 9 discusses the legislation relating to Declared Rare Flora and outlines the criteria for gazettal.

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

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

The Schedule published in the *Government Gazette* is revised annually to accommodate additions and deletions to the list of Declared Rare Flora.

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

- * the taxon must have been thoroughly searched for in most likely habitats in the wild by competent botanists during the past five years;
- * the searches have established that the plant in the wild is either rare, endangered or deemed to be threatened and in need of special protection, or it is presumed extinct.

Plants may be deleted from the Rare Flora Schedule where:

- * recent botanical survey has shown that the taxon is no longer rare, endangered or in need of special protection;
- * the taxon is shown to be a hybrid that does not comply with the inclusion criteria;

or

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

4. CALM's Priority Flora List

CALM maintains a Priority Flora List to determine priorities for survey of plants of uncertain conservation status. The list comprised 1 398 taxa (at October 1992) that were poorly known and in need of further survey or are adequately surveyed but in need of monitoring. The poorly known taxa are possibly at risk but do not meet the survey requirements for gazettal as Declared Rare Flora (DRF), as outlined in Policy Statement No. 9. Only those plants considered to be threatened on the basis of thorough survey or presumed extinct can be included on the DRF Schedule.

The Priority Flora List is divided into the following categories according to the number of known populations and the degree of perceived threat.

1: Priority One - Poorly known Taxa

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

2: Priority Two - Poorly Known Taxa

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

3: Priority Three - Poorly Known Taxa

Taxa which are known from several populations, and the taxa are not believed to be under immediate threat (i.e. not currently endangered), either due to the number of known populations (generally >5), or known populations being large, and either widespread or protected. Such taxa are under consideration for declaration as 'rare flora' but are in need of further survey.

4: Priority Four - Rare Taxa

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

5. Responsibilities within the Department

- * Reviewing Departmental policy on Declared Rare Flora is the responsibility of the CALM Corporate Executive;
- * Identification of Declared Rare Flora is the initial responsibility of Herbarium staff, but should, with appropriate training, become a Regional responsibility also;
- * Locating Declared Rare Flora is the initial responsibility of Bioconservation Group (CALMScience) staff, Wildlife Branch and the Western Australian Threatened Species and Communities Unit (WATSCU) (Nature Conservation Division) and Regional Services Division staff.
- * Determination of land status and preparation of material for notification to landowners is the responsibility of Wildlife Branch;
- * Hand-delivered notification to landowners of Declared Rare Flora populations is the responsibility of Regional staff and Wildlife Branch;
- * Maintenance of Declared Rare Flora information and database, and dissemination of these data are the responsibility of Wildlife Branch;
- * Advice on management prescriptions is the responsibility of staff of Bioconservation Group (CALMScience), Regional Ecologists (Regional Services Division), Wildlife Branch and WATSCU staff;
- * Coordination of Recovery Plans and Interim Recovery Plans for threatened taxa is the responsibility of WATSCU;
- * Management, protection and regular inspection of Declared Rare Flora populations is the responsibility of staff of the Esperance District;
- * Enforcement matters relating to the provisions of the Wildlife Conservation Act are the responsibility of Wildlife Officers in the South Coast Region;
- * Implementation and revision of the management program is the responsibility of the South Coast Region Threatened Species and Communities Recovery Team.

6. The Esperance District

The Esperance District lies along the eastern south coast of Western Australia, extending eastwards from the Vermin Proof Fence to the South Australian border and south of the 31°30' parallel. The District measures about 850 km in east-west dimension and 170 km on average in north-south dimensions. It includes the Shires of Esperance, Dundas and part of Ravensthorpe (Figure 2). District administration is based in Esperance.

Esperance is one of the two Districts which make up CALM's South Coast Region. The Esperance District contains six National Parks and about 70 Nature Reserves; fourteen of these conservation reserves each cover an area greater than 5 000 ha. The Dundas Nature Reserve (780 000 ha), Nuytsland Nature Reserve (625 000 ha) and Cape Arid National Park (280 000 ha) are major reserves within the District. The Esperance District has a total area of 14.5 million ha, with nearly 2 million ha being managed by CALM (Table 1).

TABLE 1: CALM Managed Public Lands in the Esperance District (CALM 1991)

| Land Tenure | Area (ha) |
|----------------|------------------|
| National Park | 425 460 |
| Nature Reserve | 1 508 040 |
| Timber Reserve | 3 720 |
| Misc. Reserves | 3 800 |
| TOTAL | 1 941 020 |

Agriculture is principally restricted to coastal areas west of Cape Arid, extending for 60 to 80 km inland, except for the Salmon Gums area which is about 140 km north of Esperance at the northern limit (Figure 2). There is about 1.5 million ha of agricultural land in the Esperance District. The main activities are cropping and grazing of sheep and cattle.

Inland, mining is a major activity, especially in the Norseman area. Hatter Hill and Mt Day, located in the north-western sector of the District, are other areas which attract mining interests. Pastoral leases cover much of the area east of Balladonia.

Climate

The south coast experiences a Mediterranean climate with hot, dry summers and cool, wet winters. Rainfall decreases northwards and eastwards across the District, from 674 mm per annum at Esperance to 274 mm at Norseman and 263 mm at Eucla. Along the coast the maximum rainfall is received between May and October, while inland the rain tends towards non-seasonality with quantities of rain falling due to summer thunderstorms.

Temperatures are strongly influenced by distance from the coast, with inland parts experiencing a far greater range in mean temperatures than those of Esperance (25° in summer and 7° in winter). In summer, temperatures over 38°C are common, but strong sea breezes generally provide a cooling effect close to the coast.

Geology

There are three distinct geological units within the Esperance District. The rocks of all three units have been deeply weathered and are overlain in part by weathered profiles and relatively recent soils.

The Yilgarn Block, formed 2 600 to 3 100 million years ago, lies in the western sector of the District. It consists of a layered succession of metamorphosed sedimentary and volcanic rocks which are intruded by granites. Some of these rocks include the economically important "greenstones" which contain gold and nickel; these are mainly seen around Norseman.

The Albany-Fraser Province divides the District in a north-south direction and includes the Fraser Range and the area from Esperance to Cape Arid. Sediments, derived from the erosion of granites and greenstones, were deposited along the margin of the Yilgarn Block 1 200 to 1 400 million years ago. These were then deformed and intruded by bodies of molten granite to form various peaks and ranges.

The Bremer and Eucla Sedimentary Basins were formed when the sea encroached over the land in the south coast region about 135 million years ago. A broad gulf, referred to as the Bremer Basin, formed in the area of the Nullarbor Plain and sediments dominated by limestone (calcium carbonate) were deposited. To the east of Esperance, spongolite beds formed from the skeletons of sponges (spicules) which developed in the Bremer Basin.

Physiography and Soils

In the western sector of the Esperance District, apart from the isolated granite hills and low sand dunes, the land surface is very flat and rises from sea level to a height of about 150 m. Near the coast, river drainages are well developed, forming steep gorges and river terraces. A small coastal plain is developed in Esperance Bay and is backed by a low escarpment (about 45 m).

The coast is indented by numerous rock headlands, with Cape Le Grand and Cape Arid rising to about 350 m above sea level. Offshore, numerous small, steep, rocky islands and reefs, form the Archipelago of the Recherche, and extend for 60 km to the edge of the continental shelf (Morgan and Peers 1973).

Inland on the laterised plateau, chains of small, interconnected salt lakes have formed from internal drainage. In the south, the clay pans are static, rounded, and give rise to semi-permanent, freshwater swamps. Surrounding areas are dominated by yellow duplex soils. Northwards, clay pans have developed which are saline, elongated and show a north-north-westerly migration (Morgan and Peers 1973).

The Lake Hope-Lake Johnston area, in the north-west sector of the District, is gently undulating with the higher ground separated by ill-defined water courses subject to sheet flooding. The broad valleys containing the lakes are products of rivers that originally flowed into the Eucla Basin. The lakes are shaped by the prevailing westerly winds; the eastern margins have dunes and small salt lakes, while the western side is actively eroded producing rock outcrops. There is substantial variation in the soil types including red earths, red duplex soils, yellow sands and red and yellow duplex soils. The only areas of significant relief are the Bremer Range (max. 100 m) and Fitzgerald Peaks, which include Peak Charles (654 m) and Peak Eleanor (503 m) (Gower and Bunting 1976).

In the northern sector vast plains are interspersed with low rugged ranges and hills, particularly in the vicinity of Norseman and in the Fraser Range (over 300 m). Yellow sands occur on the laterite residuals. Generally the country is gently undulating, with internal drainage towards broad valleys of red earth which contain salt lakes. The elongated salt lake beds are surrounded by loamy calcareous soils.

To the east lies the Bunda Plateau which slopes gently southwards from about 150 m above sea level to about 90 m. The flatness is largely inherited from the flatness of the Tertiary sea floor and has been perpetuated by uniform erosion. Projecting above the plains are inliers of Proterozoic rocks, for example Mt Ragged which is composed of quartzite. The surface of the limestone plateau is characterised by low stony ridges separated by clay flats. Soils are dominated by shallow calcareous loams. A scarp, known as the Hampton Range, has formed at the southern margin of the plateau. South of the scarp is a low-lying coastal plain which has chains of elongated lagoons and modern coastal sand dunes along the fringe (Doepel and Lowry 1970, Lowry 1971, Lowry and Doepel 1974).

Vegetation

Parts of the South-West Botanical Province, the Eremaean Botanical Province, and the South Western Interzone lie within the Esperance District.

The South-West Botanical Province occupies the south-west of the State, extending from Shark Bay to near Israelite Bay. Characteristic vegetation includes heath, thicket, mallee, woodland and forest. The Eyre Botanical District occupies a narrow strip along the south coast with scrub and mallee-heath communities dominating. To the north lies the Roe Botanical District which typically has mallee, scrub-heath and *Allocasuarina* thickets.

The Eremaean Botanical Province dominates Western Australia, comprising the arid central portion which is characterised by hummock grassland, scrub and low woodland. The Eucla Botanical District occupies the south-east corner of the State, extending eastwards from about Caiguna. Low trees of *Acacia papyocarpa*, *A. aneura* and *Allocasuarina cristata* grow near the coast with a bluebush steppe of *Maireana sedifolia* and annual grasses and herbs grading to a treeless centre.

The South Western Interzone lies between the above two Provinces and encompasses the Coolgardie Botanical District. Norseman and Eyre are included in this District which is dominated by eucalypt woodlands. On calcareous soils the woodlands become more open and a saltbush-bluebush understorey appears. Sandplains are characterised by scrub-heath and *Allocasuarina* thickets.

7. Botanical History of the Esperance District

The Frenchman, Labillardiere, was the naturalist of the d'Entrecasteaux expedition who visited the south coast with the corvettes *La Recherche* and *L'Esperance*. In December 1792, they were compelled by bad weather to lay anchor for a week near Esperance Bay. Plant collections were made from a small island within the Bay, as well as the mainland.

Matthew Flinders sailed along the south coast of Western Australia on the *Investigator* with the botanist, Robert Brown, artist, Ferdinand Bauer, and gardener and conservator, Peter Good, aboard. They collected plants from King George Sound during December 1801, and the next month headed east, landing at Lucky Bay and the Archipelago of the Recherche between 10 and 18 January 1802. Brown travelled west as far as Cape Le Grand, and also visited Mondrain Island and Middle Island where he collected 29 species. Many of the localities in Brown's diaries have had to be interpreted as Flinders did not name many of the islands and capes until after the voyage. The diaries are on very poor paper and written in bad quality ink or pencil. Most entries are mere notes on plants and carelessly written (Mabberley 1985). This has implications for the current List of Priority Flora as a few of the taxa on the List have not been rediscovered since Robert Brown collected them.

Excursions to Lucky Bay and Cape Arid were made by W. Baxter who collected for Henschman between 1823 and 1825, and in 1829.

John Septimus Roe, Surveyor-General, travelled from Avon to the South Coast in 1848-49 and collected plants on the journey. He reached the Pallinup River in October 1848, then headed eastwards where he named the Bremer Range and Fitzgerald Peaks (includes Peak Charles) after the then Governor, Charles Fitzgerald. Roe continued eastwards via Mt Ridley and Mt Ney (named after a horse) until he reached the Russell Range, then returned along the coastline reaching King George Sound in January 1849.

James Drummond was curator of the Botanic Gardens in Cork, Ireland, before emigrating to the Swan River Colony. In 1848, he and Maxwell explored the country between Bremer Bay and Mid Mt Barren, the eastern limit of Drummond's excursions. Maxwell later collected on his own, with some of his travels extending "towards the Great Bight".

The overland expedition of Sir John Forrest from Western Australia to Adelaide via Eucla provided some species in 1870. At a later date important collections were sent by Dempster from between his stations at Esperance and Fraser's Range. Sarah Therese Brooks, who lived at Israelite Bay and later at Balbinia (about 40 km north of Mt Ragged), also contributed many plants. It is believed that she sent hundreds if not thousands of specimens to Dr Ferdinand von Mueller in Victoria. Dr Mueller was collaborating with George Bentham who, in 1861, had started to write the seven volumes of *Flora Australiensis*. In naming species of *Hakea* and *Scaevola* after Miss Brooks, Mueller misspelt her name and gave it in the form *brookeanus* (Hamersley, in Carr and Carr 1981).

In October-November 1901, Ludwig Diels travelled from Coolgardie along the direct road to Esperance Bay, partly through still unexplored country. Cecil R.P. Andrews, an education administrator, collected along the same road in 1904, as well as along the road from the Stirling Range to Esperance. The prospector, Frank Hann, travelled from Coujinup Hill northwards then east to the Bremer Range in 1901, naming the Johnston Lakes after the Surveyor-General, H.F. Johnston. Nine years later, Hewby and May travelled a more southern route via Coujinup Hill, south of Lake Tay to Peak Charles. A number of the Rare and Priority Flora are located along these old, now largely overgrown routes.

The Government botanists, Charles A. Gardner (1929-1961) and R.D. Royce (1962-1975), collected widely through the area. The Australian Geographical Society, on their expedition to the Archipelago of the Recherche, was accompanied by J.H. Willis who wrote accounts of the islands and their flora (Willis 1953, 1959). During the 1960s, John S. Beard surveyed the eastern south coast region to prepare his vegetation maps and explanatory memoirs which are largely interpreted from aerial photographs (Beard 1969, 1973a, 1973b). A party from the University of Adelaide worked from Israelite Bay to Esperance in the spring of 1968 and is understood to have made large collections (Beard 1973a).

The proposed release of land for agriculture in the 1980s prompted a number of botanical surveys to be carried out. Mark Burgman and Ken Newbey extensively surveyed land north of the existing farmland, extending east of the Vermin Proof Fence to near the west boundary of Cape Arid National Park (Burgman 1985a, 1985b, Newbey 1983, Burgman and Newbey 1990). The Mt Beaumont area was also surveyed by Eleanor Bennett (1983). Burgman and Newbey (1990) found that of the 1 351 vascular plants identified in their survey area, 20 per cent were undescribed taxa and 11 per cent were considered to be rare, geographically restricted or very poorly known. Subsequently, many of the taxa on the Declared Rare and Priority Flora Lists have been included because of these studies.

Some of the contemporary botanists and collectors who have significantly added to our knowledge on the flora in the Esperance District include William Archer, Keith Bradby, Ian Brooker, Andrew Brown, Rhonda Bruhn, Robert Chinnock, Ray Cranfield, Michael Crisp, Thelma Daniell, Alex George, Bernie Haberley, Stephen Hopper, Neville Marchant, Doug Monk, Laurie Johnston, Greg Keighery, Nathan McQuoid, Bernie Norris, Ria Panhuysen, Jocelyn Powell, Libby Sandiford, Ian Solomon, Coral Turley, Malcolm Trudgen, Arthur Weston, Paul Wilson and Don Voigt.

PART TWO: DECLARED RARE FLORA IN THE ESPERANCE DISTRICT

This Plan covers the 23 taxa of Declared Rare Flora known to be extant within the boundaries of the Esperance District in October, 1992.

Two species listed as presumed extinct on the Schedule of Declared Rare Flora are also included. While they have been collected from the Esperance District in the past, no extant populations are recorded.

A brief description of the morphology, taxonomic affinities, flowering period, distribution and habitat, known populations, summary and recommendations for management, and pertinent references for each taxon of Declared Rare Flora are provided within this section.

Descriptions of species are, for the most part, based on original taxonomic treatments or where these are lacking, by reference to herbarium specimens and specialist botanists. The reader should note that some taxa have not been formally described and these are denoted by the term 'ms' (abbreviation for 'manuscript') after the taxon. Others have been given a phrase name, e.g. *Acacia* sp. Esperance (M.A.Burgman 1833b), to identify the taxon.

Distribution and habitat data are compiled from herbarium records and Departmental files as appropriate. All populations where collections have been made or inspected are tabulated. The table summarises the broad population details, land status, number of plants, population conditions and the date the population was last visited. Precise locality data are contained within confidential Departmental records. In a number of cases, herbarium records relate to populations that no longer exist. New populations found during the course of this project have been asterisked in the table. Detailed information on both the known and new populations surveyed during 1992 and 1993 for this project are given in a separate confidential document lodged with the Department.

Response to disturbance is mentioned if known, and suggests two separate classes of flora, namely: those species favoured by disturbance and those to which disturbance is detrimental. The former species seem to occupy a very narrow ecological niche and are rarely collected, although disturbance will result in a profusion of growth for a period, before the plants again disappear, sometimes for decades. Disturbance opportunists are discussed again in Part 4.

Extant Taxa

Adenanthos eyrei E.C.Nelson

PROTEACEAE

Toolinna Adenanthos

An erect, open shrub, up to 1 m tall. Branchlets are hairy, while older branches have very warty bark. Leaves are stalked, hairy, and varied in shape, but are mostly divided into 3 flat segments (up to 15 mm). Flowers are deep crimson, softly-hairy, solitary, stalked (4 mm) and occur in leaf axils or at the end of branches. The narrow floral tubes (25 mm) have long, exserted styles (35 mm).

Adenanthos eyrei can be distinguished from *A. forrestii* by lacking a lignotuber. *A. forrestii* has pale red and cream rather than deep crimson flowers.

Flowering Period: All year

Distribution and Habitat

A. eyrei is known only from the Toolinna area on the coast of the Great Australian Bight. It grows in deep siliceous sand dunes on cliffs, in low open scrub with *Banksia media* and *A. forrestii*.

Conservation Status

Current: Declared Rare Flora

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Toolinna | Esp | Dund | NR | 14.8.91 | - | Good |

Response to Disturbance

Assumed to be killed by fire and regenerate from seed.

Susceptibility to *Phytophthora* Dieback

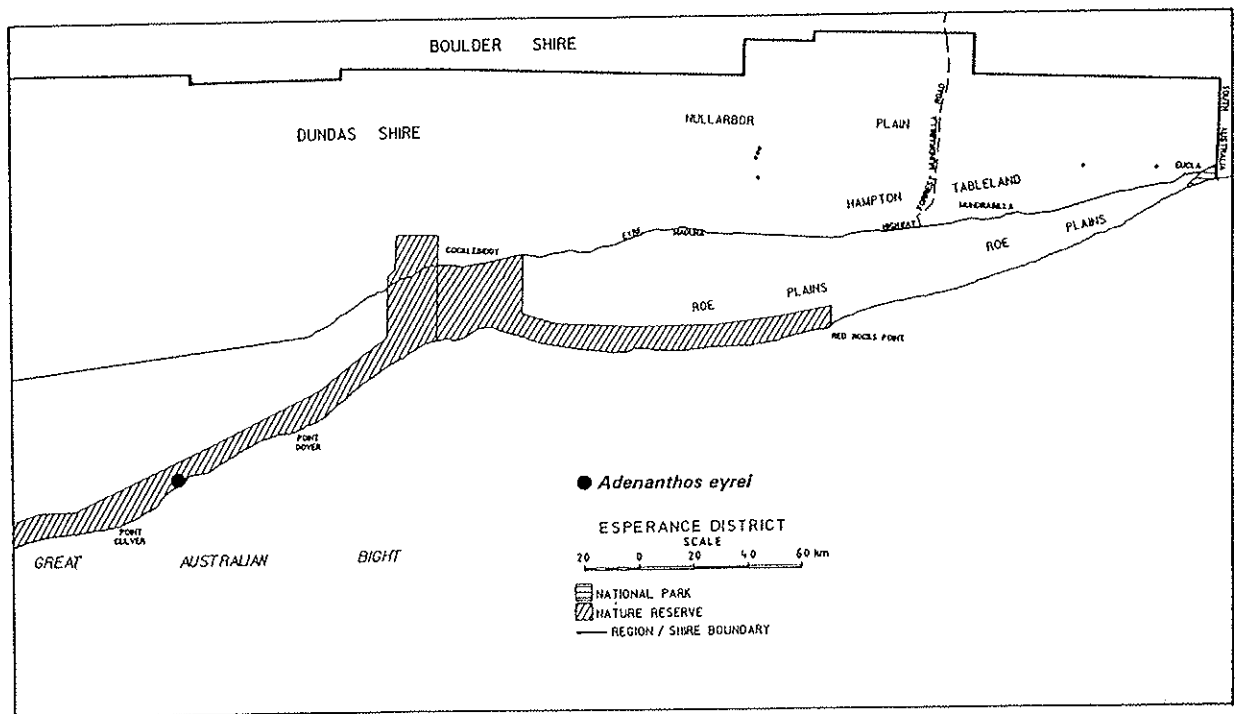
Presumed susceptible.

Summary and Recommendations

A. eyrei occurs in the Nuytsland Nature Reserve and is undisturbed. Apparently, the population is difficult to find as it looks similar to *A. forrestii*, which is very common in the area (G. Keighery, personal communication). The lack of a lignotuber is not normally used as a character to distinguish a separate taxon; consequently, the status of *A. eyrei* is questionable.

References

Hopper *et al.* (1990), Nelson (1978), Rye and Hopper (1981).



Club-leaf *Adenanthos*

A low-spreading or erect, mid-dense, woody shrub up to 2.5 m tall and 2.5 m broad, with a lignotuber. The branches are hairy at first but soon become hairless. The stalked, dull, light greenish-grey leaves are broadly triangular (10 x 5 mm) with 3 lobes at the end. Flowers are solitary, terminal, very shortly stalked, with the hairless style exerted nearly 10 mm beyond the floral tube (25 mm). Flower colour varies from dull pale pink, yellow-pink, yellow or cream. Fruits (3 mm) are slightly hairy.

The only other *Adenanthos* species that possibly overlaps the geographical range of *A. ileticos* is *A. cuneatus* which has larger, fan-like leaves (15-25 x 10-15 mm).

Flowering Period: March, July - October, December

Distribution and Habitat

A. ileticos grows from near Salmon Gums to north-west of Mt Heywood (a range of about 70 km) with an outlying population towards Balladonia. It is found in well-drained yellow sand, white clayey sand or red-brown loamy sand, in mallee or open woodland, associated with various species of *Eucalyptus* (*E. salmonophloia*, *E. leptocalyx*, *E. uncinata*, *E. incrassata*, *E. transcontinentalis*), and shrubs of *Hakea*, *Melaleuca* or *Acacia*.

Conservation Status[#]

Current: Declared Rare Flora

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------|----------|-------|----------------|-------------|---------------|-----------|
| 1a | Salmon Gums,ENE | Esp | Esp | - | 3.80 | - | - |
| 1b* | Salmon Gums,ENE | Esp | Esp | ?Water Res. | 18.11.93 | 200+ | Good |
| 2 | Salmon Gums,ENE | Esp | Esp | ?VCL | 3.80 | - | - |
| 3 | Salmon Gums,SE | Esp | Esp | - | 3.80 | - | - |
| 4 | Salmon Gums,S | Esp | Esp | MRWA Rd Res. | 17.11.92 | 28 | Average |
| 5a | Salmon Gums,S | Esp | Esp | Water Res. | | 258 | - |
| 5b | Salmon Gums,S | Esp | Esp | Rd Res. } | 17.11.92 | 215+ | Good |
| 5c | Salmon Gums,S | Esp | Esp | Rail Res.} | | 43 | Seedlings |
| 6 | Dingo Rock,SW | Esp | Esp | VCL } | | - | - |
| 7a | Dingo Rock,S | Esp | Esp | VCL } | 22.5.93 | 4 000+ | Good |
| 7b-e | Dingo Rock,S | Esp | Esp | VCL } | | 1 500+ | Seedlings |
| 8 | Dingo Rock,ESE | Esp | Esp | VCL } | | - | - |
| 9 | Dingo Rock,NE | Esp | Esp | VCL } | | - | - |
| 10a* | Mt Heywood,NW | Esp | Esp | VCL | 22.5.93 | 1 000+ | Good |
| 10b-e* | Mt Heywood,NW | Esp | Esp | VCL | 22.5.93 | 200+ | Good |
| 11 | Clyde Hill,NW | Esp | Esp | VCL | 20.5.93 | Not found | - |
| 12a* | Mt Ridley,N | Esp | Esp | VCL | 22.5.93 | 5+ | Good |
| 12b* | Mt Ridley,N | Esp | Esp | VCL | 22.5.93 | 1 | Good |
| 13a | Salmon Gums,E | Esp | Esp | Shire Rd Res. | 10.12.83 | - | - |
| 13b | Salmon Gums,ENE | Esp | Esp | NR | - | - | - |
| 13c* | Salmon Gums,E | Esp | Esp | Shire Rd Res. | 19.11.93 | 10 | Average |
| 13d* | Salmon Gums,E | Esp | Esp | Shire Rd Res. | 19.11.93 | 30 | Average |
| 14a | Ridley Rd | Esp | Esp | Private | - | - | - |
| 14b | Ridley Rd,E | Esp | Esp | Shire Rd Res.} | | 540 | Good |

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

Known Populations (cont'd)

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-------------|----------|-------|----------------|-------------|---------------|-------------------|
| 14c | Ridley Rd,W | Esp | Esp | Shire Rd Res.} | 23.9.92 | 27 | Seedlings |
| 14d | Kent Rd | Esp | Esp | Shire Rd Res.} | | - | - |
| 15 | Dundas | Esp | Dund | NR | 13.8.91 | {40 {+2 | Good Seedlings |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible but it usually occurs in an area where *Phytophthora* dieback is not considered a problem.

Summary and Recommendations

A. ileticos is common to the north of Mt Ridley on Vacant Crown Land which is not currently threatened. In areas which have been cleared for agriculture, a number of remnant populations exist along road verges. Many of the road reserves are degenerating in the Salmon Gums-Grass Patch area as a result of weed invasion from adjoining farms, clearing for firebreaks, and from road maintenance encroaching into these narrow remnants of native vegetation.

A. ileticos occurs in two Nature Reserves. The population in the Dundas Nature Reserve is undisturbed, and occurs in an area seldom visited by the public. This population is, however, small, and the size of the other Nature Reserve population is unknown.

A reassessment of the status *A. ileticos* is warranted.

References

Blackall and Grieve (1988), Elliot and Jones (1986), Leigh *et al.* (1984), Nelson (1978), Rye and Hopper (1981).

Anigozanthos bicolor subsp. *minor* (Benth.) Hopper

HAEMODORACEAE

Little Kangaroo Paw

This dwarf plant usually has several scapes 5-20 cm tall which bear solitary flowers. Both the stem and flowers are hairy. Flowers are two-coloured with a green perianth above a red ovary. The perianth (30-45 mm) is strongly constricted above the middle, being only 3-5 mm wide at the narrowest point. The anthers are about equal in length to the filaments which are 4-6 mm long. There are 2-4 ovules per locule. Leaves are flattened and 5-10 cm long.

Anigozanthos bicolor subsp. *minor* can be distinguished from *A. gabrielae* by its larger flowers and curved, not straight, perianth (greater than 30 mm).

Flowering Period: August - November

Distribution and Habitat

A. bicolor subsp. *minor* occurs in small, disjunct populations between Lake King and Condingup. It grows in moist sand and has been found near granite outcrops in heath communities.

Conservation Status

Current: Declared Rare Flora

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Condingup Peak | Esp | Esp | Shire Res. | 9.10.92 | 1 | Not found |
| 2 | Northover Soak | Esp | Rav | VCL | 1983 | 5 000+ | Post-fire |
| 3 | Dalyup | Esp | Esp | NR | 29.8.88 | - | Not found |
| 4 | Wittenoom Hill | Esp | Esp | Private | 1987 | 36+ | Post-fire |
| 5 | West River | Alb | Rav | - | 1967 | - | - |
| 6 | Twertup | Alb | Jer | NP | ca. 1967 | - | Post-fire |
| ?7 | ?Jerdacuttup | Esp | ?Rav | - | - | - | - |
| 8 | Pallarup Rocks | Kat | LG | NR | 1935 | - | - |
| 9 | Gibson,E | Esp | Esp | - | 1963 | - | - |

Response to Disturbance

Responds well to fire.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

A. bicolor subsp. *minor* is most commonly seen after dry-season fire. Populations re-establish from the soil seed bank but rapidly senesce a few years after fire and become very difficult to find. Re-survey and monitoring of known populations is required, especially post-fire.

References

Hopper (1987a, 1993), Hopper *et al.* (1990).

Hairy-Fruited *Billardiera*

Billardiera mollis is a low spreading, mid-dense shrub which grows to 50 cm tall. The reddish-brown stems have white hairs which rub off with age. The leaves are ovate to lanceolate-ovate (10-20 mm) with a sharp, pointed tip. Leaves are flat, covered on both surfaces with long white hairs when young, but become hairless with age except along the margins and midvein where the hairs remain semi-persistent. The deep blue flowers are solitary in leaf axils and are borne on slender stalks (15-25 mm). Sepals are free, narrow-lanceolate, dark blue and hairy. The recurved, blue petals have 3 or 4 distinct purple lines on the outer surface while the throat is pale blue or nearly white; anthers are white. Fruit capsules are covered with long white hairs and enclose seeds which are dark brown, smooth and shiny. The localised nature of the populations of *B. mollis* suggests that seed dispersal may be limited. It appears to be insect pollinated.

B. mollis closely resembles *B. villosa*, which is more compact, has flowers with blue anthers and leaf margins that curve backwards.

Flowering Period: August - November (to January)

Distribution and Habitat

B. mollis is geographically restricted to the Ravensthorpe Range and adjacent areas, with a range of less than 30 km. It grows near Kundip and Mt Desmond in gravelly sands over laterite or ironstone, and east along the Vermin Proof Fence in sand over laterite. It occurs in low open to low dense mallee with numerous species of *Eucalyptus* with an understorey comprising of a low open heath or more commonly a dense scrub containing *Hakea laurina*, *Melaleuca elliptica*, *Gastrolobium* sp. or *Banksia lemniiana*.

Conservation Status

Current: Declared Rare Flora

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------|----------|-------|--------------------|-------------|---------------|-----------|
| 1a,b,c | VPF | Esp | Rav | Unvested Res. | 9.12.88 | 700+ | Good |
| 1d | VPF | Esp | Rav | VCL | 26.11.81 | 3 | - |
| 1e | VPF | Esp | Rav | VCL | 26.11.81 | 20+ | - |
| 1f | VPF | Esp | Rav | VCL | 26.11.81 | 20+ | - |
| 2a | Mt Desmond,N | Alb | Rav | {Unvested Res. } | 1.1.82 | 50+ | - |
| 2b | Mt Desmond,S | Alb | Rav | {(Mining Lease) } | 25.10.87 | Rare | - |
| 3a | Kundip | Alb | Rav | VCL (Mining Lease) | 14.1.82 | 150+ | - |
| 3b | Kundip | Alb | Rav | Unvested Res. | 14.1.82 | 10+ | - |
| 4a | Rav Range | Alb | Rav | VCL | 9.80 | Common | - |
| 4b | Rav Range | Alb | Rav | VCL | 16.9.79 | - | - |

Response to Disturbance

Appears to be a disturbance opportunist along the edge of tracks.

Susceptibility to *Phytophthora* Dieback

Unknown

A shrub, up to 80 cm tall, with sparsely hairy branches. The leaves are divided into three leaflets which are almost cylindrical, 4-8 mm long and the margins are strongly rolled backwards towards the midrib. Leaflets are hairless on the upper surface, but hairy below. Flowers are pale to dark pink and are borne singly in the leaf axils on hairless red stalks. The 4 ovate petals (7 mm) have pointed tips, prominent midribs, and are loosely hairy on the outside but hairless inside except for near the tip. The sepals are red, ovate with pointed tips and about 3 mm long. Fruits consist of a capsule containing four 1-seeded carpels. Seeds are kidney-shaped (3-4 mm).

Boronia revoluta has shortly stalked leaves, which distinguishes it from the similar species *B. ericifolia* where leaves lack stalks. The latter species is found much further north between Moora and Wongan Hills.

Flowering Period: July - October

Distribution and Habitat

B. revoluta appears to be confined to ironstone outcrops in the vicinity of Forrestania and Hatter Hill, with a range of about 40 km. It prefers well drained sandy loam and laterite on the tops of ridges and small hills, where it grows in low eucalypt woodland, semi-arid mallee scrub, or heath with occasional emergent *Eucalyptus* species. Associated genera include *Banksia*, *Allocasuarina*, *Calothamnus*, *Drummondita*, *Gastrolobium* and *Dryandra*.

Conservation Status

Current: Declared Rare Flora

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|--------------------|-------------|---------------|-----------|
| 1 | Hatter Hill | Esp | Rav | VCL (Mining Lease) | 15.7.90 | 64 | Good |
| 2 | South Ironcap | Nar | Kon | VCL (Mining Lease) | 22.10.91 | 200+ | Good |
| 3 | Middle Ironcap | Nar | Kon | VCL (Mining Lease) | 1976 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible and it occurs well outside the range of known *Phytophthora* species.

Summary and Recommendations

B. revoluta has only been collected from three localities. Until September 1989, the species was thought to be extinct at Hatter Hill, however, it has since been collected there in small numbers. The species has not been relocated at Middle Ironcap since it was collected there in 1976 (F. Mollemans, personal communication; R. Thomas, personal communication).

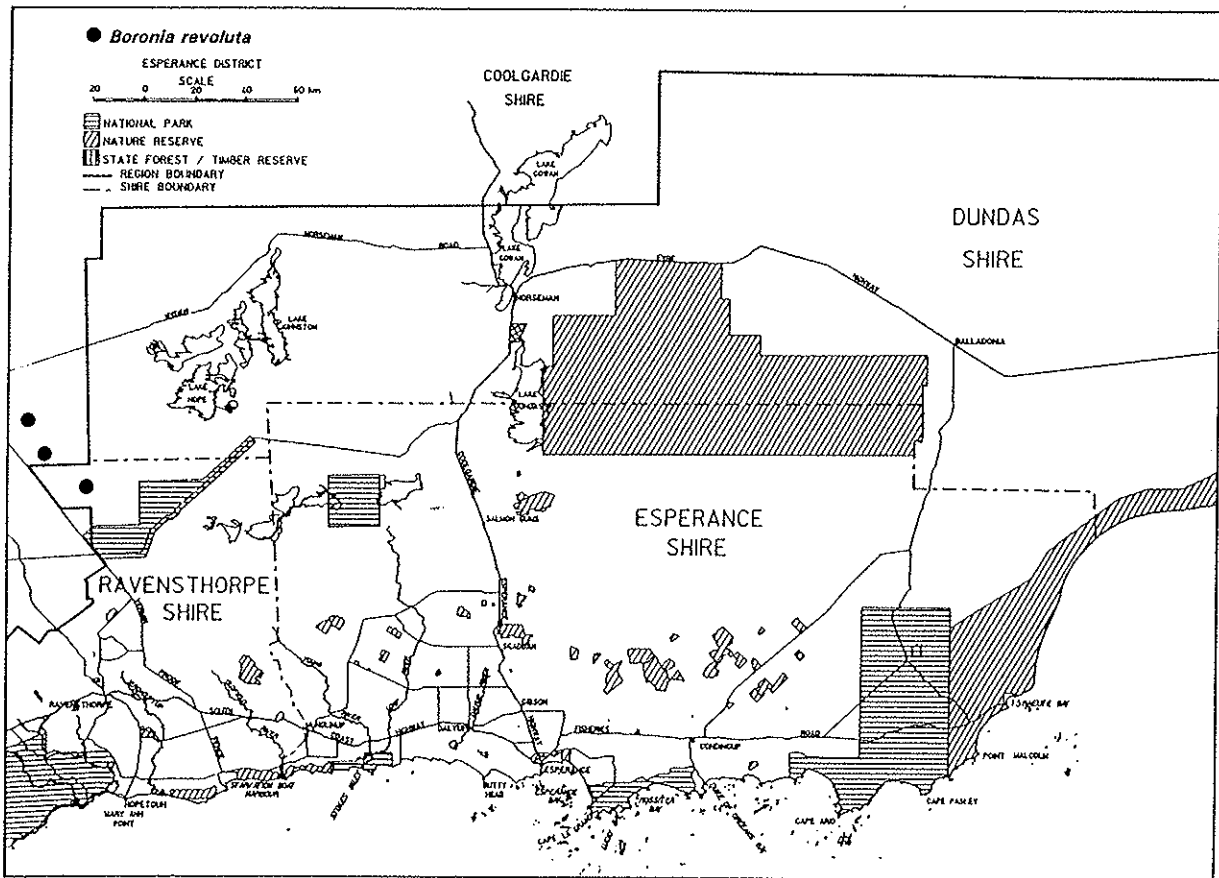
All known localities are threatened by mineral exploration activities. At South Ironcap, *B. revoluta* has been disturbed by grid lines; although many plants are undisturbed at present, further mineral exploration may endanger the population. Liaison with mineral exploration and mining companies is essential.

Summary and Recommendations (cont'd)

Further intensive surveys of ironstone hills and ridges in the vicinity of the Ironcaps is required. Surveys (late October 1992, and by Cochrane and Brown in December 1993) for the known populations in the Hatter Hill area failed to locate any plants. Surveying during the flowering season appears to be critical, otherwise plants are extremely difficult to find. Protection of populations from frequent fires would seem appropriate. Research into the pollination biology, fire ecology and population genetics of *B. revoluta* is needed.

References

Hopper *et al.* (1990), Leigh *et al.* (1984), Wilson (1971).



Caladenia exstans Hopper & A.P.Brown ms

ORCHIDACEAE

Pointing Spider Orchid

An erect, tuberous herb, 20-45 cm tall, with 1 or 2 flowers. Flowers have upswept sepals that are green with a central red stripe; the green labellum is distinctive as it has prominently pointed lobes and juts forward rather than curling under at the dark purple tip; the calli are purple-red. Leaves are up to 20 cm long and 4-6 mm wide.

Caladenia exstans ms is closely related to the larger-flowered *C. integra* which occurs some 400 km to the west.

Flowering Period: September - November

Distribution and Habitat

C. exstans ms occurs in small scattered populations, over a range of about 70 km, between Cape Le Grand and Cape Arid. It grows in moist soil pockets on coastal granite outcrops and in deeper soil around the margins of Yate flats. Associated species include *Borya constricta*, *Banksia speciosa*, *Nuytsia floribunda*, *Eucalyptus occidentalis* and *E. tetragona*.

Conservation Status

Current: Declared Rare Flora[#]

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|-------------|--------------------|---------------|-------------------|
| 1 | Cheetup Hill | Esp | Esp | NP | 8.10.85 23.9.87 | 100+ 10 | Post-fire Good |
| 2 | Thomas River | Esp | Esp | NP | 6.11.89 | 20 | Good |
| 3 | Cape Arid | Esp | Esp | NP | - | - | - |
| 4 | Shao Lu | Esp | Esp | Private | 20.9.77 | - | - |
| 5 | Alexander Bay | Esp | Esp | ?Shire Res. | - | - | - |

Response to Disturbance

Flowering is stimulated by summer fire although an appropriate interfire period needs to be determined.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

C. exstans ms occurs in both the Cape Le Grand and Cape Arid National Parks where it should remain secure. This species appears to respond to fire with over 100 plants observed flowering at Cheetup Hill approximately 10 months after the area had been burnt; only 10 were located more than 2.5 years after the fire.

Surveys to relocate *C. exstans* ms at Alexander Bay and Shao Lu are needed to ensure that the populations are conserved. Monitoring of known populations is required.

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

Caladenia voigtii Hopper & A.P. Brown ms

ORCHIDACEAE

Voigt's Spider Orchid, Mohawk Spider Orchid

An erect, tuberous herb, 8-20 cm tall, with 1 or rarely 2 flowers. Flowers (2-3 x 1-2 cm) are pale yellow-green with red-pink stripes; the sepals (except the dorsal sepal) and petals hang downwards and the labellum is rounded with a dense band of wedge-shaped calli that are white with red tips. The stems and narrow leaves (50-150 x 6 mm) are hairy.

This recently described species was previously thought to be *Caladenia cristata* which occurs near Miling, north of Perth.

Flowering Period: August - October

Distribution and Habitat

C. voigtii ms is a widespread species occurring from near Bremer Range to south-west of Balladonia, a range of about 240 km. It is found in a variety of habitats, ranging from shallow soil pockets on granite outcrops to the margins of inland salt lakes. It grows in open low woodland and open scrub communities associated with *Eucalyptus flocktoniae*, *E. cylindriflora*, *E. platycorys*, *E. eremophila* or *Callitris verrucosa*.

Conservation Status

Current: Declared Rare Flora[#]

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Mt Coobaninya, W | Esp | Esp | VCL | 22.8.89 | 200-300 | Good |
| 2 | Dowak West | Esp | Esp | Private | 17.9.77 | - | - |
| 3a | Cristata Compound | Esp | Esp | Private | 13.9.91 | 20+ | Average |
| 3b | Dowak East | Esp | Esp | Private | 10.9.78 | - | - |
| 4 | 90 Mile Tank | Esp | Dund | VCL | 28.9.88 | 40+ | Good |
| 5 | Mt Newmont | Esp | Esp | VCL | 6.9.90 | 100+ | Good |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

Although *C. voigtii* ms is widespread, the known populations are mostly small and none are known to occur in a conservation reserve. The populations occurring in Vacant Crown Land are undisturbed. Three populations occur on private property near Dowak and at least one of these has been fenced by the W.A. Native Orchid Study Group; grazing by rabbits is of concern in these areas. Monitoring and liaison with the property owners is required to ensure that these populations are appropriately managed and conserved.

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

Conostylis lepidospermoides Hopper

HAEMODORACEAE

Sedge Conostylis

A tufted, sedge-like perennial plant, up to 35 cm tall and 40 cm wide. The flat, narrow leaves (20-35 cm) are yellowish-green and have margins with 2 rows of short, dark brown bristles. Up to 6 flowers are borne in a loose inflorescence (cyme) on a scape 1-4 cm tall, i.e. much shorter than the leaves. The yellow perianth (up to 20 mm) is deeply divided into lobes (6-10 mm) and covered in long hairs. The stamens have large anthers (5 mm) and are inserted 5-7 mm above the ovary; the style is about 10 mm long.

A distinctive species with no obvious close relatives. *Conostylis lepidospermoides* is inconspicuous when not in flower due to the slender sedge-like leaves. The flowers, however, are distinctive and amongst the largest in the subgenus.

Flowering Period: September - October

Distribution and Habitat

C. lepidospermoides occurs east of Ravensthorpe and extends northwards to Ninety Mile Tank, a range of about 120 km. It grows on flat or gently undulating plains in yellow or grey sand over laterite or clay, in low heath and sedge communities with scattered emergent *Lambertia inermis*, *Banksia media*, *Eucalyptus tetragona* and other mallees.

Conservation Status

Current: Declared Rare Flora

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------|----------|-------|---------------|---------------------|-------------------|-----------|
| 1 | 90 Mile Tank,W | Esp | Dund | VCL | 17.10.74 | - | - |
| 2 | Rav,E | Esp | Rav | MRWA Rd Res. | 16.11.92 | 3+ | Average |
| 3 | Middle Road | Esp | Rav | Shire Rd Res. | 10.9.93 | 500+ | Good |
| 4a | West Point Rd | Esp | Rav | Shire Rd Res. | 6.9.83 | - | - |
| 4b | West Point Rd | Esp | Rav | Shire Rd Res. | 5.10.79 | - | - |
| 4c* | West Point Rd | Esp | Rav | Shire Rd Res. | 30.8.92 | 24 | Good |
| 5 | 90 Mile Tank,SW | Esp | Rav | NP | 27.10.80 17.9.93 | Rare Not found | - |
| 6 | Munglinup,E | Esp | ?Esp | - | 14.10.68 | - | - |
| 7 | Fields Rd | Esp | Esp | Private | 16.10.68 | - | - |
| 8 | Neds Corner Rd | Esp | Esp | Private | 26.9.68 | - | - |
| 9 | Burlabup Creek | Alb | Rav | MRWA Rd Res. | 27.9.68 | - | - |
| 10 | Mills Rd | Esp | Esp | Shire Rd Res. | 14.9.92 | 1 | Fair |
| 11* | Rockhole Rd | Esp | Rav | Shire Rd Res. | 15.9.92 | 50 | Good |
| 12 | ?West Point Rd | Esp | Rav | Shire Rd Res. | 3.10.83 | - | - |
| 13 | West Point Rd | Esp | Rav | Shire Rd Res. | 11.9.92 | 15 | Post-fire |
| 14 | West Point Rd | Esp | Rav | Shire Rd Res. | 10.9.92 | 50-100 | Good |
| 15 | Northover Soak | Esp | Rav | VCL | 21.9.79 | Occasional | - |

* = new population

Daviesia microcarpa Crisp

PAPILIONACEAE

Norseman Pea

Sprawling shrub with many long, weak, tangled stems, to 0.4 m tall and 1 m broad. The cylindrical phyllodes ('leaves', 8-20 x 0.5-0.8 mm) have a stiff, sharp point and are spirally arranged along the branches. Usually, one flower (rarely 2) is borne per leaf axil. Flowers are orange with pinkish-red on the veins and towards the centre. Pods are very small (4 x 3 mm), have raised reticulate venation, and an apex which is more or less obtuse.

Daviesia microcarpa is superficially similar to the narrow-leaved form of *D. ulicifolia*, however the leaves of the latter species are triangular in cross-section. Also, all forms of *D. ulicifolia* have spine-tipped branchlets, phyllodes which are never cylindrical, and pods which have a tapering acute apex.

Flowering Period: August - September

Distribution and Habitat

The only known population and type locality for *D. microcarpa* is on a very disturbed verge of the Eyre Highway, north-east of Norseman. It grows in red clay loam with calcrete nodules, in association with species of *Eremophila*, *Eucalyptus* and *Atriplex*.

Conservation Status

Current: Declared Rare Flora

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------|----------|-------|--------------|----------------------------------|-----------------------|------------------|
| 1 | Norseman | Esp | Dund | MRWA Rd Res. | 13.1.85 1987-1992 29.11.93 | 13 Not found 17 | - - Regen. |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible but occurs in an area where *Phytophthora* is not considered a threat.

Summary and Recommendations

Main Roads W.A. has developed a management strategy to attempt to regenerate this population. Recovery of this population should be monitored over the next five years.

A quantity of seed was collected in 1993 and sent to Kings Park for propagation.

References

Crisp (1983).

Drummondita hassellii var. *longifolia* Paul G. Wilson

RUTACEAE

Peak Charles Drummondita

A shrub which grows up to 1 m tall, with glossy somewhat spreading leaves. Leaves are alternate, cylindrical (20 mm long), wrinkled and have a sharp, curved point at the tip; they produce a scent when cut. The solitary flowers are up to 25 mm long; the yellowish calyx is hairless with 5 small sepals; petals are large and red; the 5 fertile stamens alternate with 5 sterile ones and unite to form an elongate pink-red tube which is covered in long white hairs; the style is red and has an enlarged flat end which protrudes above the stamens. The dry fruit opens by 3 valves and is normally 3-seeded.

Drummondita hassellii var. *longifolia* can be distinguished from other taxa of *Drummondita* by its leaves which are at least twice as long as other varieties.

Flowering Period: April - May, July, September - November

Distribution and Habitat

D. hassellii var. *longifolia* is restricted to the Peak Charles area. It grows in granite crevices in sandy clay on hillsides in open shrubland. Associated genera include *Opercularia*, *Melaleuca*, *Leptospermum*, *Eucalyptus* and *Calothamnus*.

Conservation Status

Current: Declared Rare Flora

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Peak Charles | Esp | Esp | NP | 18.9.93 | 400+ | Post-fire |

Response to Disturbance

D. hassellii var. *longifolia* is known only from one population in Peak Charles National Park, which was burnt by a hot fire in January 1991. Eighteen months after the fire most of the plants observed were vegetative and appeared to be seedlings (single-stemmed), only 3 larger plants were seen that were resuckering and had a couple of flowers.

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

Regular monitoring of the known population is required to determine the time for the young plants to set viable seed after the 1991 fire; this will be important to determine the appropriate interfire period for this species and fire management of the area.

References

Wilson (1971).

Eremophila denticulata F.Muell. subsp. *denticulata*

MYOPORACEAE

Fitzgerald Eremophila, Toothed Eremophila

A tall, straggly shrub to 2 m tall, with sticky, glutinous young branches and leaves. Young plants are leafy and compact, whereas older plants have leaves clustered at the ends of branches. The leaves (30-50 mm) are conspicuously toothed along the margins. The attractive red flowers are tubular with the lower corolla lobe cut to form a distinct lip, and are borne on long S-shaped stalks.

Flowering Period: October - January

Distribution and Habitat

Eremophila denticulata subsp. *denticulata* occurs in two areas about 70 km apart, south-east of Ravensthorpe and east of the Oldfield River. It is only known from areas that have been disturbed in alluvial soils along rivers and on loamy clay over granite. Nearby plant communities may include tall mallet woodland.

Conservation Status

Current: Declared Rare Flora

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------------|----------|-------|-------------|-------------|---------------|---------------------|
| 1a | Moir Rd,W | Alb | Rav | Private | 14.12.92 | 300 | Dying |
| 1b | Moir Rd,W | Alb | Rav | NP | 14.12.92 | 500 | Dying |
| 2a | Moir Track | Alb | Rav | NP | 6.1.92 | 15 | Healthy |
| 2b | Moir Track,W | Alb | Rav | NP | 10.2.93 | 5-10 000 | Dying |
| | | | | | ?24.4.93 | - | Burnt |
| 3 | Hammersley River | Alb | Rav | NP | - | - | - |
| 4 | Cheadanup | Esp | Rav | NR | 1.11.93 | 6 Mature | Dying |
| | | | | | 1.11.93 | 2 000+ | Post-fire Seedlings |

Response to Disturbance

E. denticulata subsp. *denticulata* appears to be a disturbance opportunist, with seed germination being stimulated by fire or soil disturbance.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

Until recently, the only known population of *E. denticulata* subsp. *denticulata* was located on private property in a cleared paddock, and was fenced off by the property owner in 1989. In January 1986, the population numbered 8 000-10 000 plants, but by December 1992 had declined to about 300 plants. Currently, the biggest population, known from a chained firebreak in the north east of the Fitzgerald River National Park, was consumed in a control burn in autumn 1993 (Robinson and Coates 1995).

Eremophila denticulata subsp. *trisulcata* Chinnock ms

MYOPORACEAE

Kumquat Eremophila

A compact shrub slightly over 1 m tall, which looks very similar to a kumquat. Leaves are bright green, glossy, oblong-lanceolate and serrated on the margins. The pink-red flowers are held on long S-shaped stalks that curve up under the flowers. The 4 upper corolla lobes form the upper lip of the flower and the fifth lobe is cut much lower than the others forming a distinct lower lip. The stamens are exerted beyond the corolla. After flowering the calyx is scarcely enlarged.

Flowering Period: October - November

Distribution and Habitat

Eremophila denticulata subsp. *trisulcata* ms is known only from two areas about 20 km apart; the first lies east of Mt Buraminya where three sub-populations are distributed over 5 km, the other population lies south-east of Mt Willgonarinya. It grows in fine loam over limestone.

Conservation Status

Current: Declared Rare Flora[#]

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1a | Mt Buraminya,E | Esp | Esp | VCL | 31.5.90 | 100+ | - |
| 1b | Mt Buraminya,E | Esp | Esp | VCL | 5.90 | 20 | - |
| 1c | Mt Buraminya,E | Esp | Esp | VCL | 8.90 | 1 000-2 000 | - |
| 4 | Mt Willgonarinya,SE | Esp | Esp | VCL | 9.86 | 40 | Dying |

Response to Disturbance

Like *E. denticulata* subsp. *denticulata*, this species is assumed to be a disturbance opportunist.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

E. denticulata subsp. *trisulcata* ms is restricted to old mining tracks where the middle and upper storey plants have been cleared (W. Archer, personal communication). Resurvey of populations and further study of this taxon is required, especially after fire, to confirm whether it is a disturbance opportunist.

References

Grieve and Blackall (1982).

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

Eucalyptus cerasiformis Brooker & Blaxell

MYRTACEAE

Cherry-fruited Mallee

An erect mallee growing up to 3 m tall with smooth, mottled grey over salmon-pink bark. The pith of branchlets is glandular. Juvenile leaves are lanceolate (30-40 x 6-15 mm). Adult leaves are yellow-green and glossy, alternate and narrowly lanceolate (50-80 x 7-12 mm); glands are prominent on both surfaces. Inflorescences are borne on a slender, cylindrical stalk (peduncle, 15-40 mm long) that curves downwards bearing 7 yellow flowers, each borne on a long stalk (pedicel, 10-12 mm). Buds are ovoid, contracted at the middle and have a yellow-brown, conical bud cap which contrasts with the green calyx tube. The urn-shaped fruits (12-15 x 6-9 mm) have a thick rim, depressed disc and 4-5 enclosed valves. Seed is brown and ovoid in shape.

This species is closely related to *E. dielsii* from which it differs in its smaller buds and fruits and in the urn-shaped fruits which are without a flared rim. It is also somewhat similar to *E. erythronema* but can be distinguished again by its urn-shaped fruits.

The common name of *E. cerasiformis* is a reference to the pendulous buds which look like bunches of cherries. Native bees have been observed pollinating the flowers.

Flowering Period: August - March, June

Distribution and Habitat

E. cerasiformis is known from a restricted area between Hyden and Norseman, over a 50 km range. It is usually found in depressions of undulating hills in gravelly reddish loam, where it grows in low open forest with a dense heath understorey, in association with *E. salubris*, *Melaleuca uncinata*, *Acacia* and *Casuarina* spp.

Conservation Status

Current: Declared Rare Flora

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------------|----------|-------|---------------------------------------|-------------|---------------|-----------|
| 1 | Ant Rock,NW | Esp | Dund | VCL (Mining Lease) & Shire Rd Res. | 3.3.88 | 189 | Good |
| 2a | Mt Day | Esp | Dund | VCL (Mining Lease) | 3.3.88 | 62 | Good |
| 2b | Mt Day | Esp | Dund | VCL (Mining Lease) | 15.6.88 | 20 | Good |
| 2c | Mt Day | Esp | Dund | VCL (Mining Lease) | 15.6.88 | 70+ | Good |
| 3a | Round Top Hill,SSW | Esp | Dund | Shire Rd Res. } | 3.3.88 | 40 | Good |
| 3b | Round Top Hill,SSW | Esp | Dund | VCL } | | | |
| 4a | Round Top Hill | Esp | Dund | VCL (Mining Lease) | 9.5.89 | - | - |
| 4b | Round Top Hill | Esp | Dund | VCL (Mining Lease) | 9.5.89 | - | - |
| 5a | Round Top Hill,S | Esp | Dund | VCL (Mining Lease) | 9.5.89 | - | - |
| 5b | Round Top Hill,S | Esp | Dund | VCL (Mining Lease) | 9.5.89 | - | - |
| 6 | Maggie Hays Hill,NW | Esp | Dund | VCL (Mining Lease) | 10.5.89 | - | - |
| 7 | Maggie Hays Hill,N | Esp | Dund | VCL (Mining Lease) | 10.5.89 | - | - |
| 8 | Bremer Range | Esp | Dund | VCL | 25.10.64 | - | - |

Response to Disturbance

Unknown

Eucalyptus insularis Brooker

MYRTACEAE

Twin Peak Island Mallee

A small, slender-stemmed mallee (1.5-2 m tall) in the Cape Le Grand area, and a tall mallee (1.4-8 m) on North Twin Peak Island. Bark is smooth, red-brown, pale grey, yellowish-green or greenish-grey; in the tall form there is a fibrous, red-brown basal stocking. Larger specimens have branches which are conspicuously wrinkled underneath at the base. Branchlets are 4-sided and are often reddish when young. Juvenile leaves are sessile, elliptic and have toothed edges. Older leaves are petiolate, narrowly lanceolate (to 70 x 15 mm), dull green and have a long narrow, curved point. Buds have a cap which is slightly narrower and shorter than the base. Fruits (6-8 x 6 mm) are pendulous, barrel-shaped with a thin rim and 3 or 4 valves in a sunken, shining, red-brown disc. Seeds are brown, pyramidal or elongated.

Eucalyptus insularis is superficially similar to *E. doratoxylon* whose adult leaves have a very dense network of veins and are apparently glandless; the former species has only a sparse veinal network and numerous to scattered oil glands. *E. doratoxylon* has a bud scar whereas *E. insularis* does not. *E. doratoxylon* has long peduncles (10-12 mm) which support inflorescences of usually no more than 7 cream or yellowish-white flowers, however, *E. insularis* generally has more than 7 white flowers and shorter peduncles (4-11 mm) which curve downwards.

Flowering Period: May - June, August

Distribution and Habitat

E. insularis is known from only North Twin Peak Island in the Recherche Archipelago and at one locality on Cape Le Grand. It grows along a watercourse on the western slopes of the island, while on the mainland *E. insularis* grows in shallow loamy soil in crevices on the steep slope of a granite rock amongst dense scrub. Associated species include *E. lehmanii*, *E. conferruminata* and *Acacia heteroclita*.

Conservation Status

Current: Declared Rare Flora

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Twin Peak Island | Esp | Esp | NR | 24.4.72 | - | - |
| 2 | Cape Le Grand | Esp | Esp | NP | 6.10.92 | 50 | Good |

Response to Disturbance

Response to fire and other disturbances is unknown.

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

Both of the known populations of *E. insularis* occur in conservation reserves where they should remain secure. Collection of seed is recommended. Regular monitoring is required.

References

Brooker (1974), Brooker and Kleinig (1990), Elliot and Jones (1986), Rye and Hopper (1981).

Eucalyptus merrickiae Maiden & Blakely

MYRTACEAE

Goblet Mallee, Narrow-leaved Mallee

A mallee, 2-6 m tall, with a dense crown giving the plant an almost globular appearance. The bark is rough and coloured grey-brown over white. Adult leaves are small, linear to narrowly lanceolate (60-100 x 5-9 mm) and light green to grey-green in colour. Leaf venation is almost nil, although there are numerous oil glands. Each inflorescence has up to 3 cylindrical to rounded buds (7-10 x 4-6 mm) that are borne on short stalks; the bud caps turn cherry red in colour when nearly mature. Flowers are white. Fruits are cup-shaped to cylindrical, have a thick rim and a concave disc with 3 or 4 valves; they turn mealy-white with age. The seed is whitish-grey and ovoid.

Eucalyptus merrickiae is superficially similar to *E. halophila*, *E. scyphocalyx* and *E. leptocalyx*. It can be distinguished from these species by its rough bark, narrower leaves, and only 3 flowers per inflorescence (*E. halophila*, *E. scyphocalyx* and *E. leptocalyx* typically have 7 or more) with short, rounded inflorescence stalks (peduncles).

Flowering Period: July - December

Distribution and Habitat

E. merrickiae grows in sandy, loamy depressions around the salt lakes and saline flats mainly east of Truslove to north-east of Mt Ridley. It has a range of about 60 km for the known populations, except for a disjunct occurrence 160 km to the east near Israelite Bay. It occurs in open shrub mallee, often with dense scrub beneath. Associated species include *E. halophila*, *E. uncinata*, *E. rigens* and *E. eremophila*.

Conservation Status

Current: Declared Rare Flora

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|---------------|-------------|---------------|-----------|
| 1a | Grass Patch | Esp | Esp | - | 1968 | - | - |
| | | | | | 23.9.92 | Not found | - |
| 1b | Grasspatch,S | Esp | Esp | - | 23.5.24 | - | - |
| | | | | | 23.9.92 | Not found | - |
| 2 | Israelite Bay | Esp | Esp | NR | 21.9.76 | - | - |
| 3 | Mt Ridley,NNE | Esp | Esp | VCL | 10.5.83 | - | - |
| 4 | Dempster Rd | Esp | Esp | VCL | 25.9.92 | 1 | Average |
| 5a | Mt Ridley,NW | Esp | Esp | Shire Rd Res. | 10.9.83 | - | - |
| 5b | Styles Rd | Esp | Esp | Shire Rd Res. | 23.9.92 | 3 | Average |
| 6 | Mt Ridley,WSW | Esp | Esp | - | 10.9.83 | - | - |
| 7 | Swan Lagoon | Esp | Esp | NR | 1984 | - | - |
| | | | | | 24.9.92 | Not found | - |
| 9a | Truslove Rd | Esp | Esp | Shire Rd Res. | 3.12.88 | 200+ | Good |
| | | | | | 22.9.92 | 50+ | Good |
| 9b | Truslove, E | Esp | Esp | Shire Rd Res. | 22.9.92 | 2 | Good |
| 10 | Truslove | Esp | Esp | NR | 22.9.92 | 9 | Good |
| 11 | Mt Ridley,NE | Esp | Esp | VCL | 3.12.88 | 9 | Good |
| 12* | Kents Rd | Esp | Esp | Shire Rd Res. | 30.1.93 | 20 | Good |
| 13* | Griffiths Rd | Esp | Esp | Shire Rd Res. | 24.9.92 | 1+ | Poor |
| 14a* | Ridley Rd | Esp | Esp | Shire Rd Res. | 19.11.93 | 2+ | Good |
| 14b | Ridley Rd | Esp | Esp | NR | 19.11.93 | 1+ | Good |

Known Populations (cont'd)

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|-------------------------|-------------|---------------|--------------------|
| 14c* | Ridley Rd | Esp | Esp | Shire Rd Res. & Private | 19.11.93 | 5+ 2 | Average Average |
| 15 | Truslove Rd | Esp | Esp | - | 27.5.82 | - | - |
| 16 | Dowak,E | Esp | Esp | - | 8.33 | - | - |
| 17 | Circle Valley | Esp | Esp | - | 7.11.53 | - | - |

* = new population; (pop. no. 12, Mulcahy 1993)

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

In the last 20 years, collections have been made of *E. merrickiae* from thirteen sites. Some of the localities on the specimen collections are vague and may actually refer to an already known location (e.g. pop. no. 6 may equal pop. no. 9 or 10). The majority of known populations are scattered, small and occur in disturbed, narrow road reserves. Many of the localities where collections were made earlier than 1970 have possibly been cleared for agriculture or road construction.

Although *E. merrickiae* has been recorded from four Nature Reserves, their population sizes are either unknown or appear inadequate for long-term survival of the species. Further survey of Nature Reserve No. 27768 (Ridley Rd), and the populations occurring north-east of Mt Ridley (nos. 3 and 11) are required to determine the extent of populations occurring in relatively undisturbed areas.

Seed collections were made of this species in 1991 (L. Sweedman, Kings Park) and 1993 (M. Mulcahy, CALM). Study of the pollination biology and the response to fire is recommended.

References

Brooker and Kleinig (1990), Carr and Carr (1980), Elliot and Jones (1986), Hopper *et al.* (1990), Maiden and Blakely (1925).

Jimberlana Mallee

An upright to spreading, moderately dense mallee to 4 m tall with smooth, grey bark. Leaves are elliptic as juveniles becoming lanceolate (50-110 x 6-11 mm) when older. They are dull blue-green, have a moderate network of veins and scattered to numerous, often obscure oil glands. Each inflorescence is borne on a stalk (peduncle, 7-17 mm long) which is rounded or angular in cross-section, and has up to 7 buds (13-19 x 9-10 mm) which have beaked caps. Flowers are white. Fruits have a broad disc and 4 valves which are level with the thick rim. Seeds are shining, brown and D-shaped.

Eucalyptus platydisca ms is similar to *E. diversifolia* but differs in having fruit with a level disc (*E. diversifolia* has a slightly ascending one), slightly larger buds (*E. diversifolia* buds are 7-10 x 5-6 mm), and a very restricted habit.

Flowering Period: March - June

Distribution and Habitat

E. platydisca ms is known only from Jimberlana Hill and Mt Norcott, north-east of Norseman, a geographic range of 18 km. It grows in dark brown, sandy loam amongst granite boulders, in open shrub-mallee (*E. oleosa*) over *Triodia* and *Stipa*. Associated plants include species of *Allocasuarina*, *Solanum*, *Santalum* and *Eremophila scoparia*.

Conservation Status

Current: Declared Rare Flora

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-------------------|----------|-------|---------------|-------------|---------------|-----------|
| 1 | Jimberlana Hill,N | Esp | Dund | Unvested Res. | 19.11.92 | 200+ | Good |
| 2 | Mt Norcott | Esp | Dund | VCL | 2.11.90 | 1 500 | Good |

Response to Disturbance

Has been observed regenerating after a fire in 1983.

Susceptibility to *Phytophthora* Dieback

Unknown but it occurs in an area not considered at risk from *Phytophthora* species.

Summary and Recommendations

Jimberlana Hill has been recommended as a nature reserve, however the proposal has been opposed by the Department of Minerals and Energy. Currently, the population remains undisturbed.

Further survey of the Dundas Hills is required.

References

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

Kennedia beckxiana (F.Muell.) F.Muell.

PAPILIONACEAE

Cape Arid Kennedia

A slender, prostrate or climbing legume with bright green or bluish-green trifoliolate leaves. The leaflets have prominent veins, are ovate and 25-40 mm long. The flowers are large (35-50 mm long) and borne singly or in short racemes which are encircled at the base by prominent, large, fused bracts. Flowers are bright red and have a distinctive greenish-yellow blotch at the base of the broad standard. The big, turgid pods grow to 70 mm long and have a long, pointed tip.

Flowering Period: August - December

Distribution and Habitat

Kennedia beckxiana occurs between Condingup and Israelite Bay, a range of about 100 km. It is usually found on granite hills or in coastal sandhills around granite. It grows in dense scrub of mixed proteaceous and myrtaceous species.

Conservation Status

Current: Declared Rare Flora[#]

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1a | Mt Ragged | Esp | Esp | NP | 23.4.93 | 50+ | Post-fire |
| 1b | Mt Ragged | Esp | Esp | NP | 23.4.93 | 1 000+ | Post-fire |
| 1c | Mt Ragged | Esp | Esp | NP | 23.4.93 | 500+ | Post-fire |
| 2 | Gora Hill, SW | Esp | Esp | NP | - | - | - |
| 3 | Bebenorin Hill | Esp | Esp | VCL | 13.10.83 | - | - |
| 4 | Israelite Bay | Esp | Esp | NR | - | - | - |
| 5 | Howick Hill | Esp | Esp | - | 10.44 | - | - |
| 6 | Boyatup Hill | Esp | Esp | VCL | 10.3.89 | 10 | - |
| 7a | Little Tagon Bay Pt | Esp | Esp | NP | 26.4.93 | 200+ | Degen. |
| 7b | Dolphin Cove | Esp | Esp | NP | 26.4.93 | 2 | Degen. |
| 7c | Tagon Beach | Esp | Esp | NP | 30.8.89 | 4 | - |
| 7d | Lake Boolenup | Esp | Esp | NP | 12.92 | 2 | Fair |
| 7e | Thomas River | Esp | Esp | NP | 12.92 | 5 | Fair |
| 7f | Campsite | Esp | Esp | NP | 12.92 | 1 | Fair |
| 8 | Russell Range | Esp | Esp | NP | 1889 | - | - |

Response to Disturbance

Fire regenerates this species by breaking seed dormancy and providing the conditions for it to proliferate. This situation was observed at Mt Ragged 26 months after the hot fire in February 1991, where *K. beckxiana* smothered dead trees and shrubs over large areas. Plants had already flowered and dispersed seed by this time.

Susceptibility to *Phytophthora* Dieback

Unknown

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

Lambertia echinata R.Br. subsp. *echinata*

PROTEACEAE

Prickly Honeysuckle

A much-branched shrub which grows up to 1 m tall, with hairy stems. The leaves are arranged in whorls of 3, are up to 4 cm long and taper towards the stems; they are divided into 3-5 lobes with long, sharp points, and there are prominent veins on the underside. The 4 perianth segments of the flowers are united to form a long tube (5 cm) which is broad at the top. As the flowers open, the segments coil down spirally enclosing the stamens. Flowers are pink-red and usually in groups of 7. The woody fruits are grey, shiny and nearly 2 cm long, including the beak.

Flowering Period: September

Distribution and Habitat

This species is known only from one site in the Cape Le Grand National Park, a sub-population 500 m distant has died, probably from *Phytophthora* dieback. It grows on a mixture of pure laterite and granite sheeting on windswept coastal slopes. The vegetation is very rich coastal heath, with *Dryandra* and *Calothamnus* dominating.

Conservation Status

Current: Declared Rare Flora

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|-------------|-------------|---------------|------------|
| 1 | Cape Le Grand | Esp | Esp | NP | 6.10.92 | 3 | Threatened |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Field observations suggest very high susceptibility.

Summary and Recommendations

Only three *Lambertia echinata* subsp. *echinata* plants are known to exist, and these occur on two small 'islands' in a gravel pit. The other known locality, only 500 m away, had 5 plants in undisturbed vegetation but these died recently, probably due to dieback (*Phytophthora* spp.).

This species is critically endangered, particularly as it appears to be susceptible to dieback. A recovery plan is urgently required to develop a management strategy for this species' survival. Propagation should be a high priority so that a secure number of plants can be established in cultivation. Viable seed has been collected by the CALM Threatened Flora Species Centre.

A detailed map showing the localities where different people have searched for this species in the Cape Le Grand National Park is needed at the Ranger's Office. Further survey is urgently required.

References

Bentham (1870), Curry (1992-3), Erickson *et al.* (1979), Hopper *et al.* (1990), Rye and Hopper (1981).

Myoporum turbinatum Chinnock

MYOPORACEAE

Salt Myoporum

An erect shrub to 4 m tall, which is at first multistemmed and broom-like, but eventually consists of one or a few long slender stems with leafy branches restricted to the uppermost part. Both branches and leaves are sticky and have prominent wart-like protuberances. Leaves are alternate, shiny, dark green in colour, linear (11-80 x 1 mm) and have a midrib which is distinctly grooved on both surfaces. The leaf margins have small conical teeth which are more obvious towards the tip. Flowers are dull white but often tinged with lilac and have 4 stamens which are exerted just beyond the petals. There are 4 to 8 flowers per axil. Fruits are flattened, beaked at the end and have 4 ribs or wings.

Myoporum turbinatum is similar to *M. platycarpum*, except for the fruits which are not flattened in the latter species.

Flowering Period: May, October - February

Distribution and Habitat

M. turbinatum is known only from a small area, less than 15 km wide, north-east of Esperance. It occurs on the margins of saline depressions in sandy duplex soils. It grows in mallee-heath scrub and associated species include *Melaleuca* sp., *Hakea laurina* and various *Eucalyptus* spp.

Conservation Status

Current: Declared Rare Flora

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------|----------|-------|---------------------------|-------------|---------------------|-----------|
| 1 | Coolinup Rd | Esp | Esp | Shire Rd Res. | 30.5.89 | 3 | Average |
| 2 | Heywood Rd | Esp | Esp | Private | 10.10.93 | 4 | Good |
| 3 | Heywood Rd | Esp | Esp | NR & Shire Rd Res. } | 10.10.93 | 4 Alive & 4 Dead | Degen. |
| 4 | Heywood Rd | Esp | Esp | Shire Rd Res. & Private } | 10.10.93 | 26 Alive & 7 Dead | Degen. |
| 4a | Karl Berg Rd | Esp | Esp | Shire Rd Res. & Private } | 10.10.92 | 37+ Alive & 24 Dead | Degen. |
| 5 | Heywood Rd | Esp | Esp | Shire Rd Res. & Private } | 10.10.92 | 16 Alive & 2 Dead | Average |
| 6 | Karl Berg Rd | Esp | Esp | Shire Rd Res. | 7.11.81 | Common | - |

Response to Disturbance

Some disturbance appears to be beneficial, as plants on firebreaks were observed to be in better condition than undisturbed plants.

Susceptibility to *Phytophthora* Dieback

Unknown

Myriophyllum petraeum Orchard

HALORAGACEAE

Granite Myriophyllum

An annual aquatic herb, with weak stems, 15-20 cm long. The linear leaves are alternate, and emergent leaves are longer and broader than submerged ones. Separate male and female flowers are borne singly in the axils of the upper leaves. Flowers are sessile and 4-merous; the males have 4 white petals and 8 stamens, while the females are without petals or sepals. The yellow-brown to red-brown fruits have 4 cylindrical mericarps which separate freely at maturity.

This species has no close relatives.

Flowering Period: August - September

Distribution and Habitat

Myriophyllum petraeum is distributed between Southern Cross and Mt Ragged, a geographical range of over 400 km. It is confined to ephemeral rock pools, 10-30 cm deep, on granitic outcrops. The plants collapse when pools dry out at the end of summer and must re-establish themselves from seed with the next season's rainfall.

Conservation Status

Current: Declared Rare Flora[#]

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|-------------|-------------|---------------|-------------|
| 1 | Mt Heywood | Esp | Esp | VCL | 30.9.83 | - | - |
| 2 | Mt Beaumont,NE | Esp | Esp | VCL | 29.9.83 | - | - |
| 3 | Moir Rock | Esp | Esp | VCL | 15.9.76 | - | - |
| 4 | 25 Mile Rocks | Esp | Dund | NR | 20.11.92 | 250 | Good |
| 5 | Caenyie Rock | Gold | Cool | - | 26.8.81 | Rare | - |
| 6 | Split Rocks | Mer | Yil | VCL | 17.10.90 | 80 | Disturbed |
| 7 | Boyatup Hill | Esp | Esp | VCL | 1.10.68 | - | - |
| 8 | Junana Rock | Esp | Esp | NP | 16.8.80 | - | - |
| 9 | Mt Ragged,W | Esp | Esp | NP | 16.11.76 | - | - |
| 10 | Mt Madden | Kat | LG | Water Res. | 26.10.92 | 500 | Part-grazed |
| 11 | Nulla Nulla,N | Mer | Yil | Private | 10.9.89 | 315 | Undisturbed |
| 12 | Bullarragin | Mer | West | Private | 2.9.89 | 434 | Disturbed |
| 13 | Thomas River | Esp | Esp | NP | 21.11.89 | - | - |
| 14 | 71 Mile Rocks | Gold | Cool | Water Res. | 1988 | <20 | Good |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

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

Prostanthera carrickiana B.J.Conn

LAMIACEAE

Carrick's Mintbush

An erect shrub, 50 cm tall, with densely hairy branches. Leaves are hairless and elliptical in shape (13-14 x 6-8 mm). Flowers are 23-26 mm long, pinkish-red, hairless at the base of the corolla but moderately to densely hairy towards the tip; the inner surface of the corolla is hairless. There are 2-6 flowers per inflorescence.

This species does not appear to have any close affinities with any other *Prostanthera* species occurring in Western Australia.

Flowering Period: April - May

Distribution and Habitat

P. carrickiana is only known from three localities, between Clyde Hill and Mt Burraminya, with a 20 km range. It occurs in open mallee with a low shrub understorey in greyish-brown sandy clay soils and in rock crevices.

Conservation Status

Current: Declared Rare Flora[#]

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|---------------|-------------|---------------|-----------|
| 1 | Clyde Hill,E | Esp | Esp | ?Private & NR | 3.5.83 | 10 | - |
| 2 | Clyde Hill,NE | Esp | Esp | Private | - | 10 | - |
| 3 | Mt Burraminya | Esp | Esp | VCL | 16.6.90 | 1 000+ | Good |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

According to Burgman (1985b), the area near Clyde Hill where populations nos. 1 and 2 of *P. carrickiana* grow are being developed for agriculture. Information on the specimens at the Western Australian Herbarium suggests that pop. no. 1 may occur within the Clyde Hill Nature Reserve. A survey in May 1993 failed to locate this population. Surveys to relocate the populations near Clyde Hill are urgently required. The Mt Burraminya population is large, in a relatively remote area and appears quite stable and under no immediate risk (W. Archer, personal communication).

References

Burgman (1985b), Conn (1987), Hopper *et al.* (1990).

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

Rhizanthella gardneri R.S.Rogers

ORCHIDACEAE

Underground Orchid

A succulent saprophytic herb with thick horizontal subterranean stems. The tulip-like flower heads develop just under the soil surface. Each head contains 20-90 small flowers (6 x 5 mm) surrounded by 6 to 12 large, cream or red-cream, spreading bracts (10-30 x 5-10 mm) that cracks open the soil surface as the head matures. Occasionally the tips of the floral bracts protrude through the leaf litter, leaving a tiny opening.

Flowering Period: May - July

Distribution and Habitat

Rhizanthella gardneri is known from two widely separated areas, in the Esperance District it occurs in the Munglinup-Oldfield River District; the other area lies between Corrigin and Wubin in the central Wheatbelt. A few plants are also known in New South Wales and there have been reports of *R. gardneri* being found in South Australia. In Western Australia it grows in association with *Melaleuca uncinata*, which often forms dense thickets.

Conservation Status

Current: Declared Rare Flora

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------|----------|-------|---------------|-------------|---------------|-----------|
| 1 | Babakin | Nar | BR | NR | 1982 | 110 | - |
| 2 | Sorenson's Res. | Nar | BR | NR | 1982 | 6 | - |
| 3 | Dallinup | Esp | Rav | Private | 1982 | 10 | - |
| 4 | Cheadanup | Esp | Rav | NR. | 1982 | 4 | - |
| 5 | Oldfield River | Esp | Rav | VCL | 1982 | 4 | - |
| 6 | Corrigin,W | Nar | Cor | Unvested Res. | 1982 | 50-60 | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

A comprehensive report on the biology, distribution and management of *R. gardneri* was prepared by Kingsley Dixon and John Pate (1984) following extensive surveys during 1981-82. They indicate that management of the orchid requires successful management of the whole vegetational system which supports the *Melaleuca uncinata* thickets in which *R. gardneri* is known or suspected to reside. In the Esperance District, firebreaks need to be well maintained around populations to prevent burns escaping from adjoining farmland. The impact of rabbits appears to be negligible at present, but monitoring is required. A nature reserve has been proposed to incorporate the Oldfield River population (no. 5); this proposal requires further action. A recent report has been prepared on the population genetics and life history of this species (Carstairs and Coates 1994).

Ricinocarpus trichophorus Muell.Arg.

EUPHORBIACEAE

Barrens Wedding Bush

An erect, openly spreading shrub to 0.6 m tall, with stems covered in grey felt-like hairs. The narrow leaves (25-80 x 1.5 mm) lack stalks, are dark green above and greyish felt-like below, and have margins rolled back toward the midrib (revolute). Flowers are white and unisexual; the females have 3 divided styles while the males have numerous stamens which are joined at the base to form a central column. The flowers are borne on long, pinkish-brown stalks (up to 20 mm), with 6-10 flowers at the end of each branch. Fruits are about 10 mm long, grey, hairy and surrounded by the persistent sepals; they split into 3 slits to release the dark, glossy seeds.

Flowering Period: March - May, August - November

Distribution and Habitat

Ricinocarpus trichophorus is a common but localised component of post-fire regeneration of mallee scrublands. It prefers rocky, sandy clay sites along watercourses or areas which collect run-off, such as granite rocks or breakaways. Associated species include *Eucalyptus lehmannii*, *E. tetragona*, *Melaleuca uncinata*, *Glischrocaryon aureum* and *Allocasuarina* spp.

Conservation Status

Current: Declared Rare Flora

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1a | Twertup | Alb | Jer | NP | 17.3.93 | 3 | Healthy |
| 1b | Twertup,E | Alb | Jer | NP | 7.12.93 | 20 | Healthy |
| 1c | Fitzgerald Valley | Alb | Jer | NP | 24.5.85 | Dense | Healthy |
| 2 | Mt Heywood | Esp | Esp | VCL | 21.5.93 | 1 000+ | Post-fire |
| 3 | Mt Beaumont | Esp | Esp | VCL | 8.83 | Few | - |

Response to Disturbance

Two years after a hot burn (January 1991), *R. trichophorus* was abundant and flowering on Mt Heywood, having regenerated largely by root suckers. According to K.R. Newbey (unpublished data), plants growing from seed have their first seed set after 4 years.

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

Resurvey of the Mt Beaumont population is required following the burn in 1991.

References

Hopper *et al.* (1990), Robinson and Coates (1995), Rye and Hopper (1981).

Presumed Extinct Taxa

Opercularia acolytantha Diels

RUBIACEAE

A plant, 8-10 cm tall, with hairless stems. Lower leaves are minute while the upper ones are linear or slightly broader between the middle and tip of the leaf (10-15 x 1-3 mm), acute and scarcely rough to touch (scabrous). Inflorescence stalks are long and recurve towards the globular flower head. Flowers are separate from one another; calyx tubes are 2.5 mm long. Seeds (1.5-2 mm) are 3-sided with lateral appendages.

Opercularia acolytantha is similar to *O. vaginata* except for the calyx tubes which are all joined together in the latter species, and free from each other in the former.

Flowering Period: September - October

Distribution and Habitat

O. acolytantha was originally collected near Esperance Bay, and according to Diels and Pritzel (1905) "appeared to us as being [a] genuine sand plant. We saw [it] settled on the most loose soil."

Conservation Status

Current: Declared Rare Flora - Presumed Extinct

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Esperance Bay | Esp | Esp | - | 1901 | - | - |

Response to Disturbance

Susceptibility to *Phytophthora* Dieback

Summary and Recommendations

There is no known specimen of *O. acolytantha*. Herbaria that have been searched include those in Australia, Britain and Berlin. The type specimen was collected by Diels and probably lodged in Berlin where many specimens were destroyed during World War II. Duplicates of Diels collections are widely distributed and another specimen may eventually turn up elsewhere.

References

Diels and Pritzel (1905), Grieve and Blackall (1982).

Taraxacum cygnorum Hand.-Mazz.

ASTERACEAE

Dandelion

A somewhat slender plant, up to 15 cm tall, which is possibly a short-lived perennial. Roots are simple or few-headed; the neck being somewhat scaly with fragments of old leaves, and moderately long-hairy. Leaves are erect (apparently), hairless, almost membranous, broad-lanceolate (5-25 mm wide), somewhat obtuse, long-attenuate below, and lightly toothed. There are 1-4 floral stalks (scapes) which are sub-erect, slender, loosely woolly when young, but eventually hairless, and longer than the leaves when flowering. Flower heads are rather small (to 20 mm); involucral bracts are grey-green, not horned, with about 9 each in the inner and outer series. Sulphureous flowers are a little longer than the involucre; achenes are large (7 mm), up to 40, cylindrical, dark purple, densely covered with wide, thick warty protuberances; the rostrum is straight, slender and equal in length to the achene; the pappus (5-6 mm) is white.

Flowering Period: Late winter

Distribution and Habitat

Taraxacum cygnorum was originally collected in the south-west of Australia between Swan River and Cape Riche. Another specimen, lodged in the Melbourne Herbarium, was collected from Israelite Bay.

Conservation Status

Current: Declared Rare Flora - Presumed Extinct

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Israelite Bay | Esp | Esp | NR | - | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

Recent studies by Neville Scarlett (N. Marchant, personal communication) suggest that *T. cygnorum* is naturally occurring in Victoria and Bass Strait Islands where it grows in undisturbed coastal dunes in calcareous sand. N. Lander (personal communication) has viewed both the Victorian specimens and an isosytype of *T. cygnorum* held at Geneva, and believed them to be separate taxa.

One specimen collected in the north of the state (W. Archer, personal communication) cannot be accurately determined until the type specimen has been inspected. The characters that distinguish this taxon from other *Taraxacum* appear difficult to define (G. Perry, personal communication). Further taxonomic work is required.

In April 1993, a survey at Israelite Bay failed to locate *T. cygnorum*.

References

Handel-Mazzetti (1907).

PART THREE: PRIORITY FLORA IN THE ESPERANCE DISTRICT

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

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

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

Descriptions of species were compiled by consulting references and from discussion with botanists. Distribution and habitat were recorded from Departmental Rare Flora files. The list of known populations generally refers to those in the Esperance District although there may be some populations listed which occur outside the District. Herbarium records may indicate a wider range and larger numbers of populations, some of which are known to have been destroyed since the time of collection.

A. Priority One Taxa

Based on the October 1992 Priority Flora List there are 75 Priority One taxa known from within the boundaries of the Esperance District. Of these, 37 taxa were located during surveys in 1992 and 1993. New populations or sub-populations were found for 26 taxa.

The following taxa are not included, as current information indicates that they are not distributed in the Esperance District:

Acacia rhamphophylla ms
Bossiaea strigillosa
Dryandra sp. 36 (A.S.George 16721)
Frankenia bracteata
Guichenotia apetala
Haloragis scoparia
Lachnostachys ferruginea var. *paniculata* forma *paniculata*
Microcorys pimeleoides
Microcorys wilsoniana
Pterostylis turfosa
Spyridium sp. Ravensthorpe (E.M.Bennett s.n.) = *S. glaucum* ms

The following taxa have been deleted as they were found to be another taxon:

Acacia sp. Hatter Hill (K.R.Newbey 9681)
= *Acacia singula*
Eucalyptus sp. F (K.R.Newbey 9772)
= *Eucalyptus litorea*
Eremophila sp. Mt Heywood (K.R.Newbey 8180)
= *Eremophila biserrata*
Leucopogon sp. Dundas (M.A.Burgman 1482)
= *Leucopogon* sp. Roberts Swamp (K.R.Newbey 8173)
Leucopogon sp. Peak Charles (M.A.Burgman 1476)
= *Leucopogon* sp. Bonnie Hill (K.R.Newbey 9831)
Pultenaea sp. Clyde Hill (K.R.Newbey 8236)
= *Pultenaea elachista*
Pultenaea sp. Sheoak Hill (K.R.Newbey 8003a)
= *Pultenaea conferta*
Pultenaea sp. Sparkle Hill (K.R.Newbey 2690)
= *Pultenaea neurocalyx*

The following taxa were renamed during the project:

Acacia sp. Niblick Hill (K.R.Newbey 9726)
= *Acacia diaphana* ms
Aotus sp. Dundas (M.A.Burgman 3835)
& *Pultenaea* sp. Fitzgerald River (M.A.Burgman 3835)
= *Otton rigidum* ms
Diuris sp. Gibson (A.P.Brown 243)
= *Diuris concinna*
Eucalyptus sp. Beaumont (M.A.Burgman 3135)
= *Eucalyptus burgmaniana* ms
Eucalyptus sp. Jimberlana Hill (A.Taylor s.n. 13.11.87)
= *Eucalyptus jimberlanica*
Eucalyptus sp. Pyramid Lake (M.I.H.Brooker 9526)
= *Eucalyptus delicata* ms

Gratiola sp. Cape Arid (G.J.Keighery s.n.)
= *Gratiola pedunculata*
Latrobea sp. Hatter Hill (K.R.Newbey 6532)
& *Pultenaea* sp. Hatter Hill (K.R.Newbey 6532)
= *Eutaxia* sp. Hatter Hill (K.R.Newbey 6532)
Leucopogon sp. Cascades (M.A.Burgman 3700) [aff. hamulosus]
= *Leucopogon* sp. Mt Heywood (M.A.Burgman 1211)
Spyridium sp. Mt Beaumont (K.R.Newbey 6718)
= *Spyridium minutum* ms
Stachystemon sp. Mt Beaumont (K.R.Newbey 9773)
= *Stachystemon* sp. Mt Baring (K.R.Newbey 9773)

A bushy, spreading shrub to 3 m tall, with branches dividing near ground level into 3-4 main stems. Branches are smooth, dull greyish-brown; new growth is angular with resinous margins and a white powdery ('pruinose') surface. Phyllodes ('leaves') are narrow and slightly elliptical (30-70 x 2.5-4 mm), flexible, one central nerve, strongly resinous along the margin (often in obvious droplets) and bright lightish green in colour. Flower heads are globular, golden, with 2-3 borne on a main axis in the axils of phyllodes.

Flowering Period: September

Distribution and Habitat

Acacia diaphana ms is distributed between Niblick Hill and Mt Coobaninya, with a range of about 50 km. It occurs in sandy loam and mottled clay in small, freshwater depressions. It grows in low open woodland in association with *Eucalyptus occidentalis*, *A. cyclops* and *Lepidosperma leptophyllum*.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Mt Buraminya,NW | Esp | Esp | VCL | 6.5.81 | Rare | - |
| 2 | Clyde Hill,N | Esp | Esp | ?Private | 19.9.84 | - | - |
| 3 | Niblick Hill,W | Esp | Esp | Private | 24.2.83 | Common | - |
| 4 | Mt Willgonarinya,W | Esp | Esp | VCL | 22.9.90 | - | - |
| 5 | Mt Buraminya,E | Esp | Esp | VCL | 15.9.90 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora Dieback*

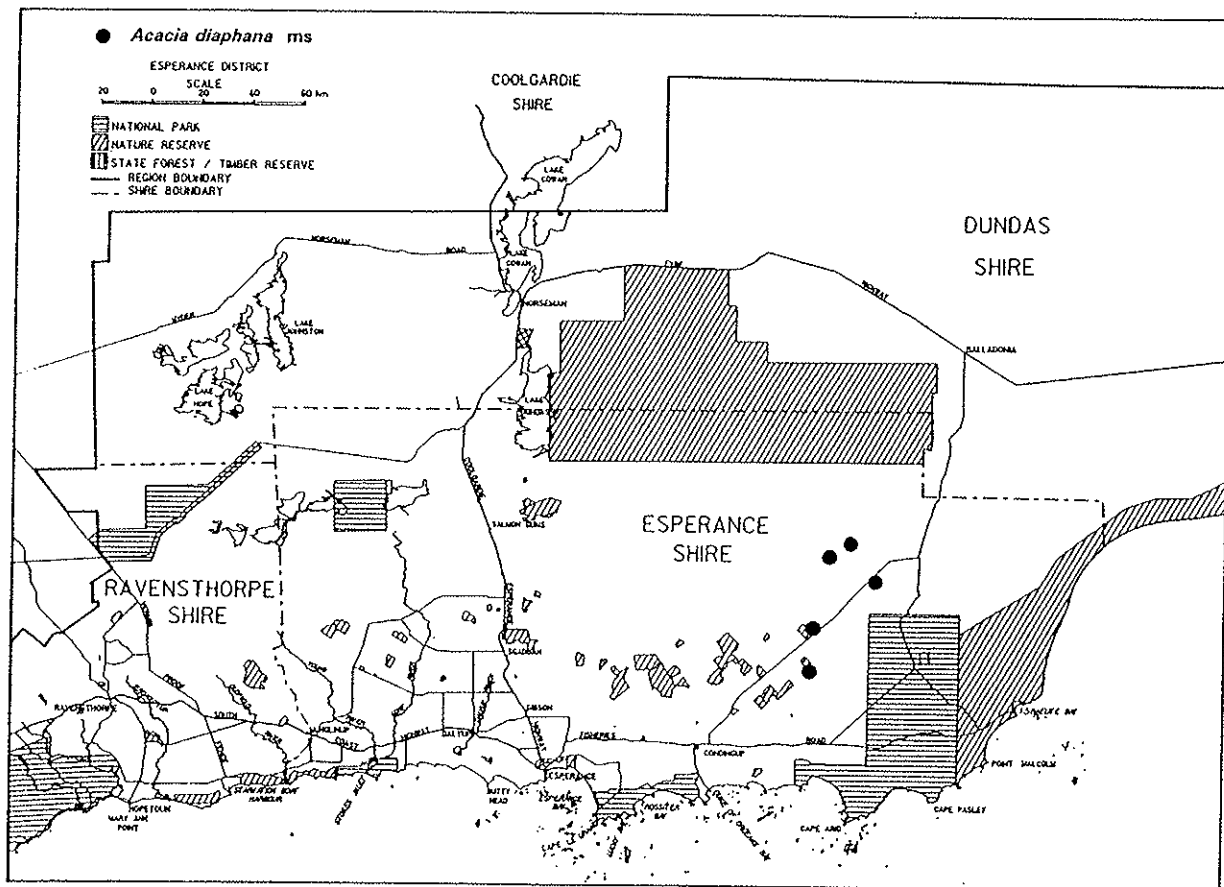
Presumed not susceptible.

Summary and Recommendations

A. diaphana ms is poorly known and possibly rare and vulnerable. The two most southern populations occur in agricultural areas and are threatened by clearing. In 1983, the population near Niblick Hill (no. 3) was not fenced from stock (Newbey 1983). Resurvey of all populations is required.

References

Newbey (1983).



An intricately branched, spreading shrub, 15-20 cm tall. Phyllodes ('leaves') are hairless, linear to oblong (3-5 x 1 mm), with a slightly upturned, sharp spiny tip; a gland may be present on the upper margin near the middle of the phyllode. Flower heads are globular and cream to yellow in colour. Legumes (20 x 4-5 mm) are slightly constricted between the seeds.

Flowering Period: October - November

Distribution and Habitat

Acacia diminuta ms is known from a few scattered localities between Jerramungup and Scaddan, over a range of 200 km. It grows in sandy clay soils in shrub mallee.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Ravensthorpe,WNW | Alb | Rav | - | 30.10.65 | - | - |
| 2 | Scaddan,N | Esp | Esp | - | 2.11.68 | - | - |
| 3 | Esperance,W | Esp | Esp | NR | 10.84 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

A. diminuta ms is poorly known and possibly rare and endangered. Access to the population in Nature Reserve No. 30583 is through dense scrub thicket; resurvey (with access requested via the adjoining landowner) is required. Surveys in the Scaddan area in 1992 failed to locate population no. 2. Further survey is required.

A dense, rounded shrub, 1.5 m tall and 3 m broad. The bark is smooth, light grey with the extremities of young branches being light brownish to yellowish-green. Phyllodes ('leaves') are asymmetrically elliptical in shape and have a small, spiny tip. A small gland is present on the upper margin near the base of the phyllode. Foliage is dull green and turns very slightly shiny with age. The globular flower heads are large (about 9 mm diam.) and bright, mid-golden in colour. Legumes are narrowly oblong (60 x 11 mm) and conspicuously rounded over the seeds.

Acacia dorsenna may be mistaken for *A. merrallii* or a large phyllode form of *A. camptoclada*. *A. dorsenna* is distinguished by its larger phyllodes, which do not have a stiff, sharp point, and the gland is close to the base; legumes are straight and larger.

Flowering Period: August - September

Distribution and Habitat

A. dorsenna is known only from a restricted area (less than 20 km) north of Norseman where it grows on low rocky hills. Soils are reddish sandy loams with limestone.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------|----------|-------|--------------|-------------|---------------|------------|
| 1 | Mt Thirsty,N | Esp | Dund | MRWA Rd Res. | 20.11.92 | 50-100 | Part-dist. |
| 2 | Norseman,N | Esp | Dund | MRWA Rd Res. | 27.9.69 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

A. dorsenna appears to be extremely rare. The only known populations are on Main Road Reserves, which are partially disturbed. In 1992, a survey for *A. dorsenna* led to the location of the population north of Norseman (no. 2). Further survey is urgently required to determine the conservation status of this species.

A shrub or small tree, 1.6-2 m tall. Phyllodes ('leaves') are linear-oblongate (30-55 x 3-4 mm), slightly incurved, and acute and finely pointed at the tip. A gland is situated 1-5 mm from the base. Narrow appendages at the base of the phyllodes (stipules, 2 mm) are occasionally persistent. The golden flower heads are globular, 16-32 flowered with generally 2 heads borne per cluster (raceme) on a stalk (3-6 mm). Legumes are black, almost cylindrical (70 x 2-3 mm), barely constricted between the seeds, and curved to once coiled.

Flowering Period: August - September

Distribution and Habitat

Acacia mutabilis subsp. *incurva* ms is known from two areas, over 220 km apart, near the Young River and between Ongerup and Pingrup. It grows on slightly undulating plain in sand or sandy loam, in very open shrub mallee and dense heath. Associated species include *Eucalyptus transcontinentalis*, *E. stoatei* and *Melaleuca subtrigona*.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|---------------------|-------------|---------------|-----------|
| 1* | West Point Rd | Esp | Esp | Shire Rd Res. & VCL | 11.9.92 | Common | Healthy |
| 2 | Ongerup,E | Alb | Gno | - | 22.9.73 | - | - |
| 3 | Ongerup,NW | Alb | Gno | - | 9.12.62 | - | - |
| 4 | Pingrup,SE | Kat | Kent | - | - | - | - |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

A. mutabilis subsp. *incurva* ms is poorly known. A recent survey has significantly extended the known range of this taxon. Further survey in the upper reaches of the Young River is required.

Acacia sp. Esperance (M.A.Burgman 1833b)

MIMOSACEAE

A shrub, less than 50 cm tall. Young branches are covered in short, felt-like hairs which are pressed close to the stem. Phyllodes ('leaves') are cylindrical (terete, 90-130 x 1.5 mm), thick, curve inwards and have a sharp spine at the tip. The globular flower heads are small (3 mm diam.), 10-flowered and borne singly on short stalks (2 mm) in phyllode axils.

Flowering Period: August

Distribution and Habitat

This taxa is known from only one collection. The plant occurs in very open shrub mallee and mid-dense shrub (less than 0.5 m tall), in reddish sand and clay in a depression near a clay pan.

Conservation Status

Current: Priority I

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Clyde Hill, NNW | Esp | Esp | VCL | 7.8.83 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

Acacia sp. Esperance is very poorly known and possibly rare. The known location is remote but may be threatened by clearing for agriculture. Further survey is required.

References

Burgman (1985b).

A shrub, 1.5 to 3.5 m tall, with separate male and female plants. The joints of the branches (articles, 17-28 x 1 mm) are smooth and have short hairs in the furrows. There are 10-12 short teeth (0.6-1.0 mm) at the end of each joint. The cones are subglobose in shape (15-17 x 13-15 mm) and attached directly to the branch. Markings on the cones are arranged in squares. Immediately below the calyx of the flower there are 2 small bracteoles which have an obtuse apex divided into 3 pyramidal bodies that are separated by a tiny, sharp point.

Allocasuarina globosa differs from *A. scleroclada* by having shorter teeth, slender articles and divided bracteoles. It can be distinguished from *A. campestris* and *A. tessellata* by having longer articles, shorter cones, and the form of the divided bracteoles on the cone.

Flowering Period: Unknown

Distribution and Habitat

A. globosa is known from only two populations, both on hilltops of basaltic rock, which are 120 km apart. At Mt Deans this species forms the dominant shrubland species, while at Mt Day other *Allocasuarinas*, *A. campestris* and *A. helmsii*, are present. The mallee *Eucalyptus oleosa* var. *oleosa* occurs at both sites.

Conservation Status

Current: Priority I

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Mt Day | Esp | Dund | VCL | 25.10.64 | - | - |
| 2 | Mt Deans | Esp | Dund | Timber Res. | 27.11.91 | 1 200 | Good |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

A. globosa has very specific habitat requirements and is possibly threatened by mining activities. At Mt Deans, although there is no current mining activity, the area is heavily pegged. Resurvey to locate the Mt Day population, and further survey of the Bremer Range is required.

References

Beard (1969), Wilson and Johnson (1989).

A straggly to dense, wide-spreading shrub to 1 m tall and 1 m wide. Leaves are shiny, thick, triquetrous, oblong (2-3 mm) and obtuse at the tip. Flowers are small with pale mauve petals. The calyx is finely honeycombed. Bracteoles are rarely seen as they fall off early. The ovary is 3-celled with 2 ovules per cell. The 15-20 stamens are in a single row, separate, with longer ones occurring opposite the petals; the filaments are slender and cylindrical.

Flowering Period: May, August - October

Distribution and Habitat

Baeckea crassifolia var. *icosandra* is distributed from near Truslove to Israelite Bay, a range of 200 km. It grows in white sand in open woodland and shrub communities, associated with *Banksia media*, *Grevillea aneura* and *Conostephium drummondii*.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------------|----------|-------|---------------|-------------|---------------|-----------|
| 1 | Mt Ney, NE | Esp | Esp | VCL | 21.5.93 | 20+ | Good |
| 2* | Mt Ridley, N | Esp | Esp | VCL | 22.5.93 | 5+ | Good |
| 3 | Clyde Hill, NNW | Esp | Esp | VCL | 4.5.83 | - | - |
| 4a | Mt Ney, SW | Esp | Esp | NR | - | - | - |
| 4b | Kau Rock Rd | Esp | Esp | Shire Rd Res. | 20.9.85 | - | - |
| 5 | Wittenoom Hills, NE | Esp | Esp | VCL | 17.9.70 | - | - |
| 6 | Wittenoom Hills | Esp | Esp | NR | 9.6.72 | - | - |
| 7 | Kau Rock, SE | Esp | Esp | VCL | 5.9.84 | - | - |
| 8 | Mt Ridley, NE | Esp | Esp | VCL | 14.9.91 | 5+ | - |
| 9 | Israelite Bay | Esp | Esp | NR | 9.02 | - | - |
| 10 | Scaddan | Esp | Esp | - | 9.92 | - | - |
| 11 | Truslove Rd | Esp | Esp | Shire Rd Res. | 16.8.82 | - | - |
| 12 | Salmon Gums, W | Esp | Esp | - | 10.3.80 | Rare | - |
| 13 | Oldfield River | Esp | Rav | - | 12.40 | - | - |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

Baeckea crassifolia var. *icosandra* is known to occur in three Nature Reserves. It is also common between Mt Ridley and Mt Buraminy (W. Archer, personal communication), an area of Crown Land which is not currently threatened by clearing for agriculture. The genus is currently under taxonomic revision (M. Trudgen, personal communication).

References

Blackall and Grieve (1980).

Caladenia tentaculata Schltdl.

ORCHIDACEAE

Green-comb Spider Orchid, Fringed Spider Orchid

An orchid, 25-35 cm tall. Leaves are narrow (80-120 x 6-12 mm) and hairy. Flowers are large (60-80 x 50-60 mm), spider-like, with 1 or 2 per plant.

Caladenia tentaculata differs from other members of the *C. dilatata* complex in its green and white flowers, hanging (tentacle-like) rather than upcurved sepals and extremely long-fringed labellum (the modified lower petal which is often referred to as the lip or tongue).

Flowering Period: September - October

Distribution and Habitat

C. tentaculata is known from a few widely scattered localities, over 200 km apart, from near Jerramungup to the Cascades area. It grows in mallee woodland adjacent to seasonal creeks.

This species is also found in South Australia and Victoria, where it is common in forest, woodland or rough scrub.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-------------|----------|-------|-------------|-----------------|----------------|-----------|
| 1 | Lort River | Esp | Esp | VCL | 31.8.78 1993 | 2 Not found | - - |
| 2 | Young River | Esp | Rav | - | 1993 | 3 | - |
| 3 | Jerramungup | Alb | Jer | ?Private | 20.9.78 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

C. tentaculata is considered rare by Hoffman and Brown (1992), and although it closely resembles species found in the eastern States, more taxonomic work is required to determine whether the western form is, in fact, the same species (A. Brown, personal communication).

Surveys by A. Brown (personal communication) have failed to relocate any plants at the Lort River locality (pop. no. 1). In Western Australia, this taxon is not known to occur in any conservation reserve. Further survey is required.

References

Bates and Weber (1990), Hoffman and Brown (1992).

A small shrub, about 30 cm tall, arising from a thick, woody rootstock. Stems and branches are wiry, weak, and covered with short, pale hairs. Leaves are often sparse, oblong-shaped (4-12 x 2-4 mm) with margins that are curved back strongly towards the midrib (revolute). The tip of the leaf is rolled backwards, like a coil (circinate), and has a fine, sharp point; the upper surface of the leaf shows conspicuous veins and is almost hairless, while the under side is covered with dense, persistent hairs. The broad, upright petal (standard, 13 mm x 13 mm) and wings of the flowers are dull yellow with orange-red markings, whereas the keel is yellow or greenish. The calyx (7-9 mm) is covered with dense, grey or white hairs; the 2 upper lobes are united. The pod (11 x 5 mm) is usually nodding, has a pointed tip, and is covered with soft hairs.

Chorizema circinale superficially resembles *C. cytisoides*, *C. obtusifolium*, *C. ulotropis* and *C. uncinatum*, which all have narrow leaves with a conspicuous network of veins and margins that curve backwards. *C. cytisoides* and *C. obtusifolium* can be distinguished by their leaves which are more than 12 mm long; *C. ulotropis* has linear leaves, about 1 mm wide; and *C. uncinatum* has hooked leaves which rarely curve backwards strongly and are never coiled; it also has more numerous flowers.

Flowering Period: September

Distribution and Habitat

C. circinale is known from only two localities, one, 50 km WNW of Grasspatch and the other, 70 km to the north-west, near Ninety Mile Tank. It grows on yellow sand or sandy clay loam in an almost flat or undulating landscape. Associated vegetation is usually heath which may include *Grevillea excelsior*, *G. aneura*, *Banksia elderiana*, *Allocasuarina campestris*, *Verticordia* spp. and *Melaleuca* spp.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------------|----------|-------|---------------------|-------------|---------------|-----------------------|
| 1 | Fields Road | Esp | Esp | Shire Rd Res. & VCL | 19.9.93 | 50-100 | Part-dist. 30% Grazed |
| 2 | Ninety Mile Tank, W | Esp | Dund | VCL | 16.12.79 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

C. circinale appears to be extremely rare. The Fields Road population (no. 1) is immediately adjacent to a gravel pit and is threatened by further extension of the pit. Apparently this area was burned in 1983, prior to being cleared and ripped (Taylor and Crisp 1992). About 30% of the plants have been grazed (1993 survey), possibly by rabbits. Liaison with the Esperance Shire is urgently required to prevent further disturbance of the population. Further survey is urgently required to accurately assess the conservation status of this species.

References

Burgman (1985b), Taylor and Crisp (1992).

An openly branching shrub, 30-70 cm tall, with numerous branches from the base that are covered in short hairs. Leaves are nearly round (7-14 x 8-14 mm) with a conspicuous network of veins, have a long sharp point and curve slightly backwards at the tip; the margins are crinkled. Flowers are borne in terminal or axillary racemes (4-12 cm) with 5-10 flowers on stalks (3-4 mm). The calyx (3.5-5 mm) is scattered with short hairs and the upper 2 lobes are united into a broad lip with 1 mm free. The corolla has a large, yellow-orange upright petal (standard, 6-9 x 8-11 mm), yellow-orange wings and an orange-red keel that is much shorter than the wings.

The pod is nodding, ovoid (8-12 x 4-6 mm) and acute at the tip.

Flowering Period: July - September

Distribution and Habitat

Chorizema nervosum is distributed over a range of nearly 350 km, from near Bremer Bay to Cape Arid, and extends inland to near Jerramungup, Mt Ney and Mt Ragged. It is found in numerous habitats, including sand, sandy clay, and on rocky slopes and gullies. Associated vegetation may be shrubland, coastal heath or low mallee-heath.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------|----------|-------|----------------|-------------|---------------|-----------|
| 1 | Cheadanup | Esp | Rav | NR | 10.84 | - | - |
| 2 | Mt Burdett,SSE | Esp | Esp | Shire Rd Verge | 25.9.92 | 1 | Average |
| 3 | Mt Ney | Esp | Esp | NR | 4.8.83 | - | - |
| 4 | Thomas River | Esp | Esp | - | 7.38 | - | - |
| 5 | Quoin Head,NE | Alb | Rav | NP | 16.7.71 | - | - |
| 6* | Parmango Rd | Esp | Esp | Shire Rd Res. | 14.11.93 | 5 | Good |
| 7* | Pt Malcolm Rd | Esp | Esp | NR | 20.4.93 | 30+ | Good |
| 8* | Sheoaks Hill,NW | Esp | Esp | NP | 22.4.93 | 100+ | Good |
| 9* | Gora Rd | Esp | Esp | NP | 22.4.93 | 500+ | Post-fire |
| 10a* | Mt Ragged | Esp | Esp | NP | 23.4.93 | 40+ | Post-fire |
| 10b* | Mt Ragged | Esp | Esp | NP | 23.4.93 | 100+ | Post-fire |
| 10c | Mt Ragged | Esp | Esp | NP | 23.4.93 | 50+ | Post-fire |
| 11* | Balladonia Rd | Esp | Esp | NP | 24.4.93 | 1 | Average |
| 12* | Young River,W | Esp | Esp | ?VCL | 9.9.93 | 20+ | Good |
| 13* | Fence Rd | Alb | Rav | Shire Rd Verge | 8.9.93 | 4 | Disturbed |
| 14* | Loc. 1040 | Alb | Rav | VCL | 11.8.93 | 500+ | Good |
| 15 | Eyre Range | Alb | Rav | NP | 2.11.65 | - | - |
| 16 | Fitzgerald | Alb | Rav | - | 23.8.63 | - | - |
| 17 | Gairdner River | Alb | Jer | - | 27.6.60 | - | - |
| 18 | Bremer Bay,NW | Alb | Jer | - | 8.7.67 | - | - |
| 19 | Cape Arid | Esp | Esp | NP | 1875 | - | - |

* = new population

Coleanthera coelophylla (A.Cunn.) Benth.

EPACRIDACEAE

An erect, bushy shrub, 30-60 cm tall. Young branches, leaves and leaf margins are covered with soft hairs. Leaves are ovate to lanceolate (14 x 5 mm) and strongly striate below. White to deep pink flowers are borne singly or rarely in pairs in the leaf axils. The calyx has long hairs around the margins. Corolla lobes are rolled back and bearded inside. The anthers are completely exerted from the corolla tube and joined together at the base to form a purple-red cone around the style.

Flowering Period: May, November

Distribution and Habitat

Coleanthera coelophylla is known only from the Borden-Nyabing area where collections were made more than 60 years ago, and from near Gibson from a 1901 collection. It grows in gravelly sand in heath communities.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Albany,E | ?Alb | ?Alb | - | 1800s | - | - |
| 2 | Borden | Alb | Gno | - | 10.28 | - | - |
| 3 | Nyabing | Kat | Kent | - | - | - | - |
| 4 | Gibson's Soak | Esp | Esp | - | 4.11.01 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

C. coelophylla is very poorly known and possibly rare. It has not been collected for over 60 years and further survey is urgently required.

References

Blackall and Grieve (1981).

A much-branched, erect shrub, 0.6 to 1.2 m tall. Leaves are narrowly oblong-linear (7-11 x 1-2 mm) and crowded towards the tips of the branchlets. Both leaves and branchlets are sparsely to moderately covered in short, soft hairs. Leaf margins are rolled backwards towards the midrib (revolute), and leaf tips have a short, sharp point. Flowers are about 10 mm long, solitary and usually hang downwards from the leaf axils. Sepals resemble the bracteoles which are densely silky-hairy on the outer surface. The lower half of the corolla is yellowish, while the upper section is deep reddish-purple.

Conostephium marchantiorum is closely allied to *C. minus* and *C. uncinatum*. The latter species also occurs north of Esperance; it has more tightly rolled leaves than *C. marchantiorum*, as well as a leaf apex which bends downwards, which is not present in either *C. marchantiorum* or *C. minus*. *C. minus* only occurs in the Perth-Gingin area.

Flowering Period: November - December

Distribution and Habitat

C. marchantiorum is distributed over an area of 65 km, from south of Peak Eleanora to near Dalyup and eastwards to Scaddan. It grows in grey or light yellow sandy soil, in open mallee and shrub heath communities. Associated species include *Eucalyptus tetragona*, *E. angulosa*, *Banksia media*, *Hakea* sp. and *Melaleuca* spp.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|---------------------|-------------|---------------|-----------|
| 1 | Truslove | Esp | Esp | NR | 17.11.92 | 12+ | Good |
| 2a | Fields Rd | Esp | Esp | VCL | 19.9.93 | 500+ | Good |
| 2b | Fields Rd | Esp | Esp | VCL | 19.9.93 | 20+ | Good |
| 3 | Grass Patch,S | Esp | Esp | MRWA Rd Res. | 17.11.92 | 10+ | Good |
| 4 | Scaddan,S | Esp | Esp | MRWA Rd Res. | 14.3.83 | - | - |
| | | | | | 20.11.92 | Not found | - |
| 5 | Scaddan,NNW | Esp | Esp | ?MRWA Rd Res. & ?NR | 6.9.86 | Frequent | - |
| 6 | Coolbidge Ck | Esp | Esp | Shire Rd Res. | 23.6.90 | Common | - |
| 7* | Fields Rd | Esp | Esp | VCL | 19.9.93 | 2 | Good |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

An erect shrub to 1.5 m tall, with branchlets densely covered in silky, straight hairs. Leaves are narrowly oblong-linear (3-5 x 0.5 mm), tightly rolled backwards towards the midrib (revolute), and clustered into several groups at the ends of branches. The leaf apex has a distinctive brittle, brown point that bends sharply downwards (deflexed). Flowers are about 10 mm long and solitary in the upper leaf axils. The bracteoles are covered in silky hairs, and are nearly as long as the calyx. The upper half of the corolla is silky-hairy, while the lower half is without hairs.

Conostephium uncinatum is closely related to *C. marchantiorum* and *C. minus*. It differs from the latter two species by having a deflexed leaf apex, shorter floral parts, and shorter, more tightly rolled leaves. *C. marchantiorum* occurs in the same region as *C. uncinatum*, however *C. minus* only grows in the Perth-Gingin area.

Flowering Period: November - December

Distribution and Habitat

C. uncinatum is distributed over an area of about 100 km, between Grass Patch and Clyde Hill. It typically grows in yellow or brown loamy sand or white sand near saline depressions. Associated plants include tall *Melaleuca* shrubs, open tree mallee of *Eucalyptus incrassata* and *E. angulosa*, and open low shrubs including *Darwinia luehmannii*.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1a | Mt Heywood,NE | Esp | Esp | VCL | 21.5.93 | 200+ | Good |
| 1b* | Mt Heywood,NE | Esp | Esp | VCL | 21.5.93 | 4 | Good |
| 2 | Clyde Hill | Esp | Esp | ?NR | 19.3.93 | - | Not found |
| 3 | Grasspatch,E | Esp | Esp | ? | 18.10.82 | - | - |
| 4a | Mt Heywood,NNE | Esp | Esp | VCL | 20.5.93 | 10 | Good |
| 4b* | Mt Heywood,NNE | Esp | Esp | VCL | 20.5.93 | 2 | Good |
| 4c | Mt Heywood,NNE | Esp | Esp | VCL | 20.5.93 | 50+ | Good |
| 4d* | Mt Heywood,NNE | Esp | Esp | VCL | 20.5.93 | 3+ | Good |
| 5 | Mt Beaumont | Esp | Esp | ?VCL | 31.12.83 | - | - |
| 6a* | Mt Heywood,NE | Esp | Esp | VCL | 21.5.93 | 50+ | Good |
| 6b* | Mt Heywood,NE | Esp | Esp | VCL | 21.5.93 | 200+ | Good |

* = new population / sub-population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

The majority of known populations occur in Vacant Crown Land north of Mt Heywood and Mt Beaumont. This region is interspersed with numerous saline lakes and depressions where this species is likely to exist. The area is not threatened by clearing for agriculture at present. Further survey is required.

References

Burgman (1985b), van der Moezel (1987).

A slender, weak perennial herb, 10-30 cm tall, which lacks hairs except for the flowers. The stems have blunt angles. The oblong to elliptical-shaped leaves (2-9 x 1.5-3 mm) lack stalks, are thick, obtuse at the tip, and may be entire or toothed along the margins. Flowering branches (to 25 mm) bear 1 to 3 flowers; bracteoles (3 mm) occur immediately beneath the flowers. Flowers are blue to pale blue; the corolla (9-11 mm) has fine silvery-grey hairs on the outside; the lobes have wings (1-2 mm wide).

Dampiera sericantha is similar to *D. parvifolia* which has numerous bracteoles beneath the flowers.

Flowering Period: August - December

Distribution and Habitat

D. sericantha has been found between the Vermin Proof Fence and Cape Le Grand National Park, a distance of 160 km. It grows on sandplain in heath communities.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-------------|----------|-------|---------------|-------------|---------------|------------|
| 1 | Munglinup,E | Esp | Esp | MRWA Rd Verge | 9.9.93 | 20+ | Part-dist. |
| 2 | VPF | Esp | Rav | - | 2.11.62 | - | - |
| 3 | Shark Lake | Esp | Esp | - | 21.5.69 | - | - |
| 4 | Esperance,W | Esp | Esp | - | 13.12.60 | - | - |
| 5 | Gibson,NW | Esp | Esp | - | - | - | - |
| 6 | Lucky Bay | Esp | Esp | NP | 1800s | - | - |

Response to Disturbance

Appears to be a disturbance opportunist.

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

Plants recently surveyed east of Munglinup (pop. no. 1) were most frequent along the Telecom line where disturbance had created a more open habitat. It is an inconspicuous shrub and its broad distribution suggests that more populations may exist. Further survey is required.

References

Bentham (1869), Rajput and Carolin (1992).

Darwinia calothamnoides N.G.Marchant ms

MYRTACEAE

A straggly shrub, to 1.5 m tall and 0.8 m wide, with pale cream-grey branches. Leaves are crowded towards the branch ends, narrow-linear (about 12 mm x 0.7 mm), almost triquetrous, have numerous oil glands on the lower surface; older leaves drop off leaving prominent leaf scars.

Flowering Period: April - May

Distribution and Habitat

Darwinia calothamnoides ms is known only from Mt Heywood, where it grows in rock crevices and on nearby sandplain.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|-------------|-------------|---------------|-----------|
| 1a | Mt Heywood | Esp | Esp | VCL | 21.5.93 | 6 | - |
| 1b | Mt Heywood,NW | Esp | Esp | VCL | 21.5.93 | 1 000+ Seedl. | Post-fire |

Response to Disturbance

A fire burnt the Mt Heywood area in January 1991. More than one thousand seedlings and resuckers of *D. calothamnoides* ms were observed in burnt sandplain at the north-west base of Mt Heywood.

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

Post-fire monitoring of the population and further survey are required.

Darwinia sp. Mt Baring (K.R.Newbey 9775)

MYRTACEAE

A shrub, 30-50 cm tall and 30-35 cm wide. Leaves are smooth, obovate (3 x 1.3 mm), thick, upper surface slightly convex, lower surface ridged, margins with fine scattered teeth. Red flower heads (8-10 mm across) occur at the branch ends and are 6-8 flowered, pendant and numerous. Flowers lack hairs; outer bracts are slightly obovate (6 x 5 mm) and slightly cupped; calyx is obconical (2.7 x 2.3 mm), 5-ridged and smooth; lobes are almost absent; petals are entire (1.4 x 1.4 mm); the style protrudes about 4 mm beyond the petals.

Flowering Period: March

Distribution and Habitat

Darwinia sp. Mt Baring is known only from two localities, near Mt Baring and in Kau Rock Nature Reserve. It grows in white sand in mallee and low shrub communities. Associated species may include *Eucalyptus tetraptera*, *Phymatocarpus maxwellii*, *Astartea ambigua* and *Calothamnus gracilis*.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Mt Baring, NW | Esp | Esp | VCL | 12.10.83 | Rare | - |
| 2 | Elds Rd | Esp | Esp | NR | 29.3.83 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

Darwinia sp. Mt Baring is known to occur in the Kau Rock Nature Reserve. Resurvey of known populations and further survey are required.

References

Newbey (1983).

Darwinia sp. Mt Ney (M.A.Burgman & S.McNee 1274)

MYRTACEAE

A sprawling or erect shrub, 0.3 to 1.0 m tall and up to 1 m wide. Young branches are cream-coloured. Leaves are narrow-linear (5-7 mm), thick, ridged on the lower surface. Flowers are large (10 mm across), occur at the ends of branches, have red bracts and a white or cream style turning reddish.

Flowering Period: April - May, August, October

Distribution and Habitat

This taxon is known only from near Mt Ney and to the north-west near Crystal Lake, a distribution of about 40 km. It usually grows on granite in white to reddish sandy clay or in yellow loamy sand, in open to dense scrub, associated with *Eucalyptus tetragona*, *Hakea* and *Calothamnus*.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------|----------|-------|-------------|-------------|---------------|------------|
| 1 | Mt Ney,N | Esp | Esp | VCL | 7.5.83 | - | - |
| 2 | Mt Ney | Esp | Esp | NR | 1.10.83 | - | - |
| 3* | Crystal Lake | Esp | Esp | VCL | 22.5.93 | 50+ | Post-dist. |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

A recent survey extended the known range of this taxon suggesting that it may be more widely distributed than initially believed. It occurs within the Mt Ney Nature Reserve where it should remain secure. Further survey is required.

Dicrastylis archeri Munir

CHLOANTHACEAE

An erect, spindly shrub, to 1 m tall. Stems are covered in greyish, short, soft hairs. Leaves are opposite, with alternate pairs at right angles to one another (decussate), narrow-oblong (10-20 x 1-2 mm), obtuse at the tip, wrinkled and hairless on the upper surface while the under side is covered with soft, greyish hairs; margins are curved backwards towards the midrib. Creamy-white flowers are borne in heads (cyme); the terminal flower usually has 4 parts, while the other flowers in a head are divided into 5 parts. The slender primary stalks (10-25 mm), flower stalks (1-2.5 mm) and corolla (2.5-3 mm) are all covered in short, soft hairs. The stamens (4 or 5) and deeply 2-branched style are extended beyond the corolla.

Dicrastylis archeri is closely related to *D. linearifolia* which has larger flowers (5-6 mm), a golden orange or rusty-coloured stem and leaves that end abruptly in a sharp point. *D. parvifolia* is also similar, and can be distinguished by its leaves which are covered in soft, greyish hairs on both sides, and smaller flowers (2-2.5 mm).

Flowering Period: December

Distribution and Habitat

D. archeri is known from only one locality, north-north-east of Mt Heywood. It grows in deep sand, in an open mallee and *Melaleuca* shrub community with *Banksia media*.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Mt Heywood,NNE | Esp | Esp | VCL | 21.5.93 | 25 | Good |

Response to Disturbance

Possibly a disturbance opportunist.

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

The only known population is on a track which is rarely used. It may be a disturbance opportunist as no plants were found in the adjacent undisturbed scrub. Further survey is required.

References

Munir (1991).

A low shrub, 20-25 cm tall, spreading to about 1 m diameter. Stems are densely covered in greyish, soft downy or matted hairs. Leaves are opposite, with alternate pairs at right angles to one another, narrow-linear (5-15 x 1-1.5 mm), somewhat rough and wrinkled on the upper surface with the underside covered in greyish, soft, matted hairs. Usually, 7 flowers are arranged in nearly globular-shaped clusters (5-7 mm diam.) which alternate along the horizontal stems. Flowers (4-4.5 mm) have a 5-lobed calyx which is covered with short, matted hairs on the outside and is hairless inside; the corolla is light purplish-blue, tubular below and usually 4-lobed, with matted hairs on the outside and long hairs on the inside. The stamens (4 or 5) and deeply 2-branched style are extended beyond the corolla.

Dicrastylis capitellata is closely related to *D. microphylla* which has stems and both sides of the leaves densely covered with grey, short, matted hairs; flower clusters are very woolly. *D. nicholasii* is also similar, but can be distinguished by the distinct stalk (15-25 mm) of the flower cluster; whereas the stalks of *D. capitellata* are only up to 3 mm long.

Flowering Period: December

Distribution and Habitat

D. capitellata is known over a 15 km range, north-east of Mt Heywood. This species grows in well-drained, fine yellow loamy sand in a low-lying, mallee-shrub community, associated with *Eucalyptus conglobata*, *Eremophila serpens*, *Melaleuca* sp. and *Gahnia* sp.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Mt Heywood,NNE | Esp | Esp | VCL | 1.12.90 | - | - |
| 2 | Mt Heywood,NNE | Esp | Esp | VCL | 11.12.90 | - | - |
| 3a* | Mt Heywood,NNE | Esp | Esp | VCL | 20.5.93 | 500+ | Good |
| 3b* | Mt Heywood,NNE | Esp | Esp | VCL | 20.5.93 | 1 000s | Post-fire |

* = new population

Response to Disturbance

Twenty-six months after a fire in January 1991, population no. 3b was found flowering and growing prolifically.

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

D. capitellata occurs in a remote area which is not threatened by clearing for agriculture at present. Monitoring of population no. 3 is required to determine whether this species is a disturbance opportunist. Further survey is required.

References

Munir (1991).

Donkey Orchid

An erect, tuberous herb 20-40 cm tall, which lacks hairs. There are three to five basal, linear leaves (8-13 x 3-4 mm). The one to five flowers are not crowded, clear bright yellow with red-brown markings on the dorsal sepal and labellum. The broadly ovate dorsal sepal (8-14 x 5-8.5 mm) projects forwards and embraces the column in the lower half; the upper margins curve backwards. The lateral sepals (10-17 x 2.5-3.5 mm) are asymmetrically acute, rolled inwards; the inner third is green and the other two thirds purplish. The petals are widely divergent; the lamina is broadly ovate, bright yellow, and strongly curved backwards; the reddish-brown claw (3-6 mm) widens just near the apex. The labellum (10-14 mm) is deeply 3-lobed, yellow with basal red-brown markings; the glandular appendages (calli) of the labellum consist of two incurved red-brown ridges (5-6 mm). The column (4 x 2.5 mm) projects forwards from the end of the ovary; the column wings are white.

Diuris concinna is closely related to *D. brevifolia*, but it can be distinguished from that species by its much broader petals, dorsal sepal and mid-lobe of the labellum. It may be confused with *D. setacea* which flowers only after fires and has spirally twisted leaves, and *D. filifolia* which has stiffly erect, larger flowers which have a rhomboid mid-lobe on the labellum and broad, short-curved lateral sepals.

Flowering Period: October

Distribution and Habitat

The four known populations of *D. concinna* occur to the north and north-east of Esperance about 50 km apart. A disjunct population occurs 200 km to the west in the Fitzgerald River National Park. *D. concinna* grows in grey-red laterite, in winter-wet shrubland or heath. Associated species include *Eucalyptus tetraptera* and *Lambertia inermis*.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|---------------|---------------------|----------------|------------|
| 1 | Gibson,N | Esp | Esp | ?Shire Res. | 12.10.93 | 200+ | - |
| 2 | Gibson | Esp | Esp | ?MRWA Rd Res. | 12.10.93 | 20+ | - |
| 3 | Gibson,S | Esp | Esp | Timber Res. | 12.10.93 | 40+ | Post-dist. |
| 4 | Fisheries Rd | Esp | Esp | NR | 27.10.90 | 21 | Good |
| 5 | Old Ongerup Rd | Alb | Rav | NP | 14.11.93 27.9.88 | Not found 1 | - - |

Response to Disturbance

Unknown, but regrowth may be stimulated by fire.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

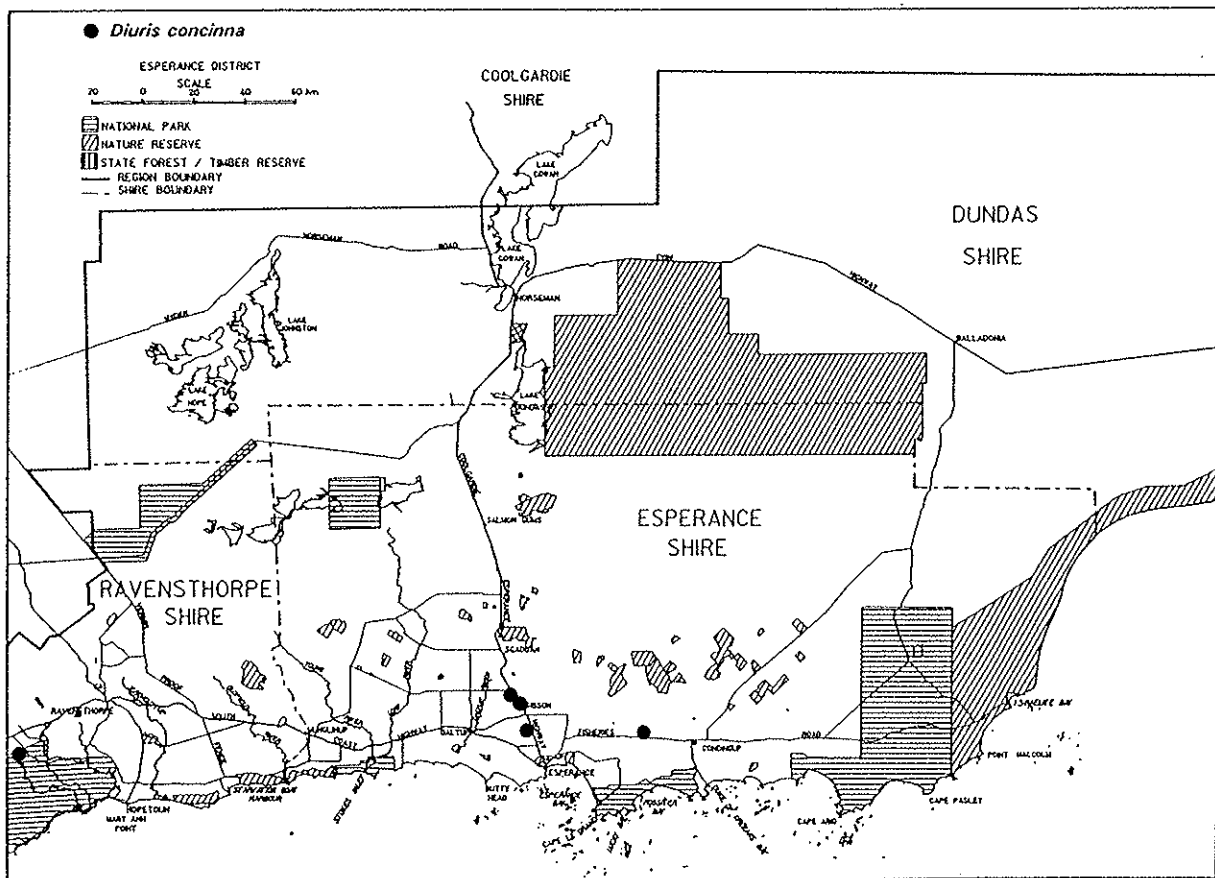
Summary and Recommendations

The population near Fisheries Road (no. 4) supposedly occurs on the disturbed margin of an old gravel pit, and was flowering 7 months after the area had been burnt (March 1990). Although this is one of the two known populations occurring in a conservation reserve, a survey in November 1993 failed to relocate this population. According to A. Brown (personal communication), *D. concinna* does not require fire to regenerate.

The population in the Helms Arboretum (no. 2), where the original collection of the species was made in 1985, was cleared in 1988 for arboriculture (Jones 1991). Since then the area has regenerated and *D. concinna* was again found there in 1993. It is recommended that the population be clearly demarcated and no tree planting occur on this site. Monitoring of the population is required.

References

Jones (1991).



Dodonaea hexandra F.Muell.

SAPINDACEAE

Horned Hop Bush

A spreading shrub to 0.6 m tall, with separate male and female plants. The linear (0.6-1.5 x 0.2 mm), sticky leaves appear to cluster at the ends of branches. Leaf margins are strongly rolled backwards towards the midrib (revolute) causing a channel on the lower surface of the leaf. Leaf tips are acute. Flowers are usually solitary and are borne on short stalks. There are 3 persistent, ovate sepals per flower. The fruit capsule is 3-angled, globular or oblong-shaped (5-7 x 5-8 mm) and splits into segments when dry.

Flowering Period: May - July

Fruiting Period: September - November

Distribution and Habitat

Dodonaea hexandra is widespread in the southern mallee regions of South Australia, with extensions into north-west Victoria. It has also been found in Tasmania. In Western Australia, *D. hexandra* has rarely been collected, and only vague locality details are available.

In South Australia, this species grows in sandy loams overlying limestone, in mallee scrub communities dominated by tree species such as *Eucalyptus incrassata*, *E. porosa*, *E. socialis* and *E. anceps*.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | ?Mt Ragged | Esp | Esp | ?NP | 2.11.1891 | - | - |
| 2 | Hopetoun | Alb | Rav | - | - | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

D. hexandra is poorly known in Western Australia. According to West (1984a), the Gwynne and Helms specimens could have been collected anywhere between Esperance and Fraser Range. Nationally, this species does not appear to be endangered, as more than 30 widely dispersed populations are known in South Australia (West 1984a). Further opportunistic survey is recommended.

References

Jessop and Toelken (1986), West (1984a).

A small, reddish plant up to 5 cm tall, with a basal rosette of green leaves and an erect flexuose stem with alternate leaves. The basal leaves have retentive glands around the margins with smaller glands within; the margins fold towards each other forming a tube-like trap arrangement when covered with sand particles. The leaves on the erect stem are crescent-shaped with 2 lobes at the angles (2 x 2.5 mm), have retentive glands around the margins and smaller glands within, and are arranged in a whorl about the stem; stalks are slender (8 mm). The apex of the plant has 1 or 2 white flowers borne on stalks (10-18 mm). Sepals are green and maroon, dotted with black, and have margins which are irregularly toothed. Petals (5 x 2 mm) have a truncated apex and margins cut into rounded teeth.

The green basal rosette is generally covered in sand washed with water, with the reddish erect stem exposed to sunlight. The basal leaves are unusual in that they are folded, possibly facilitating the capture of soil-borne insects.

Flowering Period: July - August. Dormant during dry periods.

Distribution and Habitat

Drosera salina grows east of Lake King. It is found on the margins of salt lakes, almost to the water, in salt-free white sand.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Lake King,E | Esp | Rav | VCL | 14.9.84 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

The known population is remote and not immediately threatened. Further survey is required.

References

Lowrie (1987).

Drosera sp. Hatter Hill (G.J.Barrett 15.9.89)

DROSERACEAE

A pale green rosetted plant which is similar to *Drosera bulbosa* in habit. Leaves are narrowly obovate with retentive glands on the upper surface. Numerous leafless flower stalks (longer than 3 cm) are produced from the centre of the rosette. Flowers are lilac (*D. bulbosa* has white flowers).

Flowering Period: September (*D. bulbosa* flowers May - July)

Distribution and Habitat

Only one population is known of this *Drosera* taxon, which grows in an *Allocasuarina campestris* woodland in the Hatter Hill area.

Conservation Status

Current: Priority 1

Known Population

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Hatter Hill | Esp | Rav | ?VCL | 16.9.89 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

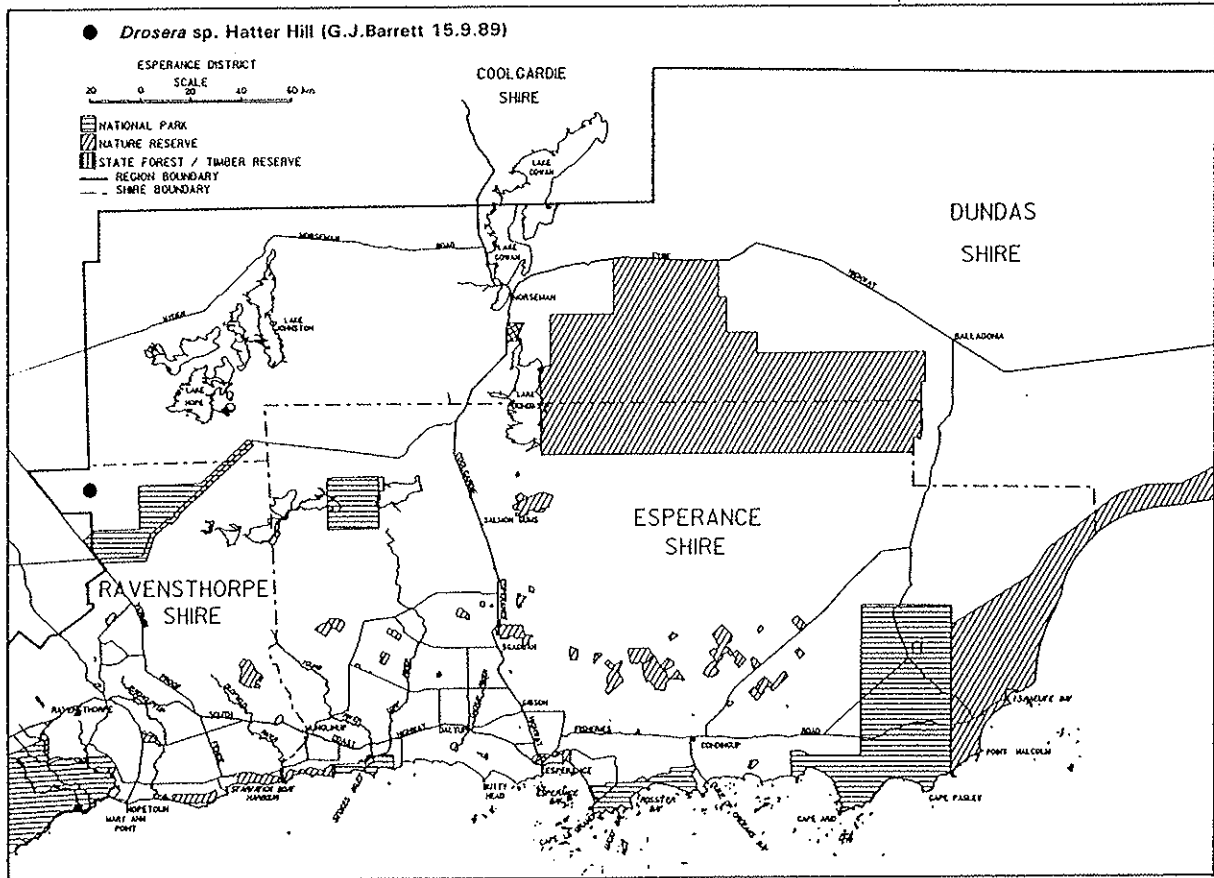
Presumed not susceptible.

Summary and Recommendations

This taxon requires further survey to determine its conservation status and distribution.

References

Barrett (1989), Lowrie (1987).



A low, diffusely-branched shrub, 10-20 cm tall and up to 30 cm broad. Leaves are pressed closely to the stem, cylindrical (terete), 3-5 mm long, curved inwards, slightly succulent and have small wart-like protuberances on the lower surface. Calyx lobes are conspicuously glandular, warty and hairless. Flowers are violet, with both the ovary and style lacking hairs.

Flowering Period: November - December

Distribution and Habitat

Eremophila chamaephila occurs in the Scaddan-Salmon Gums area, in light brown, sandy clay loams or sand over clay, usually adjacent to *Eucalyptus* woodland. Disjunct populations occur 120 km to the east, near Clyde Hill, where it grows in white clay loam with limestone. It is most prevalent in disturbed sites.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|--------------------|-------------|---------------|------------|
| 1 | Salmon Gums | Esp | Esp | - | 6.7.87 | - | - |
| | | | | | 17.11.92 | - | Not found |
| 2 | Salmon Gums,W | Esp | Esp | - | 11.31 | - | - |
| | | | | | 17.11.92 | - | Not found |
| 3 | Grass Patch,W | Esp | Esp | Shire Rd Res. | 20.9.93 | 75 | Good |
| 4 | Truslove | Esp | Esp | MRWA Rd Res. | 17.11.92 | 7 | Good |
| 5 | Wiltshire Rd | Esp | Esp | Shire Rd Res. | - | - | - |
| 6* | Dowak | Esp | Esp | NR & Western Power | 20.11.92 | 10+ | Good |
| 7a | Clyde Hill,SE | Esp | Esp | - | - | - | - |
| 7b* | Clyde Hill,E | Esp | Esp | Shire Rd Verge | 14.11.93 | 5 | Vulnerable |

* = new population / sub-population

Response to Disturbance

Appears to be a disturbance opportunist and has the ability to resucker from rootstock.

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

Most of the known populations are small.

E. chamaephila occurs in the Dowak Nature Reserve.

References

Grieve and Blackall (1982).

An erect, often spindly shrub, 0.8-2.0 m tall. Branches are covered in small warts and are sticky towards the apex. Leaves are elliptical (8-16 x 2-7 mm) and usually have 1 or 2 small teeth on either side of the apex. The cream-coloured flowers (6.5-10 mm) are borne singly or in pairs in the leaf axils. The 4 stamens, ovary and style are hairless, although the inside of the corolla tube is bearded on the middle lower lip and the tube below it. The tube may be spotted or yellow-brown spotted on the inside. The fruit is dry, hairless, shaped like two narrow cylinders pressed together and slightly covered with small, wart-like projections.

Eremophila compressa is allied to *E. saligna*, but the former species can be recognised by its warty branches, 2 or 3 teeth near the apex (*E. saligna* has numerous teeth along the leaf margins), and its bicylindrical fruit.

Flowering Period: October - December, March (probably most of the year or after rains)

Distribution and Habitat

E. compressa is distributed over an area of about 70 km, from near Grass Patch to the north of Salmon Gums and east to near Dingo Rock. It is usually found on disturbed brown clay loams adjacent to roads or along the railway line, or in loam over limestone. It may occur in undisturbed *Eucalyptus* woodland or amongst mallee and scrub.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|-------------------------|-------------|---------------|-----------|
| 1 | Salmon Gums,N | Esp | Esp | MRWA Rd Res. | 17.11.92 | 30+ | Good |
| 2a | Salmon Gums,W | Esp | Esp | Shire Rd Res. | 17.11.92 | 15 | Good |
| 2b | Salmon Gums,W | Esp | Esp | Shire Rd Res. & ?VCL | 17.11.92 | 10+ | Good |
| 2c | Gimlet Rd | Esp | Esp | Shire Rd Res. & ?VCL | 17.11.92 | 10+ | Good |
| 3 | Salmon Gums,N | Esp | Esp | MRWA Rd Res. | 18.11.92 | Not found | Mown |
| 4 | Starcevich Rd | Esp | Esp | Shire Rd Res. | 11.10.79 | <20 | - |
| 5 | Salmon Gums | Esp | Esp | - | - | - | - |
| 6 | Dingo Rock,SW | Esp | Esp | VCL | 20.10.90 | Common | Good |

Response to Disturbance

Appears to be a disturbance opportunist. Its response to fire is not known.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

R. Chinnock (unpublished data) indicates that *E. compressa* is insect pollinated. Further survey and research on the reproductive biology of this species is required.

E. compressa usually occurs in small, localised patches, with no known populations in conservation reserves. The suitability of uncleared land on the corner of Gimlet Road and Salmon Gums West Road for the purpose of a conservation reserve should be investigated.

References

Chinnock (1985).

Eremophila oblonga Chinnock ms

MYOPORACEAE

A low, domed-shaped shrub, rarely more than 20 cm tall, but commonly up to 50 cm across. Branches have small warts scattered along them. Leaves are small (2-5 x 1 mm), thick and oblong-shaped. Flower buds are brownish-black and develop into mauve to dark purple flowers (23 mm long). The calyx is smooth on the outer surface and shortly-hairy inside.

Eremophila oblonga ms is closely related to *E. weldii* which has longer leaves (4-10 mm).

Flowering Period: October - November

Conservation Status

Current: Priority 1

Distribution and Habitat

E. oblonga ms occurs east of the Fraser Range towards Caiguna and south to near Mt Coobaninya, with a known range of 150 km. It grows in light brown clay loam over shallow limestone in open woodland. Associated plants include *Olearia muelleri*, *Westringia rigida* and various *Melaleuca*, *Eucalyptus* and *Atriplex* species.

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------|----------|-------|----------------|-------------|---------------|-----------|
| 1a | Balladonia,S | Esp | Dund | VCL | - | - | - |
| 1b | Balladonia,S | Esp | Dund | VCL | - | - | - |
| 2 | Balladonia,S | Esp | Dund | Pastoral Lease | 16.11.93 | 20+ | Good |
| 3 | Balladonia,E | Esp | Dund | MRWA Rd Res. | - | - | - |
| 4a | Newman Rock,NW | Esp | Dund | MRWA Rd Res. | - | - | - |
| 4b | Newman Rock,NW | Esp | Dund | MRWA Rd Res. | 17.11.93 | 50+ | Good |
| 5* | Parmango Rd | Esp | Esp | VCL | 14.11.93 | 50 | Good |
| 6* | Parmango Rd | Esp | Esp | VCL | 14.11.93 | 350+ | Good |
| 7a* | Ponier Rock,S | Esp | Esp | VCL | 14.11.93 | 10 | Good |
| 7b* | Ponier Rock,S | Esp | Esp | VCL | 14.11.93 | 20 | Good |
| 8a* | Coragina Rock | Esp | Esp | VCL | 16.11.93 | 10 | Good |
| 8b* | Coragina Rock,N | Esp | Esp | VCL | 16.11.93 | 500+ | Good |
| 9* | Coragina Rock,N | Esp | Esp | VCL | 16.11.93 | 1 000+ | Good |
| 10a | Balladonia Rd | Esp | Esp | VCL | 16.11.93 | 50+ | Good |
| 10b* | Balladonia Rd | Esp | Esp | VCL | 16.11.93 | 1 000+ | Good |
| 10c* | Balladonia Rd | Esp | Esp | VCL | 16.11.93 | 100+ | Good |
| 10d* | Balladonia Rd | Esp | Dund | Pastoral Lease | 16.11.93 | 50+ | Good |
| 11* | Balladonia Rd | Esp | Dund | Pastoral Lease | 16.11.93 | 150+ | Good |
| 12* | Balladonia Rd | Esp | Dund | Pastoral Lease | 16.11.93 | 20+ | Good |
| 13* | Balladonia,NW | Esp | Dund | MRWA Rd Res. | 16.11.93 | 500+ | Good |
| 14* | Balladonia,NW | Esp | Dund | MRWA Rd Res. | 16.11.93 | 100+ | Good |
| 15* | Balladonia,NW | Esp | Dund | MRWA Rd Res. | 16.11.93 | 10 | Good |
| 16* | Balladonia,NW | Esp | Dund | MRWA Rd Res. | 17.11.93 | 20+ | Good |

* = new population

Response to Disturbance

Unknown

Eriostemon sp. Cascades (M.A.Burgman 1535)

RUTACEAE

A shrub, 30 cm tall. Leaves are almost globular.

This taxon is closely related to *Eriostemon gardneri*.

Flowering Period: June - September

Distribution and Habitat

This taxa is known from only three populations which are distributed over a 50 km area, in the vicinity of Pyramid Lake (north-west of Cascade). It grows in white or brown sand over reddish sandy clay in mallee heath.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Coujinup Hill,ENE | Esp | Rav | VCL | 6.1983 | - | - |
| 2 | Pyramid Lake | Esp | Esp | VCL | 8.1983 | - | - |
| 3 | Pyramid Lake,SW | Esp | Rav | VCL | 9.1983 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

The known populations occur in a remote area which is not immediately threatened by clearing for agriculture. Burgman (1985b) indicates that this taxon probably does not deserve specific status, but rather subspecies would be appropriate. The taxonomic status of these collections needs to be determined. Further surveys are required.

Note - at the time of writing this report the Western Australian Herbarium specimens were on loan and not available for inspection.

References

Burgman (1985b).

A mallee, 5 m tall. The smooth whitish and brownish bark sheds in ribbons. Leaves are dull bluish.

Flowering Period: October

Distribution and Habitat

This species is known from only two, closely occurring localities, north-west of Clyde Rock. It occurs in pale grey slightly sandy loam in an open woodland, associated with numerous *Eucalyptus* species.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Clyde Rock,NW | Esp | Esp | VCL | 6.11.86 | Frequent | Good |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

E. burgmaniana ms lies on the northern boundary of the originally proposed 'Mt Beaumont Stage 2 - Land Release Area' (Burgman 1985b). It could be threatened if this land was to be released for agriculture in the future. A survey in May 1993 failed to relocate this species, which is difficult to find due to the abundance of *Eucalyptus* species at this locality (L. Johnson, personal communication). Further survey is required to determine its range and abundance.

References

Burgman (1985b).

A tree to 8 m tall, with rough bark to 3 m. Adult leaves are stalked, narrow-lanceolate (60-95 x 4-8 mm), light green and glossy with dense venation and numerous oil glands. Inflorescences are unbranched and borne in leaf axils on peduncles (stalks) which are cylindrical (terete) to flattened (6-10 mm). There are 7 or more flowers in each inflorescence. Buds are stalked, ovoid to spindle-shaped with conical bud caps.

This species is reminiscent of *Eucalyptus salmonophloia* with its delicate buds and fruits, but differs in its rough bark, narrower leaves and conical bud caps; *E. delicata* ms is a member of the series Oleosae.

Flowering Period: March, August

Distribution and Habitat

E. delicata ms has a range of over 300 km from west of Southern Cross to east of Norseman and southwards to near Peak Eleanora. It grows in grey-white clay loam, sandy loam or red soil in woodland, associated with other eucalypts including *E. flocktoniae*, *E. valens*, *E. ovularis*, *E. longicornis* and *E. salubris*.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------------|----------|-------|-----------------------------|-------------|---------------|-----------|
| 1a | Peak Eleanora,S | Esp | Esp | VCL | 19.9.93 | 20+ | Good |
| 1b* | Peak Eleanora,S | Esp | Esp | VCL | 19.9.93 | 50+ | Good |
| 2 | Peak Eleanora,NW | Esp | Esp | NP | 8.11.86 | Frequent | - |
| 3 | Peak Charles,NE | Esp | Esp | VCL | - | Frequent | - |
| 4* | Rollond Rd | Esp | Esp | Shire Rd Res. & ?Private | 20.9.93 | 100+ | Good |
| 5 | Norseman,E | Esp | Dund | MRWA Rd Res. & NR | 17.11.93 | 50+ | Good |
| 6 | Bodallin,E | Mer | Yil | - | 7.4.83 | - | - |
| 7 | Hyden,E | Nar | Kon | - | 24.8.88 | - | - |

* = new population / sub-population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

According to L. Johnson (personal communication), *E. delicata* ms is not particularly rare, with the species being more widespread than initially believed. It occurs in the Peak Charles National Park. Further survey is required.

A tree or mallee which grows to 10 m tall. The glossy, dark green-brown or bronze bark is smooth throughout. Leaves are glossy green, lanceolate (45-90 x 5-18 mm) with stalks up to 13 mm long. Large oil glands are moderately or sparsely distributed through the leaves. The 7-flowered inflorescences are borne in axils of the leaves on thick, flattened stalks (peduncles, 2-9 x 4 mm). Flower stalks (pedicels, 1-2 mm) are angular. Buds are ovoid to globular (7-10 x 6-8 mm) with a hemispherical bud cap. The cup-shaped fruits (7-10 x 6-8 mm) are almost sessile (i.e. without stalks), have 4 locules and are often 2-winged; the disc is slightly raised or flat with the 4 broadly triangular valves exerted at their apex.

Eucalyptus jimberlanica is related to *E. terebra*, *E. tortilis* and *E. creta*, from which it can be distinguished by its slightly smaller buds and fruits, and its hemispherical rather than acute bud cap which occurs in the latter 3 species.

Flowering Period: Unknown

Distribution and Habitat

E. jimberlanica is known only from a single, small population near Norseman. It grows in red-brown loam on a basic or ultrabasic outcrop.

Conservation Status

Current: Priority 1

Known Population

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------|----------|-------|---------------|-------------|---------------|-----------|
| 1 | Jimberlana Hill | Esp | Dund | Unvested Res. | 13.11.87 | - | Good |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

E. jimberlanica appears extremely restricted in distribution. Jimberlana Hill has been recommended as a nature reserve, however the proposal has been opposed by the Department of Minerals and Energy. Further survey is urgently required.

References

Johnson and Hill (1991).

A sprawling mallee, 2-4 m tall, with smooth, grey-brown bark and a 'sock' of rough bark for 0.5-1.5 m at the base. Leaves are alternate, lanceolate (to 80 x 13 mm), dull light bluish-green initially, turning glossy dark green when older. Inflorescences are held on long stalks (peduncles, to 12 mm) and are up to 11-flowered; buds (25 x 4 mm) are borne on stalks and have a recurved tip. Fruits are barrel-shaped (to 10 x 6 mm). The light grey-brown seed is more or less spherical.

The thick, rough, basal bark and saline habitat distinguish this taxon from all other taxa in the *Eucalyptus* 'redunca' group. *E. varia* subsp. *salsuginosa* can be distinguished from subsp. *varia* by having a straggly habit and lower stature (less than 4 m).

Flowering Period: Unknown

Distribution and Habitat

E. varia subsp. *salsuginosa* is known from a few localities, less than 40 km apart, north and north-west of Esperance, particularly on tributaries of the Dalyup River. It grows along salt drainage lines or on seasonally wet flats, often associated with *E. uncinata*, *E. conglobata*, *E. leptocalyx*, *E. micranthera* or *E. kessellii*.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------------|----------|-------|----------------|-------------|---------------|-----------|
| 1 | Speddingup West Rd | Esp | Esp | ?Shire Rd Res. | 7.2.89 | - | - |
| 2 | Speddingup West Rd | Esp | Esp | ?AR | 7.2.89 | - | - |
| 3 | Moonanup Rd | Esp | Esp | ?Shire Rd Res. | 7.2.89 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

E. varia subsp. *salsuginosa* is poorly known and requires further survey. The saline habitat occupied by this taxon is rarely cleared for agriculture (Brooker and Hopper 1991).

References

Brooker and Hopper (1991).

Eucalyptus sp. B Ravensthorpe (K.R.Newbey 9715)

MYRTACEAE

A spreading, moderately-dense tree, 4 m tall, dividing just above ground level into 3 or 4 branches. Bark is smooth, light brown, shedding dark, medium grey; new growth is dark reddish-brown. The alternate leaves are elliptical (45-90 x 13-18 mm) and bright, darkish green. Leaf stalks are 15-20 mm long. Single clusters of 4-6 flowers are borne in the leaf axils on long, thick, strap-like, pendulous stalks (peduncles, 25-38 x 4 mm). Stalks (pedicels) of individual flowers are 6-7 mm long. Buds have a cylindrical calyx (7-8 x 5 mm) with a cupped base and 2 ridges, one on each side continuous with the stalk; the bud cap is horn-shaped. Fruits are dull, dark, reddish-brown and shaped like an elongated cup (12-13 x 11 mm) with a small ridge on either side and a rim extending 1 mm; the 4 valves are not exerted.

This taxon is closely related to *Eucalyptus dielsii*, but has longer buds and a narrower rim on the fruit. It may be a hybrid between *E. dielsii* and *E. platypus* or *E. eremophila*.

Flowering Period: Unknown

Distribution and Habitat

This taxon occurs about 45 km west of Cascade, with the two known populations occurring within 1.5 km of each other. It grows on well-drained clayey loam and is rare in *E. dielsii* low woodland, associated with *E. platypus*, *E. eremophila* and *E. transcontinentalis*.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|-------------|-------------|---------------|-----------|
| 1a | West Point Rd | Esp | Rav | ?VCL | 22.2.83 | <5 | - |
| 1b | West Point Rd | Esp | Rav | ?VCL | - | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

Research is required to confirm the taxonomic status of this species. The rarity of its occurrence, and the proximity of species with which it shares a number of characteristics, suggests that it may be a hybrid.

References

Newbey (1983).

Eutaxia sp. Hatter Hill (K.R.Newbey 6532)

PAPILIONACEAE

A small cushion or dome-shaped shrub, 2-4 cm tall and 12-35 cm wide. Branches are spinescent. Leaves are spirally arranged and covered in a white powdery 'bloom' that comes off when rubbed (glauous). The calyx is not conspicuously veined or ribbed.

Flowering Period: November

Distribution and Habitat

This taxon is known from two areas, Hatter Hill and south of Peak Eleanora, about 110 km apart. Near Hatter Hill it grows in clayey sand in a *Eucalyptus* woodland on a gentle undulating plain.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------|----------|-------|--------------------------|-----------------|----------------|-----------|
| 1 | Hatter Hill | Esp | Rav | ?VCL | 13.11.79 | Frequent | - |
| 2 | Hatter Hill,SSE | Esp | Rav | ?VCL | - | Common | - |
| 3 | Fields Rd | Esp | Esp | ?VCL & ?Shire Rd Res. | 9.84 12.9.92 | - Not found | - - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

Eutaxia sp. Hatter Hill is currently undergoing taxonomic review (T. Macfarlane, personal communication). It is not known to occur in any conservation reserve and appears to be rare.

In September 1992, *E.* sp. Hatter Hill was searched for at the collection site south of Peak Eleanora (pop. no. 3) but was not found. The narrow, western road reserve was very disturbed and Vacant Crown Land on the east side of the road has been cleared for a small dam. Further intensive survey of the area is recommended to determine whether this population still exists.

The Hatter Hill area was surveyed in October 1992, without this taxon being located; specific localities for these populations were unknown. Further survey is required.

References

Burgman (1985b).

An erect herb, to 25 cm tall, with 4-30 red to green hairy stems branched at the base and arising in a rosette from the crown of a taproot. Leaves are oval-shaped, very variable in size (8-18 x 4-8 mm), softly-hairy, and have minute teeth along the margin; the margin is white and thickened. Lower leaves are opposite, soon becoming alternate. Clusters of flowers (indeterminate spike) are borne in alternate bracts. Flowers are 4-merous on minute stalks (0.5 mm). The 4 green sepals have hairs along the margins, but are otherwise hairless. Petals are deep red to green (2 mm), hooded, and have shaggy hairs near the 2 front-joined petals. There are 8 stamens with yellow (abortive) to deep red, linear-oblong anthers. Fruits are pear-shaped (1.0-1.2 x 0.9 mm), contracting into an 8-ribbed neck in the upper half; the lower half has 2 transverse rows of prominent warts and is covered with minute, stiff hairs. The wall of the ripened fruit is membranous; there is 1 seed per fruit.

This species is similar to *Gonocarpus confertifolius* and *G. nodulosus*, sharing the pear-shaped fruit and hairy foliage. It is distinguished from *G. confertifolius* by its longer leaves and shorter, broader calyx lobes, and from *G. nodulosus* by its leaf arrangement and size, and flowers with 8 stamens.

Flowering Period: December

Distribution and Habitat

G. pycnostachyus was first collected in 1885 near Israelite Bay. It was recently rediscovered near Mt Heywood and Mt Merivale. This taxon appears to be a pioneer species, annual or at most a short-lived perennial, appearing after fire. Near Mt Heywood, before fire, the vegetation was dominated by dense shrubby Proteaceae growing on deep sand. North-east of Mt Merivale, it grows on shallow sand or clay loams around a rock depression, in an area which was recently burnt (Orchard 1993).

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Israelite Bay | Esp | Esp | NR | 1885 | - | |
| 2 | Mt Heywood,NE | Esp | Esp | VCL | 26.12.91 | Abundant | Post-fire |
| 3 | Mt Heywood,ENE | Esp | Esp | VCL | 1.1.92 | Very common | Post-fire |
| 4 | Mt Merivale,NE | Esp | Esp | - | 17.4.92 | - | - |

Response to Disturbance

G. pycnostachyus is a disturbance opportunist, being rediscovered by W.R. Archer in December 1991, regenerating in large numbers after a fire (early 1991) to the north-east of Mt Heywood. Subsequently, another population was found near Mt Merivale on recently burned ground (Orchard 1993).

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

Monitoring of the known populations of *G. pycnostachyus* to determine its reproductive biology. Further survey (especially after fire), particularly near Israelite Bay to confirm its occurrence in the Nature Reserve.

References

Orchard (1975, 1990, 1993).

An inconspicuous, erect, perennial herb, to 40 cm tall, with almost leafless stems. Stems are smooth, narrow, flexible and round. The alternate, triangular, red bracts (1.7 mm) and linear bracteoles (1 mm) are deciduous. Flowers are 4-merous with male or bisexual flowers apparently on different plants. The bisexual flowers lack stalks, have triangular sepals (0.4 mm), greenish, long-clawed petals (1.7 mm), 8 stamens, and an 8-ribbed, shiny ovary. Males are similar, except they are borne on stalks (2 mm) and have a rudimentary ovary. The fruit is narrowly cylindrical (2 mm), 8-ribbed, hairless and green.

Flowering Period: October - December

Distribution and Habitat

Gonocarpus simplex grows in swamps in the south-west and along the south coast of Western Australia. In the Esperance District it occurs in swamps in the Cape Le Grand National Park and nearby areas. It prefers grey peaty sand to sandy clays in association with species of Restionaceae and Cyperaceae.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------------|----------|-------|---------------|-------------|---------------|-----------|
| 1a | Cape Le Grand Rd | Esp | Esp | Shire Rd Res. | 17.12.74 | Frequent | - |
| 1b | Cape Le Grand Rd | Esp | Esp | Private | 18.11.79 | - | - |
| 1c | Cape Le Grand | Esp | Esp | NP | 12.12.92 | Abundant | Good |
| 2 | Walpole Point | Wal | Manj | - | 12.12.90 | - | - |
| 3 | Northcliffe,E | Wal | Manj | - | 11.12.87 | - | - |
| 4 | Bow River | Wal | Dnmk | - | 12.12 | - | - |
| 5 | Yelverton forest | Bsltn | Bsltn | - | 8.11.89 | Rare | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

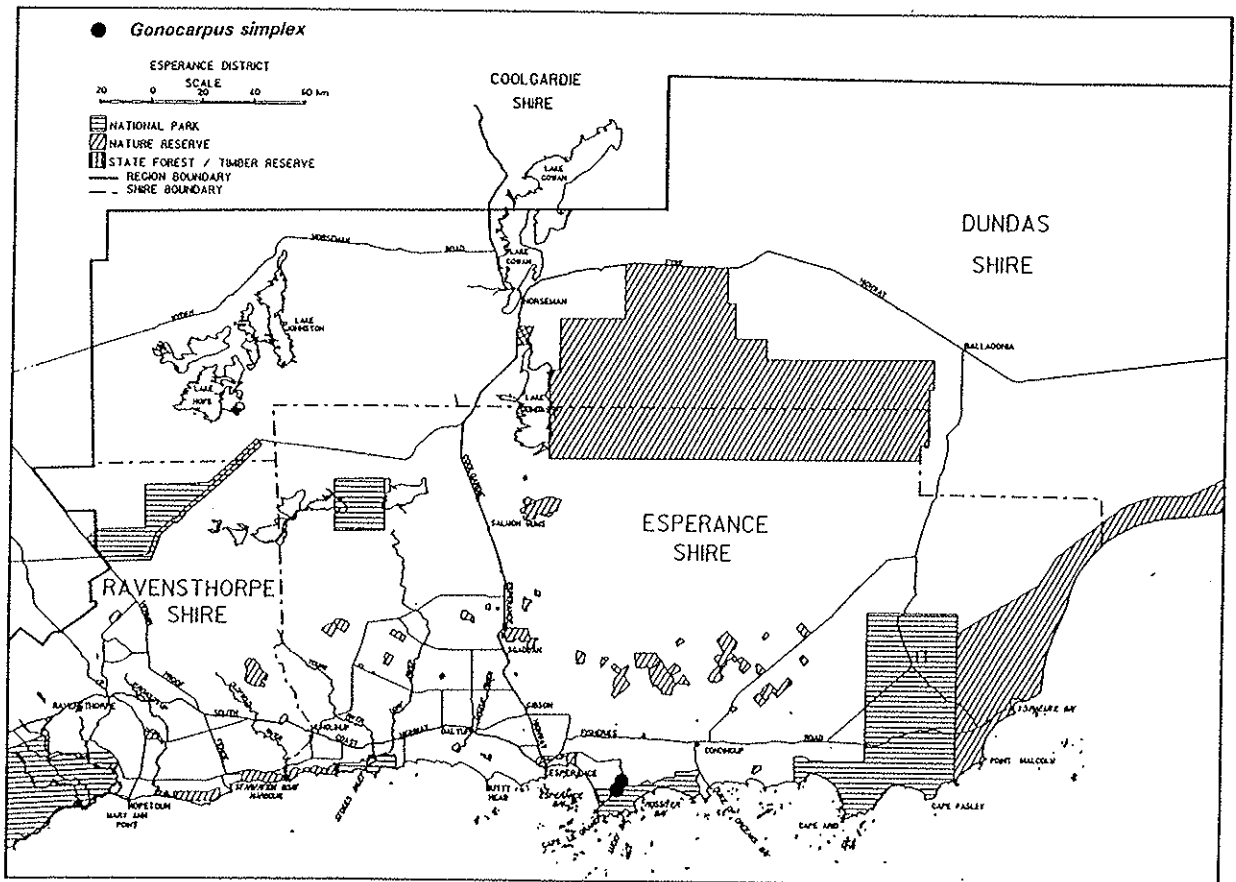
Unknown

Summary and Recommendations

Further survey of this inconspicuous species is required. It is possibly quite common in swampy areas of the Cape Le Grand National Park.

References

Orchard (1990).



Gratiola pedunculata R.Br.

SCROPHULARIACEAE

Stalked Brooklime, Heartsease

A perennial herb, 13-50 cm tall, which is erect or often creeps along the ground rooting at the base. Branches are densely covered with glandular hairs. Leaves are opposite, linear-ovate (10-30 x 3-10 mm), finely toothed, 3-veined at the base and clasp the stem. Glands form small, golden globules on the leaves, bracteoles and sepals. Cream-white flowers are borne singly or rarely in pairs in leaf axils on long stalks (8-26 mm); the corolla is at least as long as the calyx and has short and broad lips, the upper one being very shortly 2-lobed. Seed is small (0.5 mm long), dark-brown, with prominent thin longitudinal ridges and transverse ridges between.

The specimen collected in Cape Arid National Park has pink flowers which is atypical.

Flowering Period: October - November, ?January - May

Distribution and Habitat

Gratiola pedunculata occurs in South Australia, New South Wales, Victoria and Queensland. In Western Australia, it was collected by Drummond in 1848, and in 1989 this species or a closely related taxon was collected in Cape Arid National Park. It grows in moist soil on the banks of rivers and lagoons, or margins of rock pools.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Swan River Colony | - | - | - | 1848 | ?Extinct | - |
| 2 | Pine Hill | Esp | Esp | NP | 28.10.89 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

The impact of feral donkeys, cattle and rabbits which visit the water bodies around which *G. pedunculata* is likely to grow is unknown. Further survey is required.

G. pedunculata occurs within the Cape Arid National Park.

References

Barker (1986), Bentham (1869).

An attractive shrub, 1-1.5 m tall and 1-2 m wide, with hairy branchlets. Leaves are linear (35 x 1 mm) with conspicuous parallel veins, have a stiff sharp point at the tip and are often in crowded clusters at the end of small branches. Flower heads, usually about 10-flowered, are clustered at the ends of branches. Flowers are red or light yellow, silky-hairy on the exterior, have a hairy ovary and a red style (22 mm) which is hairy at the base; the pollen presenter is very oblique and oblong-shaped.

Grevillea phillipsiana is related to *G. deflexa* and *G. lavandulacea* from which it differs in having narrow linear leaves with parallel veins and a hairless style with silky hairs at its base.

Flowering Period: June - November

Distribution and Habitat

G. phillipsiana occurs near Norseman and in an area about 170 km to the north-east. It grows on moist red sand, near granite outcrops. Associated genera may include *Eucalyptus*, *Acacia* and *Allocasuarina*, with *Triodia scariosa*.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------------|----------|-------|-----------------|-------------|---------------|-----------|
| 1a | Norseman,N | Esp | Dund | VCL | 18.11.93 | 500+ | Good |
| 1b | Norseman,N | Esp | Dund | MRWA Rd Res. | 19.7.79 | 1 | Disturbed |
| 2a | Sinclair Soak,SE | Esp | Dund | - | 5.8.80 | Frequent | - |
| 2b | Sinclair Soak,SE | Esp | Dund | - | 9.8.80 | - | - |
| 3 | Woodline Hills | Esp | Dund | - | 12.9.70 | 1 | - |
| 4 | Norite Dyke | Esp | Dund | - | 9.65 | - | - |
| 5 | Cardunia Rocks | Gold | Bldr | ?Pastoral Lease | 16.9.78 | Occasional | - |
| 6 | Zanthus-Cocklebidy | ?Esp | ?Dund | - | 10.64 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

The area where it is known to grow, i.e. between the Eyre Highway and the Trans Australian Railway, is relatively remote and has been poorly surveyed. This species may extend to over 300 km east or north-east of Norseman, as one specimen has been collected "between Zanthus and Cocklebidy". Further survey is required.

References

Elliot and Jones (1986).

An erect shrub, 80-120 cm tall and 30-60 cm wide, which divides into 3-4 branches near ground level. Young branches are sticky. Leaves are alternate, linear (3-5 x 0.2 mm), without stalks, smooth and have a hooked apex. At the base of each leaf are 2 tiny, triangular-shaped stipules. Female and male flowers are on separate bushes; small (<1 mm), single flowers are borne on short (<1 mm) stalks in leaf axils. Female flowers are light green and sticky; the ovary has 2 or 3 cells. Male flowers are similar to female flowers, but have a single whorl of 7-10 stamens. Fruits are 3 mm long.

Flowering Period: October - November

Distribution and Habitat

Gyrostemon ditrigynus is distributed between Kulin and Dingo Rock, a distance of about 350 km. It is a coloniser after fire and soil disturbance, growing in well-drained sandy loam in mixed open shrub mallee, associated with *Eucalyptus cylindriflora*, *E. eremophila*, *E. forrestiana* and *E. transcontinentalis*.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------------|----------|-------|-------------|-------------|---------------|---------------|
| 1 | Mt Ridley,NE | Esp | Esp | VCL | 14.11.80 | Very common | Post-fire |
| 2 | Mt Ridley,NE | Esp | Esp | VCL | 5.5.81 | Common | Post-fire |
| 3 | Dingo Rock,E | Esp | Esp | VCL | 8.83 | - | Post-clearing |
| 4 | Ninety Mile Tank | Esp | Dund | VCL | 17.10.74 | - | - |
| 5 | Kulin,E | Nar | Kulin | ?Rd Res. | 29.9.72 | - | - |
| 6* | Ninety Mile Tank,E | Esp | Esp | VCL | 17.9.93 | 1 000s | Post-fire |
| 7* | Clyde Hill,NE | Esp | Esp | VCL | 15.11.93 | 5+ | Post-dist. |
| 8* | Clyde Hill,NE | Esp | Esp | VCL | 15.11.93 | 20 | Post-dist. |

* = new population

Response to Disturbance

G. ditrigynus is a disturbance opportunist. After fire it will rapidly recolonise an area, regenerating from seed. More than two years after a hot fire (January 1991) east of Ninety Mile Tank, thousands of flowering plants were found. North-east of Clyde Hill plants were located in one area that had been chained (but not burnt) as a fire break and in another area where soil had been ripped; it was not found in nearby undisturbed woodland.

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

In May 1993, a survey north-east of Mt Ridley failed to relocate either population nos. 1 or 2. Monitoring of post-fire populations is required to determine the longevity of *G. ditrigynus*. Further opportunistic survey is required.

References

George (1982), Newbey (1983).

A woody herb, 15-30 cm tall, with wiry stems covered in short, white, felt-like hairs. Leaves are thick, flat, oval-shaped (6-10 mm long), alternate and covered in similar hairs to the stem. Flowers are usually solitary at the end of stems, with 5 broad blue petals which are free almost to the base. Calyx lobes are linear and covered with short, brown glandular hairs.

Halgania tomentosa is similar to *H. integerrima*, however the latter has linear or oblong leaves which are very sparsely hairy, and stems which may become hairless with age. The distribution of the two species does not appear to overlap.

Flowering Period: October - November

Distribution and Habitat

Halgania tomentosa is distributed from near Tammin to east of Ninety Mile Tank, a distance of approximately 300 km. There is an additional disjunct population occurring near Newman in the Pilbara. It grows in yellow-brown sand or sandy loam with or without lateritic gravel in scrub or open heath communities and may be associated with *Eucalyptus*, *Allocasuarina*, *Dryandra* or *Verticordia*.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------------|----------|-------|--------------|-------------|---------------|-----------|
| 1a | Hatter Hill | Esp | Rav | - | 11.29 | - | - |
| 1b* | Hatter Hill,N | Esp | Rav | VCL | 27.10.92 | 5 | Good |
| 2 | Lake King,E | Esp | Rav | ?VCL & NP | 20.10.64 | - | - |
| 3 | Ninety Mile Tank,E | Esp | Esp | VCL | 10.10.66 | - | - |
| 4 | Lake Cronin,E | Esp | Dund | VCL | 17.10.84 | Occasional | - |
| 5 | Moorine Rock | Mer | Yil | - | 9.11.62 | - | - |
| 6 | Bodallin | Mer | Yil | MRWA Rd Res. | 15.10.90 | 15 | Healthy |
| 7 | Nulla Nulla | Mer | Yil | MRWA Rd Res. | 15.10.90 | 20 | Healthy |
| 8 | Chiddarcooping | Mer | West | NR & Rd Res. | 8.11.90 | 15+ | Healthy |
| 9 | Tammin | Mer | Tam | - | 18.10.67 | - | - |
| 10 | Boorabbin | Gold | Cool | NP | 17.10.85 | - | - |
| 11 | Newman,N | Pilb | - | - | 16.10.66 | - | - |

* = new sub-population

Response to Disturbance

May be a disturbance opportunist.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

An upright-spreading shrub, 20-25 cm tall and 40-55 cm broad, which divides near ground level into 4-6 spreading branches. The bark is reddish with fine ridges. The stems, leaves and calyx are all densely covered with short, stiff hairs giving a rough texture to the foliage. Leaves are bright green, without stalks, alternate, narrow-elliptical (12-20 x 1.5-2.5 mm), roughly-hairy and have a small sharp tip; smaller leaves are entire while larger ones have 2 or 4 small teeth towards the acute apex. Flowers are borne singly or in pairs in leaf axils, and form leafy flowering spikes on the last 8-12 cm of branches. The bright, light green calyx has 3-4 inflated locules with 3-4 triangular-shaped hairless sepals. Petals are hooded and pale brown. Fruits are inflated and woody (2 x 1.5 mm).

This taxon has affinity with *Haloragis digyna*, but differs by being more foliose, more floriferous, and flowering in autumn rather than November-December. *H. digyna* appears to be restricted to near coastal areas in Western Australia and South Australia, whereas this species occurs inland.

Flowering Period: March - April

Distribution and Habitat

H. sp. Ravensthorpe occurs on well-drained, shallow sandy loams on a gentle undulating plain. It is common (in patches) in *Eucalyptus transccontinentalis* mallee, in an area burnt two years previously.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Coujinup Hill | Esp | Rav | VCL | 29.4.81 | Frequent | - |

Response to Disturbance

Probably regenerates well after fire.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

The known population is in a remote locality with difficult access. Further survey is required.

References

Newbey (1983).

A small, tufted, annual aquatic herb, which has several lax, cylindrical leaves (to 25 mm) arising from the base of the plant. Separate male and female capitula are present on the same plant. The flower heads are borne on stalks (3-5 mm) and are composed of 2 (rarely 4) sheathing lanceolate bracts. Male heads have 4-8 flowers with purple stamens exerted beyond the bracts. Female heads are more numerous and have 8-14 flowers, each with 4-10 stigmatic hairs. The pale brown fruit is ovoid (0.5 mm), wrinkled, with 2 or 3 obscure veins.

Hydatella australis (South Coast) and *H. leptogyne* (Perth) may be geographical extremes of one taxonomic entity (Cooke 1987), although G. Keighery (personal communication) believes they are distinct taxa.

Flowering Period: October

Distribution and Habitat

H. australis was collected by Diels from the Hamersley River in 1901, and more recently it has been collected from granite rock pools near Cape Arid. It grows in silt or mud in shallow pools and seasonal swamps.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Hamersley River | Alb | Esp | NP | 1901 | - | - |
| 2 | Cape Arid | Esp | Esp | NP | 2.11.89 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

H. australis is a minute aquatic plant which is very poorly known and poorly collected. Little is known of the range and environmental requirements of this species. Further survey is required.

H. australis is known in the Cape Arid National Park.

References

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

A slender, annual herb, 3-15 cm tall. Leaves are few and small along robust stems, rather deeply divided into 5 broad lobes which are also toothed or lobed, and have short, stiff hairs on both sides. The stipules are fringed or jagged. Flowers are white and exceedingly small, with 6 to 12 in a head. Fruits are broader than long and formed of two similar fruitlets. Two clearly defined intermediate and two dorsal ribs are visible from each side of the fruits. As well, fruits are hairless and have a granular-warty surface.

Flowering Period: October - November

Distribution and Habitat

Hydrocotyle hispidula is widely distributed through the south-west of the State, from Perth to near Esperance, and on Middle Island in the Recherche Archipelago. It grows in sandy soil on limestone ledges, along creeklines, and near the base of a granite outcrop.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|-------------|-------------|---------------|-----------|
| 1a | Middle Is.,SE | Esp | Esp | NR | 11.11.74 | Common | - |
| 1b | Middle Is.,NE | Esp | Esp | NR | 15.11.73 | - | - |
| 2 | Mt Ridley | Esp | Esp | VCL | 1.11.75 | - | - |
| 3 | Mosman Park | Perth | Metro | - | 9.02 | - | - |
| 4 | Garden Is. | Perth | Metro | Reserve | 20.10.78 | - | - |
| 5 | Pinjarra,S | Dwel | Mur | - | 4.10.62 | - | - |
| 6 | Mt Chudalup | Wal | Manj | - | 12.11.86 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

H. hispidula is an inconspicuous annual which has been poorly collected and is possibly rare. It should remain secure on Middle Island. Further survey is required.

References

Blackall and Grieve (1980).

Hydrocotyle sp. Truslove (M.A.Burgman 4419)

APIACEAE

An inconspicuous herb, less than 5 cm tall. Flowers are in simple clusters (umbels). Stipules at the base of the leaves are thin and dry. Leaves are flat and divided into segments.

Flowering Period: October

Distribution and Habitat

Hydrocotyle sp. Truslove is distributed over at least 60 km, between Salmon Gums and Scaddan, where it is very common around salt lakes and winter-wet flats.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------|----------|-------|---------------|-------------|---------------|-----------|
| 1 | Truslove | Esp | Esp | NR | 11.9.88 | 1 000s | - |
| 2a | Salmon Gums | Esp | Esp | NR | } | | |
| 2b | Salmon Gums | Esp | Esp | NR | 11.9.88 } | 1 000s | - |
| 2c | Salmon Gums | Esp | Esp | NR | } | | |
| 3 | Grass Patch,E | Esp | Esp | NR | 11.9.88 | 1 000s | - |
| 4 | Grass Patch,SE | Esp | Esp | NR | 11.9.88 | 1 000s | - |
| 5 | Styles Rd | Esp | Esp | Shire Rd Res. | 11.9.88 | - | - |
| 6 | Scaddan East Rd | Esp | Esp | Shire Rd Res. | 11.9.88 | - | - |
| 7 | Swan Lagoon Rd | Esp | Esp | ?VCL | 11.9.88 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

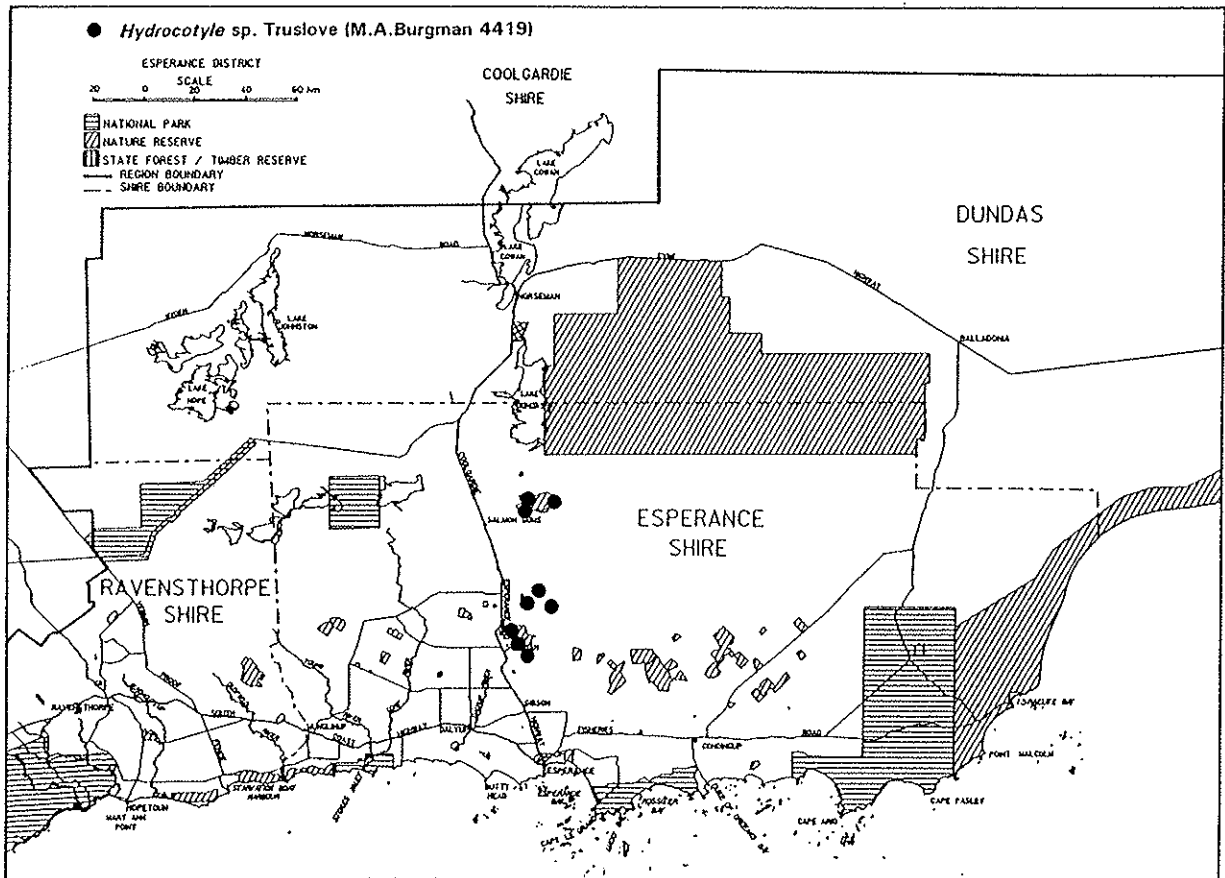
Unknown

Summary and Recommendations

Burgman (1985b) considered the status of this taxon to be uncertain. The specimen he collected was flowering which makes taxonomic verification difficult as species of *Hydrocotyle* are usually characterised by their fruits. Surveys by Wilson (personal communication) located millions of plants she considered to be the same taxon, in a relatively restricted area (about 60 km). She recorded it as being very common in four Nature Reserves.

References

Burgman (1985b).



An erect shrub which grows up to 1.2 m tall. Leaves are densely arranged on short branches and are light, bluish-green on both sides, oblong-elliptic (8-10 x 2 mm), more or less sessile, have a short, sharp tip and margins that are translucent. Flowers are small, have a white corolla (4 mm) and minute, yellow sepals (1 mm) and are borne in several-flowered inflorescences which are hidden amongst the leaves in the leaf axils. Fruits have a flat top.

Flowering Period: August - September

Distribution and Habitat

Leucopogon blepharolepis is widely distributed along the southern region of Western Australia, from near Cranbrook to "towards the Great (Australian) Bight", a distance of over 500 km. It grows in sandy soil in woodland, scrub or scrub-heath. Associated genera include *Banksia*, *Lysinema*, *Monotoca*, *Leucopogon* and myrtaceous species.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-------------------|----------|-------|--------------|-------------|---------------|-----------|
| 1 | Fanny Cove | Esp | Esp | NP | 21.4.67 | Abundant | - |
| 2* | Skippy Rock,N | Esp | Esp | NP | 9.9.93 | 1 000s | Good |
| 3 | Great Aust. Bight | Esp | ?Esp | NR | 1800s | - | - |
| 4 | Mt Maxwell | Alb | Jer | ?NP | 2.8.86 | Occasional | - |
| 5 | Geekabee Hill | Kat | Cbk | - | 4.8.86 | Frequent | - |
| 6 | Mundaring | Mdg | Mdg | State Forest | 4.2.89 | Occasional | - |

* = new population

Response to Disturbance

Probably a disturbance opportunist.

Susceptibility to *Phytophthora* Dieback

Presumed susceptible.

Summary and Recommendations

Despite the widespread distribution of *L. blepharolepis*, it remains poorly known. The population on the east side of Stokes Inlet (pop. no. 1) was burnt in January 1993; monitoring is required to determine the reproductive biology of this species following fire. The population (no. 2) in the western sector of Stokes National Park was largely burnt in 1982; 13 years later it was abundant in the dense heath regrowth.

Research is required to determine the response of *L. blepharolepis* to *Phytophthora* spp. and other plant pathogens.

References

Blackall and Grieve (1981), Mueller (1867).

Leucopogon florulentus Benth.

EPACRIDACEAE

An erect shrub, 40-50 cm tall with a robust, woody base. Branches are numerous and young branches are reddish. Leaves are thick, flat, sometimes slightly fringed with hairs, ovate to oblong, about 2 mm long, shortly stalked and have a concave apex with effectively no tip. Inflorescences are terminal (spike), many-flowered, short and compact. Flowers are white and without stalks. The ovary is 2-celled and the style short.

Flowering Period: November - February

Distribution and Habitat

Leucopogon florulentus is known only from a single collection (the type which is held at Kew, England) from an unknown locality between Perth and King George Sound.

An undescribed taxon which has close affinity to *L. florulentus* (J. Powell, personal communication) is very common in heath communities east of Esperance.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Perth-Albany | - | - | - | 1800s | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible.

Summary and Recommendations

Taxonomic revision of *Leucopogon* in Western Australia is urgently required. Classification of the many undescribed species and sorting of the Western Australian Herbarium folders would remedy many of the problems encountered in searching for the poorly known *Leucopogon* species.

Further survey of *L. florulentus* is required, although it is not likely to occur in the Esperance District.

References

Bentham (1869), Blackall and Grieve (1981).

An upright-spreading, mid-dense shrub, 30-35 cm tall x 20-25 cm broad, which divides into 4-5 branches just above ground level.

Old wood is rough, dark grey and black, while newer wood is densely covered in short, stiff hairs. The alternate leaves are crowded and held close to the branchlets. Leaves are bright green, narrow-obovate (5-7 x 1.5 mm), have a distinctive long, spiny tip (to 2 mm), margins with short, fine hairs, and an under surface which is conspicuously nerved. Inflorescences are 2-4 flowered, without stalks and occur in the axils at the ends of most branches. The 2 bracteoles, bracts and outer surface of the white corolla tube are hairy. The bracts are acuminate with long points. The corolla tube (4.5 mm) has a bearded inner surface; corolla lobes have a long point at the tip. Sepals are white with light mauve, long-pointed tips.

Flowering Period: May - June

Distribution and Habitat

Leucopogon sp. Bonnie Hill is known from south-east of Peak Eleanor and over 160 km to the east near Bonnie Hill. It grows on flat or undulating plain in well-drained sandy loams, in open mallee and low heath. Associated species include *E. leptocalyx*, *E. tetragona*, *E. uncinata*, *E. incrassata*, *Banksia media*, *Grevillea pectinata*, *Astartea ambigua* and *Gahnia ancistrophylla*.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Bonnie Hill | Esp | Esp | VCL | 10.5.82 | - | - |
| 2 | Fields Rd | Esp | Esp | VCL | 20.9.93 | 2 000+ | Healthy |
| 3 | The Cups,N | Esp | Esp | VCL | 24.6.83 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible.

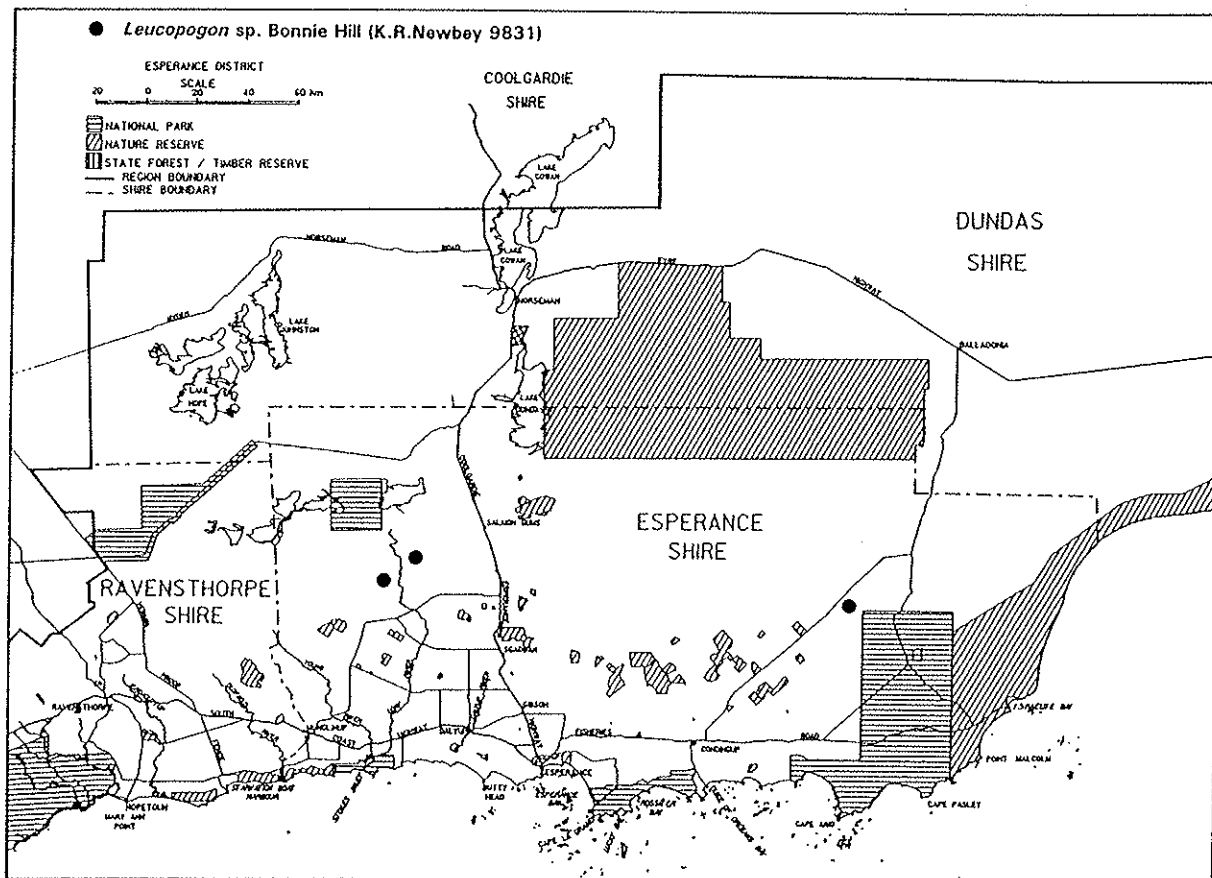
Summary and Recommendations

L. sp. Bonnie Hill probably represents a new species. The population on Fields Road (no. 2) would be threatened if more land was released for agriculture. Further action is required on the proposed vesting of Crown Land adjacent to the Lort River and Fields Road for the purpose of a conservation reserve (CALM 1991, Leighton and Watson 1992).

Further survey is required. Research is required to determine the response of this taxon to fire and to dieback (*Phytophthora* spp.).

References

Burgman (1985b), CALM (1991), Leighton and Watson (1992), Newbey (1983).



Leucopogon sp. Clyde Hill (M.A.Burgman 1207)

EPACRIDACEAE

An openly-branching or dense prickly shrub, 80 cm tall to 70 cm wide. Leaves are held erect or horizontal, concave, ovate-elliptic (10-13 x 2 mm), stalked, and taper to a rigid, sharp point. On the lower side of the leaf there are 3 parallel central veins and other veins branching towards the margin. The white flowers are erect with 2 or 3 borne together on short stalks in the axils of leaves; the corolla-tube is longer than the hairless sepals which end abruptly in a short point; bracteoles are keeled. The green fruits are globular (3.5 mm).

Leucopogon sp. Clyde Hill is closely related to *L. breviflorus* which has obtuse sepals and bracteoles.

Flowering Period: May - June

Distribution and Habitat

L. sp. Clyde Hill is known only from north-west of Clyde Hill and Peak Eleanora, over 250 km to the west. It occurs on the margins of granite outcrops in sandy loam. Associated genera include *Allocasuarina* and *Leptospermum*.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Clyde Hill,NW | Esp | Esp | VCL | 19.5.93 | 1+ | Good |
| 2* | Peak Eleanora | Esp | Esp | NP | 18.9.93 | 4+ | Good |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible.

Summary and Recommendations

L. sp. Clyde Hill is poorly known and probably represents a new species. Taxonomic revision of *Leucopogon* in Western Australia is urgently required. Classification of the many undescribed species and sorting of the Western Australian Herbarium folders would remedy many of the problems encountered in searching for the poorly known *Leucopogon* species.

Further survey is required. Research is required to determine the response of this taxon to fire and to dieback (*Phytophthora* spp.).

References

Burgman (1985b).

Leucopogon sp. Condingup (M.A.Burgman 1377)

EPACRIDACEAE

A shrub, 10-40 cm tall and 10-30 cm wide. Leaves are broader towards the tip than the base (obovate, 4-5 x 1 mm), concave, yellowish-green on both sides with fine, divergent nerves on the under side, and have an obtuse tip. Flowers are pendulous with 1- or 2-flowered inflorescences borne on long stalks (2.5-3.5 mm). The calyx (2 mm) is pale green and has concave sepals with acute tips; the corolla (3-4 mm) has a distinctive dark grey-black hue; the ovary is black.

Flowering Period: April - June

Distribution and Habitat

Leucopogon sp. Condingup is known from north-east of Condingup to Sheoaks Hill in the Nuytsland Nature Reserve, a range of about 90 km. It grows white or grey sand in low open mallee and low heath, associated with *Eucalyptus angulosa*, *Dryandra quercifolia*, *Banksia pulchella* and *B. petiolaris*.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Condingup,NE | Esp | Esp | ?NR | 20.6.83 | - | - |
| ?2 | ?Clyde Hill,SSE | Esp | Esp | - | 3.5.83 | - | - |
| 3* | Fisheries Rd | Esp | Esp | NP | 19.4.93 | 10+ | Good |
| 4* | Sheoaks Hill | Esp | Esp | NR | 22.4.93 | 100+ | Good |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible.

Summary and Recommendations

L. sp. Condingup is poorly known and probably represents a new species. Taxonomic revision of *Leucopogon* in Western Australia is urgently required. Classification of the many undescribed species and sorting of the Western Australian Herbarium folders would remedy many of the problems encountered in searching for the poorly known *Leucopogon* species.

Further survey is required. Research is required to determine the response of this taxon to fire and to dieback (*Phytophthora* spp.).

Recent surveys have found this taxon in Cape Arid National Park and the Nuytsland Nature Reserve.

References

Burgman (1985b).

Leucopogon sp. Coujinup (M.A.Burgman 1085)

EPACRIDACEAE

A spindly, rounded shrub, 20-30 cm tall and 20-30 cm wide. Leaves are small, lanceolate to elliptic (2-2.5 x 1-1.5 mm), stiff, overlapping and often clasping the stem, concave and have a sharp, spiny tip. The white flowers are erect becoming pendulous on long stalks (2 mm); the green calyx (2.5 mm) has sepals with acute tips. The pendulous fruits are sparsely covered in short white hairs.

Flowering Period: March - April

Distribution and Habitat

The known populations of *Leucopogon* sp. Coujinup are distributed over 170 km, from the Oldfield River to the north-west of Dingo Rock. It grows in white-grey sand on dune ridges adjacent to salt pans or in yellow sandy clay loam on undulating sandplain in shrub heath. It may be associated with *Banksia elderiana*, *Grevillea aneura*, *Adenanthos glabrescens*, *Beaufortia schaueri* and species of *Verticordia*, *Calytrix* and *Allocasuarina*.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Dingo Rock, NNW | Esp | Esp | VCL | 28.3.83 | - | - |
| 2 | Fields Rd | Esp | Esp | VCL | 19.9.93 | 1 500+ | Healthy |
| 3* | Fields Rd | Esp | Esp | VCL | 18.9.93 | 500+ | Healthy |
| 4 | West Point Rd | Esp | Rav | - | 10.84 | - | - |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible.

Summary and Recommendations

L. sp. Coujinup is poorly known and probably represents a new species. Taxonomic revision of *Leucopogon* in Western Australia is urgently required. Classification of the many undescribed species and sorting of the Western Australian Herbarium folders would remedy many of the problems encountered in searching for the poorly known *Leucopogon* species.

This taxon is not known to occur in any conservation reserve. The large population (no. 2) near Fields Road, north-east of Cascade, would be threatened if more land was released for agriculture. Further action is required on the proposed vesting of Crown Land adjacent to the Lort River and Fields Road for the purpose of a conservation reserve (CALM 1991, Leighton and Watson 1992).

Further survey is required. Research is required to determine the response of this taxon to fire and to dieback (*Phytophthora* spp.).

References

Burgman (1985b), CALM (1991), Leighton and Watson (1992).

An erect to spreading shrub, up 70 cm tall. Leaves are held almost perpendicular to the stem, shiny dark green on upper surface, narrow triangular (4-8 x 1-2 mm) with margins rolled backwards towards the midrib (revolute); the lower surface has minute hairs in interveinal grooves. Flowers (5-10 mm) are creamy, stalkless with 2 or 3 borne in the upper leaf axils. The calyx tube is about half the length of the corolla; sepals are acute and the bracteoles obtuse at the apex.

Two forms, one very robust and the other slighter, of this taxon are apparent. *Leucopogon* sp. Kau Rock has affinity to *L. allittii*.

Flowering Period: May /

Distribution and Habitat

L. sp. Kau Rock is widespread between Peak Eleanora and Israelite Bay, a range of over 300 km. It grows in brown sandy loam and in fine calcareous loam (marl) in woodland, open mallee and shrub communities. Associated genera include *Eucalyptus*, *Hakea* and *Banksia*.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Kau Rock,SE | Esp | Esp | NR | 29.3.83 | - | - |
| 2* | Clyde Hill,NW | Esp | Esp | VCL | 19.5.93 | 2 | Good |
| 3* | Clyde Hill,NW | Esp | Esp | VCL | 20.5.93 | 10+ | Good |
| 4* | Clyde Hill,NW | Esp | Esp | VCL | 20.5.93 | 20 | Good |
| 5* | Clyde Hill,NW | Esp | Esp | VCL | 20.5.93 | 2 | Good |
| 6* | Mt Heywood,NE | Esp | Esp | VCL | 21.5.93 | 50+ | Good |
| 7* | Sheoak Hill,N | Esp | Esp | VCL | 22.5.93 | 20+ | Good |
| 8* | Sheoak Hill,N | Esp | Esp | VCL | 22.5.93 | 10+ | Good |
| 9* | Mt Ridley,N | Esp | Esp | VCL | 22.5.93 | 1 | Good |
| 10* | Mt Ridley,N | Esp | Esp | VCL | 22.5.93 | 2 | Good |
| 11* | Mt Heywood,NW | Esp | Esp | VCL | 22.5.93 | 10+ | Good |
| 12* | Daringdella Lake | Esp | Esp | NR | 20.4.93 | 1 | Average |
| 13* | Gegelup | Esp | Esp | NR. | 21.4.93 | 10 | Good |
| 14* | Balladonia Rd | Esp | Esp | NP | 24.4.93 | 10+ | Good |
| 15* | Peak Eleanora,SW | Esp | Esp | VCL | 19.9.93 | 500+ | Good |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

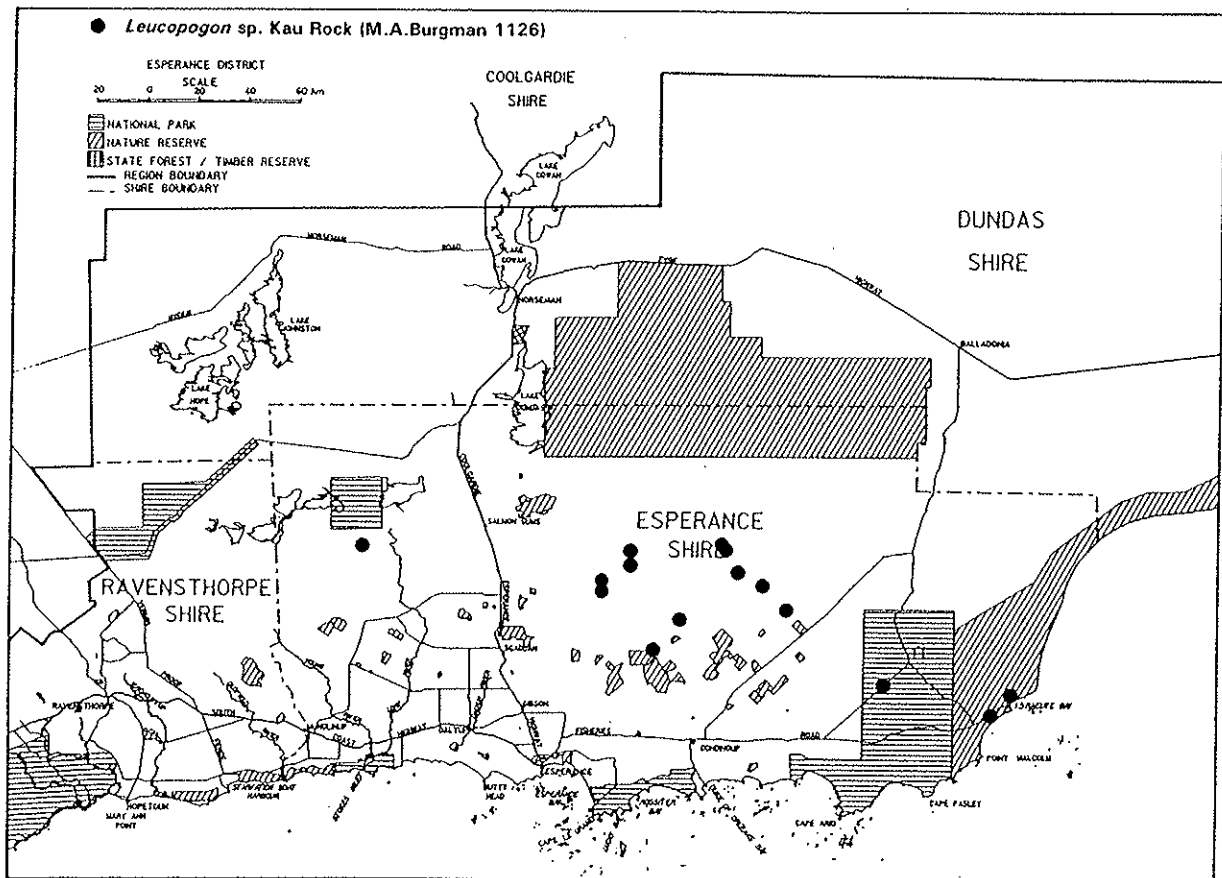
Unknown

Summary and Recommendations

Recent surveys have found *L. sp. Kau Rock* to be widespread and relatively common in areas north of those cleared for agriculture. Taxonomic classification is required.

References

Burgman (1985b).



***Leucopogon* sp. Mount Heywood (M.A.Burgman 1211)**

EPACRIDACEAE

[ex. *Leucopogon* sp. Cascades (M.A.Burgman 3700)]

A dense shrub, 40-50 cm tall and 70-90 cm wide. The numerous slender woody branches are sparsely covered with short hairs. Leaves are small, nearly circular (1-2 mm) and strongly curved backwards (recurved); the upper surface of the leaf is sparsely covered in minute glandular hairs, giving a rough texture. Flowers are cream-coloured; the calyx (3 mm) comprises more than half the length of the corolla tube (4-5 mm); the acute sepals are deeply divided and curl backwards at the tip.

Leucopogon sp. Mount Heywood has affinity to *L. hamulosus*.

Flowering Period: May

Distribution and Habitat

L. sp. Mount Heywood typically grows in white or yellow sand on the margins of saline lakes and depressions between Salmon Gums and Clyde Hill, with a known range of about 100 km.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Clyde Hill,NW | Esp | Esp | VCL | 4.5.83 | - | - |
| 2a* | Clyde Hill,NW | Esp | Esp | VCL | 20.5.93 | 100+ | Good |
| 2b* | Clyde Hill,NW | Esp | Esp | VCL | 20.5.93 | 500+ | Good |
| 3* | Mt Heywood,NNE | Esp | Esp | VCL | 20.5.93 | 100+ | Good |
| 4* | Sheoak Hill,N | Esp | Esp | VCL | 20.5.93 | 100+ | Good |
| 5* | Mt Ridley,N | Esp | Esp | VCL | 22.5.93 | 1 000+ | Good |
| 6* | Salmon Gums | Esp | Esp | NR | 18.11.93 | 100+ | Good |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

L. sp. Mount Heywood is a characteristic floral component of saline lakes and depressions in the Clyde Hill-Mt Ridley area. This area is not currently threatened by clearing for agriculture.

Burgman (1985b) may have listed two different taxa in his report as "*Leucopogon* aff. *hamulosus*". The specimen MAB 3700 is not represented in PERTH nor Burgman's field herbaria; a survey at the given locality found the superficially similar *L.* sp. Roberts Swamp (K.R. Newbey 8173). The specimen MAB 1211 is represented in Burgman's field herbarium; the phrase name *Leucopogon* sp. Mount Heywood has therefore been adopted.

Leucopogon sp. Munmlinup (K.R.Newbey 8123)

EPACRIDACEAE

An upright-spreading, mid-dense shrub, 40-80 cm tall and 30-80 cm broad. Old wood is slightly rough and dull, darkish grey, while newer wood is pale brown and densely covered in short, stiff hairs. Leaves are light green, alternate, ascending, narrow-obovate (3 mm long x 1 mm wide), and have margins that roll backwards (revolute). The lower surface of leaves have fine, parallel nerves that are covered with minute white hairs. Flowers and fruits have not been seen.

Flowering Period: Unknown

Distribution and Habitat

The only known location of this taxon is north of Munmlinup where it grows on an almost flat plain in well-drained, shallow sandy loams in *Eucalyptus redunca* open mallee. Associated species include *E. leptocalyx*, *E. uncinata*, *Grevillea pectinata*, *Melaleuca subfalcata*, *M. holosericea*, *Templetonia sulcata* and *Gahnia ancistrophylla*.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Munmlinup,N | Esp | Rav | - | 15.11.80 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible.

Summary and Recommendations

Currently, no specimen of *Leucopogon* sp. Munmlinup is lodged in the Western Australian Herbarium. Further collections are required to determine its taxonomic status. In 1992, a survey failed to relocate this taxon.

References

Newbey (1983).

An upright, mid-dense shrub, 30-35 cm tall and 20-25 cm broad, with numerous slender branchlets. Old wood is slightly rough and dull darkish grey, while newer wood is smooth and light grey. Leaves are dull green, small (2.0-2.5 x 1.5 mm), spreading, margins have scattered short hairs, and only the lower half of the leaves have the margins rolled backwards (revolute); the tip bends downwards (deflexed). The white flowers are clustered at the ends of branchlets; the calyx (2-2.5 mm) is more than half the length of the corolla and the acute sepals and bracteoles are covered in minute felt-like hairs. The globular fruits are flattened on top.

Flowering Period: September - October

Distribution and Habitat

Leucopogon sp. Roberts Swamp grows on a fossil alluvial flat on a tributary of the Lort River. The alluvium (sand over loamy clay) is not saline. It grows in open shrub mallee of *Eucalyptus angustissima* with tall shrubs of *Santalum acuminatum* and *Hakea adnata*. Other associated genera include *Acacia*, *Melaleuca* and *Restio*.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Fields Rd | Esp | Esp | VCL | 19.9.93 | 1 500+ | Good |
| 2* | Fields Rd | Esp | Esp | VCL | 20.9.93 | 2+ | Average |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible.

Summary and Recommendations

L. sp. Roberts Swamp is poorly known and possibly rare. The large population (no. 1) near Fields Road, north-east of Cascade, could possibly be threatened if more land was released for agriculture. Further action is required on the proposed vesting of Crown Land adjacent to the Lort River and Fields Road for the purpose of a conservation reserve (CALM 1991, Leighton and Watson 1992).

Further survey is required. Research is required to determine the response of this taxon to fire and to dieback (*Phytophthora* spp.).

References

Burgman (1985b), CALM (1991), Leighton and Watson (1992), Newbey (1983).

Leucopogon sp. South Coast (K.R.Newbey 8213)

EPACRIDACEAE

An upright, moderately open shrub, 45-50 cm tall and 40-50 cm broad with few secondary branches. Old wood is almost smooth, while newer wood is covered with short, dull red hairs. Leaves are dull darkish green, flat, alternate, elliptical (5-7 x 3 mm), have a short callous point and margins fringed with minute hairs. Leaves have conspicuous nerves on the lower surface. Leaf stalks are strap-like (1 mm). Inflorescences are terminal spikes of 5-7 flowers on a main stalk which is pale brown, slightly undulate and covered in short, stiff hairs. The white corolla tube (2.5-3.0 mm) is hairless with the narrow lobes curving backwards; the inner surface is bearded with white hairs. The ovary is smooth. Anthers have no appendages. Fruits are spherical (1.8 mm) with a persistent style.

Leucopogon sp. South Coast may be closely related to *L. bossiaea*.

Flowering Period: September - October

Fruiting Period: Late November - December

Distribution and Habitat

The only known location of *L.* sp. South Coast is north-east of Bonnie Hill where it grows on flat plain in calcareous, loamy sands amongst *Eucalyptus leptocalyx* mallee. Associated species include *E. incrassata*, *E. uncinata*, *Banksia media*, *Grevillea pectinata*, *Astartea ambigua*, *Lepidosperma brunonianum*, *Conostephium* sp. and *Gahnia ancistrophylla*.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|---------------|-------------|---------------|-----------|
| 1 | Bonnie Hill,NE | Esp | Esp | Shire Rd Res. | 16.11.93 | 13+ | Good |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible.

Summary and Recommendations

L. sp. South Coast is an inconspicuous species that is poorly known and possibly rare and threatened. The known locality is at the northern limit of agriculture in the Esperance District. In 1993, a survey relocated the known population by using Newbey's (1983) description. His specimen, KRN 8213 is not currently lodged in the Western Australian Herbarium. Taxonomic revision of *Leucopogon* in Western Australia is urgently required. Classification of the many undescribed species and sorting of the Western Australian Herbarium folders would remedy many of the problems encountered in searching for the poorly known *Leucopogon* species.

L. sp. South Coast is not known in any conservation reserve. Further survey is required.

References

Newbey (1983).

A diffuse shrub to 1-1.5 m tall. Leaves are opposite, shortly oblong (2-3 x 1.5 mm), thick, glandular, stalkless and have an obtuse tip. The white or straw-coloured flowers are borne singly or in lateral clusters on old wood. Staminal bundles are less than 1 cm long, each claw having 14-20 filaments. Petals are erect, about 5 mm long and have an acute apex. Calyx lobes are ovate to orbicular. The ovary has 3 locules and a long style. Fruits (5 mm diameter) are slightly immersed in the old wood and have 5 triangular-shaped, obtuse lobes.

Flowering Period: September - November

Distribution and Habitat

Melaleuca agathosmoides is known from two localities. The largest population occurs within a 5 km radius of Hatter Hill, while another collection has been made approximately 40 km to the west, near Lake King. It grows in gravelly, red clay loam and may form dense stands beneath open eucalyptus woodland.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|--------------------|-------------|---------------|------------|
| 1a | Hatter Hill,NE | Esp | Rav | VCL (Mining Lease) | 27.10.92 | 200+ | Part-dist. |
| 1b | Hatter Hill,NW | Esp | Rav | VCL (Mining Lease) | 27.10.92 | 500+ | Part-dist. |
| 1c | Hatter Hill,S | Esp | Rav | VCL (Mining Lease) | 27.10.92 | 50+ | Disturbed |
| 1d | Hatter Hill,SE | Esp | Rav | VCL (Mining Lease) | 22.3.91 | 100 000+ | Part-dist. |
| 2 | Lake King,NE | Kat | LG | - | 1.10.80 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

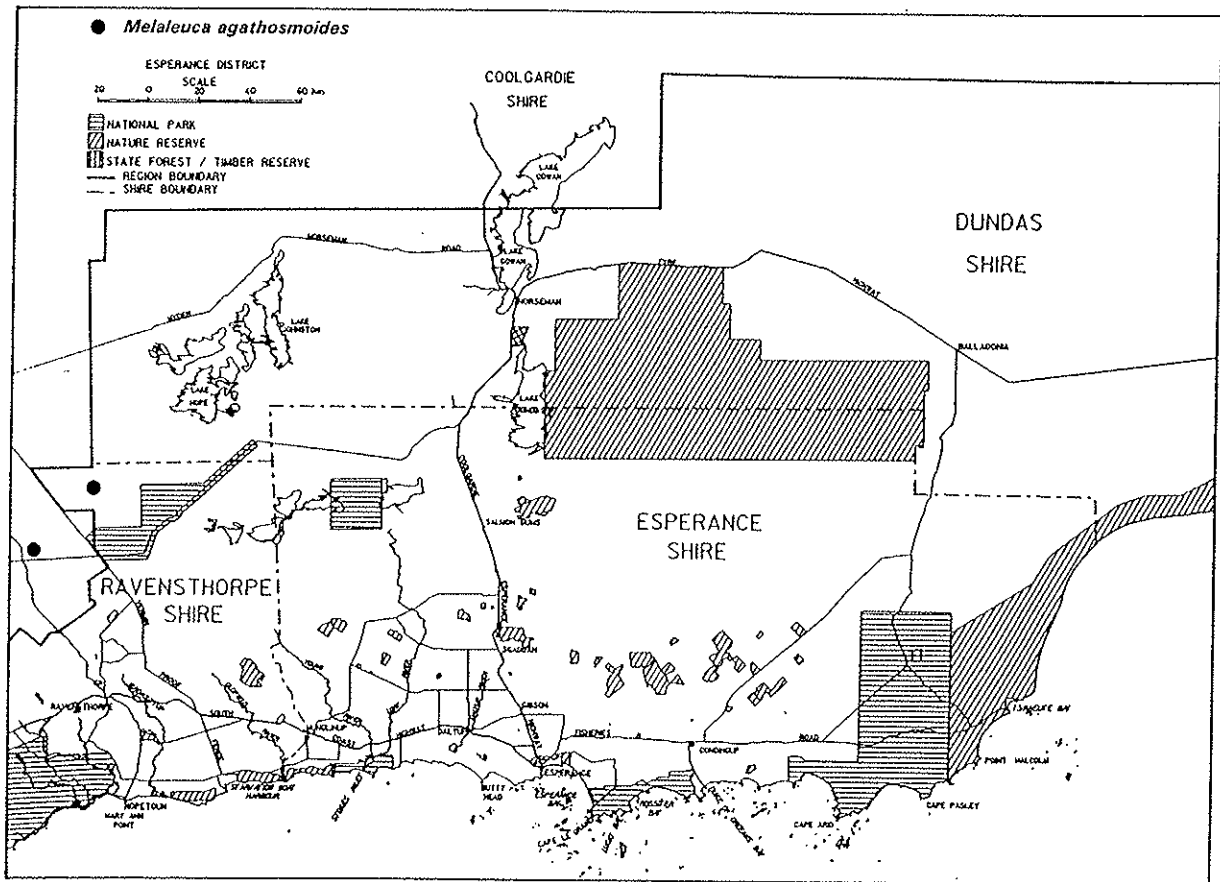
Summary and Recommendations

M. agathosmoides is geographically restricted but locally abundant at Hatter Hill. Sub-populations nos. 1a, 1b and 1c have been partially disturbed by mining activities; sub-population no. 1d has been covered by a tenement (P. Armstrong, personal communication; F. Mollemans, personal communication; R. Thomas, personal communication). Currently, mining operations have ceased in the area, however it is anticipated that the area will continue to attract considerable interest. Consequently, these populations could be under threat if mining activity were expanded. Monitoring is therefore required to ensure that this species does not become further threatened in the Hatter Hill area.

The population near Lake King needs to be resurveyed to determine its size and status. Further survey is required.

References

Blackall and Grieve (1980), Gardner (1939a).



Melaleuca calycina subsp. *dempta* Barlow

MYRTACEAE

A dense, upright shrub, 1.5-2.5 m tall. Leaves are broadly ovate (4-6 x 3-5 mm), opposite, thick, faintly glandular-dotted and have an obtuse apex. The white flower heads are globular with 1 to 3 borne at the ends of branches. Staminal bundles are less than 1 cm long; the calyx tube and lobes are covered with white, silky hairs. Bracts are numerous, overlapping, silky-hairy and brown.

This subspecies has fruit with very short lobes or an entire rim, whereas subsp. *calycina* has five long, acute protuberances spreading from the rim. Subsp. *dempta* is also distinguished by the obtuse apex of the leaf, whereas the apex is acute in subsp. *calycina*.

Flowering Period: August - September

Distribution and Habitat

Melaleuca calycina subsp. *dempta* is known from only two localities, 5 km apart, east of Scaddan. This taxon occurs near the middle of the range of *M. calycina* subsp. *calycina*. It grows in clay in winter-wet depressions.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------|----------|-------|---------------|-------------|---------------|-----------|
| 1 | Scaddan,E | Esp | Esp | Shire Rd Res. | 24.9.92 | 1 000+ | Good |
| 2* | Scaddan,E | Esp | Esp | Shire Rd Res. | 24.9.92 | 50 | Fair |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

M. calycina subsp. *dempta* is not known to occur in any conservation reserve. Both the known populations on Scaddan Road are threatened, population no. 1 by any road realignment and possibly by increased waterlogging caused by poor drainage, and population no. 2 by road maintenance. Road markers are recommended for both populations. Further survey to accurately determine the conservation status of this taxon is urgently required.

References

Barlow and Cowley (1988), Blackall and Grieve (1980).

Melaleuca coccinea subsp. *eximia* Cowley

MYRTACEAE

An openly-branched shrub, 2-3 m tall, which is covered in soft matted hairs on all parts, except the older leaves which lose their hairs. Leaves are very narrowly triangular (8-20 x 1-2 mm). The dark red inflorescence is a spike of 22-38 flowers on an axis 40-85 mm long with a stalk (2-5 mm). The broadly ovate bracts (13 x 1 mm) and the 2 elliptic bracteoles (3 x 2 mm) sometimes persist to anthesis. The calyx tube is barrel-shaped and hairy. Sepals are broadly ovate (1.5-2 mm) and persist to fruit maturity. There are 9-18 red stamens (11-26 mm, including claw 7-10 mm) per bundle. The fruit is compressed barrel-shaped (3 x 4-7 mm), papery in texture and has the valves deeply recessed below the aperture.

Flowering Period: October - December

Distribution and Habitat

Melaleuca coccinea subsp. *eximia* is known from the Wittenoom Hills Nature Reserve and about 30 km to the south-east near Coolinup Road. It grows in light brown sandy soils associated with granite outcrops in scrub with *Eucalyptus forrestiana* and *Calothamnus quadrifidus*.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1a | Wittenoom Hill | Esp | Esp | NR | 10.11.91 | - | - |
| 1b | Mt Burdett | Esp | Esp | NR | 26.11.85 | - | - |
| 2 | Coolinup Rd | Esp | Esp | ?Private | 15.12.88 | Numerous | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

M. coccinea subsp. *eximia* appears to be very geographically restricted. It occurs in the Wittenoom Hills Nature Reserve where it should remain secure. Further survey is required.

References

Cowley *et al.* (1990).

Mesomelaena sp. *Munglinup* (M.A.Burgman 3898)

CYPERACEAE

A small, inconspicuous, tufted sedge, 6 cm tall and 5 cm diameter. Spikelets are 1-2 flowered in a lateral head, 2-3 mm long.

Flowering Period: September - October

Distribution and Habitat

Mesomelaena sp. *Munglinup* has been collected west of Cascades and near "Bitterwater Swamp" which is possibly near the Warburton Ranges in the Victoria Desert. Near Cascade it grows on sandplain in very open shrub mallee and heath.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-------------------|----------|-------|----------------|-------------|---------------|-----------|
| 1a | West Point Rd | Esp | Rav | ?Shire Rd Res. | 29.9.84 | - | - |
| 1b | West Point Rd | Esp | Rav | ?VCL | 29.9.84 | - | - |
| 2 | Bitterwater Swamp | - | - | - | 10.73 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

Mesomelaena sp. *Munglinup* was searched for at both locations on West Point Rd in September 1992, but was not located. Instead, this taxon was confused with *Schoenus nanus* and *S. subflavus*, both of which are present at these sites. Burgman (1985b) describes this taxon "may be more widespread and common than [his] collections indicate". Further survey is required.

References

Burgman (1985b).

***Microcybe* sp. Hatter Hill (K.R.Newbey 6546)**

RUTACEAE

A spreading, moderately dense, woody shrub, 50-70 cm tall and 40-50 cm wide. Leaves are linear (10 mm) with the edges of the leaves rolled backwards towards the midrib (revolute). Flowers are without stalks and borne in terminal heads, with the upper leaves exceeding the head. Each flower has 5 petals, 10 free stamens and a distinct calyx which is shorter than the petals.

This taxon has affinity to *Microcybe pauciflora*.

Flowering Period: November

Distribution and Habitat

Microcybe sp. Hatter Hill is known only from the Hatter Hill area, where it occurs on a small kaolinitic breakaway in well-drained loam.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-------------|----------|-------|---------------------|-------------|---------------|-----------|
| 1a | Hatter Hill | Esp | Rav | ?VCL (Mining Lease) | 14.11.79 | - | - |
| 1b | Hatter Hill | Esp | Rav | ?VCL (Mining Lease) | 16.9.89 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

M. sp. Hatter Hill appears to have a very restricted distribution. Hatter Hill has various mining tenements covering the area. The two collections lodged in the Western Australian Herbarium have only vague locality information. Further survey is required.

An upright, spreading shrub, 0.3-1.0 m tall and 0.4-0.5 m wide. Leaves are linear (10-15 mm) with the margins rolled backwards towards the midrib (revolute) and the tip has a short, sharp point. The flowers, which are borne in dense terminal heads, are deep golden yellow with reddish centres and have a large circular upright petal. The calyx is silky-hairy, with the posterior lobes united for half their length. The ovary and pod have 2 ovules which occur in 2 separate cells.

Flowering Period: October - January

Distribution and Habitat

Mirbelia densiflora is distributed over 150 km between Young River and Newdegate, but is most frequent in the area between Hatter Hill and Frank Hann National Park. It grows on small breakaways in stony loam and on gently undulating plains in well-drained loamy sand; in open woodlands, *Eucalyptus redunca* open shrublands and heaths.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|--------------------|-------------|---------------|-----------|
| 1 | Young River | Esp | Esp | - | 1.36 | - | - |
| 2a* | Hatter Hill,N | Esp | Rav | VCL | 27.10.92 | 60+ | Healthy |
| 2b* | Hatter Hill,N | Esp | Rav | VCL | 27.10.92 | 100+ | Healthy |
| 2c | Hatter Hill | Esp | Rav | VCL (Mining Lease) | 27.10.92 | 500+ | Healthy |
| 3* | Mt Gibbs,W | Esp | Rav | VCL | 27.10.92 | 10+ | Healthy |
| 4 | Frank Hann | Esp | Rav | NP | 28.10.92 | 10+ | Healthy |
| 5 | Newdegate | Kat | LG | - | 12.10.65 | - | - |

* = new population / sub-population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

M. densiflora is found in a variety of habitats with the largest known populations occurring near Hatter Hill. At least one population occurs in the Frank Hann National Park. Further survey is required.

References

Gardner (1942).

A shrub, 1 m tall. Leaves are narrow-lanceolate (15-65 x 6-10 mm) and covered in short, felt-like hairs. Stems are covered in short, white hairs. Flowers are small, regular and white with prominent purple spots at base of the lobes and the upper section of the short, straight tube. The flowers are borne on stalks (2-3 mm) with 1-4 clustered in the axils of leaves.

Flowering Period: September

Fruiting Period: February

Distribution and Habitat

Myoporum velutinum ms is known from two localities less than 25 km apart, south of Condingup. It grows in damp, slightly saline, brown loamy sand on the margins of creeks.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Munglignup Creek | Esp | Esp | Private | 29.9.86 | Common | - |
| 2 | Mt Hawes, SE | Esp | Esp | NP | 14.2.89 | 1 | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

M. velutinum ms may be threatened in the future by increased salinity levels and waterlogging, as a result of land clearing in the catchment area where this species is known to grow. Further survey is required, especially along drainage lines in the Cape Le Grand National Park. Collection of germ-plasm/seed material is recommended.

Otton rigidum Crisp ms

PAPILIONACEAE

[ex. *Aotus* sp. Dundas (M.A.Burgman 2835)]

A shrub, 0.5-0.8 m tall and 0.4-0.9 wide, with rigid, straight branchlets that are covered in minute, tightly curled hairs and are frequently spinescent. The scattered leaves are widely spreading, stalked (0.5 mm), narrow-oblong (1.5-10 x 0.8-1.5 mm), thick, obtuse at the apex, and covered in minute hairs when young and on the lower side only when older; margins are tightly rolled backwards towards the midrib (revolute) creating a groove on the underside. Single flowers are borne in the upper leaf axils on shortly-hairy stalks (1.5-4 mm); the calyx (5 mm) is covered in short hairs and has 5 lobes which are about half the length of the calyx, the upper 2 lobes are united for approximately half their length. The large, upright, broad-ovate standard (9.5 x 8.5 mm) is notched at the summit and yellow on the upper surface and red beneath; the wings are yellow and the keel deep red. The ovary is covered with long, white hairs. The pod is almost globular (7 x 5 mm) and covered with both long white and short curly hairs.

Otton rigidum ms is closely related to *O. microphyllum* (ex. *Oxylobium microphyllum*) which mostly occurs in the Ravensthorpe-Hopetoun area and has more slender, non-spinescent branchlets and usually smaller leaves (1-5 x 0.6-2 mm).

Flowering Period: October - December

Distribution and Habitat

O. rigidum ms occurs between Peak Eleanora and Mt Heywood, a range of 140 km. It grows on sandy flats, sometimes near watercourses or salt lakes, in open mallee and shrub communities.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Mt Heywood,NE | Esp | Esp | VCL | 10.70 | - | - |
| 2 | Salmon Gums,ENE | Esp | Esp | NR | 18.11.93 | 10+ | Good |
| 3* | Salmon Gums | Esp | Esp | NR | 18.11.93 | 1 000+ | Good |
| 4 | Salmon Gums,S | Esp | Esp | - | 14.10.31 | - | - |
| 5 | Grass Patch,E | Esp | Esp | - | 19.10.82 | - | - |
| 6 | Peak Charles,SSW | Esp | Esp | NP | 11.11.79 | - | - |
| 7 | Peak Eleanora,S | Esp | Esp | VCL | 2.10.83 | - | - |
| 8 | ?Kumarl,W | Esp | Esp | VCL | 5.10.85 | - | - |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

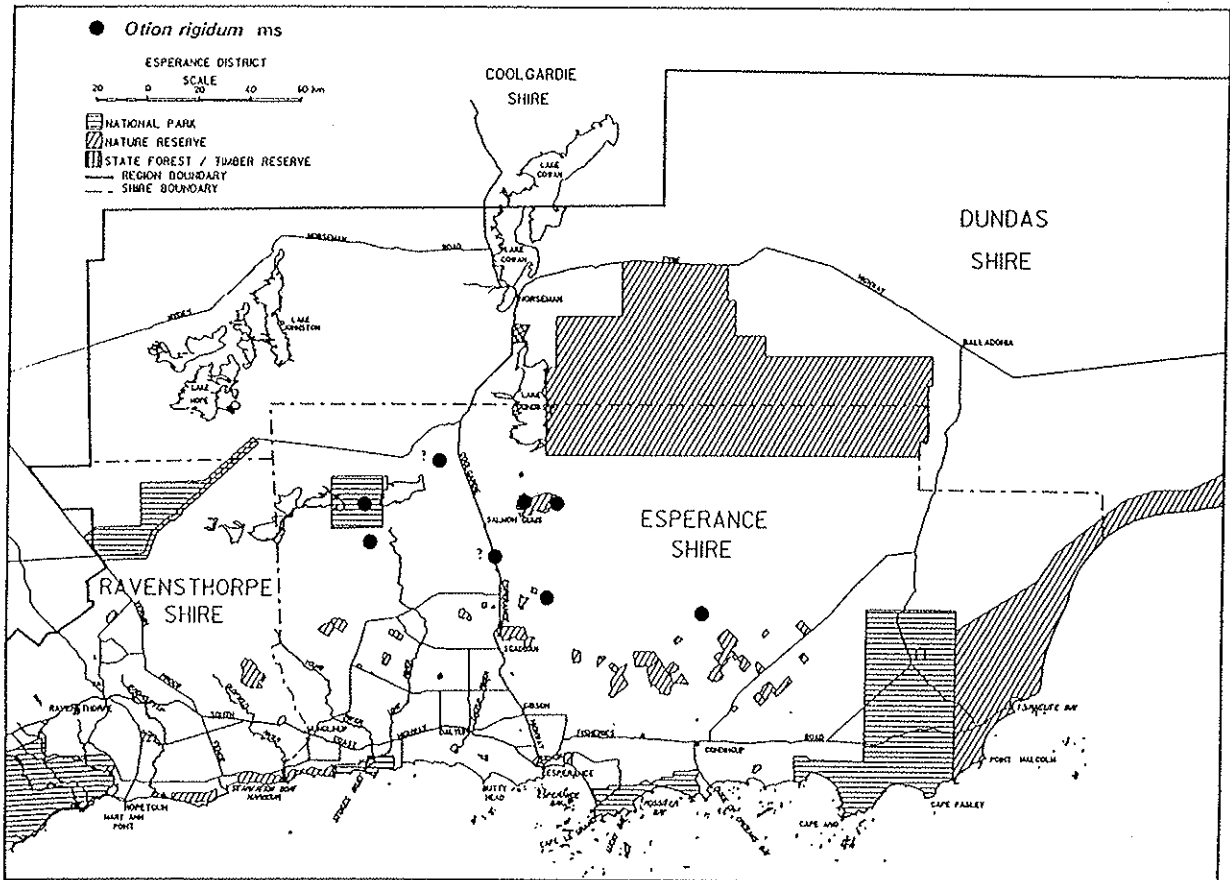
Unknown

Summary and Recommendations

O. rigidum ms is the type of a new genus being described by M. Crisp (personal communication). Recent taxonomic work has found this taxon to be reasonably widespread and not as rare and vulnerable as originally believed by Burgman (1985b). It is known to occur in the Salmon Gums Nature Reserve and Peak Charles National Park. Further opportunistic survey is required.

References

Burgman (1985b).



An erect, spreading shrub, 0.5-0.9 m tall, with many stems branching from the base. Young branchlets are moderately hairy when young, but the hairs disappear with age. The alternate, crowded leaves are small, spoon-shaped (5-11 x 2-4 mm), obtuse at the tip, twisted at the base, flat, and without hairs. Flowers are yellow-green in colour, narrow-oblong (8 x 1.5 mm) and borne on stalks (2-3 mm). The fleshy stonefruit is ellipsoid (8-11 x 5 mm) and smooth.

This species is a distinctive one, not closely resembling any other *Persoonia*.

Flowering Period: November - December

Distribution and Habitat

Persoonia baeckeoides is known from only two localities, north-east and north-west of Peak Charles, where it grows in yellow sandy loam over laterite in heath.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Peak Charles,NW | Esp | Esp | VCL | 5.12.80 | - | - |
| 2 | Peak Charles,NE | Esp | Esp | VCL | 10.66 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

The general vicinity of the known population was burnt in patches by fire in January 1991. Further survey is required to determine the size and extent of these remote populations, and to determine whether further populations exist.

An erect, multi-branched shrub, to 1.5 m tall. Leaves are thick, linear (20 x 1-1.5 mm), narrowing slightly towards the base and rounded at the apex. Solitary, regular, white flowers are borne on stalks in the leaf axils. Flowers have a distinct calyx, 5 petals, 10 free stamens which have shiny stalks, and an ovary which is also shiny. Seed is bluntly ellipsoidal (3 mm long), smooth and dark brown.

Flowering Period: April - May, October - December

Distribution and Habitat

Phebalium rude subsp. *lineare* is known only from Mt Ragged, north-west of Israelite Bay. It grows in skeletal soil on exposed slopes and in valleys amongst quartzite rocks.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Mt Ragged | Esp | Esp | NP | 23.4.93 | 1 000+ | Good |

Response to Disturbance

Two years after a hot burn on Mt Ragged (February 1991), this taxon had resprouted, with numerous stems (40-50 cm tall) from the base of plants, and was flowering.

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

P. rude subsp. *lineare* is very geographically restricted and possibly rare. Frequent fires in the Mt Ragged area may be a problem for this taxon. Further survey is required.

P. rude subsp. *lineare* occurs in the Cape Arid National Park.

References

Wilson (1970).

An erect, hairy, annual herb, to 20 cm tall. The basal leaves are broad towards the tip (egg-shaped), to 7 cm long, with margins that are toothed or entire. Stem leaves are narrower, to 4 cm long, and shallowly lobed to entire. The oldest flowers are at the edge of the elongating head of flowers. Flowers are white or yellow, with sepals 2-4 mm long and petals 3-7 mm long; the style is exerted beyond the petals. The dry fruit (<1 cm) is composed of 2 carpels separated by a partition, each valve has warty protuberances with hairs on its base; fruit stalks (<1 cm) are stout and spreading.

Flowering Period: Unknown

Distribution and Habitat

Phlegmatospermum richardsii occurs on the Nullarbor Plain from Eucla to Fowler's Bay in South Australia.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Eucla | Esp | Dund | - | 9.1879 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

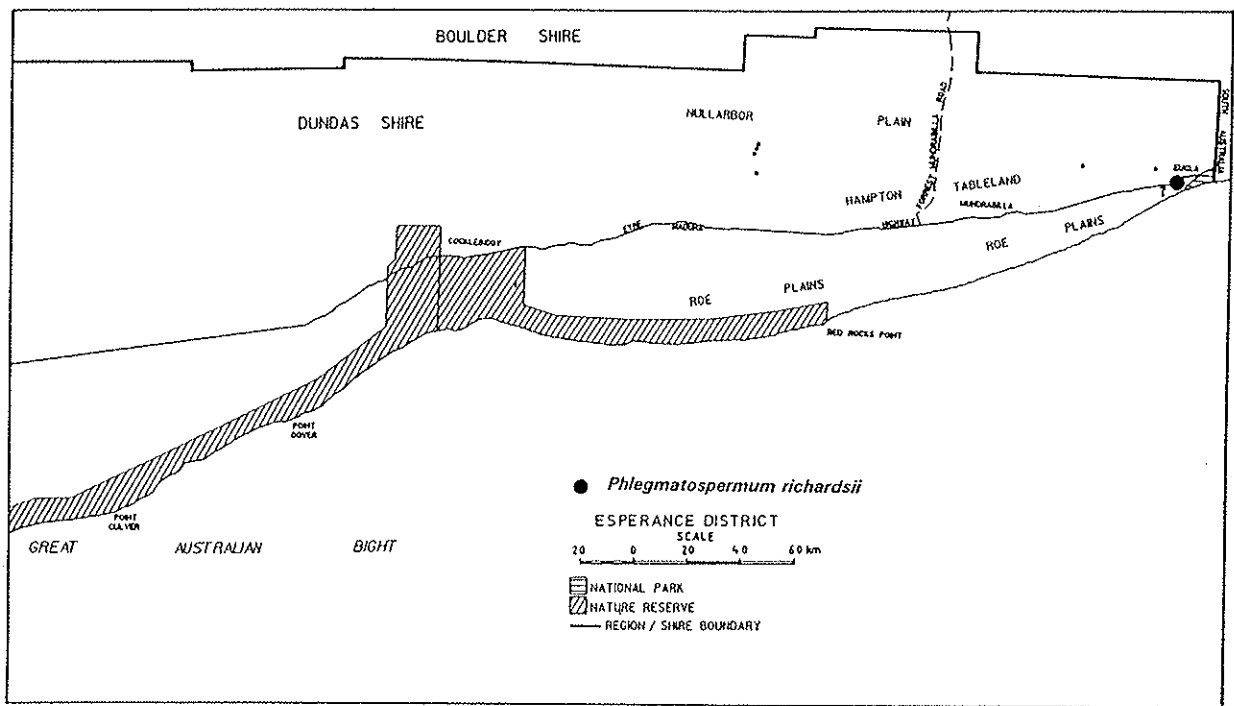
Unknown

Summary and Recommendations

P. richardsii is a poorly known species which has not been collected for 100 years. Specimens are lodged in the Adelaide and Melbourne Herbaria, but not in Perth. No specific localities are known for this species, however it appears to be mainly distributed in South Australia rather than Western Australia. Further survey is required; liaison with the Adelaide Herbarium is recommended.

References

Hewson (1982).



An undershrub, 1.5-15 cm tall, which often has the main stem buried, giving rise to a number of main branches appearing at ground level and forming a cushion. Leaves are alternate, hairless, elliptic (0.4-3.2 x 0.4-1.5 mm) and green to bluish-green. Flower heads are terminal and compact, with 4-20 pink flowers per head. Sepals are white to cream. Flower stalks are hairy. The floral tubes of male flowers are 2-2.5 mm long, while those of females are 1.5-1.7 mm long, both are densely hairy on the outside. Seed (2 x 1 mm) has faint longitudinal markings.

Pimelea halophila is related to *P. serpyllifolia* but differs in the alternate and smaller leaves, in being densely hairy on the outside of the flowers and in the shiny ovary of the female flowers.

Flowering Period: August - October

Distribution and Habitat

P. halophila is known from only two localities, east of Salmon Gums and over 200 km to the west at Lake King. It grows on slightly elevated ridges and islands of aeolian sand in or along the margins of salt lakes, in very low open shrubland.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-------------|----------|-------|-------------------|-------------|---------------|-----------|
| 1 | Lake King | Kat | LG | NR (Mining Lease) | 1.9.89 | 100+ | Good |
| 2 | Salmon Gums | Esp | Esp | NR | 16.9.88 | 300 | Healthy |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

The Lake King population has been subject of mining for gypsum in at least one area (A. Wilson, personal communication). Further survey of salt lakes between Salmon Gums and Lake King is required.

P. halophila occurs in two Nature Reserves.

References

Rye (1988).

An erect or straggling shrub to 60 cm tall, with male and female flowers on separate plants. Leaves are opposite, green, narrow but broader towards the tip (obovate, 2.5-11.5 x 0.8-2.5 mm) and lack hairs. Flowering branchlets occur in the uppermost leaf axils and have minute reddish bracts at the base. The 2 or 4 involucre bracts are leaf-like. Inflorescences consist of 5-21 cream flowers which are densely hairy outside, but lack hairs inside the tube; sepals are hairy on both sides. Male flowers have a tube (2-3 mm) that expands from 0.5 mm diameter at the middle to 1 mm at the summit; the anthers are virtually without stalks. Female flowers have a tube (1.5 x 1 mm) which scarcely continues above the ovary; the ovary has an apical tuft of hairs; the stigma is somewhat brush-like.

Flowering Period: June - July

Distribution and Habitat

Pimelea pelinos is known from only one locality east of Scaddan. It grows in grey sandy clay on low ridges between salt lakes, in shrubland.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Scaddan,E | Esp | Esp | ?VCL | 10.6.88 | 200 | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

P. pelinos appears to be geographically restricted and is not known to occur in any conservation reserve. Further survey of salt lakes south of Scaddan Road is recommended. According to Annette Wilson (personal communication), *P. pelinos* does not occur around salt lakes immediately north of Scaddan Road which have a gypsum rather than a clay substrate.

References

Rye (1989).

***Pultenaea* sp. Mt Beaumont (K.R.Newbey 7928)**

PAPILIONACEAE

A moderately open, spreading shrub, 30-40 cm tall and 18-20 cm wide, divided just above ground level into 4-5 branches which have only sparse secondary branching. Young branches are covered in short, soft hairs. Leaves are linear (5-8 x 0.8 mm), curved backwards slightly, have margins that are rolled backwards towards the midrib (revolute), and an apex with a fine, spiny tip. There is a small appendage (stipule) at the base of the leaf stalk which is narrow-triangular (5 x 1 mm), dark brown and hairy along the margins. Leafy flower heads occur at the ends of branches. The relatively small flowers are borne on short, hairy stalks. The calyx (5 x 3.5 mm) is covered with short, soft hairs; the 2 upper lobes are not united. Petals are brownish-red and yellow.

Flowering Period: November - December

Distribution and Habitat

This taxon is known from only one locality, south-east of Mt Beaumont. It grows in well-drained shallow sand over clay on a flat plain, in mixed open *Eucalyptus* shrub mallee.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|----------------|-------------|---------------|-----------|
| 1 | Mt Beaumont,SE | Esp | Esp | ?Shire Rd Res. | 10.11.1980 | Rare | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

Search for this taxon in October 1992 failed to relocate the known population. Further intensive survey of the area is required.

References

Newbey (1983).

***Rulingia tratmannii* C.R.P.Andrews**

STERCULIACEAE

= ?*Rulingia craurophylla* F.Muell.

A shrub, 0.5-1.2 m tall, with slender branches, covered when young with grey, velvety, short matted hairs which disappear as the plant matures. Leaves are linear to linear-lanceolate (20-25 x 3-6 mm), stalkless, have a rounded apex, margins that are cut into rounded teeth and curve backwards towards the midrib (revolute); both sides of the leaves are covered with star-shaped hairs. Flowers are in loose heads, borne on long, branching stalks (10-20 mm) in the axils of leaves. The calyx is covered with short matted hairs, especially at the base, and the upper part is prominently angled. Petals are expanded into lateral lobes at the base, the ligula are very narrow and 3-nerved. The ovary is without hairs. Styles are free, but the stigmas are more or less coherent.

Flowering Period: September - October

Taxonomy

This taxon appears to have been described twice, originally as *Rulingia craurophylla* by F. Mueller (1875), and later as *Rulingia tratmannii* by C.R.P. Andrews (1904) from a specimen collected near Dundas in 1903.

A note on the folder in the New South Wales Herbarium states "These species are regarded as synonyms in Blackall and Grieve 'How to Know Western Australian Wildflowers Part II'. There is no mention of *R. coacta* S.Moore which is possibly also synonymous although Gardner in his Enumerator lists both *R. coacta* and *R. tratmannii*. I am inclined to unite material bearing these 3 names under the earliest *R. craurophylla* until further evidence comes up." (Anon.)

Conservation Status

Current: Priority I

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

Inspection of the type specimens would elucidate the identity of these species. Their current locality is unknown.

References

Andrews (1904), Mueller (1875).

Scaevola sp. Swallow Rock (K.R.Newbey 9677)

GOODENIACEAE

A dense, cushion-like shrub, 1-3 cm tall and 20-35 cm wide, which divides at ground level into numerous, radiating branches pressed closely to the ground. The soft leaves (3-5 x 2 mm) are covered in long white hairs and are crowded at the ends of branches. Cream-coloured flowers are borne in the axils of leaves where they are partly hidden by foliage. The corolla tube and lobes are covered with long, white hairs.

The only other cushion-like *Scaevola* occurring in the same range is *S. pulvinaris* which can be distinguished by its hairless leaves. *S. sp.* Swallow Rock appears to have some affinity with *S. arenaria*.

Flowering Period: November - December

Distribution and Habitat

This taxon is known only from an area near Swallow Rock, 45 km east of Lake King. It is common in patches on the margins of minor, freshwater drainage lines on a flat sandplain, in a low shrub complex.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Swallow Rock | Esp | Rav | VCL | 22.11.82 | Common | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

S. sp. Swallow Rock is very poorly known and possibly geographically restricted. It not known to occur in any conservation reserve. Fresh flowering material is required for taxonomic work. Further survey is required.

References

Newbey (1983).

A moderately dense, rigid undershrub, 10-25 cm tall and 5-15 cm wide. Young branches are light brown and covered with fine hairs which disappear with age. Leaves are very small (1.0-1.3 x 1 mm) and thick, with the margins rolled backwards towards the midrib (revolute), giving the leaf an inflated appearance. The upper surface of the leaf is shiny, hairless and green, while the lower surface is cream-coloured caused by the covering of fine, matted hairs. The creamy-grey flowers are usually in pairs (or single), small (<2 mm) and without stalks.

Spyridium minutum is similar to *S. cordatum*, but can be distinguished by the flowers being single or in pairs, whereas *S. cordatum* has numerous flowers per cluster.

Flowering Period: March, May, September

Distribution and Habitat

S. minutum is widespread between the Young River and Clyde Hill extending northwards to near Salmon Gums, a range of 200 km. It prefers sandy clay loams on undulating plain, in *Eucalyptus* mallee/woodland and myrtaceous scrub.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|---------------|-------------|---------------|-----------|
| 1 | Dowak | Esp | Esp | NR | 20.11.92 | 12+ | Good |
| 2 | 529 ml peg | Esp | Dund | MRWA Rd Res. | 15.5.68 | - | - |
| 3 | Mt Beaumont,SE | Esp | Esp | Shire Rd Res. | 10.10.92 | 1 000+ | Good |
| 4 | West Point Rd | Esp | Esp | Shire Rd Res. | 9.84 | - | - |
| 5* | Cascades Rd | Esp | Esp | Shire Rd Res. | 11.9.92 | 5+ | Good |
| 6* | Griffiths Rd | Esp | Esp | NR | 12.9.92 | 10 000+ | Good |
| | | | | Shire Rd Res. | 12.9.92 | 1 000+ | Good |
| 7* | Rollond Rd | Esp | Esp | Shire Rd Res. | 12.9.92 | 2 000+ | Good |
| 8* | Rollond Rd | Esp | Esp | NR | 12.9.92 | <10 | Good |
| 9* | Rollond Rd | Esp | Esp | NR | 12.9.92 | <10 | Good |
| 10* | Rollond Rd | Esp | Esp | Shire Rd Res. | 12.9.92 | 5+ | Good |
| 11* | Rollond Rd | Esp | Esp | Shire Rd Res. | 12.9.92 | 5+ | Good |
| 12* | Fields Rd | Esp | Esp | Shire Rd Res. | 12.9.92 | Occasional | Good |
| 13* | Fields Rd | Esp | Esp | Shire Rd Res. | 12.9.92 | 60+ | Disturbed |
| 14* | Fields Rd | Esp | Esp | Shire Rd Res. | 12.9.92 | 10+ | Good |
| 15a* | Griggs Rd | Esp | Esp | Shire Rd Res. | 14.9.92 | 1 000+ | Good |
| 15b* | Fields Rd | Esp | Esp | NR | 14.9.92 | 50+ | Good |
| 16* | Grass Patch,W | Esp | Esp | Shire Rd Res. | 24.9.92 | 10+ | Good |
| 17* | Clyde Hill,NW | Esp | Esp | VCL | 20.5.93 | 1 | Good |
| 18* | Clyde Hill,NW | Esp | Esp | VCL | 20.5.93 | Occasional | Good |
| 19* | Clyde Hill,NW | Esp | Esp | VCL | 20.5.93 | 20+ | Post-fire |
| 20* | Mt Heywood,NE | Esp | Esp | VCL | 21.5.93 | 5+ | Good |
| 21* | Mt Heywood,WNW | Esp | Esp | VCL | 22.5.93 | 20+ | Good |
| 22* | Mt Heywood,NW | Esp | Esp | VCL | 22.5.93 | 10+ | Good |
| 23* | Mt Ridley,NW | Esp | Esp | VCL | 23.5.93 | 5+ | Good |
| 24* | Parmango Rd | Esp | Esp | Shire Rd Res. | 14.11.93 | 50+ | Good |
| 25* | Grass Patch | Esp | Esp | ?Rail Res. | 17.11.92 | 3 | Good |

Known Populations (cont'd)

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|---------------|-------------|---------------|-----------|
| 26* | Salmon Gums, W | Esp | Esp | Shire Rd Res. | 17.11.92 | Frequent | Good |
| 27* | Fields Rd | Esp | Esp | VCL | 19.9.93 | 20+ | Good |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

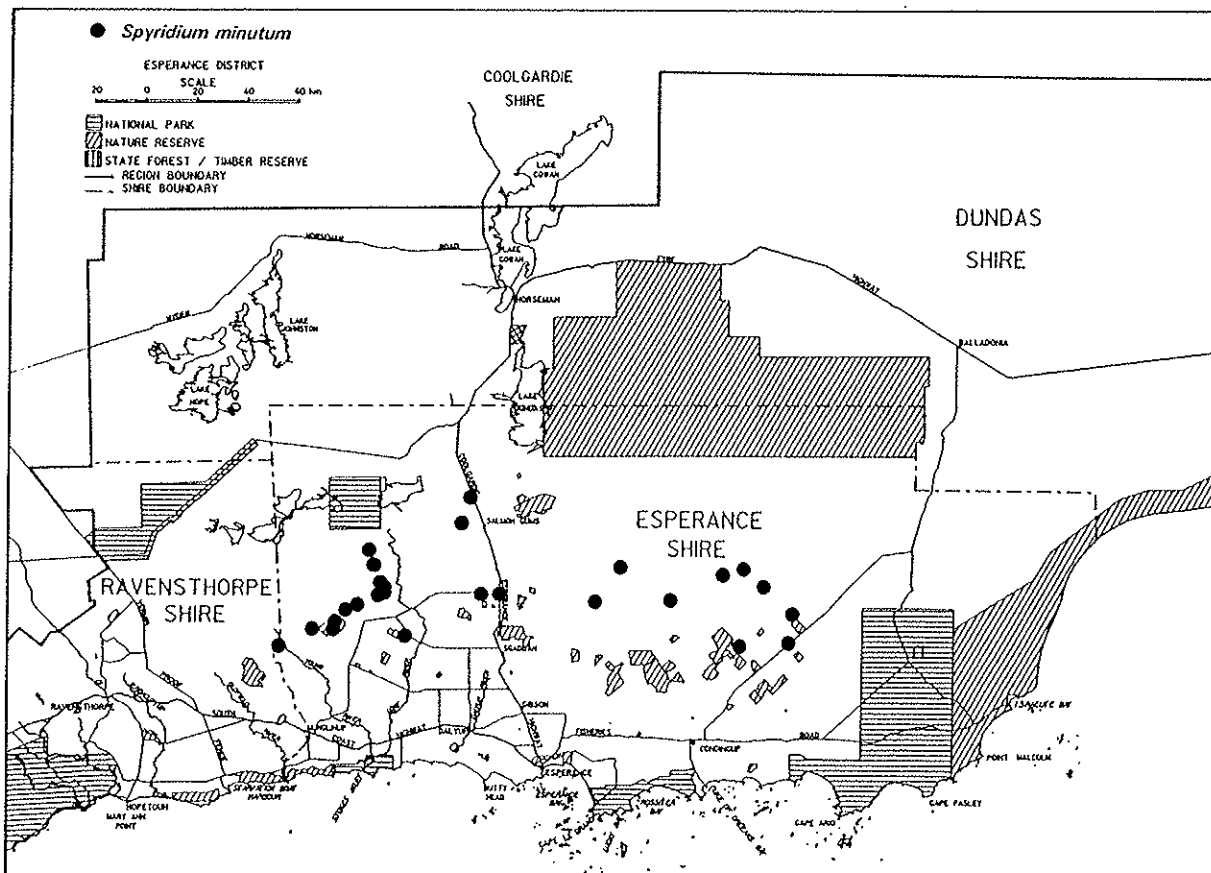
Summary and Recommendations

S. minutum was originally thought to be rare (Newbey 1983) and endangered (Burgman 1985b). Recent surveys have shown this inconspicuous species to be relatively common. Two localities of Burgman (1985b) on West Point Road were revisited and found to be the closely related *S. cordatum*.

S. minutum grows in at least four Nature Reserves.

References

Burgman (1985b), Newbey (1983).



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

EUPHORBIACEAE

A low spreading, becoming rounded, dense shrub, 15-18 cm tall and 20-30 cm wide. Stems are contorted and woody with grey rough flaky bark; young stems are ridged and bright light brown. Leaves are alternate, keeled (ridged like the bottom of a boat) with a prominent midrib underneath, narrow but broader towards the tip (5-7 x 1-2 mm) which has a hard, sharp point. There are 2 narrow-triangular bracts (stipules, 1.8 mm), at the base of each leaf. The almost pendulous, deep maroon flower heads are at the ends of branches; 3-4 male flowers surround 2 central female flowers. Male flowers have 3 outer bracts (2-4 x 1.5-2.5 mm) which are glossy black-grey with a reddish margin, the inner 3 bracts (7 x 1.4 mm) are dull black; there are 70-80 globular anthers crowded on the grey-black column (2 mm). Female flowers are tubular (2 mm) with 2 pale brown outer bracts and 4 leaf-like inner bracts; the ovary is angular, bright green with a 2-3 lobed style. Fruits (7 x 3.5 mm) are finely ridged and bright green.

Flowering Period: September - October

Distribution and Habitat

Stachystemon sp. Mt Baring is known from only two localities, near Mt Baring and over 250 km to the west near Bandalup Hill. It grows in deep white sands on a flat plain in *Eucalyptus tetraptera* mallee and on a breakaway of lateritized spongolite with *E. lehmannii* and *Banksia lemmaniana*. Associated species include *Phymatocarpus maxwellii*, *Astartea ambigua*, *Calothamnus gracilis* and *Banksia gardneri* and various sedges.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Mt Baring,NW | Esp | Esp | VCL | 11.10.83 | Rare | - |
| 2* | Bandalup Hill | Alb | Rav | VCL | 8.9.93 | 1 | - |

* = new population (C.J.Robinson)

Response to Disturbance

According to Newbey (1983) this taxon resuckers after fire.

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

In April 1993, the general area near Mt Baring population was surveyed, but this taxon was not found. Further survey is required.

References

Newbey (1983), Robinson and Coates (1995).

An upright to spreading shrub, 40-50 cm tall and 35-40 cm wide. Leaves are rigid, overlapping, very concave and curved backwards at the tip (recurved), dull green, broader towards the base than the tip (ovate, 2.5-3.0 x 2.5 mm) and have a fine, sharp spiny tip. Leaf margins are strongly serrated. Single flowers are borne in leaf axils. The corolla is white, tubular (6-7 mm), hairless inside, but with bearded lobes that curve backwards; the stamens are exposed.

Flowering Period: August - October

Distribution and Habitat

Styphelia pulchella is distributed over 550 km, from the Fitzgerald River National Park to south of Cocklebidy. It grows on well-drained, sandy clay loams on flat plains or mountain slopes, in shrub/heath communities with or without open mallee. Associated species may include *Eucalyptus transcontinentalis*, *E. salubris*, *Melaleuca pauperiflora*, *Daviesia benthamii* and *Acrotriche cordata*.

Conservation Status

Current: Priority I

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-------------------|----------|-------|--------------------|-------------|---------------|-----------|
| 1a | Cocklebidy,S | Esp | Esp | NR | 11.7.74 | - | - |
| 1b | Cocklebidy,S | Esp | Esp | NR | 9.8.86 | - | - |
| 2 | Mt Norcott | Esp | Esp | - | 22.9.78 | - | - |
| 3 | Mt Ney | Esp | Esp | NR | 5.9.86 | - | - |
| 4 | Parmango Rd | Esp | Esp | Shire Rd Res. | 5.9.86 | - | Disturbed |
| 5 | Bonnie Hill,W | Esp | Esp | - | 2.8.83 | - | - |
| 6a | Mt Ragged,SW | Esp | Esp | NP | 17.8.80 | - | - |
| 6b* | Mt Ragged,W | Esp | Esp | NP | 22.4.93 | 50+ | Post-fire |
| 7a | Hatter Hill,SE | Esp | Rav | VCL (Mining Lease) | 8.8.79 | 1 | - |
| 7b | Hatter Hill,S | Esp | Rav | VCL | 3.9.70 | Common | - |
| 8 | Jerdacuttup River | Alb | Rav | - | 15.8.65 | - | - |
| 9a | Ravensthorpe,E | Alb | Rav | - | 4.10.81 | Scattered | - |
| 9b | Ravensthorpe,E | Alb | Rav | - | 3.9.86 | - | - |
| 10 | Ravensthorpe,S | Alb | Rav | - | - | - | - |
| 11 | Mt Desmond | Alb | Rav | VCL | 9.83 | Occasional | - |
| 12 | Ravensthorpe,S | Alb | Rav | - | 26.8.65 | - | - |
| 13 | Phillips River | Alb | Rav | - | 1800s | - | - |
| 14 | East Mt Barren | Alb | Rav | NP | 9.24 | - | - |
| 15 | Eyre Range,W | Alb | Rav | NP | 26.4.69 | - | - |

* = new sub-population

Response to Disturbance

Two years after a hot burn (February 1991) in the Mt Ragged area, *S. pulchella* was found resuckering and in bud.

Susceptibility to *Phytophthora* Dieback

Unknown

Thysanotus baueri R.Br.

ANTHERICACEAE

Fringed Lily

A perennial plant with a small rhizome and tuberous roots that are ellipsoidal (25-75 x 5-10 mm). The 3-5 leaves are almost cylindrical (6-13 cm) and usually wither early. The inflorescence is racemose (8-24 cm long), with umbels of 1-4 flowers on articulated stalks (6-10 mm) and 2-4 stalkless flowers below. Sepals are elliptic (2.5 mm wide) and petals oblong-elliptic (4 mm wide) with the hairy fringe 2-2.5 mm long. There are 6 stamens; anthers are curved and twisted, the 3 yellow outer anthers being shorter (3.5 mm) than the 3 purple inner anthers (6.5 mm). The style (7 mm) is straight except for the apex.

Flowering Period: October - December

Distribution and Habitat

Thysanotus baueri is widely distributed in Western Australia, with a known range of over 1500 km. Usually it has been found in grassy open habitats in drier inland areas on open plain, in calcareous loam over limestone or in gravelly red soil.

T. baueri also occurs in central and western New South Wales, north-eastern Victoria and southern South Australia.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|----------------|-------------|---------------|-----------|
| 1 | ?Rawlinna | Gold | Bldr | Pastoral Lease | 20.10.66 | - | - |
| 2 | White Cliffs | Gold | - | Pastoral Lease | 21.10.63 | Frequent | - |
| 3* | Deralinya | Esp | Dund | VCL | 14.11.93 | 1 000+ | Healthy |
| 4 | Cocklebiddy,E | Esp | Dund | - | 13.10.83 | 1 | - |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

Although *T. baueri* is poorly known in Western Australia, its wide distribution suggests that it has been poorly collected, rather than naturally rare. Further survey is still required to determine its status in this State.

References

Brittan (1987).

An erect, spreading shrub, 40-50 cm tall and 30-50 cm wide. Leaves are dull lightish green, very broad elliptic (3 x 1.5-2 mm) and thick. Flower stalks (1-3 mm) are also very thick. Rounded clusters of 1-10 flowers are borne at the ends of branches. Flowers have light pink petals with fringed margins; the calyx tube is covered in long, grey hairs and has pale pink, comb-like, deeply fringed sepals (2-3 mm); the style (4 mm) is bearded around the upper section.

Verticordia sieberi is distinguished from *V. plumosa* by being a slender shrub with deeper fringing of the sepal lobes, and from *V. stenopetala* by the shorter petals and style (*V. sieberi* has a style equal to or just exceeding the petals, while *V. stenopetala* has a style about twice the length of the petals). *V. sieberi* var. *curta* which grows to the west of var. *pachyphylla* can be distinguished by its shorter sepals (1.5-1.7 mm) and the margins of petals which are shortly serrated.

Flowering Period: January

Distribution and Habitat

V. sieberi var. *pachyphylla* is known from two localities, one being in Frank Hann National Park. It grows on well-drained, slightly saline aeolian loamy sand on the inner slope of a salt lake. It is frequent in patches in low shrubland, associated with *Darwinia diosmoides*.

Conservation Status

Current: Priority 1

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Frank Hann | Esp | Rav | NP | 26.1.90 | Frequent | - |
| 2 | Lake King-Norseman Rd | Esp | ?Esp | Gravel Res. | 30.10.88 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

According to George (1991), further study is needed on the taxonomy of *V. sieberi*, as this species shows considerable variation. He suggests that this taxon probably occurs around other salt lakes in the region of the known population. Further survey is required.

At least one population of *V. sieberi* var. *pachyphylla* occurs within the Frank Hann National Park.

References

George (1991).

B. Priority Two Taxa

Based on the October 1992 Priority Flora List there were 74 Priority Two taxa known from within the boundaries of the Esperance District.

Of these, 39 taxa were located during surveys in 1992 and 1993. New populations or sub-populations were found for 26 taxa.

The following taxa are not included, as current information indicates that they are not distributed in the Esperance District:

Cymbonotus preissianus
Dampiera deltoidea
Eucalyptus stoatei x *tetraptera*
Grevillea wittweri

The following taxa were deleted as they were identified as being another species:

Baeckea sp. Cape Arid (K.R.Newbey 9753)
= *Micromyrtus imbricata*
Pultenaea sp. Bremer Range (K.R.Newbey 8205)
= *Pultenaea conferta*
Pultenaea sp. Wittenoom Hills (M.A.Burgman 2564)
= *Pultenaea spinulosa*

The following taxa were renamed during the project:

Amperea sp. Ravensthorpe (M.A.Burgman 2154)
= *Monotaxis* sp. Ravensthorpe (M.A.Burgman 2154)
Asteraceae genus nov. (M.A.Burgman 4418)
= *Haegiela tatei*
Daviesia sp. CAM (K.R.Newbey 8162) 'campephylla'
= *Daviesia campephylla* ms
Eucalyptus fraseri subsp. nov. Fraser Range (A.Popplewell 2.69)
= *Eucalyptus fraseri* subsp. *melanobasis* ms
Eucalyptus sp. Balladonia (S.D.Hopper 3115) [aff. *pileata*]
= *Eucalyptus spreata* ms
Grevillea sp. Scaddan (P.Olde 91/332) [aff. *plurijuga*]
= *Grevillea superba*
Persoonia hakeiformis (Esperance specimens different)
= *Persoonia* sp. Scaddan (M.A.Burgman 4424)
Scaevola brooksiana
= *Scaevola brookeana*
Spyridium sp. Frank Hann (K.R.Newbey 6688)
= *Spyridium mucronatum* subsp. *mucronatum* ms

A spreading, moderately dense shrub, 0.7-1.5 m tall with smooth, light grey bark. Phyllodes ('leaves') are narrow to elliptic and wider towards the apex (15-25 x 2.5-4.0 mm), straight or slightly curved, hairless, have numerous closely-parallel nerves, a stiff, spiny tip which is asymmetrical, and 1 basal gland. The golden flower heads are globular (3-3.5 mm), 20-25 flowered, with 2 heads per axil borne on stalks (4-7 mm). Legumes are linear (to 60 x 3 mm), not constricted between the seeds and strongly curved in one or more circles.

Acacia amyctica is very similar in appearance to *A. ancistrophylla* var. *ancistrophylla* which has fewer flowers per head, phyllodes without a spiny tip and indistinct nerves. It also resembles *A. whibleyana*, but that species has wider fruits in which the seeds are arranged obliquely, and does not occur in the same geographic area.

Flowering Period: September

Distribution and Habitat

A. amyctica is distributed over about 80 km, from Peak Charles National Park and Pyramid Lake east to Salmon Gums. It grows in loam and on sandy clay plains in low woodland and open shrubland.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------|----------|-------|---------------|-------------|---------------|-----------|
| 1 | Salmon Gums | Esp | Esp | MRWA Rd Res. | 25.9.83 | - | - |
| 2 | Salmon Gums,N | Esp | Esp | MRWA Rd Res. | 17.12.71 | - | - |
| 3a | Peak Eleanora,S | Esp | Esp | NP | 18.9.93 | 500+ | Good |
| 3b* | Peak Eleanora,S | Esp | Esp | NP | 19.9.93 | 100+ | Good |
| 3c* | Peak Eleanora,S | Esp | Esp | VCL | 19.9.93 | 1 000+ | Good |
| 3d* | Peak Eleanora,S | Esp | Esp | VCL | 19.9.93 | 1 000+ | Good |
| 4* | Rollond Rd | Esp | Esp | Shire Rd Res. | 12.9.92 | 10 | Good |
| 5 | Grass Patch,W | Esp | Esp | Shire Rd Res. | 20.9.93 | 50+ | Good |
| 6 | Dunn Swamp,E | Esp | Esp | VCL | 15.11.80 | Frequent | - |

* = new population / sub-population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

Acacia amyctica has the potential to be distributed through largely inaccessible areas of unvested Crown Land to the south-west and south-east of Peak Charles. Further opportunistic survey is required.

A spreading shrub, 0.5-1.5 m tall with branchlets that are red-brown at the extremities. Phyllodes ('leaves') are needle-like (10-25 x 1 mm), rigid, thick, hairless, 5-nerved, and have a gland 2-4 mm above the base. The small, golden flower heads are globular, 10-flowered, and borne on stalks (2 mm) with 2 per axil. Flowers are unusual in that they lack a calyx and are not subtended by bracteoles.

Acacia asepala ms has similar branchlets and phyllodes to *A. calcarata* which has 15-20 flowers per head on stalks 7 mm long. Phyllodes also resemble those of *A. colletioides* which have 8 nerves, as well the flowers have a calyx and bracteoles.

Flowering Period: September

Distribution and Habitat

A. asepala ms is known only from Marvel Loch and Frank Hann National Park, a distance of 180 km between populations. A further collection was made by A.J. Hart (1985), however the locality is unknown. This species grows on loam or sandy loam in low *Eucalyptus* woodland.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Marvel Loch | Mer | Yil | - | 23.8.79 | Scattered | - |
| 2 | Frank Hann | Esp | Rav | NP | 13.8.85 | Common | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

A. asepala ms is common and apparently secure in Frank Hann National Park, however a survey in 1993 failed to relocate this population (no. 2). Mollemans *et al.* (1993) unsuccessfully searched for the Marvel Loch population.

This species has the potential to be distributed through largely inaccessible, Vacant Crown Land to the north of Frank Hann National Park. Further survey is required.

References

Mollemans *et al.* (1993).

A spreading, domed or more or less straggly shrub, 0.5-1.5 m tall. Phyllodes ('leaves') are broader towards the mid-upper section (5-10 x 1-2.5 mm), thick, slightly fleshy, hairless and rounded at the tip; an inconspicuous gland is located 2-4.5 mm above the base. The light golden heads are globular (3-3.5 mm), 9-11 flowered and borne on stalks (4-6 mm) with 1 or 2 per node. Legumes are linear (to 40 x 3.5 mm), hairless, dark-brown and sometimes slightly constricted between the seeds which are arranged longitudinally.

A. carnosula ms is possibly related to *A. profusa* which lacks bracteoles in the flower heads, has more linear phyllodes and seeds arranged sideways in the legume.

Flowering Period: July - October

Distribution and Habitat

A. carnosula ms is confined to the Caiguna-Eyre-Cocklebidy area, except for one collection near Israelite Bay, over 200 km south-east. It grows in calcareous sand, loamy sand or clay loam over limestone pavement, in open shrub or tree mallee.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Caiguna,S | Esp | Dund | VCL | 27.8.83 | - | - |
| 2a | Cocklebidy,S | Esp | Dund | NR | 11.7.74 | - | - |
| 2b | Eyre,NNW | Esp | Dund | NR | 4.10.74 | Scattered | - |
| 2c | Eyre,NW | Esp | Dund | NR | 28.8.91 | Occasional | - |
| 3 | Twilight Cove | Esp | Dund | NR | 9.8.82 | - | - |
| 4 | Israelite Bay,W | Esp | Esp | NR | 14.8.80 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

A. carnosula ms should remain secure in the Nuytsland Nature Reserve. Further survey is required.

A rounded, intricate, prickly shrub, 0.7 m tall and 1-2 m diameter. Branchlets yellow-ribbed. The phyllodes ('leaves') are held at right-angles to the stem, rigid, quadrangular (5-30 x 1 mm) with a nerve along the ridge of each angle, and have a long, sharp spine at the tip. The globular flower heads (3-5 mm) are cream and 5-flowered. Legumes are long and narrow (40-50 x 2-3 mm) and are not contracted between the seeds.

A. castanostegia ms is closely related to *A. pachypoda* which has the base of the phyllode dilated where it attaches to the stem.

Flowering Period: July - October

Distribution and Habitat

A. castanostegia ms is distributed over about 200 km, mainly between Mt Holland and Hatter Hill, with more widespread populations known from Lake Seabrook (near Koolyanobbing) and near Norseman. It grows in sand, loam and lateritic soils, in *Eucalyptus* woodland open scrub or heath communities.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Lake Seabrook | Mer | Yil | ?VCL | 10.9.79 | - | - |
| 2 | Mt Holland,N | Mer | Yil | VCL | 23.8.79 | Common | - |
| 3 | Mt Holland,NNW | Mer | Yil | VCL | 30.7.69 | - | - |
| 4 | North Ironcap,E | Nar | Kon | VCL | 20.10.87 | - | - |
| 5 | North Ironcap,SE | Nar | Kon | VCL | 11.10.75 | Common | - |
| 6 | Lake Cronin,W | Nar | Kon | VCL | 2.11.79 | Rare | - |
| 7 | Forrestania | Nar | Kon | VCL | 25.7.79 | - | - |
| 8 | South Ironcap | Nar | Kon | VCL | 8.7.79 | Frequent | - |
| 9 | Hatter Hill,N | Esp | Rav | VCL | 27.10.92 | 1 | Good |
| 10 | Norseman,SE | Esp | Dund | VCL | 1.4.89 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

A. castanostegia ms is widespread, with much of its distribution being in Vacant Crown Land with poor access. Mollemans *et al.* (1993) suggested that road works along the Southern Cross-Forrestania Road may have affected the populations north of Mt Holland (populations 2 and 3). Further survey is warranted.

References

Mollemans *et al.* (1993).

A bushy shrub, 1-2.5 m tall. Phyllodes ('leaves') are narrow-oblong to elliptic (40-75 x 7-14 mm) with a blunt point at the tip, leathery in texture, silvery grey-green, and have 1 or 3 main nerves with numerous, fine, parallel nerves in between. The light golden flowers heads are oblong-shaped (7-10 x 4-5 mm) and borne on stalks (2-3 mm) which are solitary in axils of the phyllodes. Legumes are linear (to 100 x 4-5 mm) with the dark brown seeds (3-5 mm) arranged longitudinally.

*A. incanica*rpa ms bears some resemblance to *A. tarculensis* which grows in South Australia.

Flowering Period: November - January, April

Distribution and Habitat

*A. incanica*rpa ms is geographically restricted to the Cape Le Grand National Park. It grows in pockets of loamy sand on granitic slopes and ridges in open scrub, open heath and low shrubland.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Frenchman Peak | Esp | Esp | NP | 7.10.92 | 20+ | Good |
| 2a | Mt Le Grand | Esp | Esp | NP | 6.10.92 | - | - |
| 2b | Cape Le Grand | Esp | Esp | NP | - | 2+ | Good |
| 3 | 'Hill 49' | Esp | Esp | NP | 9.11.79 | - | - |
| 4* | Lucky Bay | Esp | Esp | NP | 7.10.92 | 15-30 | Good |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

A number of small populations of *A. incanica*rpa ms occur in the Cape Le Grand National Park where they should remain secure. Further survey is required around granite outcrops in the Park.

A spreading, rather dense shrub, 50-60 cm tall and up to 2 m diameter. The smooth, slightly shiny branchlets are somewhat flexible towards their tips. Phyllodes ('leaves') are light olive green, long and narrow (8-16 cm x 0.5 mm), cylindrical, almost grass-like in appearance and often have a curled tip; there are 8 fine, impressed nerves which become slightly raised on drying; a gland, which is not prominent, occurs on the upper surface of the phyllode some distance above the base. The light golden flower heads are shortly oblong (6-7 x 4 mm), 12-15 flowered and borne on stalks (6-13 mm), with 2-3 in each axil. Flowers are 4-merous. Legumes are twisted and coiled (to 8.5 cm) with the margins constricted between the seeds.

Flowering Period: October, February

Distribution and Habitat

Acacia kerryana is known from only four localities distributed over 200 km, from Lake Cronin to near Norseman, and north to Spargoville. It appears always to be associated with low rocky hills where it grows in granitic loamy sand, red-brown loam or red clayey loam. It may occur in association with various other species of *Acacia*, *Allocasuarina campestris*, *Triodia scariosa* and mallee eucalypts.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Bremer Range | Esp | Dund | VCL | 28.12.83 | - | - |
| 2 | Norseman,NE | Esp | Dund | - | 31.10.80 | Scattered | - |
| 3 | Spargoville,S | Gold | Cool | ?VCL | 16.2.81 | - | - |
| 4 | Lake Cronin,NW | Mer | Yil | VCL | 7.10.81 | Rare | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

The population north-east of Norseman was not relocated in a survey of the Jimberlana Hill area in November 1992. Further survey is required.

A. kerryana is not known in any conservation reserve.

References

Maslin (1982).

Acacia nitidula Benth.

MIMOSACEAE

A diffuse or bushy shrub, 0.4-2.0 m tall and 0.5-1.0 m wide, which lacks hairs and is occasionally glutinous. Young branches are reddish-brown and smooth. Phyllodes ('leaves') are linear (12-35 mm), rather thick, rigid, prominently 2- or 3-nerved and have an obtuse or minute callous point. Flowers heads are small, globular, 12-20 flowered and borne on slender stalks (4-8 mm) which are usually in pairs in the axils. Flowers are mostly 5-merous.

Flowering Period: October

Distribution and Habitat

Acacia nitidula is widespread, with populations known in Cape Arid and Cape Le Grand National Parks, on Middle Island and west of Ravensthorpe, a range of over 300 km. It typically grows in shallow loamy sand over granite.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1a | Cape Arid | Esp | Esp | NP | 25.4.93 | 1 000+ | Good |
| 1b* | Barrier Anchorage,S | Esp | Esp | NP | 26.4.93 | 500+ | Good |
| 2 | Belinup Hill | Esp | Esp | NP | 26.4.93 | 100+ | Good |
| 3 | Middle Island | Esp | Esp | NR | 22.11.73 | - | - |
| 4* | Mt Baring | Esp | Esp | NR | 25.4.93 | 20+ | Good |
| 5* | Mt Le Grand | Esp | Esp | NP | 6.10.92 | 500+ | Good |
| 6 | Ravensthorpe,W | Alb | Rav | - | 13.9.71 | - | - |

* = new population / sub-population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

A. nitidula is common on granite complexes in the Cape Arid and Cape Le Grand National Parks where it is secure at present. Further survey is required in the Ravensthorpe District, as this population appears anomalous.

References

Bentham (1864).

A rounded shrub, 0.3 to 2 m tall, with yellowish-green foliage. Branchlets are smooth and cylindrical to slightly angled. Phyllodes ('leaves') are bright green, cylindrical (20-45 x 1 mm) with the apex narrowed, crowded, smooth, have 4 or 8 obscure immersed nerves, and a fine oblique spine at the tip. The golden flower heads are globular (to 3.5 mm), 10-15 flowered, with 2 borne per axil on long stalks (to 13 mm). Legumes are straight or slightly curved, linear (to 37 mm), slightly raised over the seeds and have conspicuous, thickened margins.

A. ophiolithica is closely related to *A. uncinella* which has more phyllode nerves. *A. binata* resembles *A. ophiolithica* and occurs in the same area; it has 3 obscure nerves, obtuse phyllodes, larger flowers in short 2-headed racemes, and more or less coiled pods.

Flowering Period: August - November

Distribution and Habitat

A. ophiolithica is restricted to and locally common on the Jerdacuttup River area, east of Ravensthorpe. A collection by Maxwell, last century, was from the Oldfield River area. It grows in yellow brown sandy clay or loamy clay on or near rocky riverbanks, in association with mallee shrubland.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Ravensthorpe,E | Alb | Rav | Rd Verge | 27.11.81 | Dense | - |
| 2 | Ravensthorpe Range | Alb | Rav | VCL | 27.10.87 | Scattered | - |
| 3 | Ravensthorpe,E | Alb | Rav | Rd Verge | 25.9.83 | Common | - |
| 4 | Kundip,E | Alb | Rav | - | 11.8.88 | - | - |
| 5 | Nth Jerdacuttup Rd | Alb | Rav | - | 4.10.83 | - | - |
| 6 | Mt Desmond,E | Alb | Rav | - | 30.12.83 | - | - |
| 7 | Oldfield River tributary | ?Esp | Rav | - | 1800s | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

A. ophiolithica appears to be common in the Ravensthorpe Range and may occur within the Kundip Nature Reserve. Negotiations between the Shire, CALM and DEP are in progress to vest the Ravensthorpe Range as a reserve.

References

Robinson and Coates (1995).

A compact to open shrub, to 1 m tall. Branchlets are hairless, sometimes resinous, and yellow-orange in colour. Phyllodes ('leaves') lack hairs, are linear (7-15 x 1-1.5 mm), narrowed at the base, slightly thickened, with a sharp point to one side of the tip; a gland exists 0.2-1.5 mm above the base. The surface of the phyllodes sometimes has a waxy, powdery secretion (pruinose) giving it a bluish appearance. The golden flower heads are globular (4.5-5 mm), 10-17 flowered with 1 or 2 borne on a stalk (9-16 mm) in a phyllode axis. Legumes are oblong to narrowly oblong (to 25 x 10-12 mm) and prominently raised over the seeds alternatively on each side. Seeds are arranged sideways in the legume.

Acacia profusa ms resembles variants of *A. lachnophylla* which can be recognised by branchlets being hairy, the phyllodes having a distinct mid-nerve and the gland occurring more than 5 mm above the phyllode stalk, and legumes that are narrow and coiled.

Flowering Period: September - October

Distribution and Habitat

A. profusa ms is distributed over an area of about 180 km, between Frank Hann National Park and Mt Ridley, and northward to Kumarl. It grows in clay or sandy loam on flats in open shrub mallee, open dwarf scrub or low heath.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|---------------|-------------------|----------------|------------|
| 1 | Mt Ridley | Esp | Esp | VCL | 23.5.93 | 2 000+ | Good |
| 2 | Kumarl | Esp | Esp | - | 10.34 | - | - |
| 3 | Salmon Gums | Esp | Esp | MRWA Rd Res. | 17.11.92 | 20+ | - |
| 4 | Salmon Gums,W | Esp | Esp | Shire Rd Res. | 17.11.92 | 20+ | - |
| 5a | Grass Patch,N | Esp | Esp | ?MRWA Rd Res. | 23.10.69 | - | - |
| 5b | Grass Patch,N | Esp | Esp | MRWA Rd Res. | 20.11.92 | 2 | Average |
| 6a | Grass Patch,W | Esp | Esp | Shire Rd Res. | 24.9.92 | 100+ | Good |
| 6b | Grass Patch,W | Esp | Esp | Shire Rd Res. | 24.9.92 | 500+ | Good |
| 7 | Grass Patch,S | Esp | Esp | - | 1.9.47 23.9.92 | - Not found | - - |
| 8 | ?Frank Hann | Esp | Rav | NP | 11.10.65 | - | - |
| 9 | Frank Hann | Esp | Rav | NP | 2.8.80 | - | - |
| 10a | Rollond Rd | Esp | Esp | ?VCL | 28.9.84 | - | - |
| 10b* | Rollond Rd | Esp | Esp | Shire Rd Res. | 20.9.93 | 200+ | Good |
| 11 | Rollond Rd | Esp | Esp | Shire Rd Res. | 12.9.92 | 10-20 | Vulnerable |
| 12* | Rollond Rd | Esp | Esp | Shire Rd Res. | 12.9.92 | 36 | Vulnerable |
| 13* | Williams Rd | Esp | Esp | Shire Rd Res. | 20.9.93 | 20+ | Good |
| 14* | Starceovich Rd | Esp | Esp | Shire Rd Res. | 23.9.92 | 10 | Disturbed |

* = new population / sub-population

Response to Disturbance

Unknown

A spreading shrub, 0.2-0.7 m tall, with slender branches. Young branches are covered in soft, felty hairs. Phyllodes ('leaves') are hairless, squarish (2.5-4 x 2-4 mm), with raised nerves that give the appearance of 4 small wings; the tip is a sharp spine. The bright golden flower heads are globular (4-5 mm), 20-30 flowered and borne on stalks (4-8 mm) with 2 per node. Legumes are almost cylindrical (to 20 x 2 mm) and strongly arched, leathery in texture, hairless and black. Seeds (2 mm) are arranged lengthwise in the legume and are mottled grey and black with a conical, yellow appendage (aril).

This species does not have any close relatives.

Flowering Period: August - September

Distribution and Habitat

Acacia tetraptera ms is distributed over more than 200 km, occurring from near Hyden and Mt Holland south-east to near Grass Patch. It grows in loam or sand over clayey loam.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------|----------|-------|---------------|-------------|---------------|-----------|
| 1 | Fields Rd | Esp | Esp | Shire Rd Res. | 13.9.92 | 50-100 | Disturbed |
| 2 | Peak Eleanor,W | Esp | Esp | NP | 7.9.83 | - | - |
| 3a | Peak Charles,NE | Esp | Esp | VCL | 17.9.93 | 1 000+ | Good |
| 3b | Peak Charles,NE | Esp | Esp | VCL | 6.9.76 | - | - |
| 4 | Peak Charles,NW | Esp | Esp | VCL | 17.9.93 | 50+ | Post-fire |
| 5 | Grass Patch,E | Esp | Esp | - | 2.7.76 | Occasional | - |
| | | | | | 23.9.92 | Not found | - |
| 6a | Frank Hann | Esp | Rav | NP | 9.8.78 | - | - |
| 6b | Frank Hann | Esp | Rav | NP | 10.12.71 | - | - |
| 7a | Grass Patch,ENE | Esp | Esp | Water Res. | 23.9.92 | 15+ | Good |
| 7b | Grass Patch,ENE | Esp | Esp | Shire Rd Res. | 1.10.83 | - | - |
| 8 | Northover Soak | Esp | Rav | VCL | 6.9.83 | - | Post-fire |
| 9 | Mt Day,S | Esp | Dund | VCL | 28.12.83 | - | - |
| 10 | Mt Holland,S | Mer | Yil | VCL | 5.2.87 | - | - |
| 11 | Bounty Mine,W | Mer | Yil | VCL | 29.2.92 | - | - |
| 12 | The Pimple | Nar | Kulin | NR | 18.6.84 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

A rigid, stout, widely branching shrub, 0.4-1.2 m tall and 0.5-0.6 m wide. Young stems are slightly hairy. Leaves are bluish-green, lanceolate (6-12 x 2-5 mm) and have a stiff, sharp, spiny tip; the upper surface is shiny. Clusters of 6-12 flowers are borne in axils of the leaves. The green corolla tube (3-4 mm) has a white streak extending from the throat to halfway down the tube along the lines of fusion; corolla lobes (1.5-2.5 mm) have reflexed hairs at their apex which tend to form a line, linking the hairs at the throat. The ovary is hairless, the style short and the stigma flat. The pink fruit is shiny, globular (2-3 mm) and wrinkled.

Acrotriche patula was first described from South Australian collections. The Western Australian variant has larger flowers which are darker green than the eastern states variety.

Flowering Period: May, September - October

Distribution and Habitat

A. patula occurs between Marvel Loch and Hatter Hill, distributed over about 160 km. It grows in red-brown sandy clay on stony, breakaway slopes (quartz and ironstone) or on undulating plain in mallee, scrub or open scrub.

Along the eastern south coast, *A. patula* grows between Madura and Eucla. In South Australia, it occurs on the Eyre Peninsula, Mt Lofty Ranges and Kangaroo Island. Along the southern coast it grows in calcareous sandy soil associated with outcropping limestone.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-------------------|----------|-------|--------------------|-------------|---------------|-----------|
| 1 | Parker Range Tank | Mer | Yil | VCL & ?NR | 31.8.90 | 626 | Healthy |
| 2 | Parker Range,S | Mer | Yil | NR | 18.10.90 | 20 | Healthy |
| 3 | Cockatoo Tank | Mer | Yil | ?Water Res. | 19.10.90 | 1 | Healthy |
| 4 | Lake Cronin,SW | Nar | Kon | VCL | 3.10.79 | - | - |
| 5a | Hatter Hill | Esp | Rav | VCL (Mining Lease) | 27.10.92 | 50+ | Good |
| 5b | Hatter Hill,S | Esp | Rav | VCL | 4.9.70 | - | - |
| 6a | Eucla,N | Esp | Dund | Pastoral Lease | 30.8.74 | - | - |
| 6b | Eucla | Esp | Dund | ?MRWA Rd Res. | 2.8.79 | Occasional | - |
| 7 | Madura | Esp | Dund | Pastoral Lease | 5.9.63 | Uncommon | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

A. patula appears to be reasonably secure in the Marvel Loch-Hatter Hill region, although populations in the mining lease at Hatter Hill need to be monitored (Mollemans *et al.* 1993).

An erect, moderately open shrub, 10-30 cm tall, with the main stems frequently bare of leaves, giving the plant a slender appearance. Leaves (2-6 x 1-2 mm) are stem-clasping, closely overlapping, wide at the base and narrowing to the tip. Leaf tips are triangular or near cylindrical, erect or incurved, not twisted, and have a small, sharp spine at the apex. The pink flowers are single and terminal; sepals (7 mm) are either hairless or slightly hairy; the corolla is shorter than the calyx and is bearded inside below the middle. Staminal filaments are rather stout, thickened and bear lateral tufts of long hairs below the anthers; filaments are about the same length as the anthers, which are attached at their base. The style lacks hairs and is somewhat thickened below the middle, tapering towards the base; the stigma is club-shaped.

Flowering Period: May - August

Distribution and Habitat

Andersonia macranthera is distributed over 270 km, from near the Young River to Israelite Bay. It grows in deep white sand on sandplain in tall shrubland to low mixed heath communities.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------------|----------|-------|---------------------|-------------|---------------|-----------|
| 1 | Eld Rd | Esp | Esp | NR | 29.3.83 | 50+ | Good |
| 2 | Coolingup Rd | Esp | Esp | Shire Rd Res. | 10.10.92 | 100+ | Good |
| 3 | Styles Rd | Esp | Esp | Shire Rd Res. | 2.7.84 | - | - |
| 4 | Gibson,N | Esp | Esp | - | 10.8.51 | - | - |
| 5 | West Point Rd | Esp | Rav | Shire Rd Res. | Pre 9.92 | - | Burnt |
| 6 | Balladonia Rd | Esp | Esp | Shire Rd Res. & VCL | 25.4.93 | 20+ | Good |
| 7* | Fisheries Rd | Esp | Esp | NP | 19.4.93 | 120+ | Good |
| 8* | Daringdella Lake | Esp | Esp | NR | 20.4.93 | 50+ | Good |
| 9* | Mt Baring,N | Esp | Esp | NP | 25.4.93 | 2 000+ | Good |
| 10* | Boolenup Walk | Esp | Esp | NP | 26.4.93 | 20+ | Good |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

May be susceptible.

Summary and Recommendations

A. macranthera has been poorly collected. Recent surveys have found this species to be a common component of heathlands between Mt Baring and Israelite Bay in the Cape Arid National Park and Nuytsland Nature Reserve.

A. macranthera is secure in at least one National Park and two Nature Reserves.

References

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

A low, widely spreading shrub, to 40 cm tall and 2 m diameter. Young branches, very young leaves and flowers are finely and sparsely covered in short, soft hairs. Leaves are clustered at the ends of branches, narrow (4-6 x 1-1.5 mm), thick, concave, yellow-green and dotted with glands. Flowers are small (4-6 mm across petals), and solitary in the axils of leaf-like bracts. The very pale pink or white petals are about twice the length of the calyx lobes. There are 16-19 stamens arranged in 2 whorls, the outer whorl being longer (0.4-0.6 mm) than the inner whorl. The fruit is a capsule.

Flowering Period: December - February

Distribution and Habitat

Angasomyrtus salina is distributed over about 80 km, between Truslove and Mt Heywood. It is restricted to the low marginal sand dunes immediately above high water of salt lakes. Associated genera include *Melaleuca* and *Leucopogon*.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|---------------|-------------|---------------|-----------|
| 1 | Truslove | Esp | Esp | ?NR | 8.2.77 | - | - |
| 2* | Truslove | Esp | Esp | NR | 22.9.92 | 20+ | Good |
| 3 | Gibson,N | Esp | Esp | Shire Rd Res. | 20.11.92 | 20 | Good |
| 4a | Dempster Rd | Esp | Esp | NR | 25.9.92 | 1 000+ | Good |
| 4b* | Dempster Rd | Esp | Esp | VCL | 25.9.92 | 100+ | Good |
| 5 | Mt Heywood,NE | Esp | Esp | VCL | 21.5.93 | 1 000+ | Unburnt |
| | | | | | 21.5.93 | 1 000+ Seedl. | Post-fire |
| 6* | Mt Ridley,N | Esp | Esp | VCL | 22.5.93 | 1 000+ | Good |

* = new population / sub-population

Response to Disturbance

Regenerates from seed after fire. Thousands of post-fire seedlings were observed in population 5, 28 months after the burn.

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

Although *A. salina* has a very restricted habitat, it is rarely cleared for agricultural purposes. Indirect effects from clearing of land, such as increased salinity and waterlogging of salt lakes and watercourses, may have an adverse effect on this species. Monitoring of populations occurring in agricultural areas is recommended.

This species is secure in two Nature Reserves, and is probably common around the margins of the many salt lakes in unvested Crown Land north of Mt Ridley and westwards to Mt Heywood.

Astroloma sp. Fitzgerald (G.J.Keighery 8376)

EPACRIDACEAE

A low, multistemmed shrub, 5-25 cm tall. Leaves are erect, grey-green, lanceolate (8 x 1.2 mm), flat or slightly incurved, with a very fine, sharp yellow point at the tip. The red flowers (10 mm) are solitary in leaf axils occurring midway along the branches. The corolla tube is narrowly tapered towards the apex, white hairy at the throat and smooth below; calyx lobes (4 mm) are acute.

Flowering Period: May

Distribution and Habitat

Astroloma sp. Fitzgerald is distributed over 320 km, between the Fitzgerald River and Clyde Hill. It grows in white or red sandy clay, or stony sand in mallee heath communities.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|-------------|-------------|---------------|------------|
| 1 | Clyde Hill,SSW | Esp | Esp | - | 3.5.83 | - | - |
| 2 | Condingup,SE | Esp | Esp | Private | 12.4.65 | - | Vulnerable |
| 3 | Mt Drummond,W | Alb | Rav | NP | 24.4.66 | - | - |
| 4 | Thumb Peak | Alb | Rav | NP | 11.5.86 | Common | - |

Response to Disturbance

Appears to be a disturbance opportunity. Two of the collections have been made after disturbance, being common near Thumb Peak after fire, and near Condingup, it "grows well after first ploughing".

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

Further survey is required.

References

Robinson and Coates (1995).

Astroloma sp. Grass Patch (A.J.G.Wilson 110)

EPACRIDACEAE

A multistemmed, domed shrub, about 40 cm tall. Young branches are covered in long white hairs which disappear with age. Leaves are narrow-linear (10-15 x 1 mm), numerous, margins are curled backwards (revolute) and the apex has a long sharp spine; the upper surface is green and sparsely covered in short hairs, while the lower surface is pale green with dense, short matted hairs. Flowers are borne in the axils of leaves, usually in near opposite pairs; the calyx is dull pinkish-red, erect (about 10 x 3 mm) and swollen towards the base, the outer surface is sparsely covered with short white hairs, the inner surface lacks hairs; the corolla is dark red and covered with long silky hairs on the outside and bearded inside. The anthers are completely enclosed in the corolla tube.

Flowering Period: June

Distribution and Habitat

Astroloma sp. Grass Patch is known from near Coolbidge Creek to the east of Grass Patch, a range of about 30 km. It grows in grey-white fine sand over clay on the margins of salt lakes, associated with myrtaceous shrubs and halophytes.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1a | Ridley Rd,N | Esp | Esp | Private | 20.9.88 | 30 | Healthy |
| 1b | Kents Rd,S | Esp | Esp | Private } | | | |
| 2 | Kents Rd,S | Esp | Esp | NR } | 20.9.88 | 200+ | Healthy |
| 3 | Ridley Rd,S | Esp | Esp | Private } | | | |
| 4 | Coolbidge Creek | Esp | Esp | Private | 22.6.90 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

On present knowledge, *A. sp.* Grass Patch appears to have both specific habitat requirements and a very restricted range. Annette Wilson (personal communication) made a comprehensive survey of salt lakes in the Scaddan-Grass Patch region in 1988, and she states that "the sandy lake shores on which this species has been found are rare in the area and it is likely that the populations discovered represent much of the range".

Recent land clearing for agriculture may adversely affect the habitat of this species by increasing the salinity and occurrence of waterlogging in the salt lakes where *A. sp.* Grass Patch grows. Although one population exists in a Nature Reserve, it must be considered vulnerable.

The owners of the property to the south of Ridley Rd were going to fence population 3 in 1988-89. This has not been confirmed.

A much-branched and spreading bushy shrub to 3.5 m tall. Leaves are wedge-shaped (15-50 x 6-15 mm) being flattened at the apex and narrowing to the base of the leaf; margins are shortly serrated. The upper surface of leaves are covered with short, matted, rust-coloured hairs when young, becoming scaly with age; the lower surface is woolly. Flower heads are cylindrical (9-17 x 6-6.5 cm). Flowers are pale yellow; the style cream, and the apex of the pollen presenter purple. Each head may have up to 50 follicles (13-20 x 6-9 mm) which are largely covered by old flowers for several years. The seed (22-24 mm) has a notched wing and the body is covered with scattered small ridges.

Banksia epica is closely related to *B. praemorsa* and *B. media*. *B. media* has longer leaves (110-120 mm) and a fruiting cone where the persistent old flower parts are straight and point downwards, whereas with *B. epica* they are curled and point upwards. *B. praemorsa* is restricted to the Albany region.

Pollinators of *B. epica* include the New Holland Honey Eater and the Yellow Rumped Thornbill.

Flowering Period: April - June

Distribution and Habitat

B. epica is known from only two localities on the western coast of the Great Australian Bight. It grows in deep white sand, atop the coastal limestone cliffs or in secondary sand dunes, in heath. Associated species may include *B. media*, *B. speciosa*, *Melaleuca uncinata*, *Calothamnus* sp., *Adenanthos* sp. and *Eucalyptus mallee*.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Toolinna Cove | Esp | Dund | NR | 14.8.91 | 350 | Healthy |
| 2 | Point Culver,W | Esp | Dund | NR | 15.6.89 | 2 000+ | Healthy |

Response to Disturbance

George (1987) suggests that *B. epica* is probably killed by fire and regenerates from seed.

Susceptibility to *Phytophthora* Dieback

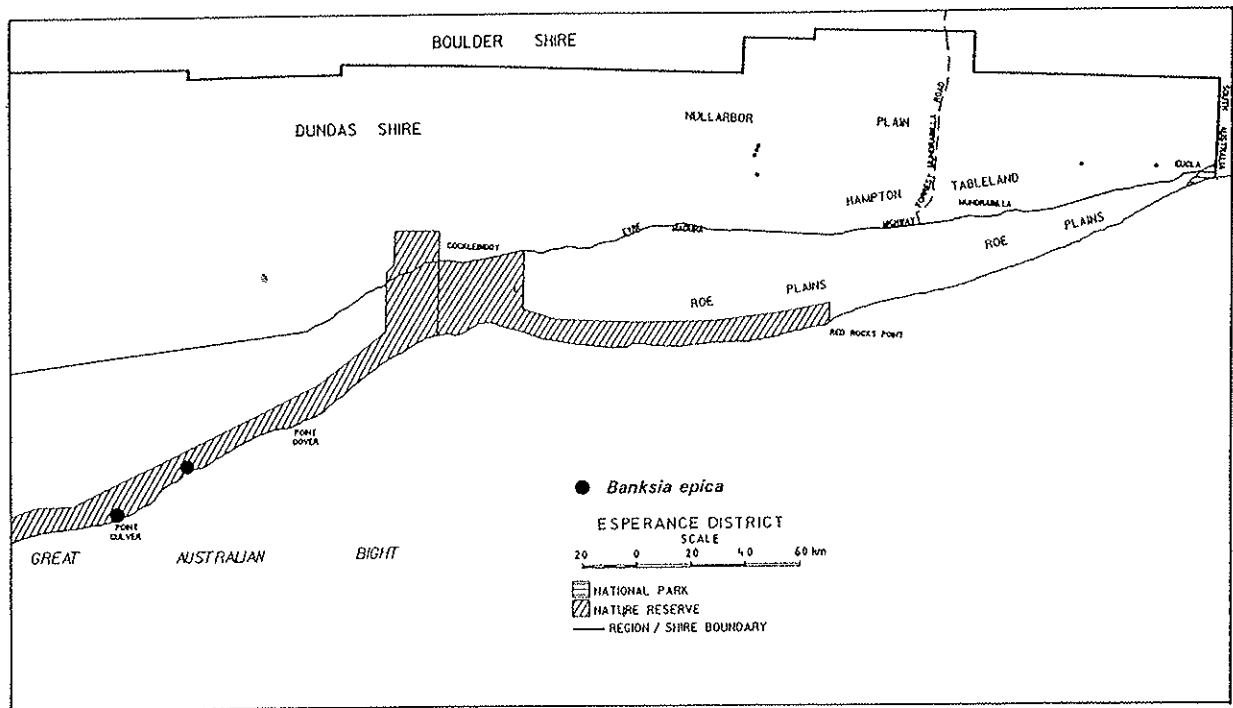
Presumed susceptible.

Summary and Recommendations

Both known populations are undisturbed and secure within the Nuytsland Nature Reserve. Due to the remote location, and the probability that more populations may occur in the largely inaccessible area where *B. epica* grows, this species is unlikely to be at risk.

References

George (1987).



A small colony of rosettes of 6-20 leaves or short leafy stems, up to 5 cm tall and 3-4 cm broad, with horizontal rhizomes at a depth of 3-10 cm. The grey-green leaves are broader towards the apex (obovate, 5-20 x 2-7 mm), and are covered in soft hairs when younger which largely disappear with age. Flowers are solitary, erect, tubular, greenish with long stamens (15-27 mm) exerted beyond the petals (8-12 mm); the ovary (5-6 mm) is densely covered with long, spreading white hairs. The maturing flower bends towards the ground as the fruit develops.

Flowering Period: September

Fruiting Period: October - November

Distribution and Habitat

Bentleya diminuta is known from one locality, extending from the north-west to the south-west of Mt Ragged. It grows in red-brown sand and red sandy clay with calcareous nodules over limestone. Associated vegetation is usually mallee which may include *Eucalyptus cooperiana*, *E. redunca*, *E. uncinata*, *E. tetragona* and *Melaleuca pentagona*.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Mt Ragged,W | Esp | Esp | NP | 24.4.93 | 2 000+ | Post-fire |

Response to Disturbance

In April 1993, *B. diminuta* was observed resprouting after a hot burn in February 1991. Rosettes were most abundant along the verge of the track; those away from the track tended to be beneath or close to mallees.

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

All known collections are from a limited area along roadsides within the Cape Arid National Park. Additional populations may exist in the surrounding region, which has not been surveyed (Crisp and Taylor 1990). Further survey is recommended.

References

Crisp and Taylor (1990).

A small shrub, about 50 cm tall. Young branches have faint glandular-warty projections and are covered in minute soft hairs in two opposite sunken grooves, otherwise the plant is hairless. Leaves (10-50 mm) have 3 or 5 leaflets which are narrow, broader towards the apex than the base (12 x 1-5 mm), flat, thick and have a slightly rounded apex. Pink flowers are borne in clusters at the ends of branches on stalks (3 mm); the 4 petals (5 mm) overlap each other at the base.

Boronia coriacea resembles *B. inornata* which can be distinguished by its linear-cylindrical leaflets and the youngest branches which lack the two sunken grooves filled with short hairs.

Flowering Period: April, October - November

Distribution and Habitat

B. coriacea is known from only a restricted area of about 15 km along the scarp west of Israelite Bay. It grows in shallow calcareous soil ('marl') over limestone both in sand-heath and in mallee vegetation.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Gora Road | Esp | Esp | NP | 4.10.70 | - | - |
| 2a | Sheoaks Hill,SE | Esp | Esp | NR | 21.4.93 | 500+ | Good |
| 2b | Sheoaks Hill,SE | Esp | Esp | NR | 21.4.93 | 10+ | Good |
| 3 | Tooklejenna Rock,N | Esp | Esp | NR | 20.4.93 | 1 000+ | Good |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

B. coriacea is restricted geographically, although within its known range it is relatively common and secure.

All the known collections are from a limited area along tracks within the Nuytsland Nature Reserve. Additional populations may exist along the escarpment, which has not been surveyed. Monitoring is required.

References

Wilson (1971).

A perennial herb to 30 cm tall and 30 cm wide, arising from a shortly-branched rhizome, with 6-20 flowering shoots produced annually. The rhizome is covered by dense brown fibres. Roots are white and tuberous below the rhizome to about 5 mm diameter, becoming slender at depth. Leaves are erect, without hairs and sticky; the blades (150-300 x 5-6 mm) are channelled, with 6-8 prominent veins; the apex has a long, stiff sharp point. Flower heads are short (60-100 mm) and spreading with a white axis and 3-6 branches (to 60 mm); the lowest bract, situated below the branches, is leaf-like and sticky. Flowers (4-6 mm) have 3 outer perianth segments that are brown-green on the outside and white inside, 3 white inner perianth segments and the stamens in 2 whorls; staminal filaments are flattened, anthers are yellow; the ovary is green (1 mm) and the style white. Capsular fruits are 3-lobed (4-5 mm) and green when mature. Seeds (1.5 mm) are very shiny and black, with a large, fleshy appendage (aril) which is white with a black margin.

Flowering Period: November

Distribution and Habitat

Caesia viscida is known only from the site where it was originally collected in Cape Arid National Park. It grows in *Banksia speciosa* shrubland on low sand dunes.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Tagon Bay Rd | Esp | Esp | NP | 23.11.93 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

A search in the general area of the known population failed to find any plants in April 1993. The vegetation and habitat where this species grows also occurs in the Nuytsland Nature Reserve and nearby Cape Le Grand National Park (Keighery 1990). Further survey is required.

References

Keighery (1990).

A succulent herb with numerous flowering stems, 3-9 cm long arising from the basal tuft of leaves. Leaves are many at the base in a tuft, as well as on the upper part of the flowering stems, obovate (1-3.5 x 1-1.3 mm), and opposite or alternate. Flowers are borne on stalks (3-5 mm) which have small, opposite bracts; sepals are broad-ovate (1.5-2 x 2-2.5 mm) and thin; the 5 petals are narrow-elliptic (1-2 x 0.4-1 mm); the 5-7 stamens have their filaments united at the base to form a ring around the ovary; the globular ovary is translucent and has 4 stigmata (0.3 mm) which are free to the base. The capsule opens by a single pore to release about 10 red-brown, glossy seeds (0.3 x 0.2 mm).

Flowering Period: October

Distribution and Habitat

Calandrinia porifera is known only from a few widely distributed localities, between Boorabbin and Fitzgerald River National Park, a distance of about 300 km. Inland, this species grows on skeletal soils of inner aprons of granite rocks, and towards the coast it grows along rivers.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-------------------|----------|-------|---------------|--------------------|----------------|-----------|
| 1 | Cascades Rd | Esp | Esp | Private & ?NR | 10.10.68 9.9.93 | - Not found | - - |
| 2 | Cundeelee Mission | Gold | Bldr | AR | 1967 | - | - |
| 3 | Boorabbin | Gold | Cool | NP | 1988 | - | - |
| 4 | Jilbadgi | Mer | Yil | NR | 1988 | - | - |
| 5 | Fitzgerald River | Alb | ?Rav | NP | 1988 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

The majority of sightings have been by K. Newbey (personal communication) who states "... while the taxon is not common, I feel that I have probably seen enough plants in conservation areas to suggest that it should be 'safe'". Newbey also indicates that this taxon flowers prolifically, with a moderate to high seed set, suggesting that the soil seed bank should be adequate for long term survival.

In spring 1993, a survey for the population on the edge of the Nature Reserve (pop. no. 1), failed to locate this species. The population may have been cleared for agriculture. The three populations referred to by K. Newbey (personal communication) are not represented in the Western Australian Herbarium. Further survey is required.

References

Syeda (1980).

Calochilus sp. Hopetoun (H. Taylor s.n.)

ORCHIDACEAE

Mallee Beard Orchid

An orchid with insignificant leaves that are reduced to a tiny bract. The dorsal and lateral sepals (to 5 mm) are bluntly pointed and pale green with dark red stripes. The petals and column are similarly coloured and contained within the sepals. The small flowers (5-15 mm) are cup-like, appear to self-pollinate, and rarely have more than one flower (of a spike of 10-12 flowers) open at a time.

This orchid has affinity to *Calochilus campestris*. In Western Australia, there are three species of *Calochilus* recognised, all of which are undescribed. *C.* sp. Hopetoun is distinguished from *C.* aff. *robertsonii* by having a shorter labellum and shorter labellum hairs.

Flowering Period: August - October

Distribution and Habitat

C. sp. Hopetoun is known from three widely separated localities, at Point Charles, Hopetoun and near Eyre, a range of 650 km. It grows in calcareous sand in coastal scrub communities.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|-------------|-------------|---------------|------------|
| 1 | Hopetoun | Alb | Rav | VCL | 26.10.92 | 30 | Vulnerable |
| 2 | Point Charles | Alb | Rav | NP | 22.10.92 | 5 | - |
| 3 | Eyre | Esp | Esp | NR | 10.93 | 3 | Good |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

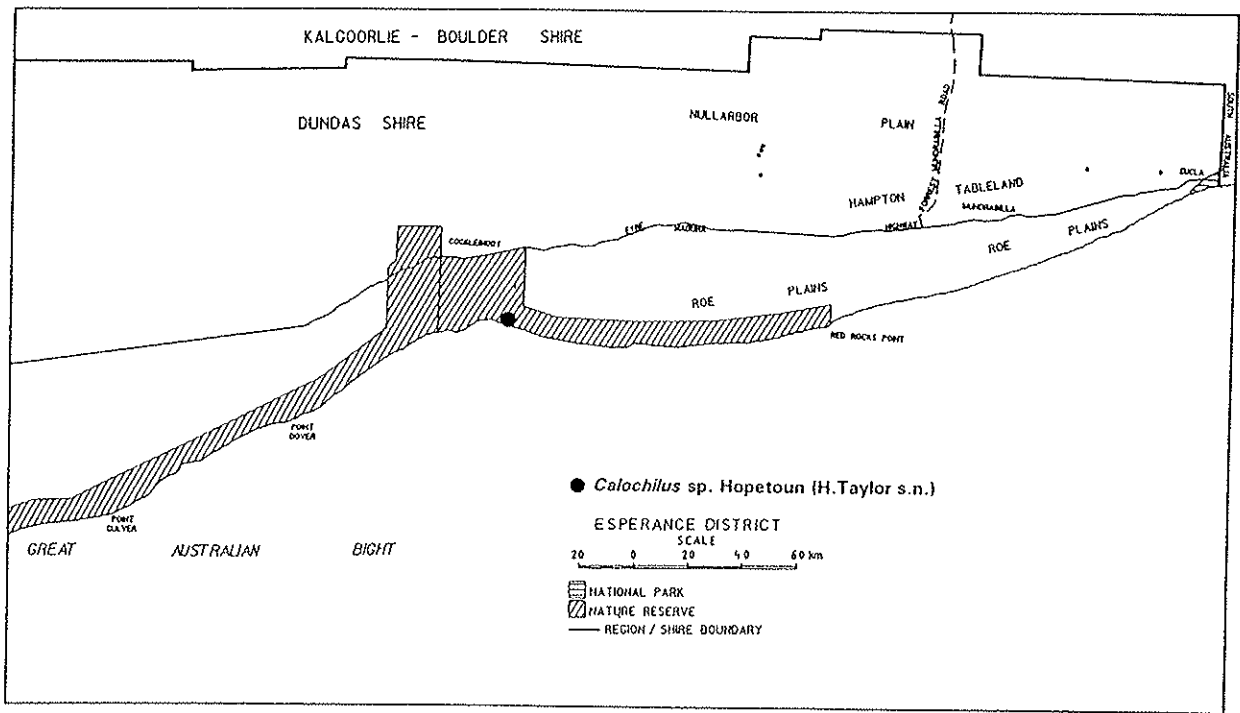
Presumed not susceptible.

Summary and Recommendations

In 1992, the Fitzgerald River National Park Association received a grant from the Gordon Reid Foundation to search for this orchid. They were unsuccessful in finding more populations, despite extensive surveys through the Park. The recent discovery of a few plants both at Point Charles and near Eyre, suggests that this taxon may be more widespread than originally believed. There are unconfirmed reports of *C.* sp. Hopetoun occurring at Chillinup Rd (Albany District), near West Mt Barren, and north of Cape Le Grand. Further survey is required.

References

Esperance Express 11 Aug. 1992, Hoffman and Brown (1992), Robinson and Coates (1995).



A semi-prostrate, rosetted annual herb, about 7 cm tall. Basal leaves are broadest towards the tip (oblanceolate, 25 mm) and slightly hairy; uppermost leaves are obovate (3-5 mm), hairy, with long hairs at the tip. The compound flower heads are very numerous (to 40 per plant), globular and of varying sizes (5-12 mm diam.), congested and lack stalks. The 4-7 inner involucre bracts are hairless, whereas the outer bract is covered in long hairs. The tubular florets (2-2.5 mm) have 5 conspicuous lobes; uppermost florets have a hairy subtending scale and reduced pappus. The achene (0.5-0.8 mm) is triquetrous. The style (0.5-1 mm) is divided at the tip.

The genus *Chthonocephalus* was revised by Short (1990) who concluded that the taxon *C. multiceps* should be excluded from *Chthonocephalus* as it differs in features of the fruit and bracts from the rest of the genus. The taxon is more closely related to *Calocephalus aervoides* which occurs on the Houtman Abrolhos Islands, and Short (1990) considers both taxa should probably be referred to a separate genus.

Flowering Period: August - September

Distribution and Habitat

Chthonocephalus multiceps was first collected from the Balladonia homestead in 1947, and has only been collected from one other locality about 65 km to the west, near Boingaring Rocks. It grows in granitic, loamy sand over granite bedrock, associated with ephemeral *Helipterum* species.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------------|----------|-------|----------------|-------------|---------------|-----------|
| 1 | Balladonia Homestead | Esp | Dund | Pastoral Lease | 31.8.47 | - | - |
| 2 | Boingaring Rocks,ESE | Esp | Dund | NR | 11.9.80 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

Although *C. multiceps* appears to be rare, Willis (1952) reports, "it is only to be expected that it will prove to have a wide distribution in the botanically little-known south-eastern part of Western Australia." The Boingaring Rocks population is in a very remote part of the Dundas Nature Reserve and is unlikely to be disturbed. Further taxonomic work and survey are required.

References

Short (1990), Willis (1952).

Comesperma lanceolatum (R.Br.) Benth.

POLYGALACEAE

A small, erect shrub (milkwort), less than 15 cm tall, with slender, hairless stems which may lie on the ground at the base. Leaves are small, narrow-linear (4-6 mm), rather rigid, with pointed tips. Flowers are blue, pea-like with 2 wings and a keel, and borne in short clusters (racemes) at the ends of the stems. Individual flowers have 5 oblong, thin sepals (4 mm). The fruit is an elliptical capsule (6 x >2 mm) that tapers rather more at the base than the tip. Seeds are oblong (3 mm) and have a tuft of long hair at the tip.

Flowering Period: November - December

Distribution and Habitat

Comesperma lanceolatum is widespread along the south coast, from near Beaufort Inlet to near Cape Le Grand, a distance of about 320 km. It grows in near-coastal sandplain in siliceous white sand or deep white sands over sandy clays, in mixed tall shrubland on quartzite ridges, on dunes, or on the plains near wet areas. It may be associated with *Banksia*.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------------------|----------|-------|----------------|-------------|---------------|-----------|
| 1 | Woodup Swamp,NE | Esp | Esp | Unvested Res. | 30.12.89 | 28 | - |
| 2 | Woolbernup | Alb | Rav | NP | 21.11.85 | Rare | - |
| 3 | Cape Riche,NW | Alb | ?Jer | ?Unvested Res. | 1.12.74 | - | - |
| 4 | No. 2 Rabbit Proof Fence | Alb | ?Jer | - | 30.11.60 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

Collections of this species were made last century by Robert Brown from the "South coast, east of King George's Sound" (Bentham 1863), and by Maxwell "on fairly wet plains near Warriup" (Mueller in Leigh *et al.* 1984). K. Newbey (personal communication) has recorded it from areas east of Cape Riche to at least Hopetoun, with a few plants occurring in the Fitzgerald River National Park; at all localities it was rare. More recently, a population has been found south-east of Mt Merivale. Further survey is required, particularly in Cape Le Grand National Park.

References

Bentham (1863), Leigh *et al.* (1984), Robinson and Coates (1995).

The typical form of *Conospermum filifolium* is white, whereas subsp. *sigmoideum* ms has pale blue flowers.

Flowering Period: August - September

Distribution and Habitat

C. filifolium subsp. *sigmoideum* ms is known only from two areas over 200 km apart; one in Frank Hann National Park and the other near North Tarin Rock. It grows in yellow sand in heath communities.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Frank Hann | Esp | Rav | NP | 17.9.93 | 50+ | Good |
| 2 | Frank Hann | Esp | Dund | NP | 17.9.93 | 20 | Good |
| 3a | Nth Tarin Rock | Kat | Dum | NR | 13.9.75 | - | - |
| 3b | Kukerin,N | Kat | Dum | - | 16.10.83 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

Further survey is required.

A stiff, robust perennial to 1 m tall, with narrowly winged stems. Leaves are without stalks, ovate-elliptic with a broad base (12-40 x 5-23 mm) and have a toothed margin. Clusters of flowers (cymes) have up to 3 branches together (60 mm) each bearing to 12 flowers borne on stalks (3.5-5.2 mm). The sepals are almost obsolete. The deep blue corolla (to 12 mm) has fine grey hairs on the outside and broad wings (3.5-4 mm wide) on the lobes. The ovary is bilocular (4 mm) and shiny.

Flowering Period: September - October

Distribution and Habitat

Dampiera decurrens occurs on the south coast from Two Peoples Bay eastwards to the Cape Le Grand National Park. It grows on skeletal soils on granite outcrops near the coast.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Lucky Bay | Esp | Esp | NP | 7.10.92 | 10 | Good |
| 2 | Frenchman Peak | Esp | Esp | NP | 7.10.92 | 2+ | Good |
| 3 | Cape Le Grand | Esp | Esp | NP | 6.10.66 | - | - |
| 4 | Hellfire Bay | Esp | Esp | NP | 14.11.76 | - | - |
| 5* | Thistle Cove,E | Esp | Esp | NP | 7.10.92 | 10+ | Good |
| 6* | Lucky Bay Rd | Esp | Esp | NP | 8.10.92 | 5+ | Good |
| 7 | Sandy Hook Is. | Esp | Esp | - | 10.11.50 | - | - |
| 8 | Mt Gardner | Alb | Alb | NR | 1800s | - | - |
| 9 | Cheyne Beach | Alb | Alb | - | 1800s | - | - |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

D. decurrens has a very restricted habitat and range in the Cape Le Grand National Park, with individual plants usually being widely scattered. Current information indicates that this plant is rare, but should be secure in the National Park.

The populations occurring in the Albany District were collected by George Maxwell about 100 years ago, and have not been collected since. Further survey of granite outcrops along the south coast is required.

References

Rajput and Carolin (1988, 1992).

An herbaceous perennial with erect, ribbed stems which are covered in short, matted golden-yellowish hairs when young, but become hairless with maturity; the nodes have a tuft of whitish hairs. Leaves are oblong-elliptic (0.5-1.5 x 0.6 mm) and have a wide base without stalks. Flowers are solitary or in clusters (cymes). Short, golden-yellow hairs cover the flower stalks (1 mm), the bracteoles (usually 2) and the sepals (0.2-0.5 x 0.3 mm). The corolla lobes (about 4 mm) and ovary have short yellowish hairs on the outside; the style and indusium are hairless. Fruits (4-5 mm) are hairy.

Dampiera orchardii is possibly closely related to *D. tenuicaulis* which is a small, slender-stemmed shrub with bright blue flowers (the corolla being about 10 mm long) which are covered on the outside with dense, dark, stellate hairs.

Flowering Period: October

Distribution and Habitat

D. orchardii is known to occur south of Newdegate and north-west of Cascade on a fault line near the upper reaches of the Young River, growing with *Glishrocaryon*, *Dodonaea* and sedges. This taxon has also been collected between "Lake King and Ravensthorpe" and "towards Tone River".

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Young River | Esp | Esp | - | 21.10.68 | - | - |
| 2 | Newdegate,S | Kat | LG | - | 4.11.65 | - | - |
| 3 | Lake King-Ravensthorpe | - | - | - | 7.11.63 | - | - |
| 4 | Towards Tone River | - | - | - | 1880 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

Extensive land clearing for agriculture has been carried out through the general area described by A. Orchard (personal communication) where this species is thought to occur and since the specimen was collected near the Young River in 1968. Further survey is urgently required.

D. orchardii is not known to occur in any conservation reserve.

References

Rajput and Carolin (1988).

A low spreading, domed shrub, 15-25 cm tall and 0.25-1 m wide. Leaves are crowded on the stem, dull grey-green, slightly succulent and triangular (2-7 x 1 mm). Heads of 12-15 flowers are borne at the ends of branches; the lower part of the calyx tube has square markings (tessellated), while the upper part has minute, pimple-like protuberances; calyx-lobes are less than half the length of the yellow-green petals; styles are also yellow-green and extend about 6 mm beyond the petals.

Flowering Period: May, August - November

Distribution and Habitat

Darwinia luehmannii occurs to the north-west and north-east of Mt Heywood. It grows in white or yellow sand or orange-brown sandy loam around the margins of salt lakes or in depressions, in open woodland or in *Melaleuca* shrub communities, associated with *M. fissurata* or *M. uncinata*.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Sheoak Hill,ESE | Esp | Esp | VCL | 29.9.83 | - | - |
| 2a* | Clyde Hill,NW | Esp | Esp | VCL | 20.5.93 | 1 | Good |
| 2b | Clyde Hill,NW | Esp | Esp | VCL | 21.5.93 | 1 000+ | Good |
| 2c* | Clyde Hill,NW | Esp | Esp | VCL | 21.5.93 | 2 000+ | Good |
| 2d* | Clyde Hill,NW | Esp | Esp | VCL | 21.5.93 | 1 000+ | Good |
| 3 | Mt Heywood | Esp | Esp | VCL | 1.9.84 | - | - |
| 4 | Mt Heywood,NE | Esp | Esp | VCL | 21.5.93 | 500+ | Good |
| | | | | | 21.5.93 | 1 000s Seedl. | Post-fire |
| 5a* | Mt Heywood,NW | Esp | Esp | VCL | 21.5.93 | 100+ | Good |
| 5b* | Mt Heywood,NW | Esp | Esp | VCL | 21.5.93 | 100+ | Good |
| 5c* | Mt Heywood,NW | Esp | Esp | VCL | 22.5.93 | 50+ | Good |
| 5d* | Mt Heywood,NW | Esp | Esp | VCL | 22.5.93 | 500+ | Good |

* = new population / sub-population

Response to Disturbance

Thousands of seedlings were observed at population 4 two years after a wildfire in January 1991.

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

D. luehmannii is common around salt lakes and in low depressions in Crown Land to the north of Mt Heywood.

References

Blackall and Grieve (1980).

***Darwinia* sp. Peak Charles (A.S.George 10627)**

MYRTACEAE

A shrub, 1.7 m tall. Petals white turning red.

Flowering Period: April

Distribution and Habitat

This *Darwinia* species is known only from Peak Charles, where it grows in granitic loam.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Peak Charles | Esp | Esp | NP | 10.4.71 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

Peak Charles and the surrounding area was burnt by a hot fire in January 1991. The species was not relocated during a survey of the area in September 1993. Further survey is required.

Daviesia campephylla Crisp

PAPILIONACEAE

A low, spreading, often domed shrub, 0.15-0.35 m tall and 0.3-1.0 m wide, which often reproduces by suckers. Phyllodes ('leaves') are spirally arranged, cylindrical or slightly flattened (6-12 x 1-2 mm); the upper edge is usually slightly dilated just below the apex giving an allusion of a green caterpillar rearing from the branches, the apex has a sharp spine on the side pointing outwards. Clusters (racemes) of 1-5 flowers are borne on short stalks (1-3 mm) in the upper axils. The calyx (3-4 mm) has the 2 upper lobes united in a truncate lip, the lower 3 lobes are broadly triangular (1 mm). The yellow corolla has a large upright petal (standard, 5-7 x 7 mm) and incurved wings; stamens are arranged in 2 whorls of 5 each. Pods are triangular (6-7 x 3.5 mm) and slightly inflated.

Flowering Period: November

Distribution and Habitat

Daviesia campephylla is known only from an area of about 15 km, to the north of Cascade. It grows in yellow sandy clay loam with some lateritic gravel, in open shrub mallee and dwarf scrub vegetation. Associated species include *Eucalyptus transcontinentalis*, *E. forrestiana*, *Melaleuca uncinata*, *M. pentagona* and *M. subtrigona*.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|-----------------|-------------|---------------|-----------|
| 1a | Griffiths Rd & | Esp | Esp | Shire Rd Res. | 12.9.92 | 2 000+ | Good |
| 1b | Edwards Rd | Esp | Esp | NR | 12.9.92 | 5 000+ | Good |
| 2 | Rollond Rd | Esp | Esp | Shire Rd Res. | 12.9.92 | 1 000+ | Good |
| 3a* | Rollond Rd | Esp | Esp | NR } | 12.9.92 | 500+ | Good |
| 3b* | Rollond Rd | Esp | Esp | Shire Rd Res. } | | | |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

Current information indicates that *D. campephylla* has a very restricted geographical range, although it is common within that area. It occurs in two Nature Reserves and should remain secure.

Studies to determine the reproduction biology and the response of *D. campephylla* to fire should be undertaken, so that appropriate management can be carried out in the Nature Reserves.

References

Burgman (1985b), Newbey (1983).

A slender, diffuse, rush-like shrub, 30-80 cm tall. The erect branchlets are initially compressed then become cylindrical and ribbed. The dull green phyllodes ('leaves') are spirally arranged, long and very narrow (50-400 x 1 mm), resemble the branchlets, have 3 prominent ribs and a sharp, spiny tip. Flowers are small, yellow streaked red and usually borne in 1-4 pairs on stalks (both peduncle and pedicel 2-3 mm long) in the axils of leaves. The calyx (4-5 mm) is somewhat flared at the top and the lobes are very short; ribs are lacking. The corolla has a broadly elliptic upright petal (standard, 8 x 10 mm) which is mostly yellow with red towards the centre and an intense yellow oblong marking at the centre; the wings are twisted so the apices form a 'V' which is open on the lower side, very dark red with yellow tips; the keel (5 x 2 mm) is dark red. The free stamens are arranged in 2 whorls. The shiny ovary has 2 ovules. Pods are roughly triangular-shaped (11-14 x 6 mm). Seed is pale yellow mottled black.

Flowering Period: October - November, ?January

Distribution and Habitat

Daviesia pauciflora occurs between Munglinup and Gibson and extends northwards to near Cascade, with a range of about 70 km. It grows in deep white sand or sand over laterite in shrub mallee and heath communities. Associated genera may include *Melaleuca*, *Lambertia*, *Adenanthos*, *Allocasuarina* and *Banksia*.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------------|----------|-------|---------------|-------------|---------------|-----------|
| 1 | Cascades Rd | Esp | Esp | Private | 16.10.68 | - | - |
| 2 | Munglinup,E | Esp | Esp | MRWA Rd Res. | 8.1.79 | - | - |
| 3 | Barker Inlet,NNE | Esp | Esp | MRWA Rd Res. | 8.1.79 | Frequent | - |
| 4 | Dalyup | Esp | Esp | ?MRWA Rd Res. | 24.11.64 | - | - |
| 5 | Cascades Rd | Esp | Esp | NR | 9.10.84 | - | - |
| 6 | Gibson,NW | Esp | Esp | - | 8.12.68 | - | - |

Response to Disturbance

Unknown, but is probably a disturbance opportunist.

Susceptibility to *Phytophthora* Dieback

Presumed susceptible.

Summary and Recommendations

D. pauciflora is poorly known and possibly rare, although the habitat where it grows is relatively common to the west of Esperance. Populations occurring along the South Coast Highway (pop. nos. 2, 3 and 4) are extremely vulnerable. In 1993, surveys for population 3 along the South Coast Highway failed to relocate this species; the MRWA road reserves in the vicinity are very degraded and choked with weeds, particularly exotic grasses. Surveys in the Cascades area during spring 1992 failed to locate any populations of this taxon.

An erect shrub to 40 cm tall. Leaves are rigid, linear (3-4 x 0.5 mm), grooved and have an obtuse tip; the margins curve backwards towards the midrib (revolute). Solitary flowers are borne on stalks (1-2 mm) in axils of the uppermost leaves (short corymb); the bracteoles are minute (1 mm). The calyx tube (5 mm) is shortly-hairy with acute, short lobes; the 2 upper lobes are united to about the middle. The corolla has a large upright petal (6 mm diameter) which is orange with purple streaks; the wings and keel are equal in length (7 mm); the keel is purple with tips that are rounded and slightly indented.

Flowering Period: August

Distribution and Habitat

This name has been misapplied to specimens in the Western Australian Herbarium. No specimens of this taxon are currently known in Perth.

The type was collected "[near] Coolgardie" last century (Moore 1898). Currently, the name *Dillwynia acerosa* has been applied to a taxon which is known only to occur in South Australia.

Conservation Status

Current: Priority 2

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

Taxonomic work is urgently required on the genus *Dillwynia* (R. Cranfield, personal communication). Examination of the type specimen of *D. acerosa* is needed before further field survey is carried out on this species.

References

Moore (1898).

A small, multi-branched annual herb, 1-6 cm tall, which is covered with minute hairs. Leaves are alternate, narrow-linear (about 10 mm). Flower heads are distinct, have greenish to pale yellow tubular florets only and occur at the ends of branches. The green, involucre bracts are obovate (4-5 mm), often with long hairs (cilia) on the rounded apex, are arranged in 2 rows, and enclose about two-thirds of the flower head. Pappus scales are numerous (12-15), short, flat, lanceolate and minutely toothed like a saw. Fertile achenes are silky-hairy at the base.

Flowering Period: August - October

Distribution and Habitat

Elachanthus pusillus is known from only three localities, 500 km apart, from east of Salmon Gums to near Cocklebiddy. A collection was made 100 years ago from Kalgoorlie. Near Cocklebiddy, this species grows in red loam over limestone on saline flats, in an *Atriplex* and *Halosarcia* shrubland.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Orchid Rocks | Esp | Esp | VCL | 10.83 | - | - |
| 2 | Cocklebiddy,E | Esp | Dund | NR | 1.10.81 | 1 000+ | - |
| 3 | Kalgoorlie | Gold | ?Kal | - | 8.1898 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

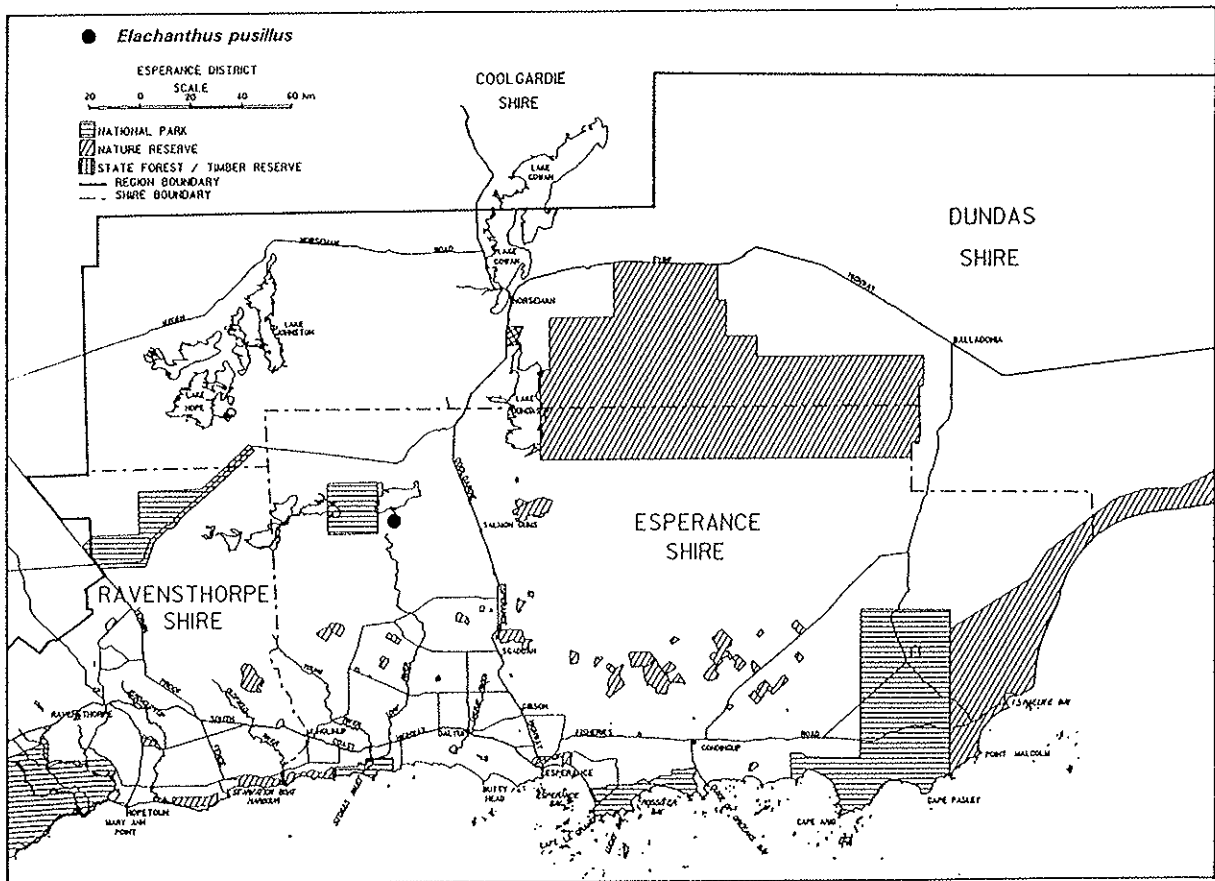
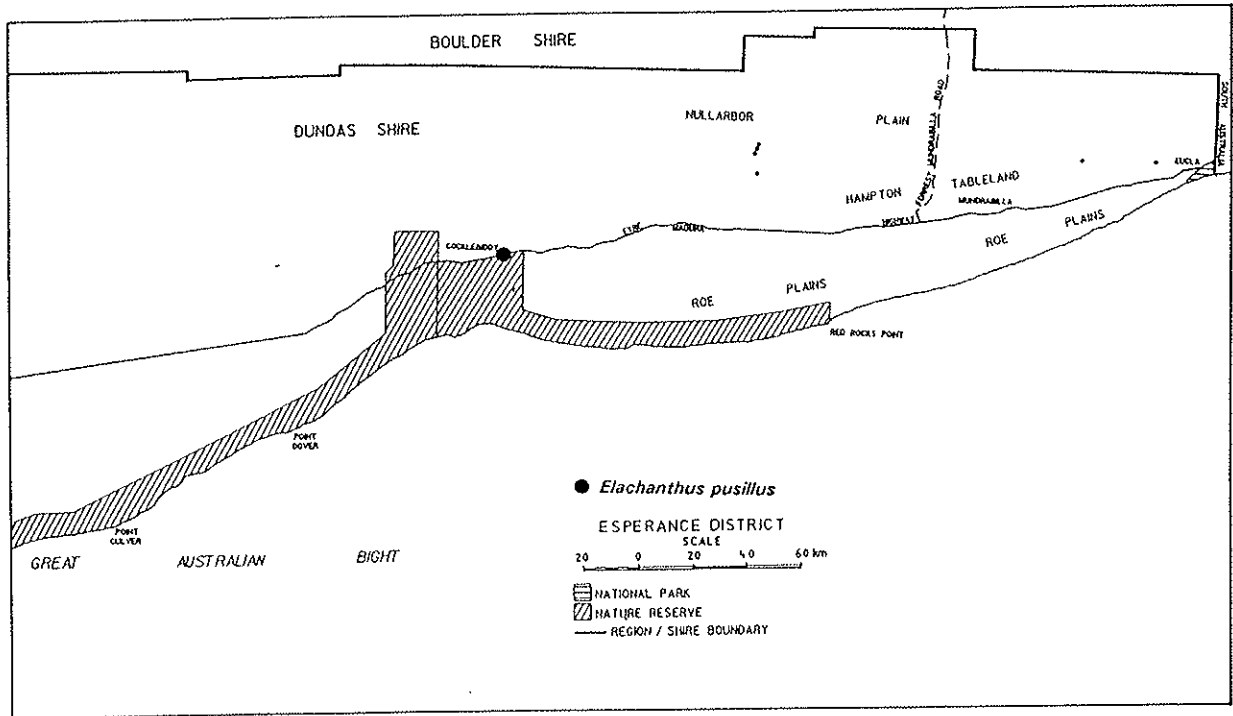
Summary and Recommendations

The population east of Cocklebiddy should remain secure in the Nuytsland Nature Reserve.

The distance between the two most recent collections suggest that there may be other populations between them. Further survey is required.

References

Burgman (1985b), Grieve and Blackall (1982).



An erect, compact or spindly shrub, 1-3.5 m tall, often weeping when old. Branches are ribbed towards the apex and prominently white-blotched in the upper parts, the blotches consisting of a dried exudate. Leaves are without stalks, alternate, elliptic (10-31 x 2-6 mm), overlapping and normally obscuring the branch, somewhat shiny, and sticky when young. Lilac flowers are borne on flattened stalks (2-3 mm) with 3 or 4 per axil; sepals are oblong-shaped (3-6 x 1 mm). The 2-lipped corolla (8-13 mm) is very pale lilac and densely glandular-hairy outside, while inside the tube is deeper lilac, purple spotted and beset with long soft hairs; the 4 stamens lack hairs; the ovary is densely hairy except for the swollen base which is hairless. The fruit is elongated egg-shaped (3-3.5 x 1.5-2 mm) and covered with long, silky hairs.

Flowering Period: November - March

Distribution and Habitat

Eremophila lactea is known from an area covering approximately 15 km, which is located about 40 km west of Grass Patch. It grows on disturbed roadside areas on light grey-brown sandy loam in very open shrub mallee. Associated species include *Eucalyptus transcontinentalis*, *E. longicornis*, *E. flocktoniae*, *Melaleuca depressa* and *Eremophila chamaephila*.

Conservation Status

Current: Priority 2[†]

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------------|----------|-------|---------------|-------------|---------------|------------|
| 1a | Williams Rd | Esp | Esp | Shire Rd Res. | 20.9.93 | 350 | Vulnerable |
| 1b | Williams Rd | Esp | Esp | Shire Rd Res. | 20.9.93 | 7 | Fair |
| 1c | Grass Patch W Rd | Esp | Esp | Shire Rd Res. | 20.9.93 | 200 | Vulnerable |
| 1d | Grass Patch W Rd | Esp | Esp | Shire Rd Res. | 20.9.93 | 20 | Fair |
| 2 | Williams Rd | Esp | Esp | Shire Rd Res. | - | Low numbers | - |
| | | | | | 20.9.93 | Not found | - |
| 3 | Rollond Rd | Esp | Esp | Shire Rd Res. | - | 200 | - |
| | | | | | 20.9.93 | Not found | - |

Response to Disturbance

A relatively short-lived, opportunistic species which is most abundant after disturbance.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

Much of the area where *E. lactea* is distributed has been cleared for agriculture; subsequently most of the known populations occur on road verges. R. Chinnock (personal communication) states that *E. lactea* has vanished from some sites where it was previously known. Monitoring of known populations is critical.

[†] 1999 status: Declared Rare Flora

A shrub, 0.5-1.5 m tall, which is without hairs or only finely-hairy. Leaves are green, narrow, club-shaped (4-8 mm), warty-glandular with a conspicuous black, shortly pointed tip. Creamy white flowers (1-4) are borne in a cluster, surrounded by foliage leaves, at the ends of branches. Flower stalks are thick (0.5-1.5 mm long). Sepals are narrow (1.5-2 mm long), fleshy and have a black tip; petals are narrow-oblong (6 mm) with short hairs on the inside and towards the margin outside. Stamens (3-4 mm) are hairy, whereas the style lacks hairs; the ovary has a sparsely hairy apex.

Flowering Period: September - November

Distribution and Habitat

Eriostemon apiculatus occurs in the Norseman-Widgiemooltha area, distributed over about 100 km. It is apparently confined to outcrops of ultrabasic rocks, growing in red-brown loam as an undershrub in open woodland, associated with *Eucalyptus flocktoniae*, *E. torquata*, *E. stricklandii* or *E. salubris*.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Norseman | Esp | Dund | - | 17.9.65 | - | - |
| 2 | Red, White, Blue | Esp | Dund | - | 19.11.92 | 15+ | Good |
| 3 | Brockway Timber | Esp | Dund | Reserve | 19.11.92 | 1 000+ | Good |
| 4* | Coach Rd Heritage | Esp | Dund | ?VCL | 19.11.92 | 1 | Average |
| 5 | Peninsula | Esp | Dund | - | 30.8.67 | - | - |
| 6 | Widgie No. 3 | Gold | Cool | - | 1.10.90 | - | - |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

The *Eriostemon apiculatus* habitat appears to coincide with mining tenements, although at least one of the mines is not working at present, i.e. the 'Peninsula'. Further survey is required.

References

Wilson (1970).

A small to medium-sized tree, to 15 m tall, with a hard black stocking (2-3 m) at the base and smooth grey bark above.

This undescribed taxon is closely related to *Eucalyptus fraseri* subsp. *fraseri* which has smooth bark. Adult leaves are lanceolate, alternate, glossy, green to dark green and the same colour on both sides; veins are dense with very irregular, intersectional oil glands. Unbranched clusters of 7 flowers are borne on angular stalks. Buds are with or without short, stout stalks, egg-shaped; bud caps are conical and usually ribbed; stamens in the bud are first erect then strongly turned downwards. Flowers are white. Fruits are cup-shaped, lack stalks, have a thick rim and a descending disc. Seed is lustrous, red-brown and flattish with a shallow network of veins.

Flowering Period: ?March - April

Distribution and Habitat

E. fraseri subsp. *melanobasis* ms is known only in the Fraser Range area, where it grows on red calcareous loam.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------|----------|-------|-------------------------------------|-------------|---------------|-----------|
| 1 | Fraser Range | Esp | Dund | Pastoral Lease, MRWA Rd Res. & ?VCL | 20.11.93 | 3 000+ | Healthy |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

E. fraseri subsp. *melanobasis* ms appears to be geographically restricted, although locally abundant in the Fraser Range. It is not known in any conservation reserve. Liaison with the lessees of Fraser Range Station is required, to determine the range of this taxon. Management of pastoral activities may be necessary to ensure establishment of young cohorts of trees.

References

Brooker and Kleinig (1990).

A mallee to 6 m tall, with rough, hard bark with shallow, longitudinal furrows at the base, and smooth grey over cream bark above. Juvenile leaves are blue-green. Adult leaves are alternating, lanceolate (to 120 x 35 mm) tapering to a long narrow point, and slightly glossy, green; veins are dense with scattered, irregular intersectional oil glands, or sometimes apparently glandless. Clusters of 7 flowers are borne on stout, flattened stalks (peduncles, 10-15 mm); buds are broadly stalked (pedicellate), elongate egg-shaped (9-11 x 5-6 mm), and sometimes ribbed; bud caps are contracted to form a beak. Flowers are creamy-white. The fruit is cup-shaped to cylindrical (8-10 x 7-9 mm), sometimes ribbed, has a thick rim and a descending disc, and 3 or 4 valves. Seed is brown, shallowly pyramidal with the under side ribbed.

This species is related to *Eucalyptus rigens*, which has 3-flowered inflorescences, and *E. famelica* which has smooth bark only. Neither of these species occur in the Israelite Bay area.

Flowering Period: April - May

Distribution and Habitat

E. litorea is known from near Israelite Bay and north-west of Mt Baring, a distribution of 65 km. It grows in yellowish sand around salt lakes, on the lee side of coastal dunes, and in shallow sandy loam over granite.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Daringdella Lake | Esp | Esp | NR | 6.9.84 | - | - |
| 2 | Israelite Bay | Esp | Esp | NR | 20.4.93 | 1 000+ | Good |
| 3* | Point Malcolm Rd | Esp | Esp | NR | 20.4.93 | 500+ | Good |
| 4 | Mt Baring,NW | Esp | Esp | VCL | 11.10.83 | - | - |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

E. litorea appears to be common near Israelite Bay, although a portion of this population occurs in the camping area and is therefore very vulnerable to fire and clearing for fuelwood. There appears to be two age structures of this population, indicating that a fire may have burnt the sector between the fisherman's buildings and the camping area some years ago. The population on the north side of Daringdella Lake was not relocated during a survey in April 1992; parts of this area were burnt in October 1991. Monitoring of the known populations and further survey along the south side of Daringdella Lake towards Point Malcolm is required.

References

Brooker and Hopper (1989), Brooker and Kleinig (1990), Newbey (1983).

A low, rounded dense mallee, to 3 m tall, with smooth or matt bark of variable colour. Foliage is dense and extends to the ground. Adult leaves are alternating, lanceolate (60-100 x 7-10 mm), held erect, at first dull, blue-green maturing glossy green; veins are dense with very numerous intersectional oil glands. Clusters of 7 flowers are unbranched and borne on rounded or angular stalks (peduncles, 2-8 mm). Buds have short stalks (pedicels) and are egg-shaped (5-7 x 3-5 mm); bud caps are bluntly conical and narrower than the calyx tube at the join; stamens in the buds are first erect then bend strongly downwards. Flowers are white. Fruits are hemispherical to conical in shape (4-5 x 6-7 mm) with a thick rim and a ring-like disc raised free of the 3 enclosed valves. Seed is red-brown and smooth with longitudinal grooves.

Eucalyptus misella is similar to *E. angustissima* but differs in its wider leaves, longer peduncles and enclosed valves.

Flowering Period: August - October

Distribution and Habitat

E. misella has a scattered distribution from west of Grass Patch to east of Scaddan, a geographic range of about 80 km. It grows on sandy clays and loams, often near salt lakes or on alluvial flats near saline creeks, and in flat, sandplain heath country associated with *E. tetragona*.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------|----------|-------|---------------------|-------------|---------------|------------|
| 1a | Scaddan Rd | Esp | Esp | Shire Rd Res. | 22.9.92 | <10 | Vulnerable |
| 1b | Scaddan Rd | Esp | Esp | - | 17.1.85 | - | - |
| 1c | Scaddan Rd | Esp | Esp | - | 14.9.84 | - | - |
| 2 | Gibson,N | Esp | Esp | MRWA Rd Res. | 7.11.86 | Frequent | - |
| 3 | Fields Rd | Esp | Esp | Shire Rd Res. & VCL | 13.9.92 | 20+ | Good |
| 4 | Griffiths Rd | Esp | Esp | ?Private | 7.11.86 | - | - |
| | | | | | 24.9.92 | Not found | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

The majority of known populations are on road reserves in areas where land has been cleared for agriculture.

Surveys along Scaddan Rd failed to relocate two sub-populations (nos. 1b and 1c) (the species was originally confused with *E. rigens*, also a low, rounded mallee occurring around salt lakes), the third (pop. no. 1a) is on a degraded road reserve which is weed invaded, providing little chance for growth of seedlings. This sub-population is vulnerable in the long term. Road markers are required.

A small tree, 10-14 m tall, with smooth, grey over salmon to copper-coloured bark. Adult leaves are alternate, lanceolate (85-170 x 12-30 mm), dull blue-green at first maturing glossy, bright green; the veins are very dense and thick. Clusters of 3 flowers are unbranched and borne on angular to flattened stalks (peduncles, 7-15 mm). Buds (17-21 x 10-15 mm) are stalked (pedicellate) and strongly ribbed all over; stamens in the bud are first erect then strongly downturned. Bud caps are conical to slightly beaked. Flowers are white. Fruits are conical (13-18 x 14-17 mm), strongly ribbed with a thick rim, descending disc and 4 valves at rim level. The seed is ruby-red to red-brown and shiny.

The strongly ribbed buds and fruits which are a distinguishing feature of *Eucalyptus pterocarpa* are similar to those of *E. lesouefii* and *E. corrugata*. However, the latter two species have rough bark at the base; *E. lesouefii* has up to 9-flowered clusters and *E. corrugata* has flattened bud caps and grey seed.

Flowering Period: September - November

Distribution and Habitat

E. pterocarpa is distributed over about 90 km to the west and north-west of Norseman. It grows in red-brown loam in open low woodland with *E. salmonophloia*, *E. dundasii*, *E. calycogona* and *E. flocktoniae* and undershrubs of *Acacia merrallii*.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Theatre Rocks,W | Esp | Dund | VCL | 20.11.92 | 50+ | Good |
| 2 | Bronzite Ridge | Esp | Dund | VCL | 13.7.89 | - | - |
| 3 | McDermid Rock,ESE | Esp | Dund | VCL | 13.1.81 | - | - |
| 4 | Norseman,NW | Esp | Dund | - | 20.8.63 | - | - |
| 5 | Norseman,W | Esp | Dund | VCL | 20.7.63 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

E. pterocarpa occurs in a poorly surveyed area of Vacant Crown Land which is largely inaccessible. A timber reserve north-west of Norseman, that would include *E. pterocarpa* and *E. brockwayi*, has been proposed (Henry-Hall 1990). Further action on this proposal and further survey is required.

References

Brooker and Kleinig (1990), Henry-Hall (1990).

A tree or mallee to 10 m tall, with erect branches from low on the trunk. Bark is smooth and coloured white, grey, salmon or bronze. The adult leaves are shaped like the blade of a scythe (falcate, up to 110 x 10-13 mm), semi-glossy, narrow, bright darkish green and held erect. The axillary inflorescences are up to 7-flowered; stamens are at first erect then bend downwards in the bud (13 x 4-6 mm) and a scar is left when the bud cap falls. Fruits are cup-shaped.

Eucalyptus spreata ms is related to *E. pileata* and *E. polita* but can be distinguished from them by its strongly beaked bud cap and from the latter by having larger buds.

Flowering Period: ?October - November

Distribution and Habitat

E. spreata ms has a scattered distribution from near Balladonia to south of Peak Eleanora, a range of about 250 km. It grows in a variety of habitats including almost flat plain, margins of salt lakes, or amongst granite rocks in calcareous red-brown loam, clay loam, sand or white sandy loam. It occurs in low open woodland either as a pure stand or with *E. diptera*, *E. eremophila*, *E. calycogona*, *E. cylindriflora* or *E. flocktoniae*.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------------|----------|-------|--------------------------------|-------------|---------------|-----------|
| 1 | Balladonia,W | Esp | Dund | MRWA Rd Res. & ?VCL | 4.11.86 | Abundant | - |
| 2 | Balladonia,W | Esp | Dund | MRWA Rd Res. & ?VCL | 10.7.85 | - | - |
| 3 | Newman Rock,E | Esp | Dund | MRWA Rd Res. & ?VCL | 22.8.79 | Pure stand | - |
| 4 | Newman Rock,W | Esp | Dund | MRWA Rd Res. & ?VCL | 10.2.85 | - | - |
| 5 | Fraser Range,W | Esp | Dund | - | 12.3.67 | Common | - |
| 6 | Fraser Range,E | Esp | Dund | MRWA Rd Res. & ?Pastoral Lease | 2.2.79 | Common | - |
| 7 | Norseman,E | Esp | Dund | NR | 22.8.79 | Abundant | - |
| | Heartbreak Ridge | Esp | Dund | NR | 14.11.83 | Frequent | - |
| 8 | Little Jam Hill | Esp | Dund | NR | 24.9.80 | Frequent | - |
| 9 | Balladonia,S | Esp | Dund | VCL | 20.10.83 | Occasional | - |
| 10 | Coragina Rock,N | Esp | Dund | VCL | 20.0.83 | Abundant | - |
| 11 | Coragina Rock,S | Esp | Esp | VCL | 25.10.78 | - | - |
| 12 | Mt Ney,NE | Esp | Esp | VCL | 17.9.70 | - | - |
| 13 | Norseman,S | Esp | Dund | MRWA Rd Res. & ?Pastoral Lease | 5.11.86 | Abundant | - |
| 14a | Kumarl,W | Esp | Esp | Shire Rd Res. | 7.4.85 | - | - |
| 14b | Salmon Gums,NNW | Esp | Esp | - | 13.3.67 | - | - |
| 15 | Dowak | Esp | Esp | MRWA Rd Res. | 5.11.86 | Frequent | - |
| 16 | Salmon Gums,N | Esp | Esp | MRWA Rd Res. | 13.3.67 | - | - |
| 17 | Truslove | Esp | Esp | MRWA Rd Res. | 22.10.83 | 1 | - |
| 18 | Peak Charles | Esp | Esp | NP | 8.11.86 | - | - |
| 19 | Fields Rd | Esp | Esp | VCL | 7.11.86 | Abundant | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora Dieback*

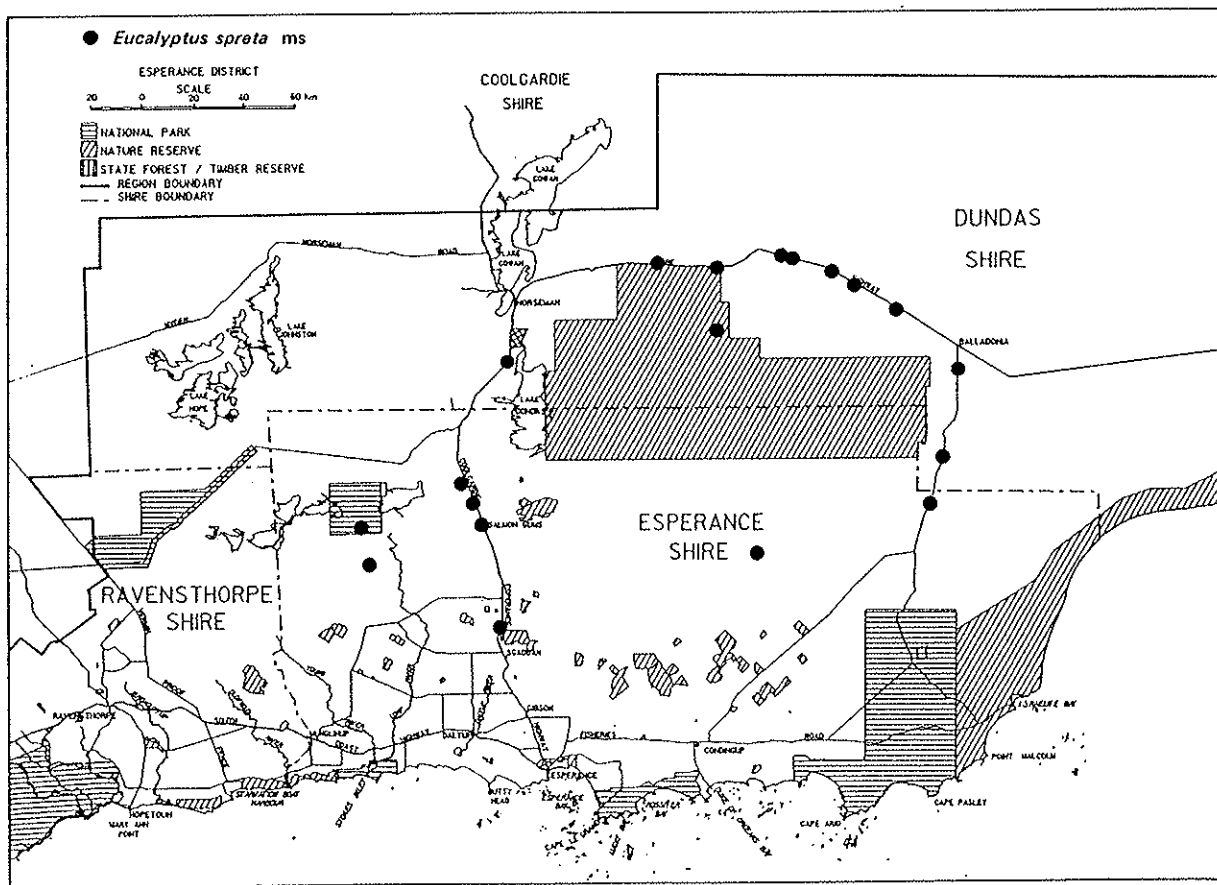
Unknown

Summary and Recommendations

E. spreta ms is widespread through the area between Salmon Gums and Balladonia, with populations occurring in the Dundas Nature Reserve (Johnson, unpublished data).

References

Brooker and Kleinig (1990).



Gastrolobium heterophyllum (Turcz.) Crisp

PAPILIONACEAE

[ex. *Oxylobium heterophyllum* (Turcz.) Benth.]

Slender Poison

A trailing rather than erect shrub with weak slender stems. The conspicuous, fine stipules (appendages at the base of the leaf stalk) are longer than the leaf stalks. Leaves are opposite, narrow-oblong (15-30 x 2-4 mm), with slightly inrolled margins underneath, and a fine spine at the tip; the upper surface is dark green, hairless and has a conspicuous network of veins, while underneath is paler with spreading hairs especially along the midrib. Hairs are absent on the older foliage. Flowers are yellow suffused with purple-red and borne in short, elongate clusters (racemes) at the ends of branches; the acute bracts persist until the flower opens. Seed pods are elliptical (about 5 x 4 mm) with a fine, long spine at the tip; 6-8 seeds are borne per pod.

Gastrolobium heterophyllum has similar leaves and flowers to the widely distributed Box Poison, *G. parviflorum*. The latter species is always erect, has longer racemes with more flowers, more robust stems and less conspicuous stipules than *G. heterophyllum*.

Flowering Period: September - October

Distribution and Habitat

G. heterophyllum is distributed between the Fitzgerald River and Esperance, a range of about 200 km. It grows in gravelly soils near rivers and in red clayey soils on flats. Associated species may include *Eucalyptus preissiana* or *Melaleuca uncinata*.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------------|----------|-------|--------------|-------------|---------------|-----------|
| 1 | Young River Mouth | Esp | Esp | NP | - | - | - |
| 2 | Yerritup Creek | Esp | Esp | ?Private | 25.9.68 | - | - |
| 3 | Gibson area | Esp | Esp | - | 9.61 | - | - |
| 4 | Esperance | Esp | Esp | - | 5.9.69 | - | - |
| 5 | Munglinup | Esp | Rav | - | 22.10.79 | - | - |
| 6 | ?Middle Rd | Esp | Rav | - | 19.9.87 | - | - |
| 7* | Young River, W | Esp | Esp | MRWA Rd Res. | 9.9.93 | 50 | Post-fire |
| 8 | Phillips River | Alb | Rav | ?NP | 26.9.41 | - | - |
| 9 | West River | Alb | Rav | NP | 24.10.86 | 1 | - |
| 10 | Mt Desmond | Alb | Rav | VCL | 22.9.79 | Occasional | - |
| 11 | Ravensthorpe, E | Alb | Rav | ?Rd Res. | 19.9.87 | Scattered | - |
| 12 | Telegraph Track | Alb | Rav | NP | 9.70 | - | - |
| 13 | Steere River | Alb | Rav | - | 23.10.61 | - | - |
| 14 | Cheritons Rind, SE | Mer | Yil | ?VCL | 23.9.89 | - | - |

* = new population

Response to Disturbance

Probably a disturbance opportunist.

Gastrolobium rigidum (C.A.Gardner) Crisp

PAPILIONACEAE

[ex. *Oxylobium rigidum* C.A.Gardner]

Rigid-leaf Poison

A low, spreading shrub, usually about 30 cm tall, but one form grows to 90 cm. Stems arise from a woody rootstock and are repeatedly forked. Leaves are opposite, oblong-elliptical (10-30 x 10-15 mm), rigid, blue-green, have short stalks and a prominent yellow midrib. Flowers are yellow suffused purple-red and borne in small, elongate clusters at the ends of branches. The pods are silky-hairy.

Flowering Period: October - November

Distribution and Habitat

The typical form of *Gastrolobium rigidum* is distributed over about 100 km, from Lake Varley to near Mt Short. It grows in sandy clay, gravel and loam in low heath communities with scattered mallees of *Eucalyptus phaenophylla*.

Aplin (1973) indicates that a larger form occurs in the mallee country around Tarin Rock.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|----------------------------|-------------|---------------|-----------|
| 1a | Frank Hann | Esp | Rav | NP | 9.11.64 | - | - |
| 1b | Frank Hann | Esp | Rav | NP | 28.10.92 | Frequent | Good |
| 2 | VPF | Esp | Rav | NP | 28.10.92 | 1 000+ | Good |
| 3 | Jackson | Kat | LG | NR | 22.9.89 | 20-50 | - |
| 4 | Mt Gibbs | Esp | Rav | VCL | 27.10.92 | 50 | Good |
| 5 | Mt Gibbs,SSW | Kat | LG | VCL | 28.10.92 | 1 500+ | Good |
| 6 | Lake Varley | Nar | Kulin | - | 10.10.49 | - | - |
| | | | | | 8.69 | - | - |
| 7 | Mt Short,NW | Alb | Rav | MRWA Rd Res. | 26.10.92 | 20+ | Good |
| 8 | Hayes Rd | Alb | Rav | Shire Rd Res. & Private | 8.11.89 | 500+ | - |
| 9a | Mt Madden | Kat | LG | NR | 20.10.61 | - | - |
| 9b* | Mt Madden,NNW | Kat | LG | Shire Rd Res. | 26.10.92 | 2+ | Good |
| 10a* | Lake King,E | Kat | LG | Shire Rd Res. | 28.10.92 | 20+ | Good |
| 10b* | Lake King,E | Kat | LG | Shire Rd Res. | 26.10.92 | 1 | Disturbed |
| 10c | Lake King,E | Kat | LG | Shire Rd Res. | 26.10.92 | 40+ | Disturbed |
| 11* | Fence Rd | Kat | LG | Shire Rd Res. & VCL | 26.10.92 | 100+ | Good |
| 12a* | Fence Rd | Kat | LG | Shire Rd Res. & VCL | 26.10.92 | 2 000+ | Good |
| 12b* | Fence Rd | Kat | LG | Shire Rd Res. | 26.10.92 | 100+ | Good |
| 13 | Tarin Rock | Kat | Dum | MRWA & Shire Rd Res. | 8.10.89 | 10-20 | - |
| 14* | Jackson Rock | Esp | Rav | VCL | 26.10.92 | 20+ | Good |

* = new population / sub-population

Response to Disturbance

May be a disturbance opportunist.

Susceptibility to *Phytophthora Dieback*

Unknown

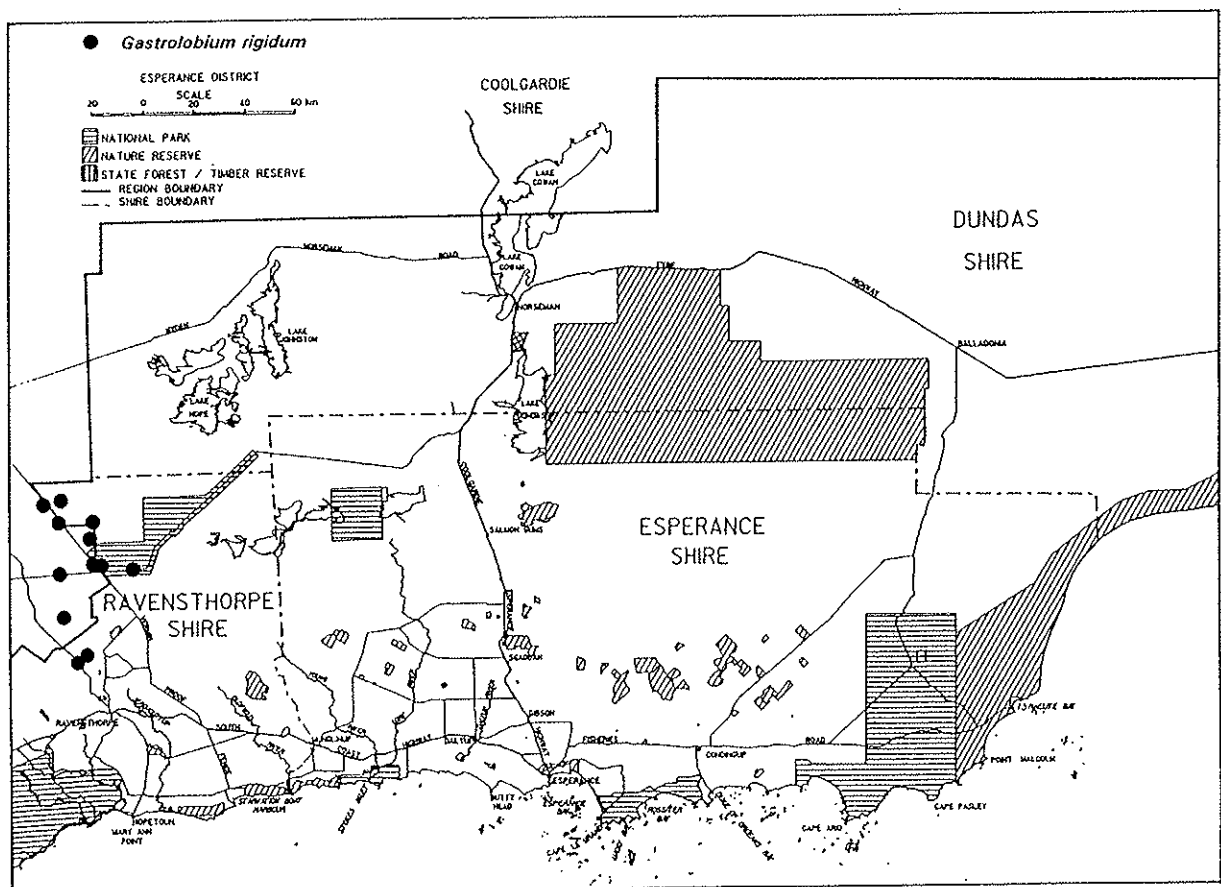
Summary and Recommendations

G. rigidum is very common along disturbed road and track verges on the east and west side of the Vermin Proof Fence, from Mt Gibbs southwards to the Lake King-Norseman Road, including the Frank Hann National Park. It is secure in this National Park, and is not immediately threatened in the Crown Land to the north of the Park.

The deletion of *G. rigidum* from the Priority Flora List is recommended, although some monitoring may be required of the larger form that grows near Tarin Rock.

References

Aplin (1973), Sampson and Hopper (1990).



An erect herb, 0.5-1.5 m tall, with few branches. Leaves are lanceolate to obovate (50-70 x 10-15 mm), shiny, bright green and have toothed margins. Yellow flowers are in elongate clusters (racemes) at the ends of branches, and borne on stalks in the axils of bracts. The base of the calyx has small, linear bracteoles. The corolla is sparsely hairy; the 2 upper corolla lobes are separated much lower than the 3 lower ones. Fruits are narrow, elongate (about 2 cm long) and have 4 locules.

Flowering Period: September - November

Distribution and Habitat

Goodenia quadrilocularis is known only from near-coastal granite rocks in the Cape Arid and Cape Le Grand National Parks, which are nearly 100 km apart. It grows in skeletal soils in rock crevices, often exposed to salt-laden winds.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Frenchman Peak | Esp | Esp | NP | 7.10.92 | 4+ | Good |
| 2 | Mt Le Grand | Esp | Esp | NP | 11.9.71 | - | - |
| 3 | Cape Le Grand | Esp | Esp | NP | 6.10.66 | - | - |
| 4* | Lucky Bay, SW | Esp | Esp | NP | 7.10.92 | 1 | Good |
| 5* | Thistle Cove, E | Esp | Esp | NP | 7.10.92 | 1 | Good |
| 6 | Cape Arid | Esp | Esp | NP | 23.10.60 | - | - |
| 7 | Mt Arid | Esp | Esp | NP | 25.4.93 | 1 000+ | Post-fire |

* = new population

Response to Disturbance

On Mt Arid, this species had flowered and set seed two years after being burnt (January 1991). The abundance of *G. quadrilocularis* post-fire suggests that it may be a coloniser of disturbed sites, becoming less common as plant communities mature.

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

G. quadrilocularis has a very restricted habitat and narrow geographical range.

At present, this species is secure within the two National Parks. Further survey is recommended between Cape Le Grand and Cape Arid.

References

Grieve and Blackall (1982).

Goodenia trichophylla (de Vriese) Benth.

GOODENIACEAE

An erect, open herb, 15-60 cm tall. Basal leaves are crowded, narrow-linear to narrow-lanceolate (4-10 cm) and have entire margins; the stem leaves are scattered and shorter. Flowers are usually single, blue with a yellow or white throat and borne on long stalks in the axils of leaves; the flower stalks have a pair of small bracteoles about halfway. The corolla is variable in size (5-12 mm), the 2 upper lobes are separated much lower than the 3 lower ones. Calyx lobes are acute, without hairs or sparsely covered with short glandular hairs and are half the length of the ovary.

Flowering Period: August - January

Distribution and Habitat

Goodenia trichophylla has a widely scattered distribution, extending from near Kalbarri on the west coast to Albany on the south coast, and east to near Cascade. It grows in sand, clayey sand or sandy loam often with lateritic gravel in low shrubland or heath communities. Associated genera may include *Callitris*, *Verticordia*, *Hakea* and *Malleostemon*.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------|----------|-------|----------------|-------------|---------------|-----------|
| 1 | Fields Rd | Esp | Esp | ?Shire Rd Res. | 9.84 | - | - |
| | | | | | 13.9.92 | Not found | - |
| | | | | | 20.9.93 | - | - |
| 2 | Coujinup Hill,E | Esp | Rav | VCL | 11.12.83 | - | - |
| 3 | Lake King,E | Kat | LG | Shire Rd Res | 22.11.86 | - | - |
| 4 | Lake Grace,W | Kat | LG | - | 10.62 | - | - |
| 5 | Quaranup | Alb | Alb | - | 28.11.78 | - | - |
| 6 | Meenaar | Mdg | Nor | NR | 12.11.86 | Occasional | - |
| 7 | Eneabba,SE | Moora | ?Crw | - | 23.12.80 | - | - |
| 8a | Kalbarri | Ger | Nthn | NP | 8.79 | Occasional | - |
| 8b | Kalbarri,E | Ger | Nthn | ?NP | 30.9.79 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

G. trichophylla appears to be widespread but locally rare. It occurs in two conservation reserves along the west coast of the State. Further survey is required.

References

Burgman (1985b), Grieve and Blackall (1982).

Grevillea superba P.Olde & N.Marriott

PROTEACEAE

[ex. *Grevillea* sp. Scaddan (P.Olde 91/332)]

A robust shrub, 2-3 m tall, without a lignotuber and with emergent floral branches up to 1 m above the shrub. Branchlets are hairy. Leaves (20-70 mm) are almost pinnate with 9-17 primary leaf lobes (5-20 x 1-2 mm) that are linear and smooth; the lower lobes are usually again divided. Clusters of flowers are at the ends of branches and usually 5-10 branched. Flowers are borne on hairy stalks (7-10 mm); the calyx tube (7-10 x 2-4 mm) is whitish over olive green ageing pink, strongly rolled backwards at the tip, densely glandular-hairy on the outside and covered with hairs over most of the inside except for the tip; the style is cream or pink and red at the end, gently curved and dilated at the tip; the pollen presenter is lateral and flat to convex. Fruits are subglobular (17 x 15 mm) and rough with 2 prominent swellings towards the end and a persistent, fragile style.

Grevillea superba is closely related to *G. plurijuga* which has trigonous leaf lobes that are undivided at the base, and its flowers are usually within the shrub.

Flowering Period: October - December

Distribution and Habitat

G. superba is distributed between Scaddan and Mt Ney, a range of 70 km. It grows in white sand over pale-brown, calcareous loam in *Eucalyptus* shrubland.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Grass Patch Rd | Esp | Esp | - | 13.10.91 | - | - |
| 2 | Grass Patch,N | Esp | Esp | - | 3.10.85 | - | - |
| 3 | Mt Burdett Rd | Esp | Esp | - | 13.11.86 | - | - |
| 4 | Mt Ridley,N | Esp | Esp | VCL | 15.10.70 | - | - |
| 5 | Kau Rock Rd | Esp | Esp | - | 20.9.85 | - | - |
| 6 | Scaddan,N | Esp | Esp | - | 2.12.69 | - | - |
| 7 | Norwood Rd | Esp | Esp | - | - | - | - |
| 8 | Truslove NR | Esp | Esp | - | - | - | - |

Response to Disturbance

Appears to be a short-lived perennial that regenerates from seed after fire (Olde and Marriott 1993).

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

Olde and Marriott (1993) indicate that 30 specimens were examined for their species description, which suggests that *G. superba* is relatively common. They indicated, however, that many of the plants in the road reserves around Scaddan appeared to be dying when surveyed in 1992. Research to determine the reproductive biology of *G. superba* and monitoring of known populations is required.

References

Olde and Marriott (1993).

An inconspicuous annual herb, 2-8 cm tall, with stems and leaves covered in cobwebby, filamentous hairs that become flattened at the base. Leaves are continuous with the branch, lanceolate or linear (3-7 x 0.5-1 mm), hairless or cobwebby, the lower ones are opposite and joined together at the base. The flower heads (2-3 mm diameter) are virtually without stalks and solitary in the axils. The involucre bracts (15-20) are arranged in 3 rows with all bracts prominently incurved and having ciliate margins. The florets just exceed the involucre; the outer florets (22-49) are female and threadlike; the inner bisexual florets (7-11) have a cylindrical corolla (1.5 mm) that has 4 very short lobes. Pappus are absent.

Flowering Period: September - November

Distribution and Habitat

Haegiela tatei is widely dispersed in Western Australia, South Australia and western Victoria, south of latitude 31°S. It is apparently restricted to saline habitats.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Mt Ney,N | Esp | Esp | VCL | 26.8.84 | - | - |
| 2 | Truslove | Esp | Esp | NR | 8.11.79 | - | - |
| 3a | Peak Eleanor,S | Esp | Esp | NP | 8.11.79 | - | - |
| 3b | Fields Rd | Esp | Esp | VCL | 26.9.84 | - | - |
| 4 | Jyndabinbin Rocks,E | Esp | Dund | NR | 22.9.80 | - | - |
| 5 | Sinclair Soak,E | Esp | Dund | VCL | 20.9.80 | - | - |
| 6 | Salt River Rd | Alb | Gno | NP | 10.11.86 | - | - |
| 7 | Ellen Peak,SE | Alb | Gno | - | 28.10.83 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

H. tatei is widespread in Western Australia, and being inconspicuous is probably poorly collected rather than rare. It should remain secure within two Nature Reserves and two National Parks. Further opportunistic survey is required.

References

Short and Wilson (1990).

Isolepis sp. Kau Rock (M.A.Burgman 1515)

CYPERACEAE

Currently there is no specimen of this taxon available in the Western Australian Herbarium.

Flowering Period: Unknown

Distribution and Habitat

Isolepis sp. Kau Rock is known from two localities, about 160 km apart. One locality is near the upper reaches of the Young River and the other is a herbfield near Kau Rock.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Coujinup Hill,E | Esp | Rav | VCL | 6.83 | - | - |
| 2 | Kau Rock | Esp | Esp | VCL | 9.84 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

According to Burgman (1985b), this taxon appears to be restricted to rocky outcrops in well watered micro-habitats. It is an inconspicuous annual and may be more widespread than collections (or lack of them) indicate. It is not known to occur in any conservation reserve.

A search for Burgman's specimens, which are possibly in storage at the Western Australian Herbarium, is urgently required. Further survey cannot be carried out until a specimen is available.

References

Burgman (1985b).

Isopogon alcornis Diels

PROTEACEAE

Elkhorn Coneflower

A dwarf shrub, 25-40 cm tall, with thick underground stems giving a suckering habit. The lower leaves on the stubby stems are narrow, widening towards the tip (up to 10 cm long including a long leaf stalk) and entire; the upper, floral leaves (up to 20 cm) are erect, flat, forked into 3 irregular lobes which look like antlers, leathery in texture and hairy on both sides. The yellow flower heads form egg-shaped cones (about 5 cm diameter) which are hidden in the foliage close to the ground; the tube and 4-perianth segments of individual flowers (2 cm long) are hairy, the end of each segment has a spoon-shaped cavity which holds an anther. Dried cones (fruits) have scars where the scales have fallen.

Flowering Period: October - November

Distribution and Habitat

Isopogon alcornis is distributed over about 140 km, between Gibson and Mt Baring. It grows in sand in open mallee and heath communities.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------|----------|-------|---------------|-------------|---------------|-----------|
| 1 | Mt Baring | Esp | Esp | NP | 25.4.93 | 1+ | Healthy |
| 2 | Mt Burdett | Esp | Esp | NR | 30.1.93 | 50+ | Good |
| 3 | Norwood Rd | Esp | Esp | VCL | 5.9.85 | 2 | - |
| | | | | | 25.9.92 | 1 | Dead |
| 4 | Gibson,N | Esp | Esp | - | 12.12.85 | 1 | - |
| 5 | Muntz Rd | Esp | Esp | NR | 14.11.93 | 100+ | Good |
| 6a | Scaddan Rd | Esp | Esp | Shire Rd Res. | 20.8.82 | - | - |
| | | | | | 24.9.92 | Not found | - |
| 6b* | Scaddan Rd | Esp | Esp | Shire Rd Res. | 24.9.92 | 1 | Fair |

* = new sub-population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Field observations suggest high susceptibility.

Summary and Recommendations

Surveys of Scaddan and Norwood Roads in 1992 found that where the known populations previously occurred, there were dead plants of the Proteaceae family, suggesting *Phytophthora* dieback may be present, and no live plants were located.

An erect, spreading shrub, 15-60 cm tall, with numerous branches. Leaves are alternate, broadest towards the point of attachment (ovate, 25-40 x 8-15 mm) and have margins that are slightly rolled backwards; the upper surface is green and lacks hairs while the underside is pale green with a dense cover of matted, stellate hairs. Flowers are borne in an elongate cluster (raceme); sepals (4-5 mm) are cream, with matted stellate hairs forming a dense cover on the outside and being only scattered on the inner surface with the greatest density towards the tip; petals are minute and hairless; anthers and their filaments are about equal in length. The ovary is densely silky-hairy; the style is without hairs.

Flowering Period: September - January, April

Distribution and Habitat

Lasiopetalum maxwellii occurs on or near granite outcrops in coastal areas between Cape Le Grand and Cape Arid. It grows in sandy skeletal soil in rock crevices and hollows, often exposed to salt-laden winds.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Lucky Bay | Esp | Esp | NP | 6.10.92 | 100+ | Good |
| 2 | Thistle Cove | Esp | Esp | NP | 7.10.92 | 2 000+ | Good |
| 3 | Cape Le Grand | Esp | Esp | NP | 7.4.66 | - | - |
| 4* | Frenchman Peak,NE | Esp | Esp | NP | 7.10.92 | 2 | Good |
| 5* | Jenamullup Creek,W | Esp | Esp | NP | 26.4.93 | 500+ | Good |
| 6* | Cape Arid | Esp | Esp | NP | 26.4.93 | Frequent | Good |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

L. maxwellii is abundant and secure on granite headlands in the Cape Le Grand National Park; it is also frequent in Cape Arid National Park. Further opportunistic survey along the coast east of Esperance is recommended.

The genus *Lasiopetalum* is currently under revision (C. Wilkins, personal communication). Further taxonomic work may determine the extent and status of this species.

References

Blackall and Grieve (1974).

A spreading, tufted sedge, up to 1 m tall and 1 m diameter. Culms are cylindrical (0.5-1.3 mm diam.), erect, dull green, smooth or pitted, have 5-10 internodes apically increasing in length (to 15 cm). Sheaths (3-20 mm) are brown and held close to the culm except when subtending a branch; the apex is acute when young and withers with age. The inflorescence is panicle-like (2-10 cm), with flowers crowded on the culm or at the ends of short side branches. Flowers have rigid, brown tepals; outer tepals are lanceolate (3.5 mm) and keeled; inner tepals are slightly shorter and concave to flat, broad lanceolate. Seeds are white and crescent-shaped (1 mm).

Flowering Period: September - November

Distribution and Habitat

Lepyrodia fortunata ms is known from two localities 40 km apart, in Cape Le Grand National Park and near Condingup. It grows in peaty sand in swamps behind foredunes, associated with *Agonis parviceps* and sedges.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Lucky Bay | Esp | Esp | NP | 10.9.66 | - | - |
| 2 | Thistle Cove,N | Esp | Esp | NP | 19.10.89 | - | - |
| ?3 | Condingup Hill,N | Esp | Esp | - | 10.11.80 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

L. fortunata ms should remain secure in the Cape Le Grand National Park. In spring 1992, a survey failed to relocate the population near Condingup Hill; the plant community described by Newbey (KRN 7942) was not evident at the locality stated. Further survey is required.

An erect shrub, about 30 cm tall. Leaves are held erect, concave, elliptic (10 x 2 mm), stalked, and have a rigid, sharp point. On the lower side of the leaf there are 3 parallel central veins and other veins branching towards the margin. The white flowers are erect with 2 or 3 borne together on short, finely-hairy stalks in the axils of leaves; the corolla tube is longer than the obtuse sepals and bracteoles; anthers are without sterile tips and extend beyond the corolla; the ovary has 5 cells; and, the style is long, slender and lacks hairs.

Flowering Period: October

Distribution and Habitat

The type of *Leucopogon breviflorus* held at Kew is a mixed collection of specimens collected by George Maxwell last century. One was collected near Israelite Bay and the other from the Stirling Range. The 'Israelite Bay' *L. breviflorus* is widespread in the Goldfields and Esperance Districts where it usually occurs in rocky areas growing in red-brown clayey sand; as well, it has been found in white aeolian sand near a small lake, and in deep yellow sand. It occurs in mallee, open shrub or thicket communities.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------------|----------|-------|-----------------|-------------|---------------|-----------|
| 1 | Israelite Bay | Esp | Esp | NR | 21.4.93 | 100+ | Good |
| 2* | Daringdella Lake | Esp | Esp | NR | 20.4.93 | 1 000+ | Good |
| 3* | Mt Baring | Esp | Esp | NP | 25.4.93 | 20+ | Good |
| 4* | Tweedale Rd | Esp | Esp | NR | 14.11.93 | 20+ | Good |
| 5 | McDermid Rock,E | Esp | Dund | VCL | 16.7.79 | - | - |
| 6 | Walyahmoning Rock,N | Gold | MtM | - | 22.9.82 | - | - |
| 7 | Illaara Station | Gold | Men | Pastoral Lease | 12.9.88 | Frequent | - |
| 8 | Bungalbin Hill | Gold | MtM | - | 2.1.89 | Frequent | - |
| 9 | Mt Jackson,E | Gold | MtM | - | 4.5.78 | Common | - |
| 10 | Mt Jackson,S | Gold | MtM | ?Pastoral Lease | 28.11.81 | Common | - |
| 11 | Whitewells Station | ?Gold | Per | Pastoral Lease | 22.11.92 | Occasional | - |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible.

Summary and Recommendations

L. breviflorus has been poorly known and difficult to identify taxonomically. It appears to be widely scattered through the South Coast and Goldfields Regions and should remain secure in two Nature Reserves and one National Park. Taxonomic work to lectotypify the species and confirmation of herbarium specimens is required (J. Powell, personal communication).

References

Bentham (1869), Blackall and Grieve (1981).

Leucopogon interruptus R.Br.

EPACRIDACEAE

A shrub to 1.5 m tall with erect branches. Leaves are mostly crowded at the end of each year's shoot, apparently in whorls, almost oval to oblong-elliptical (about 25 mm long), flat, hairless and finely nerved. Clusters of flowers (spikes) are at the ends of branches, slender and interrupted, but not exceeding the leaves. Flowers are small and numerous; bracts and bracteoles are less than half the length of the calyx; the corolla tube is shorter than the calyx; the ovary is globular, 5-celled and the style short.

Flowering Period: August - September

Distribution and Habitat

Leucopogon interruptus is known only from a few islands in the Archipelago of the Recherche and from Mt Manypeaks east of Albany. It grows in grey sand over granite rocks in mixed vegetation of dense shrub mallee and *Allocasuarina-Melaleuca* thickets.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Nth Twin Peak Is. | Esp | Esp | NR | 30.4.72 | - | - |
| 2 | Middle Island | Esp | Esp | NR | 22.11.73 | - | - |
| 3 | Sandy Hook Island | Esp | Esp | NR | 1.5.82 | - | - |
| 4 | Mt Manypeaks | Alb | Alb | NP | 17.7.86 | Common | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible.

Summary and Recommendations

A large sector of Middle Island was burnt in 1977; resurvey and monitoring of this population is recommended. Further survey of other islands in the Archipelago of the Recherche is required.

References

Bentham (1869), Blackall and Grieve (1981).

An erect, open or compact, harsh, prickly shrub, 0.5-1.5 m tall and 1.5 m wide. Young branches are covered with short, soft, white hairs. Leaves are closely overlapping, lanceolate (7-12 x 1.5-2.5 mm), often broader at the base (ovate) tapering towards the tip to a long sharp spine, concave, and with many fine near-parallel veins on the under side. Clusters (spikes) of 3 or 4, cream-coloured flowers are borne in axils of the leaves; sepals are obtuse with long hairs around the margins and are sometimes covered in woolly hairs; the ovary is 5-celled and the style long and slender. Fruits are globular (5 mm), pale green with a red apex when young turning whitish.

Flowering Period: November - January

Distribution and Habitat

Leucopogon multiflorus is distributed between Mid Mt Barren in the Fitzgerald River National Park and Cape Arid. It grows in shallow sandy soil over granite or quartzite, in low coastal scrub.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1a | Thistle Cove | Esp | Esp | NP | 8.10.92 | 10+ | Good |
| 1b | Thistle Cove,E | Esp | Esp | NP | 7.10.92 | 10+ | Good |
| 2 | Lucky Bay | Esp | Esp | NP | 21.1.66 | - | - |
| 3 | Mt Le Grand | Esp | Esp | NP | 19.7.82 | - | - |
| 4* | Hellfire Bay,E | Esp | Esp | NP | 7.10.92 | 30+ | Good |
| 5 | Mt Arid | Esp | Esp | NP | 23.11.85 | Occasional | - |
| 6 | Mid Mt Barren | Alb | Alb | NP | 16.7.70 | - | - |
| 7 | King George's Sound,E | Alb | Alb | - | - | - | - |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible.

Summary and Recommendations

L. multiflorus is known to occur in three National Parks (Cape Arid, Cape Le Grand and Fitzgerald River). It is frequent on near-shore granite slopes in the Cape Le Grand National Park and is not immediately threatened. A fire burnt Mt Arid in January 1991; resurvey of this population (no. 5) is recommended, to determine the response of *L. multiflorus* to fire. Further survey is required.

References

Bentham (1869), Blackall and Grieve (1981).

An erect, open shrub 0.3-1.0 m tall, with numerous branches from the base. Leaves are broadly oblong (2.5-4 x 1.5-2 mm), thick and have a distinct stalk (2 mm); the upper surface is dull green and minutely hairy, while the under side is paler and has 2 longitudinal furrows. The white flowers are in dense clusters at the ends of branches. Sepals are brown, less than half the length of the corolla-tube, and have hairy margins; the corolla tube (3-4 mm) is white turning orange when dry, anthers are attached above the middle on the inside and lack sterile tips; the ovary is very hairy, 1-celled and has a long, slender, hairy style.

Flowering Period: April

Distribution and Habitat

Leucopogon pleurandroides was first collected by George Maxwell last century at "Moirs Inlet", which is most likely Stokes Inlet, however no other collections have been made there. Otherwise, it is known from three widespread localities, distributed over about 270 km, near Starvation Boat Harbour, west of Cascade, and north-west of Sheoaks Hill in the Cape Arid National Park. It grows on fine calcareous loam (marl) in open woodland and low shrub in association with *Banksia media*, *Nematolepis phebaloides*, *Styphelia hainesii* and *Melaleuca* spp.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-------------------------|----------|-------|-------------|-------------|---------------|------------|
| 1 | ?Stokes Inlet | Esp | Esp | NP | 1800s | - | - |
| 2 | Starvation Boat Harbour | Esp | Rav | Shire Res. | 8.9.93 | 100+ | Post-dist. |
| 3 | Cheadanup | Esp | Rav | NR | 26.3.83 | - | - |
| 4* | Sheoaks Hill,NW | Esp | Esp | NP | 22.4.93 | 2 000+ | Good |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible.

Summary and Recommendations

The discovery of a large population in Cape Arid National Park during a survey in autumn 1993 suggests that this taxon may be more widespread than implied by the collections to date. Further survey is required.

References

Bentham (1869), Blackall and Grieve (1981).

Leucopogon rotundifolius R.Br.

EPACRIDACEAE

An erect, bushy shrub, to 1 m tall. Leaves are erect or spreading, spoon-shaped (spathulate, 6-12 x 3-5 mm), obtuse or with a small callous point, flat or slightly concave, stalked, pale green and have margins that are translucent. Small, pale yellow-green flowers are borne with 1 to 3 on a short stalk in the axils of leaves. The bracteoles are short and the sepals are less than half the length of the corolla tube; the corolla lobes are long and eventually curve backwards to the sepals. Anthers are attached above the middle of the tube and are without sterile tips; the ovary is 5-celled and tapers into a rather long style.

Flowering Period: January

Distribution and Habitat

Leucopogon rotundifolius occurs between Arid Bay and Cape Le Grand National Park, and on Middle Island. It grows in shallow sandy soils on near-shore granite outcrops in coastal scrub, and on deeper sand in open heath scrub.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------------|----------|-------|------------------|-------------|---------------|-----------|
| 1 | Arid Bay | Esp | Esp | NP | 12.6.85 | Common | - |
| 2a | Lucky Bay | Esp | Esp | NP | 21.1.66 | - | - |
| 2b | Frenchman Peak,N | Esp | Esp | NP | 18.11.79 | - | - |
| 2c | Mt Le Grand | Esp | Esp | NP | 6.10.92 | 200+ | Good |
| 2d | Le Grand Beach,N | Esp | Esp | NP | 9.10.92 | 3 | Good |
| 2e | Thistle Cove | Esp | Esp | NP | 7.10.92 | 20+ | Good |
| 2f* | Hellfire Bay | Esp | Esp | NP | 7.10.92 | 50+ | Good |
| 3a | Duke of Orleans Bay | Esp | Esp | Shire Recr. Res. | 17.7.82 | Common | - |
| 3b | Duke of Orleans Bay | Esp | Esp | Shire Recr. Res. | 18.7.82 | Common | - |
| 4 | Middle Island | Esp | Esp | NR | 22.11.73 | - | - |

* = new sub-population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible.

Summary and Recommendations

L. rotundifolius is very common in the Cape Le Grand National Park, occurring on most of the granite outcrops. As well, it grows in the Cape Arid National Park and on a Nature Reserve, where it should remain secure.

References

Bentham (1869), Blackall and Grieve (1981).

Levenhookia pulcherrima Carlquist

STYLIDIACEAE

Beautiful Stylewort

A small, erect annual herb, 3-5 cm tall, with red stems and very glandular herbage. Flowers are rose to pale pink with large and markedly notched corolla lobes; the upper corolla lobes have W-shaped red markings near the base; the corolla tube is longer than the calyx lobes. The stout, erect column is covered by a sensitive hood-like labellum that springs away and downwards when touched releasing the column and anthers. The stigmas are dissimilar; the lower one is straight while the upper is curved backwards towards the tube.

Flowering Period: October - November

Distribution and Habitat

Levenhookia pulcherrima is known from only three localities; two are within or near the Frank Hann National Park, while the other occurs nearly 70 km to the south, adjacent to the Phillips River. It grows in sand overlying granite in *Allocasuarina* woodland with *Grevillea hookeriana*, *Calytrix* and *Baeckea*, or in mallee heath.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|---------------|-------------|---------------|-----------|
| 1 | Mt Gibbs, SE | Esp | Esp | ?VCL & NP | 14.11.79 | Frequent | - |
| 2 | Frank Hann | Esp | Esp | NP | 27.10.75 | 1 000s | - |
| 3 | Phillips River | Alb | Alb | ?MRWA Rd Res. | 11.10.74 | - | - |

Response to Disturbance

Probably a disturbance opportunist.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

L. pulcherrima is poorly known and possibly rare; it has not been collected for more than 14 years. In 1975, it was observed to be regenerating in mallee heath after a fire in Frank Hann National Park. Further survey is required.

References

Grieve and Blackall (1982).

Melaleuca fissurata Barlow

MYRTACEAE

A large shrub, to 4 m tall. Leaves are near-opposite with alternate pairs at right angles to each other, elliptical (3-5 x 2 mm), concave, curve backwards from the obtuse tip and are dull green in colour. Flowers are white or yellow and borne in dense, semi-globular clusters of 5-15 flowers on one side of old, corky wood. Staminal bundles are 12-15 mm long; the ovary is densely covered in short, white hairs. Fruits (5 x 7 mm) are 3-valved, with 5 short (1 mm), triangular lobes.

Flowering Period: September

Distribution and Habitat

Melaleuca fissurata is distributed over 300 km, from near Lake King to Clyde Hill. It grows in well-drained, aeolian loamy sand on the margins of salt lakes or along drainage lines in open shrub mallee and tall shrubs. It may be associated with *Eucalyptus transcontinentalis*, *E. goniantha* and *Melaleuca* spp.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|---------------|-------------|---------------|-----------|
| 1 | Frank Hann | Esp | Rav | NP | 13.8.79 | - | - |
| 2a* | Clyde Rock Rd | Esp | Esp | VCL | 20.5.93 | 20+ | Good |
| 2b | Clyde Rock Rd | Esp | Esp | VCL | 20.5.93 | 100+ | Good |
| 3 | Mt Ney Rd | Esp | Esp | ?NR | 3.8.83 | - | - |
| 4 | Mt Ridley,SSW | Esp | Esp | Shire Rd Res. | 25.9.92 | 3 | Good |
| 5 | Cox Rd | Esp | Esp | NR | 22.9.92 | 1 000+ | Good |
| 6 | Truslove,E | Esp | Esp | NR | 22.9.92 | 20+ | Good |
| 7 | Lignite Rd | Esp | Esp | ?VCL | 17.11.92 | 1 000+ | Good |
| 8 | Truslove Rd | Esp | Esp | Shire Rd Res. | 22.9.92 | 20+ | Good |
| 9 | Lake King,WSW | Kat | LG | - | 10.8.68 | - | - |
| 10* | Ridley Rd | Esp | Esp | NR | 23.9.93 | 50+ | Good |
| 11* | Clyde Hill,NW | Esp | Esp | VCL | 21.5.93 | 100+ | Good |
| 12a* | Mt Heywood,NW | Esp | Esp | VCL | 22.5.93 | 20+ | Good |
| 12b* | Mt Heywood,NW | Esp | Esp | VCL | 22.5.93 | 500+ | Good |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Melaleuca viminea subsp. *appressa* Barlow

MYRTACEAE

A shrub, 1.3-4.5 m tall. Leaves are arranged spirally and held close to the stem, linear to narrow-elliptic (5-9 x 0.6-2 mm), rounded at the apex and slightly curved inwards, veins and glands are rarely seen. Elongate clusters (8-40 mm) of 10-50 flowers occur at both the base and tips of branches; bracts (1.5-4 x 1-2 mm) are persistent to flowering; sepals are triangular (1 mm) and have membranous margins. There are 8-11 cream-coloured stamens (5 mm including claw) per bundle. Fruits are shortly cylindrical to bell-shaped (3-4 x 2-4 mm) and bluntly toothed at the rim.

Melaleuca viminea subsp. *appressa* differs from the other subspecies by its leaves which are pressed closely to the stem and the floral parts which are distinctly shorter.

Flowering Period: September - October

Distribution and Habitat

M. viminea subsp. *appressa* is known from near Ongerup, Mt Burdett and north-west of Skeleton Rock, a distribution of over 100 km. It grows near creeks or wet depressions in clayey soils, possibly associated with granite.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Mt Burdett | Esp | Esp | NR | 28.9.88 | - | - |
| 2 | Skeleton Rock,NW | Mer | Yil | - | 8.10.86 | - | - |
| 3 | Ongerup,E | Alb | Jer | - | 21.10.75 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

Further survey is required.

References

Quinn *et al.* (1992).

Melaleuca sp. Ravensthorpe (M.A.Burgman 4018)

MYRTACEAE

Burgman (1985b) lists five specimens which he considers to be this taxon. Two have since been identified as *Melaleuca pauperiflora* subsp. *pauperiflora* (M.A.Burgman 4551 and K.R.Newbey 2764) and one as subsp. *fastigiata* (M.A.Burgman 3572b). These taxa are not considered endangered.

Currently, M.A.Burgman 4018 and 3645 have not been located in the Western Australian Herbarium so their taxonomic status cannot be determined.

Flowering Period: September - October

Distribution and Habitat

The two unidentified specimens of *M.* sp. Ravensthorpe occur south-west of Peak Charles.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Fields Rd | Esp | Esp | NP | 9.84 | - | - |
| 2 | Rawlinson Rd | Esp | Esp | ?NR | 10.84 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

It is probable that once the Burgman specimens are located, *M.* sp. Ravensthorpe will be identified as one of the subspecies of *M. pauperiflora* which are not Priority taxa. According to Burgman (1985b) the taxon is widespread in the Cascades area. No further survey is recommended until the original specimens have been examined.

References

Burgman (1985b).

A slender, erect shrub, to 2 m tall, which adopts a weeping habit with age. The linear leaves (5-7 mm) are in whorls of 3, flat or concave, and have a rounded apex. The small pale blue buds and white flowers are in groups of 3 toward the branch tips; the upper lip of the corolla forms a small hood, while the lower lip is much longer. The outer surface of the corolla is mostly hairy; the calyx has a fringe of hairs on the margin and is otherwise shiny.

Microcorys virgata is closely related to *M. barbata* which has a calyx covered in long white silky hairs, and to *M. glabra* which lacks hairs on the calyx and corolla.

Flowering Period: August - January, May

Distribution and Habitat

M. virgata is distributed between Albany and Cape Arid. It grows in a variety of habitats, including sandy soil over granite, limestone or quartzite, and clay loam. It occurs on lower slopes of mountains and on plains in woodland, shrub mallee and heath communities.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------------|----------|-------|----------------|-------------|---------------|-----------|
| 1* | Fisheries Rd | Esp | Esp | Shire Rd Res. | 19.4.93 | 1 | Good |
| 2 | Coujinup Hill,NE | Esp | Rav | VCL | 11.12.83 | - | - |
| 3 | East Mt Barren | Alb | Rav | NP | 19.11.85 | Rare | - |
| 4 | Willyung Hill | Alb | Alb | Private | 25.8.92 | 4 | Healthy |
| 5 | Chillinup Rd | Alb | Alb | Shire Rd Verge | 1.9.92 | 20 | Healthy |
| 6 | Kojonup Springs Rd | Alb | Alb | Shire Res. | 9.2.93 | 11 | Healthy |
| 7 | Hamilla Hill | Alb | Cbk | NP | 24.8.93 | 1 | - |
| 8 | Wedge Hill | Alb | Plgt | NP | 12.5.82 | - | - |
| 9 | Woodjenilup | Alb | ?Alb | Shire Rd Res. | 22.10.85 | - | - |
| 10 | Mt Groper | Alb | Alb | VCL | 16.1.85 | Scattered | - |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

M. virgata appears to be widespread but never common. Verification of specimens in the Western Australian Herbarium is required, as a number of collections have been confused with *M. barbata* and *M. glabra*. Further opportunistic survey is required.

References

Blackall and Grieve (1981), Burgman (1985b), Robinson and Coates (1995).

Monotaxis sp. Ravensthorpe (M.A.Burgman 2154)

EUPHORBIACEAE

[ex. *Amperea* sp. Ravensthorpe (M.A.Burgman 2154)]

A small, inconspicuous annual. Flowers are in dense, head-like, terminal clusters (cyme). Male flowers have 4 or more stamens that are free and have 2-celled anthers opening in longitudinal slits. Female flowers have their styles divided into 2.

Flowering Period: September - October

Distribution and Habitat

Monotaxis sp. Ravensthorpe is known from only two localities about 80 km apart, south of Peak Eleanora and near the Oldfield River. It grows in pale brown sand in very open shrub mallee and dense low heath.

Another population, whose identification is in doubt, may occur near Red Peak in the Fitzgerald River National Park.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Ravensthorpe,E | Esp | Rav | - | 6.9.83 | - | - |
| 2 | Peak Eleanora,SSE | Esp | Esp | VCL | 27.9.84 | - | - |
| ?3 | Red Peak,WNW | Alb | Jer | NP | 13.10.78 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

The general areas of the two populations in the Esperance District were surveyed in September 1992, however this taxon was not found. Further survey is required.

References

Blackall and Grieve (1974), Burgman (1985b).

An erect shrub, 0.8-1.0 m tall, which is covered in long, glandular hairs. Stems are softly-hairy, pale yellow when young, becoming purplish with age. Leaves are alternate, scattered, lack stalks, flat, oblong (6-35 x 1-10 mm), grey-green on both sides, and have a stout midvein; margins are divided into small, pointed lobes (saw-toothed). The classic daisy flower heads (26-35 mm diameter) are borne singly on long stalks (to 25 mm), in the axils of leaves at the ends of branches. The whorl of bracts surrounding the base of the flower head (involucre) is hemispherical in shape. The ray florets ('petals') number 35-43 and are lilac-coloured; the disc florets number 53-90 and are white below and yellow above; the pappus has about 20 long bristles.

Olearia laciniifolia is similar to *O. rudis* which has a number of flower heads in a leaf axils, 39-75 ray florets, 86-241 disc florets and the pappus has 31-42 long bristles and 10-14 much shorter ones.

Flowering Period: June - November

Distribution and Habitat

O. laciniifolia occurs north-east and north-west of Clyde Hill and between Lake Grace and Lake King. It grows on white sand amongst mallee and *Melaleuca* shrubland around playa lakes.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Clyde Hill,NE | Esp | Esp | ?Private | 6.83 | - | - |
| 2a* | Clyde Hill,NW | Esp | Esp | VCL | 21.5.93 | 100+ | Post-fire |
| 2b* | Clyde Hill,NW | Esp | Esp | VCL | 21.5.93 | 1+ | Post-fire |
| 3* | Peak Charles | Esp | Esp | NP | 18.9.93 | 1 | Post-fire |
| 4 | Lake Grace,E | Kat | LG | ?Rd Res. | 22.9.66 | - | - |
| 5 | Lake King | Kat | LG | - | 11.30 | - | - |
| 6 | 258 mile peg | Kat | LG | - | 24.9.63 | - | - |
| 7 | Dowels-Lake King Rd | Kat | LG | - | - | - | - |
| 8 | Kukerin,W | Kat | Dum | - | 11.9.75 | - | - |

* = new population

Response to Disturbance

Its occurrence after fire at populations 2 and 3 suggests this species is a disturbance opportunist.

Susceptibility to *Phytophthora* Dieback

Unknown

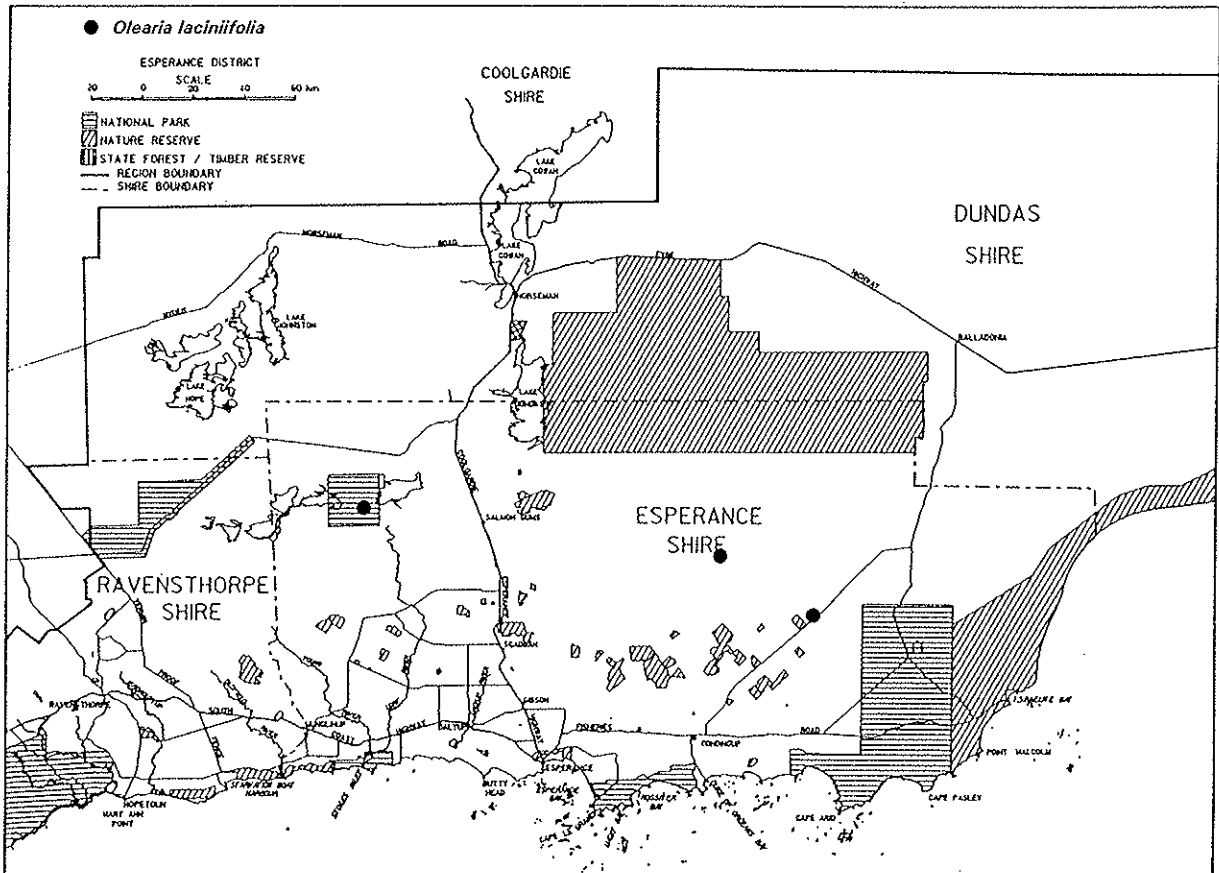
Summary and Recommendations

Although *O. laciniifolia* is widely distributed, there are few collections. Within the Katanning District, it has not been collected for nearly 20 years. Most of its known distribution is within agricultural areas which would make this taxon vulnerable.

In autumn 1993, new populations were located north-west of Clyde Hill and south of Peak Charles, both areas had been recently burnt (January 1991).

References

Lander (1990).



Opercularia hirsuta F.Muell.

RUBIACEAE

Silky-haired Stinkweed

An erect herb, about 30 cm tall, with straight and slender stems. The stems and foliage are covered with long, soft almost silky hairs. The few leaves are linear (12-28 mm) with an obtuse apex. Flower heads are globular, on erect stalks, and have numerous small flowers; the calyx-tubes are joined, and the calyx-lobes are scarcely as long as the silky-hairy corollas. Seeds are oblong-egg-shaped, obtusely 4-angled and wrinkled except for the 2 lateral smooth angles.

Flowering Period: September - October

Distribution and Habitat

Opercularia hirsuta apparently occurs between the Oldfield River and Lucky Bay and extends north to Peak Charles. It grows in shallow soil over granite, in low shrub communities.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Mt Le Grand | Esp | Esp | NP | 7.10.66 | - | - |
| 2 | Lucky Bay | Esp | Esp | NP | 7.10.92 | 1 | Good |
| 3* | Thistle Cove | Esp | Esp | NP | 7.10.92 | 2 | Good |
| 4* | Peak Charles | Esp | Esp | NP | 18.9.93 | 500+ | Post-fire |
| 5 | Esperance Bay | Esp | Esp | - | 1800s | - | - |
| 6 | Young River | Esp | Esp | - | 1800s | - | - |
| 7 | Oldfield River | Esp | Rav | - | 1800s | - | - |

Response to Disturbance

It may be a disturbance opportunist, as a large population was found after a hot fire burnt Peak Charles in January 1991.

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

O. hirsuta is poorly known, although it was collected four times by George Maxwell last century.

The taxonomic distinction between *O. hirsuta* and some other *Opercularia* is unclear; inspection of the type specimen is required to verify collections in the Western Australian Herbarium (G. Keighery, personal communication). A number of plants with affinity to the described taxon, but less hairy, were found during recent surveys (not included in table).

References

Bentham (1867), Grieve and Blackall (1982).

Opercularia rubioides Juss.

RUBIACEAE

An erect, rather stout and rigid plant, 3-6 cm tall, with numerous woody, hairless stems arising from the base. Leaves are lanceolate (10-25 mm), acute at the apex, lack stalks, and have margins that curve backwards; the upper surface is covered in short, stiff hairs that are rough to touch (scabrous). Flowers are numerous in globular heads which are borne on very short, recurved stalks and subtended by 2 floral leaves; the calyx lobes are lanceolate.

Flowering Period: October - November

Distribution and Habitat

Opercularia rubioides was described from a specimen collected last century by Drummond "towards Cape Riche". Currently, it is known only from three localities, near Cascade and north of Jerramungup. Near Lake Cairlocup it grows on a broad valley floor in deep, white siliceous sand associated with *Eucalyptus redunca* mallee.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Griffiths Rd | Esp | Esp | Private | 16.10.68 | ?Cleared | - |
| 2 | Lake Cairlocup | Kat | Kent | NR | 1.84 | Rare | - |
| 3 | Jerramungup,NE | Alb | Jer | - | 30.10.65 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

O. rubioides is an inconspicuous plant which may account for the lack of collections. The location where it was collected near Griffiths Rd in 1968 has probably been cleared for agriculture, however other populations may occur in a nearby Nature Reserve.

Surveys in the Cascade area in 1992 and 1993 failed to locate this species. Further survey is required.

References

Bentham (1867), Grieve and Blackall (1982).

***Paracaleana* sp. Nuytsland (A.P.Brown s.n.)**

ORCHIDACEAE

Esperance Duck Orchid

A small, inconspicuous orchid, 9-10 cm tall, with 1 or 2 flowers. Leaves are 10-15 x 3-7 mm. Flowers (15-18 x 8-12 mm) are reversed compared to a typical orchid and have green, broad spreading column wings which form a pouch almost enclosing the stigma. The unusual labellum is insect-like and flicks over when touched.

This taxon resembles *Paracaleana linearifolia* ms, but differs in having a narrower labellum and deeply cleft column wings.

Flowering Period: November

Distribution and Habitat

P. sp. Nuytsland is known from only one locality, about 150 km east of Esperance. It grows in sandy soil above a winter-wet flat.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Nuytsland | Esp | Esp | NP | 9.83 | 50+ | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

P. sp. Nuytsland should remain secure in Cape Arid National Park. Currently there is no specimen in the Western Australian Herbarium. Further survey is required.

References

Hoffman and Brown (1992).

Patersonia inaequalis Benth.

IRIDACEAE

Unequal Bract Patersonia

Plants forming small clumps, 30 cm tall. Leaves have parallel veins and are hairy near the base. The flower stalks are leafless and lack hairs. The white or yellow flowers have a narrow, tubular perianth with 3 broad, spreading lobes; the second outer bract is attached higher than the first. The staminal tube is long and there are 3 stamens; the inferior ovary is 3-celled.

Flowering Period: August - October

Distribution and Habitat

Patersonia inaequalis occurs in Cape Le Grand National Park and on Mondrain Island in the Archipelago of the Recherche. Last century the type was collected by G. Maxwell near Stokes Inlet, however it has not been recorded from there since. *P. inaequalis* grows in shallow sand over laterite or sand over granite rock, in coastal scrub heath, associated with *Banksia speciosa*, *Lambertia inermis* or *Eucalyptus angulosa*.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Hellfire Bay | Esp | Esp | NP | 27.8.91 | - | - |
| 2a | Mt Le Grand | Esp | Esp | NP | 8.9.86 | Common | - |
| 2b | Mt Le Grand,W | Esp | Esp | NP | 6.10.92 | 2 | Good |
| 3 | Frenchman Peak | Esp | Esp | NP | 8.8.71 | - | - |
| 4* | Lucky Bay,N | Esp | Esp | NP | 6.10.92 | 5+ | Good |
| 5 | Mondrain Island | Esp | Esp | - | 14.11.50 | - | - |
| 6 | Stokes Inlet | Esp | Esp | NP | 1800s | - | - |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

In the Cape Le Grand National Park, *P. inaequalis* is usually widely scattered, with no more than a few plants together. Further survey of larger islands in the Archipelago of the Recherche is desirable. Monitoring of known populations is recommended.

References

Bentham (1867), Blackall and Grieve (1974).

Persoonia sp. Scaddan (M.A.Burgman 4424)

PROTEACEAE

[ex. *Persoonia* aff. *hakeiformis*]

This taxon has affinity with *Persoonia hakeiformis* which is a much-branched, somewhat spreading shrub, 1.0-1.5 m tall x 1.3 m wide. Leaves are cylindrical and slightly tapering (25 mm) with a groove on the under side; a few hairs occur at the base. The yellow perianth has a large pouched segment (saccate) on the lower side; one of the 4 anthers is sterile; the style is curved.

Flowering Period: ?May

Distribution and Habitat

P. sp. Scaddan is known only from the Grass Patch-Scaddan area. It grows in mallee woodland.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|----------------------|-------------|---------------|-----------|
| 1 | Grass Patch,E | Esp | Esp | ?Shire Rd Res. & VCL | 27.5.82 | - | - |
| 2 | Truslove | Esp | Esp | NR | 10.84 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

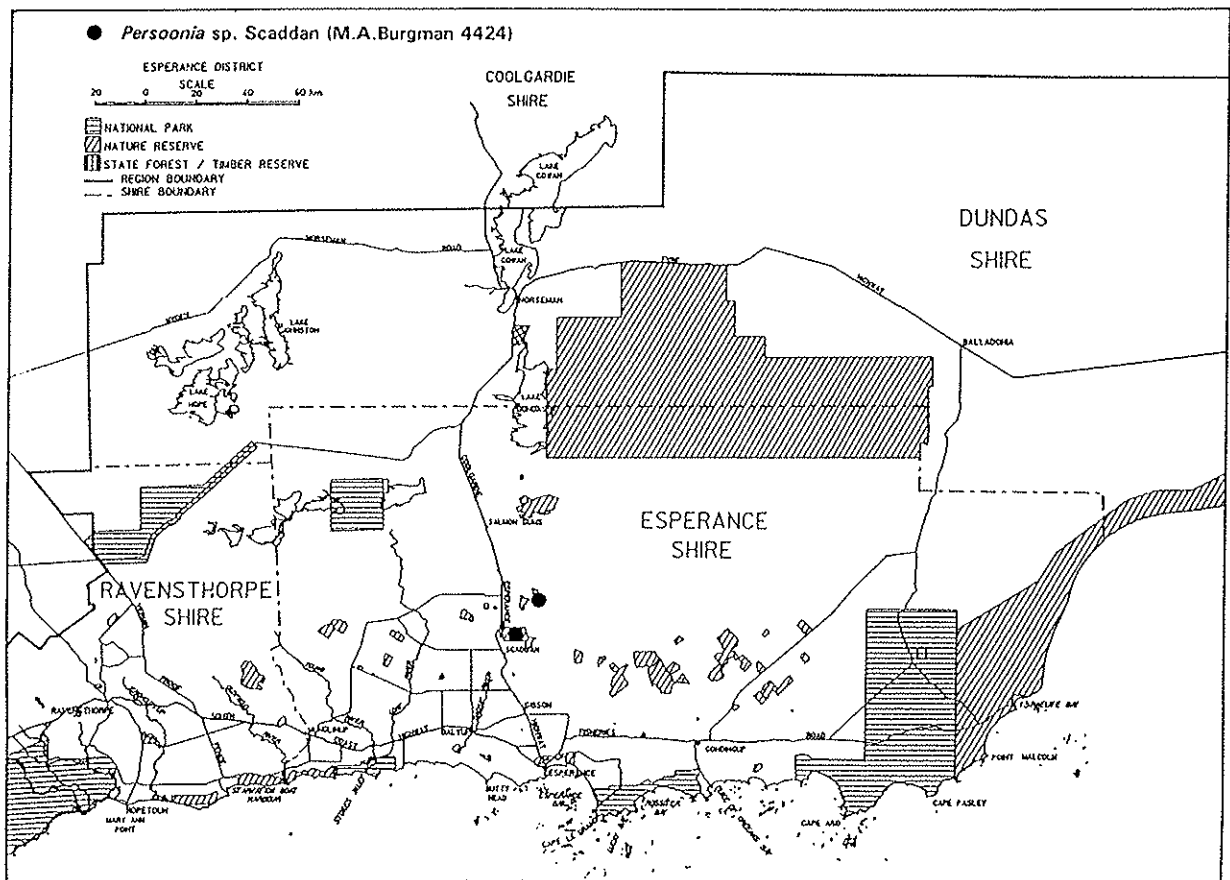
Unknown

Summary and Recommendations

Further survey is required.

References

Blackall and Grieve (1988).



A prostrate annual, 2 cm tall with closely-hairy stems (2-10 cm). The basal leaves (to 4 cm) form a rosette; stem leaves are elliptical (to 2 cm) and often toothed. Flowers are pale purplish to white and are borne in dense clusters (racemes); sepals (1.5-2 mm) and petals (2-3 mm) are small; stamens are flat and wide at the base; the style is very short. The fruit is an oval-shaped capsule with 5-7 seeds (1 mm) per locule.

Flowering Period: August - October

Distribution and Habitat

Phlegmatospermum eremaeum occurs between Coolgardie and Eyre, south of the Trans Australian Railway line. It grows in red loam over limestone in chenopod shrubland.

This species is also found on the Eyre Peninsula in South Australia and in mallee scrub of South Australia and Victoria.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Norseman,N | Esp | Dund | - | 8.8.51 | - | - |
| 2 | Cocklebidy,SSE | Esp | Dund | NR | 1.10.84 | Common | - |
| 3 | Haig,S | Gold | Bldr | - | 1.10.84 | - | - |
| 4 | Coolgardie | Gold | Cool | - | 1899 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

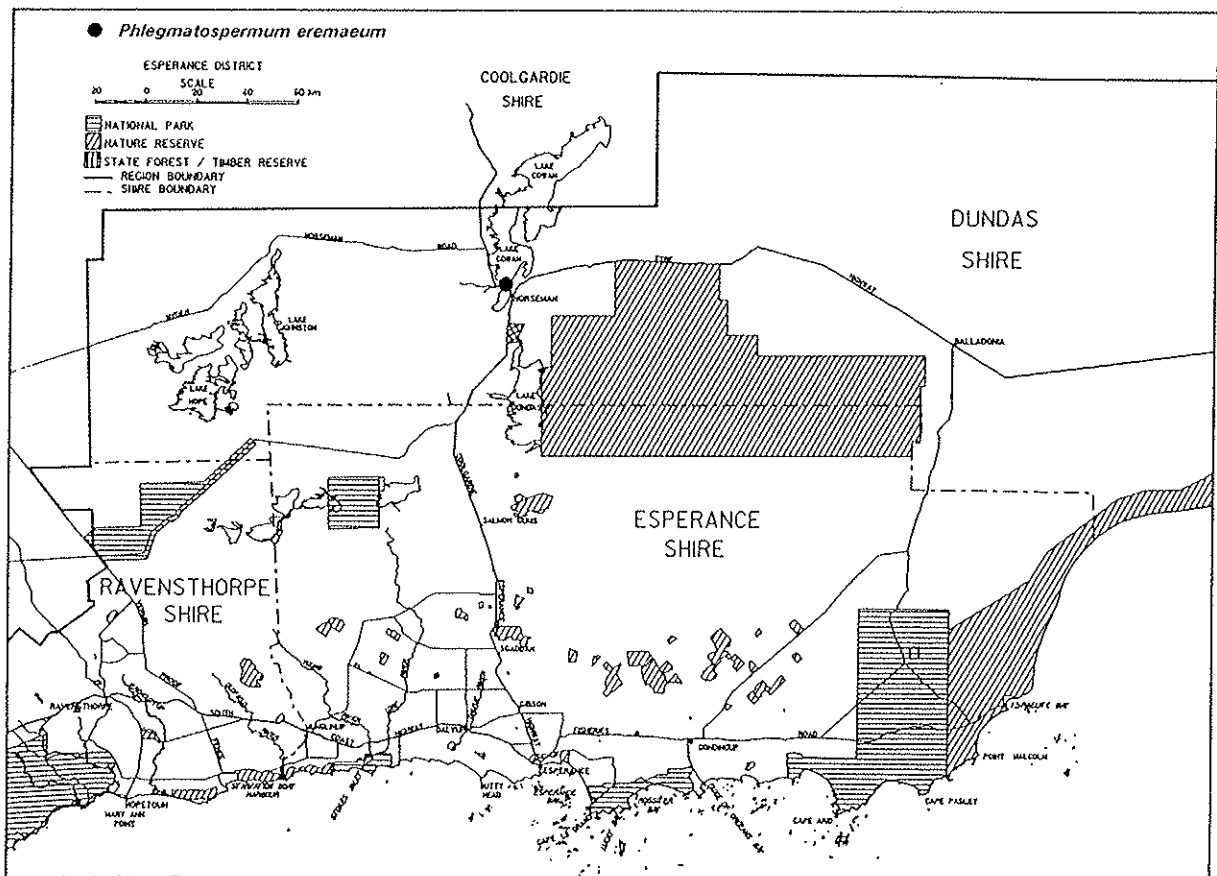
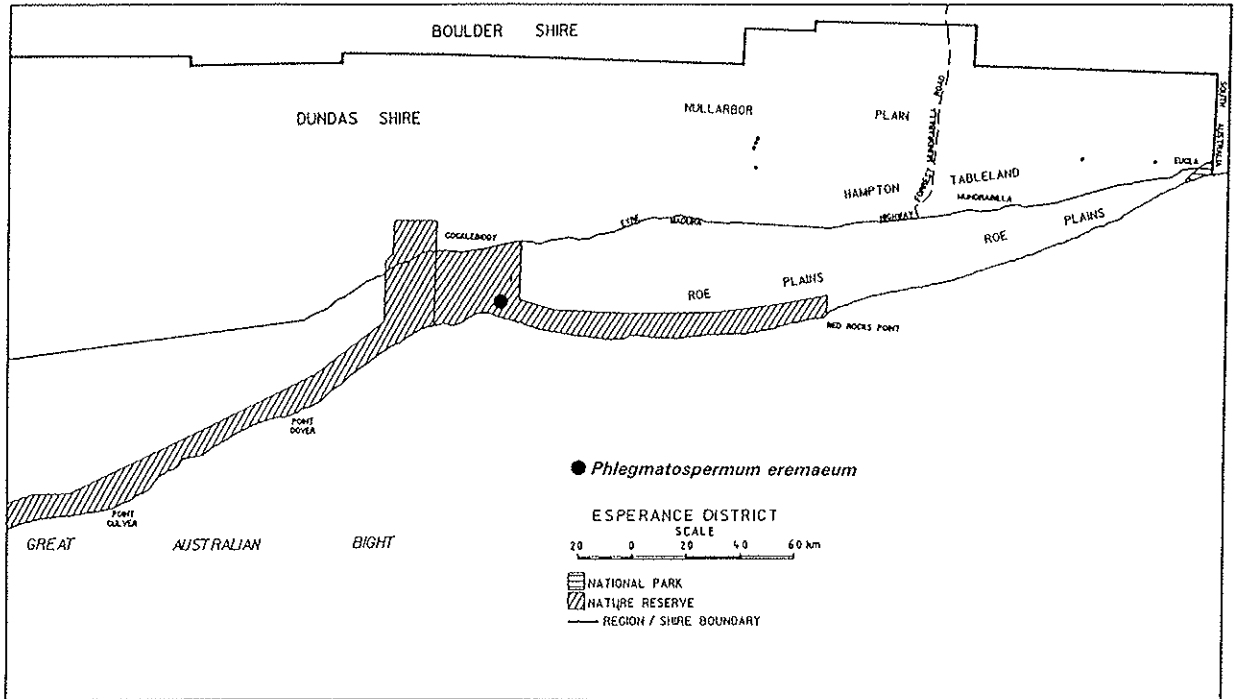
Unknown

Summary and Recommendations

P. eremaeum is apparently uncommon, although it is an inconspicuous annual, and its wide distribution from Coolgardie to near Eyre suggests that more populations may occur. It should remain secure in the Nuytsland Nature Reserve. Further survey is required.

References

Hewson (1982).



An erect, spreading shrub, 0.2-1 m tall, with stems that are yellow-red near the flowers becoming almost black further from the apex. Leaves are alternate, lack hairs except when immediately below an inflorescence, pale green to bluish green, and narrow-linear (4-17 x 0.5-1 mm). Bisexual, cream or white flowers are borne in a compact head which is surrounded by about 40 involucre bracts. The bracts are similar in colour to the leaves, narrowly triangular to linear (6-8 x 1-2 mm), densely hairy inside and with or without hairs on the outside; the margins have long hairs (ciliate). Both the floral tubes (6 mm) and sepals (2-5 mm) are very densely hairy on the outside and hairless inside.

Pimelea granitica resembles *P. imbricata* and *P. villifera*, but differs from both in having more numerous involucre bracts; as well, it has narrower leaves compared to *P. imbricata*. *P. granitica* is distributed east of longitude 118° E, while the other two species occur to the west of this meridian.

Flowering Period: September - December

Distribution and Habitat

P. granitica extends from Chiddarcooping Hill south to near Roes Rock, and from near Pingaring east to Stennet Rock, a range of about 330 km. It grows on granite outcrops, in soil pockets or shallow soil over granite sheets.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Stennet Rock | Esp | Esp | VCL | 18.11.92 | 2 | Good |
| 2a | Mt Gibbs | Esp | Rav | VCL | 13.11.79 | 1 | - |
| 2b | Mt Gibbs plain | Esp | Rav | VCL | 27.11.64 | - | - |
| 3 | Chiddarcooping | Mer | West | NR | 7.11.90 | 20-30 | Healthy |
| 4 | Mt Holland track | Nar | ?Kon | VCL | 11.31 | - | - |
| 5 | Roes Rock, NNW | Alb | Jer | NP | 17.11.85 | Scattered | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

P. granitica is widely distributed, although most populations are small. Further survey is required.

References

Mollemans *et al.* (1993), Rye (1988).

Scaevola brookeana F.Muell.

GOODENIACEAE

[= *S. brooksiana* J.H.Willis]

Heart-leaved Fan-flower

An erect shrub, to 60 cm tall. Leaves are dull, bluish-green sometimes with a whitish bloom that rubs off (glaucous), stem-clasping, broadening towards the base to form a heart shape, and widely toothed on the margins. Usually 1 to 3, blue flowers are borne in the axils of leaves; the corolla is hairless outside and the tubular portion of the corolla has short hairs on the inside; the style has short, soft hairs below the middle and the indusium (at the apex of the style) is only slightly downy.

Flowering Period: April - May, October - December

Distribution and Habitat

Scaevola brookeana was first discovered by Miss S.J. Brooks last century "in the vicinity of Israelite Bay". All recent collections are from Mt Ragged, 40 km to the north-west of Israelite Bay, where it grows in shallow, grey-brown sandy loam amongst quartzite rocks.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Mt Ragged | Esp | Esp | NP | 23.4.93 | 1 000+ | Post-fire |

Response to Disturbance

Two years after a hot burn (February 1991), many *S. brookeana* seedlings and a few larger, flowering resuckers were present on the slopes of Mt Ragged. Eight years earlier (January 1983), another fire burnt Mt Ragged and *S. brookeana* was collected two years after that fire. The population is therefore unlikely to be threatened by frequent fires. Monitoring is recommended.

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

S. brookeana is known in the Western Australian Herbarium as *S. brooksiana*. It is recommended that the former name be adopted (Carolin 1992).

References

Carolin (1992), Grieve and Blackall (1982), Mueller (1884).

Spyridium mucronatum Rye subsp. *mucronatum*

RHAMNACEAE

A mid-dense shrub, 50-60 cm tall and 40-50 cm wide. Leaves are alternate, narrow linear-ovate (3-4 x 1 mm), the upper surface is bright green and glossy with the margins rolled backwards to nearly join in the middle on the under side. The base of each leaf has 2 appendages (stipules) that are relatively large (1-1.5 mm) and triangular-shaped. Small heads of 4-6, cream-coloured flowers are numerous in the leaf axils; the outer surface of the calyx (1 mm) is covered in dense white hairs, the inner surface lacks hairs; the short style (0.3 mm) has slightly enlarged, 3-lobed stigma.

Two subspecies are recognised, subsp. *mucronatum* and subsp. *multiflorum*. The latter is more robust, has larger leaves and more flowers per head than subsp. *mucronatum*.

Flowering Period: March - May

Distribution and Habitat

Spyridium mucronatum subsp. *mucronatum* is a widespread taxon occurring from near Hatter Hill to south of Balladonia; subsp. *multiflorum* is more restricted being distributed between Gibson and Mt Ragged, a distance of about 140 km. The species grows in sand or sandy loam in mallee shrublands or heaths. Associated species include *Eucalyptus uncinata*, *E. eremophila* and *E. leptocalyx*.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|---------------------------------|------------------|----------|-------|---------------|-------------|---------------|-----------|
| subsp. <i>mucronatum</i> | | | | | | | |
| 1a | Fields Rd | Esp | Esp | Shire Rd Res. | 12.9.92 | 60+ | Average |
| 1b* | Fields Rd | Esp | Esp | Shire Rd Res. | 13.9.92 | 10+ | Good |
| 2 | Mt Ridley, NNE | Esp | Esp | VCL | 8.3.80 | Rare | - |
| 3a* | Clyde Hill, NW | Esp | Esp | VCL | 20.5.93 | 10 | Good |
| 3b* | Clyde Hill, NW | Esp | Esp | VCL | 20.5.93 | 10+ | Post-fire |
| 4a | Mt Buraminya | Esp | Esp | VCL | 8.11.80 | Scattered | - |
| 4b | Parmango Rd | Esp | Esp | VCL | 14.11.93 | 120+ | Good |
| 5 | Ponier Rock, WSW | Esp | Esp | VCL | 11.12.90 | Common | - |
| 6 | Dingo Rock, S | Esp | Esp | VCL | 22.5.93 | 100+ | Good |
| 7a | Salmon Gums, ENE | Esp | Esp | - | 6.3.80 | Scattered | - |
| 7b* | Salmon Gums, E | Esp | Esp | ?Water Res. | 18.11.93 | 100+ | Good |
| 8* | Truslove | Esp | Esp | NR | 22.9.92 | 10+ | Good |
| 9* | Truslove, E | Esp | Esp | Shire Rd Res. | 17.11.92 | Frequent | Good |
| 10* | Scaddan, N | Esp | Esp | MRWA Rd Res. | 24.9.92 | Common | Good |
| 11* | Scaddan Rd | Esp | Esp | Shire Rd Res. | 22.9.92 | Few | Average |
| 12* | Swan Lagoon | Esp | Esp | NR | 24.9.92 | 5 | Good |
| 13* | Norwood Rd | Esp | Esp | Shire Rd Res. | 25.9.92 | 20+ | Good |
| 14 | West Point Rd | Esp | Rav | ?VCL | 29.9.84 | - | - |
| 15 | Frank Hann | Esp | Rav | NP | 28.10.92 | 200+ | Good |
| 16* | Frank Hann | Esp | Rav | NP | 28.10.92 | 10+ | Good |
| 17* | Hatter Hill, N | Esp | Rav | VCL | 27.10.92 | 50+ | Good |

A rather small, densely tufted grass, 25-60 cm tall and 5-15 cm wide, with mostly basal leaves to half the height. Individual culms are slender, cylindrical, compressible, ribbed, and slightly rough-hairy just below the nodes; the 2 nodes are finely-hairy and up to 50% broader than the adjacent internodes. Leaf sheaths (about 5 mm wide) are ribbed and covered in rough, short stiff hairs. The ligule is firmly membranous (0.5-2.5 mm) and obtuse; the auricle has a dense to sparse tuft of long, straight or woolly hairs. Leaf blades (to 25 cm x <0.5 mm) are strongly ribbed and softly-hairy on the inner surface; the margins are rough with short hooks. Flower clusters (panicle, to 20 x 3 cm) have unequal, few-flowered branches (to 7 cm). The spikelets (8-10 mm) have very unequal, 3 or 5-nerved glumes and a long awn (35-55 mm) which is almost straight or gently twice bent.

Flowering Period: October

Distribution and Habitat

In Western Australia, *Stipa exilis* is known from only a few widely distributed localities, from near Cocklebiddy and the Gnowangerup-Needilup area, nearly 800 km to the east. It grows in well-drained, pale brown calcareous sandy loam, in a moderately sheltered, flat marine plain in an *Eucalyptus yalataensis* high open shrubland, or in *E. occidentalis* woodland.

This species is most abundant in South Australia where it grows in heath and scrub on sandy soil. It barely extends into Victoria and Western Australia (although not on the Nullarbor Plain).

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Cocklebiddy,S | Esp | Dund | NR | 5.10.87 | - | - |
| 2 | Loc 1401 | Alb | Jer | - | 10.11.75 | - | - |
| 3 | Gnowangerup,S | Kat | ?Gno | - | 10.10.62 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

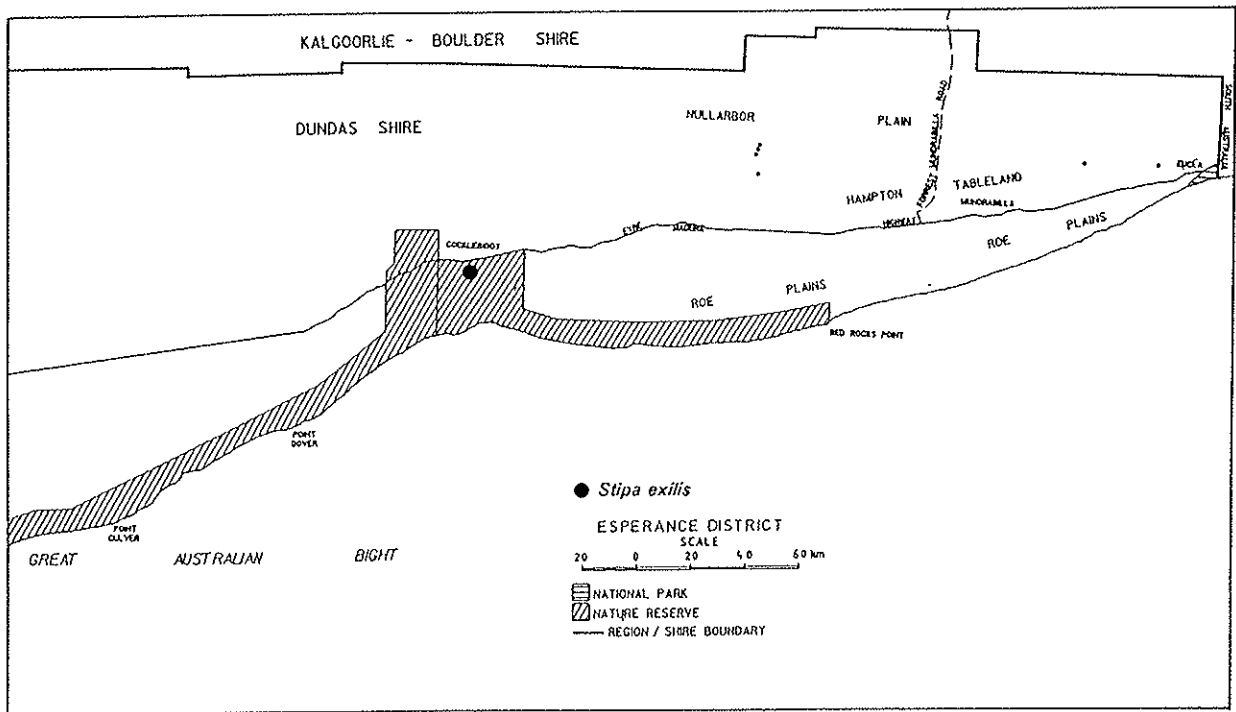
Unknown

Summary and Recommendations

S. exilis is poorly known in Western Australia. It should remain secure in the Nuytsland Nature Reserve.

References

Newbey (1983), Vickery (1980), Vickery *et al.* (1986).



Thysanotus brachyantherus Brittan

ANTHERICACEAE

A perennial herb that has a small rootstock with clustered fibrous roots that swell 5-7 cm from the stock into tubers (3-4 cm). The flowering stem is surrounded by 4-5 hairless leaves (up to 15 cm). Flower heads (panicle) are mostly solitary with 1-4 flowers; the flowering stems are cylindrical, hairless and have triangular-shaped bracts (5-12 mm) at the lowest branch; floral bracts are membranous (1.5-2 mm); flowers stalks (5-7 mm) are articulated about 1 mm from the base. The flowers have 3 inner petals that are mauve or purple and have long fringes on the margins. The 6 anthers (2-3 mm) are slightly curved and twisted.

Flowering Period: October - December

Distribution and Habitat

Thysanotus brachyantherus is known from the Mt Ragged-Russell Range area and about 80 km to the north-east towards Mt Heywood. It grows in sandy clay, clay over limestone, loam or in sandplain in low open heath associated with *Banksia*, *Dryandra* or *Eucalyptus* species.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Mt Ragged | Esp | Esp | NP | 26.10.89 | Uncommon | - |
| 2 | Mt Ragged,S | Esp | Esp | NP | 8.12.60 | - | - |
| 3 | Russell Range | Esp | Esp | NP | 8.12.60 | - | - |
| 4 | Mt Heywood,NE | Esp | Esp | VCL | 9.10.80 | Rare | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

A hot fire in February 1991 burnt the Mt Ragged region where this species is known to occur. The species was not found during a survey in April 1993; its response to fire is unknown.

T. brachyantherus grows in a variety of habitats, so the taxon may be more frequent than collections indicate. Further survey is required.

References

Brittan (1972).

A perennial herb with a small rootstock which is surrounded by the previous year's bracts, leaf bases and stems. Roots are thickened and fleshy. The leaves and floral stems are opposed by 1 or 2 membranous bracts (about 4 cm). Leaves are few, narrow-linear to cylindrical (10-25 cm), hairless, and have membranous bases similar to bracts. There is usually only 1 cluster of flowers per plant, borne on a cylindrical stem (14-25 cm), which is either unbranched or up to 4-branched. Inflorescences (umbels) are usually paired and have 4-6 flowers borne on stalks (8-10 mm). The perianth has 3 outer linear segments (7 x 1.5 mm) with a fine sharp, point; the 3 inner segments ('petals') are purple, broadly elliptical and have long (2 mm) fringed margins. The 6 stamens have purple anthers which are straight (not twisted) and the inner 3 are longer than the outer 3 anthers. The ovary is 3-locular; the style is erect and straight (3 mm). Fruits are cylindrical capsules (4 x 2 mm) bearing up to 6 seeds each; the black seeds have a yellow fleshy appendage (aril).

Flowering Period: October - December

Distribution and Habitat

Thysanotus parviflorus is distributed over about 400 km from the Stirling Ranges to Cape Le Grand. It grows in sandy loam in low *Eucalyptus* mallee sandplain on the lower slopes of hills.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------|----------|-------|--------------|-------------|---------------|-----------|
| 1a | Cape Le Grand | Esp | Esp | NP | 19.11.79 | - | - |
| 1b | Hill 49 | Esp | Esp | NP | 19.11.79 | - | - |
| 2 | Greens Rd | Esp | Esp | NR | 10.84 | - | - |
| 3 | West Mt Barren | Alb | Jer | NP | 28.10.65 | - | - |
| 4 | Stirling Ranges | Alb | - | NP | 15.10.74 | - | - |
| 5 | Denmark,E | Alb | Dnmk | MRWA Rd Res. | 26.11.90 | Occasional | - |
| 6 | Brookton,SSE | Nar | Brktn | - | 21.10.83 | Occasional | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

T. parviflorus is widespread along the south coast, occurring in the Stirling Range, Fitzgerald River and Cape Le Grand National Parks, where this taxon should remain secure.

References

Brittan (1981).

An erect annual, 10-50 cm tall, with the stems covered in scattered, spreading, usually rigid hairs. Leaves are palmately divided, usually into 3 irregularly lobed segments. Numerous (3-12) flowers are borne in umbrella-like clusters (umbels); petals are white; sepals are absent. Fruits are hairless, with only 1 very wrinkled fruitlet developing.

Flowering Period: June, November

Distribution and Habitat

Trachymene croniniana is known only from two localities, about 270 km apart, in the Stirling Ranges and east of Coujinup Hill. It grows after fire, in grey-brown sandy clay in rocky habitats near creeks or water bodies.

Conservation Status

Current: Priority 2

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Coujinup Hill,E | Esp | Rav | VCL | 25.6.83 | - | Regen. |
| 2 | Salt River Rd | ?Kat | ?Cbk | - | 14.11.82 | Rare | Regen. |

Response to Disturbance

According to G. Keighery (personal communication), this species occurs after hot summer fires.

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

Further survey is required.

References

Blackall and Grieve (1980), Burgman (1985b).

C. Priority Three Taxa

Based on the October 1992 Priority Flora List, there are 42 Priority Three taxa known from within the boundaries of the Esperance District. Of these, 26 taxa were located during surveys in 1992 and 1993. New populations or sub-populations were found for 13 taxa.

The following taxa are not included, as current information indicates that they are not distributed in the Esperance District:

Acacia durabilis ms
Acacia heterochroa subsp. *heterochroa* ms
Acacia pinguiculosa subsp. *pinguiculosa* ms
Acacia ?excentrica (B.R.Maslin 5463)
Adenanthos glabrescens subsp. *exasperatus*
Calocephalus aervoides
Grevillea fulgens

The following taxa were deleted as they were found to be another species:

Chorizema sp. Esperance (M.A.Burgman 2135)
= *Chorizema circinale*
Eucalyptus sp. Scaddan (K.R.Newbey 8183)
= *Eucalyptus misella*

The following taxa were renamed during the project:

Eucalyptus sp. Mt Ney (M.I.H.Brooker 8922) [aff. *diptera*]
= *Eucalyptus creta*
Dryandra sp. 16 (A.S.George 9446)
= *Dryandra viscida*

A compact rounded or low spreading shrub, 1-4 m tall. Phyllodes ('leaves') are cylindrical (50-110 x 1-1.5 mm), rigid, straight, commonly with a deflexed tip with a sharp rigid point, and have about 10 parallel nerves depressed below raised internerve spaces bearing raised stomata. The light golden flower heads are globular (3-4 mm), 20-25 flowered and borne with 2 per axil on stalks (2-3 mm). Legumes are linear (50 x 1.5-3 mm), raised over and constricted between the seeds, undulate and covered in short, soft hairs. Seeds are arranged longitudinally in the pod, elliptic (2.5-3 mm), dark brown and have a terminal appendage (aril).

Flowering Period: September - October

Distribution and Habitat

Acacia eremophila var. *variabilis* is known from a few widely distributed localities, from near Bruce Rock to Balladonia, a range of over 500 km. It grows in sandy habitats.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|-------------|-------------|---------------|-----------|
| 1a | Balladonia, W | Esp | Dund | - | 9.79 | - | - |
| 1b | Balladonia, W | Esp | Dund | - | 9.9.76 | - | - |
| 1c | Norseman, E | Esp | Dund | - | 17.11.93 | Not found | - |
| 2a | Comet Vale | Gold | Men | - | 6.9.61 | - | - |
| 2b | Menzies, S | Gold | Men | - | 1975 | - | - |
| 3 | Zanthus, E | Gold | Blder | - | 2.9.68 | - | - |
| 4 | Ardath | Nar | BR | - | 17.12.89 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

In November 1993, a survey between Norseman and Balladonia failed to locate this taxon; it may be difficult to find unless it is flowering. Further survey is required.

A rounded to funnel-shaped shrub, 1-2 m tall. Branchlets are finely ribbed, slightly flexible and lack hairs. Phyllodes ('leaves') are linear (40-90 x 2-3 mm), narrowed towards the base, slightly thickened, erect, light green, have a fine point at the tip, and a midrib that is only slightly raised; a gland occurs 10 mm or more from the base. The golden flower heads are globular (4-5 mm), 18-21 flowered, with 2 heads (raceme, 1-2 mm) borne per leaf axil on long stalks (5-8 mm). Flowers are 5-merous with free sepals. The shiny legumes are linear (to 60 x 3.5 mm).

Acacia euthyphylla ms is similar in appearance to *A. crassiuscula* and *A. cupularis*. *A. crassiuscula* prefers granitic habitats and has thicker dark green phyllodes with strongly raised midribs and the gland closer to the base, while *A. cupularis* can be distinguished by the blunt or callus point at the tip of the phyllodes and single flowers in the axils.

Flowering Period: August - September

Distribution and Habitat

A. euthyphylla ms is distributed between Truslove and Clyde Hill, a range of 120 km. It grows in sand or clay loam in seasonal swamps or around the margins of salt lakes, in tall myrtaceous shrubland and mallee woodland.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|---------------------|-------------|---------------|-----------|
| 1 | Truslove | Esp | Esp | NR | 22.9.92 | 2 | Good |
| 2 | Cox Rd | Esp | Esp | NR & Shire Rd Res. | 22.9.92 | 200+ | Good |
| 3 | Lignite Rd | Esp | Esp | Shire Rd Res. | 17.11.92 | 20+ | Fair |
| 4 | Bronzewing Rd | Esp | Esp | - | 6.9.84 | - | - |
| 5 | Dempster Rd | Esp | Esp | Shire Rd Res. & VCL | 25.9.92 | 3000+ | Good |
| 6a | Mt Ney Rd | Esp | Esp | NR | 10.84 | - | Post-fire |
| 6b | Mt Ney Rd | Esp | Esp | ?NR | 3.8.83 | - | - |
| 7 | ?Niblick Hill | Esp | Esp | Private | 24.2.83 | Common | - |
| 8* | Truslove Rd | Esp | Esp | Shire Rd Res. | 22.9.92 | 5+ | Good |
| 9* | Karl Berg Rd | Esp | Esp | Shire Rd Res. | 10.10.92 | 30 | Good |
| 10* | Dingo Rock,S | Esp | Esp | VCL | 22.5.93 | 1000+ | Good |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

A. euthyphylla ms is widespread at the northern limit of agriculture, north-east of Esperance. It is known to occur in two Nature Reserves and in Crown Land which is not currently threatened by clearing for agriculture.

A low, compact shrub, 30-60 cm tall, which is densely covered in long white hairs. Leaves (6-15 mm) are bipinnate with one pair of pinnae (5-15 mm) having 3-4 pairs of narrowly oblong to elliptic pinnules (3-6 x 2-3 mm) that are nerveless above and 1-nerved below. Appendages at the base of the leaves (stipules) are very narrowly triangular (4-8 mm). The golden flower heads are globular (6-8 mm), 17-20 flowered and borne on long, hairy stalks (15-20 mm). The legume (up to 40 x 5-6 mm) is covered in long hairs.

Acacia moirii subsp. *dasycarpa* is similar to subsp. *moirii* which has 3-7 pairs of leaf pinnules that are hairless above and sparsely hairy below.

Flowering Period: April - July

Distribution and Habitat

A. moirii subsp. *dasycarpa* is distributed between the Hamersley River and Munglinup, mainly south of the South Coast Highway. A disjunct population occurs between Lake King and Newdegate. It grows in white sand in tall open shrubland or in stony quartzite in low heath.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------------|----------|-------|----------------|-------------|---------------|------------|
| 1 | Lake King-Newdegate | Kat | LG | - | 13.7.71 | - | - |
| 2 | Mt Desmond | Alb | Rav | VCL | 15.12.92 | 100+ | Healthy |
| 3 | Hopetoun,N | Alb | Rav | - | 10.9.70 | - | - |
| 4a | Eyre Range,W | Alb | Rav | NP | 30.5.70 | - | - |
| 4b | Eyre Range,W | Alb | Rav | NP | 16.7.71 | - | - |
| 5a | Hamersley Drive | Alb | Rav | NP | 12.9.83 | Occasional | - |
| 5b | Hamersley Drive | Alb | Rav | NP | 25.5.83 | Common | - |
| 6 | West River | Alb | Rav | - | 3.70 | - | - |
| 7a | No Tree Hill,NE | Alb | Rav | NP | 6.8.93 | 20+ | Disturbed |
| 7b | No Tree Hill,NW | Alb | Rav | NP | 8.10.75 | - | - |
| 8 | East Mt Barren | Alb | Rav | NP | 13.4.74 | - | - |
| 9* | Vermin Proof Fence | Alb | Rav | Shire Rd Res. | 8.9.93 | 40+ | Good |
| 10* | Bedford Harbour Rd | Esp | Rav | Shire Rd Verge | 9.9.93 | 8 | Vulnerable |
| 11a* | Fence Rd | Alb | Rav | Shire Rd Res. | 8.9.93 | 1 | Good |
| 11b | Coujinup Rd | Esp | Rav | MRWA Rd Res. | 9.9.93 | 10+ | Disturbed |
| 12* | Coxall Rd | Esp | Rav | MRWA Rd Res. | 9.9.93 | 2 | Average |

* = new population / sub-population

Response to Disturbance

Grows most vigorously in areas that have been disturbed. It may be an opportunistic species that becomes less common as plant communities mature.

A low, spreading shrub, 20-50 cm tall and up to 1 m broad. Branchlets are brownish-red. Phyllodes ('leaves') are cylindrical (terete, 15-20 x 1-1.5 mm) with 8 raised nerves, rigid, erect, dark green and have a fine point at the tip; an inconspicuous gland occurs 4-10 mm from the base. Small triangular appendages (stipules, 1.5-2 mm) are persistent at the phyllode base. The light golden flower heads are globular (3-4 mm), 20-flowered, with 1 or 2 borne per axil on long stalks (7-12 mm). Flowers are 5-merous, hairless and have free sepals. Legumes are narrowly oblong (to 25 x 3 mm), shiny, leathery and undulate. Seeds are widely elliptic (2-2.5 mm long), brown and arranged longitudinally in the legume.

Acacia octonervia is a member of the "*A. sulcata* group" and is most closely related to *A. sulcata* which has 6- or 7-nerved phyllodes, golden heads of 10-15 flowers and mottled seeds.

Flowering Period: August - October

Distribution and Habitat

A. octonervia occurs in the area between the Fitzgerald and Young Rivers, with a disjunct population near Boxwood Hill. It grows in rocky sand or loam, or sandy clay in open mallee, dense low heath and open dwarf scrub communities.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------|----------|-------|------------------------|-------------|---------------|-----------|
| 1a | West Point Rd | Esp | Rav | Shire Rd Res. | 9.9.92 | 20-50 | Good |
| 1b | Melaleuca Rd | Esp | Rav | Shire Rd Res. | 10.9.92 | 1000+ | Good |
| 2 | Melaleuca Rd | Esp | Rav | ?Private | 21.10.68 | - | - |
| 3* | West Point Rd | Esp | Rav | Shire Rd Res. | 10.9.92 | 200+ | Good |
| 4* | West Point Rd | Esp | Esp | Shire Rd Res. & VCL | 11.9.92 | 2000+ | Good |
| 5* | Cascades Rd | Esp | Esp | Shire Rd Res. | 11.9.92 | Common | Good |
| 6 | Rawlinson Rd | Esp | Rav | ?Shire Rd Res. | 20.1.81 | - | - |
| | | | | | 15.9.92 | Not found | - |
| 7* | Rawlinson Rd | Esp | Esp | Shire Rd Res. | 15.9.92 | 200+ | Good |
| 8 | Whoogerup Range | Alb | Rav | NP | 7.10.75 | - | - |
| 9 | Thumb Peak | Alb | Rav | NP | 30.12.83 | - | - |
| 10 | Bandalup Creek | Alb | Rav | VCL | 6.10.66 | - | - |
| 11 | Middamidup Rd | ?Alb | ?Rav | - | 9.79 | - | - |
| 12 | Corackerup | Alb | Jer | NR | 12.82 | Common | - |
| 13 | Monjebup Rd | Alb | ?Jer | Shire Rd Res. | 10.76 | - | - |

* = new population

Response to Disturbance

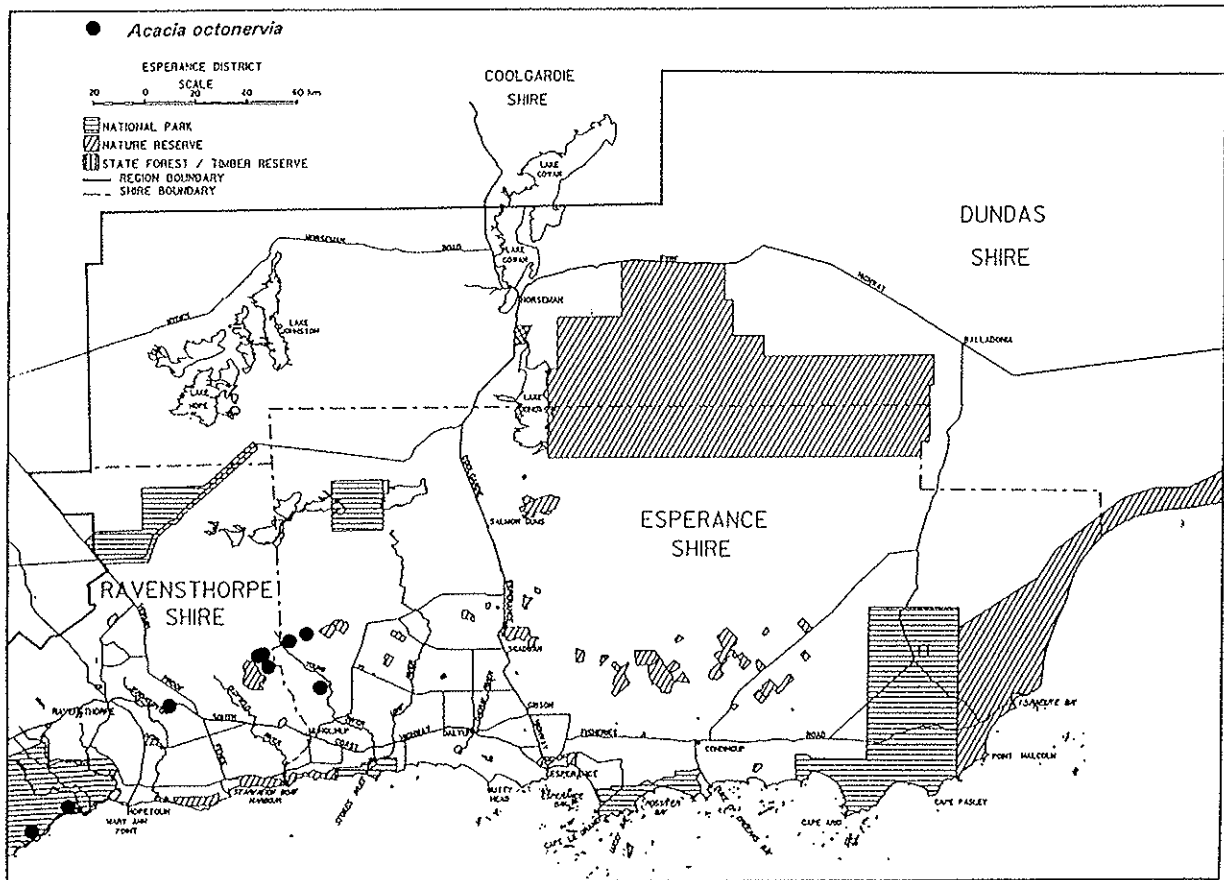
Unknown

Susceptibility to *Phytophthora Dieback*

Presumed not susceptible.

Summary and Recommendations

Within the Esperance District, *A. octonervia* is common in the upper reaches of the Young River catchment area. However, most of the known populations occur on road reserves and are vulnerable in the long term. Occasional monitoring is required.



A shrub, up to 1 m tall, with few openly spreading branches that are covered in short white hairs. Phyllodes are almost cylindrical but laterally flattened (4-7 x 1.5 mm), sparsely hairy and have a spine at the tip. Appendages at the base of the phyllodes (stipules) are rigid and spinescent. The golden flower heads are globular (4 mm), 20-flowered and borne singly in the axils of phyllodes on long purplish stalks (10 mm). Flowers are 5-merous. Legumes are cylindrical, long (about 65 x 3 mm), smooth, pendulous and red-brown.

Flowering Period: May - June

Distribution and Habitat

Acacia pritzeliana is widespread between the Young River and Mt Ragged extending northwards to Kumarl, a range of about 250 km. A disjunct population occurs near Spargoville. It grows in sandy loamy soil in woodlands and mallee scrub. Associated species may include *Eucalyptus salmonophloia* and *E. diptera*.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------------|----------|-------|----------------|-------------|---------------|-----------|
| 1 | Spargoville,S | Gold | Cool | MRWA Rd Res. | 5.66 | - | - |
| 2a | Mt Ragged | Esp | Esp | NP | 24.4.93 | 25+ | Post-fire |
| 2b* | Mt Ragged | Esp | Esp | NP | 23.4.93 | 2 | Post-fire |
| 2c* | Mt Ragged,W | Esp | Esp | NP | 24.4.93 | 20+ | Post-fire |
| 2d* | Mt Ragged,SW | Esp | Esp | NP | 24.4.93 | 2 | Post-fire |
| 3 | Mt Ragged,SW | Esp | Esp | NP | 17.1.66 | - | - |
| 4 | Thomas River | Esp | Esp | - | 1938 | - | - |
| 5a | Clyde Hill,E | Esp | Esp | NR | 19.5.93 | 100+ | Good |
| 5b* | Clyde Hill,NW | Esp | Esp | NR | 19.5.93 | Frequent | Good |
| 5c* | Clyde Hill,NW | Esp | Esp | VCL | 20.5.93 | 10+ | Good |
| 6* | Clyde Hill,NW | Esp | Esp | VCL | 20.5.93 | 20+ | Good |
| 7a | Clyde Hill,NW | Esp | Esp | VCL | 4.83 | - | - |
| 7b* | Clyde Hill,NW | Esp | Esp | VCL | 20.5.93 | 5+ | Post-fire |
| 7c* | Clyde Hill,NW | Esp | Esp | VCL | 21.5.93 | 10+ | Good |
| 7d* | Clyde Hill,NW | Esp | Esp | VCL | 21.5.93 | 50+ | Post-fire |
| 7e* | Mt Heywood,NE | Esp | Esp | VCL | 21.5.93 | 5+ | Good |
| 8 | Mt Ney,NE | Esp | Esp | VCL | 21.5.93 | 10+ | Good |
| 9 | Mt Ney,NW | Esp | Esp | VCL | 15.8.85 | - | - |
| 10a | Dingo Rock,SE | Esp | Esp | VCL | 12.5.90 | Common | - |
| 10b* | Dingo Rock,S | Esp | Esp | VCL | 22.5.93 | 3+ | Good |
| 10c* | Dingo Rock,S | Esp | Esp | VCL | 22.5.93 | Occasional | Good |
| 10d* | Dingo Rock,S | Esp | Esp | VCL | 22.5.93 | 10+ | Good |
| 11a | Wittenoorn Hills | Esp | Esp | NR | 25.9.92 | 10+ | Good |
| 11b* | Norwood Rd | Esp | Esp | Shire Rd Res. | 25.9.92 | 5+ | Good |
| 12a | Scaddan East Rd | Esp | Esp | ?Shire Rd Res. | 9.79 | - | - |
| | | | | | 24.9.92 | Not found | - |
| 12b | Scaddan East Rd | Esp | Esp | Shire Rd Res. | 24.9.92 | 5+ | Good |
| 12c* | Scaddan East Rd | Esp | Esp | Shire Rd Res. | 22.9.92 | 1 | Fair |
| 12d* | Scaddan,S | Esp | Esp | MRWA Rd Res. | 20.11.92 | 1 | Fair |
| 13 | Scaddan,N | Esp | Esp | MRWA Rd Res. | 25.9.83 | - | - |

Known Populations (cont'd)

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|---------------|-------------|---------------|------------|
| 14 | Grass Patch,S | Esp | Esp | MRWA Rd Res. | 17.11.92 | 5 | Good |
| 15a | Salmon Gums | Esp | Esp | - | 24.9.92 | - | - |
| 15b | Salmon Gums | Esp | Esp | Research Stn | 10.8.51 | - | - |
| 16 | Kumarl | Esp | Esp | - | 7.38 | - | - |
| 17a | Fields Rd | Esp | Esp | VCL | 13.9.92 | 15 | Fair |
| 17b* | Fields Rd | Esp | Esp | VCL | 19.9.93 | 5+ | Good |
| 17c* | Fields Rd | Esp | Esp | VCL | 20.9.93 | 5+ | Good |
| 18 | Dunn Swamp,E | Esp | ?Esp | ?VCL | 15.11.80 | Rare | - |
| 19* | Fields Rd | Esp | Esp | Shire Rd Res. | 14.9.92 | 2 | Vulnerable |
| 20* | Parmango Rd | Esp | Esp | Shire Rd Res. | 14.11.93 | 20+ | Good |
| 21* | Grass Patch,W | Esp | Esp | Shire Rd Res. | 24.9.92 | 1 | Fair |
| 22* | Scaddan,N | Esp | Esp | MRWA Rd Res. | 24.9.92 | 3 | Good |
| 23* | Scaddan,N | Esp | Esp | MRWA Rd Res. | 24.4.92 | 5+ | Good |
| 24* | Mt Burdett,S | Esp | Esp | Shire Rd Res. | 25.9.92 | 5+ | Good |
| 25* | Balladonia Rd | Esp | Esp | NP | 24.4.93 | 15+ | Good |
| 26* | Balladonia Rd | Esp | Esp | NP | 24.4.93 | 5+ | Good |
| 27* | Mt Heywood,NW | Esp | Esp | VCL | 22.5.93 | 3+ | Good |
| 28* | Sheoak Hill,N | Esp | Esp | VCL | 22.5.93 | Occasional | Good |
| 29* | Mt Ridley,W | Esp | Esp | VCL | 23.5.93 | 5+ | Good |
| 30* | Mt Buraminya | Esp | Esp | VCL | 14.11.93 | 1 | Good |
| 31* | Salmon Gums,W | Esp | Esp | Shire Rd Res. | 17.11.92 | 5+ | Good |
| 32* | Cascades Rd | Esp | Esp | NR | 9.9.93 | 20 | Good |

* = new population / sub-population

Response to Disturbance

Following fire, *A. pritzeliana* resuckers; some plants (pop. no. 7d) were observed to have spent pods and were again flowering 28 months after fire.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

A. pritzeliana is widely distributed north-west and north-east of Esperance. Rather than having discrete populations, this species tends to have only a few scattered plants at any locality, which may account for it being poorly known.

This species is known to occur in three Nature Reserves and in Cape Arid National Park where it is relatively common and not threatened.

References

Gardner (1939b).

An erect shrub, 0.4-2 m tall. Phyllodes ('leaves') are linear (25-45 x 1.5-4 mm) and sometimes slightly wider towards the apex, semi-rigid, the 1-7 nerves are slightly to strongly raised and the tip has a fine curved point. The golden flower heads are oval to oblong (6-9 x 4-4.5 mm), solitary in the phyllode axils on stalks that are short (to 3 mm) or absent. Flowers are 4-merous. Legumes are linear (to 65 x 3.5 mm wide) and strongly raised over and constricted between the seeds. Seeds are broadly elliptic (3 mm), arranged longitudinally in the legume, and dull black with an appendage (aril) two-thirds as long as the seed.

Acacia singula is closely related to *A. multispicata* which has cylindrical to compressed phyllodes, paired flower heads (spikes) in each axil, longer legumes and proportionately shorter appendages on the seeds.

Flowering Period: August - October

Distribution and Habitat

A. singula occurs between Lake Grace and Cascade, a range of about 220 km. It grows in gravelly sand over laterite, sometimes on rises and hilltops, in heath, scrub and mallee shrubland communities.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|---------------|-------------|---------------|------------|
| 1 | West Point Rd | Esp | Esp | Shire Rd Res. | 11.9.92 | 500+ | Post-dist. |
| 2 | Hatter Hill | Esp | Rav | - | 27.10.92 | 1000+ | Good |
| 3 | Hatter Hill,N | Esp | Rav | VCL | 8.12.84 | Frequent | - |
| 4 | Sth Ironcap,S | Mer | Kon | VCL | 8.12.84 | - | - |
| 5 | Lake Grace,E | Kat | LG | MRWA Rd Res. | 13.9.80 | - | - |
| 6 | Lake King,N | Kat | LG | ?MRWA Rd Res. | 16.9.64 | - | - |
| 7 | Lake King,S | Kat | LG | ?MRWA Rd Res. | 6.10.66 | - | - |
| 8 | Lake King,W | Kat | LG | ?MRWA Rd Res. | 11.9.64 | - | - |
| 9 | Newdegate,SW | Kat | LG | NR | 1.79 | - | - |

Response to Disturbance

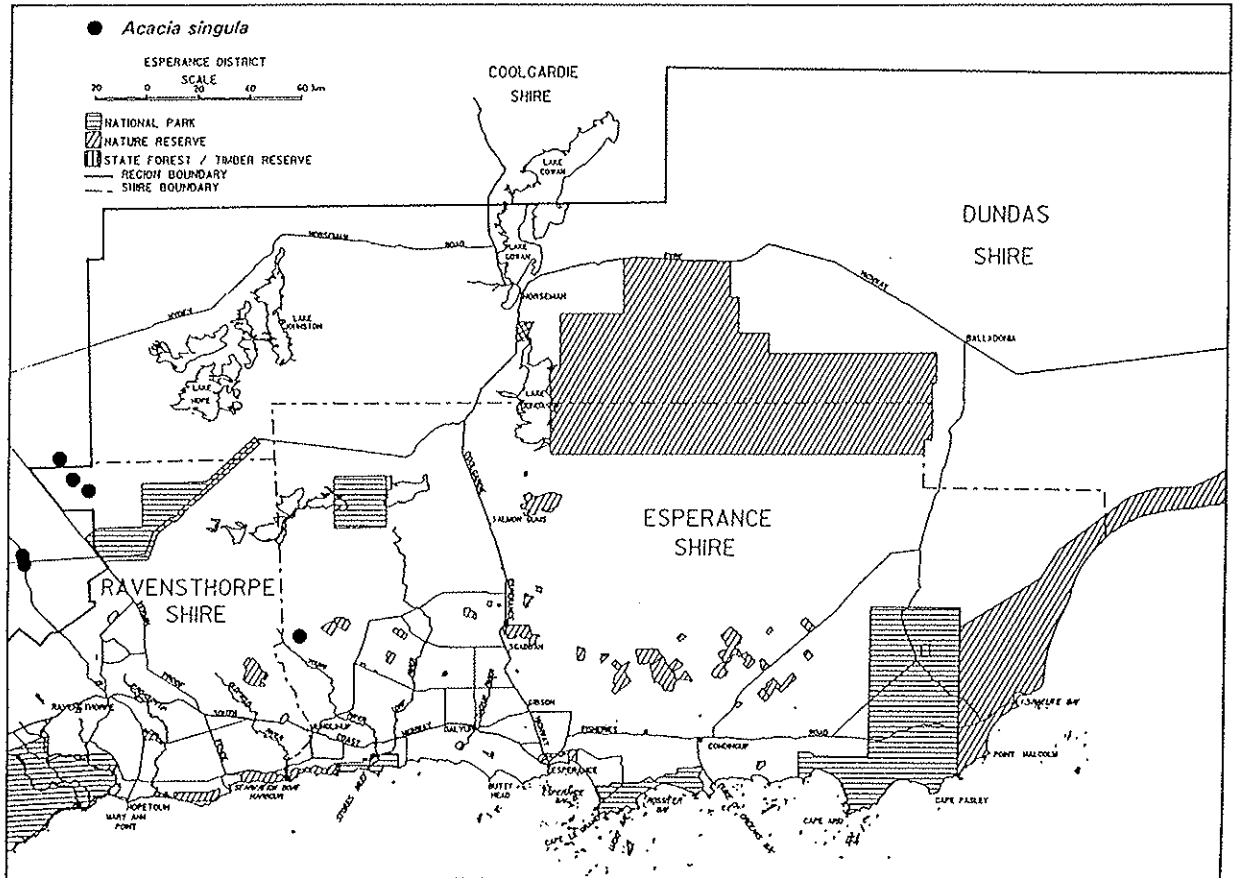
Plants regenerate well in disturbed areas but may be vulnerable to further clearing.

Susceptibility to *Phytophthora* Dieback

Presumed not susceptible.

Summary and Recommendations

The known populations of *A. singula* are widely distributed. In the Esperance District both of the known populations are vulnerable. The Hatter Hill population (no. 2) is threatened by clearing from mining activities. A portion of the West Point Rd population (no. 1) coincides with a Shire gravel pit. Monitoring of these populations and further survey are required.



An erect shrub, to 1.5 m tall, with a lignotuber. Branches are sparsely covered with short hairs when young which disappear with age. Leaves are rigid, cylindrical (20 mm) and mostly divided into 3 segments which are again divided in two. Flowers are solitary or rarely in pairs and borne on short stalks (3 mm) at the ends of branches. The perianth (17-18 mm) is cream or pink at the swollen base and the narrow tube is red-pink and covered in white hairs on the outside; inside is hairless. The ovary (1 mm) is hairy and the style (30 mm) lacks hairs.

Flowering Period: July - March

Distribution and Habitat

Adenanthos gracilipes is distributed between Lake Cronin and Peak Charles, a range of 150 km. It grows in deep siliceous sand in open mallee-heath. Associated species include *Callitris* spp., *Hakea corymbosa*, *Melaleuca subtrigona* and *Calytrix decandra*.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | 90 Mile Tank,E | Esp | Esp | VCL | 15.9.64 | - | - |
| 2 | Peak Charles,N | Esp | Esp | NP & VCL | 18.9.93 | 500+ | Post-fire |
| 3a | Frank Hann | Esp | Esp | NP | 16.9.93 | 100+ | Good |
| 3b | Frank Hann | Esp | Esp | NP | 17.9.93 | 20+ | Good |
| 4 | Tadpole Lake,S | Esp | Esp | NP | 21.7.79 | Frequent | - |
| 5 | Round Top Hill,SSW | Esp | Dund | VCL | 1.11.79 | Scattered | - |
| 6 | Hyden,E | Esp | Dund | VCL | 7.9.73 | - | - |
| 7 | Forrestania,E | Esp | Dund | VCL | 25.11.64 | - | - |
| 8 | Lake Hope | Esp | Dund | VCL | 18.1.78 | - | - |
| 9 | Lake Varley-Lake King | Kat | LG | - | 1965 | - | - |

Response to Disturbance

Thirty-two months after a hot fire in January 1991, plants which had resuckered from rootstock were flowering; no seedlings were seen.

Susceptibility to *Phytophthora* Dieback

Presumed susceptible.

Summary and Recommendations

A. gracilipes appears widespread in Frank Hann National Park and in Crown Land to the north and east, a remote area which has been poorly surveyed due to the lack of access. At present, this species does not appear to be threatened.

References

George (1974), Nelson (1978).

Allocasuarina eriochlamys
subsp. *grossa* (L.A.S.Johnson) L.A.S.Johnson

CASUARINACEAE

A dense shrub or small tree, to 3 m tall. Articles (a section of modified stem that breaks at a joint) are 9-18 mm long and 1 mm diameter, not ridged; there are 8-11 teeth (0.5-1 mm). Male spikes (16-35 mm) have 10-11 whorls per cm. Cones (20-30 x 14-21 mm) are borne on stalks (4-15 mm); bracts are thickened laterally so that the base appears 2-lobed; bracteoles protrude prominently beyond the cone body, have an acute apex and an indentation below the apex.

Allocasuarina eriochlamys subsp. *grossa* is distinguished from *A. campestris* by having more prominent and thicker cone bracts, and the bracteole has an indentation below the apex whereas it is close to the apex in *A. campestris*. Cones are smaller (16 x 13 mm) in *A. campestris*.

Flowering Period: Not known

Distribution and Habitat

A. eriochlamys subsp. *grossa* grows on granite outcrops near Norseman and west of Coolgardie, a range of 160 km. Associated species include *Eucalyptus websteriana*, *A. helmsii* and *A. campestris*.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1a | Norseman,N | Esp | Dund | - | 8.9.66 | - | - |
| 1b | Norseman,NE | Esp | Dund | - | 29.8.74 | - | - |
| 1c | Norseman,E | Esp | Dund | - | 6.9.62 | - | - |
| 1d | Norseman | Esp | Dund | - | 2.35 | - | - |
| 1e | Beacon Hill | Esp | Dund | - | 4.9.68 | - | - |
| 2 | Woolyeenyer Hill | Esp | Dund | - | 14.3.80 | Scattered | - |
| 3 | Sinclair Soak,NE | Esp | Dund | - | 10.8.80 | Common | - |
| 4 | Zanthus-Cocklebidy | Esp | Dund | - | 10.64 | - | - |
| 5a | Bulla Bulling,W | Gold | Cool | - | 7.9.66 | - | - |
| 5b | Bulla Bulling | Gold | Cool | - | 4.63 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

A. eriochlamys subsp. *grossa* is poorly collected, which may be due to its similarity to *A. campestris* which is common and widespread in the same range as this taxon. It is not known to occur in any conservation reserve. Further survey is required.

References

Wilson and Johnson (1989).

A dense, rather tangled shrub, 1.5 m tall, with a lignotuber. Branches are rigid, erect and covered in soft hairs. Leaves are scattered, linear (200-450 x 8-18 mm), hairy becoming smooth, dentate with well spaced, sharp-pointed, regular teeth. The golden-orange to orange-brown flower heads are ovoid-cylindrical (4-13 x 8-10 cm), hidden amongst the foliage and borne on erect short branchlets. The perianth (34-49 mm including limb of 5-6 mm) is hairy outside and smooth inside. Up to 30 elliptic fruits (15-25 x 8-10 mm) are borne per head.

Banksia lullfitzii is closely related to *B. elderiana* which has very similar leaves, but the yellow flower heads are pendulous and the perianth lacks hairs.

Flowering Period: March - May

Distribution and Habitat

B. lullfitzii is distributed from north of Koolyanobbing to near Ravensthorpe, a range of over 300 km. It grows in yellow sand on plains, in heath and tall shrubland communities.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------------|----------|-------|----------------|-------------|---------------|-----------|
| 1 | Koorarawalyee | Gold | Cool | - | 16.5.66 | - | - |
| 2 | Boorabbin | Gold | Cool | NP | 3.10.73 | - | - |
| 3 | Queen Victoria Rock,S | Gold | Cool | - | - | - | - |
| 4 | Yellowdine,E | Mer | Yil | - | 4.2.66 | - | - |
| 5 | Bungalbin Hill,NE | Mer | Yil | VCL | 22.9.81 | 1 | - |
| 6 | Brontie | Mer | Yil | Pastoral Lease | 14.12.26 | - | - |
| 7 | Aurora Range,NE | ?Mer | Yil | - | - | - | - |
| 8 | Duri,S | Gold | Cool | VCL | 23.9.79 | Rare | - |
| 9 | Vermin Proof Fence | Esp | Rav | ?VCL | 11.67 | - | - |
| ?10 | Ninety Mile Tank,W | Esp | Dund | ?NP | 1991 | - | ?Burnt |

Response to Disturbance

According to George (1987), *B. lullfitzii* is fire-tolerant, resprouting from a lignotuber.

Susceptibility to *Phytophthora* Dieback

Presumed susceptible but occurs outside the area where *Phytophthora* is likely to be a threat.

Summary and Recommendations

B. lullfitzii is poorly known. A population is recorded in the Banksia Atlas (Taylor 1985) as occurring near Ninety Mile Tank; there is no specimen in the Western Australian Herbarium to authenticate this locality. A fire in January 1991 burnt Ninety Mile Tank and surrounding areas. Resurvey is required once populations are reproductively mature. In 1993, surveys in the general area found *B. elderiana* only.

Leigh *et al.* (1984) recommended an extension of the western edge of the Boorabbin National Park to include the Koorarawalyee population.

Further survey is required.

References

George (1981, 1987), Holliday and Watton (1975), Leigh *et al.* (1984), Taylor (1985).

A low shrub, 15-40 cm tall, with branches sparsely to densely covered in short hairs. The yellow-green leaves are near-opposite or alternate, frequently crowded, slender-cylindrical (5-15 mm), covered in small wart-like protuberances and lack hairs. The small flowers are axillary and borne on short stalks (1-2 mm). The 4 petals are broadly elliptic (3-5 mm), have a prominent thickened midrib and are usually cream-coloured, but may be pale pink, pale blue or mauve. The stalks (filaments) of the stamens are fringed with hairs; the hemispherical ovary (1 mm) is shiny with a minute style (0.5 mm). Seed is ellipsoidal (2 mm).

Flowering Period: September - December

Distribution and Habitat

Boronia fabianoides is mainly distributed between Salmon Gums and Clyde Hill, a range of about 120 km. Two populations have been found between Norseman and Balladonia. It grows on flat or undulating plains in brown calcareous loam, in woodland and shrub communities. Associated species include *Eucalyptus oleosa*, *Melaleuca uncinata*, *Westringia rigida*, *Spyridium mucronatum*, *S. minutum* and *Acacia profusa*.

Plants with affinity to *B. fabianoides* have been found further north, near Norseman and the Woodline Hills.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------------|----------|-------|----------------|-------------|---------------|-----------|
| 1 | Grass Patch,N | Esp | Esp | - | 2.11.01 | - | - |
| 2 | Grass Patch,S | Esp | Esp | MRWA Rd Res. | 23.9.92 | 10+ | Good |
| 3* | Grass Patch,W | Esp | Esp | Shire Rd Res. | 24.9.92 | 2 | Disturbed |
| 4* | Truslove,N | Esp | Esp | MRWA Rd Res. | 23.9.93 | 15 | Good |
| 5* | Clyde Hill,NW | Esp | Esp | VCL | 20.5.93 | 10+ | Disturbed |
| 6a | Clyde Hill,NW | Esp | Esp | VCL | 20.5.93 | 15+ Seedl. | Post-fire |
| 6b | Mt Heywood,NE | Esp | Esp | VCL | 9.11.80 | Scattered | - |
| 6c* | Mt Heywood,NE | Esp | Esp | VCL | 21.5.93 | 5+ | Good |
| 7a | Clyde Rock Rd | Esp | Esp | VCL | 8.84 | - | - |
| 7b* | Clyde Hill,NW | Esp | Esp | VCL | 20.5.93 | 10+ Seedl. | Post-fire |
| 8 | Cox Rd | Esp | Esp | ?Shire Rd Res. | 15.10.82 | - | - |
| | | | | | 22.9.92 | Not found | - |
| 9 | Salmon Gums,ENE | Esp | Esp | NR | 18.11.93 | 2+ | Good |
| 10* | Norseman,ENE | Esp | Dund | MRWA Rd Res. | 17.11.93 | 1 | Good |
| 11 | Balladonia,NW | Esp | Dund | - | 12.11.76 | - | - |
| 12 | Dundas-Lake Lefroy | Esp | Dund | - | 1893 | - | - |

* = new population / sub-population

Response to Disturbance

Readily grows in situations that have been disturbed, for example, along the edges of tracks. Twenty-eight months after a fire (January 1991) north-west of Clyde Hill, numerous seedlings were found on a track.

Susceptibility to *Phytophthora Dieback*

Unknown

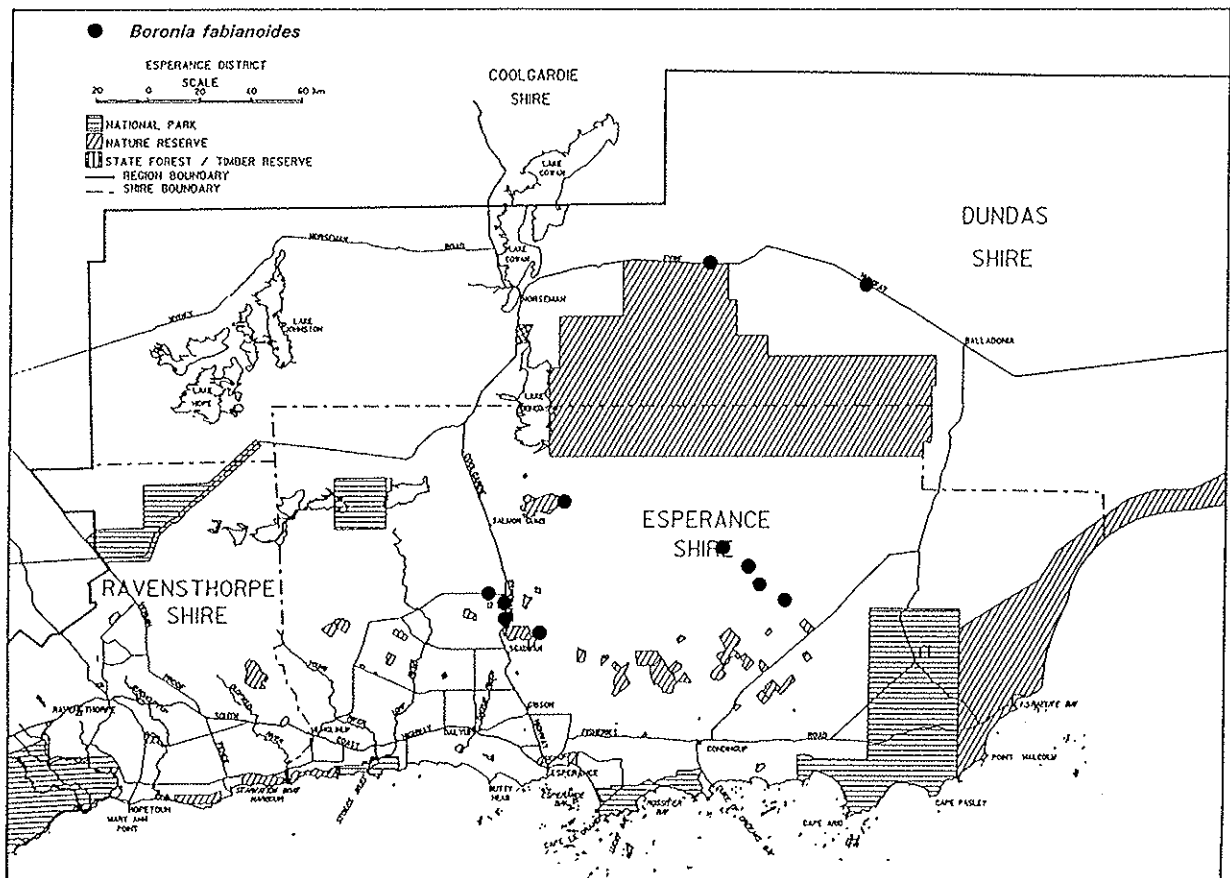
Summary and Recommendations

B. fabianoides is an inconspicuous plant which has been poorly collected.

B. fabianoides occurs on Crown Land north of the agricultural area and is not currently threatened by clearing. A few plants have been found on the eastern boundary of the Salmon Gums Nature Reserve. Further opportunistic survey is recommended.

References

Wilson (1970).



Caladenia longicauda subsp. *rigidula* Hopper and A.P.Brown ms

ORCHIDACEAE

Rigid White Spider Orchid

A distinctive orchid, 25-40 cm tall. Each plant has up to 3 white flowers (7-12 x 6-10 cm) with stiffly held petals and sepals; the dorsal sepal bends forwards over the flower while the rear lower sepals are held backwards horizontally and the front sepals hang down; the long labellum fringe and calli are red-purple. Leaves are 10-25 cm long and 6-20 mm wide.

Similar taxa which grow in the same range as *Caladenia longicauda* subsp. *rigidula* ms are: subsp. *australora* ms which has all 4 lower sepals hanging down; and the smaller flowered (4-6 x 4-5 cm) *C. cruscula* ms which has a reclining habit.

Flowering Period: August - October

Distribution and Habitat

C. longicauda subsp. *rigidula* is widely distributed along the eastern south coast, between Pallarup Rocks and Mt Ragged, a range of 350 km. It grows around rock outcrops and other winter wet areas in sand, loam and sandy clay.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------------|----------|-------|------------------|-------------|---------------|-----------|
| 1 | Wittenoom Hills | Esp | Esp | NR | 25.9.92 | 50+ | Good |
| 2 | Mt Ney, SW | Esp | Esp | - | 9.8.80 | - | - |
| 3 | Mt Ney | Esp | Esp | NR | 7.84 | - | - |
| 4 | Kau Rocks | Esp | Esp | VCL | 1.9.84 | - | - |
| 5 | Howick Hill | Esp | Esp | Private | 19.9.68 | - | - |
| 6 | Swamp Reserve | Esp | Esp | - | 1.9.77 | - | - |
| 7 | Juranda Rockhole | Esp | Esp | VCL | 16.8.80 | - | - |
| 8 | Pine Hill | Esp | Esp | NP | 16.8.80 | - | - |
| 9 | Mt Ragged | Esp | Esp | NP | 15.8.80 | - | - |
| 10 | Sheoaks Hill | Esp | Esp | NR | 14.8.80 | - | - |
| 11 | Coomalbidgup | Esp | Esp | Shire Water Res. | 9.77 | - | - |
| 12 | Howick Rd | Esp | Esp | NR | 5.9.78 | - | - |
| 13 | Swan Lagoon | Esp | Esp | NR | 24.9.92 | 1000+ | Good |
| 14 | Ashdale | Esp | Esp | - | 8.9.65 | - | - |
| 15* | Lort River | Esp | Esp | VCL | 20.9.93 | 4 | Good |
| ?16 | West River | Alb | Rav | VCL | 19.8.77 | - | - |
| 17 | Ravensthorpe, E | Alb | Rav | - | 22.9.79 | - | - |
| 18 | Pallarup Rock | Kat | LG | NR | 6.9.84 | 30 | - |

* = new population

Response to Disturbance

Unknown

Centrolepis cephaloformis
subsp. *murrayi* (J.M.Black) D.A.Cooke

CENTROLEPIDACEAE

A small, moss-like annual herb forming dense, rounded tufts, 4-8 mm tall and 8-15 mm wide. The green leaves are linear (3-9 mm), sometimes bend backwards, have a sheathing base and a translucent sharp tip. Flower heads (2-3 x 1-1.6 mm) are nestled amongst the inner leaves and have only 1 bisexual flower; 2 primary bracts tightly enclose the head; carpels 8-10; the style is free.

Centrolepis cephaloformis subsp. *murrayi* can be distinguished from subsp. *cephaloformis* as it has solitary flowers, while subsp. *cephaloformis* has 3 flowers per head. It differs from *C. humillima* by having 2 floral bracts (not 1), more numerous carpels and the free style.

Flowering Period: September - November

Distribution and Habitat

C. cephaloformis subsp. *murrayi* is known only from four widely separated localities. It was first collected on North Pearson Island in South Australia, and has since been found in the Archipelago of the Recherche, near Bremer Bay and inland from Kalbarri. It has been found in seepages over granite rock, near a watercourse and on a saline flat.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Boxer Island | Esp | Esp | NR | 8.11.50 | - | - |
| 2 | Mt Cooper, NNW | Alb | Jer | - | 9.10.87 | 1 Patch | - |
| 3 | Ajana, W | Ger | Nthn | - | 23.8.65 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

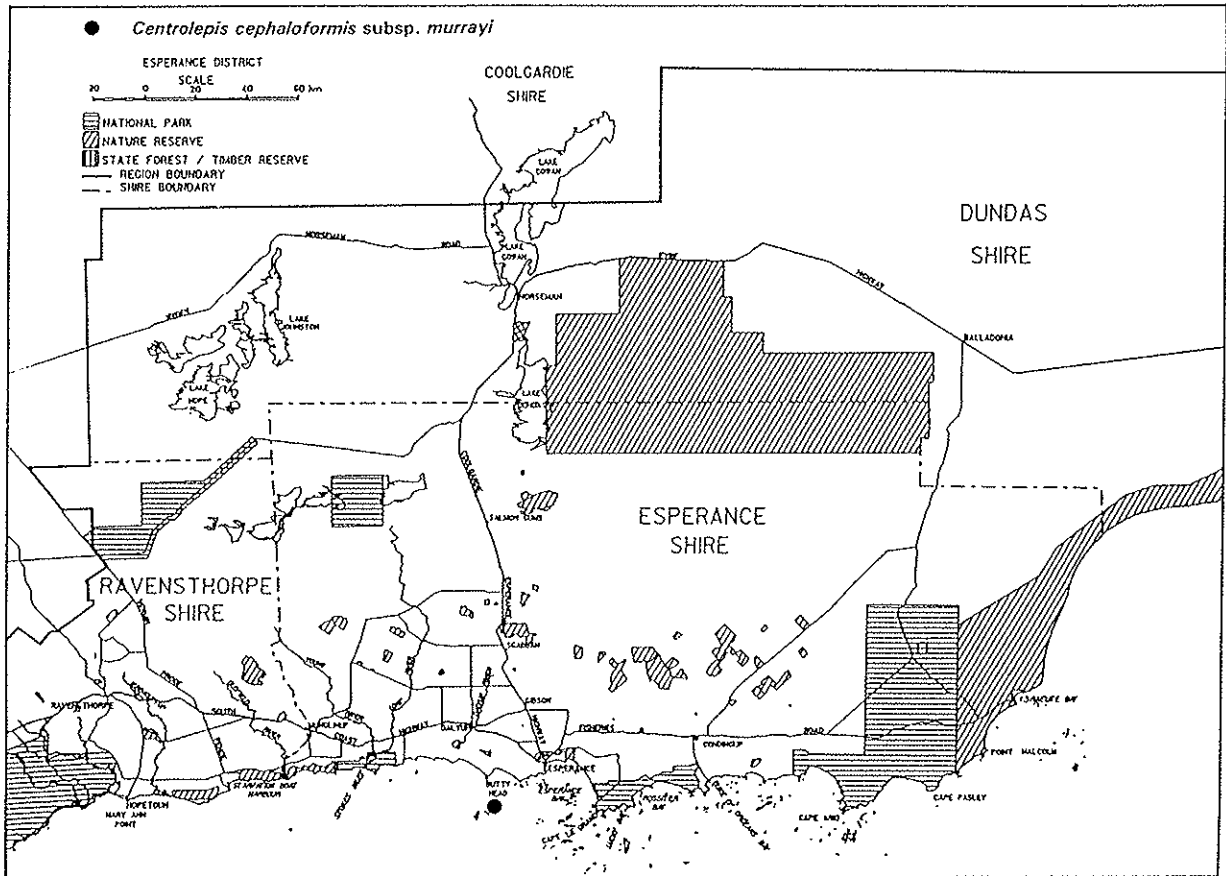
Unknown

Summary and Recommendations

C. cephaloformis subsp. *murrayi* is a minute annual that is poorly known, but has possibly been overlooked because of its small size. It has been collected only four times in the last 70 years. Further survey is required.

References

Black (1923, 1960), Cooke (1980).



A straggling, sparse shrub, to 45 cm tall, and often tangled amongst other shrubs. Leaves are linear (8-20 x 1 mm), near opposite or alternate, stalked, finely sharp-pointed and sometimes hooked at the tip; margins are rolled tightly backwards towards the midrib (revolute) which is prominent on the underside; basal appendages (stipules) are absent. Up to 10 flowers are borne in head-like clusters (racemes, 10-15 mm) at the ends of branches. The calyx (6-8 mm) is densely covered in fine, long white or grey hairs; lobes are acute at the tip, the lower lobes are divided for more than or equal to half the length of the calyx, the upper 2 lobes are united but have free tips. The corolla has a large slightly reflexed petal (8-10 x 8-11 mm) which is dented in the middle on the margin and coloured orange-yellow on the upper side and dark red-brown underneath; the wings are yellow and red-brown and shaped like an ear lobe (7.5-10 x 1-2 mm); the narrow keel which often protrudes between the wing-petals is orange-yellow at the base and dark red-brown at the tip which narrows to a point (2-4 mm) and is often curled. Stamens are all free. The ovary is covered in long, silky white hairs. Legumes are fleshy (5-7.5 x 3-4 mm).

Chorizema ulotropis has affinity to *C. cytisoides*, *C. obtusifolium*, *C. circinale* and *C. uncinatum* all of which have broader leaves (>1.5 mm).

Flowering Period: August - September

Distribution and Habitat

C. ulotropis mainly grows in the Jerramungup area, although one specimen has been collected near Young River. It grows on flat or undulating plains in sand, gravelly sand or sandy clay, in mallee-heath communities.

Conservation Status

Current: Priority 3

Known Populations (List incomplete as specimens on loan)

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|--------------|-------------|---------------|-----------|
| 1 | Young River | Esp | Esp | - | - | - | - |
| 2 | Ravensthorpe,W | Alb | Rav | - | 14.8.82 | - | - |
| 3a | Jerramungup,E | Alb | Jer | MRWA Rd Res. | 17.9.83 | - | - |
| 3b | Jerramungup,E | Alb | Jer | MRWA Rd Res. | 12.9.66 | - | - |
| 4 | Needilup Hill | Alb | Jer | - | 16.8.64 | - | - |
| 5 | Ongerup,E | Alb | Jer | MRWA Rd Res. | 23.8.63 | - | - |
| 6 | Ongerup,W | Alb | Gno | - | 22.8.62 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

No populations are known in any conservation reserve. Further survey is required.

References

Taylor and Crisp (1992).

A sprawling, short-lived herb, 10-15 cm tall and up to 1 m diameter, which divides at ground level into 4-7 prostrate slender stems. Leaves are narrow-elliptical (7-20 x 3-5 mm), acute at the tip, lack stalks, semi-succulent and are scattered along the branches. Separate male and female inflorescences are borne singly on short stalks (1 mm) in leaf axils at the ends of branches. Male flowers are small (3 mm across), pale yellow, with 8-10 anthers which are 2-celled. Female flowers are similar to male flowers, the near cylindrical ovary (2 mm) is smooth with a recessed apex; the stigma is 3-lobed and fringed with hairs. The fruit is an enlarged, barrel-shaped carpel (4-6 mm).

Cypselocarpus haloragoides has a similar habit to *Gyrostemon prostratus* which has succulent, linear leaves (3-5 mm).

Flowering Period: September - November

Distribution and Habitat

C. haloragoides is distributed between the Stirling Range and Israelite Bay, a range of 550 km. It grows in well-drained sand on coastal dunes and on sandplain. Associated species include *Sporobolus* sp., *Acacia cyclops*, *Scaevola crassifolia*, *Dryandra armata* and *Melaleuca leptospermoides*.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Israelite Bay | Esp | Esp | NR | 22.10.60 | - | - |
| 2 | Cape Arid | Esp | Esp | NP | 26.4.93 | 50+ | Good |
| 3 | Mt Baring,N | Esp | Esp | NP | 12.10.83 | 15 | - |
| | | | | | 25.4.93 | Not found | - |
| 4a | Esperance | Esp | Esp | - | 12.56 | - | - |
| 4b | Esperance | Esp | Esp | - | 8.62 | - | - |
| 5 | Jerdacuttup Lakes | Alb | Rav | NR | 15.10.83 | Common | Post-fire |
| 6 | Ravensthorpe,WSW | Alb | Rav | NP | 17.9.79 | 1 | Disturbed |
| 7 | Woolbernup Hill,NE | Alb | Rav | NP | 22.11.85 | Rare | - |
| 8 | Devils Creek Rd | Alb | Jer | - | 1960s | Few | - |
| 9 | Bremer Bay | Alb | Jer | - | - | - | - |
| 10 | Bremer Bay,S | Alb | Jer | - | 18.6.74 | Common | - |
| 11 | Bremer Bay | Alb | Jer | Golf Club | 31.8.76 | - | - |
| 12 | Bremer Bay,W | Alb | Jer | - | 12.9.87 | Scattered | Post-fire |
| 13 | Chester Pass Rd | Alb | Gno | NP | 3.9.69 | - | Post-fire |
| 14 | Salt River Rd | Kat | Cbk | - | 17.11.82 | Common | Post-fire |
| 15 | Camel Lake | Kat | Cbk | NR | 28.20.83 | - | Post-fire |

Response to Disturbance

Appears to be a disturbance opportunist. It has usually been found on sandplain after fire or on near-shore sand dunes.

An erect, openly branching shrub, 60-90 cm tall. The greyish green leaves are broadest above the middle (obovate, 0.7-1.5 x 3-7 mm), obtuse at the tip, almost hairless, leathery when dry and overlap towards the ends of branches. Dense clusters of flowers (panicle, 35-60 x 20-25 mm in outline) are borne on long stalks (5-6 mm) which are further arranged in groups (cyme) with individual flower stalks (2-4 mm) covered in grey felt-like hairs. Flowers are mostly 5-merous, with a bracteole on either side of the bract. The calyx (1-2 mm) is covered in short, greyish felt-like hairs, and the pale grey or white corolla (4-5 mm) is sparsely hairy. Five stamens (sometimes 4) are much exserted beyond the corolla. The ovary (1 mm) is densely white hairy.

Flowering Period: July, October - November

Distribution and Habitat

Dicrastylis obovata is known to occur in the Frank Hann National Park and further north, near Lake Hope, a range of about 50 km. It grows in deep yellow sand in shrub communities associated with *Melaleuca uncinata* and *Grevillea excelsior*.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------------|----------|-------|-------------|-------------|---------------|------------|
| 1 | Frank Hann | Esp | Rav | NP | 13.11.79 | Frequent | - |
| | | | | | 17.9.93 | 1 only | Vulnerable |
| 2(?=1) | Ninety Mile Tank,W | Esp | Dund | VCL | 17.10.74 | - | - |
| 3 | Forrestania-Lake Hope | Esp | Dund | VCL | 25.11.64 | - | - |

Response to Disturbance

Appears to be a disturbance opportunist.

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

D. obovata is very poorly known and possibly rare. All of the *D. obovata* collections which have been recorded from Frank Hann National Park appear to be from the one locality; the population (no. 2) recorded by both H. Demarz and E. Witter (17.10.74) as "W of Ninety Mile Tank", would also be at the same locality if they travelled the Lake King-Norseman Rd. In 1993, a survey relocated the population (no. 1) in Frank Hann National Park, and only one plant was found alongside the road where the verge had been disturbed. Further survey is required.

References

Munir (1978).

An erect shrub, to 1 m tall, with separate male and female flowers. The spreading branches are densely hairy. Leaves are triangular (7-12 x 4-10 mm) and 3-lobed above the middle, rarely dividing again, lack stalks, smooth or sparsely hairy on margin and midrib, leathery, and margins are slightly rolled backwards (revolute). Clusters of 3-5 flowers are borne on short stalks (1-2 mm) at the ends of branches. Male flowers have 8 stamens with large anthers (2-3 x 0.8 mm) that have a hairy appendage at the apex. Female flowers have a densely hairy, oblong ovary (1.5 mm) comprising 3 carpels. Fruits are 3-angled capsules which are dark red or brown tinged with purple at maturity, and bear 1-4 seeds that are black and shiny.

Flowering Period: August - November

Fruiting Period: November - January

Distribution and Habitat

Dodonaea trifida is widely distributed between Albany and the Oldfield River, a range of about 300 km. It grows in grey loamy sand, rocky loam, clay or gravelly soils, and is most often found on hillsides, as an undershrub in coastal scrub or low woodland.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Ravensthorpe,E | Esp | Rav | - | 5.8.72 | - | - |
| 2 | Kundip | Alb | Rav | VCL | 20.11.66 | - | - |
| 3 | Thumb Peak | Alb | Rav | NP | 27.10.67 | - | - |
| 4 | Fitzgerald River | Alb | ?Rav | NP | 1970 | - | - |
| 5 | Bremer Bay,NNW | Alb | Jer | NP | 18.9.86 | Scattered | - |
| 6 | Millars Point | Alb | Jer | Shire Res. | 17.11.92 | 300+ | Healthy |
| 7 | Cape Riche | Alb | Alb | Shire Res. | 3.11.92 | 50+ | Healthy |
| 8 | Mt Melville | Alb | Alb | Shire Res. | 22.11.64 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

D. trifida should remain secure in the Fitzgerald River National Park. Further survey is required.

References

Robinson and Coates (1995), West (1984b).

Dryandra viscida A.S.George

PROTEACEAE

[= *Dryandra* sp. 16 (A.S.George 9446)]

A dense, rounded shrub, to 1 m tall, without a lignotuber. Branches are hairy and densely leaved. Leaves are linear (150-350 x 5-10 mm) and cut into close, acute, short (3-6 mm), triangular lobes on both sides almost to the midrib. Flower heads are golden yellow and closely successive at the ends of branches. The perianth limb (55 mm) and bracts are hairy and sticky. Seed capsules are oblong (15 mm), sparsely hairy and sticky.

This taxon has affinity to *Dryandra horrida*.

Flowering Period: July

Distribution and Habitat

D. viscida is known from Hatter Hill, Digger Rocks, and the Ironcaps, where it grows in stony red-yellow loam in low scrub, associated with *Grevillea*, *Acacia* and *Allocasuarina*.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Hatter Hill | Esp | Rav | VCL | 27.10.92 | 1000+ | Good |
| 2 | South Ironcap | Nar | Kon | - | 8.7.79 | Frequent | - |
| 3 | Middle Ironcap | Nar | Kon | - | 2.10.86 | - | - |
| 4 | Digger Rocks, W | Nar | Kon | - | - | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible but occurs outside the area where *Phytophthora* is considered to be a threat.

Summary and Recommendations

Monitoring of the population at Hatter Hill is essential. Although mining activity has currently ceased, the population is vulnerable to future disturbance. Liaison with the mining tenement holder is needed.

Further survey is required. *D. viscida* is not known in any conservation reserve.

A shrub, to 1.5 m tall, with branches that are densely covered with wart-like, slightly raised glands. Leaves are alternate, mostly clustered at the branch tips, very thick, almost fleshy, broader towards the tip and gradually tapering to the base (obovate-spathulate, 5-13 x 2-7 mm), apex obtuse, but the tip is pointed and curved backwards; the lower surface has warty protuberances. Single flowers are borne in the leaf axils on long, purplish, S-shaped stalks (10-25 mm) that are covered in short, glandular and non-glandular hairs. The 5 calyx lobes are divided to the base, broad obovate (8-11 x 6-8 mm), overlap one another, mostly purple and covered in glandular hairs on both sides. The corolla is yellow with purple spots in bud, and the open flower is light purple with dark purple spots and inside the short tube (10-12 mm) is yellow in the lower portion. The 4 stamens extend slightly beyond the tube; the ovary is smooth. Fruits are conical (4 x 3 mm), drying black and have a wrinkled exterior. Seeds are small (2 x 0.5 mm), oblong and white.

Eremophila purpurascens is closely related to *E. alternifolia* which has less warty branches and linear leaves (20-35 x 1-4 mm).

Flowering Period: September - October

Distribution and Habitat

E. purpurascens is restricted to the granite hills around Norseman, with a known range of less than 15 km. It grows in rocky, red-brown loam in low shrub and woodland communities. Associated species include *Melaleuca uncinata* and *Triodia* spp.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------|----------|-------|---------------|-------------|---------------|-----------|
| 1a | Jimberlana Hill | Esp | Dund | Unvested Res. | 19.11.92 | 200+ | Good |
| 1b | Norseman,ENE | Esp | Dund | ?VCL | 18.11.93 | 2+ | Good |
| 2 | Norseman,NE | Esp | Dund | - | 29.8.74 | - | - |
| 3 | Norseman,NW | Esp | Dund | VCL | 24.10.67 | - | - |
| 4 | Lake Cowan | Esp | Dund | VCL | 11.9.76 | - | - |
| 5 | Norseman Hills | Esp | Dund | - | 27.9.31 | - | - |
| 6 | Norseman,S | Esp | Dund | - | 21.10.64 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

E. purpurascens appears to very geographically restricted. The majority of localities where this species grows are covered by mining leases. Further intensive survey of hills and ridges in the vicinity of Norseman is required.

References

Chinnock (1979).

Eucalyptus brockwayi C.A.Gardner

MYRTACEAE

Dundas Mahogany

An erect tree, up to 25 m tall. Bark is smooth to patchy, white or grey peeling in patches to expose fresh bark that is salmon pink to bronze. The juvenile leaves are pale green, hairy, crowded, and lack stalks, linear (30 x 5 mm) becoming elliptical (20-70 x 5-30 mm). Adult leaves are stalked, green and glossy, narrow-lanceolate (70-130 x 7-15 mm) with a very dense network of veins and apparently lack oil glands. Each inflorescence has 11-15 buds borne on an rounded or slightly angular stalk (peduncle, 5-14 mm). Individual buds (7-8 x 3-4 mm) are on very short stalks, smooth, have a bluntly conical bud cap that is shorter than the calyx tube, and a scar where the cap joins the tube. Flowers are white. Fruits are almost globular/urn-shaped (urceolate, 5-7 x 5-7 mm) with a thin rim, a descending disc, and 3 or 4 enclosed valves. Seed is smooth, grey, compressed ovoid, with longitudinal grooves.

Flowering Period: April - June

Distribution and Habitat

Eucalyptus brockwayi occurs around Norseman, over a 50 km range. It grows in red sandy, often gravelly loam, on flat or gently sloping ground, in open woodland. Associated species include *E. flocktoniae*, *E. dundasii*, *E. lesouefii*, *E. griffithsii*, *E. salmonophloia* and *Acacia merrallii*.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------|----------|-------|---------------------|-------------|---------------|-----------|
| 1a | Norseman,W | Esp | Dund | - | 15.12.40 | - | - |
| 1b | Norseman,W | Esp | Dund | - | 7.2.66 | - | - |
| 1c | Norseman,W | Esp | Dund | - | 6.46 | - | - |
| 2 | Norseman | Esp | Dund | - | 1.36 | - | - |
| 3 | Norseman,NNW | Esp | Dund | - | 27.4.88 | - | - |
| 4a | Norseman,N | Esp | Dund | MRWA Rd Res. | 21.6.78 | Abundant | - |
| 4b | Mt Thirsty | Esp | Dund | ?VCL | 27.1.67 | - | - |
| 5 | Norseman,N | Esp | Dund | MRWA Rd Res. | 2.11.92 | 15 | Good |
| 6 | Norseman,N | Esp | Dund | MRWA Rd Res. | 1.2.79 | Dominant | - |
| 7 | Norseman,NW | Esp | Dund | MRWA Rd Res. | 20.11.92 | 20+ | Good |
| 8 | Norseman,NW | Esp | Dund | VCL | 20.11.92 | Frequent | Good |
| 9a | Norseman,SE | Esp | Dund | - | 11.11.70 | - | - |
| 9b | Norseman,SE | Esp | Dund | ?VCL (Mining Lease) | 18.9.78 | - | - |
| 9c* | Norseman,SSE | Esp | Dund | ?VCL | 19.11.92 | 4 | Good |
| 10 | Norseman,S | Esp | Dund | MRWA Rd Res. | 29.3.68 | - | - |
| 11 | Norseman,S | Esp | Dund | ?MRWA Rd Res. | 19.9.78 | - | - |
| 12 | Woolyeeny Hill | Esp | Dund | - | 14.3.80 | Very common | - |
| 13 | Jimberlana Hill | Esp | Dund | - | 18.11.87 | - | - |
| 14* | Brockway | Esp | Dund | Timber Res. | 18.11.92 | 14+ | Good |

* = new population

Susceptibility to *Phytophthora Dieback*

Unknown

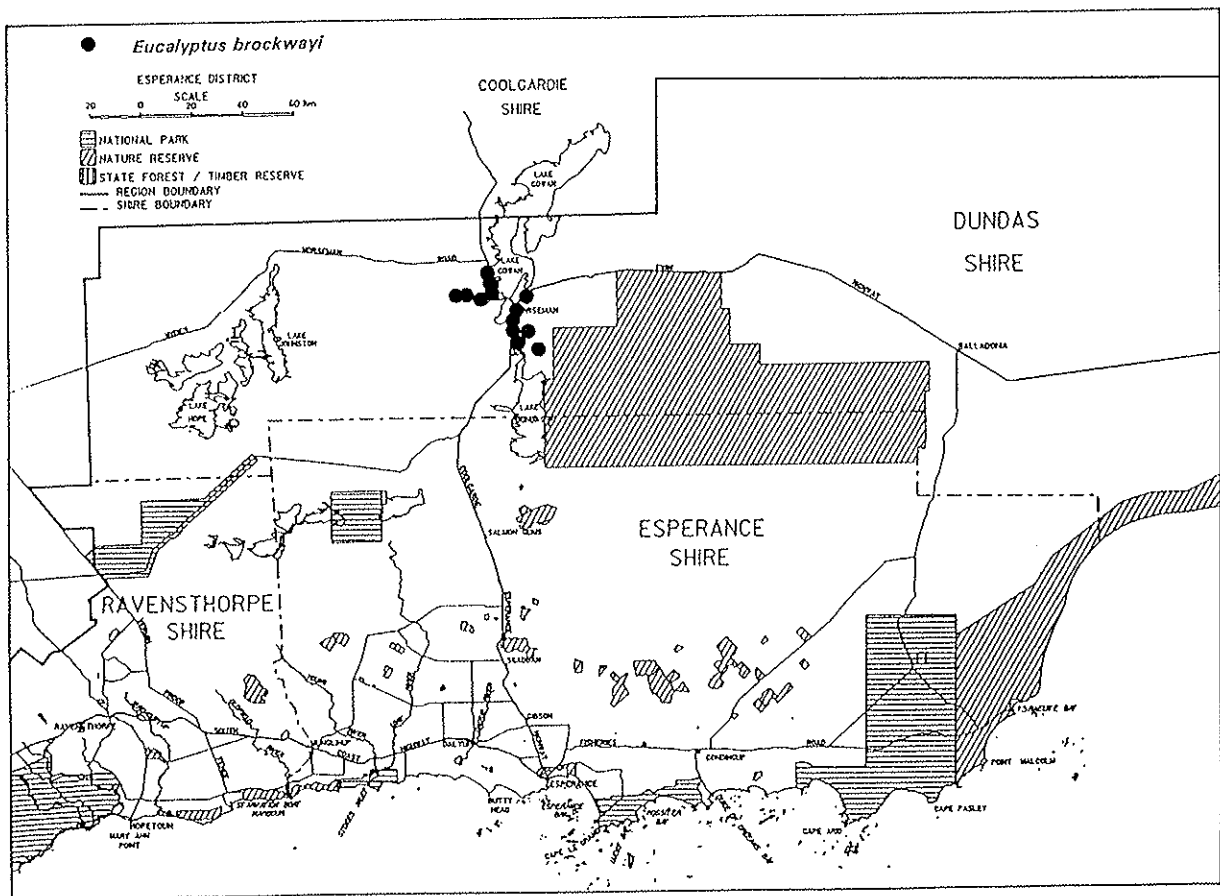
Summary and Recommendations

E. brockwayi is widespread around Norseman, although most of the known populations are small. Up to 26 km north-west of Norseman, along the Norseman-Coolgardie Highway, and westwards along a track towards Theatre Rock, *E. brockwayi* is frequent, but never abundant, with only 3 to 6 widely scattered trees at any particular locality. It is not known to occur in any conservation reserve.

A timber reserve has been proposed for an area between Theatre Rocks and Lake Cowan, which would include *E. brockwayi* and *E. pterocarpa* populations (Henry-Hall 1990). Further action on this proposal is required.

References

Brooker and Kleinig (1990), Gardner (1942), Henry-Hall (1990).



Eucalyptus creta L.A.S.Johnson & K.D.Hill

MYRTACEAE

Large-fruited Gimlet

A tree, to 10 m tall, with coarsely fluted stems and shining, smooth, bronze to coppery bark. Adult leaves are lanceolate or narrow-lanceolate (60-100 x 10-18 mm) with a sparse network of veins and large oil glands, thick, bright green and distinctly glossy. Up to 3 flowers are borne per inflorescence; stalks are very short (1-3 mm) or absent. Buds are globular to ovoid (about 15 mm wide) with conical to hooked bud caps. Flowers are creamy yellow. Fruits are broadly hemispherical, (9-12 x 15-21 mm), 2-winged, 4-5 valved and have a broad, raised scar (1.5-2.5 mm wide) from the bud cap.

Eucalyptus creta is related to *E. diptera* which has smaller buds (10-14 x 7-11 mm) and fruits (7-11 x 10-15 mm).

Flowering Period: May - June

Distribution and Habitat

E. creta has a scattered distribution north-east of Mt Ridley, with a known range of about 50 km. It grows on brown clay loam, in woodland or very open tree mallee and heath, associated with *Melaleuca* and *Acacia*.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Sheoak Hill,N | Esp | Esp | VCL | 22.5.93 | 350+ | Good |
| 2 | Sheoak Hill,NE | Esp | Esp | VCL | 12.84 | - | - |
| 3 | Sheoak Hill,NE | Esp | Esp | VCL | 9.84 | - | - |
| 4 | Clyde Rock,NNW | Esp | Esp | VCL | 12.84 | - | - |
| 5 | Mt Beaumont,N | Esp | Esp | VCL | 12.84 | - | - |
| 6 | Wittenoom Hills,N | Esp | Esp | VCL | 16.9.70 | - | - |
| 7 | Salmon Gums,N | Esp | Esp | - | 15.12.40 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

E. creta is distributed in a remote area which is not threatened by clearing for agriculture. Resurvey of known populations and further opportunistic survey are required.

References

Brooker and Kleinig (1990), Johnson and Hill (1991).

Eucalyptus exigua Brooker & Hopper

MYRTACEAE

An erect mallee, about 3.5 m tall, with smooth bark. The grey-green juvenile leaves are ovate (to 70 x 40 mm), while adult leaves are narrow-lanceolate to lanceolate (60-110 x 8-19 mm) and glossy light green. Up to 11 stalked buds are borne on a rounded stalk (peduncle, 7-19 mm). Bud caps are very short (2 mm) and very constricted at the join with the calyx tube (5 mm + 3 mm stalk). Flowers are white. Fruits are cup-shaped with 3 or 4 valves to rim level or enclosed; the disc is descending and the rim thin.

Eucalyptus exigua is closely related to *E. brachycorys* which occurs near wet depressions in the northern and central Wheatbelt. *E. brachycorys* grows up to 6 m tall, has a rough basal stocking and has smaller buds and fruits than *E. exigua*.

Flowering Period: ?February

Distribution and Habitat

E. exigua occurs in the Lake Cronin area, with a known distribution of about 75 km. It grows on sandplain or in low lying areas, in sandy loam, loam or clay loam in open woodland or mallee-heath communities. Associated species may include *E. dundasii*, *E. calycogona*, *E. eremophila*, *E. foecunda* and *E. sheathiana*.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1a | Mt Day,W | Esp | Dund | VCL | 7.11.83 | - | - |
| 1b | Hyden-Norseman Rd | Esp | Dund | VCL | 7.11.83 | Frequent | - |
| 1c | Cross Roads,E | Esp | Dund | VCL | 6.4.85 | - | - |
| 2 | McDermid Rock,SW | Esp | Dund | VCL | 15.7.79 | Scattered | - |
| 3a | Lake Cronin area | Mer | Kon | VCL | 6.2.81 | Common | - |
| 3b | Lake Cronin,NE | Mer | Kon | VCL | 21.10.86 | Frequent | - |
| 3c | Lake Cronin,E | Mer | Kon | VCL | 3.10.75 | - | - |
| 4 | Lake Cronin,E | Mer | Kon | VCL | 3.9.86 | - | - |
| 5 | Cross Roads,S | Mer | Kon | VCL | 22.7.88 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

E. exigua is only known from Lake Cronin where it forms the dominant species in the plant community. Resurvey of known populations and further survey are required.

References

Brooker and Kleinig (1990).

A medium-sized mallee. Bark is smooth, grey or pinkish-brown, sometimes with thin, rough, persistent bark at the base. Young branches are square in cross-section. Juvenile leaves are ovate to broad-lanceolate (80-120 x 30-40 mm) and dull, blue-green. Adult leaves are glossy green, lanceolate (70-90 x 15-20 mm), with a dense network of veins and sparse oil glands. Inflorescences are 7-flowered and borne on a stout, flattened stalk (peduncle, 5-12 mm). Buds (10-15 x 5-6 mm) are more or less stalkless, ribbed and have a rounded or conical to beaked bud cap. Flowers are white. Fruits are cup-shaped to cylindrical (7-9 x 7-8 mm), ribbed, thick-rimmed, and have a descending disc and 3 or 4 enclosed valves. Seed is brown and shallowly pyramidal in shape.

Eucalyptus famelica is similar to a number of species including: *E. rigens* which grows in saline habitats, has larger buds and fruits, and 3-flowered inflorescences; *E. incrassata* which has slightly larger fruits (8-13 x 7-13 mm) that are distinctly stalked, and black seeds; and, *E. litorea* which is known only east of Condingup.

Flowering Period: April - August

Distribution and Habitat

E. famelica is known only from near the coast between the Vermin Proof Fence and the Oldfield River, with a disjunct population occurring about 30 km away, to the north of Munglinup. It grows in large clumps, emergent above low shrubs in winter-wet depressions in undulating sandplain.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------------|----------|-------|-----------------------------|-------------|---------------|-----------|
| 1 | VPF-Oldfield River | Esp | Esp | NR, Shire Rd Res. & Private | 2.2.89 | 3 000+ | Good |
| 2 | Stokes Inlet,NE | Esp | Esp | - | 7.5.81 | Common | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

E. famelica appears to be geographically restricted, with about 25% of the known localities occurring on the Lake Shaster Nature Reserve where it should remain secure. The remaining populations are on road reserves and private property (N. McQuoid, personal communication). Populations on farmlands are possibly vulnerable to clearing, rising water tables and excessive salinity.

References

Brooker and Hopper (1989), Brooker and Kleinig (1990).

A mallee, to 4 m tall. with smooth bark. The bluish-green juvenile leaves are ovate to lanceolate (to 11 x 4 cm), while adult leaves are narrowly lanceolate to lanceolate (to 11 x 1 cm), held erect and slightly glossy green. Up to 13 spindle-shaped, stalked buds (to 20 x 3 mm) are borne per flattened stalk (peduncle, 10-18 mm). The bud cap is horn-shaped and may be hooked at the tip. Fruits are stalked and cylindrical (to 9 x 5 mm). Seeds are light grey-brown, smooth and subspherical.

Eucalyptus histophylla is within the series Reduncae and is closely related to *E. tumida* which has a more southern distribution in coastal and subcoastal areas, near Esperance. Possible hybrids of *E. histophylla* x *tumida* are found near Clyde Hill, Salmon Gums and west of Grass Patch.

Flowering Period: Unknown

Distribution and Habitat

E. histophylla is known south of Norseman, and between Fraser Range and Balladonia extending southwards to Mt Buraminy, a range of over 150 km. It predominantly grows on granite outcrops and may be associated with *E. eremophila*, *E. fraseri*, *E. leptophylla* and *E. indurata*.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------------|----------|-------|---------------|-------------|---------------|-----------|
| 1a | Balladonia,W | Esp | Dund | MRWA Rd Res. | 17.11.93 | 1 | Good |
| 1b | Balladonia,W | Esp | Dund | MRWA Rd Res. | 17.11.93 | 60+ | Good |
| 1c | Balladonia,W | Esp | Dund | MRWA Rd Res. | 17.11.93 | 20+ | Good |
| 3a | Boingaring Rocks | Esp | Dund | NR | 12.12.90 | Common | - |
| 3b | Boingaring Rocks,E | Esp | Dund | NR | 21.8.89 | - | - |
| 4 | Mt Coobaninya | Esp | Dund | VCL | 22.8.89 | - | - |
| 5 | Mt Buraminy | Esp | Dund | VCL | 23.8.89 | - | - |
| 6a | Norseman,S | Esp | Dund | ?MRWA Rd Res. | 5.11.86 | Frequent | - |
| 6b | Norseman,S | Esp | Dund | ?MRWA Rd Res. | 3.1.78 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

E. histophylla appears to widespread east and south-east of the Fraser Range. It occurs in the Dundas Nature Reserve and Crown Land that is not threatened by clearing. Further opportunistic survey of granite outcrops within the known distribution is recommended.

References

Brooker and Hopper (1991), Brooker and Kleinig (1990).

Eucalyptus ovularis Maiden & Blakely

MYRTACEAE

Small-fruited Mallee

A mallee or small tree, to 9 m tall, with grey-brown rough bark on the lower half and smooth pinkish-grey bark above. The rough stocking may be absent on plants growing north-east of Esperance. Leaves are stalked, alternating, narrow-lanceolate (55-90 x 5-8 mm), at first dull, grey-green becoming glossy green with a dense network of veins and numerous oil glands. More than 7 buds are borne per inflorescence on a slender, angular stalk (peduncle, 8-13 mm). Individual buds are shortly stalked, ovoid (5-6 x 3 mm), with a scar where the bud cap joins the calyx tube. Flowers are white. Fruits are borne on short stalks, ovoid to slightly urn-shaped (4-6 x 4 mm), thin rimmed with 3 enclosed valves and a descending disc. Seed is brown, compressed-ovoid with a distinct, shallow, net-like pattern on the surface.

A species similar to *Eucalyptus ovularis*, which grows in the Esperance District, is *E. myriadena* (Bullfinch-Southern Cross-Ravensthorpe) which has smaller, pear-shaped buds (4-5 x 2-3 mm) and very glossy, dark green leaves.

Flowering Period: September - April

Distribution and Habitat

E. ovularis is scattered from east of Ravensthorpe to near Balladonia, a range of about 260 km. It grows on sandy loams or clays, in open shrub mallee over low scrub. Associated species include *E. flocktoniae*, *E. eremophila* and *E. pileata*.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------------|----------|-------|---------------|-------------|---------------|-----------|
| 1 | Londonderry,S | Gold | Cool | - | 29.9.79 | Frequent | - |
| 2 | Norseman,N | Esp | Dund | MRWA Rd Res. | 27.3.68 | - | - |
| 3 | Jyndabinbin Rocks,NE | Esp | Dund | NR | 11.12.90 | Dominant | - |
| 4 | Mt Willgonarinya | Esp | Dund | VCL | 13.12.91 | Dominant | - |
| 5 | Balladonia,W | Esp | Dund | - | 21.8.79 | - | - |
| 6 | Balladonia,SW | Esp | Dund | - | 11.5.78 | Scattered | - |
| 7 | Junana Rock | Esp | Esp | NP | 6.11.86 | Dominant | - |
| 8 | Clyde Rock,NW | Esp | Esp | VCL | 6.11.86 | - | - |
| 9 | Clyde Rock,NE | Esp | Esp | VCL | 8.83 | - | - |
| 10 | Mt Ney,NNE | Esp | Esp | VCL | 8.8.83 | - | - |
| 11 | Mt Ney,NNE | Esp | Esp | VCL | 6.5.83 | - | - |
| 12 | Mt Beaumont,NNE | Esp | Esp | VCL | 10.83 | - | - |
| 13 | Kumarl,S | Esp | Esp | MRWA Rd Res. | 5.11.86 | Frequent | - |
| 14 | Salmon Gums | Esp | Esp | MRWA Rd Res. | 14.11.87 | - | - |
| 15 | Salmon Gums | Esp | Esp | NR | 10.84 | - | - |
| 16 | Grass Patch | Esp | Esp | - | 31.3.68 | - | - |
| 17* | Starcevich Rd | Esp | Esp | Shire Rd Res. | 24.9.92 | 20+ | Good |
| 18 | Peak Charles | Esp | Esp | NP | 16.11.87 | - | - |
| | | | | | 8.1.91 | - | Burnt |
| 19 | Fields Rd | Esp | Esp | NP | 18.9.93 | 1+ | Good |
| 20 | Fields Rd | Esp | Esp | VCL | 19.9.93 | 10+ | Good |

A mallee or rarely a small tree to 3 m tall. The bark is smooth, mottled grey, whitish or pale coppery. The adult leaves are broad-lanceolate (80-110 x 10-30 mm), grey-green, glossy and have many side veins. Each inflorescence has up to 7 buds borne on a cylindrical, usually pendulous stalk (peduncle, 9-21 mm). Buds are stalked (2-8 mm), slightly ribbed but non-angular (to 13 x 8 mm), and have bud caps that are rounded or hemispherical; a scar is present at the join of the bud cap with the calyx tube. Flowers are white. Fruits are semi-globular (to 10 x 13 mm), thick rimmed and have 4 valves that are enclosed but appear exerted due to the persistent style fragments.

Eucalyptus semiglobosa is closely related to subsp. *goniantha* which occurs north-east of Albany, has ribbed or angular buds and fruits, and bud caps with an acute, beaked tip. *E. semiglobosa* is also similar to *E. kessellii* which has cream buds with pointed bud caps, wide flattened inflorescence stalks (peduncles) and larger ribbed fruits (10-18 x 13-18 mm).

Flowering Period: April - June

Distribution and Habitat

E. semiglobosa has a scattered distribution from Cape Le Grand to near Mt Baring, a range of about 120 km. It grows on shallow sandy soil near granite domes, or in grey sand on plains and near wet depressions or watercourses. It grows in dense mallee thicket or in heath communities, associated with *E. cooperiana*, *E. occidentalis*, *E. uncinata*, *E. aquilina* or *E. ligulata*.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|---------------|-------------|---------------|-----------|
| 1 | Coronet Creek | Esp | Esp | NP | 22.4.72 | - | - |
| 2 | Coolinup Rd | Esp | Esp | NR | 14.11.87 | Frequent | - |
| 3 | Esperance, E | Esp | Esp | - | 25.3.68 | - | - |
| | | | | | 15.10.74 | - | - |
| 4 | Fisheries Rd | Esp | Esp | Shire Rd Res. | 26.9.92 | 1 | Damaged |
| 5 | Boyatup Hill | Esp | Esp | VCL | 19.4.93 | 600+ | Good |
| 6 | Logans Rd | Esp | Esp | Shire Rd Res. | 28.3.83 | - | - |
| 7 | Pt Malcolm, W | Esp | Esp | NR | 20.9.76 | - | - |
| 8 | Mt Arid | Esp | Esp | NP | 23.11.85 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

E. semiglobosa is widely scattered in subcoastal areas east of Esperance. It occurs in the Coolinup Nature Reserve, and Cape Le Grand and Cape Arid National Parks where it should remain secure.

Gahnia sp. Grass Patch (M.A.Burgman 4431)

CYPERACEAE

A tussock-forming perennial, 40-60 cm tall. Leaves are almost cylindrical and often curled at the tip; a tuft of long, white hairs (3-5 mm) occurs at the top of the 'sheath' (6-7 cm from the plant base). Flowers are arranged in erect, spike-like panicles; the brown spikelets have the stalk and awn covered in rows of minute clear barbs; the 4 or more outer glumes are empty and the flowering glumes closely envelope the flowers and nut.

Flowering Period: October

Distribution and Habitat

Gahnia sp. Grass Patch is common around and near salt lakes between Scaddan and Salmon Gums extending eastwards to near Parmango Road, a range of over 100 km.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-------------|----------|-------|----------------|-------------|---------------|-----------|
| 1 | Truslove | Esp | Esp | NR } | | | |
| 2 | Cox Rd | Esp | Esp | NR } | | | |
| 3 | Ridley Rd | Esp | Esp | NR } | 20.9.88 | 10 000+ | Good |
| 4 | Salmon Gums | Esp | Esp | NR } | | | |
| 5 | Howick Rd | Esp | Esp | NR | 10.84 | - | - |
| 6 | Styles Rd | Esp | Esp | ?Shire Rd Res. | 20.9.88 | - | - |
| 7 | Lignite Rd | Esp | Esp | ?Shire Rd Res. | 20.9.88 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

Surveys by A. Wilson (personal communication) located "tens of thousands" of *G. sp.* Grass Patch between Salmon Gums and Scaddan. It is known in four Nature Reserves, where it should remain secure. Only two specimens are currently lodged in the Western Australian Herbarium; further collections are required.

References

Bentham (1878), Burgman (1985b).

A dense shrub, to about 2 m tall. Leaves are narrow, rigid and divided, with lobes to 40 mm having sharp, pointed tips. Flowers are red.

Flowering Period: September - November

Distribution and Habitat

Grevillea aneura is mainly distributed between Lake King and Sheoak Hill, a range of 220 km. It grows in sand, sandy clay, or loam in mallee-heath communities.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------------|----------|-------|---------------|-------------|---------------|------------|
| 1 | Lake King,E | Kat | LG | Shire Rd Res. | 26.10.92 | 20+ | Good |
| 2 | Mt Gibbs,SE | Esp | Rav | NP | 11.8.79 | 1 | - |
| 3 | Frank Hann | Esp | Rav | NP | 16.9.93 | 50+ | Good |
| 4a | West Point Rd | Esp | Esp | Shire Rd Res. | 11.9.92 | 250+ | Good |
| 4b* | West Point Rd | Esp | Esp | Shire Rd Res. | 11.9.92 | 10+ | Good |
| 4c* | Cascades Rd | Esp | Esp | Shire Rd Res. | 11.9.92 | 500+ | Good |
| 5 | Fields Rd | Esp | Esp | VCL | 13.9.92 | 5 000+ | Good |
| 6 | Salmon Gums,SW | Esp | Esp | Shire Rd Res. | 22.1.81 | - | - |
| 7 | Salmon Gums,SE | Esp | Esp | ? | 11.3.80 | Frequent | - |
| 8a | Sheoak Hill,W | Esp | Esp | VCL | 22.5.93 | 1 000+ | Good |
| 8b* | Dingo Rock,S | Esp | Esp | VCL | 22.5.93 | 500+ | Good |
| 8c* | Dingo Rock,S | Esp | Esp | VCL | 22.5.93 | 1 500+ | Good |
| 8d* | Dingo Rock,S | Esp | Esp | VCL | 22.5.93 | 1 000+ | Good |
| 9 | Clyde Hill,N | Esp | Esp | VCL | 7.8.83 | - | - |
| 10a* | Fence Rd | Kat | LG | ?VCL | 26.10.93 | 200+ | Good |
| 10b* | Vermin Proof Fence | Esp | Rav | NP | 28.10.92 | - | Good |
| 11* | Frank Hann | Esp | Rav | NP | 16.9.93 | 100+ | Good |
| 12* | Edwards Rd | Esp | Esp | NR | 12.9.92 | 50 | Vulnerable |
| 13* | Rollond Rd | Esp | Esp | Shire Rd Res. | 12.9.92 | 100+ | Average |
| 14a* | Fields Rd | Esp | Esp | Shire Rd Res. | 14.9.92 | 50+ | Average |
| 14b* | Fields Rd | Esp | Esp | NR | 14.9.92 | 50+ | Good |
| 15* | Grass Patch,S | Esp | Esp | MRWA Rd Res. | 17.11.92 | 1 | Fair |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

A multistemmed, much-branched shrub, 1-1.3 m tall, with a lignotuber. Young branches are densely covered in short hairs which disappear with age. Leaves are cylindrical (terete, 70-130 x 1.2-1.5 mm), not grooved, smooth when mature, and have a long spine (1.5-2.5 mm) at the tip which is straight, not recurved. Inflorescences are usually 8-flowered (umbel) developing directly from the leaf axil on a very short stalk which is covered in rust-brown hairs. The sweet-smelling flowers have hairless stalks (4 mm); the torus is oblique with a gland on the lower side; the creamy-white perianth (2.5 mm) lacks hairs and is recurved behind the limb, splitting into 4 free segments; the pollen presenter is conical. The solitary fruits are broadly elliptic (15-22 x 12-15 mm), pale grey with black pustules and have 2 conspicuous horns (5-6 mm).

The leaves of *Hakea bicornata* are very similar to *H. adnata*, *H. drupacea* and *H. obliqua*. They can be distinguished by the recurved leaf tip of *H. adnata*, and the longitudinal groove in the leaf of *H. drupacea*. The flowers of *H. obliqua* are densely covered in short, silky silvery hairs.

Flowering Period: March - May, August

Distribution and Habitat

H. bicornata is distributed from east of Scaddan to near Mt Baring, a range of over 100 km. It grows in lateritic clay or clay loam over granite, in shrubland.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------------|----------|-------|----------------------------|-------------|---------------|-----------|
| 1a | Mt Baring, NNW | Esp | Esp | ?VCL | 6.12.60 | - | - |
| 1b | Mt Baring, NW | Esp | Esp | VCL | 25.4.93 | 4 | Good |
| 2* | Clyde Hill | Esp | Esp | NR | 19.5.93 | 500+ | Good |
| 3 | Clyde Hill, NW | Esp | Esp | VCL | 20.5.93 | 1 000+ | Good |
| 4 | Mt Ney | Esp | Esp | NR | 1993 | 20-30 | - |
| 5 | Dempster Rd | Esp | Esp | Shire Rd Res. | 1993 | 2 | - |
| 6 | Freebairns Rd | Esp | Esp | Shire Rd Res. | 1993 | 16 | - |
| 7 | Campbells Rd | Esp | Esp | Shire Rd Res. | 1993 | 23+ | - |
| 8 | Wittenoom Hills Rd | Esp | Esp | Shire Rd Res. | 1993 | 11 | - |
| 9 | Howick Hill, NE | Esp | Esp | ?VCL | 1993 | 60+ | - |
| 10 | Esperance Loc. 1533 | Esp | Esp | Private | 1993 | 130+ | - |
| 11 | Neridup Loc. 232 | Esp | Esp | Private | 1993 | 20+ | - |
| 12 | Scaddan Rd | Esp | Esp | Private & Shire Rd Res. | 1993 | 200-300 | - |
| 13 | Burdett | Esp | Esp | NR | 1993 | 23+ | - |
| 14 | Fisheries Rd, N | Esp | Esp | - | 1993 | 40+ | - |
| 15 | Coolinup Rd, NW | Esp | Esp | Private | 1993 | 30-40 | - |
| 16 | Coolinup Rd | Esp | Esp | - | 1993 | 200+ | - |
| 17 | Coolinup Rd | Esp | Esp | Shire Rd Res. | 1993 | 300+ | - |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora Dieback*

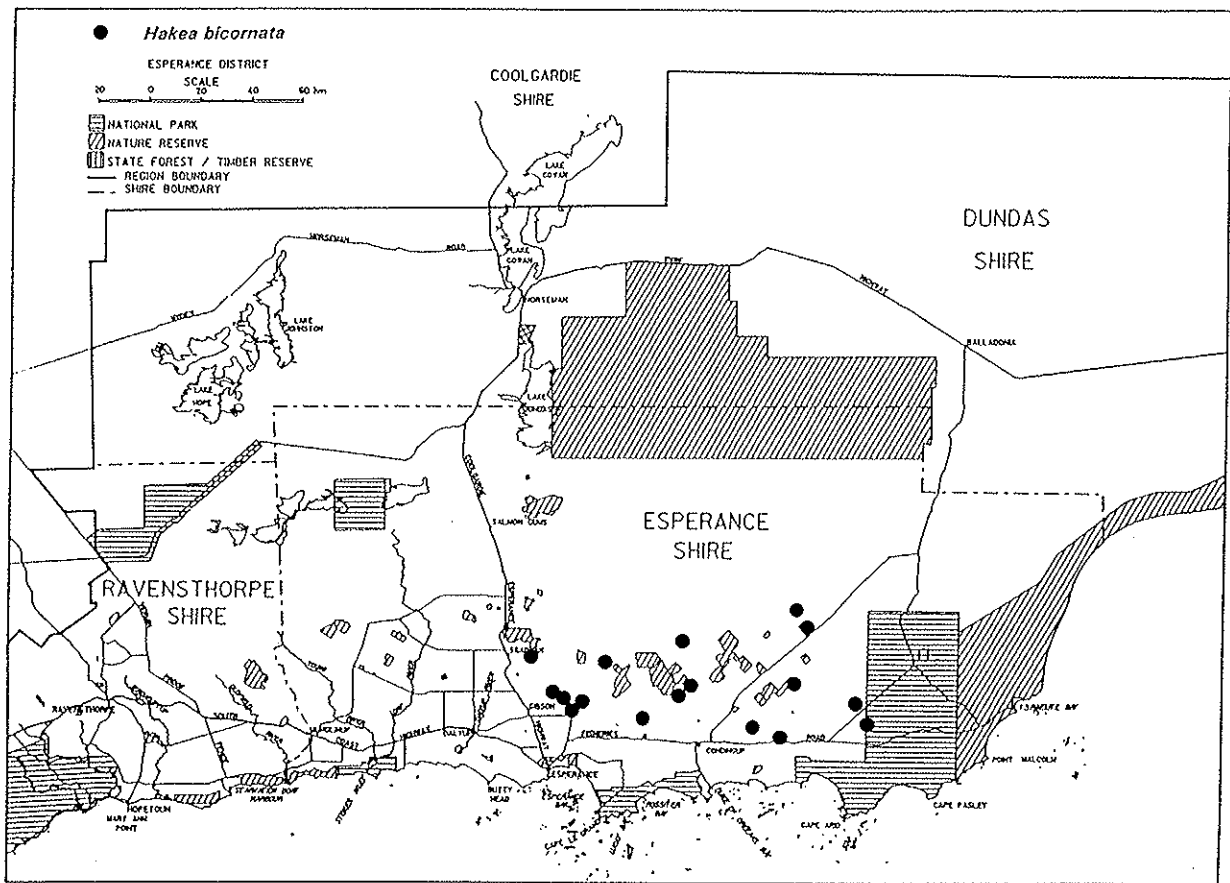
Unknown

Summary and Recommendations

H. bicornata is widespread through the agricultural area east of Scaddan (B. Norris, personal communication), and is known in three Nature Reserves where it should remain secure.

References

Barker (1990).



A small rhizomatous sedge, with few culms, 15-50 cm tall and about 1 mm diameter. Rhizomes (5 mm diam.) are connected by subterranean culms and grow up to 26 cm long. Culm internodes are 15-60 mm long. Sheaths are erect (7-15 mm), slightly loose and obtuse at the apex. A single inflorescence branch (4-12 cm) is borne per sheath axil. Flowers are few; bracts are about equal in length (1.5-3 mm). Male and female flowers are on separate plants; outer tepals are shorter (<2 mm) than the inner tepals (>2 mm). Nuts (3 mm) are borne on short stalks and have a persistent style base.

Flowering Period: October

Distribution and Habitat

Hopkinsia adscendens ms is relatively widespread around Esperance and has been collected north-east of Albany. It grows in small depressions and near watercourses in moist peaty sand with *Banksia* and *Nuytsia*.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1a | Lort River | Esp | Esp | ?VCL | 11.10.68 | - | - |
| 1b | Lort River | Esp | Esp | - | 11.9.66 | - | - |
| 2 | Young River, W | Esp | Esp | - | 16.10.68 | - | - |
| 3 | Cape Le Grand Rd | Esp | Esp | - | 9.9.66 | - | - |
| 4 | Chillinup, E | Alb | Alb | - | 23.10.75 | Frequent | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

H. adscendens ms has been poorly collected, with only male plants represented in the Western Australian Herbarium. According to B. Briggs (personal communication) this species is "difficult to find even within its range of occurrence". Further survey is required.

An upright to spreading shrub, to 1 m tall, with young branches covered in grey or rust-coloured, short matted hairs. Leaves are dull green, linear-oblong (20 mm), obtuse at the tip, smooth above and covered in white or rust-coloured hairs beneath. Flowers are borne on short stalks in few-flowered clusters (cyme) that are much shorter than the leaves. The sepals (3-4 mm) are covered in fine grey to greenish almost scaly hairs on the outside, while inside is brown and hairless. Bracteoles are small or absent. Petals are much reduced; the style is smooth and the ovary hairy.

Flowering Period: July - September

Distribution and Habitat

Lasiopetalum parvuliflorum is widely distributed between Bremer Bay and Point Malcolm, a range of 400 km. This species is also known in New South Wales and Victoria. It grows in shallow sandy soil on granite or rocky outcrops, in *Eucalyptus* woodland or mallee heath.

Conservation Status

Current: Priority 3

Known Populations In Western Australia

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Point Malcolm | Esp | Esp | NR | 20.9.76 | - | - |
| 2 | Cape Le Grand | Esp | Esp | NP | 30.7.90 | Frequent | - |
| 3 | Oldfield River | Esp | Esp | - | - | - | - |
| 4* | Howick Hill,E | Esp | Esp | ?VCL | 10.10.92 | 2 | Good |
| 5 | Point Charles | Alb | Rav | NP | 16.7.80 | Scattered | - |
| 6 | Bremer Bay,NNW | Alb | Jer | - | 26.9.77 | Frequent | - |
| 7 | Bremer Bay,NNW | Alb | Jer | - | 18.9.86 | Rare | - |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

The genus *Lasiopetalum* is currently under revision (C. Wilkins, personal communication). At present, the specimens in the Western Australian Herbarium are poorly classified. Reassessment of the status of *L. parvuliflorum* should be made after the *Lasiopetalum* collection has been correctly determined.

References

Bentham (1863), Robinson and Coates (1995).

An erect shrub, to 1.5 m tall, which is hairless or softly-hairy. Leaves are oblong-lanceolate or almost elliptical (12-20 mm), with a flattened point at the tip. Loose clusters of white flowers (spike) are borne in the upper leaf axils. Bracts are narrow-lanceolate and acute; bracteoles are half as long as the calyx. Sepals (3 mm) are often coloured. The corolla tube is nearly as long as the calyx, with lobes as long as the tube. The depressed ovary is 4- or 5- celled. Fruit is dark red-brown and much depressed, not exceeding the calyx.

Flowering Period: July - October

Distribution and Habitat

Leucopogon apiculatus is known between Cape Le Grand and Mt Ragged, a range of 140 km, and on two islands in the Archipelago of the Recherche. It grows in shallow sand over granite or quartzite, in scrub heath communities.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1a | Hellfire Bay | Esp | Esp | NP | 7.10.92 | 1+ | Good |
| 1b | Lucky Bay | Esp | Esp | NP | 6.10.92 | 10+ | Good |
| 1c | Thistle Cove | Esp | Esp | NP | 9.10.92 | 20+ | Good |
| 1d | Mt Le Grand | Esp | Esp | NP | 6.10.92 | 10 | Good |
| 1e | Cape Le Grand | Esp | Esp | NP | 8.10.92 | 1 | Good |
| 2 | Orleans Bay | Esp | Esp | Shire Res. | 18.7.82 | Common | - |
| 3 | Cape Arid | Esp | Esp | NP | 23.11.85 | Frequent | - |
| 4 | Mt Ragged | Esp | Esp | NP | 23.4.93 | 100+ Seedl. | Post-fire |
| 5 | Middle Island | Esp | Esp | NR | 14.11.74 | - | - |
| 6 | Sandy Hook Is. | Esp | Esp | NR | 10.11.50 | - | - |
| 7* | Mt Baring | Esp | Esp | NP | 25.4.93 | 200+ | Good |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible.

Summary and Recommendations

L. apiculatus is widespread and common in localised areas east of Esperance and occurs in three conservation reserves.

Leucopogon brevicuspis Benth.

EPACRIDACEAE

An erect shrub, with or without hairs on the branches and foliage. Leaves are broadly oblong (about 12 mm long) or slightly broader towards the apex, convex, with recurved margins or nearly flat, and have a minute, rigid spine at the tip. Very short clusters (spike) of 2 or 3 flowers are borne in the leaf axils. The small bracts have a minute sharp point; bracteoles are about half as long as the calyx; sepals (4 mm) are softly-hairy and acutely pointed at the tip. The corolla tube is as long as the calyx; the corolla lobes are rather shorter and erect at the base. Anthers are obtuse and lack sterile tips. The ovary is shiny and 5-celled. Fruit is ovoid-oblong (about 6 mm) with a very hard exterior.

Leucopogon brevicuspis is very closely related to *L. propinquus* which has rigid, linear leaves.

Flowering Period: March - April

Distribution and Habitat

Bentham (1869) indicates *L. brevicuspis* was represented by two specimens, one collected in the Stirling Range and another from an unspecified locality, collected by Drummond. Recent specimens with affinity to this taxon have been collected from Frank Hann National Park, north-east of Mt Heywood, Mt Ney, and towards Israelite Bay.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-----------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Stirling Range | Alb | ?Pigt | NP | 1869 | - | - |
| 2 | Frank Hann | Esp | Rav | NP | 20.11.85 | Frequent | - |
| 3 | Mt Ney | Esp | Esp | NR | 7.84 | - | - |
| 4 | Mt Heywood,NE | Esp | Esp | VCL | 9.11.80 | Scattered | - |
| 5* | Point Malcolm,N | Esp | Esp | NR | 19.4.93 | 2 | Fair |
| 6* | Sheoaks Hill | Esp | Esp | NR | 22.4.93 | 5+ | Good |

* = new population

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible.

Summary and Recommendations

Further taxonomic work is required to determine the distinguishing characters of *L. brevicuspis* and which specimens in the Western Australian Herbarium are within this taxon.

References

Bentham (1869).

A shrub, 1 m tall, which is hairless except for the shortly-hairy inflorescence axis. Leaves are arranged in threes, narrowly ovate (4-9 x <1 mm), obtuse and slightly thickened at the apex, curve backwards, and have 10-15 large glands on the lower surface. The inflorescence is a crowded spike or head (5-25 mm) of 10-35 flowers; bracts (1.2-2 x 1 mm) are persistent to anthesis; sepals (0.6 mm) are persistent to mature fruit. There are 3-10 stamens (4-6 mm) per bundle with filaments white to yellow. Fruits are shortly bell-shaped with an elongated base (2-4 x 3-5 mm), sometimes compressed by mutual pressure, with persistent rounded outspread sepals.

Melaleuca incana subsp. *tenella* can be distinguished from subsp. *incana* which usually has hairy leaves that are larger (4-17 x 1-3 mm), 40-100 small and about 20 larger leaf glands, and longer stamens (4-8.5 mm).

Flowering Period: August - October

Distribution and Habitat

M. incana subsp. *tenella* is found on the coast and adjacent inland areas from near Esperance to Duke of Orleans Bay, a range of about 60 km. It grows in swampy and moist areas in scrub thickets.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Cape Le Grand | Esp | Esp | NP | 3.10.74 | - | - |
| 2 | Coolinup Rd | Esp | Esp | NR | 14.11.93 | 300+ | Good |
| 3 | Esperance,N | Esp | Esp | - | 18.9.50 | - | - |
| 4 | Condingup,SE | Esp | Esp | Private | 21.9.68 | - | - |
| 5 | Orleans Bay,N | Esp | Esp | ?Rd Res. | 30.9.68 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

M. incana subsp. *tenella* is known in two conservation reserves. Further surveys, especially in the Lake Warden Nature Reserve and the Cape Le Grand National Park, are recommended.

References

Quinn *et al.* (1992).

A tangled or spreading shrub, to 4 m tall. Leaves are spirally arranged on the stem, broadly elliptic (6-13 mm wide) and undulate at the margin. The inflorescence is a spike of 30-65 flowers on an axis 23-47 mm long with a stalk (15-25 mm). The calyx tube is barrel-shaped (1.5 mm). Stamens are red with 23-34 per bundle; claws are 8-11 mm long. Fruits are compressed barrel-shaped (3.5 x 5 mm), papery in texture and the valves are deeply recessed below the aperture.

Melaleuca macronychia subsp. *trygonoides* differs from subsp. *macronychia* which has obovate to broadly obovate, flat leaves, fewer stamens (20-23 per bundle) and longer claws (11-17 mm).

Flowering Period: February, July, August, October

Distribution and Habitat

M. macronychia subsp. *trygonoides* is found between Lake Johnston and Coolgardie, with a known range of 90 km. It grows in shallow sandy soil on the margins of granite outcrops amongst scrub thicket, associated with *Acacia*, *Allocasuarina*, *Leptospermum* and *Melaleuca*.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | McDermid Rock | Esp | Dund | VCL | 15.2.81 | - | - |
| 2 | Lake View Rock | Esp | Dund | VCL | 8.2.67 | - | - |
| 3 | Queen Victoria Rocks | Gold | Cool | NR | 21.10.88 | Common | - |
| 4 | Cave Hill | Gold | Cool | VCL | 23.10.88 | Common | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

M. macronychia subsp. *trygonoides* appears to have a specific habitat requirement around granite rocks, with known populations occurring in a relatively remote area of Crown Land. Further opportunistic survey of granite outcrops west and north-west of Norseman is recommended.

References

Cowley *et al.* (1990).

Myriocephalus appendiculatus Benth.

ASTERACEAE

White-tip Myriocephalus

An erect annual herb, to 20 cm tall, which is sparingly branched and covered in loose, woolly and short glandular hairs. Leaves are linear or narrowly ovate (5-35 x 1-5 mm), acute at the apex, and slightly dilated at the base which partially clasps the stem. Solitary compound heads (up to 15 mm diam.) are borne at the ends of erect stems; bracts of the general involucre have white spreading tips nearly 2 mm long. The numerous partial heads are 4-6 flowered. Achenes are minutely hairy. Pappus are absent or of 1 or 2 microscopic scales.

Flowering Period: September - December

Distribution and Habitat

Myriocephalus appendiculatus is widespread from Eneabba to Mt Ragged, with the majority of known populations occurring in the Perth region. It grows in coarse sand and clay, often in moist depressions, in low open woodland.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Mt Ragged,W | Esp | Esp | NP | 16.11.76 | - | - |
| 2 | Meekatharra,S | Ger | Cue | - | 7.10.89 | - | - |
| 3 | Ellen Brook | Swan | Metro | NR | 30.11.84 | - | - |
| 4 | Upper Swan | Swan | Metro | - | 11.11.59 | - | - |
| 5 | Eneabba,S | Moor | Car | - | 18.9.77 | - | - |
| 6 | Lake Indoon,W | Moor | Car | - | 8.9.79 | Dense | - |
| 7 | Gillingara | Moor | VP | - | 13.11.06 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

M. appendiculatus is a widespread annual which has been poorly collected. Its extensive distribution suggests that further populations should exist. Further survey is recommended.

References

Bentham (1867), Grieve and Blackall (1982), Marchant *et al.* (1987).

An erect shrub with branches covered in short hairs. Leaves are crowded, linear-lanceolate (12-25 mm), contracted at the base, 1-nerved, and rough to touch (scabrous). Yellow flowers (10 mm) are borne on short stalks in leaf axils and are either hairless or sprinkled with a few hairs. The ovary is shiny with a straight style and stigma.

Bentham (1870) considered *Persoonia flexifolia* and *P. spathulata* to be very closely related, with differences observed being only "very slight, no more than what we constantly observe between different specimens of other species".

Flowering Period: Unknown

Distribution and Habitat

P. scabra was collected last century by Robert Brown from near Lucky Bay. It is known from the Frank Hann National Park in the "Peak Charles-Mount Ragged area" (Weston 1984).

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|----------------------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Lucky Bay | Esp | Esp | NP | 1802 | - | - |
| 2 | Frank Hann | Esp | Rav | NP | 1978 | - | - |
| 3? | Peak Charles - Mt Ragged area | Esp | Esp | - | - | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Presumed susceptible.

Summary and Recommendations

According to P. Weston (personal communication) "the name *Persoonia scabra* R.Br. has been misapplied in Western Australia (by Blackall and Grieve and by the State Herbarium) to an undescribed species from the Lake Grace-Newdegate-Ravensthorpe area.... The 'real' *P. scabra* R.Br. was not recollected until 1978 by Doug Monk in Frank Hann National Park, but has been collected a number of times since then by Ken Newbey in the Frank Hann-Peak Charles-Mt Ragged area. It is not endangered by land clearance at present".

At present, there are no 'real' *P. scabra* specimens in the Western Australian Herbarium. Further taxonomic work is recommended along with surveys in the Frank Hann National Park to obtain representative specimens of this taxon.

References

Bentham (1870).

An erect, branched shrub, 30-75 cm tall, with the stem and branches densely clothed in scales; branches are arranged in threes. Leaves are small, broadly ovate or elliptic-ovate (2-6 x 1-4 mm), reflexed, shortly pointed, margins are rolled slightly backwards to form a shallow concavity on the lower side; the upper side is smooth, glutinous and underneath is covered in scurfy scales. Flowers are solitary in the axil of upper leaves; the leaf-like bracts (2-4 x 1.5-2 mm) are reflexed. The calyx (5-7 mm) has a long tube and 5 short lobes, and is densely scaly on the outside but smooth inside. The white corolla (9-12 mm) has stellate hairs on the back of the lobes and is mostly smooth inside except for a dense ring of hairs above the ovary; the lower lip is broadly elliptic and the other 4 similar lobes are oblong-elliptic; stamens are exerted above the corolla tube; the globose ovary is densely hairy; the style is shortly 2-lobed at the tip. The fruit (4-5 x 2-3 mm) is covered in hairs and has a depression at the top and 2 opposite, short projections at the distal end.

Flowering Period: October - November

Distribution and Habitat

Pityrodia chrysocalyx is distributed between Scaddan and Norseman, extending westwards to Lake Tay and eastwards to Mt Ridley. It grows in sand and sandy loam in open shrub mallee and woodland communities.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|---------------|----------|-------|---------------|-------------|---------------|-----------|
| 1a | Scaddan,N | Esp | Esp | ?MRWA Rd Res. | 13.11.76 | - | - |
| 1b | Grass Patch,S | Esp | Esp | - | 2.10.81 | - | - |
| 2 | Grass Patch,N | Esp | Esp | - | 5.9.62 | - | - |
| 3 | Lake Tay,E | Esp | Esp | VCL | 11.11.79 | Common | - |
| 4 | Mt Ridley,N | Esp | Esp | VCL | 13.10.90 | 200+ | - |
| 5 | Norseman | Esp | Dund | - | 14.10.67 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

A survey between Scaddan and Grass Patch in 1992 failed to relocate this taxon. It is not known to occur in any conservation reserve. Further survey is required.

References

Munir (1979).

A low, spreading perennial herb, to 25 cm tall. Stems are from a perennial rootstock, apparently leafless, cylindrical or angular, erect and rush-like, but the upper branches often flexuose or recurved. Leaves are few and minute. Numerous white or pale pink flowers are arranged on short slender stalks in simple umbels at the ends of stems. Involucral bracts are linear and reflexed. Styles have a thick conical base. Fruit is smooth and flattish (2 x 2 mm), the dorsal edge almost winged, the lateral ribs are thickened and almost as prominent as the somewhat turgid centres of the carpels, but separate from them on each side by a narrow furrow.

Flowering Period: October - December

Distribution and Habitat

Platysace haplosciadea is known from the Cape Arid and Cape Le Grand National Parks and a disjunct population north-west of Margaret River. It grows in white sand in winter-wet areas in low heath communities.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1a | 'Hill 49' | Esp | Esp | NP | 19.11.79 | - | - |
| 1b | Mt Le Grand | Esp | Esp | NP | 12.12.60 | - | - |
| 1c | Lucky Bay | Esp | Esp | NP | 10.10.74 | Common | - |
| 1d | Rossiter Bay | Esp | Esp | NP | 7.11.82 | - | - |
| 1e | Ranger's residence | Esp | Esp | NP | 13.11.89 | Plentiful | - |
| 2 | Cape Arid | Esp | Esp | NP | 29.11.71 | - | - |
| 3 | Yelverton forest | Bsltn | Aug | - | 8.11.89 | Abundant | - |
| 4 | Gales Brook | - | - | - | 1800s | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

P. haplosciadea appears to be well represented in the Cape Le Grand National Park where it should remain secure. Further opportunistic survey along the coast, east of Esperance, is recommended.

References

Bentham (1866).

Pomaderris intangenda F.Muell.

RHAMNACEAE

A spreading shrub, to 90 cm tall, with spiny branches and extremely hairy branchlets. Leaves are small, oblong to wedge-shaped (10-25 mm) with toothed or lobed margins near the tip, hairless, dark green above and pale green beneath. The white, tubular flowers are small and borne on singly in leaf axils on short stalks; the 5 calyx lobes are broadly triangular (2 mm) and fall off early. Fruit is a large 3-chambered capsule (8 mm).

Flowering Period: June - August

Distribution and Habitat

Pomaderris intangenda is known from Mt Ridley and north of Westonia and Boorabbin. The type specimen was collected before 1876 from 'between the port of Esperance Bay and the mountains of Frazer's Range' (Mueller 1876). It is possible that the collection was from the Mt Ridley population. This species grows in humus-rich soil on the slopes of granite outcrops, in tall shrubland or scrub.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|--------------------|----------|-------|----------------|-------------|---------------|-------------|
| 1 | Geeraning | Mer | West | NR. | 11.9.89 | 2 | 2 Dead |
| 2 | Walyamoning | Mer | West | NR | 11.9.89 | 2 | Undisturbed |
| 3 | Yanneymoonning | Mer | West | NR | 11.9.89 | 12 | 1 Dying |
| 4 | Yanneymoonning,N | Mer | West | Private | 12.9.89 | 4 | Undisturbed |
| 5 | Mt Walter | Gold | Cool | VCL | 16.9.81 | 2 | - |
| 6 | Mt Ridley | Esp | Esp | VCL | 23.5.93 | - | Good |
| 7 | Donkey Rocks | Gold | Men | VCL | 8.6.89 | Abundant | - |
| 8 | Ularring | Gold | Men | Pastoral Lease | 16.6.88 | Frequent | - |
| 9 | Bates Cave | Nar | Kon | - | 9.7.87 | - | - |
| 10 | The Humps | Nar | Kon | - | 3.9.76 | - | - |
| 11 | Eaglestone Hill | Mer | Nun | - | 13.8.72 | - | - |
| 12 | Nungarin Rock | Mer | Nun | - | 13.8.72 | - | - |
| 13 | near Bencubbin | Mer | MtM | - | 2.6.22 | - | - |
| 14 | Billyacatting Hill | Mer | Tra | NR | 2.9.77 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

P. intangenda is widespread, especially in the Merredin District, although according to Mollemans *et al.* (1993), it usually occurs in low numbers. The habitat in which this species grows, however, is not likely to be cleared for agriculture. The population at Mt Ridley is within an area that has been proposed for vesting with the Esperance Shire.

An erect shrub, to 80 cm tall, with smooth purplish-brown bark. Leaves are opposite, oblong (15-30 x 6-8 mm), obtuse at the tip, and the midrib partly impressed into the upper surface; the margins roll backwards tightly towards the midrib (revolute); the upper surface is dark green and shiny, while underneath is pink and densely hairy; stalks are up to 8 mm long. Small clusters of yellowish flowers (cyme) form pseudo-heads at the ends of short branchlets. There are usually 10-12 petal-like bracts, which are orbicular (1.8 mm diam.), overlapping, leathery, irregularly toothed, prominently nerved, red to pale pink; the outer bracts are usually empty and the intermediate ones often have a cluster of 3 or 4 flowers in their axils; the terminal cluster consists of 6-10 flowers. Each flower has a 4-5 lobed calyx tube (5 mm) and stamens (6-7 mm) that extend beyond the tube. True petals are absent.

Flowering Period: February - April, June, August - October

Distribution and Habitat

Siegfriedia darwinioides is distributed between the Pallinup River and Starvation Boat Harbour, a range of 180 km. It grows on stony red loam or kaolinic-lateritic breakaway, in mallee scrub or woodland communities.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|-------------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Mt Short | Alb | Rav | Shire Res. | 16.12.92 | 200+ | Healthy |
| 2 | Bandalup | Alb | Rav | VCL | 8.9.93 | 300+ | Healthy |
| 3 | Mt Desmond | Alb | Rav | VCL | 8.9.93 | Scattered | Healthy |
| 4 | Mt McMahon | Alb | Rav | VCL | 4.91 | 100+ | Healthy |
| 5 | Eyre Range | Alb | Rav | NP | 2.11.65 | - | - |
| 6a | Gnowellen Rd | Alb | ?Alb | - | 25.6.76 | - | - |
| 6b | Corackerup | Alb | ?Alb | NR | - | Few | - |
| 7 | Starvation Boat Harbour | Esp | Esp | - | 8.25 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

The majority of known populations of *S. darwinioides* occur in the Ravensthorpe Range. Negotiations are presently being undertaken between the Shire, DEP and CALM to vest this area as a reserve. Further survey in the Fitzgerald River National Park is recommended.

Sphenotoma parviflorum F.Muell.

EPACRIDACEAE

Paper Heath

A slender, erect perennial, 15-30 cm tall, with a few branches above 25 cm. Leaves are lanceolate-subulate (rarely 12 mm), mostly ciliate on the margins, the lower ones more or less spreading, but not recurved, all the rest are pressed close to the stem. A dense, ovate cluster of white flowers (spike) forms at the end of the stem; each flower is about 12 mm long within an ovate, pointed bract which is at least as long as the calyx. Sepals (4 mm) are pointed at the tip. The corolla tube is as long as the calyx, and the lobes are only half as long as the tube. The ovary is hairless.

Sphenotoma parviflorum is very similar to *S. gracile* which has corolla lobes about equal in length to the corolla tube.

Flowering Period: ?October

Distribution and Habitat

The type of *S. parviflorum* (lodged at Kew, England) shows the locality as being "Thomas River and Cape Le Grand".

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Thomas River & Cape Le Grand | Esp | Esp | ?NP | ?1802 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Unknown

Summary and Recommendations

S. parviflorum is taxonomically poorly defined. Many of the specimens in the Western Australian Herbarium may actually be the very similar *S. gracile* which is relatively common along the south coast (J. Powell, personal communication). Taxonomic work is urgently required on these taxa to correctly identify these specimens.

References

Bentham (1869).

A low, dense shrub, 10-25 cm tall. Leaves are linear, semi-cylindrical or triquetrous (6 mm) and opposite. Greenish-white flowers are borne on stalks (2-4 mm) in the upper axils of the short branchlets, forming a dense flat-topped leafy corymb. The calyx tube is hemispherical (3 mm diam.), softly-hairy with longer hairs at the base along with a dense ring of white hairs. Sepals are ovate (4 mm) and very shortly and irregularly toothed-hairy. Petals are rather shorter than the sepals and entire with a broad, dark-coloured central line. Stamens are united for nearly 2 mm above the calyx tube; staminodes form a distinct outer series. The red style is very long. The ovary has 2 ovules.

Flowering Period: August - October

Distribution and Habitat

Verticordia verticordina is known from between Cheetup Hill and Price Hill, a range of 90 km. It grows in peaty sand or sandy clay over granite or limestone, in low open heath communities.

Conservation Status

Current: Priority 3

Known Populations

| Pop. No. | Population | District | Shire | Land Status | Last Survey | No. of Plants | Condition |
|----------|------------------|----------|-------|-------------|-------------|---------------|-----------|
| 1 | Price Hill | Esp | Esp | NP | 9.12.60 | - | - |
| 2a | Cheetup Hill,N | Esp | Esp | NP | 17.8.89 | Abundant | - |
| 2b | Orleans Bay,N | Esp | Esp | NP | 9.10.92 | 1 000+ | Healthy |
| 2c | Orleans Bay,N | Esp | Esp | Shire Res. | 9.10.92 | 1 000+ | Healthy |
| 3 | Condingup,SE | Esp | Esp | Private | 21.9.68 | - | - |
| 4 | Munglignup Creek | Esp | Esp | - | 30.9.68 | - | - |
| 5 | Mt Baring | Esp | Esp | NP | 28.10.67 | - | - |

Response to Disturbance

Unknown

Susceptibility to *Phytophthora* Dieback

Possibly susceptible.

Summary and Recommendations

V. verticordina is known in the Cape Le Grand and Cape Arid National Parks, where it should remain secure. Further opportunistic survey in areas between the two Parks is recommended.

References

Bentham (1867).

PART FOUR: THE PLAN FOR MANAGEMENT

1. Determining Priorities

This section assesses the conservation status of each species of Declared Rare Flora (DRF) within the Esperance District and makes recommendations for protection, research and management. On the basis of these recommendations, each species was ranked on a scale of 1 to 3 under 15 categories (Table 2) recognised as potential threats or management requirements. Species with a low degree of threat or urgency for management and research action were given a score of 1. Those with a high degree of threat were allocated a score of 3. Species neither threatened nor in need of action were marked with a dash. The scores were summed for each of the 23 species and for each threat/requirement category. Table 2 summarises the perceived threats, and management and research requirements for each species of extant DRF in the Esperance District.

Table 3 lists the 23 species of extant DRF in priority order according to the urgency of their requirement for management action. Species with a high ranking score are most threatened and/or most in need of action. It is intended that all requirements for each species, as outlined in the previous species treatments, will be implemented. Work will be conducted, programmed or deferred according to priority, available funds and existing resources and workloads. Attention is directed to Table 2 to determine which taxa should have priority for management actions. This will enable resources and staff within the Esperance District to be allocated where they are most urgently required.

Species most in need of attention for a particular management or research requirement can be determined from Table 2.

2. Management and Research Actions

The following details the threats/management requirements given in Table 2.

(i) Small declining populations

Species were ranked according to the known numbers of plants:

| <u>Rank</u> | <u>No. of Plants</u> |
|-------------|----------------------|
| 3 | <250 or unknown |
| 2 | 250 - 1 000 |
| 1 | 1 000+ |

A number of species of DRF have very small population sizes making them particularly vulnerable to localised disturbance. Species at risk in some or all of their known populations are:

Adenanthos eyrei
Anigozanthos bicolor subsp. *minor*
Caladenia exstans ms
Daviesia microcarpa
Eucalyptus insularis
Eucalyptus merrickiae
Lambertia echinata
Myoporum turbinatum
Rhizanthella gardneri

(ii) Accidental destruction during road/rail/public utility maintenance

A number of populations of DRF and Priority taxa in the Esperance District occur on, or partly on, road and to a lesser extent rail reserves. Except for the areas of recent land release, most road/rail reserves are only one or two chains (20 or 40 m) wide, which includes the road itself and one or more public utilities. The narrow reserves are affected, both directly and indirectly, by the use and nature of adjoining lands (predominantly agriculture). Threats include weed invasion, periodic grazing (road reserves are sometimes used as stock routes), drift of chemical sprays

and fertilisers, fenceline maintenance and periodic burning. Being access routes, the vegetation on road reserves can also be affected by rubbish dumping, uncontrolled vehicle access, wildflower picking and camping. The location of populations of Rare Flora in more secure larger patches of remnant vegetation should always be a high priority.

The majority of road reserves are managed by local authorities or Main Roads W.A., and rail reserves by Westrail. DRF can be accidentally damaged during road works such as maintenance operations (grading, weed control), drainage works, minor and major road/rail upgrading, metal dumps and gravel/sand extraction. These authorities all use contract personnel and equipment as well as permanent staff for these operations. Management and field personnel within Shires and the two government agencies need to know where the populations of DRF and Priority Flora occur to avoid accidental destruction of plants. This is carried out currently by notification letters from CALM and the use of linear markers in the field.

Above- and below-ground utilities such as power lines, water pipelines and telecommunication lines generally follow road and rail reserves. As many threatened or Priority Flora populations occur on these narrow linear reserves, any maintenance, upgrading or management of these utilities close to known populations can damage plants. This will generally be in the form of mechanical damage to plants by machinery and equipment. However, some agencies control weeds around poles or along pipelines with residual chemicals, which can kill or damage native plants. Such chemicals should not be used adjacent to DRF populations.

Main Roads W.A. has developed a permanent, but discrete field marking system for demarcation of environmentally significant areas on road reserves. CALM has adopted this system to mark DRF and Priority Flora populations occurring along linear routes both on CALM land and other areas. Local Shires have also been encouraged to adopt such a system. However, there can be problems with roadside markers, as many people now recognise them and smaller plants can be trampled by 'tourists' and removed by unscrupulous plant collectors. Populations most urgently in need of linear marking on road reserves, CALM and other lands are:

Boronia revoluta
Conostylis lepidospermoides
Daviesia microcarpa
Eucalyptus cerasiformis
Eucalyptus merrickiae
Eucalyptus platydisca ms
Myoporum turbinatum

(iii) Invasive weeds

Invasive weeds pose a significant threat to some populations particularly those on the narrow road reserves managed by local authorities. In many cases, effective weed control strategies involving herbicide treatments or mechanical removal have yet to be developed for most threatened flora populations because of the large number of invasive weed species and differences in weed composition between sites. Taxa which should be monitored for invasive weeds are:

Conostylis lepidospermoides
Myoporum turbinatum

(iv) Grazing

DRF populations on private property in the District are generally on farmland where they require protection from grazing by domestic stock. In many situations landholders themselves have excluded stock, and in others CALM has provided fencing as part of formal agreements. Rabbits are a widespread and often overlooked problem, particularly on sandy soils and granite outcrop areas. Both of these habitats contain many DRF species. Other feral animals (e.g. goats) have been detected in more remote areas. Monitoring of the following taxa is required:

Myriophyllum petraeum
Rhizanthella gardneri

(v) Mining activities

The mining industry is centred around Norseman, along with pockets of activity in the north-west sector (including Hatter Hill and Mt Day) of the Esperance District. Numerous DRF and Priority taxa occur in these areas and are generally poorly surveyed. Mining activities which may affect DRF include exploration (clearing of survey lines, drilling and costean operations), actual mine site establishment, provision of services (road making, power) and increased recreation activity by mine workers. Close liaison between companies, CALM, the Department of Minerals and Energy, Department of Environmental Protection and the Environmental Protection Authority is essential. Species most at risk are:

Boronia revoluta
Eucalyptus cerasiformis

(vi) *Phytophthora dieback*

Insufficient data are currently available to accurately assess the impact of the soil-borne pathogens, *Phytophthora* species, on DRF in the Esperance District. In at least some cases plants not destroyed by direct infection may be severely affected by resultant structural and ecological changes in ecological communities which have the disease. Disturbances such as road construction are known to promote the spread of the disease, particularly in moist, relatively low-lying sites unless carried out under strictly controlled hygiene conditions. Any operations in localities likely to support the pathogen should be conducted under strict hygiene conditions. *Phytophthora* poses a very significant threat to the three remaining plants of *Lambertia echinata*.

(vii) Land clearing and associated agricultural activities

Many threatened taxa within the Esperance District lie within the agricultural zone. Populations may be endangered by clearing of land, installation of firebreaks, spray drift, changes in drainage and/or water tables, and increased nutrients. Other associated threats such as grazing and invasive weeds are discussed above. Species at risk are:

Anigozanthos bicolor subsp. *minor*
Caladenia exstans ms
Caladenia voigtii ms
Conostylis lepidospermoides
Eucalyptus merrickiae
Myoporum turbinatum
Myriophyllum petraeum
Prostanthera carrickiana
Rhizanthella gardneri

(viii) Liaison with landholders

Close association and cooperation with private landholders, local authorities, land managers, mining companies and government agencies (e.g. DEP, Ministry for Planning, DOLA, Western Power and Main Roads W.A.) is essential to ensure the continued survival of the majority of DRF in the Esperance District. Survival of some taxa currently relies on the goodwill of local Shires and private landowners. Departmental staff are required to provide advice and assistance, regarding conservation and management, to landholders and other agencies with Rare Flora populations on land under their control. Landowners are requested to arrange their operations so that the area of Rare Flora will not be destroyed or damaged in any way. Priority species for staff liaison with landowners or managers are:

Boronia revoluta
Caladenia voigtii ms
Conostylis lepidospermoides
Daviesia microcarpa
Eucalyptus cerasiformis
Eucalyptus merrickiae
Myoporum turbinatum

(ix) Land acquisition

Acquisition of land by the Department, by donation, exchange or purchase, is required for those species not well represented on conservation reserves. DRF occurring on land reserved for nature conservation are generally considered to be less threatened than those on land designated for other purposes. It should be noted, however, that their presence on a reserve contributes to, but does not guarantee, population survival. Reserves, like other areas, are subject to disturbances such as weed invasion, fire, altered drainage and water tables, grazing, disease, and where approved, mining activities.

Species were ranked according to the known number of conservation reserves in which the populations grow:

| <u>Rank</u> | <u>No. Populations in Conservation Reserves</u> |
|-------------|---|
| 3 | nil |
| 2 | 1 |
| 1 | >1 |
| - | all |

The following are Priority species for land acquisition:

Billardiera mollis
Boronia revoluta
Caladenia voigtii ms
Daviesia microcarpa
Eremophila denticulata subsp. *trisulcata*
Eucalyptus cerasiformis
Eucalyptus platydisca

(x) Survey taxa

Species were ranked according to their known distributional range:

| <u>Rank</u> | <u>Range</u> |
|-------------|--------------|
| 3 | <25 km |
| 2 | 25-100 km |
| 1 | >100 km |

Further survey of suitable habitats in the wild to locate other populations is a requirement for almost all of the DRF in the Esperance District. Two taxa (*Adenanthos eyrei* and *Drummondita hassellii* var. *longifolia*) were found to be very geographically restricted, but were considered reasonably 'safe' in a conservation reserve. Taxa that are most urgently in need of intensive field surveys are:

Billardiera mollis
Daviesia microcarpa
Eremophila denticulata subsp. *trisulcata*
Eucalyptus platydisca
Lambertia echinata
Myoporum turbinatum
Prostanthera carrickiana

(xi) Resurvey and mapping of known populations

For most populations early records and location plans have been very poor, with many only known from herbarium specimens or vague locations. Although Rare Flora Report Forms and detailed site plans are available for many populations there are a number which still require this base-line survey information.

After initial detailed assessment each population in the District should be resurveyed at least once every five years to observe fluctuations in population numbers and to monitor changes. Species were ranked according to the proportion of populations visited since 1990:

| <u>Rank</u> | <u>Populations surveyed (since 1990)</u> |
|-------------|--|
| 3 | <25% |
| 2 | 25-75% |
| 1 | >75% |

The following species are in urgent need of mapping and resurvey of known populations:

Anigozanthos bicolor subsp. *minor*
Billardiera mollis
Caladenia exstans ms
Eucalyptus cerasiformis
Rhizanthella gardneri

(xii) Monitoring of populations

Surveys to provide information on population dynamics, plant longevity and regeneration, as well monitoring changes in habitat which may threaten survival are required for all DRF. The following groups of species have highest priority for the establishment of permanent monitoring plots and for more intense monitoring at regular intervals:

- Species which require specialised annual/biannual monitoring to assess population dynamics:

Drummondita hassellii var. *longifolia*
Myriophyllum petraeum
Rhizanthella gardneri

- Short-lived disturbance species which are not generally found in the wild without some disturbance event, and require special monitoring to determine their longevity:

Anigozanthos bicolor subsp. *minor*
Billardiera mollis
Eremophila denticulata subsp. *denticulata*
Eremophila denticulata subsp. *trisulcata*
Myoporum turbinatum

- Species with small population numbers which require at least annual monitoring as any damage or loss of plants may result in local extinction:

Boronia revoluta
Daviesia microcarpa
Lambertia echinata

(xiii) Research in particular fire and disturbance ecology

Few of the DRF in the District have been the subject of detailed studies. Research into their taxonomy, genetic systems, population biology and ecology is needed to determine the best means of protecting and managing populations. Response to different fire regimes, drought tolerance, and the impact of bees on native pollinators (particularly of members of the Orchidaceae) require attention. The following species are in most urgent need of research:

Anigozanthos bicolor subsp. *minor*
Daviesia microcarpa
Lambertia echinata
Myoporum turbinatum
Rhizanthella gardneri

More specifically a number of taxa, particularly those known from only one or a few localities, require urgent research on their fire ecology and should where possible be excluded or protected from fire until appropriate fire regimes have been developed by both research and regional staff. Taxa which may require protection/exclusion from fire until specific fire regimes have been developed are:

Boronia revoluta
Drummondita hassellii var. *longifolia*
Lambertia echinata
Myoporum turbinatum
Rhizanthella gardneri
Ricinocarpus trichophorus

(xiv) Seed collection, storage and propagation

Collection and long-term storage of germ-plasm (seed or tissues) from wild populations of DRF provides a source of propagation material for future re-establishment. Priority for collection of this material will depend upon the degree of threat to the species. CALM is undertaking work in this area through its Threatened Flora Seed Centre at the Herbarium.

Although conservation of DRF in the wild is the highest priority, all species should ideally be established in a germplasm storage program. This would ensure safety against extinction, particularly for those species known in the wild from only a few individuals. Kings Park and Botanic Garden have an active propagation research program and currently hold living collections of a number of DRF.

(xv) Re-establishment in suitable habitats in the wild

Taxa poorly represented on conservation reserves and considered critically endangered should be propagated and re-established in suitable, less vulnerable habitats on land designated for nature conservation. Species requiring re-establishment into the wild by CALM staff under approved management programs are:

Daviesia microcarpa
Lambertia echinata

3. **Priority Flora in the Esperance District**

The conservation status of the Priority Flora in the Esperance District was assessed in Part 3. Recommended status, based on recent surveys, is listed in Table 4. The priority for conservation action in the Esperance District is:

Poorly known taxa in need of further survey

- Priority One
- Priority Two
- Priority Three

Taxa requiring monitoring

- Priority Four

4. **Assistance from Volunteers and Information Systems**

(i) Rare flora volunteers

In recent years CALM has used volunteers to assist with a number of flora surveys including the Banksia Atlas, the Rare Eucalypt Survey and the Rare Poison Plant Survey. In 1990, CALM initiated a Rare Flora Volunteer Program. The Esperance District has a list of volunteers who are willing to work on various projects. Currently the Wildflower Society updates and incorporates flora specimens into the herbarium at the Esperance Office.

A significant number of new populations of DRF and Priority taxa have been located by amateur botanists, either individuals or members of groups such as the Orchid Society, Wildflower Society of Western Australia and the Naturalist's Club. Such groups and individuals should be given every encouragement to continue their good work.

(ii) District recording systems

Confidential registers, with precise locality details of known populations, are maintained in the Esperance District office and in the central record system at CALM's head office in Como. The register is updated as required. Information on populations on CALM land will also be retained on individual nature reserve files.

(iii) Herbarium specimens

The Western Australian Herbarium has requested voucher specimens from all populations of DRF and Priority species. Specimens of DRF can only be collected with written approval from the Minister. Colour slide photographs of DRF are requested for the 'DELTA.RED' project, aimed at capturing a computerised image of each threatened taxon.

The District aims to collect a representative specimen of each of its DRF and Priority taxa, to be lodged at the Esperance Office with duplicate vouchers in Perth.

5. Conservation and Management of Special Areas

The Esperance District is of national importance due to its diversity of endemic flora. Current records show 25 DRF species (includes 2 presumed extinct) and 191 Priority taxa.

A number of areas have been proposed as conservation reserves. River corridors have been surveyed in 1991 for the Young River and Lort River to ascertain their potential to act as functional corridors for wildlife and their value as nature reserves in their own right. A number of Priority taxa were found to occur in these corridors, especially near the Lort River. Management of these areas, in consultation with local landowners, local authorities and government agencies, is required.

Jimberlana Hill and the surrounding area, north-east of Norseman, supports some threatened species. Ongoing liaison with mining companies, Dundas Shire and Main Roads W.A., to ensure the conservation of this area is needed.

6. Implementation and Term of the Management Program

A recovery team will be appointed which will oversee and report annually to the Corporate Executive on the implementation of this Management Program.

This Program will run for a period of 10 years, unless subsequent research or changes to the Schedule of Declared Rare Flora cause it to be superseded earlier. During this period, the Department of CALM may institute any changes to the provisions outlined in this program as are found, through further research, to be necessary for conservation of the Declared Rare Flora and Priority taxa in the Esperance District.

TABLE 2. ESPERANCE DISTRICT DECLARED RARE FLORA SCORED (1-3) ACCORDING TO THE DEGREE OF THREAT OR URGENCY FOR MANAGEMENT AND RESEARCH ACTION.

| SPECIES | THREATS | | | | | | MANAGEMENT ACTIONS | | | | | | | | | |
|---|-----------------------------|------------------------|----------------|---------|-------------------|----------------------|--------------------|---------|------------------|-------------|-----------------------|------------|---|----------------------------|-----------------------|--------------------------------|
| | Small declining populations | Accidental destruction | Invasive weeds | Grazing | Mining activities | Phytophthora dieback | Land clearing | Liaison | Land acquisition | Survey taxa | Re-survey populations | Monitoring | | Research i.e. fire/ecology | Germplasm collections | Re-establishment/translocation |
| <i>Adenanthos eyrei</i> | 3 | - | - | - | - | 2 | - | - | - | 3 | 1 | 2 | 2 | 3 | - | 16 |
| <i>Adenanthos ileticos</i> | 1 | 2 | 1 | - | - | 2 | - | 1 | - | 1 | - | - | - | 1 | - | 9 |
| <i>Amigozanthos bicolor</i> subsp. <i>minor</i> * | 3 | - | - | 1 | - | - | 2 | 2 | 1 | 1 | 3 | 3 | 3 | 3 | - | 22 |
| <i>Billardiera mollis</i> * | 2 | 2 | - | 1 | 1 | - | 1 | - | 3 | 3 | 3 | 3 | 2 | 3 | - | 24 |
| <i>Boronia revoluta</i> | 2 | 3 | - | - | 3 | - | - | 3 | 3 | 2 | 2 | 3 | 3 | 3 | - | 27 |
| <i>Caladenia exstans</i> ms* | 3 | - | - | - | - | - | 2 | 2 | 1 | 2 | 3 | 2 | 2 | 3 | - | 20 |
| <i>Caladenia voigtii</i> ms | 2 | - | - | 1 | - | - | 2 | 3 | 3 | 1 | 2 | 2 | 2 | 3 | - | 21 |
| <i>Conostylis lepidospermoides</i> | 2 | 3 | 1 | - | - | - | 2 | 3 | 2 | 1 | 2 | 2 | 2 | 3 | - | 23 |
| <i>Daviesia microcarpa</i> | 3 | 3 | - | 1 | - | - | - | 3 | 3 | 3 | 1 | 3 | 3 | 3 | 3 | 29 |
| <i>Drummondia hasselii</i> var. <i>longifolia</i> | 2 | - | - | - | - | - | - | - | - | 3 | 1 | 3 | 3 | 3 | - | 15 |
| <i>Eremophila denticulata</i> subsp. <i>denticulata</i> * | 1 | 2 | - | - | - | - | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 1 | - | 15 |
| <i>Eremophila denticulata</i> subsp. <i>trisculcata</i> ms* | 1 | - | - | - | - | - | - | - | 3 | 3 | 2 | 3 | 2 | 3 | - | 17 |
| <i>Eucalyptus cerasiiformis</i> | 2 | 3 | - | - | 3 | - | - | 3 | 3 | 2 | 3 | 2 | 2 | 3 | - | 26 |
| <i>Eucalyptus insularis</i> | 3 | - | - | - | - | - | - | - | - | 2 | 2 | 2 | 2 | 3 | - | 14 |
| <i>Eucalyptus merrickiae</i> | 3 | 3 | - | - | - | - | 3 | 3 | 1 | 2 | 2 | 2 | 2 | 2 | - | 23 |
| <i>Eucalyptus platydisca</i> ms | 1 | 2 | - | - | 1 | - | - | 2 | 3 | 3 | 1 | 1 | 2 | 3 | - | 19 |
| <i>Kennedia becockiana</i> * | 1 | - | - | - | - | - | - | 2 | 1 | 2 | - | 1 | 1 | 2 | - | 10 |

TABLE 3. ESPERANCE DISTRICT DECLARED RARE FLORA RANKED IN PRIORITY ORDER FOR PROTECTION AND MANAGEMENT ACTION

Species requiring highest priority (ranked >22)

| Rank Total* | |
|-------------|------------------------------------|
| 29 | <i>Daviesia microcarpa</i> |
| 29 | <i>Myoporum turbinatum</i> |
| 27 | <i>Boronia revoluta</i> |
| 26 | <i>Eucalyptus cerasiformis</i> |
| 24 | <i>Billardiera mollis</i> |
| 23 | <i>Conostylis lepidospermoides</i> |
| 23 | <i>Eucalyptus merrickiae</i> |
| 23 | <i>Lambertia echinata</i> |
| 23 | <i>Rhizanthella gardneri</i> |

Species requiring high priority (ranked 19-22)

| | |
|----|---|
| 22 | <i>Anigozanthos bicolor</i> subsp. <i>minor</i> |
| 21 | <i>Caladenia voigtii</i> ms |
| 20 | <i>Caladenia exstans</i> ms |
| 19 | <i>Eucalyptus platydisca</i> ms |
| 19 | <i>Prostanthera carrickiana</i> |

Species requiring medium priority (ranked 14-17)

| | |
|----|---|
| 17 | <i>Eremophila denticulata</i> subsp. <i>trisulcata</i> ms |
| 16 | <i>Adenanthos eyrei</i> |
| 16 | <i>Myriophyllum petraeum</i> |
| 15 | <i>Drummondita hassellii</i> var. <i>longifolia</i> |
| 15 | <i>Ricinocarpus trichophorus</i> |
| 15 | <i>Eremophila denticulata</i> subsp. <i>denticulata</i> |
| 14 | <i>Eucalyptus insularis</i> |

Species recommended for deletion from the Declared Rare Flora List (ranked <14)

| | |
|----|----------------------------|
| 10 | <i>Kennedia beckxiana</i> |
| 9 | <i>Adenanthos ileticos</i> |

* Rank totals are derived from the 15 categories of threats/management requirements given in Table 2.

TABLE 4. PRIORITY ONE, TWO AND THREE SPECIES LISTS WITH RECOMMENDED STATUS INDICATED

| Species | Recommended Status |
|---|--------------------|
| Priority One taxa | |
| <i>Acacia diaphana</i> ms | P1 |
| <i>Acacia diminuta</i> ms | P1 |
| <i>Acacia dorsenna</i> | P1* |
| <i>Acacia mutabilis</i> subsp. <i>incurva</i> ms | P1 |
| <i>Acacia</i> sp. Esperance (M.A.Burgman 1833b) | P1 |
| <i>Allocasuarina globosa</i> | P1 |
| <i>Baeckea crassifolia</i> var. <i>icosandra</i> | P3 |
| <i>Caladenia tentaculata</i> | P1 |
| <i>Chorizema circinale</i> | P1* |
| <i>Chorizema nervosum</i> | P4 |
| <i>Coleanthera coelophylla</i> | P1 |
| <i>Conostephium marchantiorum</i> | P3 |
| <i>Conostephium uncinatum</i> | P1 |
| <i>Dampiera sericantha</i> | P1 |
| <i>Darwinia calothamnoides</i> | P1 |
| <i>Darwinia</i> sp. Mt Baring (K.R.Newbey 9775) | P2 |
| <i>Darwinia</i> sp. Mt Ney (M.A.Burgman & S.McNee 1274) | P2 |
| <i>Dicrastylis archeri</i> | P1 |
| <i>Dicrastylis capitellata</i> | P1 |
| <i>Diuris concinna</i> | P2 |
| <i>Dodonaea hexandra</i> | P1 |
| <i>Drosera salina</i> | P1 |
| <i>Drosera</i> sp. Hatter Hill (G.J.Barrett 15.9.89) | P1 |
| <i>Eremophila chamaephila</i> | P2 |
| <i>Eremophila compressa</i> | P1 |
| <i>Eremophila oblonga</i> ms | Delete |
| <i>Eriostemon</i> sp. Cascades (M.A.Burgman 1535) | P1 |
| <i>Eucalyptus burgmaniana</i> ms | P1 |
| <i>Eucalyptus delicata</i> | P3 |
| <i>Eucalyptus jimberlanica</i> | P1* |
| <i>Eucalyptus varia</i> subsp. <i>salsuginosa</i> | P1 |
| <i>Eucalyptus</i> sp. B Ravensthorpe (K.R.Newbey 9715) | P1 |
| <i>Eutaxia</i> sp. Hatter Hill (K.R.Newbey 6532) | P1 |
| <i>Gonocarpus pycnostachyus</i> | P1 |
| <i>Gonocarpus simplex</i> | P2 |
| <i>Gratiola pedunculata</i> | P2 |
| <i>Grevillea phillipsiana</i> | P1 |
| <i>Gyrostemon ditrigynus</i> | P3 |
| <i>Halgania tomentosa</i> | P3 |
| <i>Haloragis</i> sp. Ravensthorpe (K.R.Newbey 8269) | P1 |
| <i>Hydatella australis</i> | P2 |
| <i>Hydrocotyle hispidula</i> | P2 |
| <i>Hydrocotyle</i> sp. Truslove (M.A.Burgman 4419) | Delete |
| <i>Leucopogon blepharolepis</i> | P2 |
| <i>Leucopogon florulentus</i> | P1 |
| <i>Leucopogon</i> sp. Bonnie Hill (K.R.Newbey 9831) | P1 |
| <i>Leucopogon</i> sp. Clyde Hill (M.A.Burgman 1207) | P2 |

*With highest priority for further survey and consideration for gazettal as DRF

Delete - species recommended to be taken off the Priority Flora list

| | |
|--|--------|
| <i>Leucopogon</i> sp. Condingup (M.A.Burgman 1377) | P2 |
| <i>Leucopogon</i> sp. Coujinup (M.A.Burgman 1085) | P1 |
| <i>Leucopogon</i> sp. Kau Rock (M.A.Burgman 1126) | Delete |
| <i>Leucopogon</i> sp. Mount Heywood (M.A.Burgman 1211) | P3 |
| <i>Leucopogon</i> sp. Munglinup (K.R.Newbey 8123) | P1 |
| <i>Leucopogon</i> sp. Roberts Swamp (K.R.Newbey 8173) | P1 |
| <i>Leucopogon</i> sp. South Coast (K.R.Newbey 8213) | P1 |
| <i>Melaleuca agathosmoides</i> | P1 |
| <i>Melaleuca calycina</i> subsp. <i>dempta</i> | P1* |
| <i>Melaleuca coccinea</i> subsp. <i>eximia</i> | P2 |
| <i>Mesomelaena</i> sp. Munglinup (M.A.Burgman 3898) | P1 |
| <i>Microcybe</i> sp. Hatter Hill (K.R.Newbey 6546) | P1 |
| <i>Mirbelia densiflora</i> | P2 |
| <i>Myoporum velutinum</i> ms | P2 |
| <i>Otton rigidum</i> ms | P3 |
| <i>Persoonia baeckeoides</i> | P1 |
| <i>Phebalium rude</i> subsp. <i>lineare</i> | P2 |
| <i>Phlegmatospermum richardsii</i> | P1 |
| <i>Pimelea halophila</i> | P2 |
| <i>Pimelea pelinos</i> | P1 |
| <i>Pultenaea</i> sp. Mt Beaumont (K.R.Newbey 7928) | P1 |
| <i>Rulingia tratmanii</i> | Delete |
| <i>Scaevola</i> sp. Swallow Rock (K.R.Newbey 9677) | P1 |
| <i>Spyridium minutum</i> | Delete |
| <i>Stachystemon</i> sp. Mt Baring (K.R.Newbey 9773) | P1 |
| <i>Styphelia pulchella</i> | P3 |
| <i>Thysanotus baueri</i> | P3 |
| <i>Verticordia sieberi</i> var. <i>pachyphylla</i> | P2 |

Priority Two Taxa

| | |
|--|--------|
| <i>Acacia amytica</i> | P3 |
| <i>Acacia asepala</i> ms | P2 |
| <i>Acacia carnosula</i> ms | P2 |
| <i>Acacia castanostegia</i> ms | P3 |
| <i>Acacia incanicarpa</i> ms | P2 |
| <i>Acacia kerryana</i> | P1 |
| <i>Acacia nitidula</i> | P3 |
| <i>Acacia ophiolithica</i> | P3 |
| <i>Acacia profusa</i> ms | Delete |
| <i>Acacia tetraptera</i> ms | Delete |
| <i>Acrotriche patula</i> | P3 |
| <i>Andersonia macranthera</i> | Delete |
| <i>Angasomyrtus salina</i> | P4 |
| <i>Astroloma</i> sp. Fitzgerald (G.J.Keighery 8376) | P2 |
| <i>Astroloma</i> sp. Grass Patch (A.J.G.Wilson 110) | P1* |
| <i>Banksia epica</i> | P4 |
| <i>Bentleya diminuta</i> | P2 |
| <i>Boronia coriacea</i> | P2 |
| <i>Caesia viscida</i> | P2 |
| <i>Calandrinia porifera</i> | P2 |
| <i>Calochilus</i> sp. Hopetoun (H.Taylor s.n.) | P2 |
| <i>Chthonocephalus multiceps</i> | P2 |
| <i>Comesperma lanceolatum</i> | P2 |
| <i>Conospermum filifolium</i> subsp. <i>sigmoideum</i> | P2 |
| <i>Dampiera decurrens</i> | P3 |
| <i>Dampiera orchardii</i> | P1 |

*With highest priority for further survey and consideration for gazettal as DRF

Delete - species recommended to be taken off the Priority Flora list

| | |
|--|---------------|
| <i>Darwinia luehmanii</i> | Delete |
| <i>Darwinia</i> sp. Peak Charles (A.S.George 10627) | P2 |
| <i>Daviesia campephylla</i> | P2 |
| <i>Daviesia pauciflora</i> | P2 |
| <i>Dillwynia acerosa</i> | P2 |
| <i>Elachanthus pusillus</i> | P2 |
| <i>Eremophila lactea</i> | P1* |
| <i>Eriostemon apiculatus</i> | P2 |
| <i>Eucalyptus fraseri</i> subsp. <i>melanobasis</i> ms | P3 |
| <i>Eucalyptus litorea</i> | P2 |
| <i>Eucalyptus misella</i> | P1 |
| <i>Eucalyptus pterocarpa</i> | P2 |
| <i>Eucalyptus spreata</i> ms | Delete |
| <i>Gastrolobium heterophyllum</i> | P3 |
| <i>Gastrolobium rigidum</i> | Delete |
| <i>Goodenia quadrilocularis</i> | P3 |
| <i>Goodenia trichophylla</i> | P2 |
| <i>Grevillea superba</i> | P3 |
| <i>Haegiela tatei</i> | P3 |
| <i>Isolepis</i> sp. Kau Rock (M.A.Burgman 1515) | P1 |
| <i>Isopogon alcicornis</i> | P2* |
| <i>Lasiopetalum maxwellii</i> | P3 |
| <i>Lepyrodia fortunata</i> ms | P2 |
| <i>Leucopogon breviflorus</i> (Israelite Bay) | P3 |
| <i>Leucopogon interruptus</i> | P2 |
| <i>Leucopogon multiflorus</i> | P2 |
| <i>Leucopogon pleurandroides</i> | P2 |
| <i>Leucopogon rotundifolius</i> | P4 |
| <i>Levenhookia pulcherrima</i> | P2 |
| <i>Melaleuca fissurata</i> | Delete |
| <i>Melaleuca viminea</i> subsp. <i>appressa</i> | P2 |
| <i>Melaleuca</i> sp. Ravensthorpe (M.A.Burgman 4018) | P2 |
| <i>Microcorys virgata</i> | P3 |
| <i>Monotaxis</i> sp. Ravensthorpe (M.A.Burgman 2154) | P2 |
| <i>Olearia laciniifolia</i> | P2 |
| <i>Opercularia hirsuta</i> | P2 |
| <i>Opercularia rubioides</i> | P2 |
| <i>Paracaleana</i> sp. Nuytsland (A.P.Brown s.n.) | P2 |
| <i>Patersonia inaequalis</i> | P2 |
| <i>Persoonia</i> sp. Scaddan (M.A.Burgman 4424) | P2 |
| <i>Phlegmatospermum eremaeum</i> | P2 |
| <i>Pimelea graniticola</i> | P2 |
| <i>Scaevola brookeana</i> | P2 |
| <i>Spyridium mucronatum</i> subsp. <i>mucronatum</i> ms | Delete |
| <i>Spyridium mucronatum</i> subsp. <i>multiflorum</i> ms | Addition (P2) |
| <i>Stipa exilis</i> | Delete |
| <i>Thysanotus brachyantherus</i> | P2 |
| <i>Thysanotus parviflorus</i> | P3 |
| <i>Trachymene croniniana</i> | P2 |
| Priority Three Taxa | |
| <i>Acacia eremophila</i> var. <i>variabilis</i> | P1 |
| <i>Acacia euthyphylla</i> ms | P4 |
| <i>Acacia moirii</i> subsp. <i>dasycarpa</i> | P4 |
| <i>Acacia octonervia</i> | P4 |
| <i>Acacia pritzeliana</i> | Delete |

*With highest priority for further survey and consideration for gazettal as DRF
Delete - species recommended to be taken off the Priority Flora list

| | |
|--|--------|
| <i>Acacia singula</i> | P3 |
| <i>Adenanthos gracilipes</i> | P3 |
| <i>Allocasuarina eriochlamys</i> subsp. <i>grossa</i> | P3 |
| <i>Banksia lullfitzii</i> | P3 |
| <i>Boronia fabianoides</i> | P3 |
| <i>Caladenia longicauda</i> subsp. <i>rigidula</i> | Delete |
| <i>Centrolepis cephaloformis</i> subsp. <i>murrayi</i> | P2 |
| <i>Chorizema ulotropis</i> | P3 |
| <i>Cypselocarpus haloragoides</i> | P3 |
| <i>Dicrastylis obovata</i> | P2 |
| <i>Dodonaea trifida</i> | P3 |
| <i>Dryandra viscida</i> | P1 |
| <i>Eremophila purpurascens</i> | P3 |
| <i>Eucalyptus brockwayi</i> | P3 |
| <i>Eucalyptus creta</i> | P3 |
| <i>Eucalyptus exigua</i> | P3 |
| <i>Eucalyptus famelica</i> | P4 |
| <i>Eucalyptus histophylla</i> | P3 |
| <i>Eucalyptus ovularis</i> | Delete |
| <i>Eucalyptus semiglobosa</i> | P3 |
| <i>Gahnia</i> sp. Grass Patch (M.A.Burgman 4431) | Delete |
| <i>Grevillea aneura</i> | Delete |
| <i>Hakea bicornata</i> | Delete |
| <i>Hopkinsia adscendens</i> ms | P3 |
| <i>Lasiopetalum parvuliflorum</i> | P3 |
| <i>Leucopogon apiculatus</i> | Delete |
| <i>Leucopogon brevicuspis</i> | P3 |
| <i>Melaleuca incana</i> subsp. <i>tenella</i> | P3 |
| <i>Melaleuca macronychia</i> subsp. <i>trygonoides</i> | P2 |
| <i>Myriocephalus appendiculatus</i> | P3 |
| <i>Persoonia scabra</i> | P2 |
| <i>Pityrodia chrysocalyx</i> | P3 |
| <i>Platysace haplosciadea</i> | P3 |
| <i>Pomaderris intangenda</i> | Delete |
| <i>Siegfriedia darwinioides</i> | P3 |
| <i>Sphenotoma parviflorum</i> | P2 |
| <i>Verticordia verticordina</i> | P3 |

*With highest priority for further survey and consideration for gazettal as DRF
Delete - species recommended to be taken off the Priority Flora list

**TABLE 5. Declared Rare and Poorly Known Flora in the Esperance District as at 1992.
Conservation status updated to December 1999.**

| Declared Rare Flora | Conservation Code |
|---|-------------------|
| A. Extant Taxa | |
| <i>Adenanthos eyrei</i> | R |
| <i>Adenanthos ileticos</i> | P4 |
| <i>Anigozanthos bicolor</i> subsp. <i>minor</i> | R |
| <i>Billardiera mollis</i> | R |
| <i>Boronia revoluta</i> | R |
| <i>Caladenia exstans</i> ms..... | P4 |
| <i>Caladenia voigtii</i> ms | P4 |
| <i>Conostylis lepidospermoides</i> | R |
| <i>Daviesia microcarpa</i> | R |
| <i>Drummondita hassellii</i> var. <i>longifolia</i> | R |
| <i>Eremophila denticulata</i> subsp. <i>denticulata</i> | R |
| <i>Eremophila denticulata</i> subsp. <i>trisulcata</i> ms..... | P4 |
| <i>Eucalyptus cerasiformis</i> | R |
| <i>Eucalyptus insularis</i> | R |
| <i>Eucalyptus merrickiae</i> | R |
| <i>Eucalyptus platydisca</i> ms | R |
| <i>Kennedia beckxiana</i> | P4 |
| <i>Lambertia echinata</i> subsp. <i>echinata</i> | R |
| <i>Myoporum turbinatum</i> | R |
| <i>Myriophyllum petraeum</i> | P4 |
| <i>Prostanthera carrickiana</i> | P4 |
| <i>Rhizanthella gardneri</i> | R |
| <i>Ricinocarpos trichophorus</i> | R |
| Presumed Extinct Taxa | |
| <i>Opercularia acolytantha</i> | X |
| <i>Taraxacum cygnorum</i> | X |
| A. Priority One taxa | |
| <i>Acacia diaphana</i> ms | P1 |
| <i>Acacia diminuta</i> ms | P1 |
| <i>Acacia dorsenna</i> | P1 |
| <i>Acacia mutabilis</i> subsp. <i>incurva</i> ms | P2 |
| <i>Acacia</i> sp. Esperance (M.A.Burgman 1833b)..... | P1 |
| <i>Allocasuarina globosa</i> | P1 |
| <i>Baeckea crassifolia</i> var. <i>icosandra</i> | P1 |
| <i>Caladenia tentaculata</i> (now <i>C. longifimbriata</i>)..... | P1 |
| <i>Chorizema circinale</i> | P1 |
| <i>Chorizema nervosum</i> | Delete |
| <i>Coleanthera coelophylla</i> | P1 |
| <i>Conostephium marchantiorum</i> | P1 |
| <i>Conostephium uncinatum</i> | P1 |
| <i>Dampiera sericantha</i> | P1 |
| <i>Darwinia calothamnoides</i> ms..... | P1 |
| <i>Darwinia</i> sp. Mt Baring (K.R.Newbey 9775) | P1 |
| <i>Darwinia</i> sp. Mt Ney (M.A.Burgman & S.McNee 1274)..... | P1 |
| <i>Dicrastylis archeri</i> | P1 |
| <i>Dicrastylis capitellata</i> | P1 |
| <i>Diuris concinna</i> | P1 |
| <i>Dodonaea hexandra</i> | P1 |
| <i>Drosera salina</i> | P2 |
| <i>Drosera</i> sp. Hatter Hill (G.J.Barrett 15.9.89)(now <i>D. browniana</i>).. | P2 |
| <i>Eremophila chamaephila</i> | P2 |
| <i>Eremophila compressa</i> | P1 |
| <i>Eremophila oblonga</i> ms..... | Delete |
| <i>Eriostemon</i> sp. Cascades (M.A.Burgman 1535) (now <i>Philothea</i> <i>gardneri</i> subsp. <i>globosa</i>) | P1 |
| <i>Eucalyptus burgmaniana</i> ms | P1 |
| <i>Eucalyptus delicata</i> | Delete |
| <i>Eucalyptus jimberlanica</i> | P1 |
| <i>Eucalyptus varia</i> subsp. <i>salsuginosa</i> | P1 |
| <i>Eucalyptus</i> sp. B Ravensthorpe (K.R.Newbey 9715)(aff. <i>platypus</i>) | P1 |
| <i>Eutaxia</i> sp. Hatter Hill (K.R.Newbey 6532).. | P1 |
| <i>Gonocarpus pycnostachyus</i> | P3 |
| <i>Gonocarpus simplex</i> | P3 |
| <i>Gratiola pedunculata</i> | P2 |
| <i>Grevillea phillipsiana</i> | P1 |
| <i>Gyrostemon ditrigynus</i> | P4 |
| <i>Halgania tomentosa</i> | P2 |
| <i>Haloragis</i> sp. Ravensthorpe (K.R.Newbey 8269)..... | P1 |
| <i>Hydatella australis</i> | P1 |
| <i>Hydrocotyle hispidula</i> | Delete |
| <i>Hydrocotyle</i> sp. Truslove (M.A.Burgman 4419) | P1 |
| <i>Leucopogon blepharolepis</i> | P3 |
| <i>Leucopogon florulentus</i> | P2 |
| <i>Leucopogon</i> sp. Bonnie Hill (K.R.Newbey 9831)..... | P1 |
| <i>Leucopogon</i> sp. Clyde Hill (M.A.Burgman 1207)(aff. <i>breviflorus</i>)..... | P1 |
| <i>Leucopogon</i> sp. Condingup (M.A.Burgman 1377)(aff. <i>concinus</i>) | P1 |
| <i>Leucopogon</i> sp. Coujinup (M.A.Burgman 1085) | P1 |
| <i>Leucopogon</i> sp. Kau Rock (M.A.Burgman 1126) | P1 |
| <i>Leucopogon</i> sp. Mount Heywood (M.A.Burgman 1211) | P1 |
| <i>Leucopogon</i> sp. Munglinup (K.R.Newbey 8123)..... | P1 |
| <i>Leucopogon</i> sp. Roberts Swamp (K.R.Newbey 8173)..... | P1 |
| <i>Leucopogon</i> sp. South Coast (K.R.Newbey 8213)..... | P1 |

| | |
|---|--------|
| <i>Melaleuca agathosmoides</i> | P1 |
| <i>Melaleuca calycina</i> subsp. <i>dempta</i> (now <i>Melaleuca dempta</i>) | P3 |
| <i>Melaleuca coccinea</i> subsp. <i>eximia</i> | P3 |
| <i>Mesomelaena</i> sp. <i>Munglinup</i> (M.A.Burgman 3898) | P1 |
| <i>Microcybe</i> sp. <i>Hatter Hill</i> (K.R.Newbey 6546)(aff. <i>pauciflora</i>) | P1 |
| <i>Mirbelia densiflora</i> | P1 |
| <i>Myoporum velutinum</i> ms | P1 |
| <i>Otione rigidum</i> ms | P2 |
| <i>Persoonia baeckeoides</i> | P1 |
| <i>Phebalium rude</i> subsp. <i>lineare</i> (now <i>Rhadinothermus rudis</i> subsp. <i>linearis</i>) | P4 |
| <i>Phlegmatospermum richardsii</i> | P1 |
| <i>Pimelea halophila</i> | P2 |
| <i>Pimelea pelinos</i> | P1 |
| <i>Pultenaea</i> sp. <i>Mt Beaumont</i> (K.R.Newbey 7928)(now <i>P. conferta</i>) . Delete | |
| <i>Rulingia tratmannii</i> | Delete |
| <i>Scaevola</i> sp. <i>Swallow Rock</i> (K.R.Newbey 9677) (now <i>S. humifusa</i>) | Delete |
| <i>Spyridium minutum</i> | Delete |
| <i>Stachystemon</i> sp. <i>Mt Baring</i> (K.R.Newbey 9773) | P1 |
| <i>Styphelia pulchella</i> | P1 |
| <i>Thysanotus baueri</i> | P1 |
| <i>Verticordia sieberi</i> var. <i>pachyphylla</i> | P1 |

B. Priority Two Taxa

| | |
|---|--------|
| <i>Acacia amyctica</i> | P2 |
| <i>Acacia asepala</i> ms | P2 |
| <i>Acacia carnosula</i> ms | P2 |
| <i>Acacia castanostegia</i> ms | Delete |
| <i>Acacia incanicarpa</i> ms | P2 |
| <i>Acacia kerryana</i> | P2 |
| <i>Acacia nitidula</i> | P2 |
| <i>Acacia ophiolithica</i> | P3 |
| <i>Acacia profusa</i> ms (now <i>Acacia carnosula</i>) . P2 | |
| <i>Acacia tetraptera</i> | Delete |
| <i>Acrotriche patula</i> | P2 |
| <i>Andersonia macranthera</i> | P2 |
| <i>Angasomyrtus salina</i> | P2 |
| <i>Astroloma</i> sp. <i>Fitzgerald</i> (G.J.Keighery 8376) | P2 |
| <i>Astroloma</i> sp. <i>Grass Patch</i> (A.J.G.Wilson 110) | P2 |
| <i>Banksia epica</i> | P2 |
| <i>Bentleya diminuta</i> | P2 |
| <i>Boronia coriacea</i> | P2 |
| <i>Caesia viscida</i> | P2 |
| <i>Calandrinia porifera</i> | P3 |
| <i>Calochilus</i> sp. <i>Hopetoun</i> (H.Taylor s.n.) | P2 |
| <i>Chthonocephalus multiceps</i> | P2 |
| <i>Comesperma lanceolatum</i> | P2 |

| | |
|--|--------|
| <i>Conospermum filifolium</i> subsp. <i>sigmoideum</i> ms | P2 |
| <i>Dampiera decurrens</i> | P2 |
| <i>Dampiera orchardii</i> | P2 |
| <i>Darwinia luehmanii</i> | P2 |
| <i>Darwinia</i> sp. <i>Peak Charles</i> (A.S.George 10627) | P2 |
| <i>Daviesia campephylla</i> | P2 |
| <i>Daviesia pauciflora</i> | P2 |
| <i>Dillwynia acerosa</i> | P1 |
| <i>Elachanthus pusillus</i> | P2 |
| <i>Eremophila lactea</i> | R |
| <i>Eriostemon apiculatus</i> (now <i>Philothea</i> <i>apiculata</i>) | P2 |
| <i>Eucalyptus fraseri</i> subsp. <i>melanobasis</i> ms | P2 |
| <i>Eucalyptus litorea</i> | P2 |
| <i>Eucalyptus misella</i> | P3 |
| <i>Eucalyptus pterocarpa</i> <i>E. subsp. pterocarpa</i> ms | P4 |
| <i>E. subsp. obtusatans</i> ms | P1 |
| <i>Eucalyptus spreata</i> ms | Delete |
| <i>Gastrolobium heterophyllum</i> | Delete |
| <i>Gastrolobium rigidum</i> | P2 |
| <i>Goodenia quadrilocularis</i> | P2 |
| <i>Goodenia trichophylla</i> | P2 |
| <i>Grevillea superba</i> | P2 |
| <i>Haegiela tatei</i> | P2 |
| <i>Isolepis</i> sp. <i>Kau Rock</i> (M.A.Burgman 1515) (now <i>I. australiensis</i>) | P2 |
| <i>Isopogon alcicornis</i> | P3 |
| <i>Lasiopetalum maxwellii</i> | P2 |
| <i>Lepyrodia fortunata</i> ms | P2 |
| <i>Leucopogon breviflorus</i> (<i>Israelite Bay</i>) ... Delete | |
| <i>Leucopogon interruptus</i> | P2 |
| <i>Leucopogon multiflorus</i> | P2 |
| <i>Leucopogon pleurandroides</i> | P2 |
| <i>Leucopogon rotundifolius</i> | P3 |
| <i>Levenhookia pulcherrima</i> | P2 |
| <i>Melaleuca fissurata</i> | P4 |
| <i>Melaleuca viminea</i> subsp. <i>appressa</i> | P2 |
| <i>Melaleuca</i> sp. <i>Ravensthorpe</i> (M.A.Burgman 4018) | P2 |
| <i>Microcorys virgata</i> | Delete |
| <i>Monotaxis</i> sp. <i>Ravensthorpe</i> (M.A.Burgman 2154) | P2 |
| <i>Olearia laciniifolia</i> | P2 |
| <i>Opercularia hirsuta</i> | P2 |
| <i>Opercularia rubioides</i> | P2 |
| <i>Paracaleana</i> sp. <i>Nuytsland</i> (A.P.Brown s.n.) | P2 |
| <i>Patersonia inaequalis</i> | P2 |
| <i>Persoonia</i> sp. <i>Scaddan</i> (M.A.Burgman 4424) (now <i>P. cymbifolia</i>) | P3 |
| <i>Phlegmatospermum eremaeum</i> | P2 |
| <i>Pimelea graniticola</i> | Delete |

Scaevola brookeana P2
Spyridium mucronatum subsp.
mucronatum..... Delete
Stipa exilis (now *Austrostipa exilis*) P2
Thysanotus brachyantherus..... P2
Thysanotus parviflorus P2
Trachymene croniniana P3

C. Priority Three Taxa

Acacia eremophila var. *variabilis* P3
Acacia euthyphylla ms P3
Acacia moirii subsp. *dasycarpa* P4
Acacia octonervia..... P3
Acacia pritzeliana P3
Acacia singula P3
Adenanthos gracilipes P3
Allocasuarina eriochlamys subsp. *grossa* P3
Banksia hullfitzii P3
Boronia fabianoides Delete
Caladenia longicauda subsp.
rigidula ms Delete
Centrolepis cephaloformis subsp. *murrayi*.... P3
Chorizema ulotropis P4
Cypselocarpus haloragoides Delete
Dicrastylis obovata P2
Dodonaea trifida P3
Dryandra viscida..... P3
Eremophila purpurascens P3
Eucalyptus brockwayi P3
Eucalyptus creta..... P3
Eucalyptus exigua P3
Eucalyptus famelica P3
Eucalyptus histophylla P3
Eucalyptus ovularis P3
Eucalyptus semiglobosa P3
Gahnia sp. Grass Patch (M.A.Burgman 4431)
now *G. ancistrophylla* Delete
Grevillea aneura P4
Hakea bicornata..... Delete
Hopkinsia adscendens ms P3
Lasiopetalum parviflorum..... P3
Leucopogon apiculatus P3
Leucopogon brevicuspis..... P3
Melaleuca incana subsp. *tenella* P3
Melaleuca macronychia subsp.
trygonoides P3
Myriocephalus appendiculatus P3
Persoonia scabra P3
Pityrodia chrysocalyx..... P3
Platysace haplosciadia..... Delete
Pomaderris intangenda
(now *Granitites intangendus*)..... P3
Siegfriedia darwinioides P3
Sphenotoma parviflorum P3
Verticordia verticordina..... P3

R Declared Rare Flora - Extant Taxa
Taxa which have been adequately searched for and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such.
X Declared Rare Flora - Presumed Extinct Taxa
P1 Priority One - Poorly known Taxa
Taxa which are known from one or a few (generally <5) populations which are under threat
P2 Priority Two - Poorly Known Taxa
Taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat
P3 Priority Three - Poorly Known Taxa
Taxa which are known from several populations, and the taxa are not believed to be under immediate threat
P4 Priority Four - Rare Taxa
Taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors.
delete species recommended to be taken off the Priority Flora list

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GLOSSARY

| | |
|-------------------|---|
| achene | a small, dry, indehiscent, 1-seeded fruit |
| acute | terminating in a distinct but not protracted point, the converging edges separated by an angle of less than 90° |
| aeolian | wind blown |
| alternate | of leaves or other lateral organs, borne singly at different heights on the axils |
| annual | a plant whose life span ends within one year after germination |
| anther | that part of the stamen which contains the pollen |
| aril | a fleshy appendage of the seed, growing near the seed stalk |
| awn | a bristle-like appendage |
| axil | the angle between a leaf or bract and the axis bearing it. adj. axillary |
| beak | a prominent terminal projection |
| bract | a leaf-like structure, different in form from foliage leaves and without an axillary bud, associated with an inflorescence or flower |
| bracteoles | a small bract-like structure borne singly or in pairs on the stalk or calyx of a flower |
| calyx | the sepals of one flower collectively |
| callus | a hard thickened part, e.g. on the labellum of some orchids; adj. callous |
| capsule | a dry fruit formed from two or more united carpels and dehiscing at maturity to release seeds |
| cilia | in higher plants, hairs more or less confined to the margins of an organ; adj. ciliate |
| claw | a narrow, stalk-like basal portion of a petal, sepal or bract |
| concave | curved like the inside of a sphere or circle |
| corolla | the petals of a flower collectively |
| corymb | an inflorescence in which the lowest flower stalks continue to grow until they reach approximately the same level as the terminal one, so that all the flowers are brought to the same level; the oldest flowers are at the edges |
| culm | the stem of grasses, usually hollow except at the nodes |
| cyme | an inflorescence in which each flower, in turn, is formed at the tip of a growing axis and further flowers are formed on branches arising below it; oldest flowers are in the centre not on the edges |
| deciduous | falling seasonally |
| decussate | in pairs, with successive pairs borne at right angles to each other |
| dehiscent | breaking open at maturity to release the contents |

| | |
|----------------------|---|
| disc | a plate or rim of tissue, derived from the receptacle of a flower, occurring between whorls of floral parts |
| elliptic | oval in outline, widest at the centre |
| ephemeral | a short-lived plant |
| exserted | protruding |
| filament | the stalk of a stamen |
| floret | a grass flower, together with the lemma and palea that enclose it (often applied to flowers in Cyperaceae and Asteraceae) |
| free | not fused or united (with other organs) |
| fruit | the seed-bearing structure in angiosperms formed from the ovary after flowering |
| genus | a group of species believed to be related phylogenetically and usually clearly separable from other such groups, or a single species without close relatives; pl. genera |
| gland | a structure, without or on the surface of the plant, with a secretory function |
| glandular | bearing glands; functioning as a gland |
| glaucous | blue-green in colour, with a whitish bloom |
| glume | a dry, scaly bract |
| habit | the growth form of a plant, comprising its size, shape, texture and orientation |
| habitat | the environment in which the plant lives |
| herb | any vascular plant that never produces a woody stem |
| herbaceous | not woody; soft in texture |
| hybrid | an offspring of genetically different parents |
| indusium | a cup enclosing the stigma |
| inflorescence | the group or arrangement in which flowers are borne on a plant |
| internode | the portion of a stem between the level of insertion of two successive leaves or leaf pairs (or branches of an inflorescence) |
| involucre | a whorl of bracts surrounding the head of a flower and rising from its base |
| keel | applied to the two front-united petals of a flower in Papilionaceae |
| keeled | of leaves or bracts, folded and ridged along the midrib; ridged like the keel of a boat |
| labellum | a lip; in Orchidaceae, the distinctive median petal that serves as an alighting platform for pollinating insects |
| lanceolate | of a leaf, about four times as long as broad, broadest at the lower half and tapering towards the tip |
| leaflet | one of the ultimate segments of a compound leaf |

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| legume | a fruit characteristic of the families Mimosaceae, Caesalpiaceae and Papilionaceae, formed from one carpel and either dehiscent along both sides, or indehiscent |
| lignotuber | a woody swelling below or just above the ground, containing adventitious buds from which new shoots develop if the top of the plant is cut or burnt |
| ligule | the apical part of a petal in the flowers of Sterculiaceae; the strap-shaped petal-like corolla of the outer florets in the heads of Asteraceae; a membranous or ciliate projection from the junction of the leaf-sheath and the blade in a grass |
| linear | very narrow in relation to the length, and with the sides parallel |
| mallee | a growth habit in which several woody stems arise separately from a lignotuber (usually applied to shrubby eucalypts) |
| midrib | the central, and usually the most prominent, vein of a leaf or leaf-like organ |
| nerve | a vein |
| node | the level (transverse plane) of a stem at which one or more leaves arise |
| oblanceolate | similar in shape to lanceolate but attached at the narrower end |
| oblong | having the length greater than the width but not many times greater, and the sides parallel |
| obovate | similar in shape to ovate but attached at the narrower end |
| obtuse | blunt or rounded at the apex, the converging edges separated by an angle greater than 90 degrees |
| orbicular | circular or nearly so |
| ovate | shaped like a section through a long axis of an egg, and attached by the wider end |
| panicle | a compound raceme; an indeterminate inflorescence in which the flowers are borne on branches of the main axis or on further branches of these |
| pappus | a tuft (or ring) of hairs or scales borne above the ovary and outside the corolla in Asteraceae |
| pedicel | the stalk of a flower |
| peduncle | the stalk of an inflorescence |
| perennial | a plant whose life-span extends over more than two growing seasons |
| perianth | the calyx and corolla of a flower, especially where the two are similar |
| petal | a member of the inner whorl of non-fertile parts surrounding the fertile organs of a flower, usually soft and coloured conspicuously |
| phyllode | a leaf whose blade is much reduced or absent, and whose petiole and rachis have assumed the function of a whole leaf |
| pod | a leguminous fruit |
| prostrate | lying flat on the ground |

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| raceme | an indeterminate inflorescence in which a main axis produces a series of flowers on the lateral stalks, the oldest at the base and the youngest at the top |
| recurved | curved or curled downwards or backwards |
| scale | a reduced or rudimentary leaf |
| sepal | a member or the (usually green) outer whorl of non-fertile parts surrounding the fertile organs of a flower |
| sessile | without a stalk |
| shrub | a woody plant less than 5 m tall, either without a distinct main axis, or with branches persisting on the main axis almost to its base |
| species | a taxon comprising individuals, or populations of individuals, capable of interbreeding to produce fertile offspring; the largest group of individuals between which there are no distinguishable, consistent differences in form or reproductive mechanisms |
| spike | an unbranched, indeterminate inflorescence in which the flowers are without stalks |
| spine | a stiff, sharp-pointed structure, formed by modification of a plant organ |
| spinescent | ending in a spine; modified to form a spine |
| stamen | the male organ of seed-forming plants, consisting of the pollen bearing anther and supported by the filament |
| staminode | a sterile stamen |
| standard | the posterior petal in the flower in Papilionaceae |
| stellate | star-shaped; consisting of star-shaped cells |
| stigma | the female part of the flower which receives the pollen and is supported by the style |
| style | the stalk joining the stigma to the ovary |
| taxon | a group or category, at any level, in a system for classifying plants or animals |
| trifoliolate | having three leaflets |
| tepal | a segment or unit of a perianth that is not clearly differentiated into calyx or corolla |
| umbel | a racemose inflorescence in which all the individual flower stalks arise in a cluster at the top of the peduncle and are of about equal length |
| venation | the arrangement of veins in a leaf |
| wing | a membranous expansion of a fruit or seed, which aids dispersal; a thin flange of tissue extended beyond the normal outline of a stem or petiole; a lateral petal of a flower in Papilionaceae |