A Floristic Survey of the southern Swan Coastal Plain

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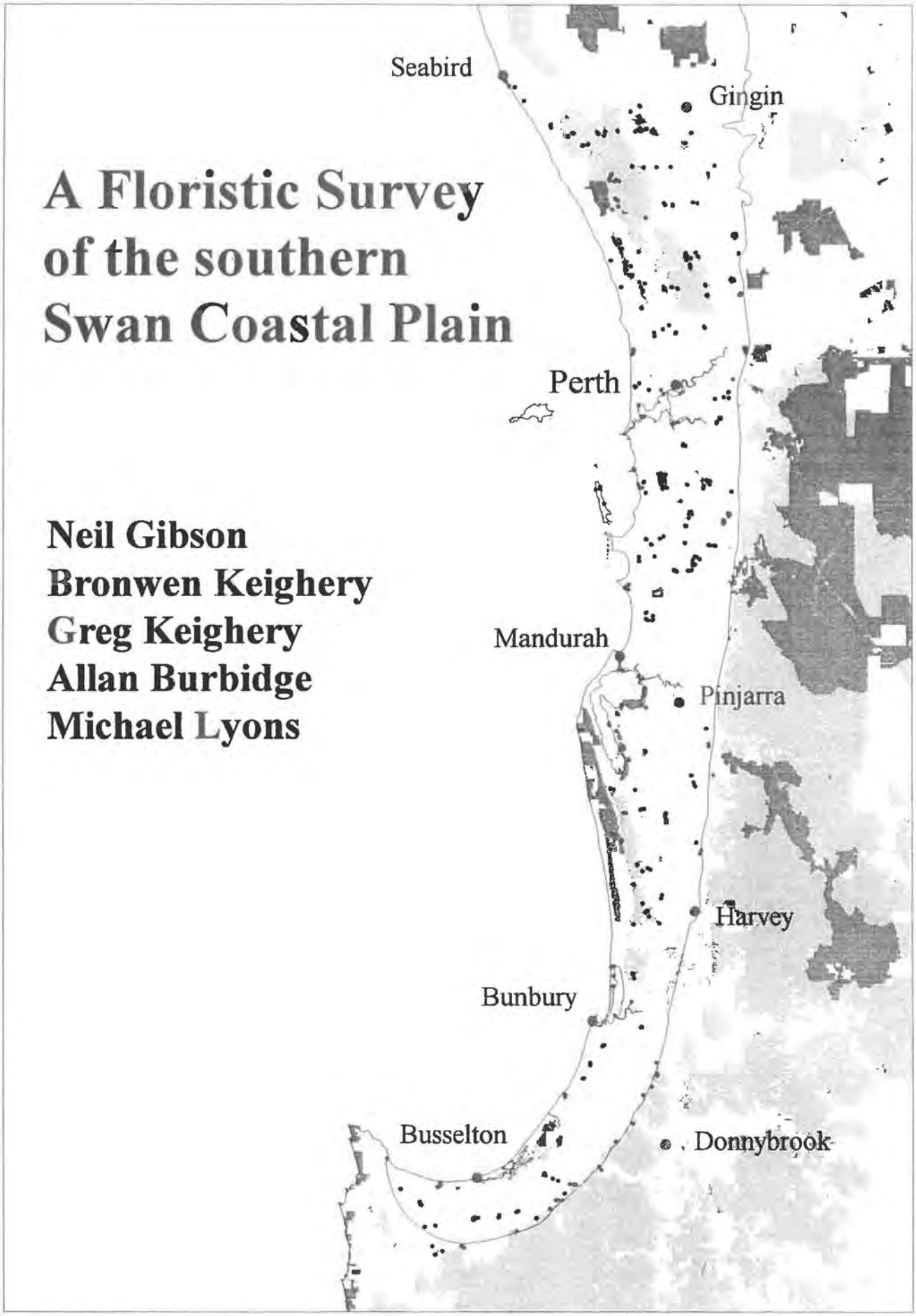

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Australian Heritage Commission.

A Floristic Survey of the Southern Swan Coastal Plain

by

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ABSTRACT

A study was undertaken of the plant communities of remnant bushland on the southern Swan Coastal Plain (between Seabird and the foothills of the Whicher Range). Five hundred and nine sites were established and the floristic data were used to define the major regional community types.

A total of 1485 flowering plant taxa (species, subspecies and varieties) were found in the 509 quadrats or in adjacent areas. Of these taxa 1313 were natives and 172 were weeds. Sixty one taxa appear to be endemic to the study area. Most of the endemics are restricted to the eastern side of the coastal plain (28 taxa) or to areas of ironstone (13 taxa). Seventy seven taxa appear to have their southern range end and 48 taxa to have their northern range end in the study area. Ten species of Declared Rare Flora (DRF) were found during the survey. Two of these taxa (*Schoenus natans* and *Tetraria australiensis*) were previously believed to be extinct. In all, 19 new populations of DRF were recorded and a further 75 priority species were encountered. Eleven species are proposed for listing as Declared Rare Flora (eight of these species are from the very restricted southern ironstone communities) and changes to the priority listing are recommended for another 13 taxa. At least seven taxa appear to have become locally extinct on the southern Swan Coastal Plain.

The floristic analysis defined 30 communities types. It was possible to further subdivide some of these groups and, in all, a total of 43 types and subtypes were recognised. The major environmental correlates with this classification were seasonal moisture regime and geomorphology. Of the 30 major community types, three are found on the heavy soils of the eastern coastal plain, 16 in seasonal wetlands, four are centred on the Bassendean Dunes and seven are largely restricted to Spearwood and Quindalup systems.

The floristic classification showed very poor correlation to vegetation structure and, while geomorphology was a major environmental correlate, floristic community types were poorly correlated to individual mapped units. Similarly the floristic classification was poorly correlated with previously mapped vegetation complexes.

Of the 43 recognised community types or subtypes, ten are unreserved and a further 10 are only known from a single National Park or Nature Reserve. One community type (southern ironstones) is considered critically threatened, two communities are considered endangered, 15 are considered vulnerable and 11 are considered susceptible should any change in management or land use occur. Twelve communities are considered at low risk from any present threat and two communities could not be assessed due to insufficient information. Reserve recommendations are made to protect the three most threatened community types.

RECOMMENDATIONS

This study of the plant communities of the Swan Coastal Plain between Seabird and the foothills of the Whicher Range has lead to the following recommendations:

1) Eleven taxa should be proposed for listing as Declared Rare Flora and the priority listing for 13 taxa should be changed as detailed (Table 6).

2) The three most threatened community types need urgent reservation. The following areas should be declared as A class Nature Reserves for the protection of flora and fauna:

a) the southern ironstone communities from the five small areas of State Forest and the road and rail reserve east of Ruabon Nature Reserve. (This road and rail reserve is also of regional significance as it is one of the last two remaining continuous vegetated transects in the study area showing the catena of original vegetation types on the eastern side of the plain.)

b) the sedgeland in Holocene dune swales in the Point Becher area (M106) and the north west corner of Lake Walyungup (M103).

c) the eastern *Banksia attenuata* woodlands over species rich dense shrublands from Koondoola open space, Landsdale Rd, M12, and M 53

3) Final selection of areas for reservation of the 10 poorly reserved community types should be made in conjunction with species reservation data currently being collected.

4) The road and drain reserve on the southern side of Mundijong Road be declared as an A class Nature Reserve. (This area is of regional significance being the second catena of vegetation types across the eastern side of the plain).

5) As a consequence of the small amount of remnant vegetation on the eastern side of the plain, all such remnants in the study area with the basic vegetation intact or able to be regenerated are of high conservation value.

6) A further analysis of reservation status is needed since the present definition does not consider the area of communities reserved.

7) A similar analysis needs to be undertaken to determine conservation values of remnants not covered in this study since floristic community types are not well correlated to presently available geomorphological or vegetation mapping.

8) Additional work on the Swan Coastal Plain is required to determine, more precisely, the nature of floristic variation in the seasonal wetlands (because of their high levels of heterogeneity).

INTRODUCTION

The Swan Coastal Plain is a narrow belt of aeolian, alluvial and colluvial deposits generally of Holocene or Pleistocene age on which is found the city of Perth and most of the population of Western Australia. It extends from Dunsborough (33°45"S) north to Jurien (30°06"S). Beard (1980, 1981, 1990) included both the plain and the adjacent Dandaragan Plateau in the Drummond Botanical Subdistrict. Over most of its length the plain itself is less than 30 km wide and bounded on the west by the Indian Ocean and to the east by the faulted Yilgarn block (McArthur and Bettenay 1960). Ninety-seven percent of the alluvial soils on the eastern side of the plain in this area has already been cleared for agriculture or urban developments (A.H. Burbidge and J.K. Rolfe, unpublished data). Over the last 20 years there has also been a rapid expansion of major population centres. It is on the southern Swan Coastal Plain where most of the urban development will occur over the next 20 years (Department of Planning and Urban Development 1990). Despite the proximity of a major urban centre there still remains significant gaps in our knowledge of the distribution of flora and floristic communities of this area. Availability of such knowledge is vital if conservation of our unique flora and plant communities is to be integrated with urban and industrial growth.

CLIMATE

The coastal plain has a warm mediterranean climate with warm dry summers of five to six months and winter precipitation of 700 to 1000 mm (Table 1, Bureau of Meteorology 1988). Most of the plain receives 800 - 900 mm this drops off to 700 mm north of Yanchep and rises to over a 1000 mm at the base of the Scarp south of Pinjarra. There are similar gradients in mean temperatures across the study area (Table 1). The whole coast is under the influence of west to south westerly winds during winter but experiences strong diurnal wind patterns in summer with afternoon sea breezes reaching 20 - 30 knots. These winds occur throughout the summer months except when blocking high pressure systems result in dry hot easterlies.

Table 1. Annual rainfall, number of rain days, annual mean maximum temperature, annual mean minimum for five centres. Note Lancelin occurs on the coast just north of the study area. Data from Bureau of Meteorology (1988).

	Rainfall (mm)	Rain days	Mean Max. Temp (°C)	Mean Min. Temp. (°C)
Lancelin	627	112	24.0	13.3
Perth	869	119	23.6	13.5
Mandurah	888	118	23.4	13.4
Dwellingup	1279	131	21.7	9.7
Bunbury	871	119	21.9	12.4

GEOLOGY AND LANDFORMS

The Darling Fault forms the eastern boundary of the study area south to near Dardanup. The coastal plain then swings southwest bounded by the Whicher Range. The plain itself is made up of five major geomorphological elements (McArthur and Bettenay 1960, Churchward and McArthur 1980) (Table 2). These elements lie more or less parallel to the coast with the narrow Ridge Hill Shelf (Pleistocene age) of colluvial and alluvial deposits and old beach sands occurring at the base of the Darling Scarp. The Pinjarra Plain abuts the Ridge Hill Shelf, this alluvial plain is of Pleistocene to Holocene age, originating from the river systems flowing down from the Scarp. This is the most fertile land system and has been extensively cleared for agriculture. Dominating the central section of the plain are the Pleistocene aged Bassendean and Spearwood Dune systems. To the east are the low lying Bassendean dunes, falling from 40-80 m relief in the north of the study area to almost sea level in the south. The younger Spearwood Dunes lie to the west. These have a less leached profile with a similar relief of 50-80 m in both the north and south of the study area (Semeniuk and Glassford 1989). Churchward and McArthur (1980) recognise two subdivisions within the Spearwood Dunes: the Karrakatta unit of deep

yellow sands and the Cottesloe unit of thinner sands on Tamala limestone closer to the coast. The Quindalup Dunes on the western margin of the plain are calcareous coastal Holocene dunes. Overlaying the Quindalup, Spearwood and Bassendean Systems are a series of Holocene swamp and estuarine deposits. The geology of the area is tightly tied to these geomorphological units as is the vegetation (Briggs and Wilde 1980, Heddle *et al.* 1980).

Table 2. Geomorphological classifications of the lower Swan Coastal Plain. The McArthur and Bettenay (1960) classification was further refined by Churchward and McArthur (1980). Land forms are subparallel to coastline. The broader classification is used in the text except where otherwise indicated.

Major geomorphological systems (McArthur and Bettenay 1960)	**More detailed geomorphological units (Churchward and McArthur 1980)**
Quindalup Dunes	Quindalup unit
Spearwood Dunes	Cottesloe unit Karrakatta unit Herdsman unit
Bassendean Dunes	Bassendean unit Southern Rivers unit Caladenia unit Yoongarillup unit Herdsman unit
Pinjarra Plain	Guildford unit Abba unit Beermullah unit Bootine unit Yanga unit Cannington unit Serpentine unit Swan unit Dardanup unit Vasse unit
Ridge Hill Shelf (and similar units along the flanks of the Dandaragan Plateau and Whicher Scarp)	Forrestfield unit Regan unit (Dandaragan Plateau) Coonambidgee unit (Dandaragan Plateau) Cartis unit (Whicher Scarp)

Recent mapping of the permanent and seasonal wetlands of the coastal plain between Moore River and Mandurah has shown over 3000 wetlands on this section of the plain (Water Authority of Western Australia 1992). Semeniuk (1987) proposed a geomorphological classification of these wetlands based on basin shape and period of inundation. In addition to creeks, rivers and lakes, Semeniuk (1987) recognised the following units:

1. Seasonally inundated basins — Sumplands
2. Seasonally waterlogged basins — Damplands
3. Seasonally inundated flats — Floodplains
4. Seasonally waterlogged flats — Palusplain

All these wetland types are widespread across the study area.

SOILS

Fine scale geomorphological and soils mapping have not used a consistent methodology across the study area. Information on the soils of the study area can be obtained from a series of maps at 1:50 000 scale. These maps have been produced to supply information for planners concerned with aspects of urban, rural, industrial, transport or raw material and water supply development. The

Urban Geology and Environmental Geology Series prepared and published by the Geological Survey section of the Department of Minerals and Energy (Anon 1976, 1977a,b, 1978, 1981, 1982; Belford 1987a,b; Gozzard 1982a,b, 1983a,b, 1986, 1987; Jordan 1986a,b; Leonard 1991; Smurthwaite 1986a,b) used comparable mapping units throughout the study area, while the various land resources and land capability studies (King and Wells 1990; McArthur 1986; McArthur and Bartle 1980; Tille and Lantzke 1991; van Gool 1990; Wells and Hesp 1989) produced by various agencies, have generally not used directly comparable mapping units. While both types of maps cover most of the study area, the information available from these maps are not easily integrated, either with each other or with the broader scale mapping units of Churchward and McArthur (1980). As a consequence, only the series using comparable mapping units, the Urban Geology and Environmental Geology Series, can be used across the entire study area. Also, the units from this series can be directly compared with the major geomorphological systems (McArthur and Bettenay 1960) and, to a lesser extent, to the units identified by Churchward and McArthur (1980).

The general soil boundaries of Churchward and McArthur (1980), although used widely in vegetation mapping on the Swan Coastal Plain, are often quite different from those of the 1:50 000 maps referred to above. While the detailed mapping of the 1:50 000 maps is a better predictor of vegetation than the general maps, it is not possible to use standard soil maps reliably to predict vegetation patterning. For example, the Cardup Nature Reserve was considered to be an area representative of the Pinjarra Plain vegetation (Department of Conservation and Environment 1983) as on the broad scale maps of Churchward and McArthur (1980) it is entirely located on alluvial soils. However, in more detailed mapping van Gool (1990) maps Bassendean sands of aeolian origin on the sandy valleys and rises. To the west is mapped alluvium of the Pinjarra Plain and to the east colluvium of the Ridge Hill Shelf. Only small intrusions of these soils are mapped as being in the reserve. By contrast Jordan (1986a) maps much greater areas of colluvium and alluvium in the reserve. The rises are mapped as Bassendean sands. Further examples of inconsistencies in soil mapping are discussed by Semeniuk and Glassford (1989) and Semeniuk(1990).

VEGETATION

The early work of Speck (1952, 1958) was the first systematic attempt to map the major plant communities of this area. He described six major associations based on commonly occurring dominants and soil associations. Later more detailed structural mapping was undertaken by Smith (1973, 1974) and Beard (1979a, b), with both authors again recognising the importance of soil type. Beard (1980) used these maps as a basis for defining the Swan Coastal Plain as a subregion of the Darling Botanical District which encompasses the forest regions of south west Western Australia.

Heddle *et al.* (1980) produced a vegetation map at 1:250 000 scale based on vegetation complexes correlated to the major geomorphological units of Churchward and McArthur (1980). These were broader units than defined by Beard and Smith and were based on the concept of a series of vegetation communities forming regularly repeating vegetation complexes. The basis of this type of mapping was earlier quadrat based studies undertaken by Havel (1968) where he showed floristic site types in the Bassendean and Spearwood Dunes systems north of Perth were largely determined by degree of soil leaching and soil moisture. His work showed that the *Banksia* woodland of that area was made up of seven different floristic community types. Later work by Cresswell and Bridgewater (1985) suggests that at least 49 floristic community types are found on the dune systems around Perth with additional factors of seasonality of soil moisture, topographic position and historical factors being highlighted as important in determining vegetation pattern. Griffin and Keighery (1989) in a study of the northern sand plain vegetation showed strong geographical patterning and high levels of heterogeneity especially in wet heath communities. A survey of remnant vegetation on the eastern side of the plain from GinGin to Pinjarra found ephemeral wetlands were major centres of endemism on the eastern side of the plain (Keighery and Trudgen 1992). Again the wetlands were found to be highly heterogenous. Recent work by Griffin (1993) has shown significant regional variation in vegetation of Quindalup Dunes between Swan and Irwin Rivers. He suggests that foredune and beach communities are less variable than those found a short distance inland. Landform, proximity to coast, age, geology and soil type had major influence on floristic community types. Reports by Keighery (1990) and Keighery and Keighery (1992) list known endemics and communities believed to be rare in the study area.

PURPOSE OF THE SURVEY

A survey of remnant vegetation of the southern half of the Swan Coastal Plain (as defined by Beard 1980, 1990) was undertaken to provide a more detailed knowledge of the conservation status of species and communities that occur in this area. The study area extended from Seabird 31° 15"S south to Dunsborough and east to include the colluvial deposits of the Darling and Whicher Ranges (Figure 1). The map shows Beard's (1990) boundary of the Swan Coastal Plain; our study included a few colluvial surfaces south of this boundary.

Due to limits on both time and resources the study was restricted to remnant bushland areas on public lands and one area of private property ('Lowlands' property).

Previous ecological studies on the coastal plain have been at local scales and are of limited use in gaining an understanding of the major floristic gradients across the study area. No regional floristic based vegetation survey for the southern Swan Coastal Plain has been published. Given the need to assess conservation significance of vegetation at a finer scale than present data allow, a quadrat based survey was undertaken to delimit floristic community types.

METHODS

Five hundred and nine 10 m x 10 m quadrats (plots, sites) were established in remnant vegetation in the study area (Figure 1). These sites were located on public land and on the 'Lowlands' property. As a result, not all the geographical or geomorphological variation could be covered. In particular the Ridge Hill Shelf, Pinjarra Plain and Quindalup land systems were under sampled. In the case of the former two they have largely been cleared (and hence the chance to study them lost) while few reserves occur on the latter land system. The 509 sites established attempted to cover the major geographical, geomorphological and floristic variation found on Crown lands. Previous studies by Keighery and Trudgen (1992) and Keighery and Keighery (1992) were used to identify areas to be sampled. Care was taken to locate sites in the least disturbed vegetation available in the area being sampled. It was not possible to cover fully the estuarine and riverine vegetation in the time available for this study; these restricted habitat types have been documented elsewhere (Pen 1980, 1993; Siemon *et al.* 1993). Some 190 of the sites were established with the aid of volunteers (See Acknowledgments). These sites were more aggregated but were located in areas containing a high degree of habitat diversity. Replication was somewhat greater in the volunteer sites than elsewhere.

Within each site all vascular plants were recorded. Most sites (>95%) were visited on at least two occasions. The seasonally wet clay pans were visited up to four times to ensure that the extended period of recruitment of annual and geophytic taxa that occurs as these pools dry was fully covered. Data on slope, aspect, vegetation structure and condition were collected from each site. Slope was scored on a one to three scale from flat to steep. Aspect was recorded as one of 16 cardinal directions. Vegetation structure was recorded using Muir's (1977) classification. Vegetation condition was scored on a five point scale with a score of one indicating vegetation in near natural condition and five indicating highly disturbed sites with significant weed invasion (after Trudgen 1991). Cause of disturbance varied but included grazing, disease, logging, high frequency fires, tracks, etc. Geomorphology and vegetation complex were derived from Heddle *et al.* (1980) and Churchward and McArthur (1980). Soil / geomorphology unit was derived from the Environmental and Urban Geology Series (Gozzard 1982a,b, 1983a,b, 1986, 1987; Smurthwaite 1986a,b; Jordan 1986a,b; Belford 1987a,b; Leonard 1991; Anon 1976, 1977a,b, 1978, 1981, 1982). Equivalent units to the Environmental Geology Series were derived from the Urban Geology Series based on map classification and field notes. The seven sites not covered by these map series were allocated to an appropriate unit based on field observation. It should be noted that as discussed earlier the units defined by these series are at times at variance with other soil / geomorphological classifications. This series was used because it gave the only complete uniform coverage of the study area. All sites were permanently marked with four steel fence droppers and most had their position fixed using a GPS unit. Estimates of mean annual rainfall and mean annual temperature were derived from the BIOCLIM model of Busby (1986).

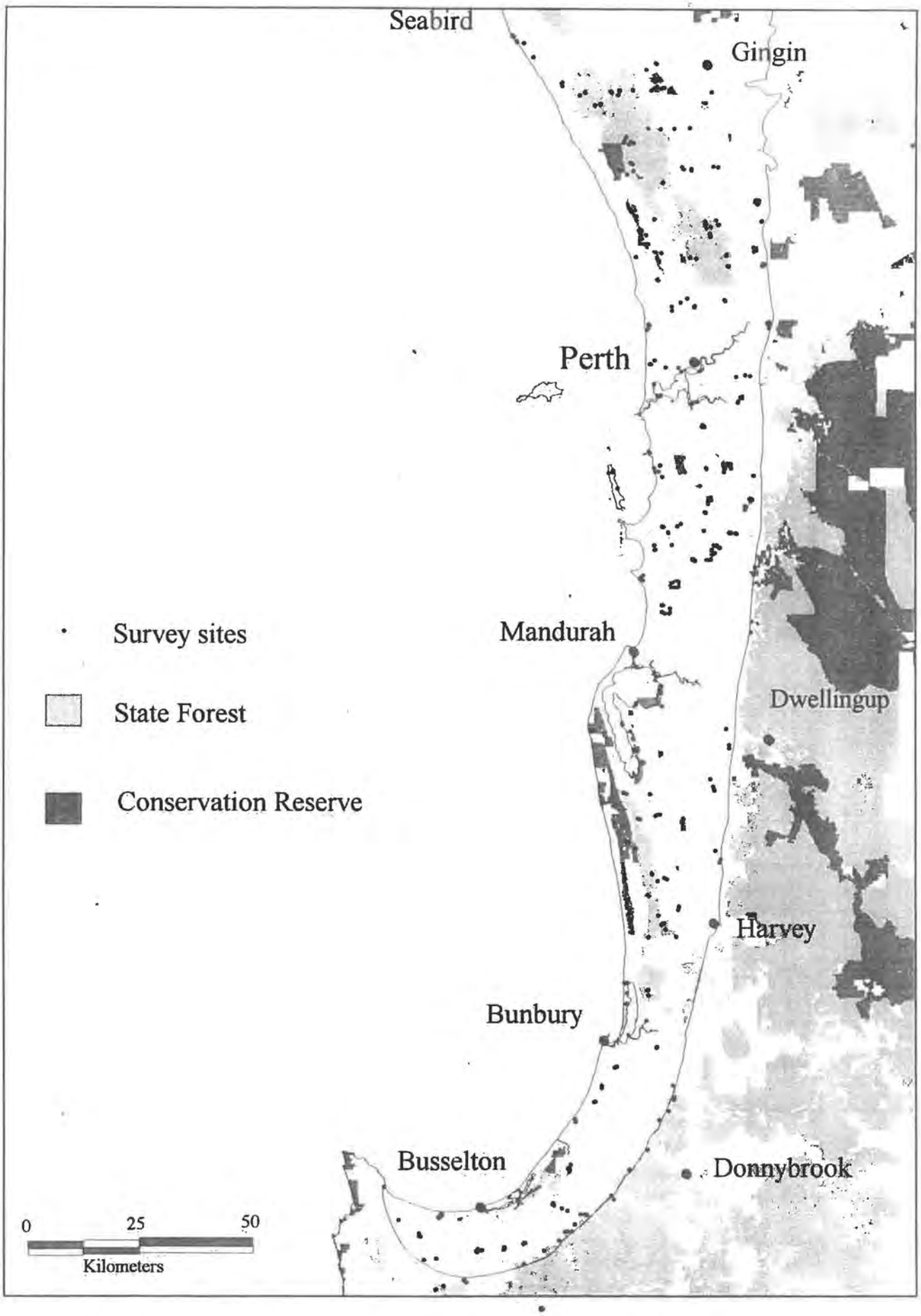


Figure 1. Location of survey sites in the study area. Conservation reserves include those managed by CALM with conservation in their purpose. The eastern boundary of the area is Beards' (1990) Swan Coastal Plain boundary.

Sites were classified according to similarities in species composition using the Czekanowski coefficient and "unweighted pair-group mean average" fusion method (UPGMA, Sneath and Sokal 1973). Species were classified into groups according to their occurrence at the same sites by using the TWOSTEP similarity algorithm (Austin and Belbin 1982) followed by UPGMA fusion. Alternate classifications were tried using the ALOC algorithm (Belbin 1987) and with replicate volunteer sites removed. The resulting classifications were largely similar and only the former will be discussed in detail.

Semi-strong hybrid (SSH) ordination of the sites data was undertaken to show spatial relationships between groups and to elucidate possible environmental correlates with the classification (Belbin 1991). Statistical relationship between site groups for such factors as species richness, weed frequency, percentage weed frequency, mean annual rainfall and mean annual temperature and slope class were tested using one way analysis of variance (ANOVA) and pairwise comparison of means made using least significant difference (Sneath and Sokal 1973). It was necessary to use square root transformation on weed frequency and square root and arcsine transformation on percentage weed frequency data to ensure normal distribution. Values reported have been back transformed.

Species nomenclature follows Green (1985) and current usage at the Western Australian Herbarium. Selected voucher specimens will be lodged in PERTH. Vegetation nomenclature is highly variable between different studies. In this report we present classifications based solely on floristic composition at two scales, a four group classification ('super groups') which reflect landscape scale pattern, and a finer 30 group classification. These 30 groups are called 'community types'. Finer subdivision of our community types is likely in the future as more detailed data become available. We use 'vegetation type' to refer to structural vegetation units. In south-western Australia it is well established that structural units generally encompass a range of floristic communities (Hável 1968, Griffin *et al.* 1983, Cresswell and Bridgewater 1985, Keighery and Trudgen 1992).

RESULTS AND DISCUSSION

FLORA

A total of 1485 flowering plant taxa (species, subspecies and varieties) were found in the 509 quadrats or in adjacent areas (Appendices 2, 3). Of these taxa 1313 were natives and 172 were weeds. In all 433 genera from 109 families were recorded with the Proteaceae (111 taxa), Papilionaceae (109 taxa), Myrtaceae (107 taxa), Cyperaceae (94 taxa), Orchidaceae (91 taxa), Asteraceae (87 taxa), and Poaceae (74 taxa) being the most common families. Of the 1313 native taxa at least 130 are undescribed representing a significant proportion of the taxa recorded (8.7%) (Appendix 2). Thirty of these taxa are newly recognised, reflecting the lack of previous systematic survey across the study area.

Weeds were most abundant in the Poaceae (34 taxa), Asteraceae (20 taxa), Iridaceae (16 taxa), Papilionaceae (15 taxa), Caryophyllaceae (12 taxa) and Scrophulariaceae (7 taxa). Weed frequency in the 509 quadrats ranged from zero to a maximum of 28 taxa per plot. The highest percentage weed frequencies were encountered in seasonal wetlands and in the Quindalup and Spearwood Dune systems.

Endemics

Of the 1485 taxa 61 appear to be endemic to the study area (Table 3). Most of the endemics are restricted to the eastern side of the coastal plain (28 taxa) or to areas of ironstone (13 taxa). A further five taxa (*Calothamnus* aff. *crassus* (Royce 84), *Dryandra* aff. *nivea* (GJK 6622), *Lepyrodia* aff. *macra* (GJK 9848), *Loxocarya magna* Ms) appear to be endemic to the ironstones of both the Swan and Scott Coastal Plains. None of the ironstone endemics from the Swan Coastal Plain are known from any conservation reserve. A further 13 taxa not encountered during the present survey also appear to be endemic to the study area (Table 4).

Table 3. List of taxa endemic to the southern Swan Coastal Plain and recorded during the present survey.

Coastal Dunes
Carpobrotus sp. (Hepburn Heights, GJK 11518)
Veronica aff. calycina (BJK & NG 235)

Coastal Limestone
Astroloma microcalyx
Billardiera aff. ringens (GJK 12977)
Hakea aff. undulata (BJK & NG 897)
Melaleuca aff. acerosa (GJK 11242)

Pinjarra Plain
Acacia lasiocarpa var. bracteolata (long peduncle form)
Aponogeton hexatepalus
Blennospora aff. drummondii (Golden bracts, BJK & NG 20)
Caesia micrantha (Large swamp form, BJK & NG 094)
Chamaescilla aff. spiralis (GJK 12501)
Conospermum pedunculatum Ms
Drosera bulbigena
Drosera macrantha (Swan coastal plain form, BJK & NG 228)
Drosera tubaestylis
Eleocharis sp. Kenwick (GJK 5180)
Eryngium pinnatifidum subsp. palustre Ms
Eryngium subdecumbens Ms
Grevillea brachystylis subsp. brachystylis
Hydatella dioica
Isotropis cuneifolia subsp. glabra Ms
Kunzea littericola Ms
Myriocephalus helichrysoides
Myriophyllum echinatum
Pimelea imbricata var. major
Rhodanthe pyrethrum
Schoenus aff. tenellus (BJK & NG 110)
Schoenus capillifolius
Schoenus natans
Stylidium mimeticum
Trichocline sp. (GJK 6382-glabrous)
Verticordia lindleyi subsp. lindleyi
Verticordia plumosa var. pleiobotrya
Verticordia plumosa var. vassensis

Foothills
Conospermum undulatum
Eremaea asterocarpa subsp. brachyclada
Eucalyptus marginata subsp. elegantella

Ironstone
Andersonia aff. latiflora (Ironstone, BJK & NG 227)
Brachysema modesta (sp. Treeton, BJK & NG 01)
Brachysema papilio (sp. Williamson. GJK 12719.)
Calothamnus aff. quadrifidus (Ironstone, BJK & NG 230)
Chamelaucium roycei Ms
Darwinia sp. (Williamson Rd, GJK 12717)
Dryandra sp. 30 (aff. squarrosa, ASG 11657)
Grevillea elongata
Grevillea mccutcheonii Ms
Hakea varia (Yellow flowered ironstone form BJK & NG 226)
Opercularia vaginata (Ironstone form, BJK & NG 238)
Petrophile latericola Ms
Synaphea sp. (Ironstone, wedge leaves GJK sn)

Coastal Plain
Caladenia huegelii
Dillwynia dillwynioides
Diuris micrantha
Dodonaea hackettiana
Jacksonia aff. sericea (swamp form)
Jacksonia sericea
Johnsonia aff. pubescens (GJK 5249)
Macarthuria aff. australis (Capel)
Tetraria australiensis
Tripterococcus sp. Cannington (A.S. George 16201)

The Pinjarra Plain endemics are all restricted to the heavy soils of the eastern side of the plain and the alluvial soils near the Peel-Harvey Estuary. Species such as *Aponogeton hexatepalus, Schoenus capillifolius, Schoenus natans,* and *Eleocharis* sp. Kenwick (GJK 5180) are restricted to clay pans which are seasonally inundated. Others such as *Rhodanthe pyrethrum, Myriocephalus helichrysoides,* and *Blennospora* aff. *drummondii* (Golden bracts, BJK & NG 20) form carpets of colour on the clay flats as they dry.

Range ends

The southern range end of 77 taxa and the northern range end of 48 taxa occur in the study area (Appendix 2). Eight taxa (*Acacia littorea, Calothamnus* aff. *crassus* (Royce 84), *Lambertia propinqua, Persoonia graminea, Pseudoloxocarya grossa* Ms, *Restio serialis* Ms, *Stylidium imbricatum, Stylidium preissii*) represent significant northern disjunctions, while a further 16 taxa (*Acacia barbinervis subsp. barbinervis, Actinostrobus acuminatus, Banksia incana, Beaufortia squarrosa, Calectasia grandiflora, Calytrix angulata, Calytrix leschenaultii, Conothamnus trinervis,*

Cryptandra humilis, Dasypogon obliquifolius, Eremaea fimbriata, Haemodorum loratum, Pityrodia bartlingii, Schoenus aff. *obtusifolia* (EAG 3841), *Schoenus latitans, Scholtzia ciliata*) represent significant southern disjunctions (Appendix 2).

Table 4. Taxa apparently endemic to the southern Swan Coastal Plain but not recorded in the present study.

Taxon	Priority Listing (02/02/94)
Acacia benthamii	2
Calandrinia sp. Kenwick (aff. composita)	1
Calytrix breviseta subsp. breviseta	R
Chamelaucium sp. GinGin (N. Marchant sn. 4.11.88) [aff. pauciflorum]	1
Conostylis aculeata subsp. cygnorum	-
Conostylis pauciflora subsp. pauciflora	4
Cryptandra glabrata	1
Diuris purdiei	R
Drakaea elastica	R
Epiblema grandiflorum var. cyanea Ms	R
Grevillea sp. Yanchep (P. Olde 91/240) [aff. obtusifolia]	1
Lasiopetalum membranaceum	2
Lepidosperma rostratum	1

New records for the study area

In addition to the 30 newly recognised taxa found in the course of this survey another 51 taxa were found that had apparently not previously been recorded for the study area (Table 5). For many of these taxa this represents the first definitive record of Darling Scarp and Plateau species on the coastal plain.

Table 5. New records for the southern Swan Coastal Plain based on Western Australian Herbarium collections and field observation.

Acacia browniana
Acacia dentifera
Acacia divergens
Acacia ericifolia
Acacia lateriticola
Acacia urophylla
Amperea ericoides
Amperea volubilis
Aristida contorta
Aristida ramosa
Beaufortia sparsa
Callitriche hamulata
Calothamnus aff. crassus (Royce 84)
Calothamnus graniticus subsp. leptophyllus
Calothamnus pallidifolius
Cassytha micrantha
Chamaexeros serra
Chorizandra cymbaria
Conospermum teretifolium
Conostylis setosa
Cyathochaeta clandestina
Darwinia thymoides
Evandra aristata
Gyrostemon subnudus
Hakea cristata
Hovea elliptica
Hyalosperma demissum
Ixiolaena viscosa
Kennedia stirlingii
Lambertia propinqua
Laxmannia grandiflora
Leptomeria ericoides
Leptomeria scrobiculata
Lomandra drummondii
Lomandra nutans
Lomandra spartea
Nemcia dilatata
Opercularia apiciflora
Patersonia rudis
Persoonia graminea
Petrophile shuttleworthiana
Platysace haplosciadia
Ptilotus humilis subsp. humilis
Restio seralis
Scholtzia ciliata
Stylidium imbricatum
Stylidium roseonanum
Stylidium spathulatum
Xanthorrhoea drummondii

Rare and Priority taxa found during the survey

Ten species of Declared Rare Flora (DRF, Department of Conservation and Land Management 1994) were found during the survey (Figure 2, Table 6). Two of these taxa (*Schoenus natans* and *Tetraria australiensis*) were previously believed to be extinct. Another species *Centrolepis caespitosa* is currently listed as extinct although it has been recently collected from the South Stirlings. In all, 19 new populations of DRF were recorded in the course of the survey. In addition to the DRF a further 75 priority species were encountered (Table 6).

Table 6. List of Declared Rare and Priority Flora encountered during the survey. Recommendations for listing as DRF and other changes to the Priority list (02/02/94) are also shown where relevant.

Taxon	Current Listing	Suggested Listing
Acacia flagelliformis	4	
Acacia lasiocarpa var. bracteolata (Long peduncle form)	1	
Acacia mooreana	2	
Acacia semitrullata	3	
Andersonia aff. latiflora (Ironstone BJK & NG 227)	-	1
Angianthus micropodioides	3	
Anthotium junciforme	4	
Aponogeton hexatepalus	R	
Aristida ramosa	1	-
Baeckea tenuifolia	-	1
Banksia meisneri var. ascendens	4	
Billardiera aff. ringens (GJK 12977)	-	1
Blennospora aff. drummondii (golden bracts BJK & NG 20)	-	3
Brachysema modesta (sp. Treeton BJK & NG 001)	1	R
Brachysema papilio (sp. Williamson GJK 12719)	1	R
Caladenia huegelii	R	
Calothamnus aff. crassus (Royce 84)	1	
Calothamnus aff. quadrifidus (Ironstone BJK & NG 230)	-	1
Calothamnus graniticus subsp. leptophyllus	2	
Carpobrotus modestus	1	
Centrolepis caespitosa	R	
Chamaescilla aff. spiralis (GJK 12501)	-	1
Chamelaucium erythrochlorum Ms	R	
Chamelaucium roycei Ms	R	
Chorizema varium	R	
Conospermum undulatum	4	R
Conostephium minus	4	
Conostylis pauciflora subsp. euryrhipis	1	
Darwinia sp. (Williamson Rd GJK 12717)	1	R
Dillwynia dillwynioides	-	2
Diuris micrantha	R	
Dodonaea hackettiana	4	
Drosera marchantii subsp. marchantii	4	
Drosera occidentalis subsp. occidentalis	4	
Dryandra aff. nivea (GJK 6622)	-	R
Dryandra sp. 30 (aff. squarrosa ASG 11657)	1	R
Eleocharis sp. Kenwick (GJK 5180)	1	
Eremaea asterocarpa subsp. brachyclada	-	1
Eryngium pinnatifidum subsp. palustre Ms	1	
Eryngium subdecumbens Ms	1	
Eucalyptus argutifolia	R	
Eucalyptus marginata subsp. elegantella	1	R
Franklandia triaristata	4	
Gnephosis angianthoides	-	2
Grevillea althoferorum	1	
Grevillea brachystylis subsp. brachystylis	2	
Grevillea elongata	2	R
Grevillea mccutcheonii Ms	1	
Haemodorum loratum	3	
Hakea aff. undulata (BJK & NG 897)	2	4
Hakea myrtoides	3	
Hakea varia (Yellow flowered ironstone form BJK & NG 226)		R
Haloragis aculeolata	2	
Haloragis tenuifolia	1	
Hibbertia spicata subsp. leptotheca	3	

(Table 6 continued on next page)

Table 6 continued.

Hydatella dioica	2	
Isopogon drummondii	3	
Isopogon scaber	1	
Isotropis cuneifolia subsp. glabra Ms (GJK 9242)	-	R
Jacksonia sericea	3	
Jacksonia sp. Busselton (GJK 4482) PN	3	
Lambertia multiflora	3	
Lambertia propinqua	-	2
Lepidium puberulum	4	
Leptomeria ericoides	1	
Leptomeria lehmannii	2	
Lepyrodia heleocharoides	3	
Loxocarya magna Ms	3	
Lysinema elegans	2	
Melaleuca aff. acerosa (GJK 11242)	2	
Mitrasacme palustris	1	
Mitrasacme sp. Southwest (GJK 343)	2	
Myriocephalus appendiculatus	3	
Myriophyllum echinatum	1	2
Parsonsia diaphanophleba	2	-
Petrophile latericola Ms	1	R
Pithocarpa achilleoides	2	
Pultenaea skinneri	4	
Restio gracilior	3	
Rhodanthe pyrethrum	3	
Schoenus benthamii	3	
Schoenus capillifolius	2	
Schoenus natans	R	
Schoenus pennisetis	1	
Stachystemon axillaris	4	
Stylidium aff. bulbiferum (Ironstone - BJK & NG 706)	-	2
Stylidium longitubum	1	
Stylidium mimeticum	1	
Stylidium rigidifolium	2	
Synaphea acutiloba	3	
Synaphea pinnata	4	
Tetraria australiensis	R	
Thysanotus glaucus	4	
Trichocline sp. (Glabrous - GJK 6382)	-	1
Triglochin stowardii	2	
Tripterococcus sp. Cannington (A.S. George 16201) PN	1	
Verticordia lindleyi subsp. lindleyi	4	
Verticordia plumosa var. pleiobotrya	1	
Verticordia plumosa var. vassensis	1	
Villarsia submersa	4	

Taxa Subject to Recommendations for Gazettal as Declared Rare Flora or for Priority Listing

Sufficient survey was done in the course of this study and in earlier surveys (Whicher Range - G.J. Keighery, unpublished; the Scott Plain - Keighery and Robinson 1992; eastern Swan Coastal Plain - Keighery and Trudgen 1992; the south coast - N. Gibson and M. Lyons, unpublished; metropolitan region - Kelly *et al.* 1993) to make the following recommendations for changes to the schedule of Declared Rare Flora and to the Priority List (Table 6). A site record indicates the taxon was found in one or more of the 509 quadrats, an area record indicates the taxon was found in bushland remnants in which the quadrats were located.

Andersonia aff. *latiflora* (Ironstone BJK & NG 227)
Record type: site records, 4 populations from community type 10b.
Taxonomic status: previously unrecognised taxon.
Related taxa: distinguished from *Andersonia latiflora* by its larger leaves, low dense habit and occurrence on ironstones on the plain rather than on the laterites of the adjacent plateaus.
Comment: from community type 10b ranked as critical (Table 23); probably highly susceptible to *Phytophthora spp.*
Recommendation: Priority 1.

Baeckea tenuifolia
Record type: area record, one population from community type 8.
Comment: the only known population of this species in the study area (also occurs at several other localities to Moora in the north), from community type 8 ranked as vulnerable (Table 23).
Recommendation: Priority 1.

Billardiera aff. *ringens* (GJK 12977)
Record type: site record, one population from community type 29a.
Taxonomic status: previously unrecognised subspecies (E. Bennett pers. comm.).
Related taxa: *Billardiera ringens* which is found in the Geraldton area.
Comment: the only currently known population of this taxon, from a community type ranked as susceptible (Table 23).
Recommendation: Priority 1.

Blennospora aff. *drummondii* (golden bracts BJK & NG 20)
Record type: site records, eight populations from community types 7, 10a and 18.
Taxonomic Status: previously unrecognised taxon.
Related taxa: distinguished from *Blennospora drummondii* by the golden corolla lobes; typical *Blennospora drummondii* was only found in the north of the study area.
Comment: these community types are ranked as vulnerable (Table 23).
Recommendation: Priority 3.

Brachysema modesta Ms (sp. Treeton BJK & NG 001)
Record type: area record, one population from the interface between community types 10b and 1a.
Taxonomic status: previously unrecognised taxon, being described by M. Crisp (pers. comm.).
Related taxa: distinguished from *Brachysema minor* in having cream flowers (sometimes blushed with pink) grouped in diffuse prostrate terminal racemes.
Comment: confined to a single locality on the interface between community types 10b and 1a (Fig. 3).
Recommendation: gazettal as Declared Rare Flora (current listing, Priority 1).

Brachysema papilio Ms (sp. Williamson GJK 12719)
Record type: area record, one population from community type 10b.
Taxonomic status: previously unrecognised taxon, being described by M. Crisp (pers. comm.).
Related taxa: distinguished from *Brachysema sericea* by its distinctive upright habit, V-shaped apex to the leaves, terminal racemes of smaller cream or pale red flowers.
Comment: a reseeder confined to a single small population on the southern ironstone shrublands (community type 10b); this community type is ranked as critical (Table 23, Figure 3).
Recommendation: gazettal as Declared Rare Flora (current listing, Priority 1).

Calothamnus aff. *quadrifidus* (Ironstone BJK & NG 230)
Record type: site and area records, community type 10b.
Taxonomic status: previously unrecognised taxon.
Related taxa: distinguished from *C. quadrifidus* in being 2.5 metres tall, with glabrous leaves and brighter, light red flowers, reseeder.
Comment: confined to community type 10b which is ranked as critical (Table 23).
Recommendation: Priority 1.

Chamaescilla aff. *spiralis* (GJK 12501)
Record type: site records, 3 populations from community type 8.
Taxonomic status: previously unrecognised taxon.
Related taxa: differs from *C. spiralis* in having straight not spirally twisted leaves, pale blue flowers and plants grow and flower in pools up to 5 cm deep rather than in sands.
Comment: confined to community type 8 which is ranked as vulnerable (Table 23).
Recommendation: Priority 1.

Conospermum undulatum
Record type: site records, 2 populations from community type 20a.
Comment: this taxon has been well surveyed (Kelly *et al.* 1993, Keighery and Trudgen 1992) and is confined to community type 20a which is ranked as endangered (Figure 3, Table 23); probably highly susceptible to *Phytophthora.*
Recommendation: gazettal as Declared Rare Flora (current listing, Priority 4).

Darwinia sp. (Williamson Rd GJK 12717)
Record type: site record, individual from community type 10b.
Taxonomic status: previously unrecognised taxon.
Related taxa: distinguished from *Darwinia apiculata* in having recurved leaves, fringed floral bracts, which are red-green in colour and fewer flowers in the inflorescence.
Comment: represented currently by a single adult individual, and numerous seedlings, on the southern ironstone shrublands (community type 10b) which is ranked as critical (Figure 3, Table 23), reseeder.
Recommendation: gazettal as Declared Rare Flora (current listing, Priority 1).

Dillwynia dillwynioides
Comment: an uncommon species found on seasonally inundated flats, generally alongside rivers or deeper swamps, between Harvey and north of Yanchep on the Plain, eight populations were identified in this study and there are eight collections in the WA Herbarium.
Recommendation: Priority 2.

Dryandra aff. *nivea* (GJK 6622)
Record type: site and area records, community type 10b.
Taxonomic status: recently recognised taxon.
Related taxa: one of the many 'mound' forms of *Dryandra nivea* , to be recognised as a distinct species (A.S. George pers. comm.).
Comment: confined to the southern ironstone shrublands (community type 10b) and ironstones in the Scott River area, community type 10b is ranked as critical (Figure 3, Table 23), highly susceptible to *Phytophthora*, reseeder.
Recommendation: gazettal as Declared Rare Flora (current listing, Priority 1).

Dryandra sp. 30 (aff. *squarrosa* ASG 11657)
Record type: site and area records, community type 10b.
Taxonomic status: a recently recognised taxon.
Related taxa: related to *Dryandra squarrosa* (A.S. George pers. comm.).
Comment: confined to the southern ironstone shrublands (community type 10b), community type 10b is ranked as critical (Figure 3, Table 23), highly susceptible to *Phytophthora*, reseeder.
Recommendation: gazettal as Declared Rare Flora (current listing, Priority 1).

Eremaea asterocarpa subsp. *brachyclada*
Record type: area record, community type 21b.
Taxonomic status: a recently recognised taxon.
Related taxa: related to *Eremaea asterocarpa* subsp. *asterocarpa.*
Comment: A very restricted taxa with very few collections.
Recommendation: Priority 1 (Hnatiuk 1993).

Eucalyptus marginata subsp. *elegantella*
Record type: 2 area records.
Taxonomic status: recently described taxon (Brooker and Hopper 1993).
Comment: confined to the Ridge Hill Shelf between Byford and Coolup, no populations are known from a conservation reserve (Figure 3).
Recommendation: gazettal as Declared Rare Flora (current listing, Priority 1).

Grevillea elongata
Record type: single area record, community type 10b.
Comment: all specimens of this species are from a single population on the southern ironstone shrublands (community type 10b), community type 10b is ranked as critical (Figure 3, Table 23).

Recommendation: gazettal as Declared Rare Flora.

Gnephosis angianthoides
Record type: a single large population of this taxon was found in the study growing on a sandy bank beside the Serpentine River.
Comment: the majority of collections in the Herbarium are from the wheatbelt with only three old collections (1910, 1917 and undated) from the plain around Perth. Indumentum patterns on these specimens indicate that can be separated from the wheatbelt populations (E.A. Griffin pers. comm.).
Recommendation: Priority 2.

Hakea aff. *undulata* (BJK & NG 897)
Record type: site and area from a single population on a limestone ridge in Yalgorup National Park, community type 26b and 28.
Taxonomic status: a recently recognised taxon (M. Trudgen pers. comm.).
Related taxa: distinguished from *Hakea undulata* by its generally smaller leaves, flowers and fruit and habitat, *Hakea undulata* being confined to isolated occurrences on the eastern side of the Plain and the Plateau in the study area, reseeder.
Recommendation: Priority 4.

Hakea aff. *varia* (Yellow flowered ironstone form BJK & NG 226)
Record type: site and area records, community type 10b.
Taxonomic status: a previously unrecognised taxon.
Related taxa: distinguished from the widespread *Hakea varia* in being up to 2.5 metres tall with bright lemon yellow flowers, flowering in spring not summer-autumn and terete leaves.
Comment: confined to the southern ironstone shrublands (community type 10b), community type 10b is ranked as critical (Figure 3, Table 23) , reseeder.
Recommendation: gazettal as Declared Rare Flora.

Isotropis cuneifolia subsp. *glabra* Ms
Record type: site and area records, community type 7.
Taxonomic status: a previously unrecognised subspecies.
Related taxa: distinguished from the typical subspecies by the absence of hairs, a characteristic crescent shaped apex to the leaves and habitat as it is confined to the seasonally inundated heavy soils of the Pinjarra Plain.
Comment: confined to GinGin area in community type 7, which is ranked as vulnerable (Figure 3, Table 23)
Recommendation: gazettal as Declared Rare Flora.

Lambertia propinqua
Record type: area record, community type 10b.
Comment: the single record of this species in the study area represents a disjunct population from the other populations on the south coast east of Albany, community type 10b is ranked as critical (Table 23), highly susceptible to *Phytophthora*, reseeder.
Recommendation: Priority 2.

Myriophyllum echinatum
Record type: site and area records from eight populations in community types 7, 8, 9 and 10b.
Comment: a poorly collected species found on the seasonally inundated heavy soils of the Pinjarra Plain.
Recommendation: Priority 2 (presently Priority 1).

Petrophile latericola Ms
Record type: site and areas records from community type 10b.
Taxonomic status: a previously unrecognised species.
Related taxa: distinguished from the more widespread *Petrophile brevifolia* by its smaller inflorescences, leaves and lack of a lignotuber.
Comment: confined to community type 10b, ranked as critical (Figure 3, Table 23), highly susceptible to *Phytophthora*, reseeder.

Recommendation: gazettal as Declared Rare Flora (presently Priority 1).

Stylidium aff. *bulbiferum* (BJK & NG 706)
Record type: site records from community type 10b.
Taxonomic status: a recently recognised taxon (A.H. Burbidge and A. Lowrie unpubl.).
Related taxa: distinguished from *Stylidium bulbiferum* in being associated with community type 10b in the study area (also recorded at Eagle Bay in association with granitic soils) and having single terminal flowers, not a raceme.
Comment: generally confined to community type 10b, ranked as critical (Table 23).
Recommendation: Priority 2.

Trichocline sp.
Record type: site and area records from five populations in community types 8 and 10b.
Taxonomic status: a recently recognised species (Keighery and Keighery 1991), currently being investigated and will be described as a distinct species (R. Cranfield pers. comm.).
Related taxa: distinguished from *Trichocline spathulata* in being associated with seasonally inundated heavy soils and having short, linear leaves and shorter inflorescences that are smaller in all measurements.
Comment: not known from any conservation reserve.
Recommendation: Priority 1.

Other unusual and recently delineated taxa

Acacia lasiocarpa
Two varieties of this taxon occur in the study area. *Acacia lasiocarpa* var. *lasiocarpa* is found in near coastal areas generally on sand over Tamala limestone but is also characteristic of the Beach Ridge Plain at Becher Point. The other variety, *Acacia lasiocarpa* var. *bracteolata* (long peduncle) is endemic to the study area and confined to community types 7 and 8, on the seasonally waterlogged and inundated heavy soils of the Pinjarra Plain. This taxa was referred to by Maslin (1975) as a form of *A. lasiocarpa* var. *lasiocarpa* where he noted its affinities with var. *bracteolata*. It is presently a Priority 1 taxon under the name *Acacia lasiocarpa* var. *bracteolata* (long peduncle).

Acacia paradoxa
An uncommon taxon in the study area associated with riverine banks of several geomorphological systems. The vegetation of all areas where this taxon was found were so degraded that it is not possible to sample the community in which this taxon occurred in the study area.

Angianthus drummondii - preissianus - micropodioides Group
In this study five taxa were clearly distinguished in this group in the field: *A.* aff. *drummondii*, *A. drummondii*, green prostrate and upright forms of *A. preissianus* and *A. micropodioides*. The two forms of *A. preissianus* were combined for this study. Identifications of specimens in the herbarium are confused and this group needs to be re-examined (P.S. Short, pers. comm.).

Aristida ramosa
There are two known populations of this species in Western Australia (also occurs in eastern Australia), the population recorded in this survey is a new record for the study area.
It is presently a Priority 1 taxon and this listing should be maintained.

Boronia alata
Only two records are known for the study area: Rottnest Island and riverine cliffs at Minim Cove.

Boronia denticulata (Single site record)
This taxon was probably more common than study records indicate. *Boronia denticulata* is very similar to *B. spathulata* (especially around Perth) and flowering material is required to accurately determine the two taxa. A third taxon, *B. fastigiata*, also becomes very similar to *B. spathulata* around Perth and may also have been placed under *B. spathulata* in this study. Herbarium records indicate that *B. denticulata* is found in the south of the study area and replaced by *B. fastigiata* to the north

Bossiaea eriocarpa (Large flowered form, BJK & NG 229)
Bossiaea eriocarpa is a widespread taxon with poorly understood patterns of variation. Marchant *et al.* (1987) commented that *B. eriocarpa* and *B. ornata* intergrade in the Perth region. However records from this study recognise a large flowered and leaved form of *B. eriocarpa* that is apparently confined to community type 3b. This taxon should be recognised at the specific level. These two taxa co-occurred in two areas (including one site). This taxon requires further survey, and should be considered for listing as Priority 1.

Calothamnus aff. *crassus* (Royce 84)
This taxon was previously considered to be confined to the south coast (Scott River and Chester Block) and this is the first record on the Plain. The community in which this taxa was found was confined to a narrow roadside remnant but it would probably group with community type 10b.

Calothamnus graniticus subsp. *leptophyllus*
This is the first record on the Plain and the second in the Perth Region.

Centrolepis caespitosa
Although listed as presumed extinct (Priority List 2/2/94) there is a recent collection from the South Stirlings (GJK collection). The two populations from the study area are from community types 8 and 10b (Figure 2). The current gazettal of the taxon as Declared Rare Flora is supported.

Chorizema varium
This presumed extinct taxon was rediscovered in 1990 just north of the study area on Tamala limestone. A further four populations have been located in community type 29a. This taxon has a very restricted geographical range and is presently not known from any conservation reserve (Figure 2). The current gazettal of the taxon as Declared Rare Flora is supported.

Craspedia species
Two species of *Craspedia* are recognised. *Craspedia* sp. as delineated by Marchant *et al.* (1987) is yet to be described. This taxon is confined to sandy soils and has a woolly indumentum and pale yellow flowers. *Craspedia* sp. nov. (Waterloo, GJK 13110) is completely glabrous with bright yellow flowers, and was found growing in water on the seasonally inundated heavy soils of the Pinjarra Plain near Waterloo. The community in which it was found was not sampled in the study as all areas located were too disturbed to be sampled. This community is closest to that represented in the study area by community type 8. Further investigation of this taxon is required for a recommendation to be made but it is apparently endemic to the study area.

Drosera macrantha subsp. *macrantha* (Swan Coastal Plain form, BJK & NG 228)
A tall robust densely glandular hairy form of *Drosera macrantha* from Marri Woodland on the eastern side of the Plain. Further investigation of this taxon is required for a recommendation to be made but it is apparently endemic to the study area.

Elatine gratioloides
A rarely collected aquatic previously known from one other location in the study area near Boyanup. The single collection from near Waroona in this study is a new record for the Perth Region (Marchant *et al.* 1987).

Eryngium subdecumbens Ms
A recently recognised species (Keighery and Keighery 1991) occurring in three populations in community types 7 and 8 between Kenwick and Busselton. The current priority listing (Priority 1) should be maintained.

Gompholobium capitatum, *G. preissii* and *G. tomentosum*
Marchant *et al.* (1987) comments on the need for further studies on the species boundaries between these three species. In the study area these three were readily distinguished in the field. *Gompholobium capitatum* has a dense corymb of relatively large bright yellow flowers, narrowly linear to terete pilose leaflets and was only found in sandy clay seasonally inundated areas south of

Capel. *Gompholobium preissii* was confined to the Ridge Hill Shelf north of Bullsbrook and has small orange flowers and narrowly ovate leaflets. *Gompholobium tomentosum* has a variety of forms which have probably been the source of the confusion between the three taxa. All forms have dull yellow flowers but these vary greatly in size.

Gompholobium confertum
An unusual maroon coloured form of this species was found in the study area at three widely separated localities (Burnside Road, State Forest 65 and Koondoola) in three different community types. This taxon requires further investigation to determine its taxonomic status.

Grevillea althoferorum
A newly described species previously known from a single locality (Olde and Marriot 1993), a new population of this species was located in the study area near Bullsbrook. The current coding as Priority 1 should be maintained as this taxon is probably susceptible to *Phytothphora* which is present in the area of the new population. It should be considered for gazettal as Declared Rare Flora.

Hovea trisperma var. *grandiflora*
A large flowered variety of this widespread species found on the Ridge Hill Shelf in six community types in the study area. It was placed in synonomy under *H. trisperma* in the latest revision of the genus *Hovea*. This distinctive variant co-occurs with *H. trisperma* var *trisperma*, and should be re-instated.

Hydatella dioica
A poorly collected inconspicuous species of inundated clay flats. A new location was found in this study and it is now known from three sites in the study area from community types 7 and 8. This community type needs to be searched at the appropriate time to locate further populations.

Isopogon scaber
This species was found in nine separate sites in a variety of community types on the Ridge Hill Shelf and Pinjarra Plain near Busselton. This species is also known from a single population on the Plateau near Dale.

Johnsonia aff. *pubescens* (GJK 5249)
This taxon is closely related to *Johnsonia pubescens* and will probably be described as a subspecies of *J. pubescens*. It is known from Cardup, Brickwood and Lowlands, all Bassendean Sands on the eastern side of the Plain. *Johnsonia pubescens* also occurs at Cardup and is here at the southern limit of its distribution.

Kennedia coccinea
A common species of the Plateau and to a lesser extent the Ridge Hill Shelf that also occurs less commonly on the Quindalup sands and the sand over Tamala limestone. Further studies on this species are required to establish if the coastal populations can be distinguished taxonomically.

Lysinema elegans
An uncommon species confined to the Bassendean Sands between Moore River and Jandakot. With the location of a new population in State Forest 65 (site record) the species is now known from two populations in the north of its range but the only other populations in the Jandakot area are threatened. The current priority listing (Priority 2) should be maintained.

Macarthuria aff. *australis*
A previously unrecognised taxon found between Capel and Jandakot on Bassendean Sands adjacent to seasonally inundated areas. This taxon may be *Macarthuria* sp. Harvey (Priority 1) but no collection was located in PERTH.

Marsilea sp. (BJK & NG 084)
A single collection of this taxon was made from community type 7 in Austin Bay Nature Reserve. Our collection is a poor match for *Marsilea drummondii*. Further studies are required to establish this taxon's taxonomic relationships.

Melaleuca aff. *acerosa* (GJK 11242)
Previously only recorded on thin sand Tamala limestone at Parrot Ridge, a further population may occur on a similar ridge immediately to the north. This needs to be checked in the appropriate season. The current priority listing (Priority 2) should be maintained.

Myriocephalus species
Four species of *Myriocephalus*; (*M. appendicularis, M. helichrysoides, M. rhizocephalus* and *M. isoetes)* were found in the study. While these species are common in community types 7 and 8 (single occurrence in community type 9) they are rarely collected. In their vegetative phase two of the species, *M rhizocephalus* and *M. isoetes*, are difficult to distinguish and both are poorly collected.

Nemcia sp. (Cordate leaves, BJK & NG 032)
A recently recognised species (M. Crisp pers. comm.), represented presently by a single specimen in the Herbarium and one site record in this study from Dardanup. This species should be further investigated for possible Priority listing.

Nemcia reticulatum
This species has a distinct broad leaved coastal form which is very common on near-coastal sands and sand over Tamala limestone on the Plain extending from Burns Beach to Northampton. This taxon is not known in any conservation reserves south of Nambung.

Opercularia vaginata (Ironstone form, BJK & NG 238)
A gracile form of this species consistently associated with community type 10b (area and four site records). Further studies on this form are required to establish if this form can be distinguished taxonomically.

Parsonsia diaphanophleba
A creeper confined to areas of relatively intact native vegetation on the riverine banks on the Murray and Serpentine Rivers extending up onto the Darling Plateau. Few intact areas remain along these rivers on the Plain. The current priority listing should be maintained but consideration should be given to gazettal of this species as DRF.

Petrophile serruriae
A pink variant of this species occurs on the sand over Tamala limestone on the Plain from Yalgorup to Geraldton. Further studies on this form are expected to establish this form as a distinct species.

Podolepis gracilis (Swamp form)
A robust glabrous form of this species with large pink or white flowers was consistently distinguished in the field on the seasonally inundated heavy soils of the Pinjarra Plain from GinGin to Busselton. Further studies on this form are required to establish if it can be distinguished taxonomically.

Rhodanthe manglesii and *R. spicata*
These two species were uncommon in the study area and were associated with the northern ironstones south of GinGin. It was not possible to sample this community as the only areas located in reasonable condition were on private land.

Schoenus natans
Previous to this study this species was considered to be extinct. Five populations were located in the study area in community types 7 and 8 in fresh water pools on clay (Figure 2). The current gazettal as Declared Rare Flora should be maintained.

Schoenus sp 2
A recently recognised species (B. L. Rye pers. comm.) found on the seasonally inundated heavy soils of the Pinjarra Plain from GinGin to Busselton in the study area.

Scholtzia ciliata
An isolated population of this taxon was found near Yarloop on the Ridge Hill Shelf.

Stipa campylachne, S. semibarbata, S. hemipogon and *S. mollis*
These four species are difficult to distinguish and are grouped in this study. *Stipa campylachne* and *S. semibarbata* are listed by Marchant *et al.* (1987) but all four may occur in the study area. *Stipa hemipogon* is recorded for the Perth Region but is not included in Marchant *et al.* (1987).

Stylidium bulbiferum
A variant of this species occurs on the thin sand over Tamala limestone on the Plain from Yalgorup to Yanchep. Further studies on this form are expected to establish it at the subspecific level and possibly at species level.

Stylidium preissii
Although previously recorded on the Plain it is presently known in the study area from only one locality in the Jandakot area (A. Lowrie, pers. comm.). Otherwise this species is known from the south coast between Esperance and Mt Manypeaks. The Jandakot population is in need of detailed study to establish its relationship to the south coast populations.

Stylidium roseonanum
A large population of this species occurred at Austin Bay in community type 7. This is an inconspicuous and poorly collected species and it should be considered for Priority listing.

Synaphea species
Eight recently recognised undescribed taxa are distinguished in the study area. While each of these taxa are considered to be locally common they are of restricted distribution (A.S. George pers. comm.) and should be considered for Priority listing on completion of the current taxonomic revision.

Tetraria australiensis
Prior to this study this species was considered to be extinct. Two populations were located in the study area on sandy soils associated with heavy soils on the Pinjarra Plain (Figure 2). The current gazettal as Declared Rare Flora should be maintained.

Themeda triandrus
Roadside populations of this species were observed in the study area associated with Wandoo Woodlands from GinGin to Dardanup. It was not possible to sample this community as all locations were in a very disturbed condition, generally being reduced to scattered trees over exotics.

Tribonanthes aff. *violacea*
A tall robust pale purple flowered form of *Tribonanthes violacea* confined to community type 7 in this study (also found at Alfred Cove in a community which is floristically similar to community type 7). Further studies on this form are expected to establish this form as a distinct species.

Veronica aff. *calycina* (BJK & NG 235)
This taxon is related to *V. calycina* but is more robust and less densely pubescent and is currently known from less than five records on the Quindalup Dunes at Yalgorup and Alkimos (Trudgen and Keighery 1990). Most of the habitat type that it occurs in between Yalgorup and Yanchep has been cleared or degraded by grazing and it appears to be rare or at least very uncommon. This is probably *V. stolonifera* described from Fremantle.

Wurmbea dioica subsp. aff. *alba* (GJK 12803)
A robust large flowered form of this taxon found growing in water up to half a metre deep in community types 7,8 and 10b.

Wilsonia humilis
An uncommon species in the study area confined to highly saline communities near Coogee, Mandurah and Rottnest. This species is not listed in Marchant *et al.* (1987).

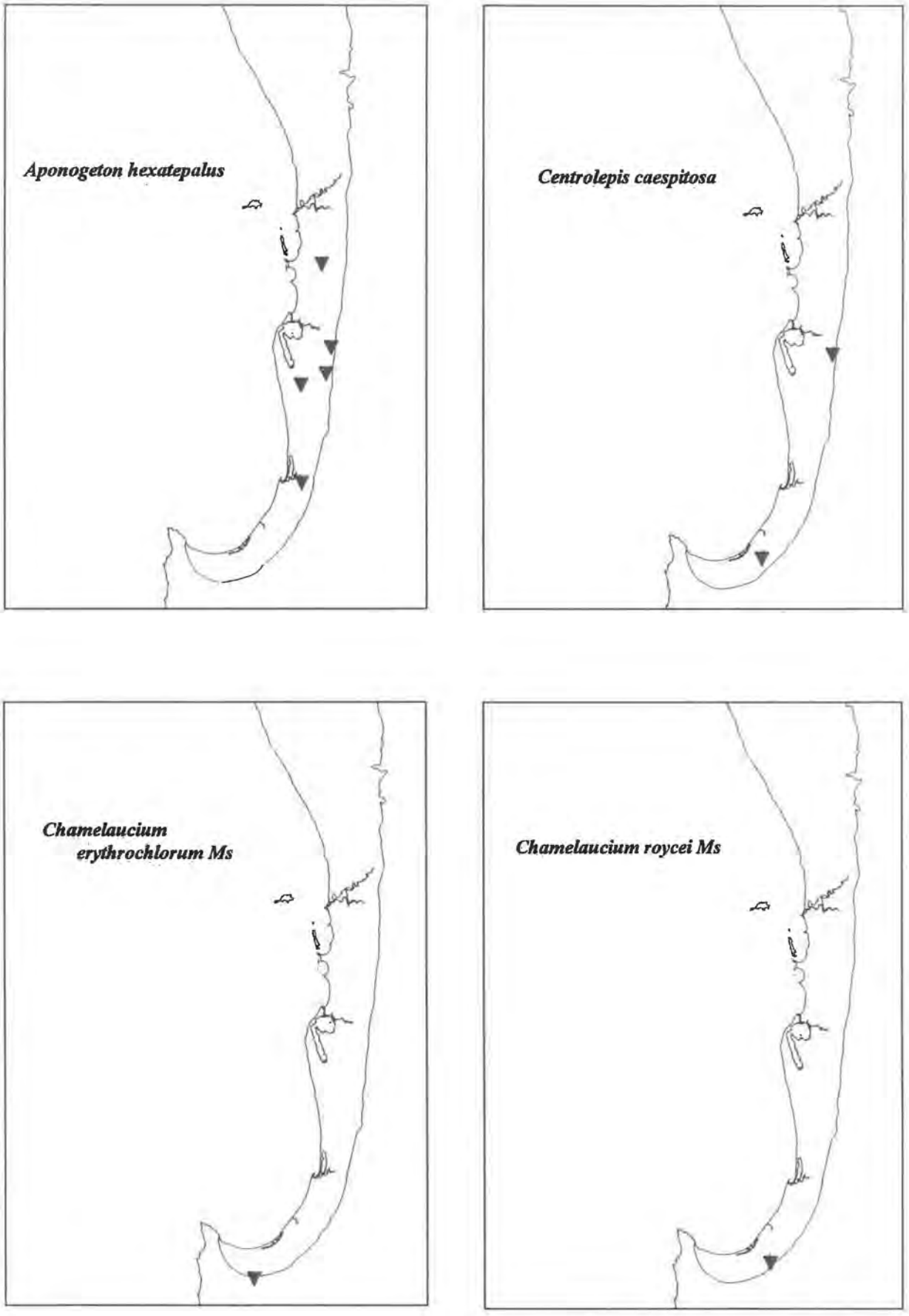


Figure 2. New populations of Declared Rare Flora in the study area.

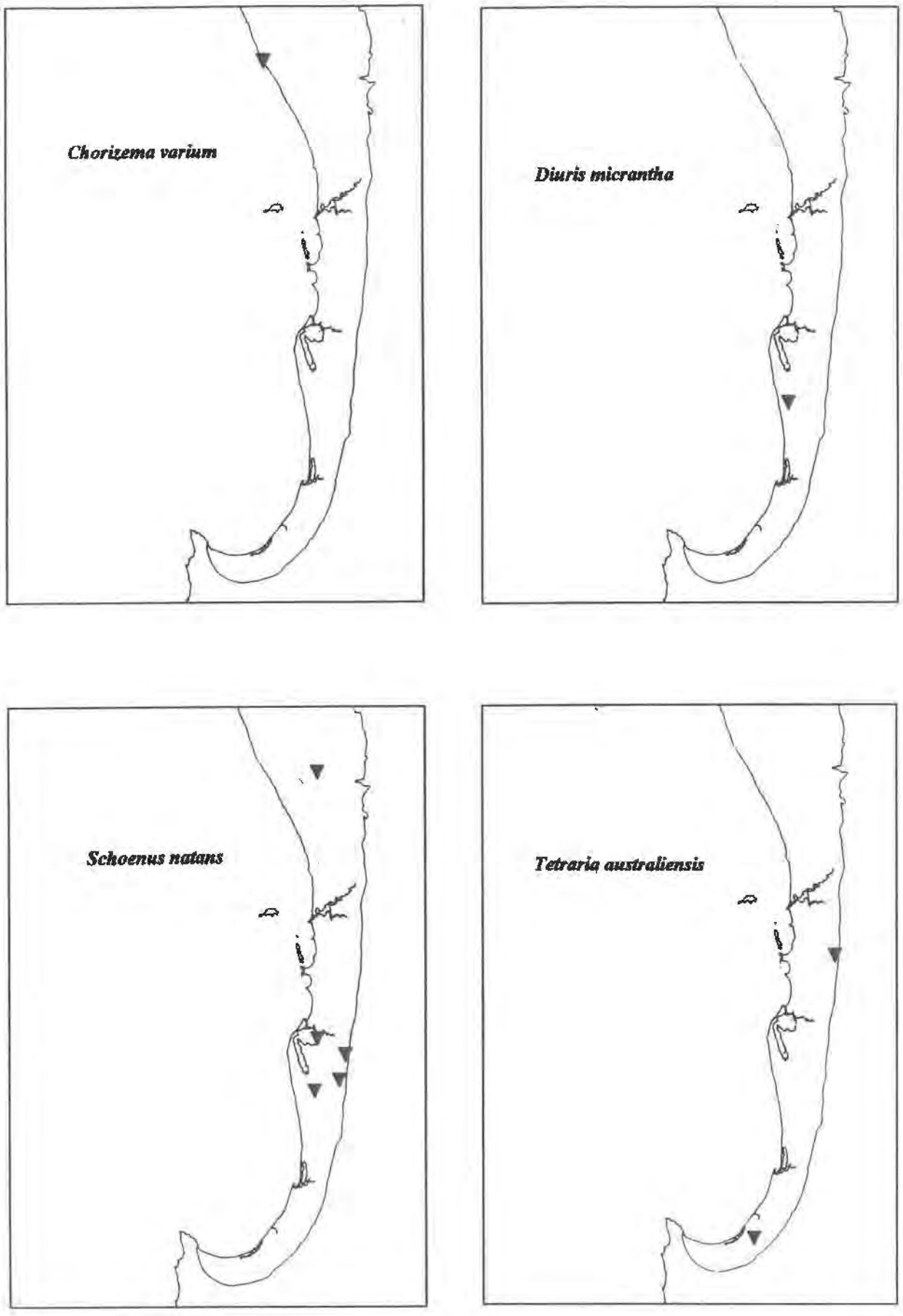


Figure 2 (cont.). New populations of Decared Rare Flora in the study area.

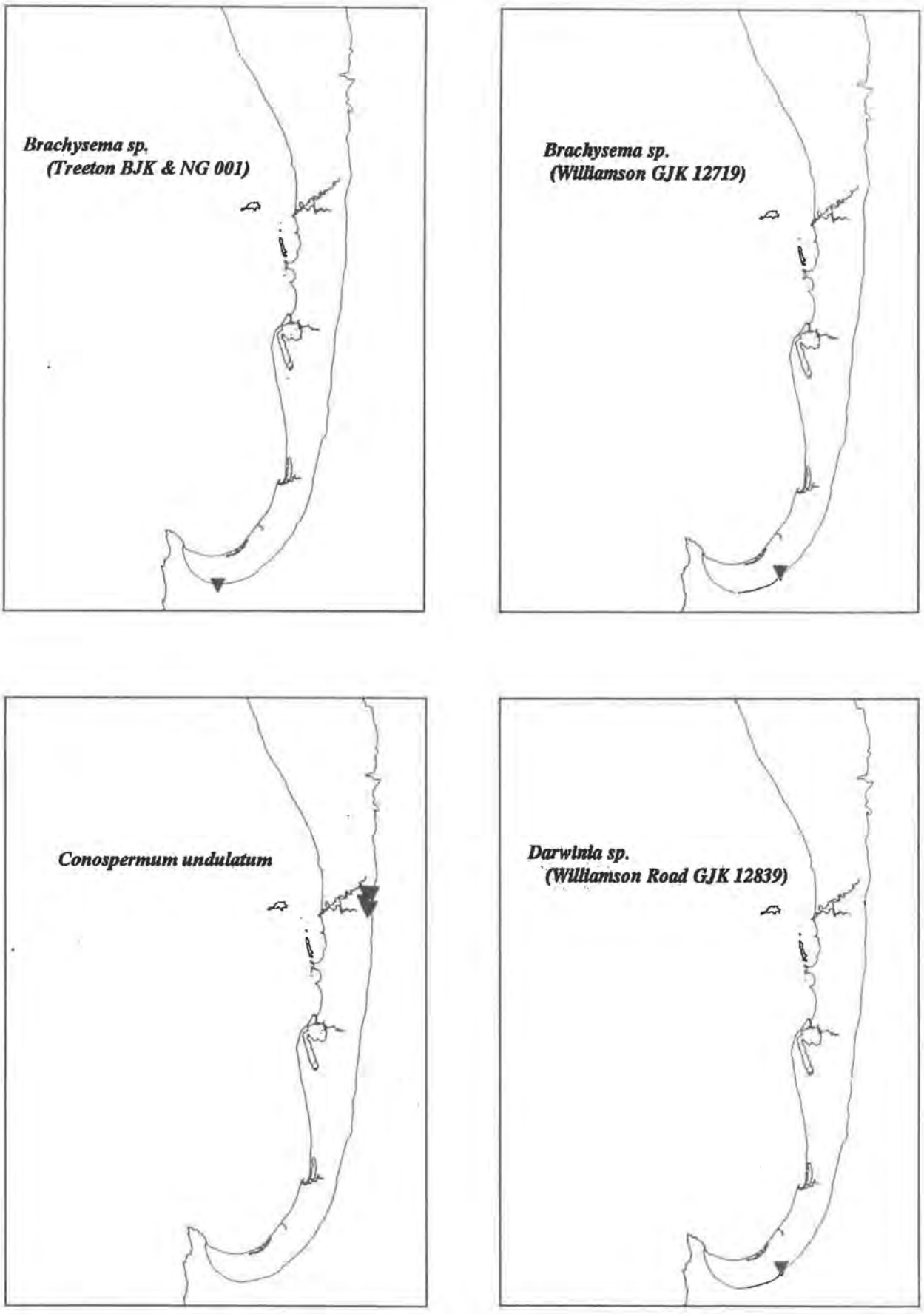
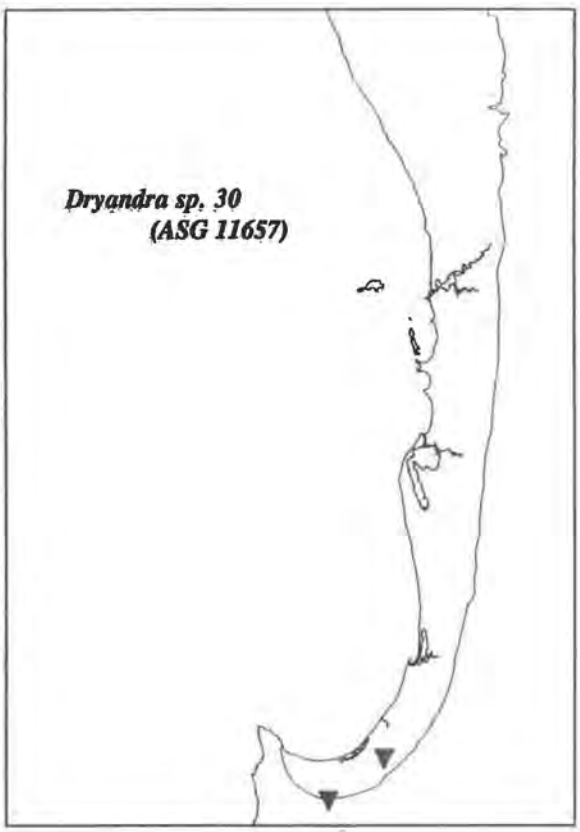
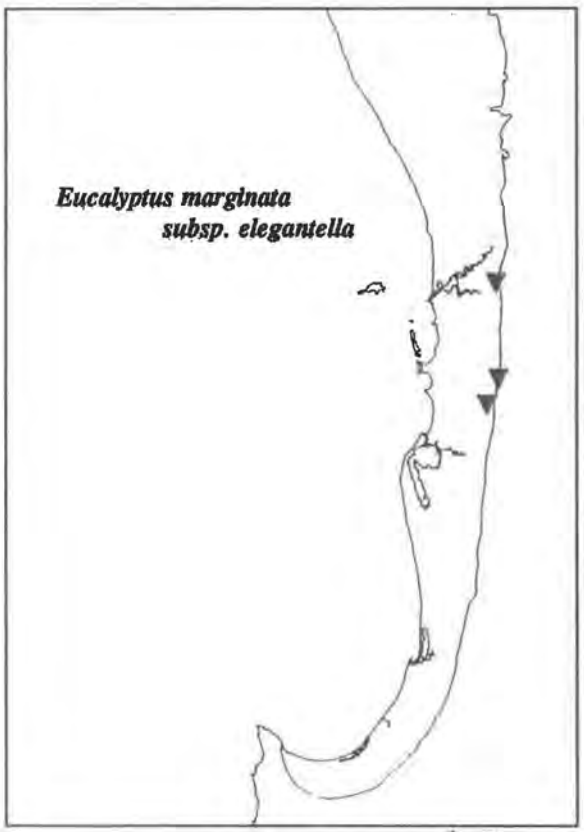


Figure 3. Location of proposed Declared Rare Flora in the study area.





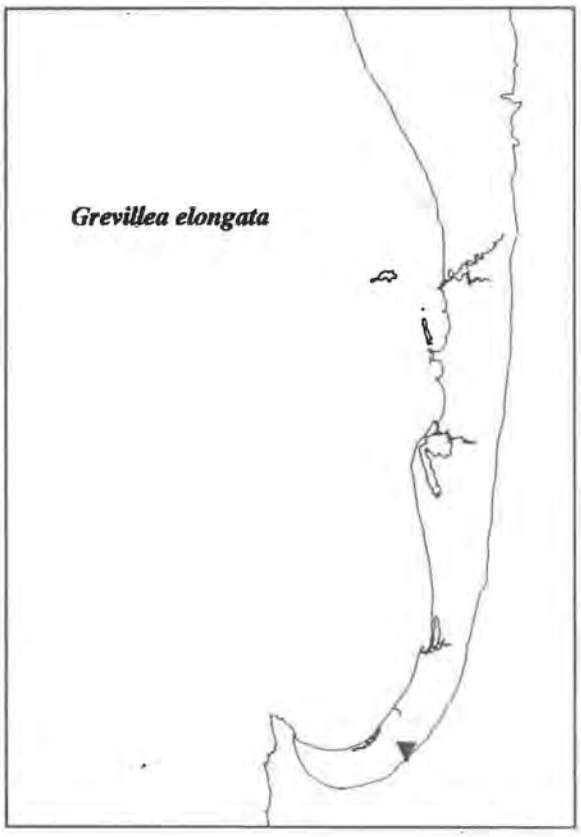
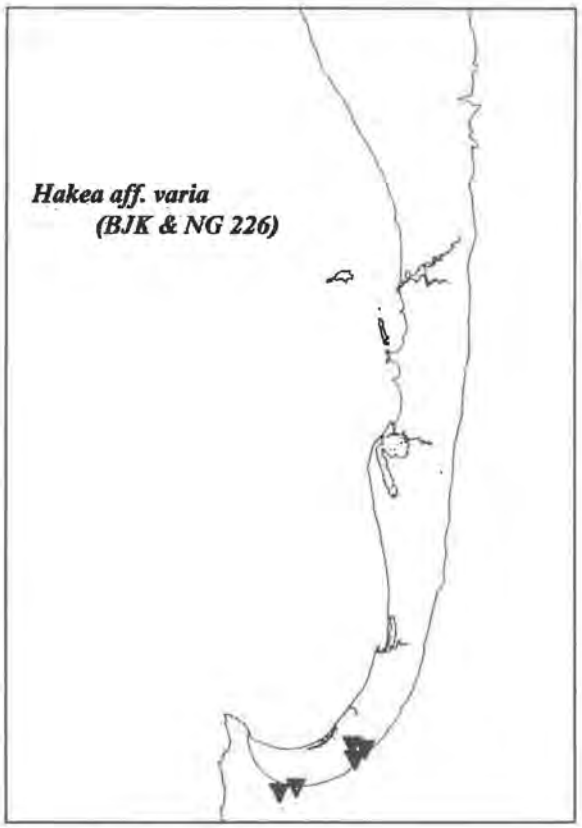
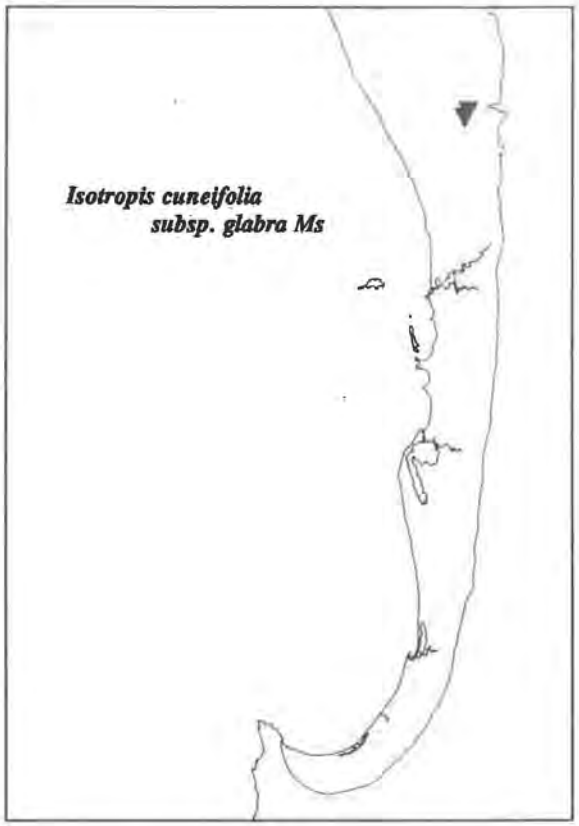


Figure 3 (cont.). Location of proposed Declared Rare Flora in the study area.





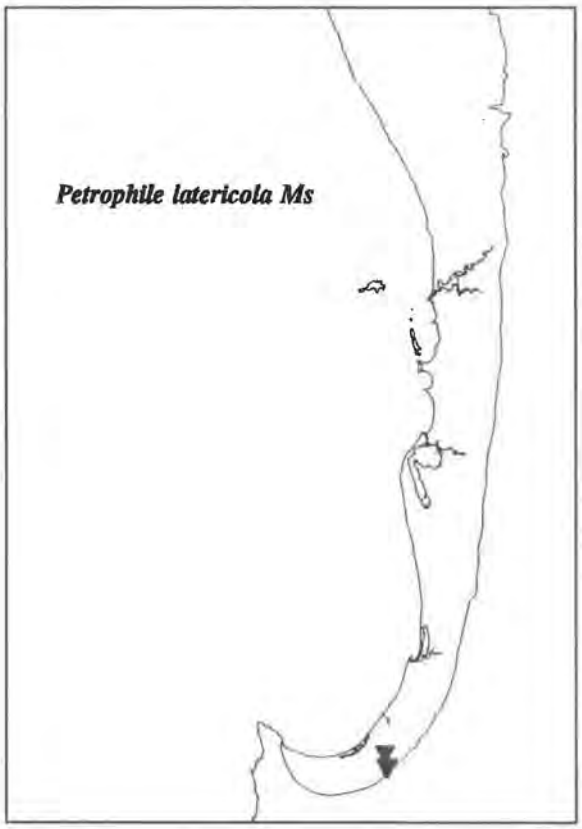


Figure 3 (cont.). Location of proposed Declared Rare Flora in the study area.

Areas of importance for conservation of Declared Rare Flora and proposed Declared Rare Flora

Most of the populations of Declared Rare Flora and proposed Declared Rare Flora encountered in the present survey lie outside the current reserve network. All of these areas are considered of high conservation value. More detailed analysis of the conservation and reservation status of species occurring on the coastal plain will be the subject of a future report. General areas in which DRF and proposed DRF occur are shown in Table 7 and Figures 2 and 3.

Table 7. General areas in which DRF and proposed DRF was located in the present survey and their present vesting.

Area	Current Vesting
Austin Bay Nature Reserve	A-class Nature Reserve
Agriculture Protection Board Reserve	Vested in APB for conservation of flora
Brixton Street Wetlands	Homeswest
C53 (Coolup Reserves)	Local Government and Road Reserve
C58 (Reserve A23172)	Local Government
GinGin Road Reserve	Road Reserve
Ken Hurst Park	Local Government
Lake Bambun (Reserve 22831)	Local Government
Lake Muckenburra (Reserve 25431)	Local Government
M53 (Reserve C29880)	SECWA, Fires Board, Main Roads, WAWA
Meelon Nature Reserve	Proposed A-class Nature Res (vested in CALM)
Mundijong Road	Road and Drain Reserves
Southern Ironstones	State Forest
Talbot Road Reserve	Local Government
VCL South of Seabird (part Red Book 5.24)	Vacant Crown Land
Waterloo School Site	Local Government
Wonnerup Road Reserve	Road and Rail Reserve
Yalgorup National Park	A-class National Park
Yoongarillup Nature Reserve	A-class Nature Reserve

Comparison with the Flora of the Perth Region

The *Flora of the Perth Region* (Marchant *et al.* 1987) records some 2057 species (almost 2200 taxa in all) from an area of 10,500 square kilometres stretching from Guilderton to Boyanup and inland to cover the Darling Scarp and part of the Plateau (see Map 1 in Marchant *et al.* 1987). This area covers 80-90% of our study area and it is useful to compare our data with that of the Flora.

Table 8. Geographic occurrence of 792 taxa recorded in the Flora of the Perth Region but not encountered in the present survey.

Habitat	Number of Taxa
Restricted to Coastal Plain	525
Restricted to Scarp or Plateau	222
Largely restricted to Scarp and Plateau	18
Taxonomic revisions (no longer in FPR area)	27
Total	792

Some 792 taxa recorded in the *Flora of the Perth Region* were not encountered during the current survey (Table 8). Of these taxa 222 are restricted to the Darling Scarp and Plateau (areas not sampled). The present survey may have been expected to encounter the 525 taxa recorded as occurring on the coastal plain. Of these 525 taxa 183 were native and 342 were introduced. The most important

families are the Poaceae, Papilionaceae, Asteraceae, Cyperaceae, Brassicaceae, Orchidaceae, Solanaceae and Iridaceae (Table 9).

The significant number of weed species not encountered in the present survey suggests that either our sampling of vegetation in the best condition missed a large number of weed species or that a large number of agricultural weeds do not invade bushland remnants. Given the large number of species involved it appears there is a suite of weed species poorly adapted to survival in bushland remnants.

Table 9. Native and introduced taxa for the most important families recorded for the Swan Coastal Plain but not encountered in the present survey.

Family	Native taxa	Introduced taxa	Total
Poaceae	6	81	87
Papilionaceae	7	36	43
Asteraceae	6	34	40
Cyperaceae	16	6	22
Brassicaceae	3	17	20
Orchidaceae	19	-	19
Solanaceae	2	17	19
Iridaceae	-	17	17

The two families for which significant numbers of non-weed species were missed were the Cyperaceae and the Orchidaceae. The Cyperaceae are common components of riverine and estuarine habitats which were under sampled in the present survey while the Orchidaceae are easily missed ephemeral taxa for which sampling time is critical, because flowers are crucial for identification and many species flower sporadically or only after summer fires.

Given that our total area of sampling was 5.01 ha (509 x 100 m^2) the absence of only 183 native taxa indicates adequate coverage of most habitat types. Some 102 of these taxa have a riverine distribution and this habitat type was not sampled in the present survey . Of the remaining 80 odd taxa some are naturally rare (as indicated by low number of herbarium collections and field knowledge). As discussed above the survey has recorded a further 51 taxa not previously recorded from the plain (approximately 30% of these are new records for the area covered by the Perth Flora).

A synthesis of data from collections of Coastal Plain taxa lodged in the Western Australian Herbarium (PERTH) and taxonomic revisions indicate that there are at least seven or possibly eight taxa that are presumably extinct on the Coastal Plain. These taxa have not been collected for at least 50 years despite thorough searching (Table 10).

Table 10. Taxa likely to be extinct in the study area.

Taxon	Last Collections in the Study Area
Dampiera triloba	Gnangara Oct. 1945 (49 years ago)
Empodisma gracillimum	Bunbury 1870, Bayswater 1935
Euphrasia scabra	Harvey 1860, Fremantle 1874
Gahnia decomposita	Bayswater 1902
Glyceria australis	Harvey 1940
Isopogon attenuatus	Waterloo 1920
Polygonum hydropiper	Harvey 1940
Ptilotus divaricatus	Pinjarra 1904

The contemporary absence of taxa such as *Empodisma gracillimum* and *Gahnia decomposita* from Bayswater and Bunbury strongly suggests that some wetland types originally in these areas have been lost. Both these taxa are very conspicuous and it is unlikely that further searching will rediscover them in these areas.

VEGETATION

For the floristic analysis some species had to be amalgamated into complexes due to difficulty of differentiating between closely related taxa without good flowering material (eg. *Thysanotus patersonii* and *Thysanotus manglesianus*, see Appendix 3) As a result the data were reduced to 1369 taxa. Of these 272 taxa occurred at only one site. Singletons (taxa recorded from only one plot) were recorded in 166 plots at frequency of one to seven singletons per plot. Preliminary analyses of the floristic dataset showed that singletons had no effect (ie. contained little information) on the community classification so they were excluded. The final data set consisted of 1097 taxa in 509 sites. Species richness ranged from seven to 86 per site (100^2 m), with individual taxa occurring in between two and 306 sites (Figure 4).

Multivariate analysis can assist in sorting both sites and species data such that patterns in species composition are more easily seen. The decision as to the number of site and species groups defined is subjective and related to the scale of pattern of interest (Kent and Coker 1992). In this analysis site groups are discussed at two scales: the four group level ('super groups'), roughly corresponding to major geomorphological patterning and the 30 group level which best reflected the scale of pattern seen in the field. Within some of the 30 groups finer subdivisions could be made and our final classification was of 43 individual groups and subgroups. This classification will not be definitive and as more data becomes available new floristic communities will emerge and a better understanding of inter and intra group relationships will be possible. This will be particularly true for the seasonal wetlands which are our most heterogenous group.

Four group classification

The four group classification ('super groups') broadly reflects the major geomorphological elements with the exception of one group made up of all the seasonal wetlands (Figure 5). Group 1 in this classification comprises sites almost entirely restricted to the Pinjarra Plain and Ridge Hill Shelf. The second major grouping are the almost entirely seasonal wetlands which occur across all geomorphological groups. The third major group is centred on but not exclusive to Bassendean Dunes. There are also significant occurrences on Pinjarra Plain and Spearwood Dunes systems. Group 4 is almost exclusively a Spearwood and Quindalup Dunes group. It can be seen from the dendrogram that group 2 (seasonal wetlands) is the most variable group, having by far the largest number of community types and lowest average number of sites / community type (Figure 6).

At the four group level there are significant differences between species frequency, weed frequency, slope, mean annual rainfall, and mean annual temperature (Table 11). Sites classified into group 1 are concentrated on the eastern side of the plain and the alluvial soils bordering the Peel - Harvey estuary (Figure 5a). The wide spread clearance of this land system is readily apparent (as blank areas) on this map. This group had significantly higher species richness than all other groups except group 3 and a lower number of weed species than any group other than group 3 (centred on Bassendean Dunes) (Table 11). Rainfall was also significantly higher reflecting it position at the base of the Scarp and concentration in the south.

The seasonal wetland group (group 2) are more or less uniformly spread across the plain, except in the north west of the study area where the decrease in rainfall and steeper nature of the Spearwood Dunes exclude them (Figure 5b). These wetlands have significantly lower species richness than all other groups. Weed frequency was also moderately high, with the percentage of weeds as a proportion of total species richness being very high, comparable only with Spearwood / Quindalup Dune groups (group 4) (Table 11). The lack of correlation with major geomorphological elements contrasts markedly with the other three super groups. The high level of heterogeneity within this group is consistent with patterns found by Griffin and Keighery (1990) on the northern sandplain.

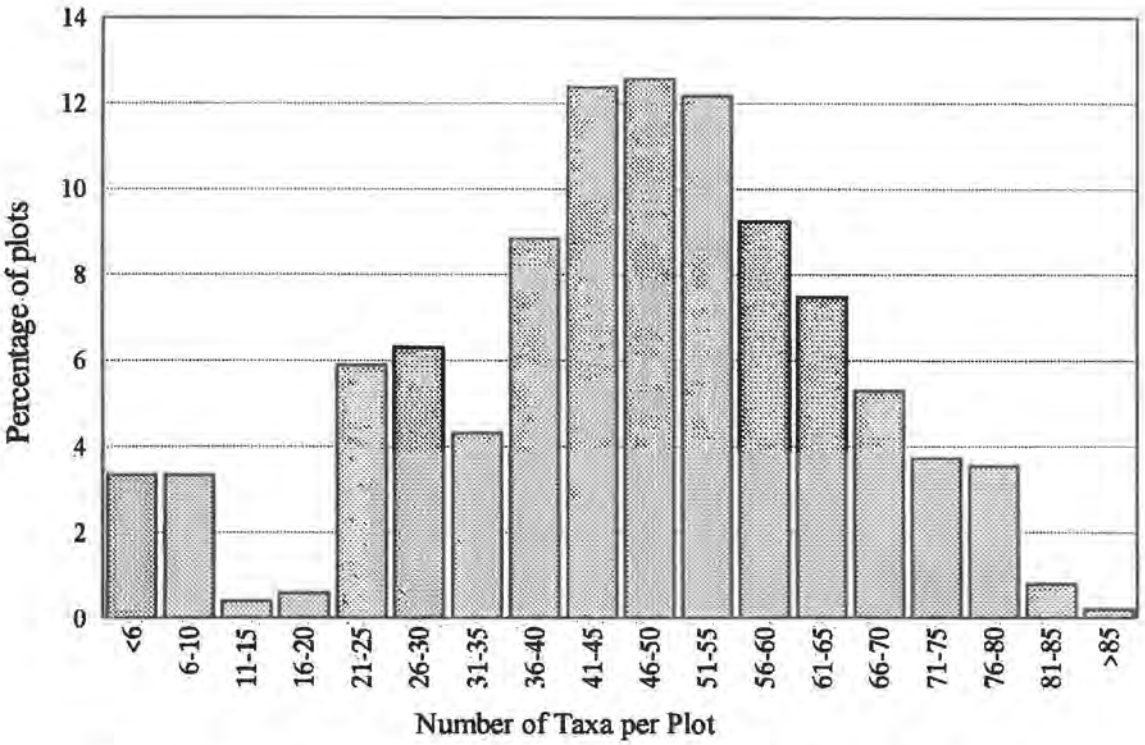


Figure 4. Histogram showing percentage of plots with different species richness. Note the group of species poor wetlands at one end and the very high species richness of some woodlands and shrublands at the other.

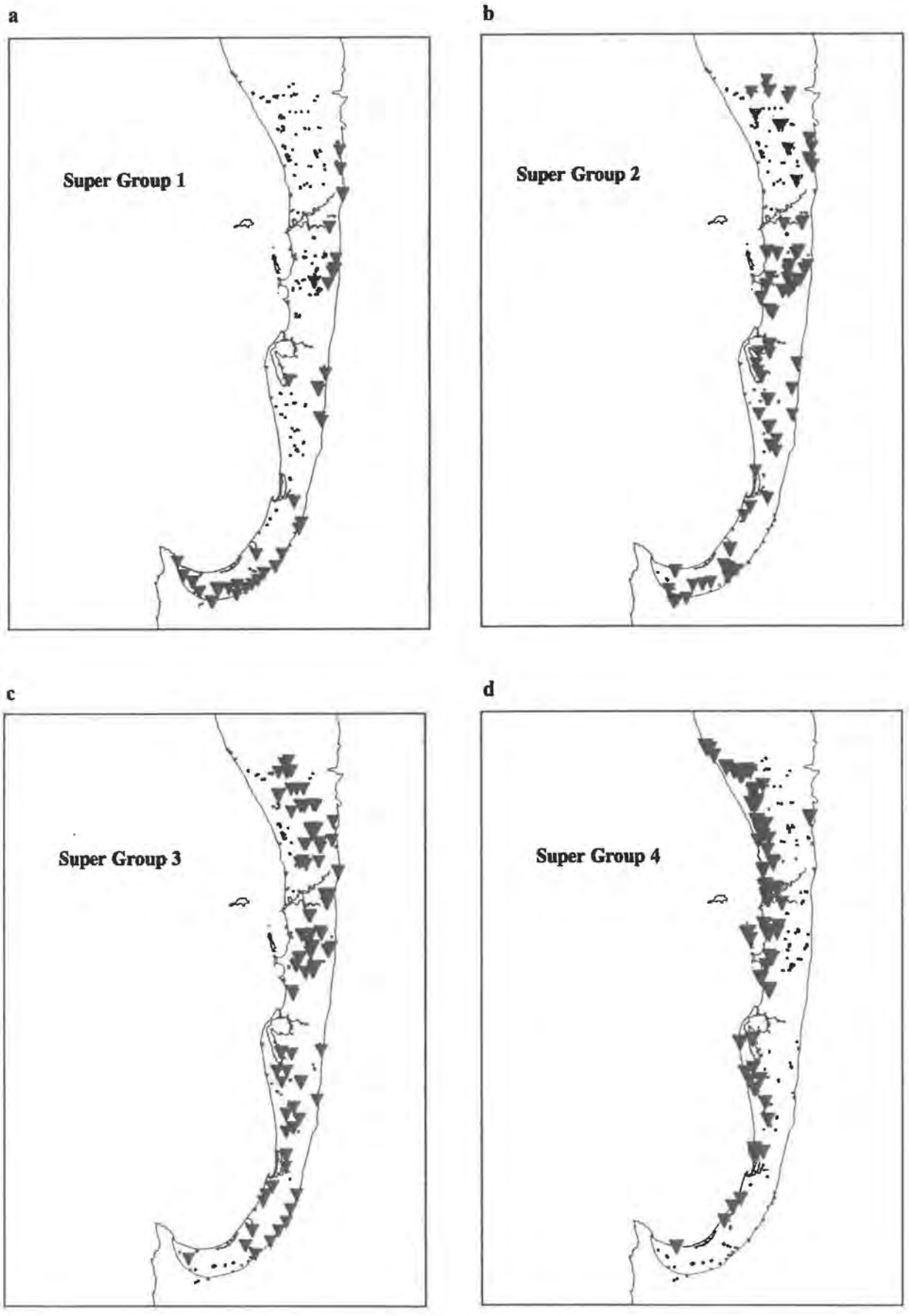


Figure 5. Distribution of the four major floristic groups across the Plain.

Group 3 is centred largely on the Bassendean Dunes but with significant numbers of plots on Spearwood and Pinjarra Plain and in the south on the Whicher Scarp (Figure 5c). The Whicher Scarp plots were generally *Banksia* woodlands on sand sheets occurring up to 110 m altitude. This group had high levels of species richness and low mean weed frequency (Table 11).

Most of the 151 sites in group 4 occur on the Spearwood or Quindalup Dunes (Figure 5d) They have a largely western distribution except for a small group of *Banksia* woodlands sites at Bullsbrook at the base of the Scarp. The number of plots diminishes to the south as does the occurrence of these land systems. This group has moderate levels of species richness, relative high levels of weed invasion and lower annual rainfall than most other groups reflecting the concentration of this community type in the north and west of the study area. Vegetation condition was significantly poorer on the coast relative to all other groups except for the seasonal wetlands (Table 11).

The major environmental correlates with the four group classification are major geomorphological units (McArthur and Bettenay 1960, Churchward and McArthur 1980) and a rainfall gradient running at 90 degrees to the coastline. Temperature, rainfall, geomorphology, and slope were all significantly inter correlated. It should also be noted that while the major variation in the vegetation appears to be primarily controlled by geomorphology, significant departures from this pattern are seen in the floristic data. This aspect will be discussed further below.

Table 11. Means for species frequency, weed frequency, slope (class 1 - flat; to class 3 - steep), annual rainfall, annual temperature and condition rating (class 1 - excellent, to class 5 - very disturbed) at the four super group level. Groups means with the same superscript are not significantly different at P < 0.001.

Super Group.	Mean species richness	Mean weed frequency	Slope	Mean annual rainfall (mm)	Mean annual temp (°C)	Mean condition rating	Number of quadrats
1	60.4^{a}	3.5^{a}	1.5^{a}	975^{a}	17.1^{a}	2.1^{a}	61
2	36.2^{b}	6.2^{b}	1.1^{b}	913^{b}	17.5^{b}	2.4^{ab}	154
3	54.6^{a}	3.4^{a}	1.7^{a}	902^{b}	17.7^{bc}	2.2^{a}	143
4	45.8^{c}	8.8^{c}	2.0^{c}	840^{c}	17.9^{c}	2.6^{b}	151

Thirty group classification

In the more detailed classification 30 community types and 35 species groups have been defined. Some of the 30 communities types have been further subdivided where distinct subunits were recognisable in the sorted two way table (Figure 6, Table 12). The sorted two way table shows only those species that occur at frequency of > 50% in at least one of the site groups. For some of the species groups, no species reached this frequency and these are omitted from the table. Very strong patterning in both site and species groups is evident (Table 12). Distribution maps for each of the community types are shown in Appendix 1.

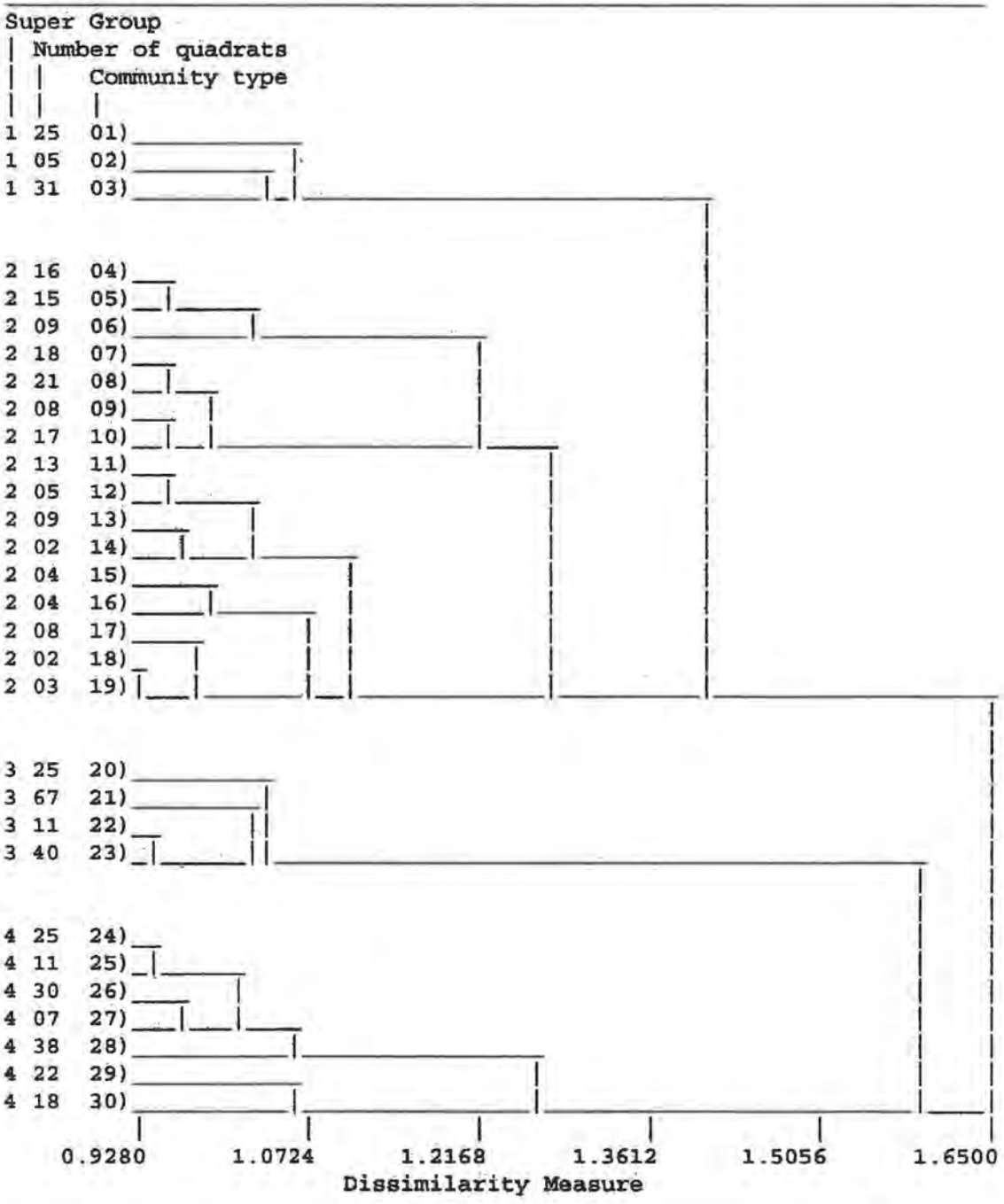
Community types of heavy soils

Three community types are found on the heavy soils of the eastern coastal plain. These heavy soil communities are defined by the general absence of species in the large species groups A, B, and I. and the presence of species in species groups R and S (Table 12).

Community type 1 is restricted to the area south of Bunbury and has two distinct subgroups. Type 1a occurs along the northern edge of State Forest along the base of the Whicher Range and is composed of *Eucalyptus haematoxylon - E. calophylla - E. marginata* forests and woodlands. The one site of this community type on the plain proper belonged to a fertile soil unit (Abba very fertile), that has been almost entirely cleared (Tille and Lantzke 1990). Community type 1a was characterised by high frequency of species in species group S and moderate frequencies in species group R. Lower frequency

species such as *Acacia teretifolia, Acacia varia* var. *varia, Agonis grandiflora,* and *Xanthosia pusilla* are virtually restricted to type 1a.

Figure 6. Dendrogram showing the four super groups and the 30 community types defined from the floristic presence / absence data set.



Community type 1b consists largely of *E. calophylla* forests and woodlands of bushland remnants on the plain south of Capel. Group R species were more common in community type 1b with lower frequencies of group S species compared to the previous group. In addition another low frequency group which includes *Acacia myrtifolia, Opercularia spermacocea* and *Acacia mooreana* are largely restricted to type 1b.

Table 12. Sorted two way table showing species frequency by community type. Only species which occur with frequencies of at least 50% in any one community type are shown.

Taxon	1a	1b	2	3a	3b	3c	4	5	6	7	8	9	10a	10b	11	12	13	14	15	16	17	18	19	20a	20b	20c	21a	21b	21c	22	23a	23b	24	25	26a	26b	27	28	29a	29b	30a	30b	30c
Species group A																																											
Wurmbea monantha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	-	-	-	-	-	-	-	-	-	-	-	-	55	5	-	-	-	8	-	-	-
Stylidium maritimum Ms	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	73	5	-	-	-	8	-	-	-
Acanthocarpus preissii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-	-	-	-	-	-	-	-	40	18	-	16	-	5	78	85	71	75	-
Rhagodia baccata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	-	-	-	-	-	-	-	-	-	-	-	-	20	9	45	21	-	3	78	77	57	88	33
Spyridium globulosum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	9	9	16	29	-	78	46	86	100	100
Acacia rostellifera	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33	-	-	-	-	-	-	-	-	-	32	-	9	16	-	-	11	54	29	38	-
* Crassula glomerata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	67	-	-	-	-	-	-	-	-	-	40	-	18	5	-	-	67	46	-	-	-
Olearia axillaris	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28	9	-	11	14	-	33	62	-	13	67
Poa porphyroclados	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	67	-	-	-	-	-	-	-	-	-	24	9	9	-	-	3	67	77	-	13	67
* Dischisma arenarium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33	-	-	-	-	-	-	-	-	-	20	-	73	21	-	-	33	77	-	25	-
Senecio lautus subsp. dissectifolius	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	18	16	14	-	78	77	-	25	-
* Galium murale	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	27	27	-	-	5	56	-	71	75	-
* Lagurus ovatus	-	-	-	-	-	-	-	-	-	6	-	-	-	-	8	-	-	-	-	-	13	-	33	-	-	-	-	-	-	-	-	-	52	18	9	-	-	3	44	8	-	38	-
Calandrinia brevipedata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	27	21	-	-	22	23	-	63	33
Parietaria debilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-	-	-	-	-	-	-	-	-	36	55	11	-	-	56	8	29	75	33
Carex preissii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	9	-	5	-	-	22	8	-	100	-
* Trachyandra divaricata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	9	-	5	-	-	22	-	57	63	-
Lepidosperma gladiatum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	-	-	-	13	-	33	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	25	67
Acacia lasiocarpa var. lasiocarpa	-	-	-	23	-	-	-	-	11	-	5	-	13	-	-	-	-	-	-	-	-	-	33	-	-	-	3	-	-	-	-	-	28	-	82	16	57	-	22	85	-	-	67
Leucopogon parviflorus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	33	14	-	-	5	-	-	-	-	10	48	9	64	37	86	5	67	62	-	50	-
Lomandra maritima	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33	-	-	-	-	-	-	-	-	-	64	-	45	37	86	8	44	92	14	-	-
Melaleuca acerosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	-	5	8	-	9	-	5	52	-	82	68	100	13	22	92	14	-	-
Dryandra sessilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28	-	91	42	29	11	11	-	14	-	67
Grevillea thelemanniana subsp. preissii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40	-	100	32	100	3	22	-	14	-	-
Melaleuca huegelii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	-	82	11	29	-	44	-	14	-	-
Trymalium albicans	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	91	11	71	3	22	8	14	-	-
Templetonia retusa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	-	33	-	-	-	-	-	-	-	-	-	20	-	64	16	86	-	33	8	29	50	67
Hydrocotyle hispidula	-	-	-	-	-	-	-	-	-	-	-	-	-	11	-	-	-	-	-	-	13	-	-	-	-	-	-	-	-	-	-	-	4	-	73	5	14	-	33	8	-	13	33
Acacia truncata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	36	-	86	-	-	15	-	-	-
Hibbertia spicata subsp. leptotheca	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	-	9	-	71	-	11	15	-	-	-
Astroloma microcalyx	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36	16	100	-	-	8	-	-	-
Comesperma confertum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	8	9	9	5	86	-	11	23	-	-	-
Schoenus laetus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	57	-	-	-	-	-	-
* Anagallis arvensis	-	-	-	8	-	10	-	-	22	28	14	13	-	-	8	-	-	50	-	25	13	50	100	-	11	-	23	-	-	-	-	-	92	45	64	68	-	29	67	15	43	50	-
* Sonchus oleraceus	-	-	-	-	-	20	-	7	11	33	19	13	-	11	38	-	11	-	-	25	63	50	33	-	-	11	21	-	6	-	21	-	64	64	82	68	-	39	67	8	29	50	67
Dianella revoluta	-	-	-	-	13	30	-	13	11	6	-	-	-	-	8	-	-	50	-	-	-	50	-	-	-	-	10	-	6	-	-	-	56	27	-	32	14	26	11	8	43	-	100
* Ehrharta longiflora	-	-	-	8	13	10	6	7	56	6	5	-	-	-	15	-	-	-	-	25	-	-	-	-	11	-	5	-	6	-	11	-	44	18	-	-	-	16	44	8	43	25	33
* Petrorhagia velutina	-	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21	-	-	-	-	-	68	91	9	26	-	34	11	-	-	13	33
* Bromus diandrus	-	-	-	-	-	-	-	-	11	-	-	-	-	-	23	-	-	-	-	-	-	-	67	-	-	-	3	-	-	-	-	-	52	64	-	11	-	13	56	69	-	25	-
* Cerastium glomeratum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	13	50	33	-	-	-	5	-	-	-	-	-	68	45	45	63	-	21	56	-	43	50	67
Caladenia latifolia	-	-	-	-	-	-	-	7	-	-	-	-	-	-	8	-	-	-	-	-	13	-	-	-	-	-	-	-	-	-	-	-	24	73	9	16	14	3	33	15	14	88	67
Eucalyptus gomphocephala	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-	-	10	-	-	-	-	-	24	82	-	32	-	11	11	-	29	38	33
Conostylis candicans	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	-	18	37	-	26	22	62	14	-	33
* Heliophila pusilla	-	-	-	-	-	-	-	-	11	-	-	-	-	11	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-	-	-	48	36	73	68	-	18	22	54	-	13	33
Daucus glochidiatus	-	-	-	-	-	-	-	7	-	-	-	-	-	-	8	-	-	-	-	-	-	50	33	-	-	-	26	-	6	-	-	-	28	91	91	95	57	58	78	77	-	38	100
Hardenbergia comptoniana	8	-	-	-	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	-	33	14	-	-	38	8	-	-	-	-	68	64	55	63	29	29	67	38	43	100	67
Phyllanthus calycinus	-	-	-	-	25	20	-	7	-	-	-	-	-	-	8	-	-	-	25	-	-	-	-	-	-	-	10	-	-	-	-	-	56	82	45	47	-	18	-	62	43	50	-
Stipa flavescens	-	-	-	-	13	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33	-	-	-	15	-	6	-	-	-	56	55	91	42	-	21	78	92	57	63	-
* Orobanche minor	15	8	-	-	38	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	4	55	-	-	-	5	44	15	-	13	-
* Conyza albida	-	8	-	-	-	-	-	-	-	6	5	-	-	11	31	20	11	-	25	-	13	-	33	-	-	-	3	-	6	-	5	-	12	18	-	5	-	11	-	-	-	-	67
* Zantedeschia aethiopica	-	8	-	-	-	-	6	-	-	-	-	-	-	-	38	-	-	-	-	25	13	-	-	-	-	-	10	-	6	-	-	-	-	9	-	-	-	-	-	-	29	63	-
Schoenus grandiflorus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	20	18	-	21	14	11	-	54	14	-	-
Species group B																																											
Agonis flexuosa	-	8	-	-	13	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-	-	15	8	-	-	-	-	4	64	-	5	-	-	-	8	-	88	-
Geranium retrorsum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33	-	-	-	-	-	-	-	-	-	-	55	27	11	-	-	-	-	-	75	-
Oxalis perennans	-	-	-	-	-	10	-	-	-	-	-	13	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	82	-	11	-	-	-	-	14	88	-
Dichondra repens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	-	-	-	-	-	-	-	63	-
Hibbertia cuneiformis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	-	-	-	-	-	-	-	100	-
* Oxalis pes-caprae	-	8	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	-	67

	1a	1b	2	3a	3b	3c	4	5	6	7	8	9	10a	10b	11	12	13	14	15	16	17	18	19	20a	20b	20c	21a	21b	21c	22	23a	23b	24	25	26a	26b	27	28	29a	29b	30a	30b	30c
* Trifolium glomeratum	-	8	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	-	-	-	-	67	-	-	-	-	-	-	-	-	-	4	9	-	-	-	-	-	-	-	-
Callitris preissii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	-	71	-	-
* Myriophyllum asparagoides	-	-	-	-	-	10	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	-	-	-	-	5	-	-	71	13	-
Eremophila glabra	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	56	-	29	-	-
Isolepis nodosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	-	-	-	-	100	-	-	-	-	-	-	-	-	-	-	9	-	-	-	-	22	-	-	-	-
Muehlenbeckia adpressa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	11	-	-	-	-
Species group C																																											
Acacia aurocistes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Species group D																																											
Stipa pycnostachya	-	-	-	-	13	50	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Species group E																																											
Cynthochaeta avenacea	31	8	20	85	50	80	19	7	33	-	48	63	13	-	-	-	-	-	-	-	-	-	-	-	11	-	-	-	13	-	-	-	-	-	-	-	-	3	-	-	-	-	-
Neurachne alopecuroidea	-	8	-	69	38	80	6	-	22	-	48	-	-	33	-	-	-	-	-	-	-	-	-	-	11	89	-	17	19	-	-	-	-	-	-	-	-	3	-	-	-	-	-
Goodenia caerulea	23	-	-	62	-	40	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thalymitra cyanea	31	-	60	23	25	40	6	-	-	-	10	-	-	22	-	-	-	50	-	-	-	-	-	-	22	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Halgania cyanoptylla	-	25	80	54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Symphea petiolaris	8	33	80	62	-	-	-	-	-	-	5	13	25	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-
Species group F																																											
Grevillea brachystylis subsp. brachystylis	-	-	60	-	-	-	-	-	-	-	-	-	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopogon scaber	-	-	80	-	-	-	-	-	-	-	-	-	13	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leptocarpus tenax	-	8	80	-	-	-	6	-	-	-	-	-	-	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Species group G																																											
Hakea varia (BJK & NG 226)	-	-	-	-	-	-	-	-	-	-	-	13	-	56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lomosorya magna Ms	-	-	-	-	-	-	-	-	-	-	-	13	-	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Opercularia vaginata (BJK & NG 238)	-	-	-	-	-	-	-	-	-	-	-	-	-	56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Species group H																																											
* Crassula ruteria	-	-	-	-	-	-	-	-	-	6	10	-	-	-	23	20	11	-	75	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isolepis producta	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Species group I																																											
Acacia saligna	-	-	-	-	-	30	-	40	44	11	14	13	13	-	31	-	11	50	-	-	25	100	67	-	-	-	5	-	-	-	-	-	24	-	-	11	-	5	11	23	-	-	-
Baumea juncea	-	-	20	-	-	-	-	47	-	22	-	13	25	-	8	-	33	-	-	25	63	-	100	-	-	-	-	-	6	9	-	-	4	9	-	-	-	-	-	-	-	-	-
Lepidosperma longitudinale	-	-	-	-	-	-	25	40	-	17	5	50	-	-	77	100	-	-	-	-	50	100	33	-	-	-	3	-	-	-	-	-	-	9	-	-	-	-	-	-	-	-	-
Eucalyptus rudis	-	-	-	-	-	-	-	20	11	-	5	-	-	11	62	-	22	50	-	-	13	-	-	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cynodon dactylon	-	-	-	8	-	-	-	-	11	-	-	-	-	-	15	-	11	-	75	25	25	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Epilobium billardiereanum	-	-	-	-	-	-	-	-	-	-	5	-	-	11	-	60	-	-	-	25	13	-	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gahnia trifida	-	-	-	-	-	-	-	-	-	11	5	-	13	-	8	-	-	-	-	25	88	100	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lobelia alata	-	-	-	-	-	-	-	-	-	6	5	13	13	11	23	40	11	-	25	-	75	-	33	-	-	-	-	-	-	-	-	-	-	-	9	-	-	-	-	-	-	-	-
Melaleuca rhaphiophylla	-	-	-	-	-	-	-	20	11	22	-	-	-	-	23	40	56	50	75	25	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Triglochin procerum	-	-	-	-	-	-	-	-	-	22	29	13	-	-	15	40	78	-	100	-	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Atriplex cinerea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	75	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
* Atriplex prostrata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Samolus repens	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	75	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sarcocornia quinqueflora	-	-	-	-	-	-	-	-	-	17	-	-	-	-	-	-	-	-	25	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sporobolus virginicus	-	-	-	-	-	-	-	-	-	6	-	-	-	-	8	-	-	-	-	75	25	-	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	-	-	-	33
Lemna disperma	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	-	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Melaleuca teretifolia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	80	11	-	50	-	38	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Baumea articulata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60	-	-	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oxylobium linearе	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Villarsia latifolia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Melaleuca incana	-	-	40	-	-	-	-	7	-	6	-	-	-	-	8	-	11	-	-	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leptomeria lehmannii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Species group J																																											
Brachyscome bellidioides	-	-	-	-	-	-	-	7	-	56	19	-	38	11	-	-	-	-	-	-	-	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Schoenus sp. 2 (GJK 5739)	-	-	-	-	-	-	-	7	-	56	24	38	13	-	-	-	11	-	-	-	-	50	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

	1a	1b	2	3a	3b	3c	4	5	6	7	8	9	10a	10b	11	12	13	14	15	16	17	18	19	20a	20b	20c	21a	21b	21c	22	23a	23b	24	25	26a	26b	27	28	29a	29b	30a	30b	30c
Centrolepis polygyna	-	-	-	-	-	-	-	-	-	56	5	-	13	-	-	-	-	-	-	-					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pogonolepis stricta	-	-	-	-	-	-	-	-	-	56	5	-	-	-	-	-	-	-	-	-					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cotula coronopifolia	-	-	-	-	-	-	-	-	-	39	-	-	25	-	46	20	-	-	75	25					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Apholis cyperoides	8	8	40	31	13	10	31	40	33	39	43	25	100	89	8	-	-	-	-	-					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Centrolepis aristata	8	17	20	31	13	20	38	40	33	83	90	38	100	100	31	40	-	-	-	-					22	22	3	8	-	-	11	-	-	-	-	-	-	-	-	-	-	-
Drosera menziesii subsp. menziesii	-	8	20	54	-	10	-	13	33	44	62	13	88	44	-	-	-	-	-	-					-	-	-	-	-	18	-	-	-	-	-	-	-	3	-	-	-	-
Drosera gigantea	-	-	20	23	13	-	44	20	33	39	10	50	88	44	-	-	-	-	-	-					-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-
Burchardia multiflora	-	17	20	15	-	20	31	13	-	22	48	63	50	22	8	-	11	-	-	-					-	11	-	-	6	9	-	-	-	-	-	-	-	-	-	-	-	-
Drosera rosulata	-	17	20	38	13	20	6	-	-	28	52	63	38	56	-	-	-	-	-	-					-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Viminaria juncea	-	8	-	38	13	10	-	-	-	-	67	25	50	67	-	-	11	-	-	-					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Astartea aff. fascicularis	-	-	60	-	-	-	63	40	11	33	33	50	25	-	62	100	44	-	-	-					-	-	-	-	9	-	-	-	-	-	-	-	-	-	-	-	-	-
Eutaxia virgata	-	-	100	-	-	-	19	20	-	6	43	50	13	11	-	40	44	-	-	-					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hakea varia	-	-	80	23	-	-	13	27	-	-	19	63	63	22	-	-	67	-	-	-		100	-	-	-	-	-	-	9	-	-	-	-	-	-	-	-	-	-	-	-	-
* Cicendia filiformis	-	-	-	8	13	-	-	13	11	61	86	-	63	11	8	20	-	-	-	-					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
* Cyperus tenellus	-	-	20	8	-	20	-	-	-	33	95	50	100	44	15	-	11	-	-	-					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
* Monopsis debilis	-	-	-	8	-	-	-	7	-	17	62	-	25	22	31	40	11	-	-	-					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
* Juncus capitatus	-	-	-	-	25	10	6	13	11	44	52	-	50	22	15	20	-	-	-	-					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Philydrella pygmaea	-	-	20	15	13	10	-	13	-	83	43	25	63	67	-	-	-	-	-	-					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Schoenus odontocarpus	-	-	-	15	13	-	6	7	-	50	57	25	50	56	-	-	-	-	-	-					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polypompholyx multifida	-	-	20	-	-	-	-	13	11	56	43	13	50	67	-	-	11	-	-	-					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Goodenia micrantha	-	-	-	23	-	20	-	7	-	61	52	-	25	11	-	20	11	-	-	-					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Schoenolaena juncea	-	8	20	15	-	-	6	-	-	39	38	13	75	-	-	-	33	-	-	-					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Schoenus rigens	-	-	-	-	-	-	-	13	22	17	14	13	75	11	8	-	-	-	-	-					-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-
Thelymitra antennifera	-	-	-	-	-	-	6	7	-	28	19	-	50	56	-	-	-	-	-	-					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
* Parentucellia viscosa	-	-	-	-	-	20	-	13	22	11	71	13	25	11	8	80	-	-	25	-		100	-	-	-	-	-	-	-	-	-	-	9	9	16	-	-	11	8	-	13	-
Melaleuca viminea	-	-	-	8	-	-	-	13	22	56	19	63	13	-	8	20	11	-	-	25	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leptocarpus canus	-	-	-	8	-	-	-	-	22	6	38	63	13	-	15	40	22	-	-	-	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Melaleuca lateritia	-	-	-	8	-	-	-	13	-	11	29	13	-	-	23	-	56	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chorizandra enodis	-	-	-	-	-	-	-	-	-	6	67	50	-	-	-	-	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leptocarpus canus	-	-	-	23	-	-	-	-	11	22	48	-	-	-	-	-	11	-	-	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Haemodorum simplex	-	-	-	8	-	20	-	-	11	17	67	-	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Borya scirpoides	-	-	-	62	13	20	-	-	-	6	43	25	38	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Verticordia densiflora	-	-	-	31	-	20	-	7	22	11	24	-	88	-	-	-	-	-	-	-	-	-	-	-	-	11	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-
Kunzea aff. micrantha (BJK & NG 040)	8	-	60	-	-	-	-	-	-	17	-	25	25	78	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calothamnus lateralis	-	-	100	-	-	-	6	7	-	-	-	25	-	22	8	40	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hakea sulcata	-	-	60	8	-	-	-	-	-	-	-	13	75	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-
Caladenia marginata	-	8	-	-	-	-	6	-	-	-	-	-	38	56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	-	-	-	-	-	-	-	-	-	-	-	-	-
* Briza minor	-	50	-	31	75	20	31	60	-	78	86	13	63	44	46	40	22	50	-	-	-	50	-	-	-	22	28	17	6	-	11	-	40	82	-	16	-	26	-	-	-	-
* Romulea rosea	-	-	-	46	25	80	19	27	56	44	90	-	25	22	23	-	-	-	-	25	-	-	67	-	-	11	8	-	6	-	11	-	40	9	9	-	-	16	22	8	29	-	-
Drosera glanduligera	8	8	-	23	38	20	31	33	33	39	19	13	25	56	8	-	-	-	-	-	-	-	-	-	22	33	-	-	-	9	-	-	-	-	-	-	-	-	-	-	-	-
Silaeurus humifusus	-	8	20	38	-	30	44	80	11	56	33	13	63	33	8	60	-	-	-	-	-	-	-	-	22	22	5	-	6	-	16	-	-	-	9	5	-	18	-	-	-	-
* Monsonia bractosta	8	8	-	15	25	10	25	20	56	11	19	25	-	-	-	-	-	-	-	-	-	-	-	-	11	11	13	8	6	-	-	-	-	-	-	11	-	-	11	-	-	-
Haemodorum spareiflorum	-	-	60	-	25	-	-	7	-	6	5	-	13	11	-	-	-	-	-	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Species group K																																										
* Lolium rigidum	-	-	-	-	-	-	-	-	-	11	5	-	-	-	15	-	-	-	-	25	-	-	67	-	-	-	-	-	-	-	-	-	16	-	-	5	-	-	22	-	14	-	-
Species group L																																										
Banksia ilicifolia	-	-	-	-	-	-	13	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21	25	38	91	32	38	-	-	-	-	-	-	-	-	-	-
Kunzea ericoides	-	-	-	-	-	-	19	60	-	-	-	-	-	-	23	40	-	100	-	-	-	-	-	-	-	-	33	42	50	18	26	-	-	-	-	-	3	-	-	-	-	-
Jacksonia furcellata	-	-	-	-	13	-	6	27	11	6	-	-	-	-	8	-	-	100	-	-	-	-	-	-	-	-	26	-	38	9	21	-	4	18	-	-	5	-	15	-	-	-
Leptomeria cunninghamii	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-	-	-	-	3	-	-	-	-	-	-	9	-	-	3	-	-	-	-	-
Species group M																																										
Adenanthos obovatus	-	50	40	-	-	-	56	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	18	5	-	-	-	-	-	-	-	-	-	-	-
Melaleuca preissiana	-	-	20	-	-	-	75	27	11	-	-	13	-	11	46	-	22	100	-	-	-	-	-	-	-	-	-	-	31	27	11	-	-	-	-	-	-	-	-	-	-	-
Schoenus rodwayanus	15	-	20	8	-	-	63	20	-	-	-	13	13	-	15	20	-	-	-	-	-	50	-	-	-	-	8	-	-	18	-	-	-	-	-	-	-	-	-	-	-	-
Hypocalymma angustifolium	15	75	60	15	13	50	81	27	56	6	48	25	13	11	15	-	11	-	-	-	-	-	-	-	-	-	8	-	19	55	16	-	-	-	-	5	-	3	-	-	-	33
Pericalymma ellipticum	-	33	80	54	-	-	81	67	11	-	5	38	50	89	-	40	22	-	-	-	-	-	-	-	-	-	3	-	19	36	-	5	-	-	-	-	-	-	-	-	-	-
Thysanotus multiflorus	8	17	80	8	13	-	44	13	-	-	5	-	-	11	8	40	-	-	-	-	-	50	-	14	-	-	13	-	-	18	11	-	4	-	-	-	-	-	-	-	-	-
Baumea vaginalis	-	8	-	-	-	-	-	13	-	-	-	-	-	-	-	-	33	100	-	-	25	-	-	-	-	-	-	-	-	18	-	-	-	-	-	-	-	-	-	-	-	-
Species group N																																										
Beaufortia elegans	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27	11	57	-	-	-	-	-	3	-	-	-	-

	1a	1b	2	3a	3b	3c	4	5	6	7	8	9	10a	10b	11	12	13	14	15	16	17	18	19	20a	20b	20c	21a	21b	21c	22	23a	23b	24	25	26a	26b	27	28	29a	29b	30a	30b	30c
Conostephium minus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	-	-	3	-	6	-	5	62	-	-	-	-	-	-	-	-	-	-	-
Stylidium diuroides	-	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43	-	-	-	-	-	27	5	71	-	-	-	-	-	3	-	-	-	-	-
Melaleuca aff. trichophylla	-	-	-	-	-	-	-	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	9	-	71	-	-	-	-	-	3	-	-	-	-	-
Verticordia nitens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	73	5	33	-	-	-	-	-	-	-	-	-	-	-
Species group O																																											
Adenanthos cygnorum	-	-	-	-	-	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	-	44	-	-	19	73	53	48	-	-	-	-	-	3	-	-	-	-	-
Banksia menziesii	-	-	-	-	-	-	6	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43	44	22	26	-	69	45	93	95	4	-	-	-	-	39	-	-	-	-	-
Schoenus curvifolius	-	-	-	8	-	-	13	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	71	-	67	5	17	38	36	89	90	4	-	-	5	-	11	-	-	-	-	-
Scholtzia involucrata	-	-	-	-	-	-	6	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33	33	10	8	56	9	79	86	-	-	-	-	-	8	-	-	-	-	-
Hibbertia subvaginata	8	17	-	-	-	-	6	7	-	-	-	13	-	-	-	-	-	-	-	-	-	-	-	-	-	22	21	17	38	45	63	86	-	-	-	-	-	11	-	-	-	-	-
Calytrix flavescens	-	-	-	-	-	-	6	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29	22	-	15	83	19	9	68	95	-	-	-	-	-	11	-	-	-	-	-
Leucopogon conostephioides	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	-	22	13	75	50	45	84	71	4	-	-	-	-	-	-	-	-	-	-
Alexgeorgea nitens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-	-	-	-	6	9	32	81	-	-	-	-	-	32	-	-	-	-	-
Eremaea pauciflora	-	-	-	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	71	44	44	5	17	6	-	37	95	-	-	-	5	-	8	-	-	-	-	-
Jacksonia densiflora / floribunda complex	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	57	-	56	-	-	6	9	42	76	-	-	-	-	-	3	-	-	-	-	-
Anigozanthos humilis	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22	-	3	8	-	-	21	76	-	9	9	5	14	29	-	8	-	-	-
Arnocrinum preissii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43	11	56	5	-	13	-	26	10	-	-	-	5	-	-	-	-	-	-	-
Acacia pulchella	31	67	20	8	13	50	19	-	-	-	-	38	13	33	13	20	-	50	-	-	-	-	-	-	-	11	28	58	19	-	32	52	16	27	9	37	-	53	-	-	-	-	-
Drosera menziesii subsp. penicillaris	31	67	-	38	25	50	19	7	-	22	-	13	-	11	-	-	11	-	-	-	-	-	-	86	33	44	26	92	31	-	74	52	16	9	18	-	-	34	-	8	-	-	-
Eriostemon spicatus	46	58	20	100	63	-	38	13	-	-	-	13	-	-	-	-	-	-	-	-	-	-	-	57	56	56	56	75	13	27	74	95	8	-	-	-	43	11	-	-	-	-	-
Xanthosia huegelii	15	67	20	69	63	-	50	7	-	-	5	13	-	-	8	-	-	-	-	-	-	-	-	57	67	22	56	83	13	27	63	76	8	9	9	21	43	32	-	-	-	-	-
Banksia attenuata	8	8	-	-	-	-	-	7	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	78	22	87	92	88	82	100	100	16	36	-	26	-	79	-	-	-	-	-
Conostephium pendulum	8	-	-	-	-	-	-	7	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	86	78	22	51	75	6	55	68	67	4	-	-	11	-	53	-	-	-	-	-
Petrophile linearis	46	33	-	-	13	-	-	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	78	67	79	92	56	82	95	100	12	9	-	5	-	53	-	-	-	-	-
Stylidium piliferum	23	8	-	-	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	86	67	11	38	58	38	55	84	67	-	-	-	-	-	18	-	-	-	-	-
Bossiaea eriocarpa	31	17	-	-	100	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	89	89	79	92	25	-	95	90	12	27	18	37	14	47	-	-	-	-	-
Lomandra hermaphrodita	62	75	-	23	75	-	25	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	86	78	89	59	83	50	27	95	81	4	9	-	5	14	53	-	-	-	-	-
Burchardia umbellata	62	50	-	15	88	80	19	13	11	6	-	-	-	-	-	-	11	50	-	-	-	-	-	100	89	89	82	92	56	-	89	86	28	27	-	5	-	82	-	-	-	-	-
Lyperanthus nigricans	31	25	-	-	25	10	13	13	-	-	-	-	-	22	-	-	-	50	-	-	-	-	-	-	56	33	36	67	38	27	47	33	4	27	-	-	-	32	-	-	-	-	-
Conostylis juncea	-	-	-	-	75	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	67	-	74	-	44	27	79	71	-	9	-	-	-	5	-	-	-	-	-
Dasypogon bromeliifolius	23	33	40	38	13	-	81	13	22	-	-	-	-	11	15	-	-	-	-	-	-	-	-	43	100	67	72	92	56	64	63	52	4	-	-	-	-	8	-	-	-	-	-
Phlebocarya ciliata	-	33	-	-	25	-	56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29	44	11	69	92	25	64	63	48	4	-	-	-	-	8	-	-	-	-	-
Drosera paleacea	8	-	-	-	-	-	-	13	33	-	5	-	-	-	-	40	-	-	-	-	-	-	-	29	56	-	15	33	25	55	21	33	-	-	-	-	-	5	-	-	-	-	-
Lyginia barbata	-	8	60	15	13	10	50	40	11	-	-	-	38	22	-	-	-	-	-	-	-	-	-	100	11	89	67	92	88	64	95	95	16	-	-	-	-	8	-	-	-	-	-
Stylidium brunonianum	8	8	80	46	13	20	75	47	-	-	-	-	-	11	23	-	-	-	-	-	-	-	-	57	56	33	33	33	50	82	74	71	4	-	-	16	-	50	-	-	-	-	33
Patersonia occidentalis	54	-	20	54	38	30	44	27	-	6	14	25	50	22	23	-	11	-	-	-	-	100	-	100	-	89	59	83	69	64	89	95	4	27	-	5	-	24	-	-	-	-	-
Stylidium repens	15	17	20	23	13	10	88	20	33	-	-	-	-	44	-	20	-	-	-	-	-	-	-	29	22	44	8	42	56	82	74	76	-	-	-	5	-	24	-	-	-	-	-
Amphipogon turbinatus	-	17	-	23	-	10	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	71	67	100	13	42	13	27	68	52	-	-	-	-	-	21	-	-	-	-	-
Leporella fimbriata	-	-	-	8	13	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	56	67	15	75	31	45	47	43	-	-	-	-	-	13	-	-	-	-	-
Stirlingia latifolia	15	17	60	38	13	-	6	7	22	-	-	-	13	11	-	-	-	-	-	-	-	-	-	100	67	78	31	67	19	36	47	57	4	-	-	5	-	21	-	-	-	-	-
Hibbertia huegelii	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	78	44	3	25	6	-	26	24	-	-	-	-	-	26	-	-	-	-	-
Lysinema ciliatum	-	8	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43	22	22	-	50	-	36	11	24	8	-	-	-	100	5	-	-	-	-	-
Anigozanthos manglesii	8	-	-	15	50	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29	11	56	8	25	19	-	11	-	4	18	-	5	-	3	-	8	-	-	-
Laxmannia squarrosa	-	-	-	-	-	20	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	22	-	21	-	13	-	63	5	-	-	-	-	-	11	-	-	-	-	-
Waitzia suaveolens	-	-	-	-	-	-	-	-	-	-	-	-	-	11	8	-	-	-	-	-	-	-	-	14	-	-	5	-	6	-	58	-	-	18	-	5	14	26	-	-	-	-	-
Cassytha flava	8	-	-	8	13	-	-	7	-	-	-	-	13	-	-	-	-	-	-	-	-	-	-	14	-	-	10	-	-	18	16	38	8	-	27	11	57	3	-	8	-	-	-
Nemcia reticulata	-	-	-	15	-	-	-	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43	11	-	3	-	-	-	21	38	-	-	-	5	29	8	56	23	-	-	-
Hemiandra pungens	15	8	-	8	-	-	-	-	-	-	-	-	-	56	8	-	-	-	-	-	-	-	-	57	11	33	26	25	6	-	16	14	4	-	-	5	-	3	11	62	-	13	-
Acacia sessilis	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	22	56	-	-	6	-	5	-	-	-	-	-	-	3	-	-	-	-	-
Restio sinuosus Ms	-	-	-	8	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	33	-	-	6	-	-	-	-	-	-	-	-	3	-	-	-	-	-
Conostylis aurea	-	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	71	11	78	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-
Caustis dioica	-	-	20	-	-	-	-	-	-	-	-	-	-	56	-	-	-	-	-	-	-	-	-	29	-	22	-	-	-	-	-	10	-	-	-	-	-	8	-	-	-	-	-
Calectasia cyanea	-	8	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29	56	11	3	-	6	-	-	10	-	-	-	-	-	13	-	-	-	-	-
Daviesia nudiflora	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	57	-	-	-	-	-	-	-	-	-	-	-	-	-	18	-	-	-	-	-
Daviesia triflora	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	71	22	33	5	-	-	-	26	19	8	-	-	-	-	29	-	-	-	-	-
Scaevola repens var. repens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	86	11	78	3	-	-	-	16	19	12	-	9	-	-	11	-	8	-	-	-
Monotaxis grandiflora	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	71	11	22	3	8	-	-	-	5	-	-	-	-	-	13	-	-	-	-	-
Synaphea spinulosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	57	-	-	8	-	-	-	5	14	-	9	-	5	-	13	-	-	-	-	-
Eremaea asterocarpa subsp. asterocarpa	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	56	-	-	-	-	11	10	-	-	-	-	-	8	-	-	-	-	-
Species group P																																											
Acacia stenoptera	31	25	60	15	38	-	19	7	-	-	19	-	25	56	8	-	-	-	-	-	-	-	-	-	11	-	21	42	-	18	11	-	-	-	-	-	-	8	-	-	-	-	-
Chamaescilla corymbosa	54	67	-	38	75	20	31	33	11	11	14	13	13	22	-	-	11	-	-	-	13	-	-	14	100	67	59	75	44	-	42	-	4	36	-	5	-	13	-	-	-	13	-
Dampiera linearis	77	92	100	77	38	20	75	27	-	6	24	50	-	56	15	-	-	-	-	-	-	-	-	57	33	-	46	42	19	45	79	38	-	9	9	-	14	3	-	-	-	-	-

	1a	1b	2	3a	3b	3c	4	5	6	7	8	9	10a	10b	11	12	13	14	15	16	17	18	19	20a	20b	20c	21a	21b	21c	22	23a	23b	24	25	26a	26b	27	28	29a	29b	30a	30b	30c
Hypolaena exsulca	38	50	60	69	50	10	81	80	22	6	-	25	13	33	8	20	-	-	-	-	-	-	-	71	44	22	49	67	56	45	32	29	-	-	-	-	-	8	-	-	-	-	
Thysanotus thyrsoideus	23	25	20	31	63	40	25	20	-	6	5	38	50	56	15	-	-	-	-	-	-	-	-	14	11	-	10	17	-	27	21	24	-	-	-	-	-	5	-	-	-	-	33
Schoenus brevisetis complex	-	-	20	38	-	-	-	20	-	-	14	-	13	-	15	-	-	-	-	-	13	-	-	29	44	78	3	-	6	18	11	38	-	-	-	-	-	3	-	-	-	-	
Laxmannia sessiliflora subsp. australis	8	-	20	8	-	10	6	-	-	-	-	-	-	44	-	-	-	-	-	-	-	-	-	14	22	56	-	75	6	-	11	-	-	-	-	-	-	5	-	-	-	-	
Allocasuarina humilis	8	8	20	23	25	10	-	-	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-	57	67	78	5	33	6	-	5	5	28	-	-	11	29	21	-	-	-	-	
Haemodorum laxum	15	25	-	85	50	20	-	7	-	-	5	13	13	-	-	-	-	-	-	-	-	-	-	100	67	100	3	-	6	-	-	-	4	-	-	5	-	24	-	-	-	-	
Thysanotus triandrus	15	-	-	38	25	-	-	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	71	33	11	3	-	-	9	11	10	-	-	-	-	-	8	-	-	-	-	
Conostylis setigera	54	33	20	54	13	-	-	-	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-	71	67	11	-	8	13	9	5	24	8	-	18	23	-	50	-	-	-	-	
Hakea ruscifolia	23	42	-	8	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29	67	44	-	8	-	-	-	-	-	-	-	26	14	16	-	-	-	-	
Baeckea camphorosmae	8	-	-	46	50	30	-	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	56	-	10	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	
Grevillea pilulifera	-	-	-	46	25	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	56	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	-	
Prostanthera fraseri	-	17	-	-	63	-	-	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	44	11	8	8	-	-	-	-	-	-	-	-	-	5	-	-	-	-	
Eucalyptus calophylla	38	92	20	77	88	60	13	-	11	-	5	13	-	-	15	-	-	-	-	-	-	-	-	-	11	11	36	17	19	-	5	-	-	9	-	-	-	13	-	-	-	-	
Tetraria octandra	77	92	20	85	100	70	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	57	100	56	8	17	-	-	-	-	4	27	-	23	14	32	-	-	-	-	
Kingia australis	38	58	100	92	38	10	-	-	-	-	-	-	13	11	-	-	-	-	-	-	-	-	-	14	44	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Loxocarya fasciculata	77	92	80	100	100	30	6	-	-	-	5	25	38	67	-	-	-	-	-	-	-	-	-	86	100	33	23	50	51	-	-	-	-	-	-	-	-	-	-	-	-	
Mesomelaena tetragona	38	83	80	100	88	70	-	7	11	-	19	13	13	11	-	-	-	-	-	-	-	-	-	14	78	44	5	8	6	-	-	-	-	-	-	-	9	-	-	-	-	
Gompholobium marginatum	31	42	-	46	63	60	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	-	
Lepidosperma sp. (BJK & NG 232)	15	42	20	31	38	70	-	-	-	-	14	-	-	33	8	-	-	-	-	-	-	-	-	-	33	22	3	8	-	-	-	-	-	-	-	-	11	-	-	-	-	
Hibbertia vaginata	8	8	-	-	13	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	56	-	21	67	31	9	5	-	-	-	-	-	-	-	-	-	-	-	
Melaleuca thymoides	31	17	-	-	-	-	13	-	-	-	-	13	-	-	-	-	-	-	-	-	-	-	-	-	11	-	41	100	38	-	37	-	-	9	-	-	-	-	-	-	-	-	
Jacksonia sp. Busselton (G.J.K. 4482) PN	8	8	-	-	-	-	-	-	-	-	-	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	92	-	-	-	-	-	-	-	-	-	-	-	-	-	
Eucalyptus marginata subsp. marginata	100	75	-	8	88	-	6	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	43	56	-	64	33	13	-	11	-	12	18	-	5	-	34	-	-	-	-	
Hypocalymma robustum	62	42	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-	-	-	-	-	-	-	43	56	-	28	75	-	-	21	5	4	9	-	-	-	21	-	-	-	-	
Lomandra sericea	85	67	-	-	25	-	6	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43	56	11	51	50	-	18	16	24	-	9	-	-	-	11	-	-	-	-	
Xylomelum occidentale	62	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	67	-	26	42	-	-	-	-	-	9	-	-	-	-	-	-	-	-	
Cyathochaeta clandestina	15	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	57	11	22	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	
Gompholobium confertum	54	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43	11	44	5	8	-	9	-	14	-	-	-	5	-	3	-	-	-	-	
Labichea punctata	46	8	-	-	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Species group Q																																										
Acacia willdenowiana	31	25	-	-	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29	22	67	15	42	-	-	21	-	4	55	-	-	29	11	-	-	-	-	
Astroloma pallidum	23	25	-	15	25	10	-	-	11	-	-	-	-	-	8	-	-	-	-	-	-	-	-	71	56	-	28	-	-	-	-	5	8	18	-	-	-	26	-	-	-	-	
Calandrinia flava	38	-	-	8	63	-	6	60	11	6	-	13	-	11	8	20	-	-	-	-	-	-	-	-	56	-	69	50	56	-	47	10	12	55	9	21	14	37	-	-	-	-	
Lomandra caespitosa	15	33	-	8	38	-	13	7	11	-	-	38	13	-	-	-	-	-	-	-	-	-	-	57	11	33	67	50	81	18	32	38	8	64	9	37	-	37	-	-	-	-	
Hibbertia hypericoides	100	100	-	38	100	30	-	-	-	-	-	-	-	22	-	-	-	-	-	-	-	-	-	100	78	89	90	100	13	-	68	57	48	82	9	79	57	100	-	-	-	33	
Hovea trisperma var. trisperma	38	58	-	-	38	10	-	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43	22	-	49	58	-	9	58	29	16	45	-	11	14	26	-	-	-	-	
Drosera stolonifera	15	-	-	15	75	10	-	7	-	6	-	-	-	-	8	-	-	-	-	-	-	100	-	29	44	56	62	-	19	-	-	-	-	45	18	16	29	8	-	-	-	-	
Isotropis cuneifolia	8	8	-	8	-	-	6	-	-	-	-	-	13	-	-	-	-	-	-	-	-	-	-	14	-	56	31	-	-	-	11	14	8	18	9	5	-	32	-	8	-	-	
Dasythonia occidentalis	-	8	-	-	38	-	6	-	-	-	5	-	-	11	-	-	-	-	-	-	-	-	-	57	11	-	51	17	25	-	74	19	12	18	55	42	14	50	22	62	-	-	
Gompholobium tomentosum	-	8	-	-	25	-	13	40	11	-	-	-	-	-	8	-	-	-	-	-	-	-	-	57	56	67	79	58	63	27	79	29	36	18	55	21	29	55	22	54	-	-	
Loxocarya flexuosa	15	25	-	-	-	60	-	-	22	-	5	-	-	11	-	-	-	-	-	-	-	-	-	57	-	44	69	25	38	-	63	48	72	36	100	79	100	87	44	92	-	-	33
Trachymene pilosa	15	17	-	8	25	10	25	67	22	17	-	-	-	11	15	20	-	-	-	-	-	-	-	29	44	100	79	92	81	18	79	38	24	82	100	95	86	82	67	77	57	75	67	
Hibbertia racemosa	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29	-	-	49	42	31	9	42	14	32	36	36	53	57	8	-	23	-	-	-	
Drosera erythrorhiza	-	-	-	8	75	30	6	13	22	11	5	-	-	-	-	-	-	-	-	-	-	-	-	86	100	-	64	25	56	9	84	71	20	55	36	74	43	79	-	-	-	-	33
* Ursinia anthemoides	-	-	-	31	38	30	25	60	67	17	19	-	-	-	-	-	-	-	-	-	-	-	-	29	56	100	56	25	50	27	74	38	20	36	9	32	-	71	-	-	-	-	33
* Gladiolus caryophyllaceus	-	-	-	8	-	30	-	-	-	-	10	-	-	8	-	-	-	-	-	-	-	-	-	57	-	89	-	-	25	27	68	43	40	-	9	5	-	68	-	-	-	-	
Stipa compressa	-	8	-	-	-	20	-	33	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-	-	11	78	8	58	19	-	58	38	-	-	55	42	-	26	-	-	-	-	
Wahlenbergia preissii	-	-	-	15	13	-	-	13	-	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	13	17	6	-	32	33	8	-	-	58	-	34	11	-	-	-	
* Aira caryophyllea/cupaniana group	8	17	20	23	63	10	38	73	11	39	57	-	38	44	8	80	11	-	-	-	-	-	-	43	-	11	46	33	31	9	63	19	24	55	73	100	14	71	33	-	14	13	33
* Briza maxima	8	42	20	85	100	100	56	60	100	67	86	13	38	33	77	-	11	-	-	-	-	-	-	14	11	56	79	58	81	-	84	5	72	82	18	-	-	74	22	-	-	25	33
* Hypochaeris glabra	15	83	60	62	100	60	69	93	100	56	52	50	50	78	62	40	33	50	-	-	13	50	-	29	44	56	87	75	81	18	89	10	80	91	91	89	-	89	11	8	-	-	67
Thysanotus manglesianus/patersonii	8	50	20	54	-	50	-	33	33	56	48	-	25	22	38	-	-	-	-	-	-	50	-	43	11	44	46	42	81	-	53	-	48	36	91	58	71	63	33	23	43	25	100	
Conostylis aculeata	8	33	40	15	25	20	6	13	-	-	-	13	50	33	8	-	11	-	-	-	-	-	-	14	-	78	64	25	38	9	42	19	64	64	-	21	57	53	22	23	-	13	-	
Lepidosperma angustatum	92	75	40	46	75	40	25	-	11	-	19	38	38	44	-	-	-	-	-	-	-	50	-	29	67	33	85	83	44	9	68	38	72	73	45	74	86	58	22	92	29	50	-	
Xanthorrhoea preissii	54	92	100	92	100	90	75	20	22	-	33	-	13	33	15	-	-	-	-	-	-	-	100	67	43	89	33	38	17	44	55	58	43	52	18	9	79	57	95	-	-	-	-	
Centrolepis drummondiana	8	-	-	8	25	10	-	40	22	11	10	13	50	56	15	40	-	-	-	-	-	-	-	14	-	44	13	42	31	9	53	19	20	18	9	63	-	50	-	-	-	-	
Quinetia urvillei	8	-	-	-	25	10	6	67	11	33	19	-	13	11	-	20	-	-	-	-	-	-	-	-	-	22	44	28	8	13	-	32	5	4	18	18	21	-	26	-	-	-	-	
Drosera macrantha	-	-	-	15	13	40	-	-	22	22	10	25	13	22	-	-	11	-	-	-	-	-	-	-	-	56	33	28	-	13	9	16	5	8	9	36	5	71	16	-	8	-	-	
Hyalosperma cotula	-	-	-	31	38	10	6	13	11	6	52	25	-	33	-	-	-	-	-	-	-	-	-	-	11	11	15	-	6	-	-	29	4	-	45	-	43	13	-	8	-	-	-	
Mitrasacme paradoxa	15	-	-	8	-	-	13	53	-	28	10	25	-	56	-	40	-	-	-	-	-	50	-	29	-	44	5	25	13	27	37	62	-	-	82	11	29	13	22	-	-	13	-	
Stylidium calcaratum	15	25	20	23	38	-	6	13	-	22	19	38	50	56	-	-	-	-	-	-	-	-	-	57	-	-	5	-	13	9	11	14	4	-	-	11	-	37	-	-	-	-	
Podolepis gracilis	8	-	-	-	13	-	-	-	-	6	14	13	25	-	8	-	-	-	-	-	-	-	-	-	11	100	21	-	-	-	-	-	-	9	-	11	-	16	-	8	-	-	
Homalosciadium homalocarpum	-	-	-	-	63	30	25	40	-	17	5	-	-	8	-	-	50	-	-	-	-	-	-	-	-	-	11	33	8	13	-	5	-	8	45	36	53	-	47	11	8	-	-	
Kennedia prostrata	-	-	-	8	50	30	6	-	11	-	5	-	-	-	15	-	-	50	-	-	-	-	33	-	-	-	28	-	13	9	-	-	8	27	9	53	14	26	-	23	-	13	-	

	1a	1b-c	2	3a	3b	3c	4	5	6	7	8	9	10a	10b	11	12	13	14	15	16	17	18	19	20a	20b	20c	21a	21b	21c	22	23a	23b	24	25	26a	26b	27	28	29a	29b	30a	30b	30c
Lagenifera huegelii	-	58	-	-	50	20	6	7	-	-	5	-	-	-	8	-	-	50	-	-	-	-	-	-	-	11	-	74	25	31	-	16	-	4	73	9	89	43	55	-	-	-	38	-
Macromnia riedlei	15	8	-	-	13	-	-	13	-	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	64	25	25	-	21	5	40	100	-	37	-	37	-	-	-	13	33
Leucopogon propinquus	-	25	-	-	25	-	-	7	-	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	11	33	-	6	-	-	-	4	73	-	32	-	24	-	-	-	-	-
Sowerbaea laxiflora	-	8	-	-	75	50	6	-	-	11	14	-	-	-	15	-	-	-	-	-	-	-	-	-	22	22	49	-	6	-	16	-	16	91	9	58	-	61	-	-	-	13	-
Dichopogon capillipes	-	-	-	-	38	30	-	-	-	6	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	31	-	-	-	-	-	20	64	-	11	-	8	-	-	-	13	-
* Trifolium campestre	-	-	-	-	-	10	-	-	-	6	5	-	-	-	-	-	-	-	-	-	-	50	-	14	11	-	23	-	-	-	-	-	28	73	27	5	-	21	-	-	-	-	-
Crassula colorata	-	-	-	-	13	-	13	7	22	6	-	-	-	-	-	20	-	-	25	-	-	-	-	-	11	-	8	25	13	9	32	5	44	18	64	68	-	29	78	38	14	13	-
Millotia tenuifolia	-	8	-	-	-	-	6	33	-	22	-	-	-	22	-	-	-	-	-	-	-	-	-	14	-	-	18	25	13	-	42	-	12	36	91	89	-	32	22	8	-	25	-
Waitzia citrina	-	8	-	-	13	-	6	27	-	-	-	-	-	-	-	60	-	-	-	-	-	-	-	-	-	11	8	25	-	-	11	-	4	9	45	42	14	5	11	15	-	25	-
Microlaena stipoides	-	-	-	8	-	-	-	7	11	-	5	-	-	-	31	-	-	-	-	-	-	-	-	-	-	-	28	-	31	-	-	5	20	73	18	53	-	37	-	8	14	63	-
Pterostylis aff. nana	8	-	-	-	-	-	6	27	11	17	-	-	-	-	15	-	-	-	-	-	-	-	-	-	-	-	31	17	38	18	5	10	4	45	64	53	57	21	-	15	-	50	67
Isolepis marginata	-	-	-	-	-	10	6	15	22	44	19	25	13	33	38	-	11	-	-	-	13	50	-	-	-	11	8	-	19	9	16	5	28	27	27	74	-	26	33	31	-	25	33
* Vulpia myuros	-	-	-	8	13	10	19	27	-	17	24	-	-	22	8	20	-	-	-	-	-	50	-	-	-	-	8	8	19	-	16	-	24	27	100	47	-	34	44	-	-	13	-
* Ehrharta calycina	-	-	-	15	-	-	-	-	56	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	13	-	19	-	32	-	32	18	-	11	-	24	-	-	-	-	33
Lepidosperma sp. (BJK&NG 231)	-	-	-	-	-	-	13	-	-	-	-	-	13	-	-	-	-	-	-	-	-	-	33	57	-	-	3	-	6	-	11	5	8	-	-	-	14	29	-	-	-	-	-
Mesomelaena pseudostygia	-	-	-	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	67	100	8	-	6	-	11	10	28	-	-	32	-	95	-	-	-	-	33
Stawellia dimorphantha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	56	5	-	-	-	-	8	-	-	5	-	39	-	8	-	-	-
Petrophile macrostachya	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	57	11	-	-	-	-	-	-	5	4	-	-	26	-	39	-	8	-	-	-
Opercularia vaginata	8	8	-	31	-	60	-	-	-	-	38	-	-	22	-	-	11	-	-	-	-	100	33	-	-	-	8	-	-	-	16	-	24	-	73	5	71	24	33	54	-	-	-
Hakea trifurcata	-	-	-	23	-	30	-	7	-	-	10	-	25	-	-	-	-	-	-	-	-	-	-	-	-	11	-	-	-	-	-	8	-	27	11	57	5	-	-	-	-	-
Hybanthus calycinus	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43	-	56	5	-	-	-	5	-	36	18	27	32	-	18	-	23	-	-	-
Poa drummondiana	-	-	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22	5	-	-	-	5	-	4	18	36	42	71	21	22	46	-	-	-
Cassia nicrantha	-	50	20	31	88	70	6	7	22	11	19	13	-	11	15	-	-	-	-	-	-	-	-	-	-	11	23	-	-	-	-	5	8	27	-	11	-	26	-	-	-	13	-
Caesytha glabella	-	17	60	62	13	-	19	-	-	6	10	13	13	33	-	-	-	-	-	-	-	50	-	14	11	-	3	17	-	-	5	-	4	-	36	26	57	-	11	38	-	-	-
Dryandra nivea	77	50	60	92	75	60	6	7	33	-	10	-	25	11	-	-	-	-	-	-	-	-	-	43	89	67	8	8	13	-	-	-	44	18	73	68	86	29	22	8	-	-	-
Tricoryne elatior	31	42	20	69	25	20	25	-	-	-	5	-	-	11	8	-	-	-	-	-	-	50	33	43	11	22	8	8	31	18	5	5	28	27	45	42	57	13	22	-	29	25	-
Briochilus dilatatus	54	42	40	15	-	-	-	-	11	-	5	13	25	11	-	-	-	-	-	-	-	-	-	-	11	-	21	42	-	-	-	-	8	-	82	5	43	11	-	-	-	50	33
Caesytha mesomoa	23	25	-	8	-	10	13	20	-	17	-	63	13	-	31	80	67	-	-	-	25	50	-	14	-	-	13	8	-	-	5	5	12	-	27	5	-	13	44	15	-	38	-
Stylidium junceum	15	8	-	-	-	-	25	7	-	-	-	25	-	-	8	20	11	-	-	-	-	-	-	-	-	-	3	8	6	18	5	5	-	-	27	11	71	3	11	15	-	-	-
Species group R																																											
Acacia extensa	46	83	20	-	-	-	6	-	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-	-	-	-	8	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Billardiera versifolia	54	67	-	-	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lomandra purpurea	-	58	-	8	25	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	-	5	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Agrostocrinum scabrum	62	67	60	15	38	20	6	-	-	-	14	13	-	-	8	-	-	-	-	-	-	-	-	-	22	-	23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conospermum virgatum	8	42	80	-	38	-	-	-	-	-	-	-	-	-	-	20	11	-	-	-	-	-	-	-	33	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stipa semibarbata/campylachne	-	83	-	15	13	30	-	7	-	6	5	13	-	11	8	-	-	-	-	-	-	-	-	14	11	-	3	-	-	-	5	-	-	18	-	-	-	3	-	-	-	-	-
Daviesia pesiisii	23	33	60	-	13	-	-	-	-	-	-	13	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-
Hibbertia rhadinopoda	38	25	60	-	-	-	-	-	-	-	5	-	-	11	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xanthosia candida	8	67	-	-	-	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boronia spathulata	46	17	60	8	-	-	38	7	-	-	-	25	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Species group S																																										
Hakea cycloptera	54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Eucalyptus haematoxylon	62	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hibbertia amplexicaulis	69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopogon sphaerocephalus	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hakea amplexicaulis	69	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xanthorrhoea gracilis	54	17	-	-	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-
Hovea chorizemifolia	54	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	-	-	-	-	-	-	-	-	9	-	-	-	-	-	-	-	-
Pentapeltis peltigera	54	25	-	-	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gompholobium knightianum	85	25	-	-	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	33	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stylidium amoenum	62	25	-	-	-	-	6	-	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	8	6	-	-	-	-	-	-	-	-	-	-	-	-	-
Amphipogon amphipogonoides	85	33	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	9	-	5	-	-	-	-	-	-	-	-	-	-
Petrorhoe umbrosa forma xanthina	85	67	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stawellia calliptera	62	75	20	-	13	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gompholobium polymorphum	62	75	20	-	25	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	9	-	5	-	-	-	-	-	-
Tetrarrhena laevis	31	67	-	-	13	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Logania serpyllifolia	62	8	-	-	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	-	-	11	-	3	-	-	-	-	-	-	-	-	5	14	-	-	-	-	-	-
Opercularia spiciflora	38	58	-	-	13	10	-	-	-	-	14	-	13	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Number of plots/type	**13**	**12**	**5**	**13**	**8**	**10**	**16**	**15**	**9**	**18**	**21**	**8**	**8**	**9**	**13**	**5**	**9**	**2**	**4**	**4**	**8**	**2**	**3**	**7**	**9**	**9**	**39**	**12**	**16**	**11**	**19**	**21**	**25**	**11**	**11**	**19**	**7**	**38**	**9**	**13**	**7**	**8**	**3**

These community types have the highest mean species richness recorded (67.6 and 67.8 species / plot; Table 13). Weed frequency is significantly higher in community type 1b reflecting higher human impacts to the remnants to which this community is confined (2.4 weeds/ plot cf. 0.3 weeds/ plot). The community type 1a which occurred along the edge of a large forest block had the lowest disturbance rating of any group (Table 13). Mean rainfall for these groups was high as would be expected from their southern distribution.

Community type 2 are shrublands or open low woodlands restricted to small remnants south of Busselton. These occur on seasonally inundated sandy clay soils. They are shrub rich and thus differ from all other seasonal wetlands which classify into super group 2. They are best characterised by species groups E, M and R and are lacking most species in species group S. This community type has moderate species richness (mean 51 species / plot). Weed frequency is low with a low disturbance rating (Table 13). The wetter nature of these sites is apparent with the occurrence of species such as *Kingia australis*, *Eutaxia virgata* and *Calothamnus lateralis* being present in all plots. These species are totally lacking in both subgroups of community type 1.

The third community type of the heavy soils occurs further north stretching from Waterloo to Pearce airforce base (Appendix 1). This community type is considered to have been one of the most extensive community on the eastern side of the coastal plain (Keighery and Trudgen 1992) but due to clearing is now regionally rare (Keighery and Keighery 1992). It has three distinct subgroups comprising either *Eucalyptus calophylla*, *E. marginata* or *Eucalyptus wandoo* woodland or *Xanthorrhorea preissii* dominated scrub or heath formations. These three subgroups differ in the relative proportions of species in species groups P, Q and R.

Community type 3a has, in addition, high frequencies of species group E (Table 12). This subgroup occupies the wettest sites with high frequencies of *Eucalyptus calophylla* and *Kingia australis*, and very low frequencies of *E. marginata*. *Pericalymma elliptica* was present in over half the sites of this subgroup.

By contrast in group 3b most sites are dominated by both *E. calophylla* and *E. marginata*. Species such as *Bossiaea eriocarpa* and *Conostylis juncea* differentiate this subgroup. Type 3b has been recorded from alluvial soils near the Peel - Harvey estuary as well as the better drained sites on the eastern side of the plain.

Group 3c extended further to the north and differed from the other subgroups in terms of frequency of species occurrence rather than having different species groups. *Eucalyptus wandoo* was an occasional dominant and this group lacks species such as *Bossiaea eriocarpa*, *Stylidium piliferum* and *Conostylis juncea* (common in type 3b) and *Acacia drewiana*, *Hakea incrassata*, and *Lepyrodia macra* (common in type 3a). Thirty percent of quadrats included *Acacia saligna*, this species was not recorded in the other subgroups.

There were significant differences in mean species richness between the subgroups. Subgroups 3a (58.9) and 3b (61.2) were significantly higher than subgroup 3c (48.0) (Table 13). Not surprisingly rainfall was also significantly lower in subgroup 3c. There was no significant difference in weed frequency between any of the groups. Average vegetation condition ranged from 2.0 in community type 3a to 2.6 in group 3c which represent more disturbed condition than seen in either community types 1 or 2.

Community types of the seasonal wetlands

Almost all of the quadrats in the second major subdivision of the dataset are seasonal wetlands. These occur across all major geomorphological elements. They are the most heterogenous group, with many more community types discernible than the other major groups (Figure 6). Many of the community types are represented by only a few quadrats with restricted distributions (Appendix 1).

Table 13. Average values for species richness, rainfall, slope (1 - flat to 3 - steep), weed frequency, vegetation condition (1 - excellent to 5 - badly degraded) and number of quadrats in each of the groups and subgroups in the 30 group classification.

Type	Species richness	Rainfall	Slope	Weed frequency	Vegetation condition	Number of quadrats
1a	67.6	1001	2.0	0.3	1.7	13
1b	67.8	966	1.5	2.4	2.0	12
2	51.0	972	1.0	0.8	1.9	5
3a	58.9	985	1.3	3.9	2.0	13
3b	61.2	1013	1.3	5.7	2.4	8
3c	48.0	907	1.5	6.0	2.6	10
4	36.9	922	1.0	3.3	2.0	16
5	38.4	907	1.1	5.8	2.1	15
6	26.6	885	1.2	7.9	3.6	9
7	46.4	864	1.0	8.0	2.3	18
8	52.0	943	1.0	11.0	2.7	21
9	35.5	972	1.1	2.2	2.0	8
10a	51.8	956	1.0	5.8	2.1	8
10b	53.7	987	1.6	4.9	2.2	9
11	27.2	920	1.3	6.9	2.7	13
12	26.4	895	1.0	5.5	2.9	5
13	17.4	918	1.0	1.4	1.8	9
14	16.5	792	1.0	0.7	2.3	2
15	17.5	833	1.0	4.3	2.9	4
16	13.5	893	1.3	3.7	2.9	4
17	13.6	872	1.0	1.7	2.3	8
18	39.5	942	1.0	5.6	2.5	2
19	22.6	829	1.3	6.9	2.7	3
20a	67.4	876	1.7	1.0	1.7	7
20b	62.7	1026	1.6	1.4	2.6	9
20c	64.0	875	1.7	4.0	2.2	9
21a	54.6	938	1.7	4.2	2.5	39
21b	61.3	948	1.8	1.7	2.0	12
21c	40.5	916	1.3	3.6	2.6	16
22	32.5	841	1.0	0.6	2.0	11
23a	62.8	884	1.8	5.2	2.0	19
23b	53.8	810	1.8	0.7	1.8	21
24	41.8	815	2.0	14.2	3.0	25
25	52.8	922	1.6	12.9	3.3	11
26a	50.2	844	2.2	8.0	2.1	11
26b	52.7	852	1.8	8.4	2.5	19
27	39.0	932	2.2	0.0	1.7	7
28	55.2	818	1.8	8.0	2.5	38
29a	40.7	799	2.1	11.2	2.3	9
29b	35.6	834	2.2	3.4	1.8	13
30a	21.1	781	2.0	6.3	3.2	7
30b	37.6	902	1.9	7.7	3.1	8
30c	27.3	825	2.6	3.7	2.7	3

The first two wetland communities are shrub rich damplands (Semeniuk 1987) centred on the Bassendean land system. These two communities with a diverse and dense shrub grow in soils that are saturated for short periods in winter. Free surface water is rare. Community type 4 is distributed over the length of the coastal plain and was generally found on the Bassendean or Southern River units. This shrub rich community generally has scattered *Melaleuca preissiana* as an overstorey. Where tree species are absent it forms heaths or scrubs. It shares a number of species in species group O and Q with upland Bassendean communities (Table 12). *Pericalymma ellipticum, Hypolaena exsulca, Hypocalymma angustifolium* and *Dasypogon bromeliifolius* were the most constant species in this community type. Average species richness for this group was 36.9.

By contrast, community type 5 has no consistent dominant overstorey. Dominants may include *Banksia ilicifolia, M. preissiana, Actinostrobus pyramidalis* and *Kunzea ericifolia.* While species composition is similar to the previous group this community has a higher frequency of species in species group L and a higher frequency of annual species. It also includes two sites from low dunes ridges in Austin Bay Nature Reserve. It generally has more open ground and a less dense shrub layer than community type 4. It has a mean species richness of 38.4 with an average weed frequency of 5.8. This community was recorded from Bassendean, Vasse, Herdsman and Beermullah land units.

Community type 6 is the first of the seasonal wetlands on the heavy soils, it has been recorded on the Guildford and Yanga units from Cardup to Bullsbrook. Floristically it is transitional between the moderately species rich Bassendean wetland described above and the heavy soil communities described below. Average species richness has dropped to 26.6 species / plot and average weed frequency risen to 7.9 / plot. The rise in weed species is even more dramatic when expressed as a percentage. It had the highest disturbance rating of any community and inspection of air photos indicates that this community type appears to have arisen from major disturbance events. In some cases this may have been clearing or grazing in others it appears to have resulted from major *Phytophthora* infections. It is not clear from the data which community type these sites would have belonged to prior to disturbance. The most faithful species to this group are all weeds except for *Hypocalymma angustifolium* (Appendix 1).

The next four community types are typical clay pan, clay flat and ironstone communities (seasonal wetlands) of the heavy soil of the eastern side of the plain and the heavy soils near the Peel - Harvey estuary. Keighery and Trudgen (1992) describe these communities as a mosaic of structural types. Sites of community type 7 are generally dominated by either *Melaleuca viminea, M. uncinata, M. cuticularis* or *Casuarina obesa* or a mixture of these species. This community occurs on heavy clay soils that are generally inundated from winter into mid summer. Species composition (*Melaleuca cuticularis,* and *Casuarina obesa*) may indicate some saline influence for at least some part of the year.

High frequencies of species in species group J defines community types 7 to 10. Differences between these groups is primarily on proportions of the species shown in Table 12, and in occurrence of a series of less frequent species restricted to each of these four types.

In community type 7, for example, such species as *Brachycome bellidioides, Schoenus* sp 2, *Centrolepis polygyna, Pogonolepis stricta* and *Cotula coronopifolia* (species group J) are more typical of this community. In addition species such as *Angianthus* aff. *drummondii, Eryngium pinnatifidum* subsp. *palustre* Ms, and *Blennospora* aff. *drummondii* occur in this community in low frequency (<50%) and are absent from community types 8 to 10.

These four clay pan, clay flat and ironstone communities are the most species rich seasonal wetlands (35.5 - type 9 to 53.7 - type 10b), with type 7 having an average of 46.4 species. Much of the species richness in all four communities types comes from geophytes and an annual flora that germinates, grows and flowers sequentially as these areas dry over summer. While the massive sheet ironstone finds surface expression in community type 10b, ironstone is known to occur at varying depth in the other three communities in this group.

In early spring many of the sites in community type 7 are covered by free water up to 30 cm deep. *Cotula coronopifolia* formed yellow floating mats in some pools while others were dominated by

Villarsia submersa. Aquatic species are common in this community type early in the growing season. As the wetland dries a succession of species such as *Centrolepis* spp. and annual *Stylidium* spp. successively germinate grow and flower, resulting in an extended flowering period of over three months. It is likely that some of these communities would have occurred in the totally altered *Casuarina obesa* woodland south of Serpentine (Keighery and Trudgen 1992). The understorey of these stands have been completely converted to improved pasture. Some sites within community type 7 have significant variation in species composition and it may be that other related communities have been lost due to agricultural development.

Weed frequencies tend to be high in these four communities but given the high species richness the percentage of weeds is low to moderate. Average vegetation condition similarly ranges from 2.1 to 2.7.

Community type 8 are the clay pan communities which can be dominated by *Viminaria juncea, Melaleuca viminea, M. lateritia* or *M. uncinata* but also occasionally by *Eucalyptus wandoo*. They differ in proportions of species from species group E, and occurrence of such species as *Hypocalymma angustifolium, Acacia lasiocarpa* var. *bracteolata* (Long peduncle form), and *Verticordia huegelii* at moderate frequencies (Table 12). Aquatic annuals are again common but pools probably are not inundated to the same depth or for the same length of time as those above. Species richness averages 52 species / plot with weed frequencies of 11 / plot (almost entirely annuals or geophytes). This community had the highest disturbance score of the heavy soil wetland communities (2.7). This community type is distributed from Ellen Brook to Waterloo on small remnants of less than 20 ha (Appendix 1).

Average species richness in community type 9 fell dramatically to 35.5 (significantly lower than other heavy soil wetland communities) (Table 13). This community represents shrublands or open woodlands of clay flats that are inundated for long periods. Sedges are more apparent in this community (moderate frequencies of *Chorizandra enodis, Cyathochaeta avenacea, Lepidosperma longitudinale* and *Leptocarpus coangustatus*) and weed frequencies (2.2 / plot) drop significantly lower than other heavy soil wetlands, presumably because of the long inundation times.

The most rapidly drying of the clay flats form community type 10. These generally have shallower microtopography than the previous three community types or else have thin skeletal soils. Indeed two distinct subgroups are recognisable for this community. Both subgroups are differentiated from the other clay pan community types by the almost complete lack of low frequency species in species group H. This species group includes aquatic annuals and geophytes typical of the other clay pan and flat communities (eg. *Schoenus natans, Crassula natans, Eryngium pinnatifidum* subsp. *palustre* Ms, *Wurmbea dioica* subsp. aff. *alba* and *Amphibromus neesii*). Community type 10b occurs on small areas of ironstone with thin skeletal soils in the Busselton area. Much of this land unit has been cleared. These sites have an endemic flora which can be seen in species group G. These endemics include *Petrophile latericola* Ms, *Andersonia* aff. *latiflora, Dryandra* sp 30, *Hakea* aff. *varia* (Yellow flowered form with an earlier flowering period), *Loxocarya magna,* and *Lepyrodia* aff. *macra.* These communities are very rich with large numbers of annuals and geophytes.

All of the remaining nine wetland community types have much lower species richness than the preceding groups, except for community type 18 (shrublands on calcareous silts). These groups are largely the deeper wetlands and consequently much of the annual flora drops out (see species group J). These groups are generally but not totally restricted to the aeolian units.

Community type 11 occurs on both Bassendean and heavier soil units. Sites in this community are generally dominated by with *Eucalyptus rudis* and / or *Melaleuca rhaphiophylla* . This community is found from Bullsbrock south to Pinjarra with an outlying site south of Bunbury (Appendix 1). Common species of this community type include *Astartea* aff. *fascicularis, Lepidosperma longitudinale* and *Pericalymma elliptica.* Average species richness is 27.2 (Table 13).

Sites in community type 12 have similar species composition to type 11 but are mostly dominated by *Melaleuca teretifolia* and / or *M. rhaphiophylla. Lepidosperma longitudinale* and *Astartea* aff. *fascicularis* also commonly occur in this community type. It is differentiated by high frequencies of

Baumea articulata, Oxylobium linearis and *Villarsia latifolia* and is restricted to the moderately deep seasonal wetlands of the Bassendean and Southern River units between Forrestdale Lake and Capel. Average species richness was 26.4.

Community type 13 represents deeper wetlands (seasonally inundated to 1 m) on clay or humus rich sandy soils and occurs on a variety of land systems (but primarily Bassendean and Pinjarra Plain). Where it occurs on the Bassendean system it occurs low in the landscape with considerable organic matter accumulation. Dominants recorded include *Eucalyptus rudis, Melaleuca rhaphiophylla, M. lateritia* and in one plot *Melaleuca preissiana*. Characteristic species are *Triglochin procera, Melaleuca rhaphiophylla* and *Hakea varia*. This community type occurs south from Serpentine but an outlier was recorded from a deep wetland area in the head waters of GinGin Brook. Average species richness was very low (17.4) as was average weed frequency (1.4), again reflecting the long period of inundation of this wetland type.

The next wet community (type 14) has a similar inundation period to type 13 but occurs on sandy soils. Only two sites were located in this community type: one dominated by *Eucalyptus rudis* and the other by *Banksia littoralis* and *Melaleuca rhaphiophylla*. Common taxa included *Melaleuca preissiana, Baumea vaginalis* (understorey dominant), *Kunzea ericifolia* and *Jacksonia furcellata*. This community was one of the most species poor recorded in our study (mean 16.5 species / plot) but had very few weeds. This community was only recorded in the north of our study area (Appendix 1).

Melaleuca rhaphiophylla or *Casuarina obesa* dominate community type 15. This group occurs on alluvial sediments and is related to community types 7 and 9. It occurs in site which are inundated for much longer periods and to a greater depth than community type 9 and as a result the annuals of species groups J and Q are absent. More typical aquatic species (species group H) and deep wetland species (group I) are more common (Table 12). It is obviously more saline than community type 9 with species such as *Atriplex cinerea, Samolus repens, Sarcocornia quinqueflora* and *Sporobolus virginicus* being more common. Species richness is low (mean 17.5 species / plot). The community was only recorded on the eastern side of the plain north of Perth and adjacent to the Peel-Harvey Estuary (Appendix 1).

Community type 16 is made up of the most saline sites. It is quite heterogenous and includes a saline estuarine site, a site on Tamala limestone in the salt spray zone and two sites from saline flats south of Busselton. These environments were poorly sampled and with further sampling more homogenous communities could be defined. The saline flats south of Busselton are now a very rare community type since most of this soil type has been converted to pasture.

The last three wetland communities are restricted to the Spearwood, Quindalup and Vasse land systems close to the coast. Community type 17 has only been recorded from swales in Quindalup and Spearwood dunes or at interfaces with other systems. This group is generally dominated by *Melaleuca rhaphiophylla* although one swale was dominated by *Eucalyptus gomphocephala*. This is the only record of Tuart in a seasonal wetland in this study. Species in species group I were common with *Gahnia trifida* being the usual dominant or subdominant in the understorey. Species diversity was very low (mean 13.6 species / site). This community type was found south from Rockingham (Appendix 1).

Community type 18 was a very species rich (39.5) community found restricted to a calcareous silt flat in Yalgorup National Park. The two sites located in this community were open low scrubs with rich annual flora. Common taxa were *Acacia saligna* (suckering form), *Leptomeria lehmannii*(a taxa apparently restricted to this community type), *Xanthorrhoea preissii, Gahnia trifida* and *Melaleuca teretifolia*. This flat would be classified by Semeniuk (1987) as a dampland.

The final wetland community type (type 19) is a species poor Quindalup swale community found restricted to the linear features in the Becher Point area and adjacent Quindalup swales at the northern end of Lake Walyungup. This community is dominated by *Lepidosperma longitudinale, Isolepis nodosa* and *Muehlenbeckia adpressa*. At the Lake Walyungup site an overstorey of *Banksia littoralis* was present. This community type had an average of 22.6 species / plot had moderate to high frequencies of species in species group A, species typical of the Quindalup and Spearwood systems.

Community types centred on the Bassendean system

The third major grouping (super group 3 in Figure 6) in the analysis is made up of four community types. While over 50% of the sites in this group occur on the Bassendean land system, another 20% of sites are mapped as occurring on Spearwood Dunes and a further 18% of sites are mapped as occurring on Pinjarra Plain. Inspection of the dendrogram and the sorted two way table (Figure 6 and Table 12 - see species group O) shows that despite this variation in geomorphology, all sites in the third major group are much more closely related to each other than any other site. This is despite the fact that most of the upland Pinjarra Plain and Ridge Hill Shelf sites occur in super group 1 and most upland Spearwood sites occur in super group 4 (Figure 5).

Community type 20 occurs from Koondoola south to Yarloop. Sites in this community type were generally *Banksia attenuata* woodlands, *Eucalyptus marginata - Banksia attenuata* woodlands or shrublands. The three subgroups of this community type share high frequencies of species in species group O with community type 28 which encompasses much of the *Banksia* woodland sites on Spearwood Dunes. However this community lacks most species of species group A which are common on the Spearwood system.

Sites in community type 20a were found on sandy soils near Koondoola and also at base of the Scarp at Forrestfield covering two distinct land form units, Southern River unit (part of the Bassendean system, Table 2) and Karrakatta unit (part of the Spearwood system). The environmental geology series (Gozzard 1986) also places the sites north of Perth on the Spearwood Dunes. Structurally this group was either *Banksia attenuata* woodlands or *Eucalyptus marginata - Banksia attenuata* woodlands. This group is the richest of any of the *Banksia* communities recorded with an average species richness of 67.4 species / site. Weed frequency was low and the community was distinctive in having a diverse shrub layer and *Mesomelaena pseudostygia* occurs in all plots. Sites of community type 20a were differentiated from the other two subgroups by occurrence of species such as *Alexgeorgea nitens, Daviesia nudiflora, Synaphea spinulosa, Hibbertia racemosa, Stylidium calcaratum* and a variety of other taxa occurring at low frequency. These unusual *Banksia* woodlands have been previously identified by Keighery and Trudgen (1992) and Keighery and Keighery (1992).

Community type 20b was found on sands at the base of the Scarp between Byford and Yarloop. These sands were mapped as belonging to the Guildford or Forrestfield units (Pinjarra Plain and Ridge Hill Shelf). This community type was again very species rich (mean 62.7) with low weed frequency (Table 13). Most sites in this community type were *Eucalyptus marginata - Banksia attenuata* woodlands but *Banksia* woodlands and heaths were also found. Again *Mesomelaena pseudostygia* was common occurring in 67% of plots. Species that differentiated this subgroup included *Hakea stenocarpa, Conostylis setosa* and *Johnsonia* aff. *pubescens* as well as the absence of species restricted to the other subgroups.

Sites in community type 20c were largely scrubs and some *Banksia attenuata* woodlands again on sands of Forrestfield or Guildford units. This community type was only recorded from the Talbot Rd bushland at the base of the Scarp east of Perth. Species in species group C and D were largely restricted to this community type (as well as low frequency taxa not shown in Table 12). Again *Mesomelaena pseudostygia* was a ubiquitous species. This community type contained taxa more common on the Scarp (eg. *Templetonia biloba)* and taxa such as *Neurachne alopecuroides*, a species more typical of the marri - wandoo woodlands of the heavy soils. Species richness was again high in this community type (64.0) with average weed frequency rising to four species / plot.

In the original analysis patterns in sites and species grouping of community type 21 were equivocal. Data from this community type was re-analysed and three clear subgroups emerged. Community type 21a are primarily *Eucalyptus marginata - Banksia attenuata* woodlands, *Eucalyptus marginata - E. calophylla - B. attenuata* woodlands or *B. attenuata* woodlands. This is community type has high frequencies of most species in species groups O and Q and low frequencies of mainly native and weedy annuals from species group A. It also differs from the other two subgroups by presence of taxa such as *Sowerbaea laxiflora, Drosera pallida, Leucopogon propinquus* and *Isotropis cuneifolia. Allocasuarina fraseriana* and *Eucalyptus gomphocephala* are sometimes present as dominant or

codominant. Average species richness in this community type is 54.6 species / plot. This community type commonly occurs in the central part of the coastal plain from Perth to Capel. Two outlying occurrences of this community have been recorded north of Perth, these *Eucalyptus calophylla - B. attenuata* woodlands surround small lakes in the Bassendean Dunes east of state forest 65 (Appendix 1). Just on half of sites in this group occur on Bassendean Dunes, another third occur on Spearwood system and the rest on alluvial soils. The data suggests that some further segregation of the sites between Perth and Woodmans Point may be possible.

The second subgroup (type 21b) is restricted to sand sheets at the base of the Whicher Scarp, the sand sheets on elevated ridges or the sand plain south of Bunbury. Structurally this community type is normally *B. attenuata* or *Eucalyptus marginata - B. attenuata* woodlands. It differs from the other subgroups in the relative frequencies of species in species groups O and Q and by occurrence of species such as *Acacia extensa, Jacksonia* sp. Busselton, *Laxmannia sessiliflora, Lysinema ciliatum* and *Johnsonia acaulis* which are almost totally absent from the other subgroups. Species richness averages 61.3 species / plot.

Community type 21c occurs sporadically between GinGin and Bunbury. This community is significantly less species rich (mean 40.5) than the other subgroups and is largely restricted to the Bassendean systems. This subgroup tends to occupy the more low lying wetter sites and is variously dominated by *Melaleuca preissiana, Banksia attenuata, B. menziesii, Regelia ciliata, Eucalyptus marginata* or *E. calophylla* either singly or in combination. Structurally this community type may be either a woodland or occasionally shrubland.

Sites in community type 22 are also low lying and have significantly lower slopes than all other community types in the super group 3 except for community 21c. Sites in community 22 are generally *Banksia ilicifolia - B. attenuata* woodlands but *Melaleuca preissiana* woodlands and scrubs were also recorded. This community type was recorded on Bassendean and Spearwood systems and typically had very open understoreys. This group is likely to be seasonally waterlogged. It was found in the central coastal plain north of Rockingham. Species richness was low (mean 32.5) and the group was characterised by high frequency of species in species group M and a general absence of species in species group Q (compared to other communities in super group 3).

In *Banksia attenuata - B. menziesii* woodlands of community type 23 *Eucalyptus marginata* and *E. calophylla* are rare. This community type is generally restricted to the Bassendean system and can be subdivided into two distinct groups in the north of the study area. Type 23a stretches from Bullsbrook south to the Woodman Point area. Species richness of this group is very high with an average of 62.8 species / plot recorded, weed frequency is still relatively low at about 5.2 per site. This community type is differentiated by moderate frequencies of species in species groups L and M. The other subgroup (type 23b) has a more northern distribution (from Melaleuca Park to GinGin) and is characterised by high frequencies of species in species group N as well as a series of lower frequencies species not shown in Table 12. This group has a lower species richness than the other subgroup (53.8) and a significantly lower mean weed frequency (0.7 species / plot) reflecting the more extensive and intact *Banksia* woodlands which still occur north of Perth.

Community types centred on the Spearwood and Quindalup systems

The last major group seen in the dendrogram (Figure 6) are sites centred on the Spearwood and Quindalup systems. This group contains seven community types, types 24 to 28 are largely restricted to the Spearwood system while types 29 and 30 occur on Quindalup system. Both the Spearwood and Quindalup types are characterised by high frequency of species in group A. The Spearwood types also have moderate to high frequency of species in group Q, while this group of species are much less common in the Quindalup types. Indeed sites in the Quindalup types lack species from most species groups shown in Table 12.

Community type 24 are heaths or heaths with scattered *Eucalyptus gomphocephala* occurring on deeper soils north from Woodmans Point. All but three sites in this community type occur on the Cottesloe unit of the Spearwood system. This community is closely related to community type 25 which encompasses the *E. gomphocephala - Agonis flexuosa* woodlands south of Woodmans Point.

The former community differs in its virtual lack of species such as *Agonis flexuosa, Geranium retrorsum, Oxalis perennans, Lomandra micrantha* and *Luzula meridionalis.* This change in community type may be related to the drop in rainfall at the northern end of the study area. The southern group was recorded from Karrakatta, Cottesloe and Vasse units. Occasionally dominants other than Tuart were recorded (eg. *E. calophylla* at Paganoni block and *E. decipiens* at Kemerton). In both cases Tuart formed the overstorey nearby.

The heathland sites in community type 24 differ in presence of taxa such as *Dryandra sessilis, Calothamnus quadrifidus* and *Schoenus grandiflorus.* This may represent a distinct subgroup within type 24. The southern *E. gomphocephala - Agonis flexuosa* woodlands (type 25) are significantly richer than the northern group (52.8 cf. 41.8 species / plot). Weed frequency was very high in both groups (mean values of 14.2 and 12.9).

Community type 26 is restricted to the large limestone ridges north of Perth and those in the Yalgorup area. The two distinct subgroups are related to degree of soil development. On the skeletal soil on ridge slopes and ridge tops heaths dominated by *Melaleuca huegelii, M. acerosa, M.* aff. *acerosa* or *Dryandra sessilis* are found (type 26a). On the lower slopes or in pockets were deeper soil is able to develop *Eucalyptus gomphocephala, E. foecunda* or *E. petrensis* Ms woodlands or mallee develop over a dense heath (type 26b). Occasionally an overstorey was absent.

Type 26b is virtually restricted to the Cottosloe unit. Taxa typical of the limestone heaths are *Trymalium albicans, Templetonia retusa, Stylidium maritima, Wurmbea monantha,* and *Acacia lasiocarpa.* While on the deeper soils *Hibbertia hypericoides, Caladenia flava, Lagenifera huegelii, Sowerbaea laxiflora, Schoenus clandestinus* and *Mesomelaena pseudostygia* are common. Species richness is similar in both subgroups (mean 50.2 and 52.7) as was a high mean weed frequency (8.0 and 8.4 species / plot).

Another limestone community was community type 27. This was largely restricted to the Yalgorup area and was either shrubland or mallee heath variously dominated by *E. decipiens, E. foecunda, Melaleuca acerosa* or *Hakea prostrata.* While similar in species composition to type 26 it differs in lacking many of the annual native and weed species and by the occurrence of taxa such as *Acacia truncata, Hibbertia spicata,* subsp. *leptotheca,* and *Comesperma conferta.* This community has significantly lower species richness than the other two limestone community types (39.0) and significantly lower average number of weeds (less than 1 species / plot). Most sites in this community type fall in the Yoongarillup unit (as do two sites in community type 26b) with an outlier occurring north of Perth on Shire View Hill. The large limestone ridge on which these sites occur appears little different geomorphologically from other large ridge systems north of Perth (Semeniuk 1990) and species composition is more likely to be controlled by light availability.

The last community in the Spearwood system is community type 28. This community type is largely made up of *Banksia attenuata* woodlands, *Eucalyptus calophylla - B. attenuata* woodlands or *E. marginata - B. attenuata* woodlands. Community type 28 is characterised by high frequencies of species in species groups A, O and Q. It differs from the other Spearwood community types in the occurrence of species from species group O. Community type 28 has been recorded from Thompson's Lake north to Seabird. Species richness averages 55.2 species / plot and average weed frequency is high at 8 species / plot. Sites in this community predominantly fall in the Karrakatta and Cottosloe units except for a group of sites on at the base of the Dandaragan scarp (Appendix 1). These plots are clearly seen as outliers on the distribution map, separated from the main occurrence by Bassendean sands. These sites are atypical in lacking species such as *Daucus glochidiatus* and in the presence of species such as *Lepidosperma* 'eastern terete', *Scaevola phlebopetala* and *Acacia willdenowiana.* The sandy soils at the foot of the Scarp (Ridge Hill Shelf, Table 2) have been variously thought to be derived from weathered laterite (McArthur and Bettenay 1960) or to be a fossil shoreline beach and dune deposits (Woods 1979).

Both the Bullsbrook sites and the more western sites clearly show differences in species composition compared to the *Banksia* woodlands on Bassendean systems. In the Bassendean *Banksia* woodlands species from species group A were largely absent (except in community type 21a which includes unusual Spearwood sites). In addition species such as *Mesomelaena pseudostygia* and *Petrophile*

macrostachya which are common in the Spearwood *Banksia* woodlands are largely absent from Bassendean communities.

The other eastern *Banksia* woodlands and heaths (community types 20a, 20b, and 20c) are floristically more closely related to typical Bassendean *Banksia* communities (Figure 6, Table 12), although community type 20a also has significant associations with Spearwood communities as discussed earlier. The floristic data could be interpreted to indicate several different origins for these eastern sands or perhaps, more likely, indicate complex interleaving and / or reworking of some of the sand masses.

Community types 29 and 30 are largely restricted to the Quindalup system. Type 29 contains two distinct subgroups. The first subgroup are mostly heaths on shallow sands over limestone close to the coast. These communities do not have a single dominant but important species include, *Spyridium globulosum, Rhagodia baccata,* and *Olearia axillaris.* Average number of species / plot was 40.7 and weed frequency was high (mean 11.2 weeds / plot). This community was found from Seabird to Garden Island with woodland variants at Trigg and Yalgorup. These two anomalous sites, one *Callitris* woodland and the other a *Melaleuca lanceolata* woodland were both degraded with high numbers of annual weed species. As a result these two woodlands were classified with the Quindalup heaths rather than the other *Callitris - Melaleuca* woodland sites (community type 30a) as might have been expected.

Sites of the other subgroup (type 29b) were dominated by *Acacia* shrublands or mixed heaths of the larger dunes. This community type stretched from Seabird to south of Mandurah. Average species richness was 35.6 species / plot and weed frequency was significantly lower at 3.4 species / plot. Again there was no consistent dominant but species such as *Acacia rostellifera, Acacia lasiocarpa, Melaleuca acerosa* were important.

Community type 30 is typically the forests and woodlands of the Quindalup system. Again several subgroups are recognisable, type 30a are the *Callitris preissii, Melaleuca lanceolata* and (occasionally) *Eucalyptus gomphocephala* forests and woodlands restricted to a small area from Perth to Garden Island (Keighery and Keighery 1992). Typically the *Callitris* and *Melaleuca* forests have a dense overstorey with relatively few understorey taxa. As a result species richness is low (mean 21.1 species / plot, cf. type 29a) significantly lower than all other Quindalup community types except for type 30c. The two Tuart plots in this group are likewise both depauperate. Speck (1952) describes this community in some detail and states that it was probably more widespread in the past being restricted by too frequent fires. Certainly the area of this community type has been significantly reduced since his study by both fire and urban development but we can find no reference that this community type was more widespread at the time of white settlement. The best examples of this community type are now found on Garden Island were a no burn policy and a native Tammar population have resulted in impressive largely weed free *Callitris* and *Melaleuca* forests and woodlands.

Other *Eucalyptus gomphocephala* sites of the Quindalup system occur in community type 30b. This group is either dominated by Tuart or by *Agonis flexuosa.* It differs from community types 24 and 25 (Tuart / *Agonis* communities on Spearwood system) by complete absence of many species in species group Q. This community type also has significantly fewer weeds than types 24 and 25 (7.7 cf 14.2 and 12.9). Species richness is similar with a mean richness of 37.6 species / plot. The presence of species such as *Hibbertia cuneiformis, Geranium retrorsum* and *Dichondra repens* differentiate this group from other Quindalup community types. This community is found from the Leschenault Peninsular south to Busselton.

The final subgroup (30c) is a small heterogenous group of 3 sites similar to type 30b. This group lacks many of the species from species group A. It is represented by a single plot of *Eucalyptus argutifolia* mallee and two *Dryandra* scrub / thicket plots above the Swan estuary on Spearwood dunes. These sites are depauperate yet contain typical Quindalup taxa such as *Spyridium globulosum, Olearia axillaris* and *Poa porphyroclados.* This community type needs further sampling. However, the Swan River sites occur in the only remnant of this community type on the river.

A summary of the community types and the major land system on which they occur is presented in Table 14.

Table 14. Generalised description of the 30 community types and most frequent landforms on which they occur.

Floristic community type	Generalised description	Predominant landform type (as mapped by Churchward and McArthur 1980)
1a	*E. haematoxylon - E. marginata* woodlands on Whicher foothills	Ridge Hill Shelf
1b	Southern *E. calophylla* woodlands on heavy soils	Pinjarra Plain
2	Southern wet shrublands	Pinjarra Plain
3a	*E. calophylla - Kingia australis* woodlands on heavy soils	Pinjarra Plain
3b	*E. calophylla - E. marginata* woodlands on sandy clay soils	Pinjarra Plain
3c	*E. calophylla- Xanthorrhoea preissii* woodlands and shrublands	Pinjarra Plain
4	*Melaleuca preissiana* damplands	Bassendean
5	Mixed shrub damplands	Bassendean / Pinjarra
6	Weed dominated wetlands on heavy soils	Pinjarra Plain
7	Herb rich saline shrublands in clay pans	Pinjarra Plain
8	Herb rich shrublands in clay pans	Pinjarra Plain
9	Dense shrublands on clay flats	Pinjarra Plain
10a	Shrublands on dry clay flats	Pinjarra Plain
10b	Shrublands on southern ironstones	Pinjarra Plain
11	Wet forests and woodlands	Bassendean / Pinjarra
12	*M. teretifolia* and / or *Astartea* aff. *fascicularis* shrublands	Bassendean
13	Deeper wetlands on heavy soils	Bassendean / Pinjarra
14	Deeper wetlands on sandy soils	Bassendean / Spearwood
15	Forests and woodlands of deep seasonal wetlands	Pinjarra Plain
16	Highly saline seasonal wetlands	-
17	*M. rhaphiophylla - Gahnia trifida* seasonal wetlands	Quindalup / Spearwood
18	Shrublands on calcareous silts	Lake deposit
19	Sedgelands in Holocene dune swales	Quindalup
20a	*Banksia attenuata* woodlands over species rich dense shrublands	Spearwood / Pinjarra
20b	Eastern *Banksia attenuata* and / or *E. marginata* woodlands	Ridge Hill / Pinjarra
20c	Eastern shrublands and woodlands	Ridge Hill / Pinjarra
21a	Central *Banksia attenuata - E. marginata* woodlands	Bassendean /Spearwood
21b	Southern *Banksia attenuata* woodlands	Ridge Hill / Pinjarra
21c	Low lying *Banksia attenuata* woodlands or shrublands	Bassendean
22	*Banksia ilicifolia* woodlands	Bassendean
23a	Central *Banksia attenuata - B. menziesii* woodlands	Bassendean
23b	Northern *Banksia attenuata - B. menziesii* woodlands	Bassendean
24	Northern Spearwood shrublands and woodlands	Spearwood
25	Southern *E. gomphocephala - Agonis flexuosa* woodlands	Spearwood
26a	*M. huegelii - M. acerosa* shrublands of limestone ridges	Spearwood
26b	Woodlands and mallees on limestone	Spearwood
27	Species poor mallees and shrublands on limestone	Spearwood
28	Spearwood *B. attenuata* or *B. attenuata - Eucalyptus* woodlands	Spearwood
29a	Coastal shrublands on shallow sands	Quindalup
29b	*Acacia* shrublands on taller dunes	Quindalup
30a	*Callitris preissii (*or *M. lanceolata)* forests and woodlands	Quindalup
30b	Quindalup *E. gomphocephala* and / or *A. flexuosa* woodlands	Quindalup
30c	Other mallees or scrubs	Quindalup - Spearwood

Major species groups

Thirty five species groups were defined in the classification. The 19 groups which had species frequency of at least 50% in one community type are shown in Table 12. The classification, groups species, based on similar distribution in sites. In the same way the site classification groups sites based

on similar species composition. While the 35 species groups will not be discussed detail, the major patterning does warrant some discussion.

Species group A is largely restricted to Spearwood and Quindalup community types (types 19, 21a and 24 to 30). Species group B was also largely restricted to community types with the Spearwood and Quindalup systems to south but had less widespread occurrences within these sites than species in species group A. Species group E are largely restricted to the eastern side of the plain on sandy soils, while those of species group G are typical of the southern ironstone communities.

Group H species are annual aquatic taxa and species in species group I were typical of the seasonal wetlands. Species group J occurred in both the seasonal wetlands and the heavy soils of the eastern side of the plain.

Species in group L were typical of wet *Banksia* woodlands and group M were wet Bassendean species. Northern Bassendean taxa occurred in species group N while species group O typically occur in sites centred on the Bassendean system (types 20 to 23) but many of these species also occur on well drained sites on the east of the plain (types 1 to 3) and in the Spearwood *Banksia* community. Species group Q are the most ubiquitous group but are less common in seasonal wetlands and sites on Quindalup system. Group R were another group of southern taxa and group S were more typical of foothills of the Whicher Scarp.

Distribution of singletons

Given the large number of singletons (i.e. taxa found in only one plot) that were recorded in this survey (272) it was of interest to know if these taxa were distributed randomly across the study area or were aggregated. If all of these species were naturally rare then a random Poisson distributed might be expected. If however some land systems or community types have been massively reduced in area then singletons could be expected to be clustered in small remnants. The distribution pattern of the singletons was tested for randomness by initially calculating expected distribution assuming a random Poisson distribution then testing these results against the observed frequency using a Chi-squared test. This analysis showed that the distribution of singletons was highly non random ($X^2 = 79.05$, $P < 0.005$) with fewer than expected singletons at frequency two and many more singletons than expected at frequencies greater than or equal to four. All of the quadrats with higher than expected numbers of singletons were from the eastern side of the plain. These patterns are likely to have arisen from the almost total clearance (>95%) of these heavy soils on the eastern side of the plain resulting in some suites of species now having a very localised distribution. It is likely that careful searches of bushland remnants with high singleton frequencies will result in the location of further rare species.

ENVIRONMENTAL CORRELATES

Comparison of floristic groups with geomorphology / geology

The 509 sites were located on 40 different Environmental Geology units (Table 15; Gozzard 1982a,b, 1983a,b, 1986, 1987; Smurthwaite 1986a,b; Jordan 1986a,b; Belford 1987a,b; Leonard 1991; Anon 1976, 1977a,b, 1978, 1981, 1982). Many of these units were only sampled a few times so it was necessary to amalgamate similar units to compare with the floristic community types. In all, 16 amalgamated units are recognised (Table 15 and 16). There is a very close correlation between these amalgamated units and the major geomorphological and geological systems (McArthur and Bettenay 1960) (Table 2).

These data clearly show that while floristic types are broadly correlated with geomorphological / geological units there is generally not a direct one to one correspondence. This was also true when the full 40 geomorphological / geological units were examined. A few community types were found on only one unit (types 18, 27, 29b), but two of these communities were represented by only a few sites. Type 29b (*Acacia* shrubland on taller Quindalup dunes) was found only on the Quindalup system. Another 12 community types were recorded from only two geomorphological / geological units (types 6, 10b, 12, 14, 15, 18, 19, 20a, 20c, 25, 26a, 30c).

No sites in community types 1-3 (super group 1) occurred on Swamp, Vasse, Quindalup or Spearwood units. Similarly no sites from community types 20-23 (super group 3) occurred on Swamp, Vasse or Quindalup units nor did any sites from community types 24-30 (super group 4) occur on Pinjarra Plain, Ridge Hill Shelf or associated units except for 5 sites in community type 28 (Spearwood *Banksia* community) as previously discussed.

Table 15. Environmental geology units (reflecting geomorphology / soils) sampled during the floristic survey of the southern Swan Coastal Plain. Amalgamated units used in the analysis are shown in Table 16.

Amalgamated Environmental Geology Unit	Environmental Geology Code	Amalgamated Unit Name (major geomorphological system (Table 2))	Geology Code
SWP	cs1	swamp deposits - holocene	qhw
SWP	cps	swamp deposits - holocene	qhw
SWP	cps1	swamp deposits - holocene	qhw
SWP	scp	swamp deposits - holocene	qhw
SWP	spc1	swamp deposits - holocene	qhw
SWP	spm	swamp deposits - holocene	qhw
SWP	sp1	swamp deposits - holocene	qhw
SWP	ms5	swamp deposits - holocene	qhw
VA	m5	lagoonal and estuarine deposits (vasse)	qhg
VA	sm2	lagoonal and estuarine deposits (vasse)	qhg
VA	ls5	lagoonal and estuarine deposits (vasse)	qhg
Q	sl	safety bay sands (quindalup)	qhs
Q	s2	safety bay sands (quindalup)	qhs
Q	s13	safety bay sands (quindalup)	qhs
Q	ls4	safety bay sands (quindalup)	qhs
Ss	s7	sands from tamala limestone (spearwood)	qts
Stl	ls1	tamala limestone (spearwood)	qtl
Stl	ls2	tamala limestone (spearwood)	qtl
Bs	s8	bassendean sands	qpb
Bld	s9	lagoonal deposits - bassendean dunes	qpw
Bs/PP	s10	bassendean sands over guildford formation	qpb/qpa
Pgf	ms2	guildford formation (pinjarra plain)	qpa
Pgf	mgs1	guildford formation (pinjarra plain)	qpa
Pgf	c2	guildford formation (pinjarra plain)	qpa
Pgf	cs	guildford formation (pinjarra plain)	qpa
Pgf	sc	guildford formation (pinjarra plain)	qpa
Pad	cp	alluvial deposits (pinjarra plain)	qha
Pad	s14	alluvial deposits (pinjarra plain)	qha
Pad	sm1	alluvial deposits (pinjarra plain)	qha
Pad	msc1	alluvial deposits (pinjarra plain)	qha
Pa/cd	gl	alluvial/colluvial deposit (pinjarra plain)	qha/qc
P/R	fs3	alluvial/colluvial deposit (pinjarra / ridge hill)	qha/qc
Rcd	msg1	colluvial deposits (ridge hill shelf)	qc
Rcd	csg	colluvial deposits (ridge hill shelf)	qc
Rcd	ms3	colluvial deposits (ridge hill shelf)	qc
Rcd	smg1	colluvial deposits (ridge hill shelf)	qc
Rcd	s5	colluvial deposits (ridge hill shelf)	qc
Rcs	s6	colluvial sand (ridge hill shelf)	qs
Rbs	s12	yoganup form (ridge hill shelf-beach deposit)	qpr
Sca	g2	scarp - gravels and laterite	ql (czl)
Sca	la1	scarp - gravels and laterite	ql (czl)

Table 16. Floristic community classification compared to amalgamated environmental geology units. Codes used for the amalgamated environmental units as in Table 15.

			Quin	Spearwood		Bassendean			Pinjarra Plain				Ridge Hill Shelf			
Community type	SWP	VA	Q	Ss	Stl	Bs	Bld	Bs/ PP	Pgf	Pad	Pa/c d	P/R	Rcd	Rcs	Rbs	Sca
1a									1				1	2	1	8
1b						6		2		3					1	
2						3		1			1					
3a						2		1	8				2			
3b						1		2					2	1	2	
3c									6				2		2	
4	1	1				4	1	6	3							
5	5					4	1	3		2						
6									8				1			
7	4	4						2	6		2					
8						1			18				2			
9	1							1	5				1			
10a								4	3		1					
10b								2				7				
11	4	2		1		3		2					1			
12	4							1								
13	4							1	3	1						
14			1			1										
15	3	1														
16		2			1					1						
17	1	4	3													
18		2														
19	2		1													
20a				4		3										
20b						7							1		1	
20c													4		5	
21a				12	2	19	1	3		1			1			
21b						6							2	3	1	
21c				1		7	1	5	2							
22				3		5	1	2								
23a						15		3					1			
23b				1		17		3								
24			6	4	14	1										
25	1			10												
26a				1	10											
26a			1	9	9											
27					7											
28				26	6	1								5		
29a		1	3		5											
29b			13													
30a			4	1	2											
30b	1		6	1												
30c			1		2											
□																

It is interesting to note that no community type is restricted to Rbs unit (Yoganup formation - an early Pleistocene beach ridge unit at the base of the Ridge Hill Shelf) (Tables 15 and 16). At least seven different communities have been recorded from this unit. Similarly the colluvial sand units of the Shelf (Rcs) are occupied by at least four different communities. The seasonal wetland communities occupy all geology / geomorphological units except the sandy Ridge Hill Shelf units and gravels associated with the Whicher Scarp.

The implication of these results is that while geomorphology is one of the major correlates with community composition, by itself it is not a good predictor of plant community type.

Ordination results

Ordination of the sites data was undertaken to show spatial relationships between groups and to elucidate possible environmental correlates with the classification. A measure of how good the ordination fits the original association matrix is termed the stress values. This value decreases as the number of dimensions in the ordination increases and a compromise between stress values and number of dimensions in the solution has to be reached. In the present analysis stress values decreased from 0.22 in a three dimensional solution, to 0.18 in a four dimensional solution, to 0.17 in a five dimensional solution. Consequently the results of the four dimensional solution are reported below.

The first two axes of the group means of the ordination confirm the major environmental correlates are moisture regime and soil type. Axis 1 is related to site soil moisture regime, with the seasonal wetlands occurring at low values on this axis and upland groups occurring at higher values (Figure 7). The second axis separates dominant geomorphological units within the upland group, with the predominantly Quindalup groups occurring at low scores, Spearwood groups at intermediate scores and Bassendean and Pinjarra Plains groups at high scores. Patterns within the seasonal wetlands are less clear but heavy soil groups also occur at high scores on axis 2 and sandy soils at lower scores. The exception to this trend is the group mean for community type 15 (forests and woodlands of deep seasonal wetlands) which occurs at low value on this axis. Axis 3 shows even clearer separation of land units, while axis 4 was not interpretable (Figure 7).

The correlation between axis 1 and seasonality of soil moisture is clearly seen when average slope score (on a five point scale) is overlain on the ordination. Low slope scores are restricted to the low axis 1 scores and high average slope scores are at high axis 1 values (Figure 8a). As was discussed previously rainfall increases from coast across the coastal plain to the Scarp. In addition there is area of higher rainfall at base of the Whicher Scarp and a general decrease in rainfall north of Wanneroo. The broad pattern of decrease inland from the coast correlates strongly with the geomorphological pattern across the plain. It is no surprise therefore when the high average rainfall groups (on a five point scale) generally high scores on axis 2. (Figure 8b)

Species richness was also strongly correlated with ordination scores. Species poor wetlands were concentrated in lower left quadrant and species poor upland communities in the lower right (Figure 8c). Groups with highest average species richness were confined to Pinjarra Plain and Bassendean groups (super groups 1 and 2) in the upper right quadrant as well as the seasonally wet clay pans which had extended periods of geophyte and annual recruitment as the pools dried. Average percentage weed frequency followed similar trends (Figure 8d). Highest percentage of weeds occurred in species poor wetland and upland sites. In addition the herb rich shrublands in clay pans (community type 8) and community type 6 also had a high percentage of weeds. All community types associated with Tuart (types 24, 25 and 30b) have been heavily weed invaded (Table 12). It was rare in this survey to find any Tuart sites that had not been significantly invaded. It should also be noted that sites were located least disturbed areas found.

Vegetation condition is a subjective score (from 1 least disturbed to 5 most disturbed) based on weed frequency, weed aggressiveness, site disturbance, fire frequency and disease impact on a five point scale (Figure 8e). The groups with the highest average disturbance were again some of the species poor wetlands (types 6, 12, 15, 16). and the Tuart and *Callitris - M. lanceolata* woodlands (types 24, 25, 30a and 30b). The communities in the best condition tended to be the species rich communities of the Pinjarra Plain and Bassendean systems. Some of the best vegetation includes sites from small

remnants. These data suggests that weed invasion of the species rich communities only occurs after major disturbance events.

CORRELATIONS WITH OTHER CLASSIFICATIONS

Correlation with structural units

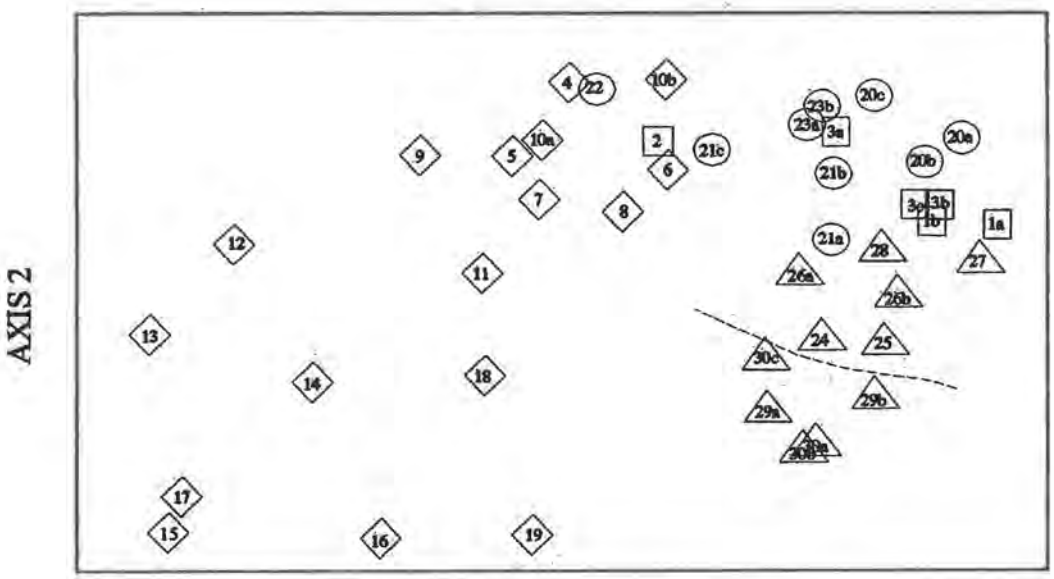
Structure has been used by various authors to map vegetation types or community complexes. It has been suggested that structural units bear little correlation to plant floristics in a variety of Western Australian ecosystems (Griffin *et al.* 1983, Cresswell and Bridgewater 1985, Keighery and Trudgen 1992, Griffin 1993). At each of the 509 sites a detailed structural description was recorded (Muir 1977). From these descriptions the structure of the dominant layer was compared to the floristic classification (Table 17). In all, 41 units were found in six major formations (Table 18). There appears to be little correlation between floristic group and structural units and only slightly better correlation between floristic group and formations. The mallee formation was entirely restricted to community types centred on the Spearwood system (super group 3) with only one exception from a Quindalup swale (type 30c). The seasonal wetland group were the most heterogenous in terms of structural diversity. The communities centred on the Bassendean system (super group 3) were largely forest and woodland formations as were the communities from uplands on heavy soils (super group 1). Most communities occurred in a variety of formations and vegetation units. The most diverse structurally was community type 24 (Northern Spearwood shrublands and woodlands) which was recorded from 14 structural units in four different formations.

These results are consistent with Cresswell and Bridgewater's (1985) conclusions that in areas of great species or vegetation richness, floristically based classificatory methods appear the most appropriate to describe the full vegetation variation which is an essential prerequisite to the development of adequate conservation planning.

Correlation with vegetation complexes (Heddle *et al.* 1980)

The vegetation complexes mapped by Heddle *et al.* (1980) are based on the concept of a series of vegetation communities forming regularly repeating vegetation complexes. These authors believed that vegetation was changing continuously and that pattern of vegetation change could only be detected in a localised area. Consequently it was necessary to map broad vegetation complexes. Both Beard (1979a) and Cresswell and Bridgewater (1985) believed that fine scale repeatable patterns were apparent both in structure (Beard 1979a) and floristics (Cresswell and Bridgewater 1985). Our data has shown that repeatable floristic communities do occur across the coastal plain and that these communities appear to be primarily determined by seasonal water regimes and geomorphology. As shown above our 30 floristic groups do not equate to structural units and as a result could not be mapped simply.

Four hundred and seventy-one of our sites occurred in the area mapped by Heddle *et al.* (1980). Our 471 sites occurred in 27 of the 75 vegetation complexes mapped by these authors. Tables 19 and 20 show the correlation between our floristic types and the mapped vegetation complexes. The floristic types occurred in between one (types 10b, 18 and 19) and 10 vegetation complexes (type 21a). Some floristic groups were centred on one or two particular complexes but also occurred at lower frequency in other complexes (eg. type 24, 26a, 29b). There is little indication in our data that groups of floristic communities are restricted to particular vegetation complexes across the coastal plain.



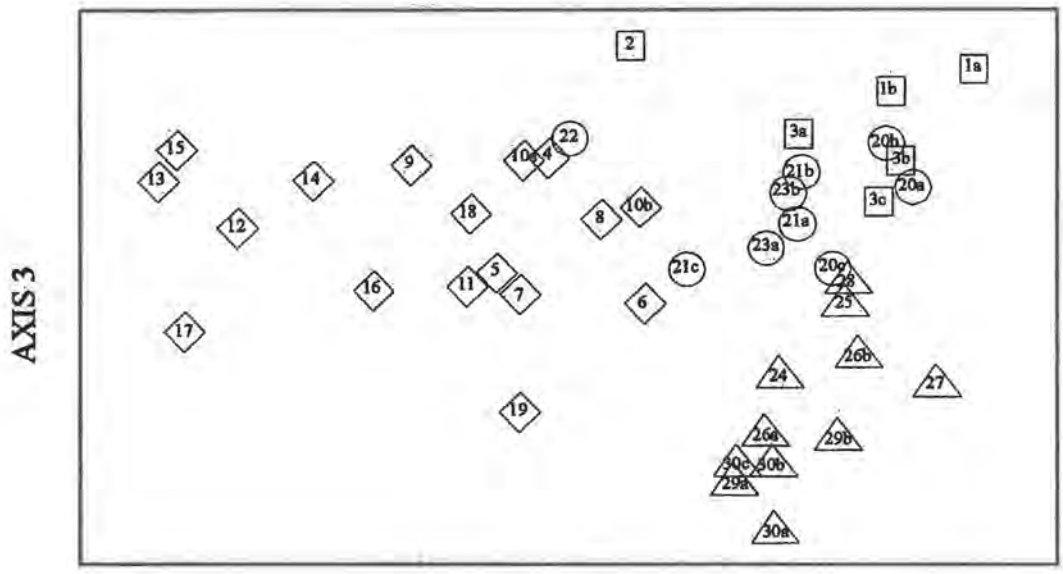
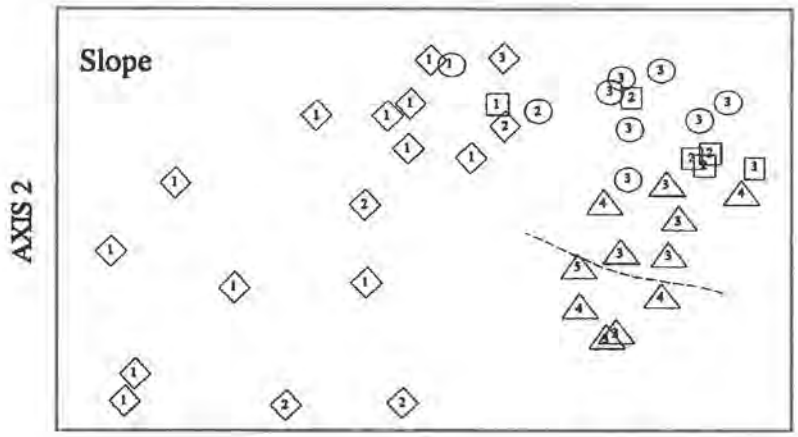
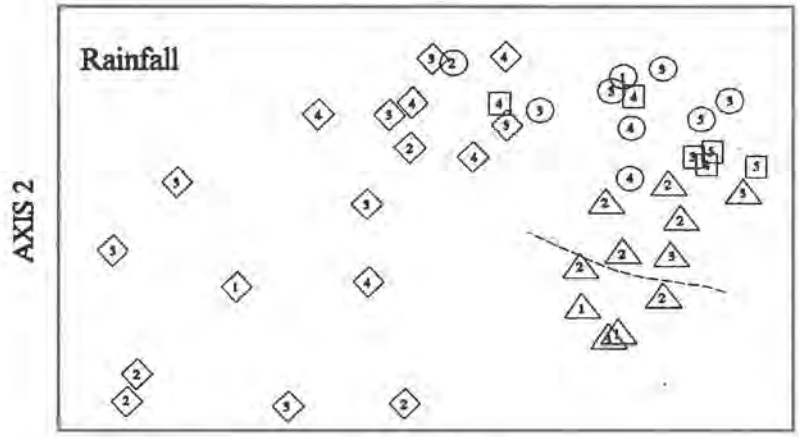


Figure 7. Ordination diagram of 43 floristic groups/subgroups. Symbols indicate super groups to which they belong (squares - super group 1; diamonds - super group 2: circles - super group 3: triangles - super group 4). In super group 4 Quindalup sites fall below the dotted line.





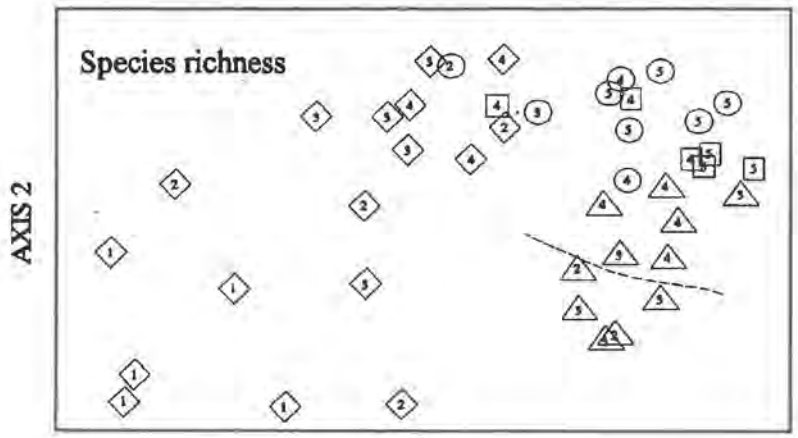


Figure 8. Ordination diagrams of 43 floristic groups/subgroups showing slope, rainfall, species richness, weed frequency, and vegetation condition on a five point scale. (Slope - flat to steep; rainfall, species richness, and weed frequency - low to high; vegetation condition - least disturbed to most disturbed).

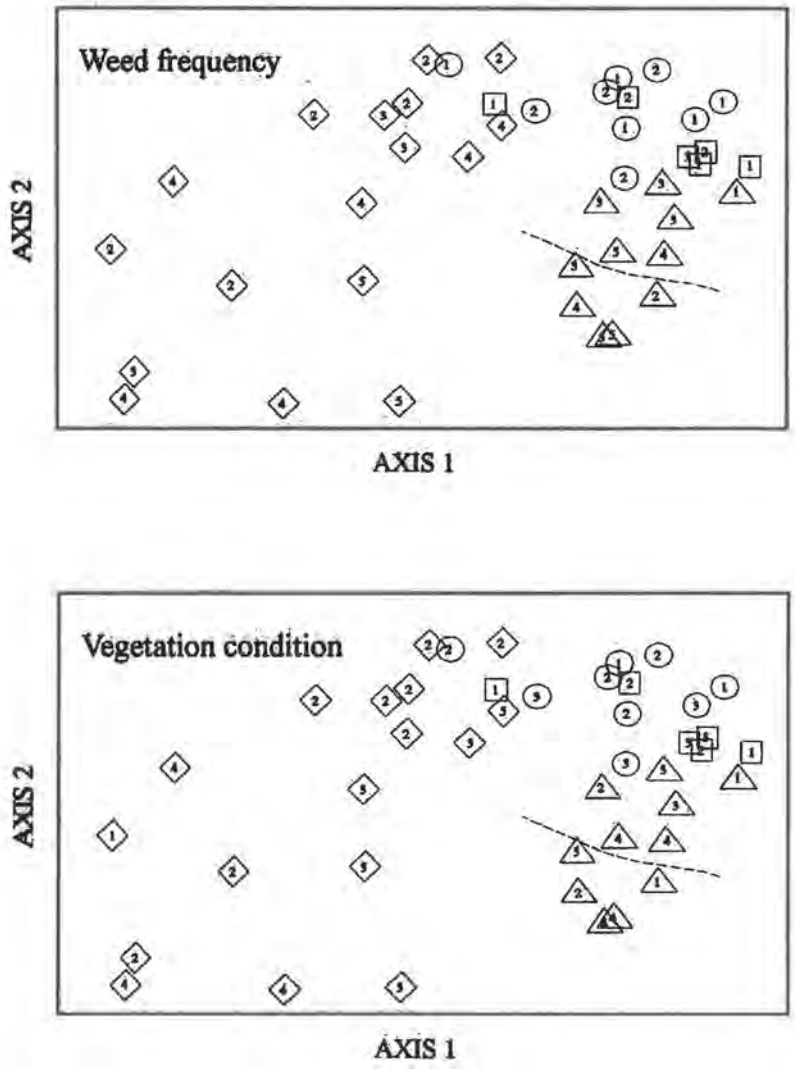


Figure 8 (cont.). Ordination diagrams of 43 floristic groups/subgroups showing slope, rainfall, species richness, weed frequency, and vegetation condition on a five point scale. (Slope - flat to steep; rainfall, species richness, and weed frequency - low to high; vegetation condition - least disturbed to most disturbed).

Table 17. Comparison of structural units with the floristic community types (H = Herbland, S = Sedgeland)

	Forest						Woodland			Mallee						Shrublands																H	S	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
1a			8			3	1		1																										
1b			4	2		4				2																								
2												1														1						1	1	1			
3a						1	1		1	4																						2	1				
3b				2		1	1		2	2																											
3c			1	2			1			3																1				1		1					
4							1		3	4	1												1			1	1	2		1							1
5				1			2		1	4													1	1		1		1	1	2							
6				1		2					2															2		1		1							
7							1	1			6												1			1	2			1	3		1			1	
8						2		1															1		1	3				3	1	3		3		1	2
9							1																	1		1	1	1	1	1				1			
10a																								1		1		2		1		1		1		1	
10b																								1						3	1			3	1		
11		2		1	1	1		4	1		1													1						1						
12																							1				2	1	1								
13		1			1				1			1												1						1	1	1		1			
14							1			1																											
15					1	1			1														1														
16					1	1																			1			1									
17	1	1		1	4	1																															
18																																			1	1		
19									1																												1
20a					2			2	1		2																										
20b					1			4			3	1																									
20c							1	1			2																			1				1	1	2	
21a	1			5	10		6	12		2	2																		1								
21b				1	2		3	3			3																										
21c				1	6		3	3			1													1													
22								8			2																										
23a					5		1	8	2		3																										
23b					1			11	3		5	1																									
24			1		2		3	4																													
25					2		4			4																											
26a																																					
26b				1	1		2	3																													
27																																					
28				1	10	1	3	13		1	3	3																									
29a		1			1																																
29b												1																									
30a		1	1	1	2			1		1																											
30b		1			3		2			1																											
30c																																					

Table 18. List of formations and structural units recorded for the 509 plots surveyed in the floristic survey of the southern Swan Coastal Plain. Structural units follow Muir (1977). Codes used in Table 17 to compare floristic classification to structural classification.

Structural Formation	Structural Unit	Code
Forest	dense forest	1
	dense low forest A	2
	dense low forest B	3
	forest	4
	low forest A	5
	low forest B	6
Woodland	woodland	7
	low woodland A	8
	low woodland B	9
	open woodland	10
	open low woodland A	11
	open low woodland A	12
	very open low woodland B	13
Mallee	tree mallee	14
	open tree mallee	15
	dense shrub mallee	16
	shrub mallee	17
	open shrub mallee	18
	very open scrub mallee	19
Shrubland	dense thicket	20
	dense heath A	21
	dense heath B	22
	dense low heath C	23
	dense low heath D	24
	thicket	25
	heath A	26
	heath B	27
	low heath C	28
	low heath D	29
	scrub	30
	low scrub A	31
	low scrub B	32
	dwarf scrub C	33
	dwarf scrub D	34
	open scrub	35
	open low scrub A	36
	open low scrub B	37
Herbland	herbs	38
	open herbs	39
Sedgeland	dense low sedges	40
	low sedges	41

COMMUNITY RESERVATION AND CONSERVATION STATUS

Presumed destroyed community types

Several community types appear to have been totally destroyed in the study area over the last 100 years. It is difficult to know exactly what has been lost however in several case the remaining native species or early botanical accounts indicate total community loss. For example, Gozzard (1982b) maps a small area of Muchea limestone (Qpm) as occurring in the Bullsbrook area. A careful search found no significant remnant vegetation on public lands. The few native species still occurring on this geology suggests it supported a significantly different community type than anything found on other remnants in this area today. It appears that the community may have been dominated by a suckering form of *Acacia saligna*. All occurrences of this geology on private lands appear to have been mined or converted to pasture or both.

Table 19. The 27 vegetation complexes mapped by Heddle et al. *(1980) on the southern Swan Coastal Plain.*

Code	Vegetation Complex
For	Forrestfield Complex
Abba	Abba Complex
Guild	Guildford Complex
Swan	Swan Complex
Dard	Dardanup Complex
Serp	Serpentine River Complex
Beer	Beermullah Complex
Yang	Yanga Complex
Cann	Cannington Complex
Sth R	Southern River Complex
Bass N	Bassendean Complex - North
Bass CS	Bassendean Complex - Central and South
Bass NT	Bassendean Complex - North Transition
Bass CST	Bassendean Complex - Central and South Transition
Karr N	Karrakatta Complex - North
Karr NT	Karrakatta Complex - North Transition
Karr CS	Karrakatta Complex - Central and South
Cott N	Cottesloe Complex - North
Cott CS	Cottesloe Complex - Central and South
Herd	Herdsman Complex
Quin	Quindalup Complex
Yoon	Yoongarillup Complex
Vass	Vasse Complex
Reg	Regan Complex
King	Kingia Complex
Jarr	Jarrahwood Complex
Cart	Cartis Complex

Another example is the extensive alluvial flats between Thomas Rd and the Serpentine River where large areas of the improved pasture are dominated by *Casuarina obesa*. It is likely that this community was related to type 7 but had significantly different species composition. Speck (1952) briefly comments on this community which had been almost totally converted by the time of his study. No extant remnants of these *C. obesa* woodlands are known.

Table 20. Comparison of vegetation complexes recognised by Heddle et al. *(1980) with the floristic classification from the present study.*

	RHS	PINJARRA PLAIN								BASSENDEAN				SPEARWOOD						QUI			WHICHER SCARP			
Community type	For	Abba	Guild	Swan	Dard	Serp	Beer	Yang	Cann	Sth R.	Bass N	Bass CS	Bass NT	Bass CST	Karr N	Karr NT	Karr CS	Cott N	Cott CS	Herd	Quin	Yoon	Vass	Reg	King	Jarr	Cart
1a		1																							2	1	4
1b		1								1																	
2																											
3a	3		10																								
3b	1		5						1																		
3c	3		7																								
4									1	6	1	5		1													
5							2				1	6		1						2			3				
6			5					4																			
7		1	1				2	5			1												5				
8	2		16			1				2																	
9		1	3			3											1										
10a			2						3	1																	
10b		5																									
11					1		1	1				6					1			1			2				
12										4		1															
13		1	2			1				1	1	1							1	1							
14											1							1									
15							1	2															1				
16												1							1								
17																	1		1		4		1				
18																							2				
19																					3						
20a										3							4										
20b	2		7																								
20c	6		3																								
21a			2	1					4	7	1	10		1			10		2			1					
21b		3								2							1								1		4
21c			1		1			2		3		7				1	1										
22											4	2	1	1				3									
23a			2				1				3	12	1														
23b											14		2		1	2			2								
24												1					1		20		3						
25												1					7		1				2				
26a															1			7	3								
26b															2			10	3		2	2					
27																			1			6					
28							2				1	2			2		8	8	12					3			
29a																			3		5	1					
29b																			1		11	1					
30a																			2		5						
30b																					5	1					
30c												2									1						

A restricted community not sampled in this survey

An undescribed northern ironstone community is known to occur on private land in the GinGin area. Roadside occurrences of this community type were so badly disturbed as to preclude sampling. Major differences in community composition between this community type and the southern ironstone community (type 10b) were the much greater dominance of annual Asteraceae and absence of the southern endemic ironstone taxa. This community is totally unreserved, apparently very restricted and would be classed as critically threatened. The private land on which this community occurs is grazed. Some of the ironstone soils have been converted to improved pasture.

Analysis of reservation and conservation status of the 30 community types

For the purposes of this analysis a community is considered well reserved if it occurs in two widely separated National Parks and / or Nature Reserves. If a community is known from only one National Park or Nature Reserve it is considered poorly reserved (since it is susceptible to catastrophe) and unreserved if it is not known from any National Park or Nature Reserve. Other land categories are useful additions to conservation estate (such as local government reserves for conservation of flora) but do not carry the legislative protection of National Parks and Nature Reserves in security of tenure and purpose.

The obvious limitation of this approach is that no estimate of the actual area of the community in the National Park or Nature Reserve has been determined. This was beyond the scope of the present study. Furthermore, many of the Nature Reserves on the eastern side of the plain are small remnants. As a result some communities which are classified as well reserved may in fact be represented by only two small remnants. Further detailed analysis of reservation status will be needed for those communities only known from these small Nature Reserves.

In all the floristic analysis recognised 43 community types or subtypes. Ten of these are unreserved, and a further 10 are only known from a single National Park or Nature Reserve (Table 22). Analysis of lands and geomorphological data has shown most Ridge Hill Shelf and Pinjarra Plain (fluviatile deposits) have had more than 90% of their original vegetation cleared. Only two of the 13 units have been less severely impacted (A.H. Burbidge and J.K. Rolfe, unpublished). The most severely impacted units were 99.4% cleared (Guildford and Swan units). These data were used to indicate which of the floristic units are likely to have suffered major range contractions (Table 23). In addition to communities which have been almost totally cleared for agriculture and other purposes there are naturally rare community types. These communities are generally restricted to uncommon geological or geomorphological units. Seven such communities are recognised and a further three may fall into this category.

Using these data and an assessment of future potential threat, communities were allocated to one of seven community conservation status categories (Table 21). Allocation to a category is likely to change in time due to further survey or further alienation in much the same way as CALM's species priority list changes through time as better information becomes available.

The shrublands on southern ironstones (community type 10b) are considered to be critically endangered. This community type is not presently reserved. These ironstones are regionally rare and have been massively impacted by agriculture clearance (Tille and Lantzke 1990). It is also a very species rich community type and has a number of endemic taxa some of which are Declared Rare Flora (DRF) under the Wildlife Conservation Act (*Chamelaucium erythrochlorum* Ms, and *Chamelaucium roycei* Ms) or are proposed for declaration (*Brachysema modesta* (sp. Treeton BJK & NG 001), *Brachysema papilio* (sp. Williamson GJK 12719), *Darwinia* sp. (Williamson Rd GJK 12717), *Dryandra* aff. *nivea* (GJK 6622), *Dryandra* sp. *30* (aff. *squarrosa* ASG 11657), *Grevillea elongata, Hakea varia* (Yellow flowered ironstone form BJK & NG 226), and *Petrophile latericola* Ms) (Tables 3, 6).

Two further community types are considered endangered. These are the sedgelands in Holocene dune swales (community type 19) and *Banksia attenuata* woodlands over species rich dense shrublands (community type 20a). The former community type is very restricted and has only been recorded from

the Becher Point (M106) and Lake Walyungup (M103) areas. Both are in proposed conservation areas but this area has a rapidly expanding urban population and is presently the subject of major planning amendment to the Metropolitan Regional Scheme. The area is also being considered for a Rapid Transport Corridor (Bowman, Bishaw and Gorham, and Department of Planning and Urban Development 1994).

Community type 20a is also regionally rare. It is a very species rich *Banksia* woodland occurring over restricted areas to the north and east of Perth on two different land systems. It was recorded at Koondoola open space, Landsdale Rd, remaining section of M12 (a small reserve near Marangaroo Golf course), M 53 (Reserve C29880, Forrestfield), and the APB complex at Forrestfield.

All of these areas have been proposed as conservation reserves. The APB land has had conservation of flora recognised in its purpose (P. Keppel, pers. comm.) and Koondoola Open Space has been zoned for Regional Open Space. Marangaroo Open Space is recognised as a conservation area by the Wanneroo Council but more than 60% of the original M12 (System 6) recommendation has been developed as a golf course and some remaining parts of this reserve appear badly infected by dieback. There are a variety of development proposals for M53 and some parts of this reserve have been alienated for the Roe highway and other road realignments. Future use of the Landsdale Rd bushland is presently being decided.

A further 15 community types are considered vulnerable (11 because they are the remaining fragments of previously extensive communities) and 11 are considered susceptible should any change in management or land use occur. Twelve communities are considered at low risk from any threat and two communities are not able to be assessed due to insufficient information.

Table 21. Definition of community conservation status (after Department of Conservation and Land Management, unpubl.).

Community conservation status	Definition
Presumed destroyed	A community that is totally destroyed or so extensively modified that it is unlikely to re-establish ecosystem processes in the foreseeable future.
Critical	A community with most or all of its known occurrences facing severe modification or destruction in the immediate future.
Endangered	A community in danger of severe modification or destruction throughout its range, if causal factors continue operating.
Vulnerable	A community likely to move into the endangered category in the near future if the causal factors continue operating.
Susceptible	A community of concern because there is evidence that it can be modified or destroyed by human activities, or would be vulnerable to new threatening process.
Low risk	A community that does not qualify for one of the above categories.
Insufficiently known	A community for which there is inadequate data to assign to one of the above categories

Suggested improvements to reservation and conservation of floristic community types

There is an urgent need to adequately protect the three most threatened community types, all of which are presently unreserved. These three communities are only known from small remnants. To adequately protect these communities these remnants should be declared as A class Nature Reserves for the protection of flora and fauna.

Southern ironstone communities (type 10b): This community type is known from five small areas of State Forest and a road and drain reserve east of Ruabon Nature Reserve (Figure 9c). This road and drain reserve is also of regional significance as it is the last remaining continuous vegetated transect across the lower Swan Coastal Plain showing the catena of original vegetation types. Several species of DRF or proposed DRF are found along this reserve. Immediate steps should be taken to have the vesting and purpose of these areas changed. Our survey has shown that even quite small remnants can maintain themselves in very good condition for long periods of time without disturbance. All forms of disturbance should be excluded from these critical threatened remnants until we have a much better understanding of community function.

Table 22. Present reservation and conservation status of the floristic communities on the southern Swan Coastal Plain. Numbers refer to the number of plots located in each community - tenure class, not number of individual reserves.

Type	Nature Res.	Nat. Park	State Forest	Local Govt	Federal	Crown Land	VCL	Road Res.	Private
1a			10	2				1	
1b	2			5		4		1	
2	1			3		1			
3a				7		4		2	
3b	3		2	3					
3c	1			5	1	3			
4	5		3	4		1	1	1	1
5	6		2			3	1		3
6	8				1				
7	10			3		2		3	
8	9			3		4		5	
9	3			3		1		1	
10a	5			2		1			
10b			6					3	
11	5					2		1	5
12	5								
13	4			1		3	1		
14			1				1		
15	3			1					
16	2			2					
17	2	1				5			
18	2								
19						1	2		
20a				1		6			
20b	6		1	2					
20c				9					
21a	14		5	4		9	2		5
21b	4		5	1		2			
21c	6			1		2	1		6
22	1		8	1			1		
23a	6		4	4		4			1
23b			13	1			7		
24	1	5		10		9			
25	1		6			4			
26a			8	3					
26b	5	1	12				1		
27	4	2		1					
28	7	7	10	5		7	2		
29a		1		4	1		3		
29b		3		1			9		
30a	2			2	3				
30b	2	5	1						
30c				2			1		

□

Table 23. Community reservation and conservation status on the southern Swan Coastal Plain. A community is considered well reserved if known from at least two National Parks or Nature Reserves, poorly reserved if known from only one National Park or Nature Reserve and unreserved if it was not recorded from a National Park or Nature Reserve. Communities likely to have been > 90% cleared are indicated as are naturally rare communities.

Type	Reservation status	Range contraction likely to be > 90%	Regionally rare	Conservation status
1a	Unreserved			Susceptible
1b	Well reserved	Yes		Vulnerable
2	Poorly reserved	Yes	? Yes	Vulnerable
3a	Unreserved	Yes		Vulnerable
3b	Well reserved	Yes		Vulnerable
3c	Poorly reserved	Yes		Vulnerable
4	Well reserved			Low risk
5	Well reserved			Low risk
6	Well reserved			Low risk
7	Well reserved	Yes		Vulnerable
8	Well reserved	Yes		Vulnerable
9	Well reserved	Yes		Vulnerable
10a	Well reserved	Yes		Vulnerable
10b	Unreserved	Yes	Yes	Critical
11	Well reserved			Low risk
12	Well reserved			Low risk
13	Well reserved			Low risk
14	Unreserved	?	?	Insufficiently known
15	Well reserved	Yes	? Yes	Vulnerable
16	Poorly reserved	Yes		Vulnerable
17	Well reserved			Low risk
18	Poorly reserved		Yes	Vulnerable
19	Unreserved		Yes	Endangered
20a	Unreserved		Yes	Endangered
20b	Poorly reserved	Yes	Yes	Vulnerable
20c	Unreserved		Yes	Vulnerable
21a	Well reserved			Low risk
21b	Well reserved	?		Susceptible
21c	Well reserved			Susceptible
22	Poorly reserved			Susceptible
23a	Well reserved			Low risk
23b	Unreserved			Susceptible
24	Well reserved			Susceptible
25	Poorly reserved			Susceptible
26a	Unreserved			Susceptible
26b	Well reserved			Low risk
27	Well reserved		Yes	Low risk
28	Well reserved			Low risk
29a	Poorly reserved			Susceptible
29b	Poorly reserved			Susceptible
30a	Poorly reserved		Yes	Vulnerable
30b	Well reserved	? yes		Susceptible
30c	Unreserved			Insufficiently known

Community type 19 (sedgeland in Holocene dune swales): This community type is only known from small linear wetlands in the Point Becher area (M106) and north west corner of Lake Walyungup (M103) (Figure 9b). Both of these areas are in proposed conservation areas. These reserves should be gazetted as A class Nature Reserves for conservation of flora and fauna. This endangered community type is very restricted and presently at risk from urban and infrastructure developments.

The eastern *Banksia attenuata* woodlands over species rich dense shrublands (type 20a): This community type is also considered endangered. It is also very restricted being recorded in this survey from only seven quadrats. This community is found at Koondoola open space, Landsdale Rd, M12 (a small reserve near Marangaroo Golf Course), M 53 (another System 6 recommendation), and the Agricultural Protection Board (APB) complex at Forrestfield. Koondoola, M12 and M 53 are proposed conservation reserves. The APB reserve has recently had the conservation of flora inserted into its purpose. All the other small remnants should be declared as A class Nature Reserves for the conservation of flora and fauna (Figure 9a). Urgent investigation of areas apparently affected by dieback at M12 need to be undertaken with implementation of any necessary control action.

Another area that should be vested as a Nature Reserve for the conservation of flora and fauna as a matter of priority is the road and drain reserve along Mundijong Rd (Figure 9b). Like the road east of Ruabon Nature Reserve this linear remnant covers the full catena of vegetation types across the alluvial soils of the coastal plain west of Mundijong. These two linear remnants are therefore of both regional and national significance depicting the vegetation sequences that elsewhere have been reduced to fragments or totally cleared. Road verges have long been considered important for conservation. The EPA (1976) has stated that it is of the opinion that all road verges should be protected. The regional importance of these two reserves require formal vesting for conservation purposes.

For the other 16 community types that are unreserved or poorly reserved a range of reservation strategies are possible to improve their reservation status. To locate reserves optimally, both species and community reservation status need to be considered. Species reservation data are presently being gathered in a concurrent project (G.J. Keighery, unpublished data). In a future report these data sets will be combined to allow an optimal reservation strategy to be developed. Table 24 shows possible areas for reservation that would improve the present reservation status of the remaining unreserved or poorly reserved community types.

It should be noted that many of the possible areas are already proposed National Parks, Nature Reserves or EPA red book recommendations or are presently being managed for conservation as one of their primary aims (eg. Garden Island, Ambergate Reserve, Trigg Reserve, Brickwood Reserve, Brixton Street). However their present vesting does not give them maximum protection under WA legislation. This table highlights the very high conservation values of these areas.

It is also of note that while a community type is reserved in two or more National Parks or Nature Reserves it can still be considered vulnerable. This is because of the almost total clearance of these vegetation types and small size of the remaining remnants. Their size makes them particularly vulnerable to disturbance and to invasion by weeds. Our results are consistent with the earlier work of Keighery and Trudgen (1992) who found all remnants on the alluvial soils which had their basic structure intact or were able to regenerate had significant flora conservation values regardless of the remnant's size. Our data strongly supports this conclusion and we would consider any such remnant on the alluvial soils on the Swan Coastal Plain to be of high conservation value.

The results reported above relate to a survey of largely public lands on the coastal plain between Seabird and Dunsborough. Several community types were not sampled in detail due to time or access limitations. More detailed study of the Quindalup system (including foredune and beach communities), estuarine and riverine types are needed before a comprehensive understanding of conservation and reservation of all community types is achieved for this section of the coastal plain (but see Griffin 1993 for assessment of conservation status of Quindalups in the northern half of our study area). How well our sampling covers plant communities on private lands also needs to be assessed.

Table 24. Possible areas for reservation to improve community conservation status for the 15 non critical or endangered community types on the southern Swan Coastal Plain.

Type	Reservation status	Possible areas for conservation reserves.
1a	Unreserved	Areas of State Forest along base of Whicher Range, Payne Road Reserve
3a	Unreserved	Brixton Street, Brickwood Reserve, Mundijong Rd, C53, Lambert Lane
14	Unreserved	M5, Proposed Ridges extension to Yanchep N.P. (M4)
20c	Unreserved	Talbot Rd Reserve
23b	Unreserved	M5, Gnangara Water Reserve, Proposed Melaleuca Park NR (M9), Proposed Ridges extension to Yanchep N.P (M4), Lake Muckenburra Reserve, VCL north of M5
26a	Unreserved	Lake Clifton townsite, Proposed Caraban NR (C12), Proposed extensions Yeal Swamp NR (M5), Proposed Ridges extension to Yanchep N.P (M4), Shire View Hill
30c	Unreserved	VCL south of Seabird (part EPA recommendation 5.24), Mt Henry Reserve (M66)
2	Poorly reserved	Ambergate Reserve, Yoongarillup Water Reserve
16	Poorly reserved	No other saline flats known, saline heaths and estuarine vegetation poorly sampled.
18	Poorly reserved	No other remnants on calcareous silts known
20b	Poorly reserved	Burnside Road, extensions to Yarloop NP, Brickwood Reserve
22	Poorly reserved	Proposed extensions Yeal Swamp NR (M5), Proposed Ridges extension to Yanchep N.P (M4), Proposed Melaleuca Park NR (M9), Gnangara Water Reserve
25	Poorly reserved	Paganoni area, C71, Lyons block (C57), Stirling block, Treasure block (C56)
29a	Poorly reserved	VCL south of Seabird (part EPA recommendation 5.24), M91, Trigg reserve (M36), Garden Is (M96), Burns Beach reserve (part M1)
29b	Poorly reserved	VCL south of Seabird (part EPA recommendation 5.24), Port Kennedy (M106), VCL west of Proposed Caraban NR
30a	Poorly reserved	Garden Is (M96), Peppermint Grove Reserve (M54)

What has been presented in this report is a regional overview of the floristic communities. Communities can be defined at a variety of scales depending on what questions are being asked. Undoubtedly finer subdivisions of our community types will be made in the future as these communities are studied in more detail. As more detailed information becomes available the classification will be refined. Seasonal wetlands are currently the most heterogeneous group and deserve more attention.

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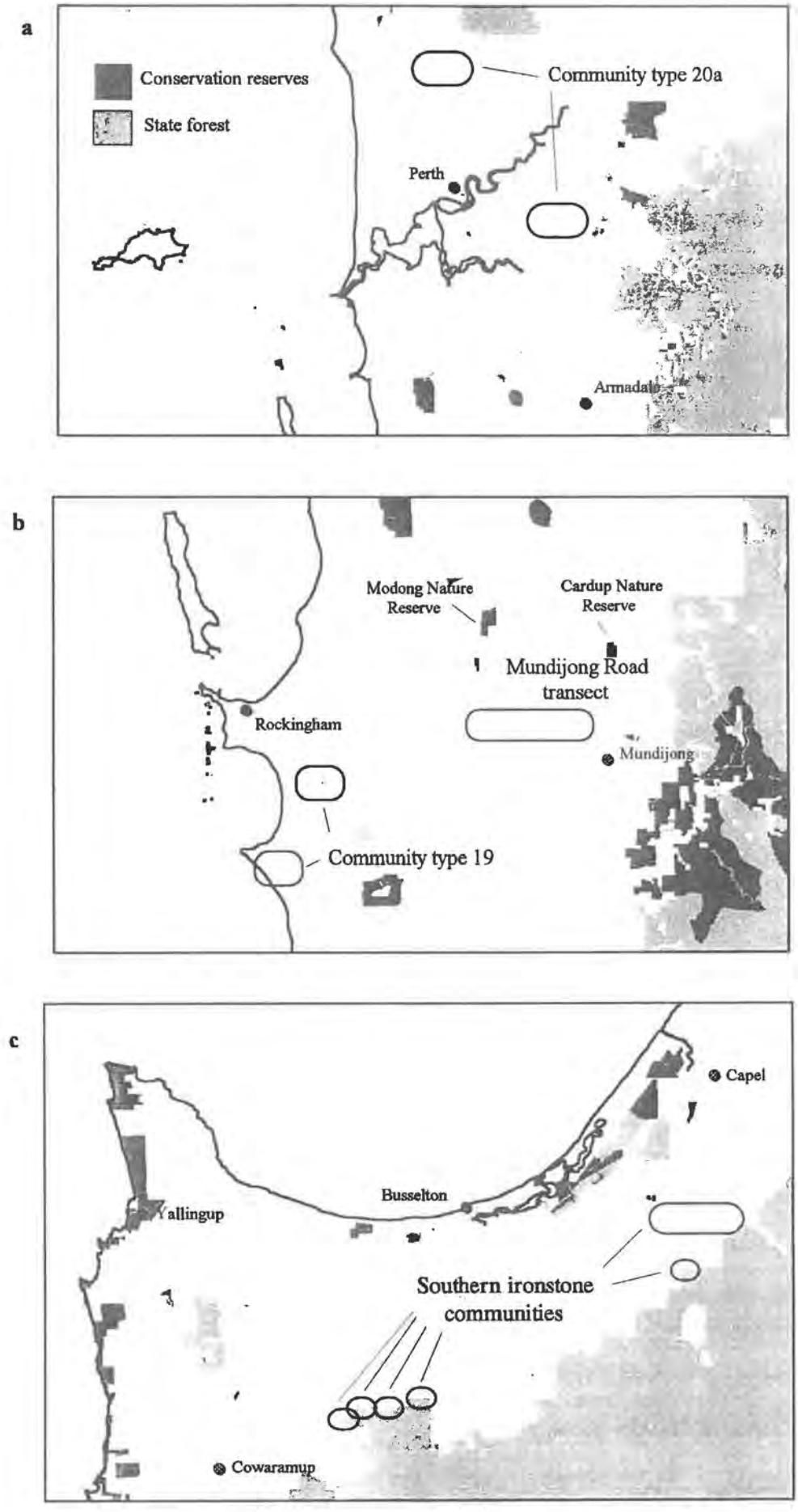

Figure 9. General areas (circled) containing parcels of land recommended for reservation to protect critically threatened and endangered community types and the Mundijong Road vegetation transect.

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Appendix 1

The following maps show the distribution of the community types delineated during the survey. Accompanying each map is a description of each community.

Typical and common taxa

Typical taxa occur with a frequency of >75%, while taxa listed as common occur with frequencies between 50 and 75%.

Reservation status

Well reserved	known from two or more A class National Parks or Nature Reserves
Poorly reserved	known from a single A class National Park or Nature Reserve
Unreserved	not known to occur in any A class National Park or Nature Reserve

Conservation status (CALM unpublished)

Presumed destroyed	A community that is totally destroyed or so extensively modified that it is unlikely to re-establish ecosystem processes in the foreseeable future.
Critical	A community with most or all of its known occurrences facing severe modification or destruction in the immediate future.
Endangered	A community in danger of severe modification or destruction throughout its range, if causal factors continue operating.
Vulnerable	A community likely to move into the endangered category in the near future if the causal factors continue operating.
Susceptible	A community of concern because there is evidence that it can be modified or destroyed by human activities, or would be vulnerable to new threatening process.
Low risk	A community that does not qualify for one of the above categories.
Insufficiently known	A community for which there is inadequate data to assign to one of the above categories

Structural units

Units follow Muir (1977) and indicate the range of structural units these communities are known from.

Community type: 1a

***Eucalyptus haemotoxylon - E. marginata* woodlands on Whicher foothills**

Reservation Status: Unreserved
Conservation Status: Susceptible

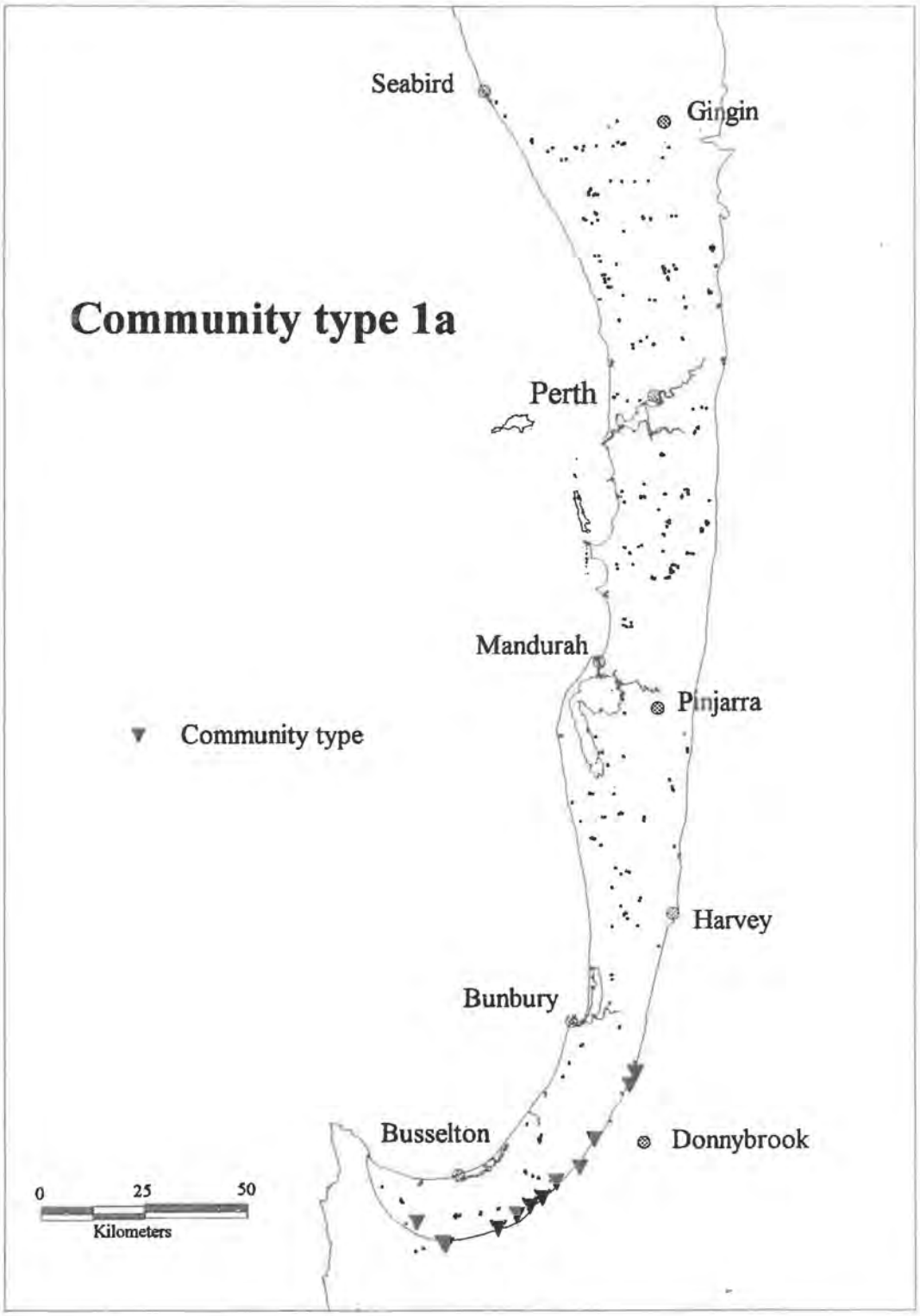
Typical Species:

Trees	Shrubs	Herbs
Eucalyptus marginata	*Dryandra nivea*	*Amphipogon amphipogonoides*
	Gompholobium knightianum	*Dampiera linearis*
	Hibbertia hypericoides	*Lepidosperma angustatum*
		Lomandra sericea
		Loxocarya fasciculata
		Patersonia umbrosa forma *xanthina*
		Tetraria octandra

Other common species:

Trees	Shrubs	Herbs
Eucalyptus haematoxylon	*Billardiera variifolia*	*Agrostocrinum scabrum*
Xylomelum occidentale	*Gompholobium confertum*	*Burchardia umbellata*
	Gompholobium polymorphum	*Chamaescilla corymbosa*
	Hakea amplexicaulis	*Conostylis setigera*
	Hakea cyclocarpa	*Eriochilus dilatatus*
	Hibbertia amplexicaulis	*Lomandra hermaphrodita*
	Hovea chorizemifolia	*Patersonia occidentalis*
	Hypocalymma robustum	*Pentapeltis peltigera*
	Isopogon sphaerocephalus	*Stylidium amoenum*
	Logania serpyllifolia	
	Scaevola calliptera	
	Xanthorrhoea gracilis	
	Xanthorrhoea preissii	

Mean species richness:	67.6	**Structural units**
Mean weed frequency:	0.3	forest woodland
Mean vegetation condition:	1.7	low woodland A open woodland
Number of quadrats:	13	


Seabird
Gingin
Community type 1a
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 1b

Southern *Eucalyptus calophylla* woodlands on heavy soils

Reservation Status: Well reserved
Conservation Status: Vulnerable

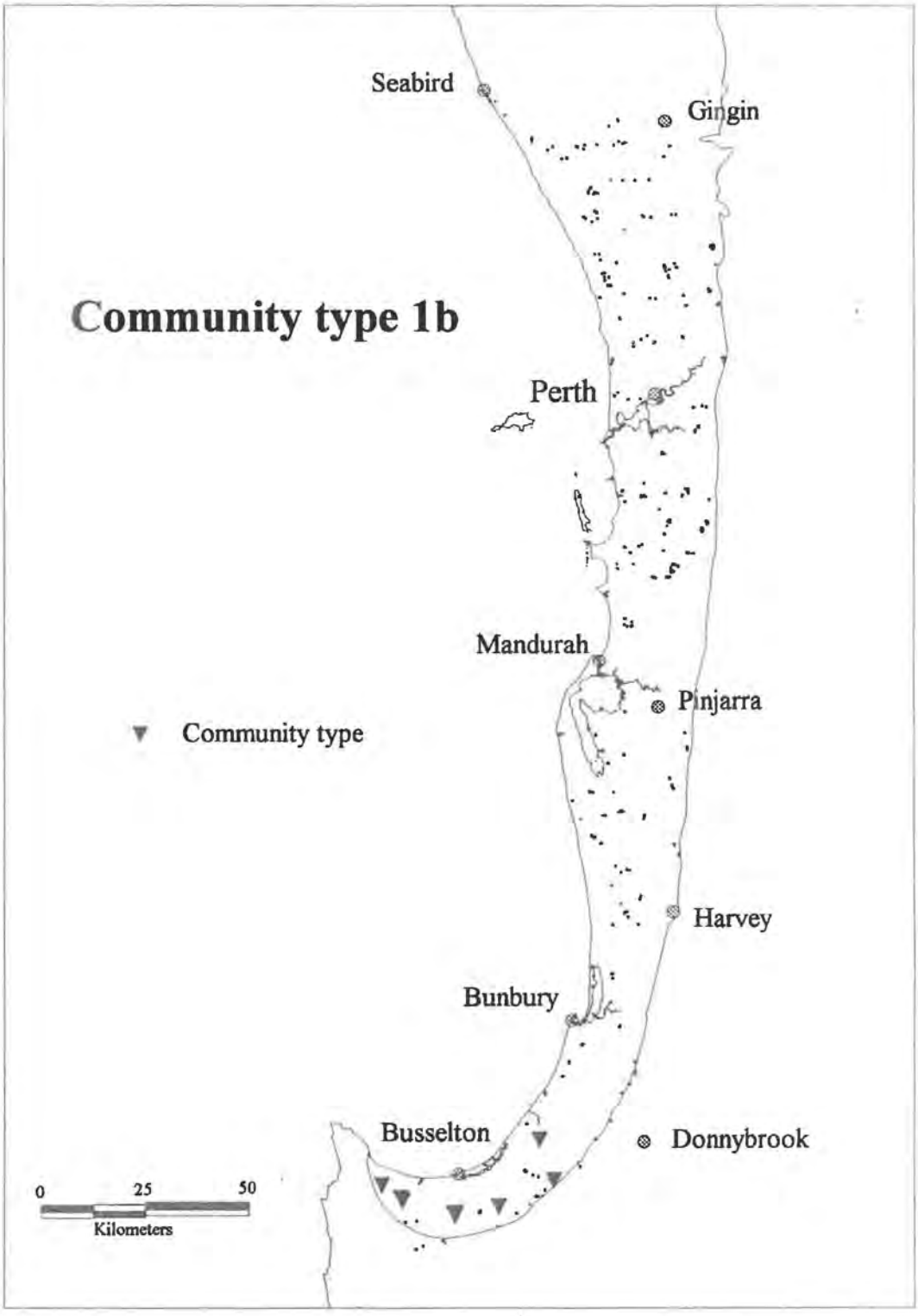
Typical Species:

Trees	Shrubs	Herbs
Eucalyptus calophylla	*Acacia extensa*	*Dampiera linearis*
Eucalyptus marginata	*Gompholobium polymorphum*	* *Hypochaeris glabra*
	Hibbertia hypericoides	*Lepidosperma angustatum*
	Hypocalymma angustifolium	*Lomandra hermaphrodita*
	Scaevola calliptera	*Loxocarya fasciculata*
	Xanthorrhoea preissii	*Mesomelaena tetragona*
		Stipa semibarbata/campylachne
		Tetraria octandra

Other common species:

Trees	Shrubs	Herbs
	Acacia pulchella	*Agrostocrinum scabrum*
	Adenanthos obovatus	*Burchardia umbellata*
	Billardiera variifolia	*Caesia micrantha*
	Dryandra nivea	*Chamaescilla corymbosa*
	Eriostemon spicatus	*Drosera menziesii* subsp. *penicillaris*
	Hovea trisperma	*Hypolaena exsulca*
	Kingia australis	*Lagenifera huegelii*
		Lomandra purpurea
		Lomandra sericea
		Opercularia apiciflora
		Patersonia umbrosa forma *xanthina*
		Tetrarrhena laevis
		Thysanotus manglesianus /patersonii complex
		Xanthosia candida
		Xanthosia huegelii

Mean species richness:	**67.8**	**Structural units**
Mean weed frequency:	**2.4**	forest low forest A
Mean vegetation condition:	**2**	woodland open low woodland A
Number of quadrats:	**12**	


Seabird
Gingin
Community type 1b
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 2

Southern wet shrublands

Reservation Status: Poorly reserved
Conservation Status: Vulnerable

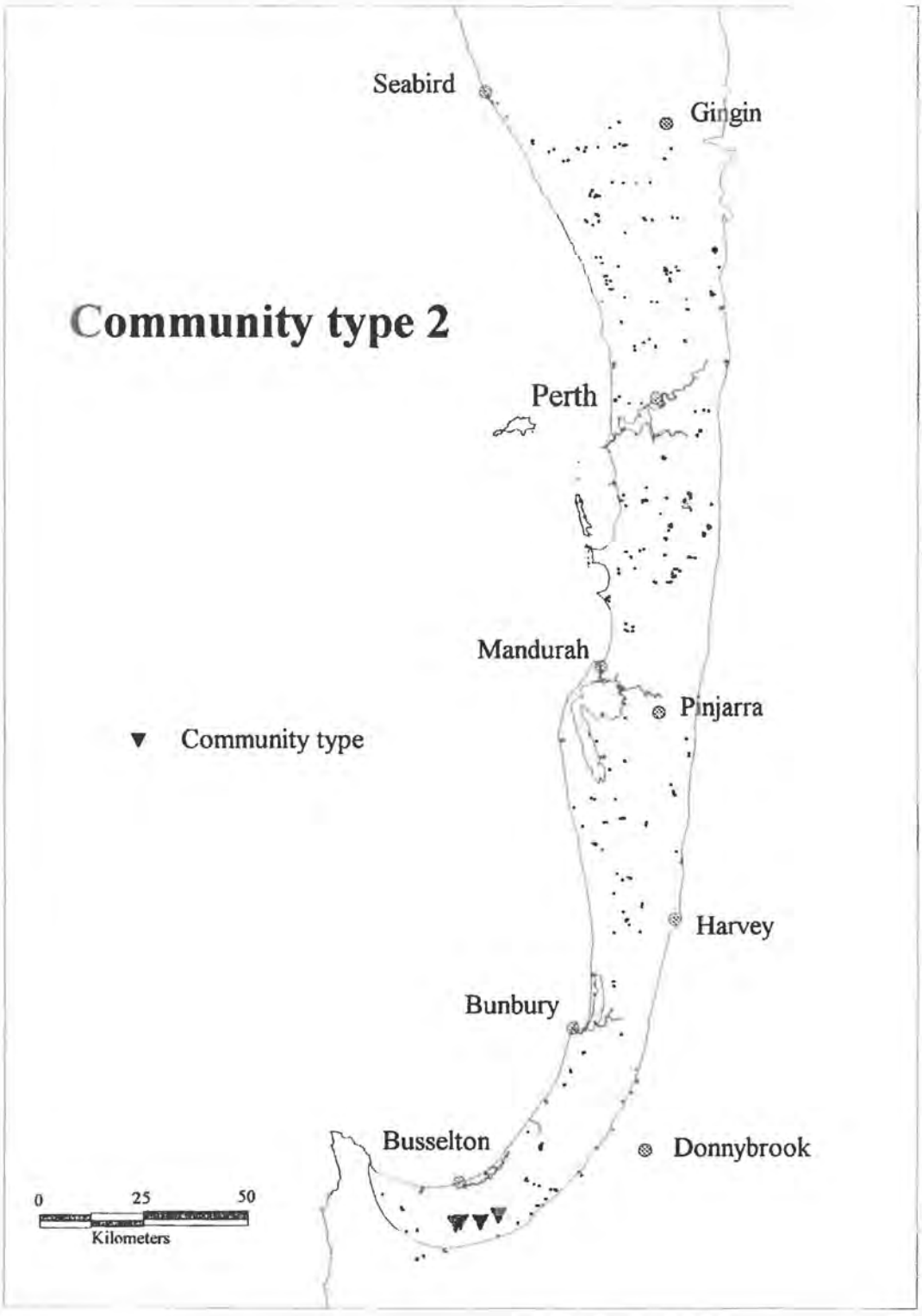
Typical Species:

Trees	Shrubs	Herbs
	Calothamnus lateralis	*Comesperma virgatum*
	Eutaxia virgata	*Dampiera linearis*
	Hakea ceratophylla	*Leptocarpus tenax*
	Hakea varia	*Loxocarya fasciculata*
	Isopogon scaber	*Mesomelaena tetragona*
	Kingia australis	*Stylidium brunonianum*
	Pericalymma ellipticum	*Thysanotus multiflorus*
	Synaphea petiolaris	
	Xanthorrhoea preissii	

Other common species

Trees	Shrubs	Herbs
	Acacia stenoptera	*Agrostocrinum scabrum*
	Astartea aff. *fascicularis*	*Cassytha glabella*
	Boronia spathulata	*Haemodorum sparsiflorum*
	Daviesia preissii	*Hypocalymma angustifolium*
	Dryandra nivea	**Hypochaeris glabra*
	Grevillea brachystylis	*Hypolaena exsulca*
	Hakea sulcata	*Lyginia barbata*
	Hibbertia rhadinopoda	*Thelymitra crinita*
	Kunzea aff. *micrantha* (BJK & NG 040)	
	Stirlingia latifolia	

Mean species richness:	**51**	**Structural units**
Mean weed frequency:	**0.8**	open low woodland B thicket
Mean vegetation condition:	**1.9**	open scrub open low scrub A
Number of quadrats:	**5**	open low scrub B


Community type 2
Seabird
Gingin
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 3a

Eucalyptus calophylla - Kingia australis woodlands on heavy soils

Reservation Status: Unreserved
Conservation Status: Vulnerable

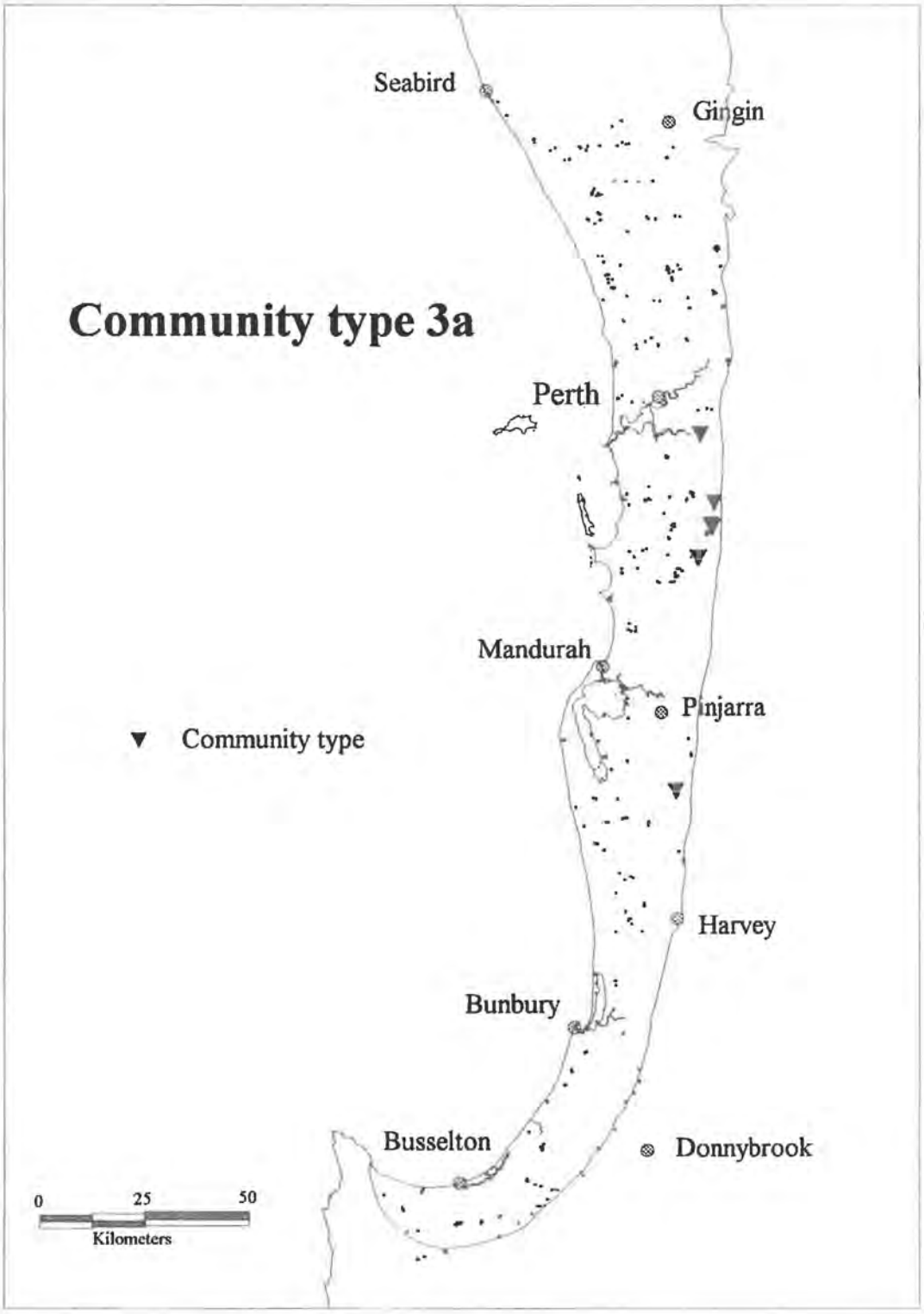
Typical Species:

Trees	Shrubs	Herbs
Eucalyptus calophylla	*Dryandra nivea*	**Briza maxima*
	Eriostemon spicatus	*Cyathochaeta avenacea*
	Kingia australis	*Dampiera linearis*
	Xanthorrhoea preissii	*Haemodorum laxum*
		Loxocarya fasciculata
		Mesomelaena tetragona
		Tetraria octandra

Other common species:

Trees	Shrubs	Herbs
	Goodenia caerulea	*Borya scirpoidea*
	Synaphea petiolaris	*Cassytha glabella*
	Hakea ceratophylla	*Conostylis setigera*
	Pericalymma ellipticum	*Drosera menziesii* subsp. *menziesii*
		**Hypochaeris glabra*
		Hypolaena exsulca
		Neurachne alopecuroidea
		Patersonia occidentalis
		Thysanotus manglesianus /patersonii complex
		Tricoryne elatior
		Xanthosia huegelii

Mean species richness:	**58.9**	**Structural units**
Mean weed frequency:	**3.9**	woodland low woodland A
Mean vegetation condition:	**2**	open woodland open low woodland A
Number of quadrats:	**13**	low heath D low scrub A low scrub B open scrub open low scrub A


Seabird
Gingin
Community type 3a
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 3b

***Eucalyptus calophylla* - *E. marginata* woodlands on sandy clay soils**

Reservation Status: Well reserved
Conservation Status: Vulnerable

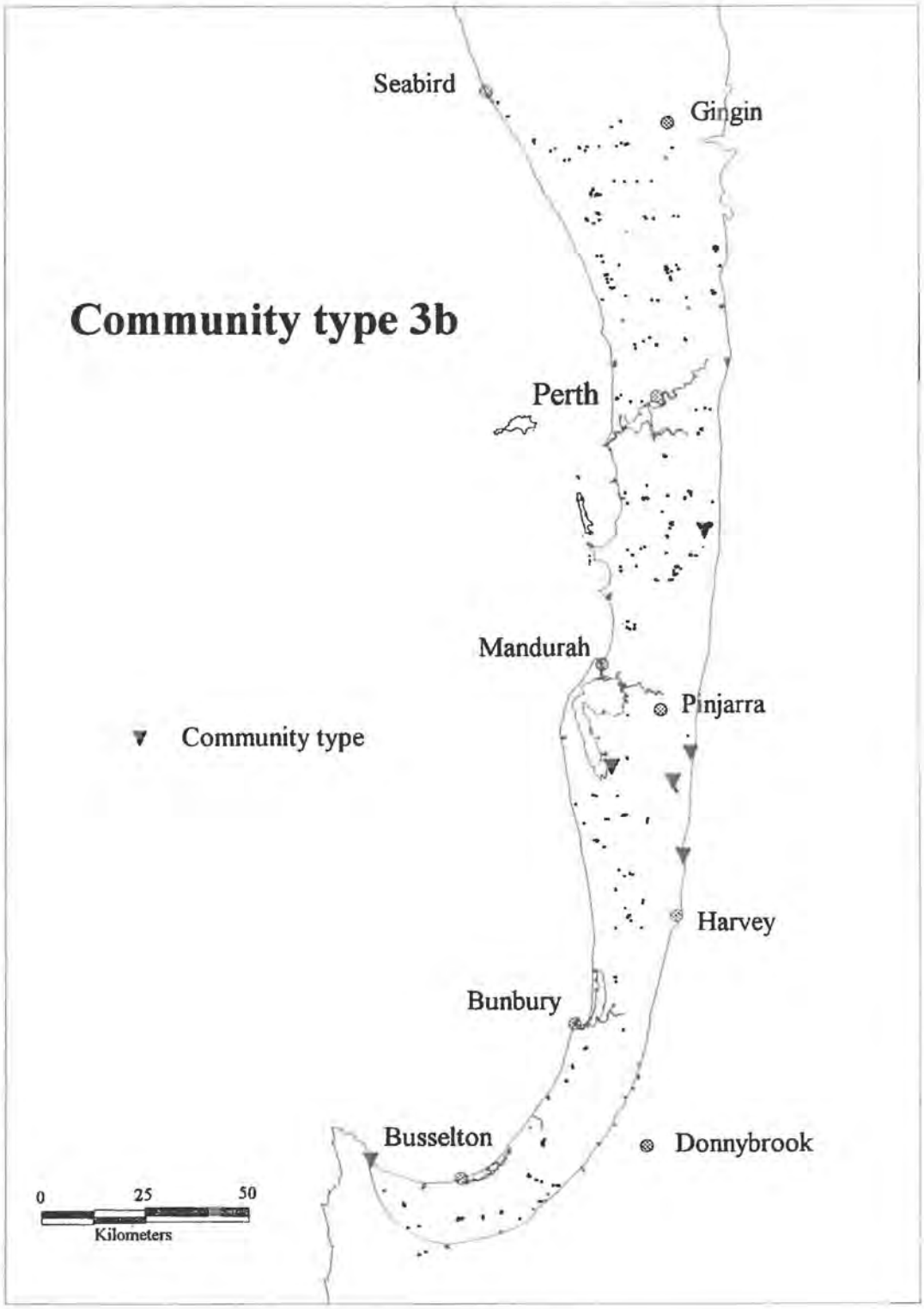
Typical Species:

Trees	Shrubs	Herbs
Eucalyptus calophylla	*Bossiaea eriocarpa*	**Briza maxima*
Eucalyptus marginata	*Dryandra nivea*	**Briza minor*
	Hibbertia hypericoides	*Burchardia umbellata*
	Xanthorrhoea preissii	*Caesia micrantha*
		Chamaescilla corymbosa
		Conostylis juncea
		Drosera erythrorhiza
		Drosera stolonifera
		**Hypochaeris glabra*
		Lepidosperma angustatum
		Lomandra hermaphrodita
		Loxocarya fasciculata
		Mesomelaena tetragona
		Sowerbaea laxiflora
		Tetraria octandra

Other common species:

Trees	Shrubs	Herbs
	Acacia willdenowiana	**Aira caryophyllea*
	Baeckea camphorosmae	*Anigozanthos manglesii*
	Eriostemon spicatus	*Caladenia flava*
	Gompholobium marginatum	*Cyathochaeta avenacea*
	Kennedia prostrata	*Haemodorum laxum*
	Pronaya fraseri	*Homalosciadium homalocarpum*
		Hypolaena exsulca
		Lagenifera huegelii
		Stylidium piliferum
		Thysanotus thyrsoideus
		Xanthosia huegelii

Mean species richness:	**61.2**	**Structural units**
Mean weed frequency:	**5.7**	low forest A woodland
Mean vegetation condition:	**2.4**	low woodland A open woodland
Number of quadrats:	**8**	open low woodland A


Seabird
Gingin
Community type 3b
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 3c

Eucalyptus calophylla - Xanthorrhoea preissii woodlands and shrublands

Reservation Status: Poorly reserved
Conservation Status: Vulnerable

Typical Species:

Trees	Shrubs	Herbs
Eucalyptus calophylla	*Xanthorrhoea preissii*	* *Briza maxima* *Burchardia umbellata* *Cyathochaeta avenacea* *Neurachne alopecuroidea* * *Romulea rosea*

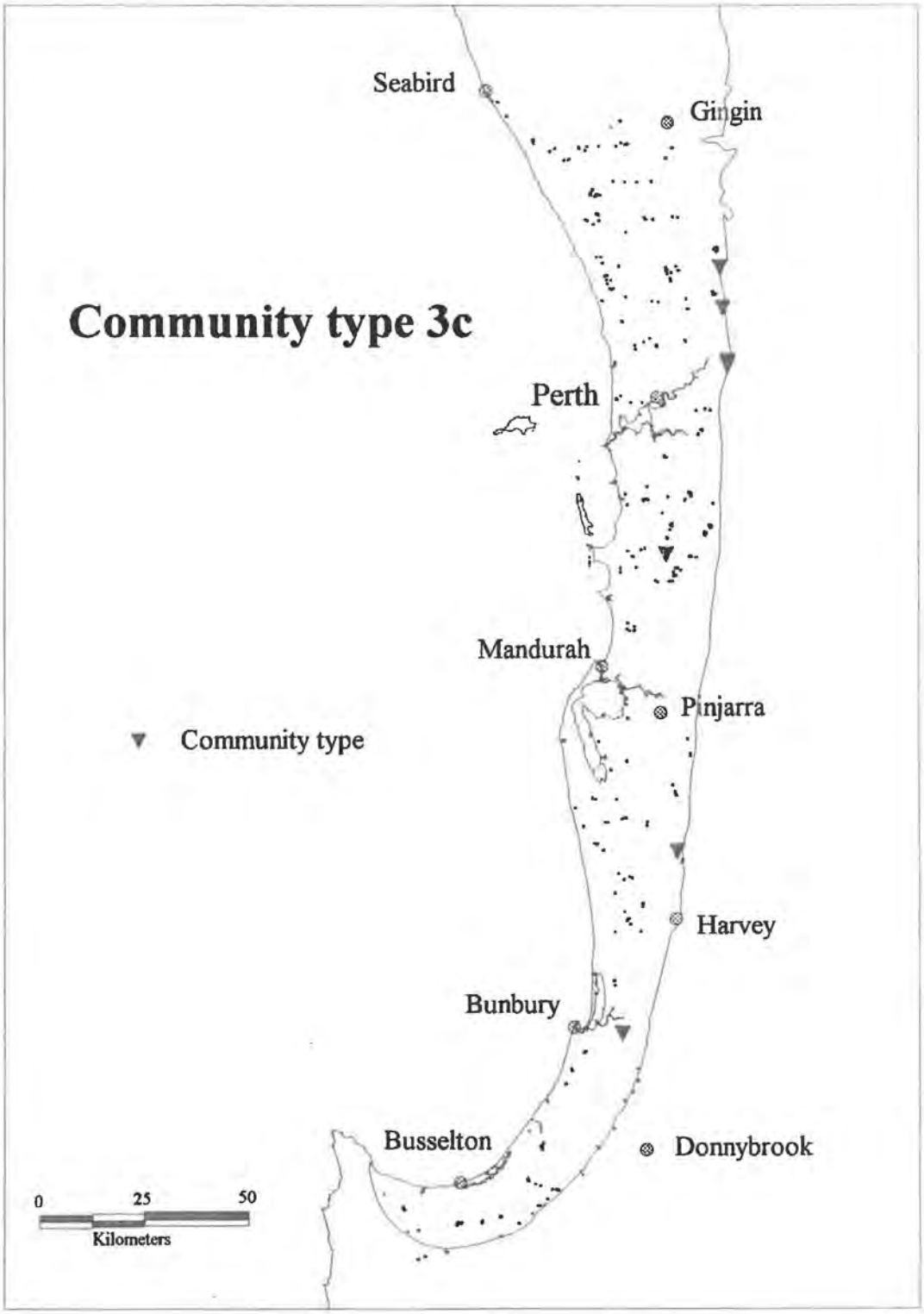
Other common species:

Trees	Shrubs	Herbs
	Acacia pulchella *Dryandra nivea* *Gompholobium marginatum* *Hypocalymma angustifolium*	*Caesia micrantha* *Drosera menziesii* subsp. *penicillaris* * *Hypochaeris glabra* *Lepidosperma sp.* (eastern terete) *Loxocarya flexuosa* *Mesomelaena tetragona* *Opercularia vaginata* *Sowerbaea laxiflora* *Stipa pycnostachya* *Tetraria octandra* *Thysanotus manglesianus/ patersonii* complex

Mean species richness:	**48**
Mean weed frequency:	**6**
Mean vegetation condition:	**2.6**
Number of quadrats:	**10**

Structural units

forest
low forest A
heath A
low woodland A
open low woodland A
open scrub
low scrub B


Seabird
Gingin
Community type 3c
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 4

Melaleuca preissiana damplands

Reservation Status: Well reserved
Conservation Status: Low risk

Typical Species:

Trees	Shrubs	Herbs
Melaleuca preissiana	*Hypocalymma angustifolium*	*Dampiera linearis*
	Pericalymma ellipticum	*Dasypogon bromeliifolius*
	Xanthorrhoea preissii	*Hypolaena exsulca*
		Stylidium brunonianum
		Stylidium repens

Other common species:

Trees	Shrubs	Herbs
	Adenanthos obovatus	**Briza maxima*
	Astartea aff. *fascicularis*	**Hypochaeris glabra*
		Lyginia barbata
		Phlebocarya ciliata
		Schoenus rodwayanus
		Xanthosia huegelii

Mean species richness: **36.9**

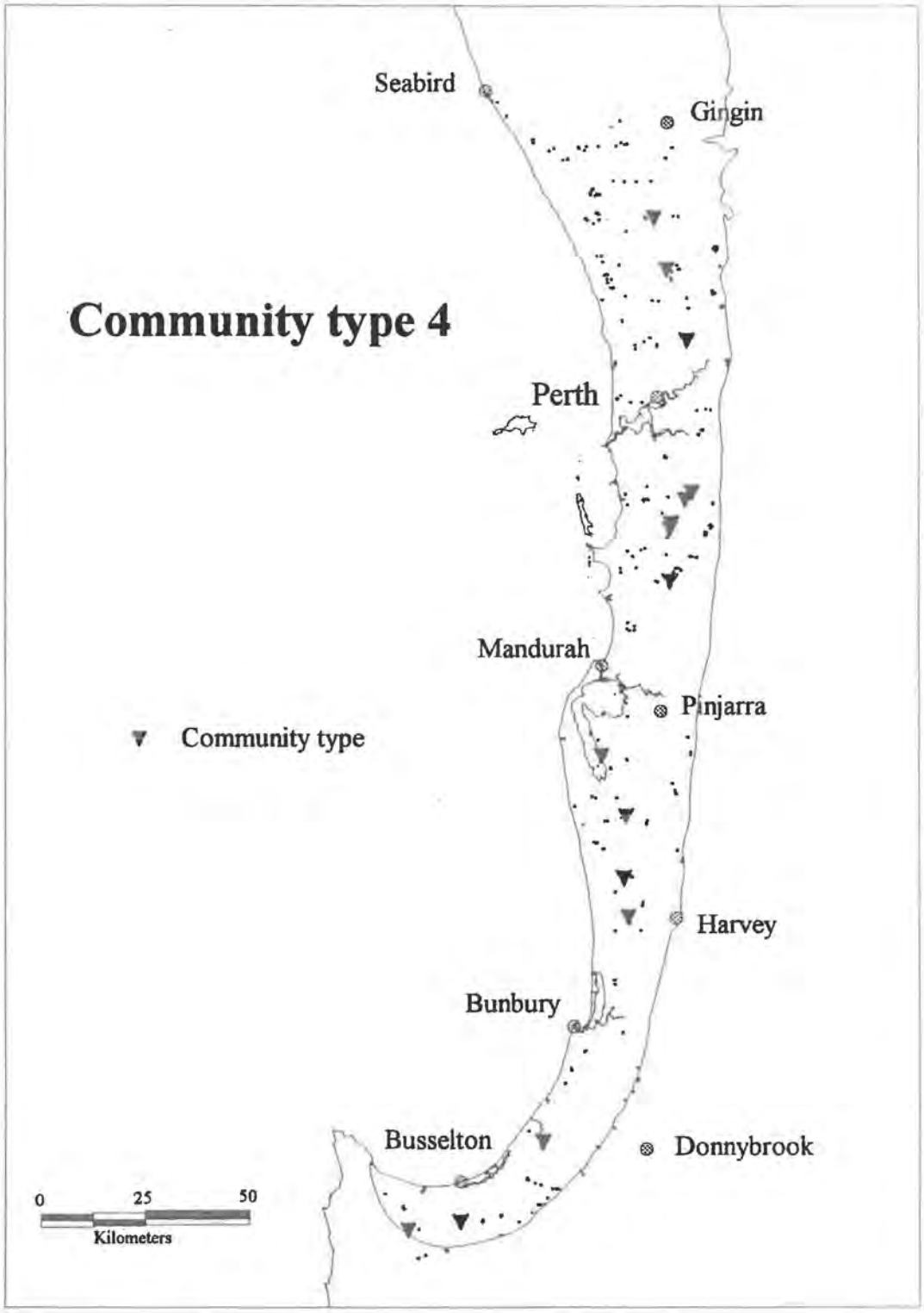
Mean weed frequency: **3.3**

Mean vegetation condition: **2**

Number of quadrats: **16**

Structural units

dense low heath C
low woodland A
open woodland
open low woodland A
heath A
heath B
low heath C
low scrub A
dense low sedges


Seabird
Gingin
Community type 4
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 5

Mixed Shrub damplands

Reservation Status: Well reserved
Conservation Status: Low risk

Typical Species:

Trees	Shrubs	Herbs
		**Hypochaeris glabra*
		Hypolaena exsulca
		Siloxerus humifusus

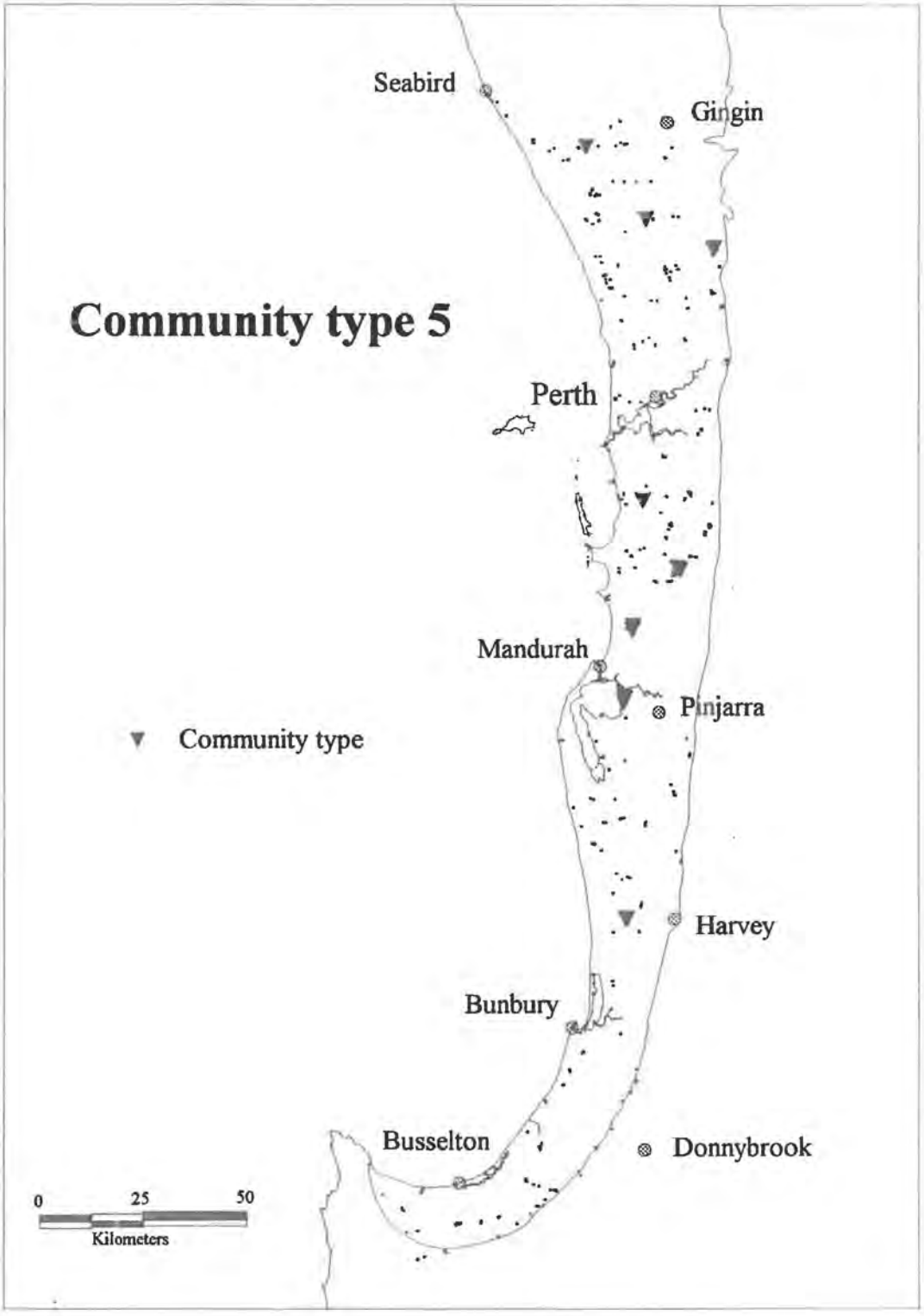
Other common species:

Trees	Shrubs	Herbs
	Kunzea ericifolia	**Aira caryophyllea*
	Pericalymma ellipticum	**Briza maxima*
		**Briza minor*
		Caladenia flava
		Mitrasacme paradoxa
		Quinetia urvillei
		Trachymene pilosa
		**Ursinia anthemoides*

Mean species richness:	**38.4**
Mean weed frequency:	**5.8**
Mean vegetation condition:	**2.1**
Number of quadrats:	**15**

Structural units

low forest A
low woodland A
open woodland
open low woodland A
dense heath B
dense low heath C
thicket
heath B
low heath C
scrub


Seabird
Gingin
Community type 5
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 6

Weed dominated wetlands on heavy soils

Reservation Status: Well reserved
Conservation Status: Low risk

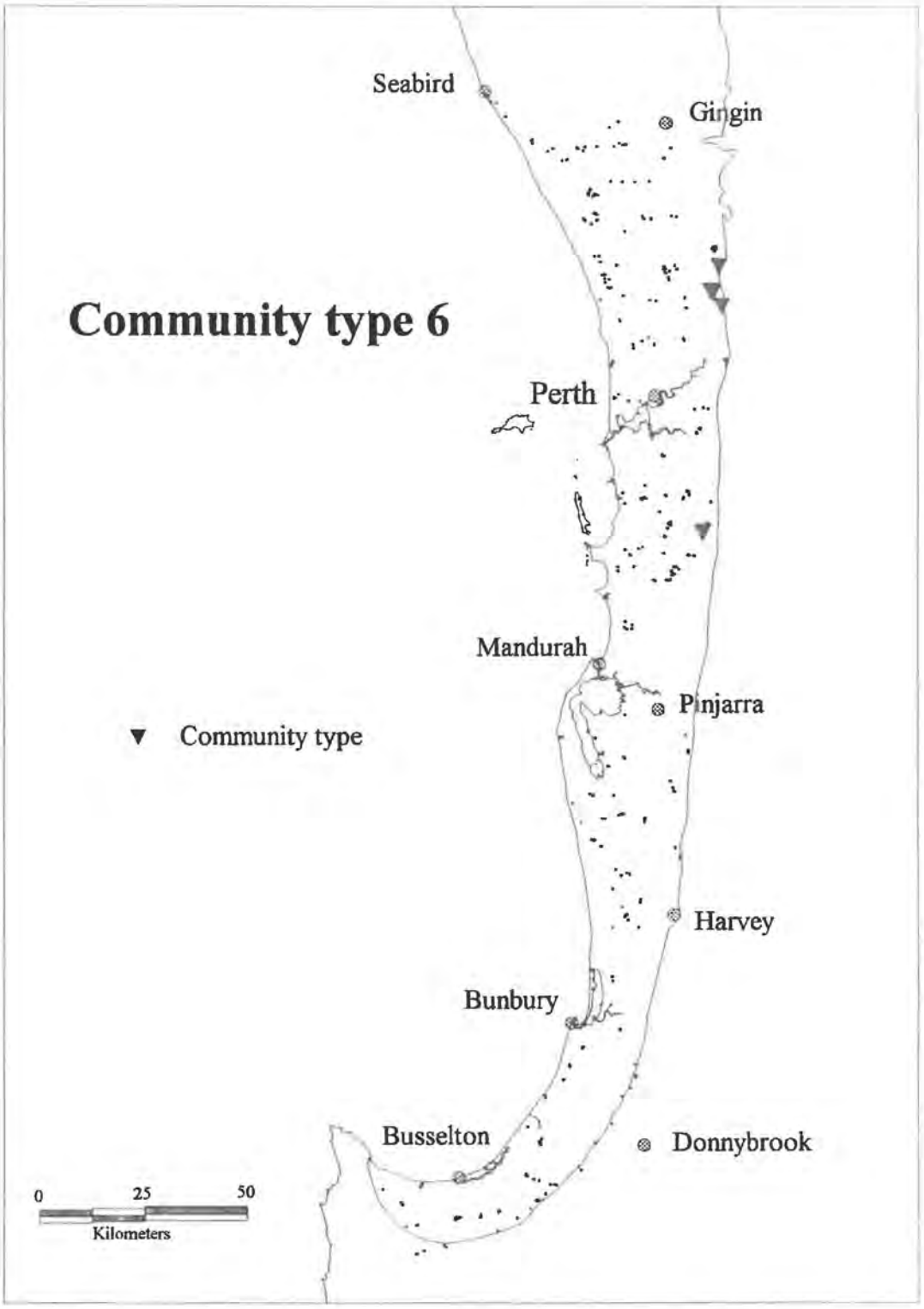
Typical Species:

Trees	Shrubs	Herbs
		* *Briza maxima*
		* *Hypochaeris glabra*

Other common species:

Trees	Shrubs	Herbs
	Hypocalymma angustifolium	* *Ehrharta calycina*
		* *Ehrharta longiflora*
		* *Monadenia bracteata*
		* *Romulea rosea*
		* *Ursinia anthemoides*

Mean species richness:	**26.6**	**Structural units**
Mean weed frequency:	**7.9**	low forest A woodland
Mean vegetation condition:	**3.6**	open low woodland A heath A
Number of quadrats:	**9**	low heath C scrub


Seabird
Gingin
Community type 6
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 7

Herb rich saline shrublands in clay pans

Reservation Status: Well reserved
Conservation Status: Vulnerable

Typical Species:

Trees	Shrubs	Herbs
		**Briza minor*
		Centrolepis aristata
		Philydrella pygmaea

Other common species:

Trees	Shrubs	Herbs
	Melaleuca viminea	*Brachyscome bellidioides*
		**Briza maxima*
		Centrolepis polygyna
		**Cicendia filiformis*
		Goodenia micrantha
		**Hypochaeris glabra*
		Pogonolepis stricta
		Polypompholyx multifida
		Schoenus odontocarpus
		Schoenus sp. 2 (GJK 5739)
		Siloxerus humifusus
		Thysanotus manglesianus/ patersonii complex

Mean species richness: 46.4

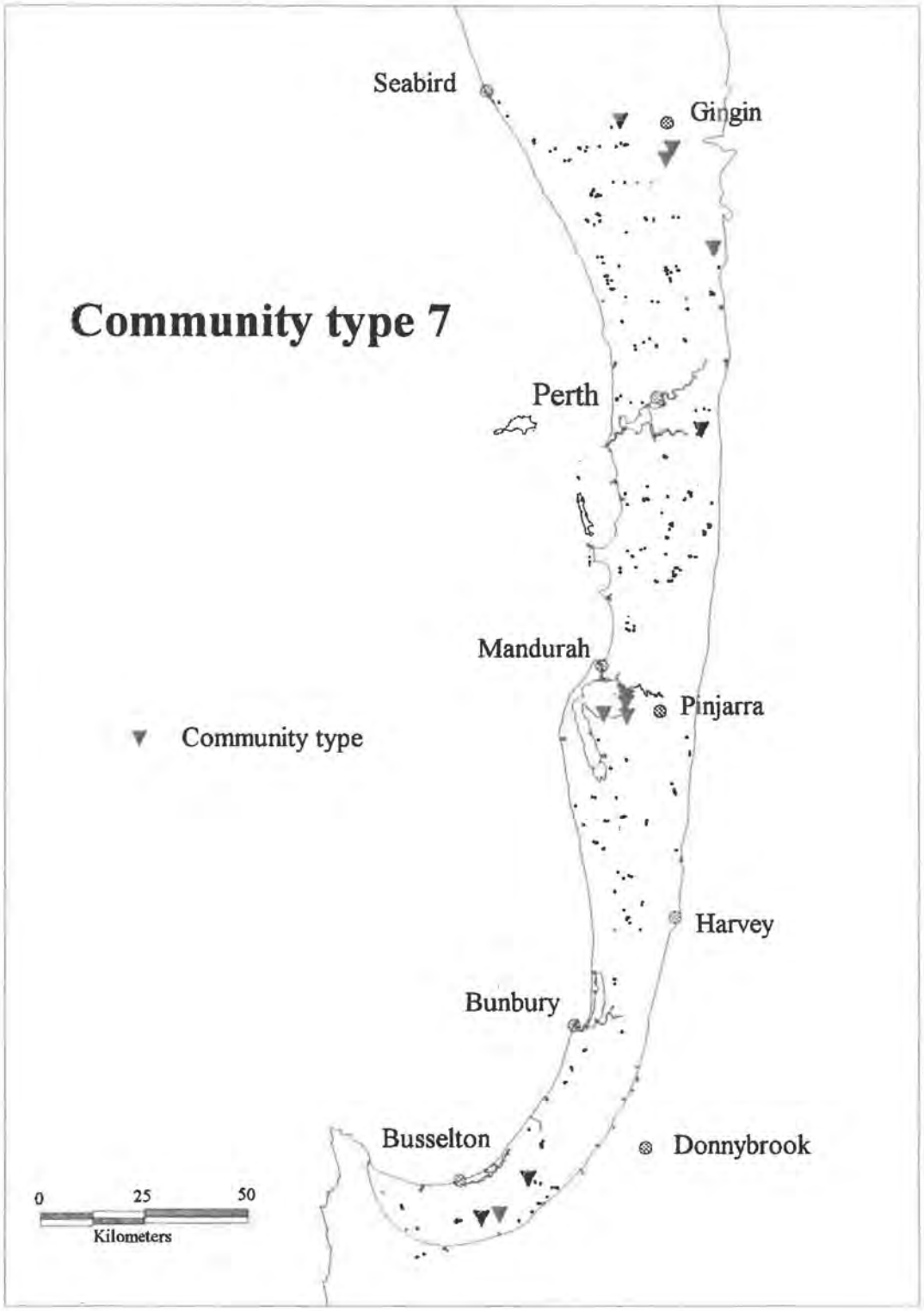
Mean weed frequency: 8

Mean vegetation condition: 2.3

Number of quadrats: 18

Structural units

low woodland A
low woodland B
open low woodland A
dense heath A
heath A
thicket
scrub
low scrub A
open scrub
open herbs


Seabird
Gingin
Community type 7
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 8

Herb rich shrublands in clay pans

Reservation Status: Well reserved
Conservation Status: Vulnerable

Typical Species:

Trees	Shrubs	Herbs
		**Briza maxima*
		**Briza minor*
		Centrolepis aristata
		**Cicendia filiformis*
		**Cyperus tenellus*
		**Romulea rosea*

Other common species:

Trees	Shrubs	Herbs
	Viminaria juncea	**Aira caryophyllea*
		Chorizandra enodis
		Drosera menziesii subsp. *menziesii*
		Drosera rosulata
		Goodenia micrantha
		Haemodorum simplex
		Hyalosperma cotula
		** Hypochaeris glabra*
		** Juncus capitatus*
		** Monopsis debilis*
		** Parentucellia viscosa*
		Schoenus odontocarpus

Mean species richness: 52

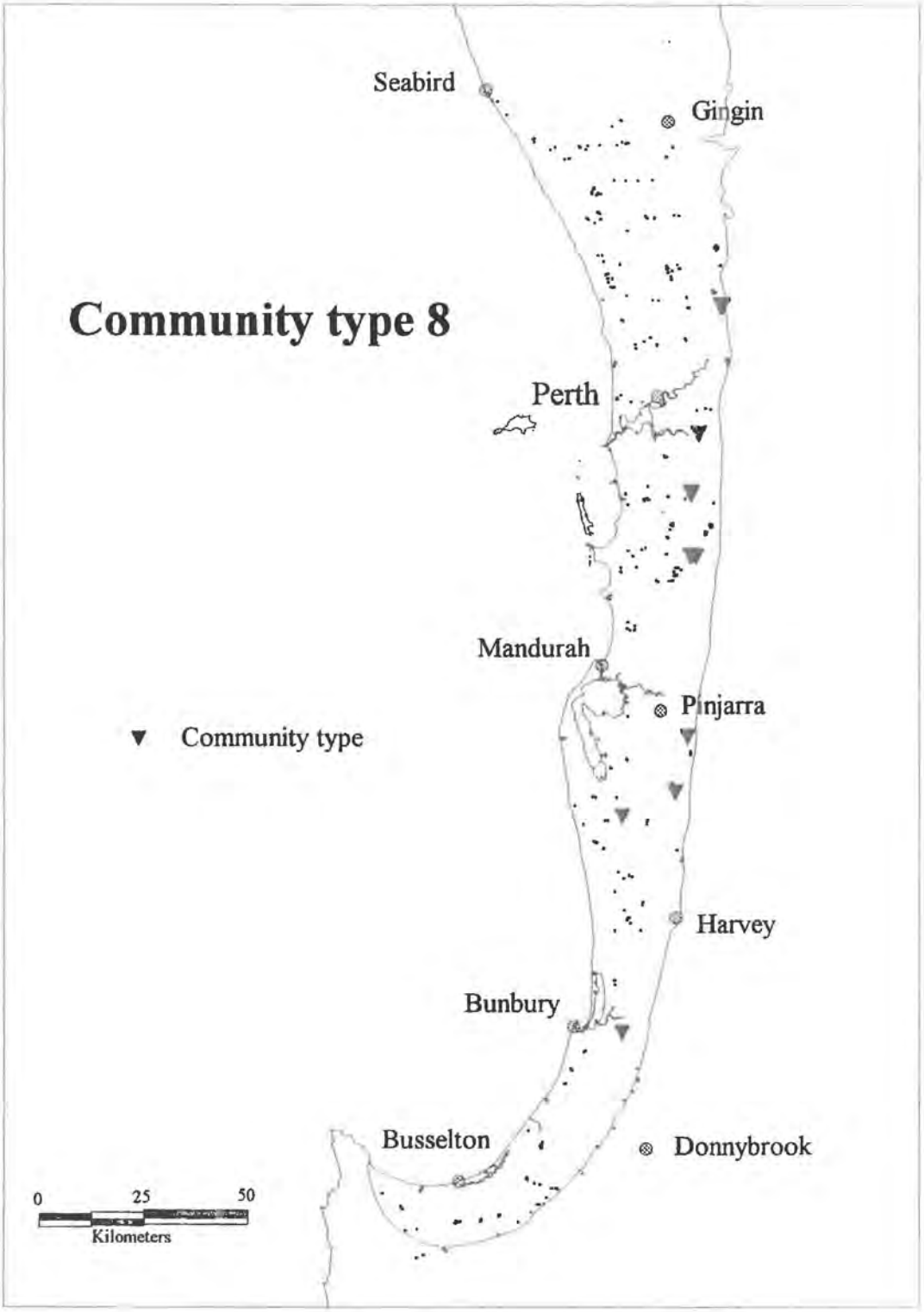
Mean weed frequency: 11

Mean vegetation condition: 2.7

Number of quadrats: 21

Structural units

woodland
low woodland B
dense thicket
dense low heath D
thicket
scrub
low scrub A
low scrub B
open scrub
open low scrub B
herbs


Seabird
Gingin
Community type 8
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 9

Dense shrublands on clay flats

Reservation Status: Well reserved
Conservation Status: Vulnerable

Common species:

Trees	Shrubs	Herbs
	Astartea aff. *fascicularis*	*Burchardia multiflora*
	Eutaxia virgata	*Cassytha racemosa*
	Hakea varia	*Chorizandra enodis*
	Melaleuca viminea	*Cyathochaeta avenacea*
		**Cyperus tenellus*
		Dampiera linearis
		Drosera gigantea
		Drosera rosulata
		** Hypochaeris glabra*
		Lepidosperma longitudinale
		Leptocarpus coangustatus

Mean species richness: **35.5**

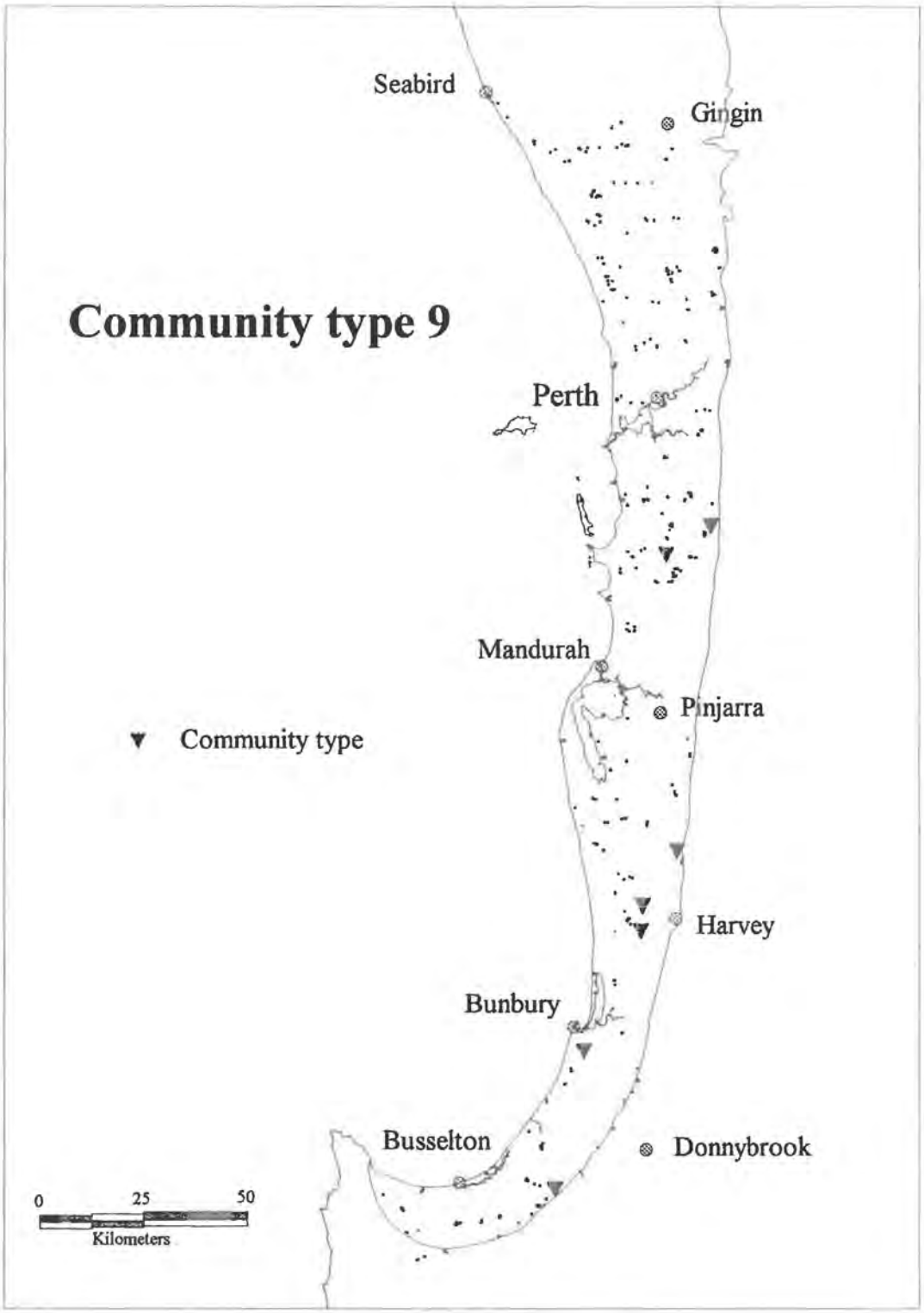
Mean weed frequency: **2.2**

Mean vegetation condition: **2**

Number of quadrats: **8**

Structural units

low woodland A
dense heath B
thicket
heath A
heath B
low heath C
scrub
open scrub


Seabird
Gingin
Community type 9
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: **10a**

Shrublands on dry clay flats

Reservation Status: Well reserved
Conservation Status: Vulnerable

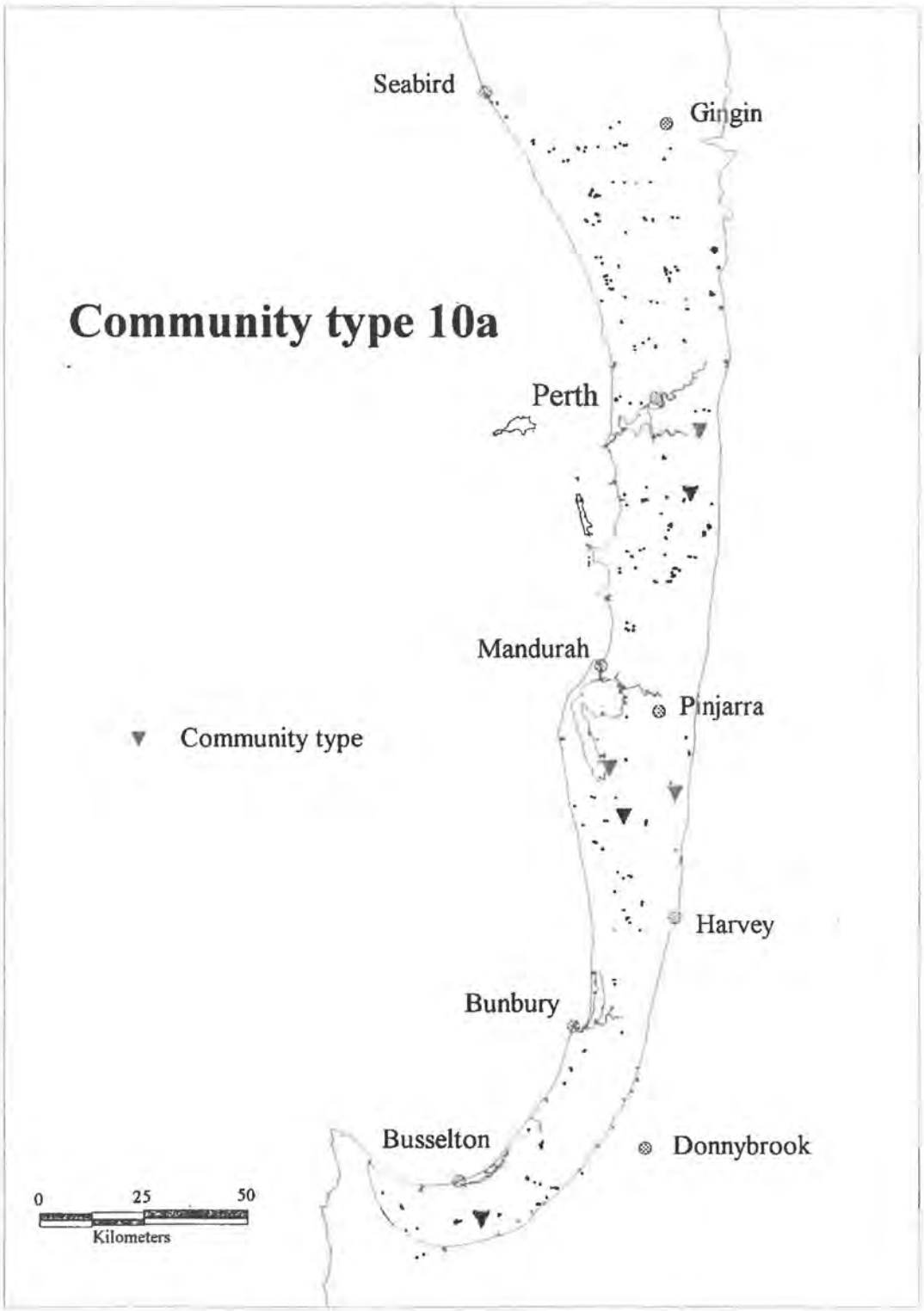
Typical Species:

Trees	Shrubs	Herbs
	Hakea sulcata	*Aphelia cyperoides*
	Verticordia densiflora	*Centrolepis aristata*
		**Cyperus tenellus*
		Drosera gigantea subsp. *gigantea*
		Drosera menziesii subsp. *menziesii*
		Schoenolaena juncea
		Schoenus rigens

Other common species:

Trees	Shrubs	Herbs
	Hakea varia	*Burchardia multiflora*
	Pericalymma ellipticum	**Briza minor*
	Viminaria juncea	*Centrolepis drummondiana*
		**Cicendia filiformis*
		Conostylis aculeata
		**Hypochaeris glabra*
		**Juncus capitatus*
		Patersonia occidentalis
		Polypompholyx multifida
		Schoenus odontocarpus
		Stylidium calcaratum
		Thelymitra antennifera
		Thysanotus thyrsoideus
		Philydrella pygmaea
		Siloxerus humifusus

Mean species richness:	**51.8**	**Structural units**
Mean weed frequency:	**5.8**	dense heath B thicket
Mean vegetation condition:	**2.1**	heath B scrub
Number of quadrats:	**8**	dwarf scrub C open scrub open low scrub B


Seabird
Gingin
Community type 10a
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 10b

Shrublands on southern ironstones

Reservation Status: Unreserved
Conservation Status: Critical

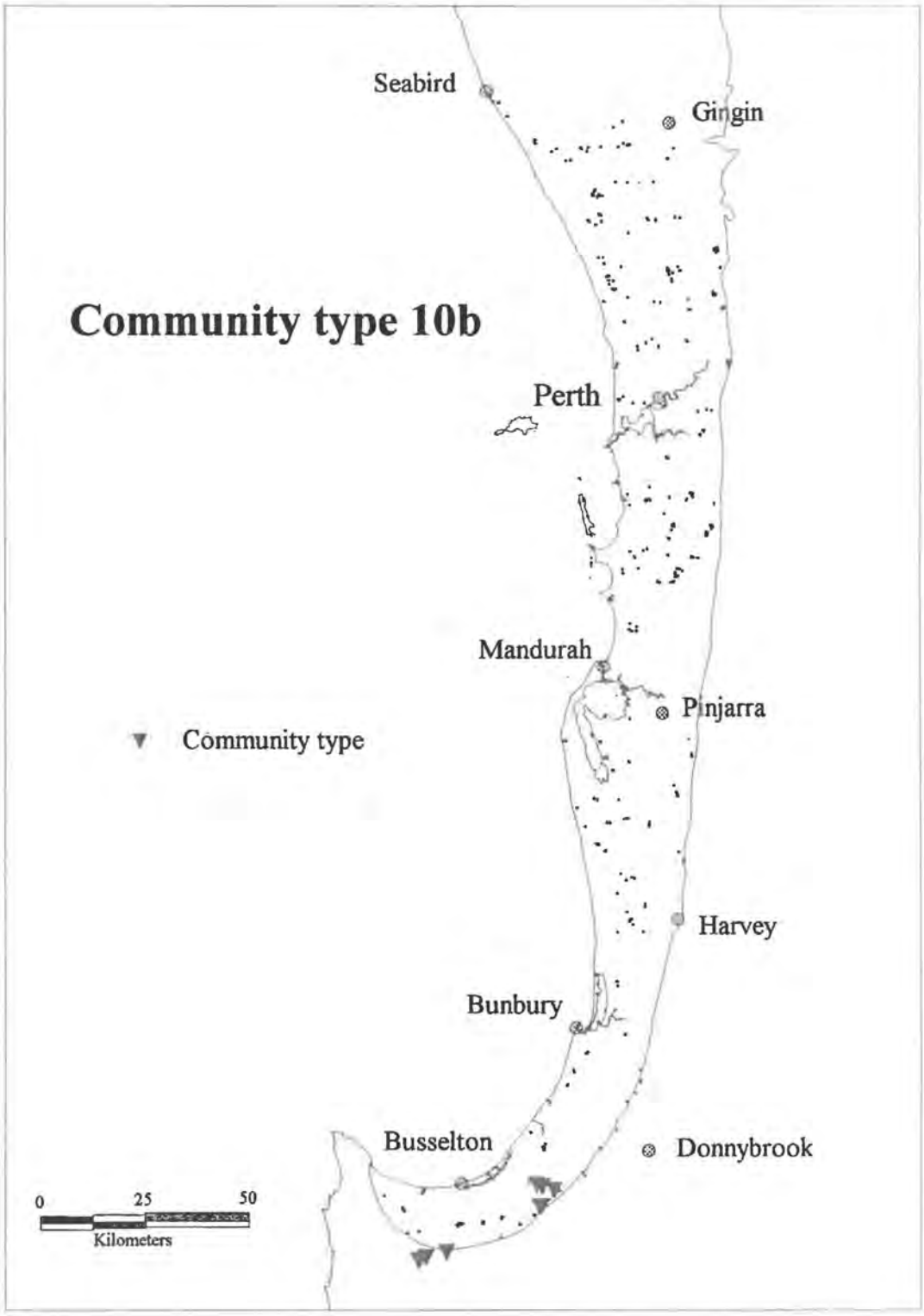
Typical Species:

Trees	Shrubs	Herbs
	Kunzea aff. micrantha (BJK & NG 040)	*Aphelia cyperoides*
	Pericalymma ellipticum	*Centrolepis aristata*
		**Hypochaeris glabra*

Other common species:

Trees	Shrubs	Herbs
	Acacia stenoptera	*Borya scirpoidea*
	Hakea varia (Yellow flowered ironstone form)	*Caladenia marginata*
	Hemiandra pungens	*Caustis dioica*
	Viminaria juncea	*Centrolepis drummondiana*
		Dampiera linearis
		Drosera glanduligera
		Drosera rosulata
		Loxocarya fasciculata
		Loxocarya magna Ms
		Mitrasacme paradoxa
		Opercularia vaginata (Ironstone form)
		Philydrella pygmaea
		Polypompholyx multifida
		Schoenus odontocarpus
		Stylidium calcaratum
		Thelymitra antennifera
		Thysanotus thyrsoideus

Mean species richness:	**53.7**	**Structural units**
Mean weed frequency:	**4.9**	dense heath B scrub
Mean vegetation condition:	**2.2**	low scrub A open scrub
Number of quadrats:	**9**	open low scrub A


Seabird
Gingin
Community type 10b
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 11

Wet forests and woodlands

Reservation Status: Well reserved
Conservation Status: Low risk

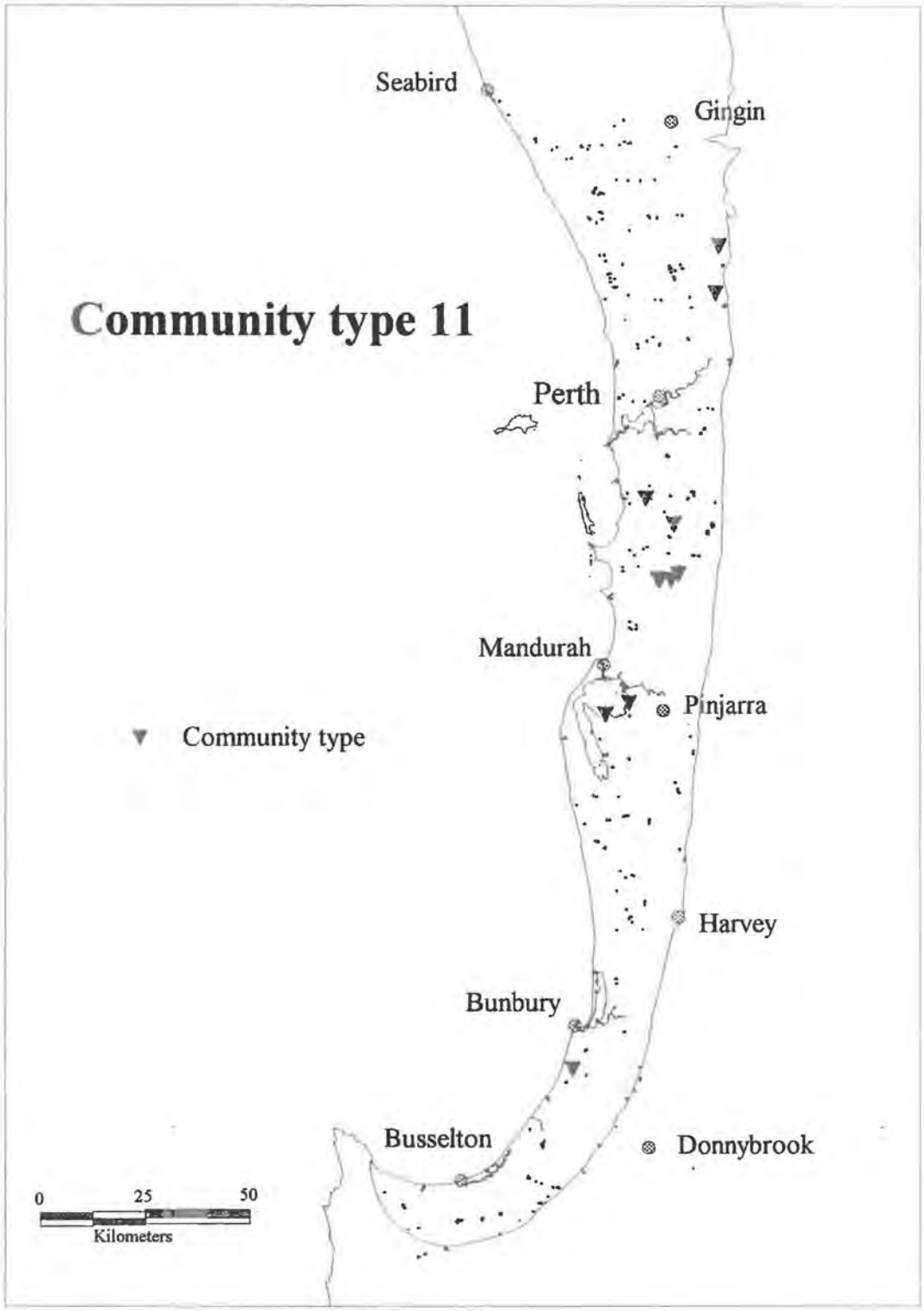
Typical Species:

Trees	Shrubs	Herbs
		**Briza maxima*
		Lepidosperma longitudinale

Other common species:

Trees	Shrubs	Herbs
Eucalyptus rudis	*Astartea* aff. *fascicularis*	* *Hypochaeris glabra*

Mean species richness:	**27.2**	**Structural units**
Mean weed frequency:	**6.9**	dense low forest A
		forest
Mean vegetation condition:	**2.7**	low forest A
		low forest B
Number of quadrats:	**13**	low woodland A
		low woodland B
		open low woodland A
		dense heath B
		low scrub A


Seabird
Gingin
Community type 11
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 12

Melaleuca teretifolia and/or *Astartea* aff. *fascicularis* shrublands

Reservation Status: Well reserved
Conservation Status: Low risk

Typical Species:

Trees	Shrubs	Herbs
	Astartea aff. *fascicularis*	**Aira caryophyllea*
	Melaleuca teretifolia	*Cassytha racemosa*
		Lepidosperma longitudinale
		**Parentucellia viscosa*

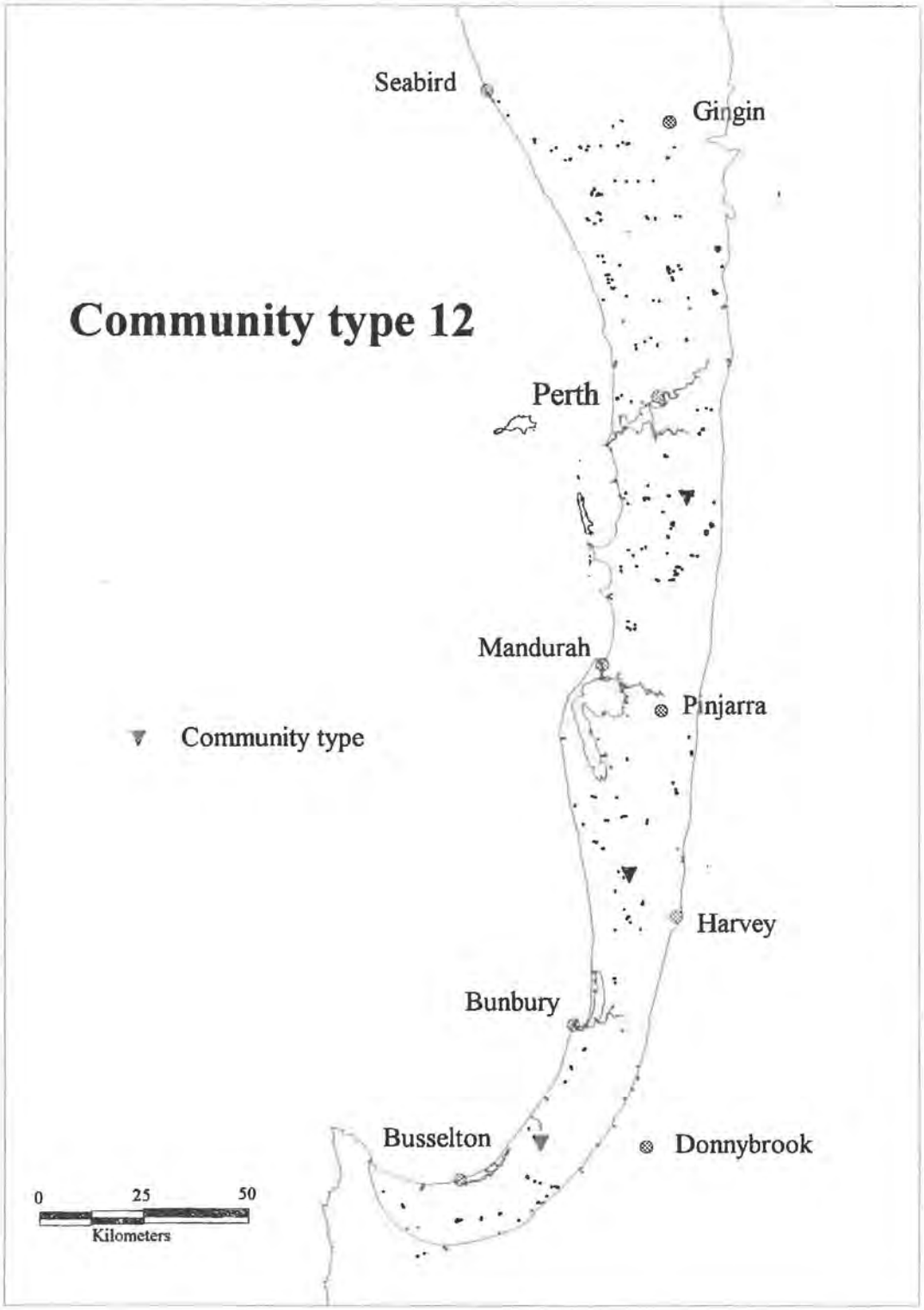
Other common species:

Trees	Shrubs	Herbs
	Epilobium billardierianum	*Baumea articulata*
	Oxylobium lineare	*Siloxerus humifusus*
		Villarsia latifolia
		Waitzia citrina

Mean species richness:	**26.4**
Mean weed frequency:	**5.5**
Mean vegetation condition:	**2.9**
Number of quadrats:	**5**

Structural units

dense thicket
thicket
heath A
heath B


Seabird
Gingin
Community type 12
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 13

Deeper wetlands on heavy soils

Reservation Status: Well reserved
Conservation Status: Low risk

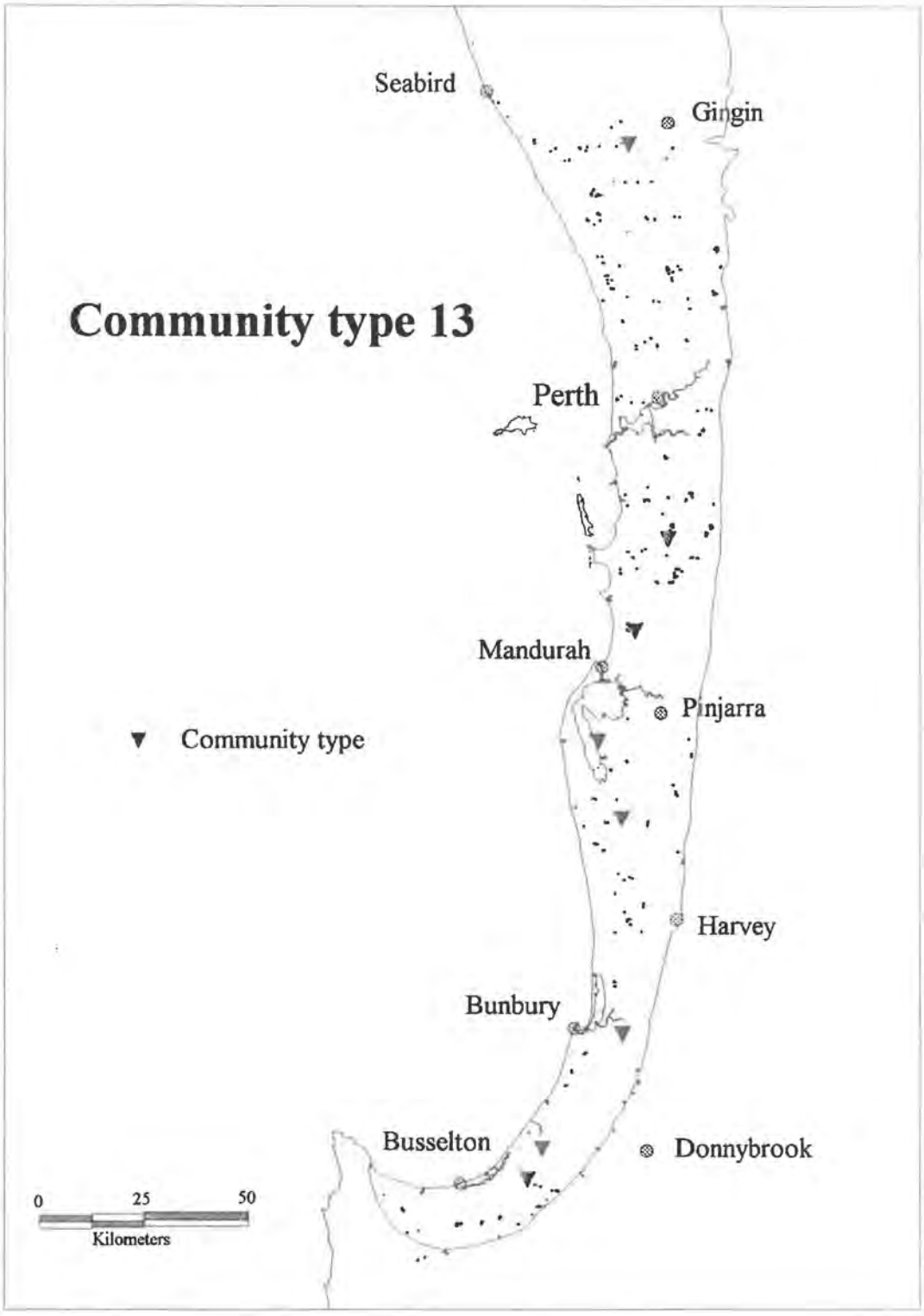
Typical Species:

Trees	Shrubs	Herbs
		Triglochin procerum

Other common species:

Trees	Shrubs	Herbs
	Hakea varia	*Cassytha racemosa*
	Melaleuca lateritia	
	Melaleuca rhaphiophylla	

Mean species richness:	**17.4**	**Structural units**
Mean weed frequency:	**1.4**	dense low forest A
		low forest A
Mean vegetation condition:	**1.8**	low woodland B
		open low woodland A
Number of quadrats:	**9**	dense heath A
		scrub
		low scrub A
		low scrub B
		dwarf scrub D


Seabird
Gingin
Community type 13
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 14

Deeper wetlands on sandy soils

Reservation Status: Unreserved
Conservation Status: Insufficiently known

Typical Species:

Trees	Shrubs	Herbs
	Jacksonia furcellata	*Baumea vaginalis*
	Kunzea ericifolia	
	Melaleuca preissiana	

Other common species:

Trees	Shrubs	Herbs
Eucalyptus rudis	*Acacia pulchella* var. *pulchella*	**Anagallis arvensis*
	Acacia saligna	**Briza minor*
	Kennedia prostrata	*Burchardia umbellata*
	Melaleuca lateritia	*Dianella revoluta*
	Melaleuca rhaphiophylla	*Homalosciadium homalocarpum*
		**Hypochaeris glabra*
		Lagenifera huegelii
		Lyperanthus nigricans
		Thelymitra crinita

Mean species richness: 16.5

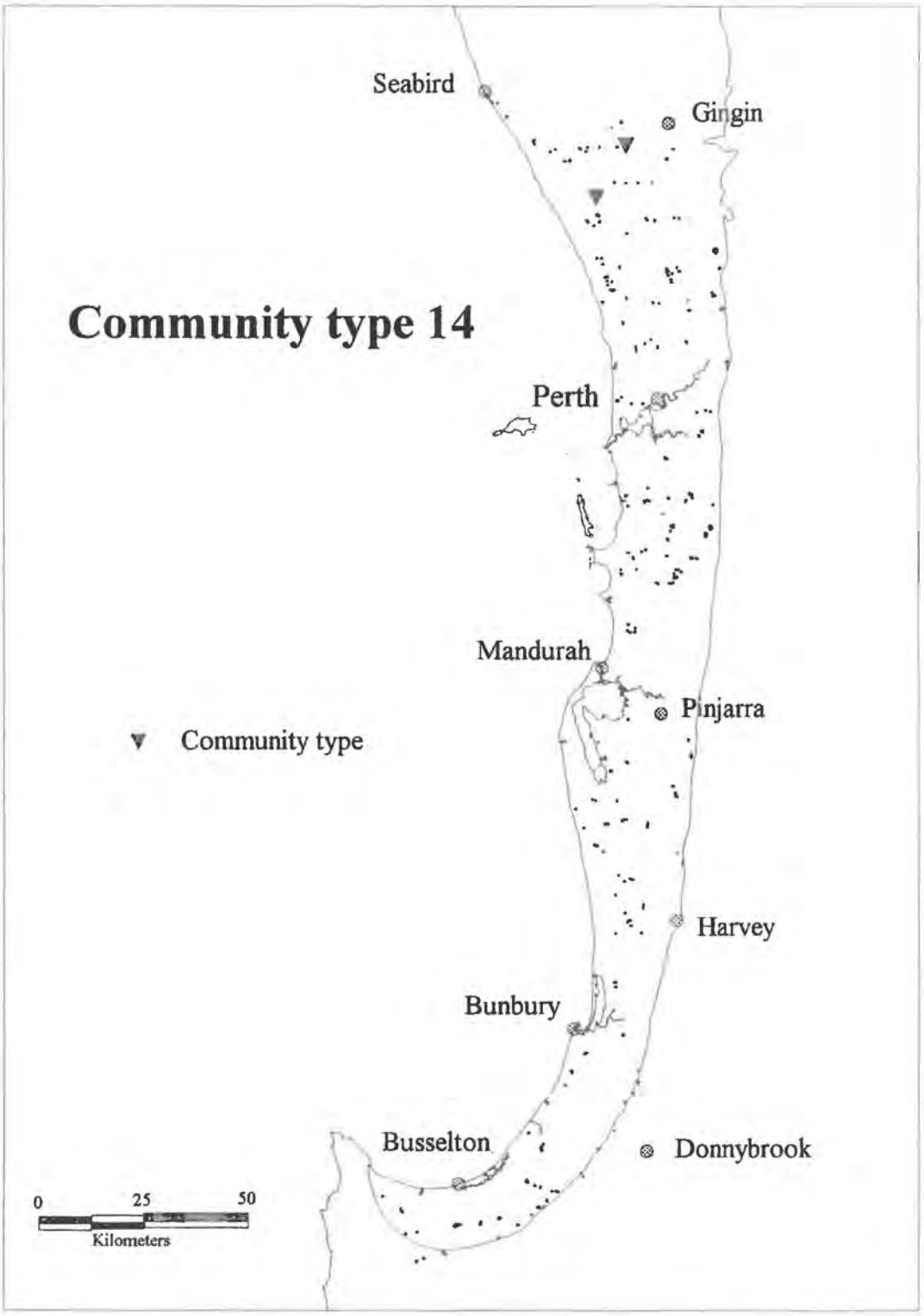
Mean weed frequency: 0.7

Mean vegetation condition: 2.3

Number of quadrats: 2

Structural units

woodland
open low woodland A


Seabird
Gingin
Community type 14
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 15

Forests and woodlands of deep seasonal wetlands

Reservation Status: Well reserved
Conservation Status: Vulnerable

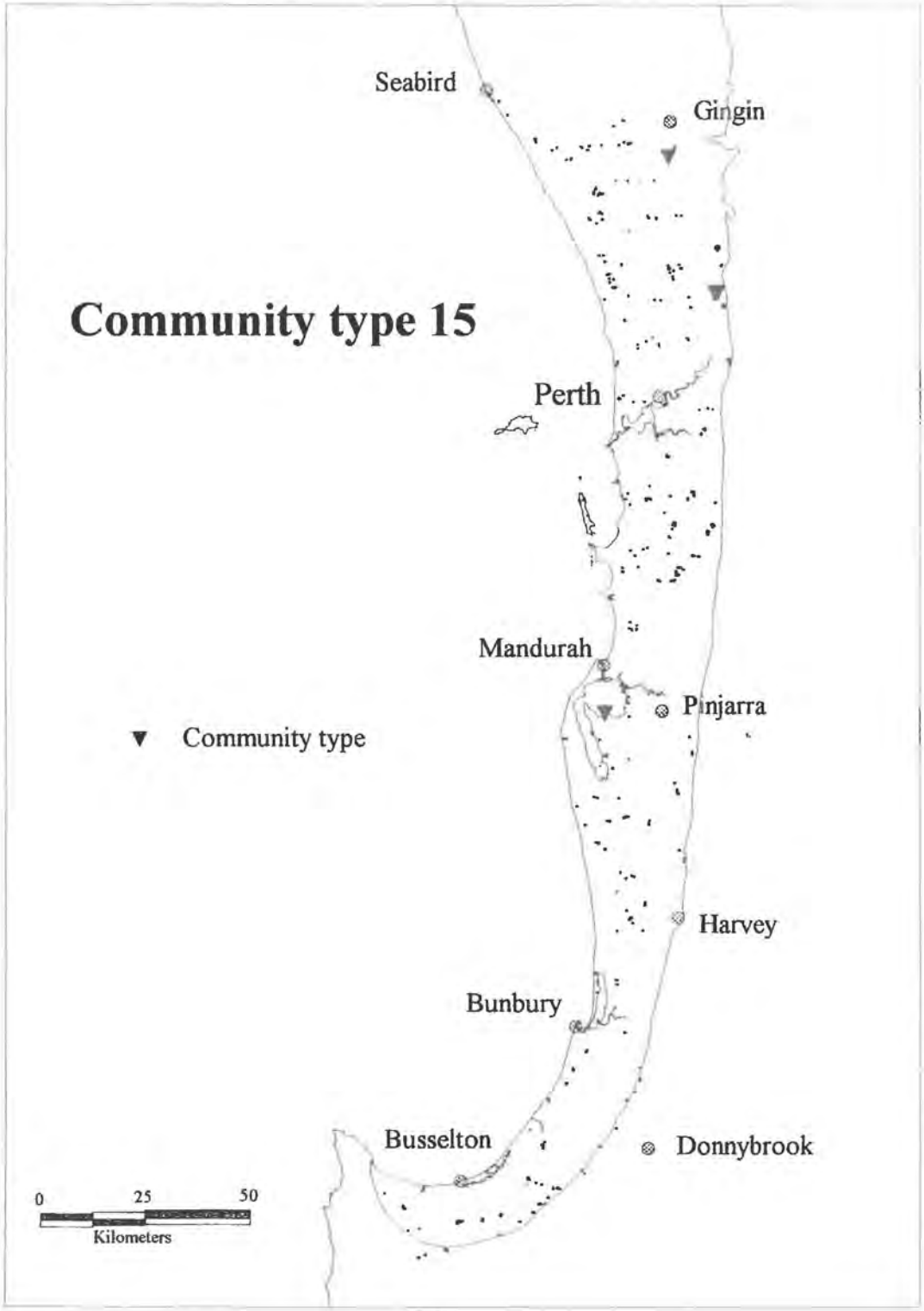
Typical Species:

Trees	Shrubs	Herbs
Melaleuca rhaphiophylla		*Cotula coronopifolia*
		Crassula natans
		**Cynodon dactylon*
		Isolepis producta
		Lemna disperma
		Triglochin procerum

Other common species:

Trees	Shrubs	Herbs
	Melaleuca teretifolia	

Mean species richness:	**17.5**	**Structural units**
Mean weed frequency:	**4.3**	low forest A low forest B
Mean vegetation condition:	**2.9**	low woodland B dense thicket
Number of quadrats:	**4**	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Gingin
Community type 15
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 16

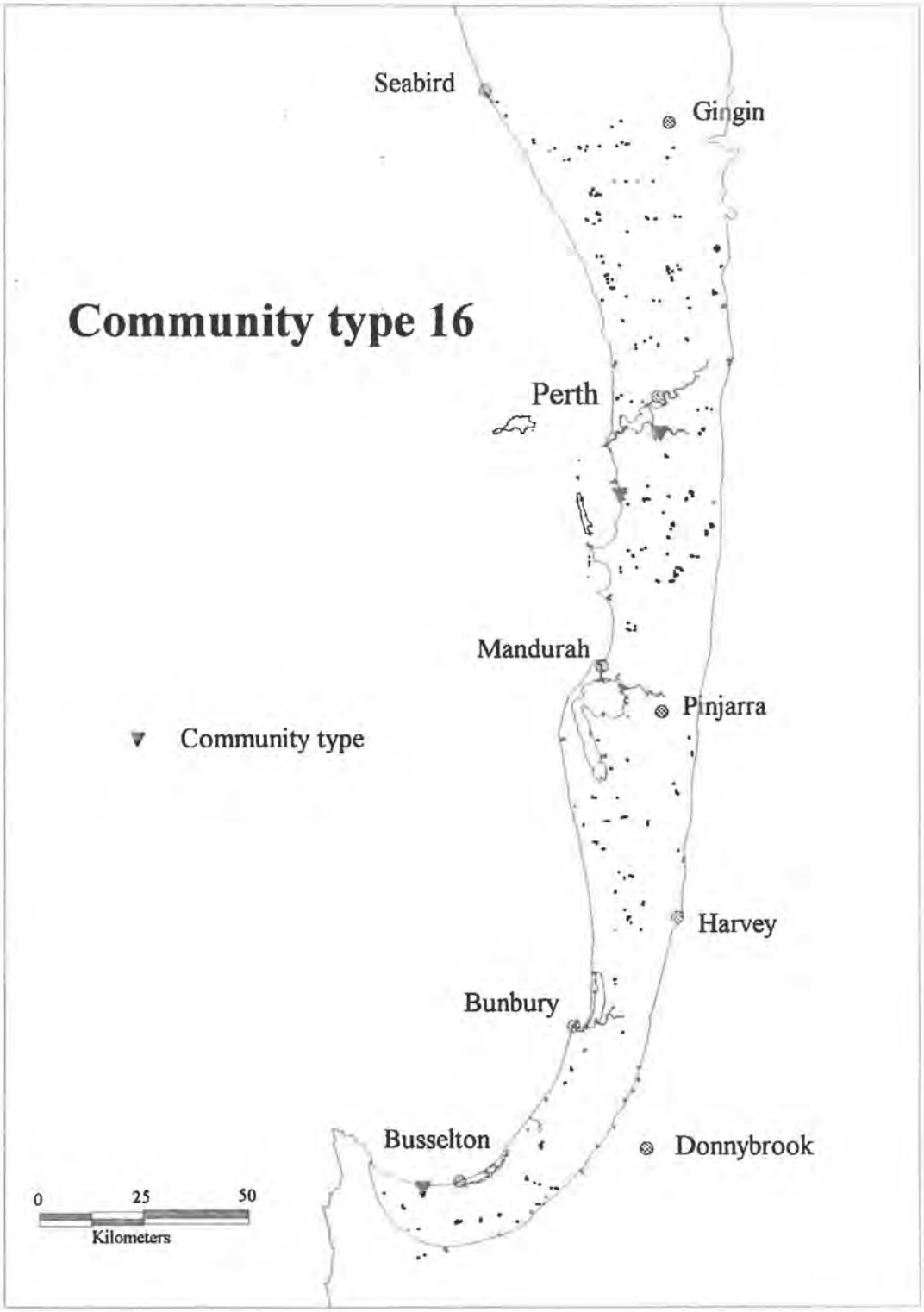
Highly saline seasonal wetlands

Reservation Status: Poorly reserved
Conservation Status: Vulnerable

Typical Species:

Trees	Shrubs	Herbs
	Atriplex cinerea	*Samolus repens*
	**Atriplex prostrata*	*Sporobolus virginicus*
	Sarcocornia quinqueflora	

Mean species richness:	**13.5**	**Structural units**
Mean weed frequency:	**3.7**	low forest A low forest B
Mean vegetation condition:	**2.9**	dense low heath D low heath C
Number of quadrats:	**4**	


Seabird
Gingin
Community type 16
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 17

Melaleuca raphiophylla - Gahnia trifida seasonal wetlands

Reservation Status: Well reserved
Conservation Status: Low risk

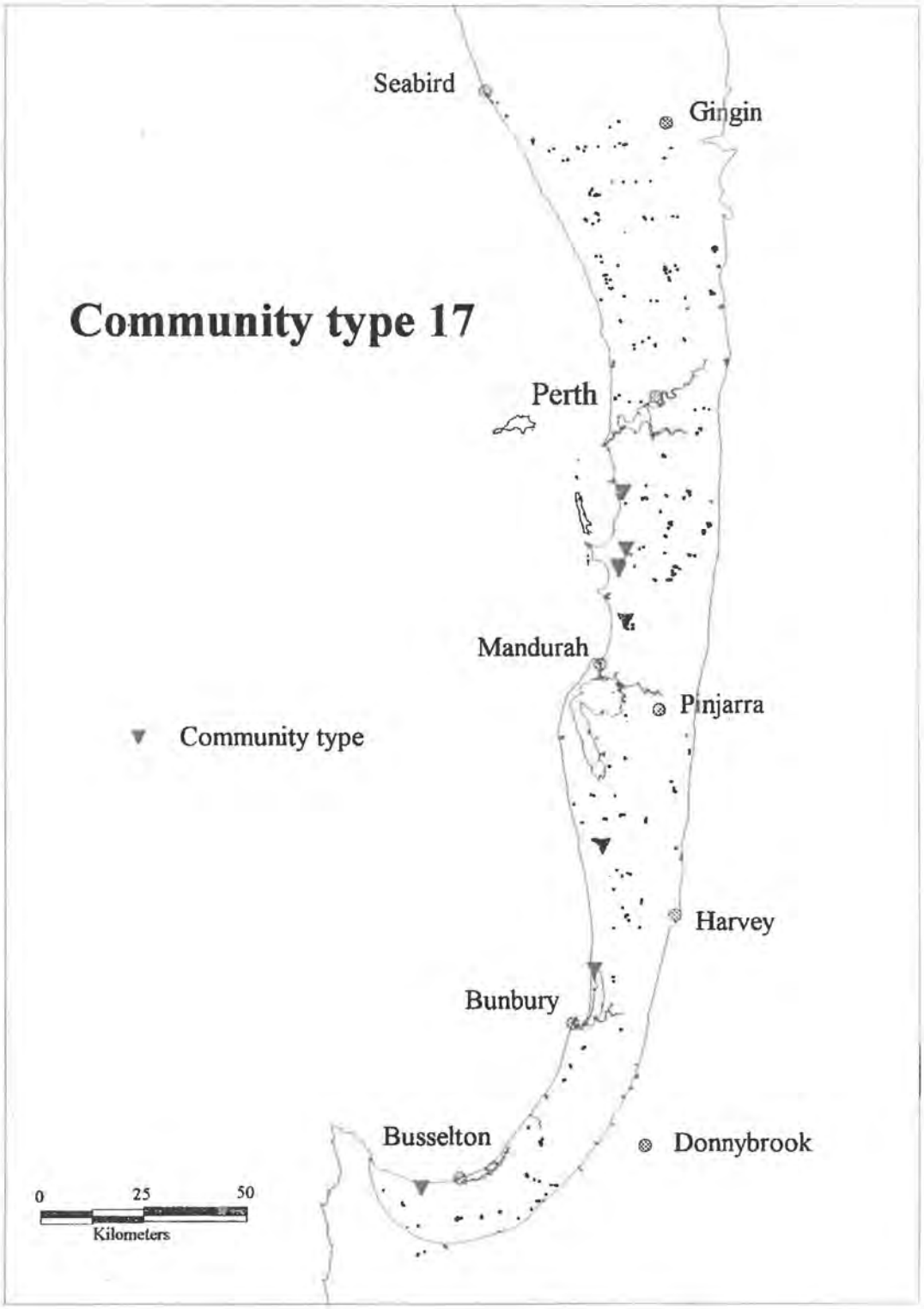
Typical Species:

Trees	Shrubs	Herbs
Melaleuca rhaphiophylla		*Gahnia trifida*
		Lobelia alata

Other common species:

Trees	Shrubs	Herbs
		Baumea juncea
		Lepidosperma longitudinale
		**Sonchus oleraceus*

Mean species richness:	**13.6**	**Structural units**
Mean weed frequency:	**1.7**	dense forest dense low forest A
Mean vegetation condition:	**2.3**	forest low forest A
Number of quadrats:	**8**	low forest B


Seabird
Gingin
Community type 17
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 18

Shrublands on calcareous silts

Reservation Status: Poorly reserved
Conservation Status: Vulnerable

Typical Species:

Trees	Shrubs	Herbs
	Acacia saligna	*Drosera stolonifera*
	Hakea varia	*Gahnia trifida*
	Leucopogon parviflorus	*Lepidosperma longitudinale*
	Melaleuca incana	*Leptocarpus canus*
	Melaleuca teretifolia	*Leptomeria cunninghamii*
	Melaleuca viminea	*Leptomeria lehmannii*
	Xanthorrhoea preissii	*Opercularia vaginata*
		* *Parentucellia viscosa*
		Patersonia occidentalis

Other common species:

Trees	Shrubs	Herbs
	Logania serpyllifolia	* *Anagallis arvensis*
		Brachyscome bellidioides
		* *Briza minor*
		Cassytha glabella
		Cassytha racemosa
		* *Cerastium glomeratum*
		Daucus glochidiatus
		Dianella revoluta
		* *Hypochaeris glabra*
		Isolepis marginata
		Lepidosperma angustatum
		Mitrasacme paradoxa
		Schoenus rodwayanus
		Schoenus sp. 2 (GJK 5739)
		* *Sonchus oleraceus*
		* *Trifolium campestre*
		Thysanotus manglesianus/ patersonii complex
		Thysanotus multiflorus
		Tricoryne elatior
		* *Vulpia myuros*
		Wurmbea monantha

Mean species richness: 39.5

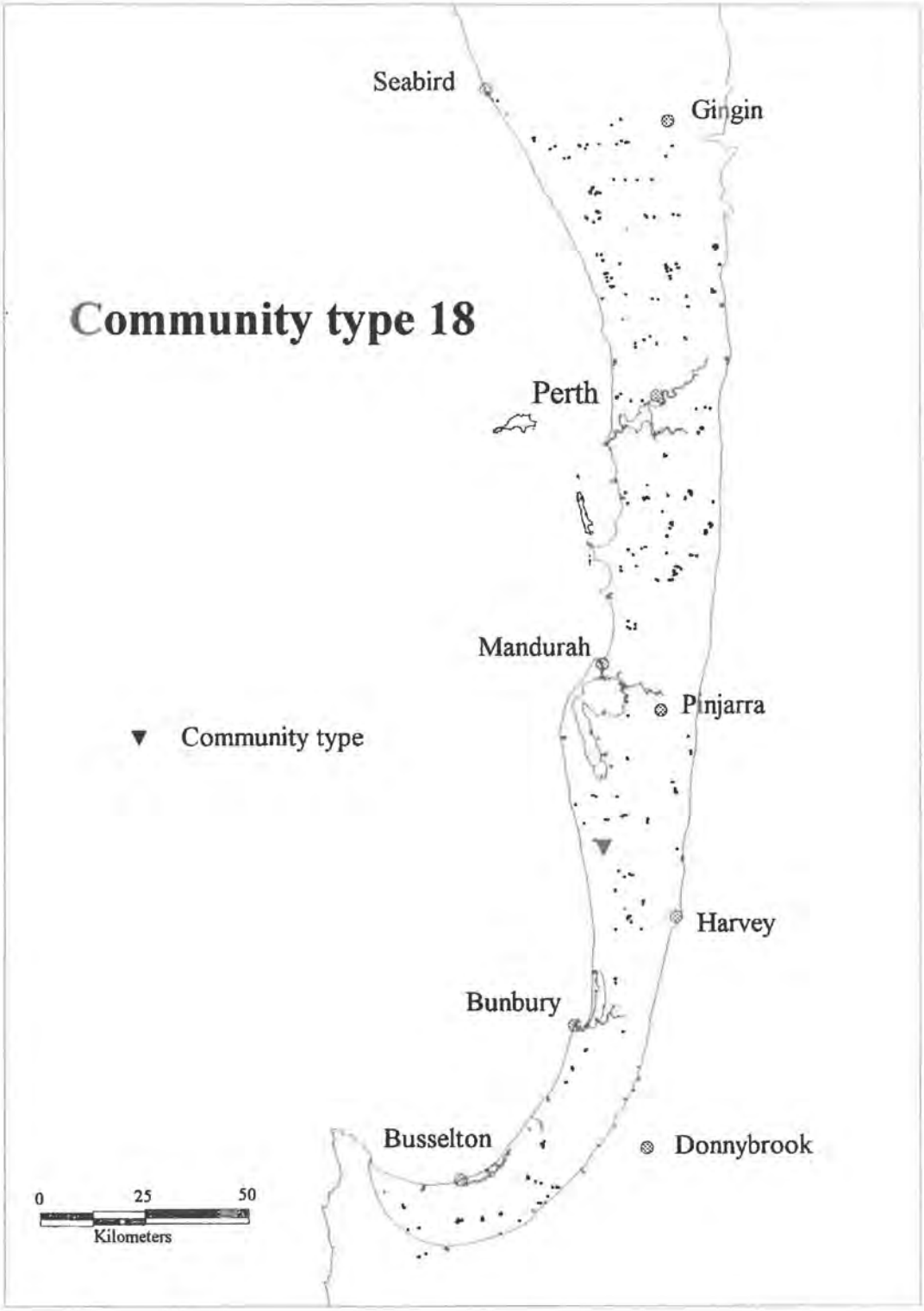
Mean weed frequency: 5.6

Mean vegetation condition: 2.5

Number of quadrats: 2

Structural units

open low scrub A
open low scrub B


Seabird
Gingin
Community type 18
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 19

Sedgelands in Holocene dune swales

Reservation Status: Unreserved
Conservation Status: Endangered

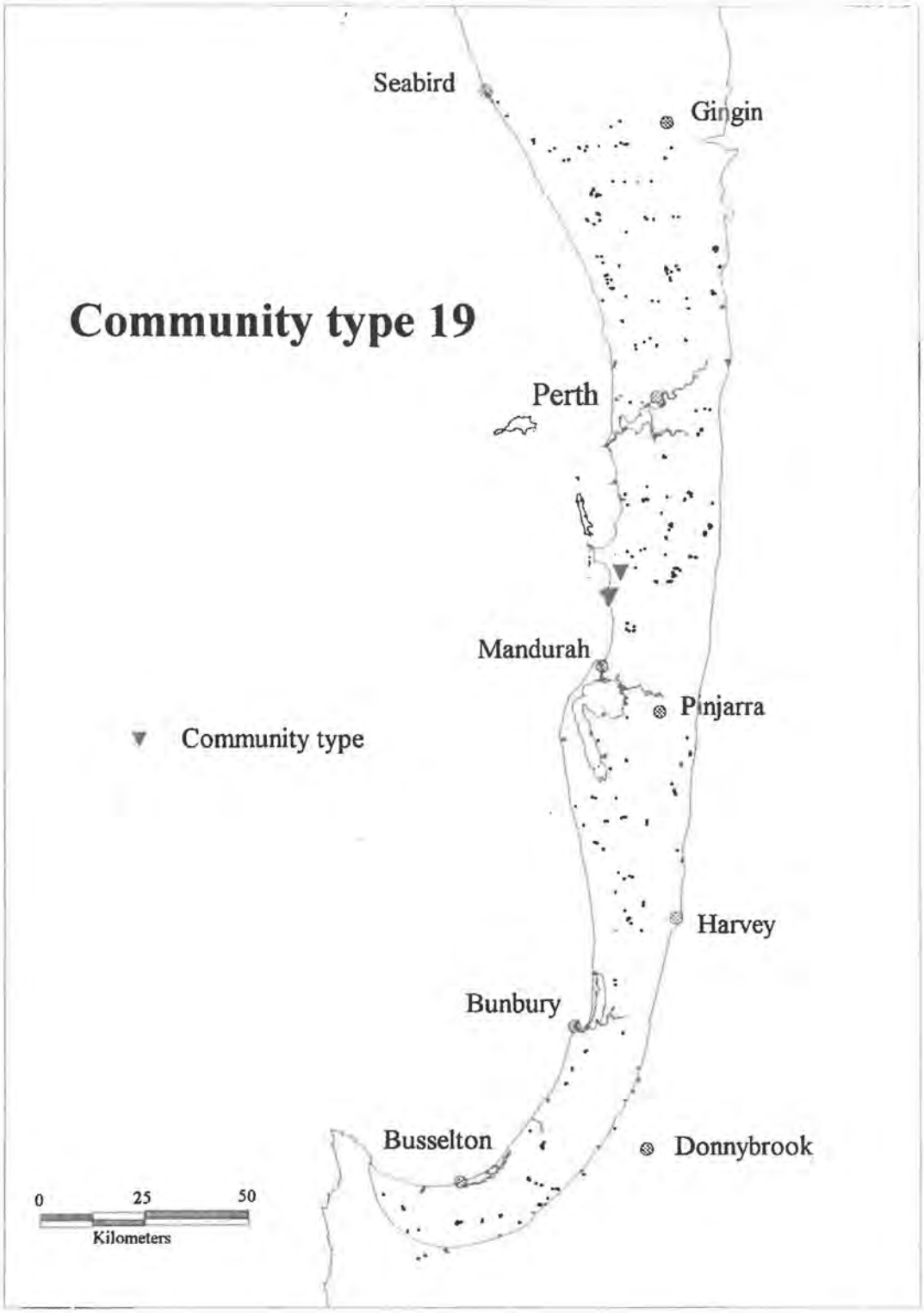
Typical Species:

Trees	Shrubs	Herbs
	Muehlenbeckia adpressa	* *Anagallis arvensis*
		Baumea juncea
		Isolepis nodosa

Other common species:

Trees	Shrubs	Herbs
	Acacia saligna	* *Bromus diandrus*
	Xanthorrhoea preissii	* *Crassula glomerata*
		* *Lolium rigidum*
		Poa porphyroclados
		* *Romulea rosea*
		* *Trifolium glomeratum*

Mean species richness:	**22.6**	**Structural units**
Mean weed frequency:	**6.9**	low woodland A
		open scrub
Mean vegetation condition:	**2.7**	low sedges
Number of quadrats:	**3**	


Seabird
Gingin
Community type 19
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 20a

***Banksia attenuata* woodlands over species rich dense shrublands**

Reservation Status: Unreserved
Conservation Status: Endangered

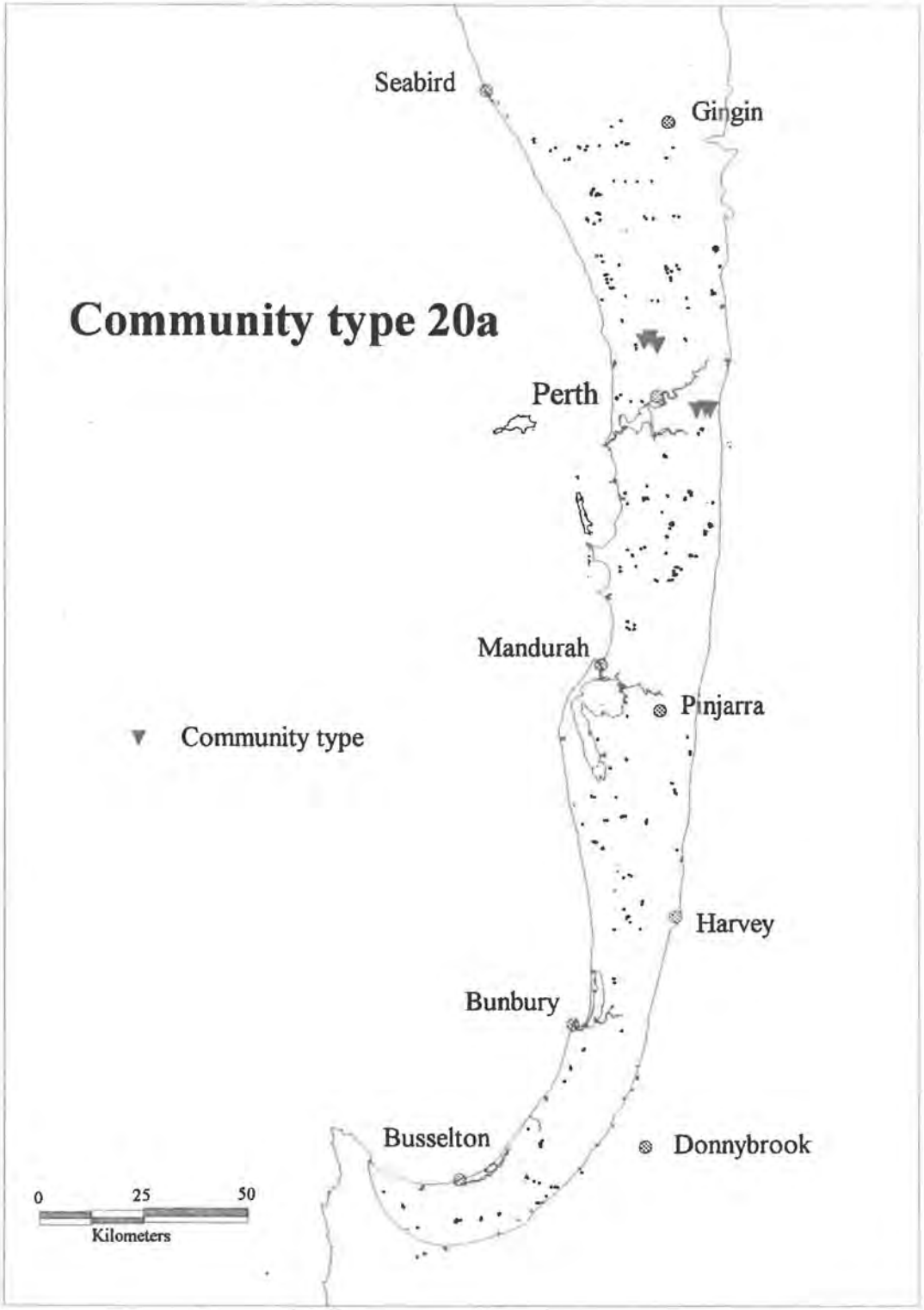
Typical Species:

Trees	Shrubs	Herbs
Banksia attenuata	*Bossiaea eriocarpa*	*Alexgeorgea nitens*
	Conostephium pendulum	*Burchardia umbellata*
	Hibbertia huegelii	*Drosera erythrorhiza*
	Hibbertia hypericoides	*Drosera menziesii* subsp. *penicillaris*
	Petrophile linearis	*Haemodorum laxum*
	Scaevola repens var. *repens*	*Lomandra hermaphrodita*
	Stirlingia latifolia	*Loxocarya fasciculata*
		Lyginia barbata
		Mesomelaena pseudostygia
		Patersonia occidentalis
		Stylidium piliferum

Other common species:

Trees	Shrubs	Herbs
	Allocasuarina humilis	*Amphipogon turbinatus*
	Astroloma pallidum	*Conostylis aurea*
	Daviesia nudiflora	*Conostylis setigera*
	Daviesia triflora	*Cyathochaeta clandestina*
	Eremaea pauciflora	*Dampiera linearis*
	Eriostemon spicatus	*Danthonia occidentalis*
	Gompholobium tomentosum	**Gladiolus caryophyllaceus*
	Hemiandra pungens	*Hypolaena exsulca*
	Jacksonia densiflora / floribunda complex	*Lepidosperma sp.* (coastal terete)
	Petrophile macrostachya	*Lomandra caespitosa*
	Synaphea spinulosa	*Loxocarya flexuosa*
		Monotaxis grandiflora
		Schoenus curvifolius
		Stylidium brunonianum
		Stylidium calcaratum
		Tetraria octandra
		Thysanotus triandrus
		Xanthosia huegelii

Mean species richness:	**67.4**	**Structural units**
Mean weed frequency:	**1**	low forest A low woodland A
Mean vegetation condition:	**1.7**	low woodland B open low woodland A
Number of quadrats:	**7**	


Seabird
Gingin
Community type 20a
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 20b

Eastern *Banksia attenuata* and/or *Eucalyptus marginata* woodlands

Reservation Status: Poorly reserved
Conservation Status: Vulnerable

Typical Species:

Trees	Shrubs	Herbs
Banksia attenuata	*Bossiaea eriocarpa*	*Burchardia umbellata*
	Conostephium pendulum	*Chamaescilla corymbosa*
	Dryandra nivea	*Dasypogon bromeliifolius*
	Hibbertia huegelii	*Drosera erythrorhiza*
	Hibbertia hypericoides	*Lomandra hermaphrodita*
	Petrophile linearis	*Loxocarya fasciculata*
	Xanthorrhoea preissii	*Mesomelaena tetragona*
		Restio sinosus Ms
		Tetraria octandra

Other common species:

Trees	Shrubs	Herbs
Eucalyptus marginata	*Allocasuarina humilis*	*Amphipogon turbinatus*
Xylomelum occidentale	*Astroloma pallidum*	*Caladenia flava*
	Baeckea camphorosmae	*Conostylis juncea*
	Calectasia cyanea	*Mesomelaena pseudostygia*
	Eriostemon spicatus	*Conostylis setigera*
	Gompholobium tomentosum	*Drosera macrantha*
	Grevillea pilulifera	*Drosera paleacea*
	Hakea ruscifolia	*Haemodorum laxum*
	Hibbertia vaginata	*Lepidosperma angustatum*
	Hypocalymma robustum	*Leporella fimbriata*
	Labichea punctata	*Lomandra sericea*
	Stirlingia latifolia	*Lyperanthus nigricans*
		Stylidium brunonianum
		Stylidium piliferum
		**Ursinia anthemoides*
		Xanthosia huegelii

Mean species richness: 62.7

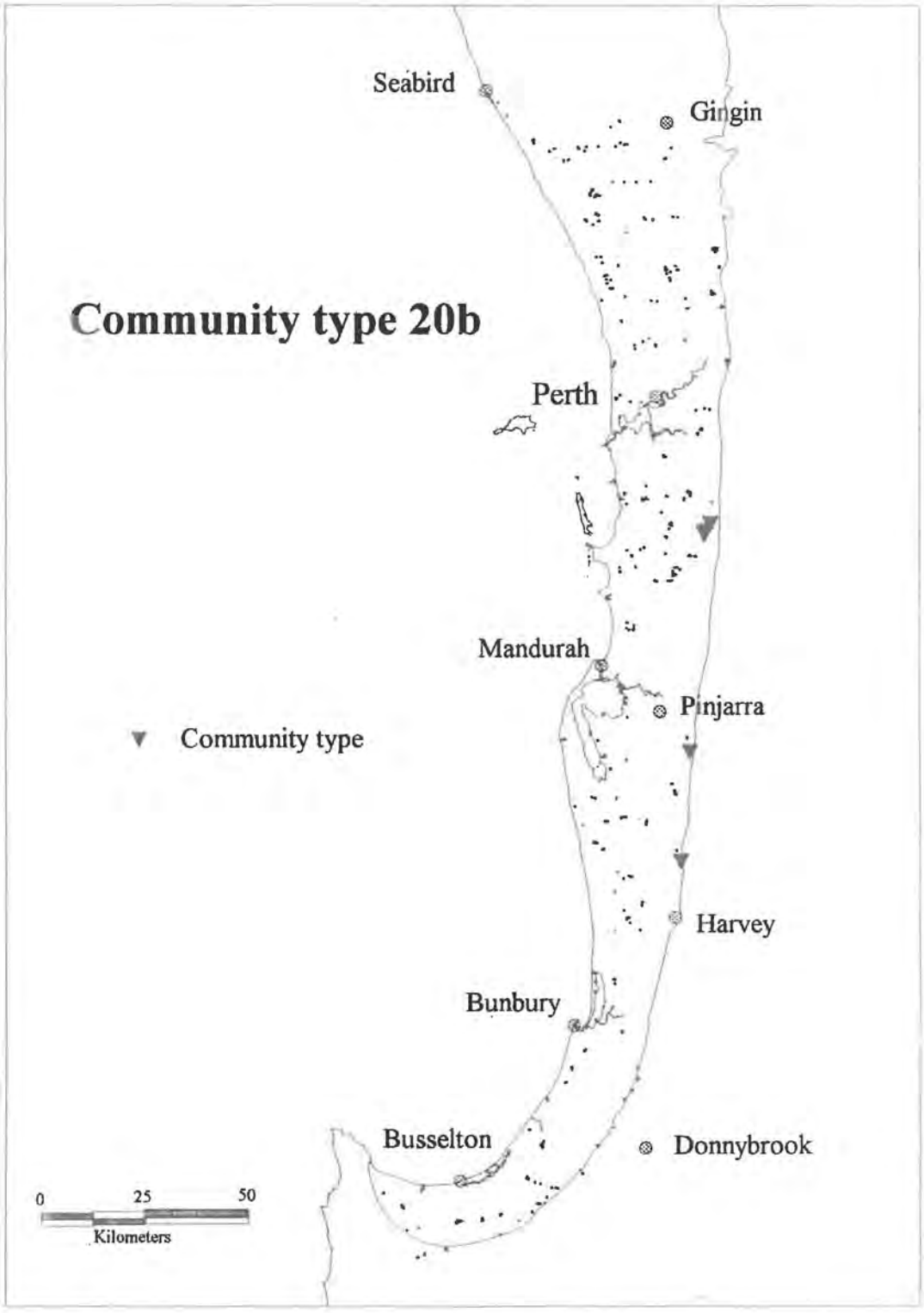
Mean weed frequency: 1.4

Mean vegetation condition: 2.6

Number of quadrats: 9

Structural units

low forest A
low woodland A
open low woodland A


Seabird
Gingin
Community type 20b
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 20c

Eastern shrublands and woodlands

Reservation Status: Unreserved
Conservation Status: Vulnerable

Typical Species:

Trees	Shrubs	Herbs
	Allocasuarina humilis	*Amphipogon turbinatus*
	Bossiaea eriocarpa	*Burchardia umbellata*
	Hibbertia hypericoides	*Conostylis aculeata*
	Scaevola repens var. *repens*	*Conostylis aurea*
	Stirlingia latifolia	**Gladiolus caryophyllaceus*
		Haemodorum laxum
		Lomandra hermaphrodita
		Lyginia barbata
		Mesomelaena pseudostygia
		Neurachne alopecuroidea
		Patersonia occidentalis
		Podolepis gracilis
		Schoenus aff. *brevisetis*
		Stipa compressa
		Trachymene pilosa
		**Ursinia anthemoides*

Other common species:

Trees	Shrubs	Herbs
	Acacia auronitens	*Anigozanthos manglesii*
	Acacia sessilis	*Arnocrinum preissii*
	Acacia willdenowiana	**Briza maxima*
	Dryandra nivea	*Chamaescilla corymbosa*
	Eremaea asterocarpa subsp. *asterocarpa*	*Dasypogon bromeliifolius*
	Eriostemon spicatus	*Drosera stolonifera*
	Gompholobium tomentosum	*Hybanthus calycinus*
	Jacksonia densiflora / floribunda complex	**Hypochaeris glabra*
	Petrophile linearis	*Isotropis cuneifolia*
	Scaevola canescens	*Laxmannia sessiliflora* subsp. *australis*
		Leporella fimbriata
		Schoenus curvifolius
		Stipa pycnostachya
		Tetraria octandra

Mean species richness: 64

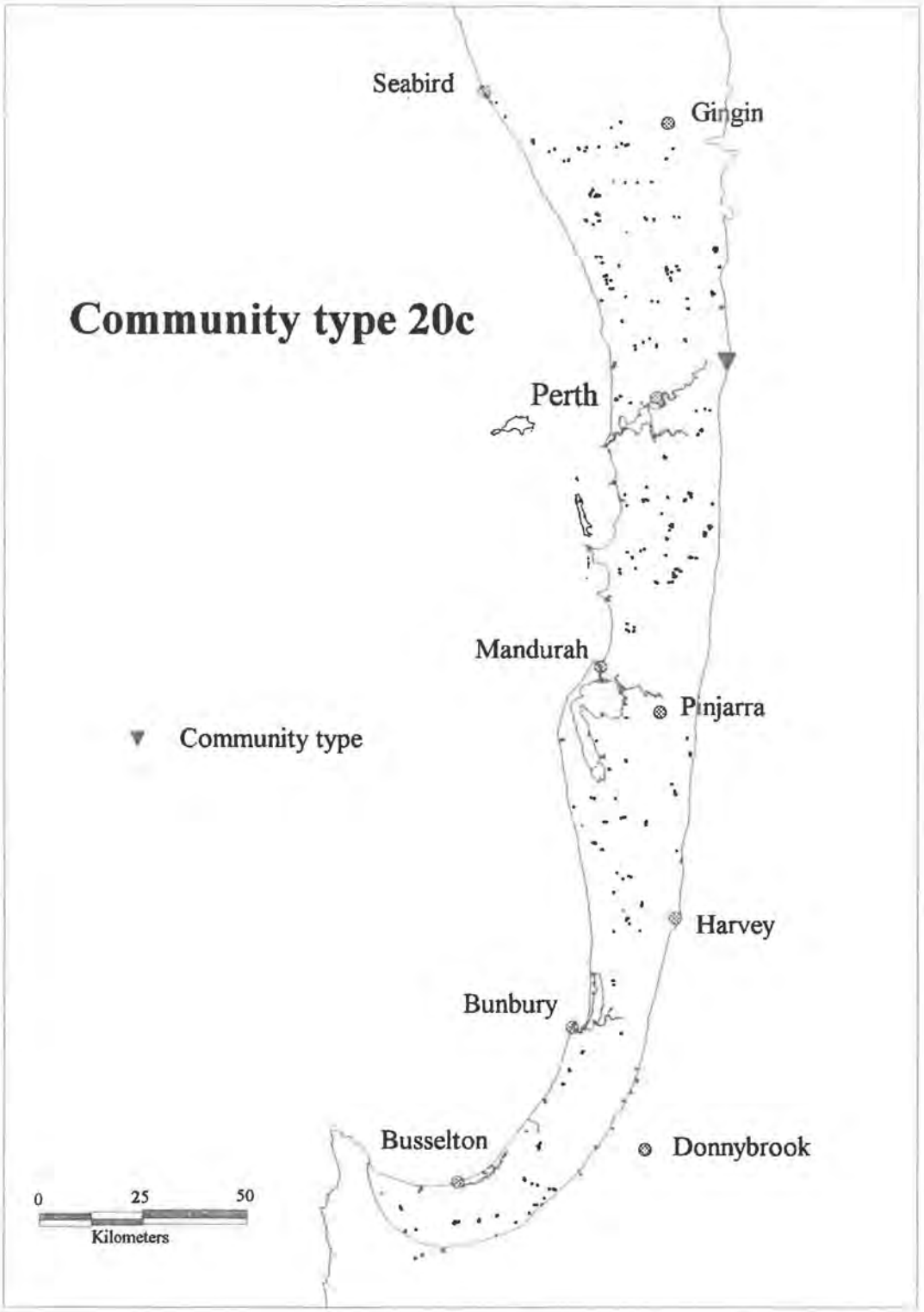
Mean weed frequency: 4

Mean vegetation condition: 2.2

Number of quadrats: 9

Structural units

woodland
low woodland A
open low woodland A
scrub
open scrub
open low scrub A
open low scrub B


Seabird
Gingin
Community type 20c
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 21a

Central *Banksia attenuata - Eucalyptus marginata* woodlands

Reservation Status: Well reserved
Conservation Status: Low risk

Typical Species:

Trees	Shrubs	Herbs
Banksia attenuata	*Bossiaea eriocarpa*	**Briza maxima*
	Gompholobium tomentosum	*Burchardia umbellata*
	Hibbertia hypericoides	**Hypochaeris glabra*
	Petrophile linearis	*Lepidosperma angustatum*
		Trachymene pilosa

Other common species:

Trees	Shrubs	Herbs
Eucalyptus marginata	*Conostephium pendulum*	*Caladenia flava*
	Eriostemon spicatus	*Chamaescilla corymbosa*
	Macrozamia riedlei	*Conostylis aculeata*
		Conostylis juncea
		Danthonia occidentalis
		Dasypogon bromeliifolius
		Drosera erythrorhiza
		Drosera stolonifera
		Lagenifera huegelii
		Lomandra caespitosa
		Lomandra hermaphrodita
		Lomandra sericea
		Loxocarya flexuosa
		Lyginia barbata
		Patersonia occidentalis
		Phlebocarya ciliata
		**Ursinia anthemoides*
		Xanthosia huegelii

Mean species richness: **54.6**

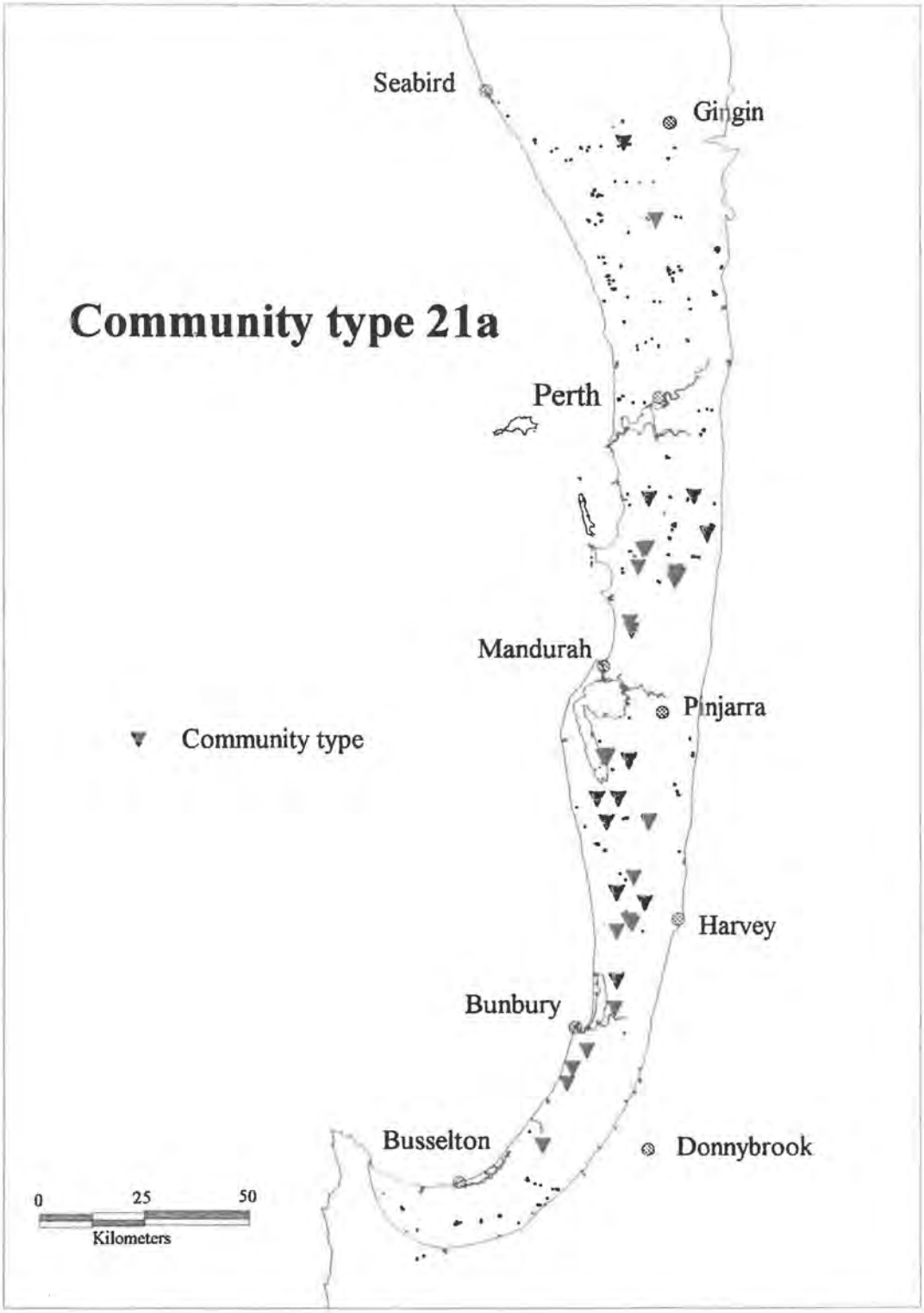
Mean weed frequency: **4.2**

Mean vegetation condition: **2.5**

Number of quadrats: **39**

Structural units

dense forest
forest
low forest A
woodland
low woodland A
open woodland
open low woodland A
low heath C


Seabird
Gingin
Community type 21a
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 21b

Southern *Banksia attenuata* woodlands

Reservation Status: Well reserved
Conservation Status: Susceptible

Typical Species:

Trees	Shrubs	Herbs
Banksia attenuata	*Bossiaea eriocarpa*	*Burchardia umbellata*
	Calytrix flavescens	*Chamaescilla corymbosa*
	Conostephium pendulum	*Dasypogon bromeliifolius*
	Eriostemon spicatus	*Drosera menziesii* subsp. *penicillaris*
	Hibbertia hypericoides	**Hypochaeris glabra*
	Hypocalymma robustum	*Laxmannia sessiliflora* subsp. *australis*
	Jacksonia sp. Busselton (G.J. Keighery 4482)	*Lepidosperma angustatum*
	Leucopogon conostephioides	*Leporella fimbriata*
	Melaleuca thymoides	*Lomandra hermaphrodita*
	Petrophile linearis	*Lyginia barbata*
		Patersonia occidentalis
		Phlebocarya ciliata
		Trachymene pilosa
		Xanthosia huegelii

Other common species:

Trees	Shrubs	Herbs
	Acacia extensa	**Briza maxima*
	Acacia pulchella var. *pulchella*	*Caladenia flava*
	Boronia spathulata	*Hypolaena exsulca*
	Gompholobium tomentosum	*Lomandra caespitosa*
	Hibbertia vaginata	*Lomandra sericea*
	Hovea trisperma	*Loxocarya fasciculata*
	Lysinema ciliatum	*Lyperanthus nigricans*
	Stirlingia latifolia	*Stipa compressa*
		Stylidium piliferum

Mean species richness: 61.3

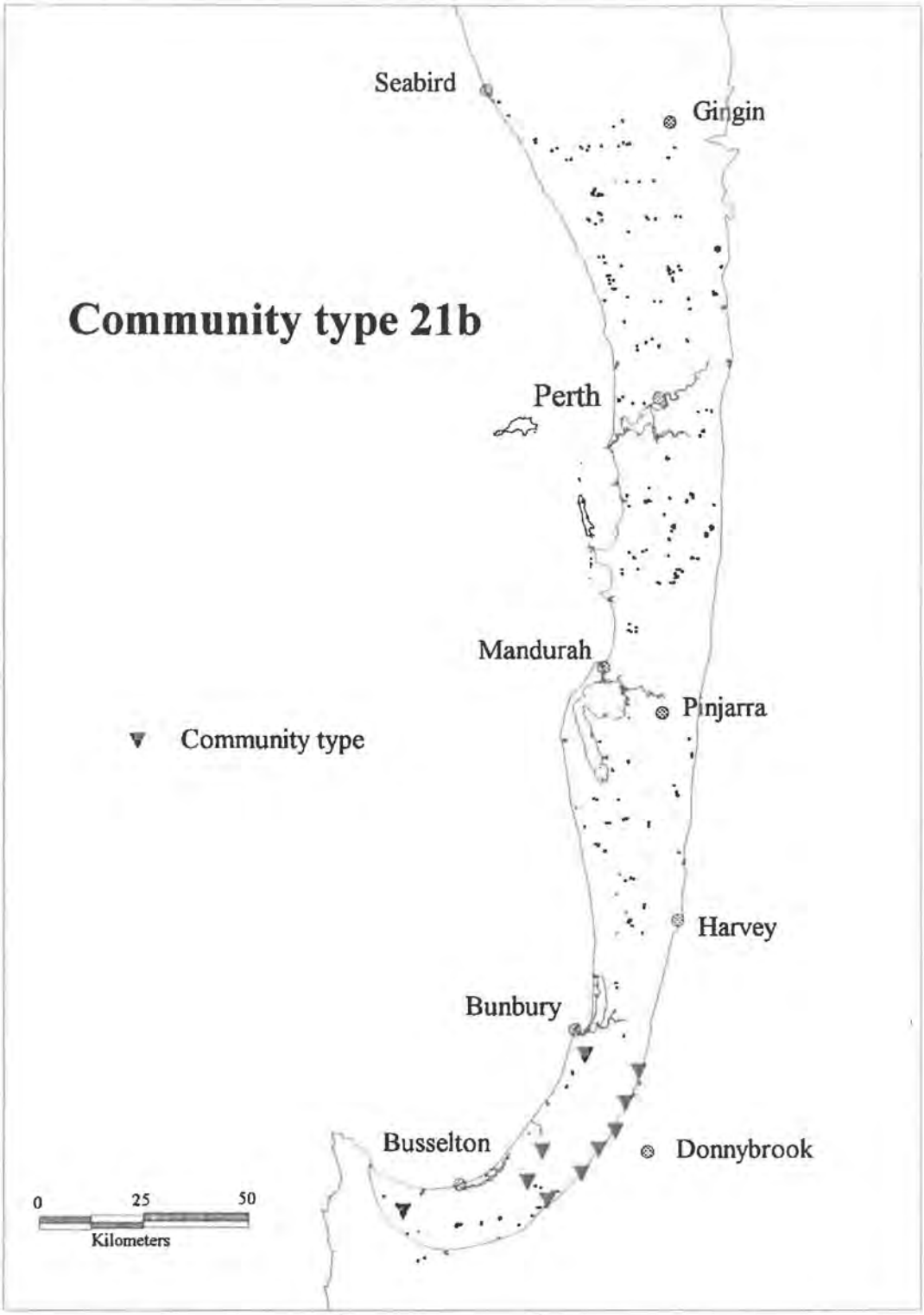
Mean weed frequency: 1.7

Mean vegetation condition: 2

Number of quadrats: 12

Structural units

forest
low forest A
woodland
low woodland A
open low woodland A


Seabird
Gingin
Community type 21b
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 21c

Low lying *Banksia attenuata* woodlands or shrublands

Reservation Status: Well reserved
Conservation Status: Susceptible

Typical Species:

Trees	Shrubs	Herbs
Banksia attenuata		**Briza maxima* **Hypochaeris glabra* *Lomandra caespitosa* *Lyginia barbata* *Thysanotus manglesianus/ patersonii* complex *Trachymene pilosa*

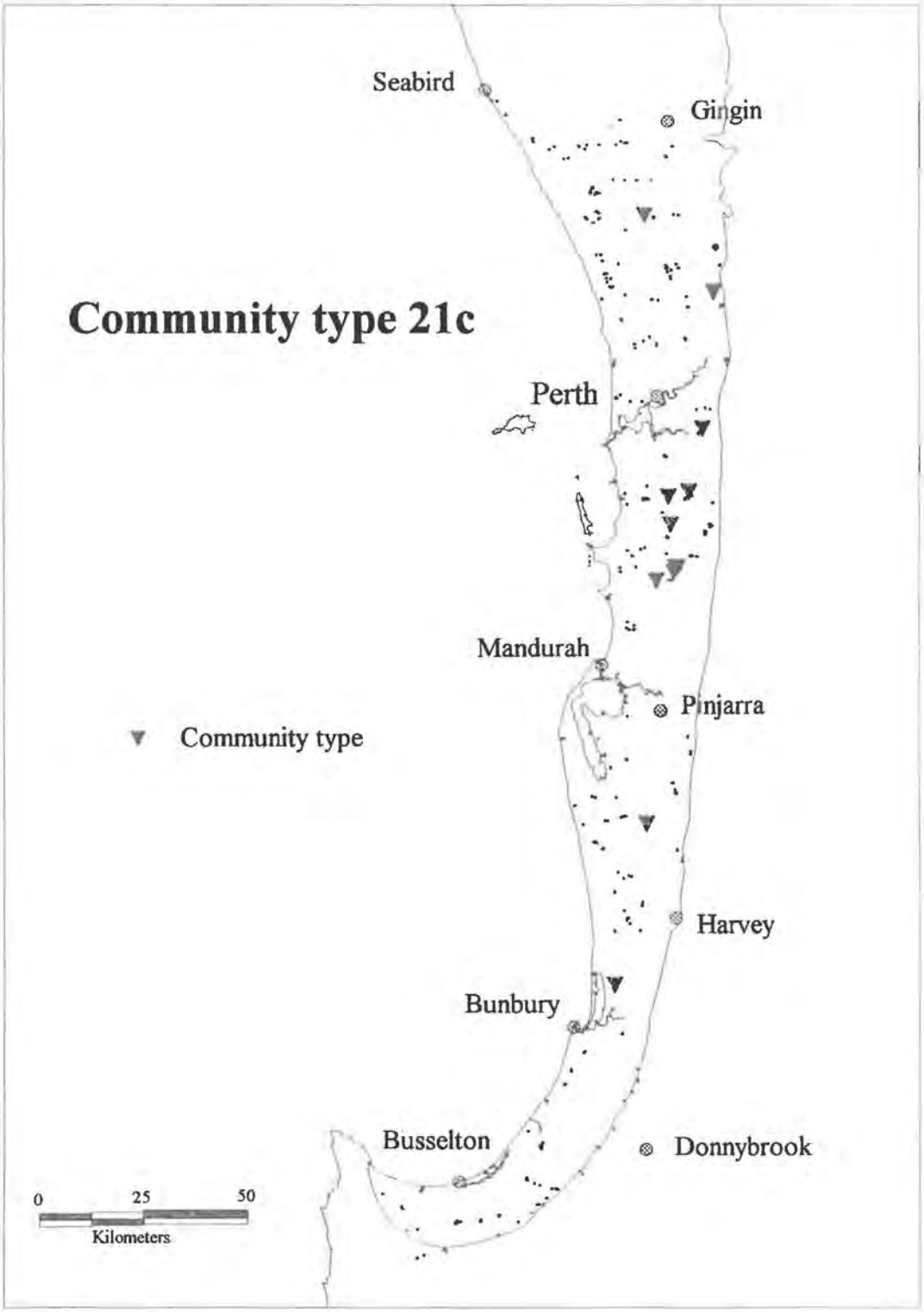
Other common species:

Trees	Shrubs	Herbs
Banksia menziesii	*Gompholobium tomentosum* *Kunzea ericifolia* *Leucopogon conostephioides* *Petrophile linearis* *Scholtzia involucrata*	*Burchardia umbellata* *Caladenia flava* *Dasypogon bromeliifolius* *Drosera erythrorhiza* *Hypolaena exsulca* *Lomandra hermaphrodita* *Patersonia occidentalis* *Stylidium brunonianum* *Stylidium repens* **Ursinia anthemoides*

Mean species richness:	**40.5**
Mean weed frequency:	**3.6**
Mean vegetation condition:	**2.6**
Number of quadrats:	**16**

Structural units

forest
low forest A
woodland
low woodland A
open low woodland A
dense heath B
dwarf scrub C


Seabird
Gingin
Community type 21c
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 22

Banksia ilicifolia woodlands

Reservation Status: Poorly reserved
Conservation Status: Susceptible

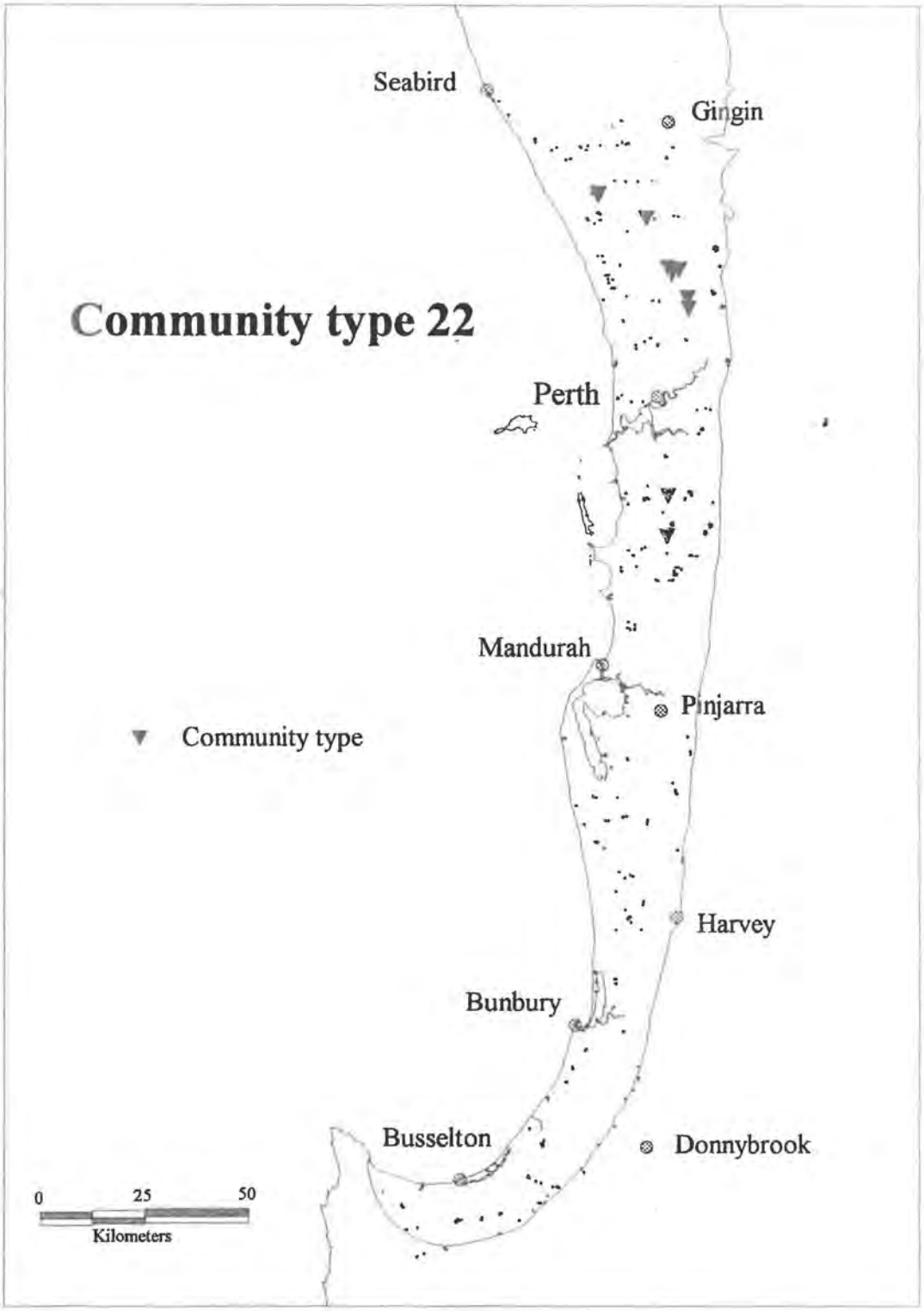
Typical Species:

Trees	Shrubs	Herbs
Banksia attenuata	*Petrophile linearis*	*Stylidium brunonianum*
Banksia ilicifolia		*Stylidium repens*

Other common species:

Trees	Shrubs	Herbs
		Dasypogon bromeliifolius
		Drosera paleacea
		Lyginia barbata
		Patersonia occidentalis
		Phlebocarya ciliata
		Stylidium piliferum

Mean species richness:	**32.5**	**Structural units**
Mean weed frequency:	**0.6**	low woodland A open low woodland A
Mean vegetation condition:	**2**	open scrub
Number of quadrats:	**11**	


Seabird
Gingin
Community type 22
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 23a

Central *Banksia attenuata - B. menziesii* woodlands

Reservation Status: Well reserved
Conservation Status: Low risk

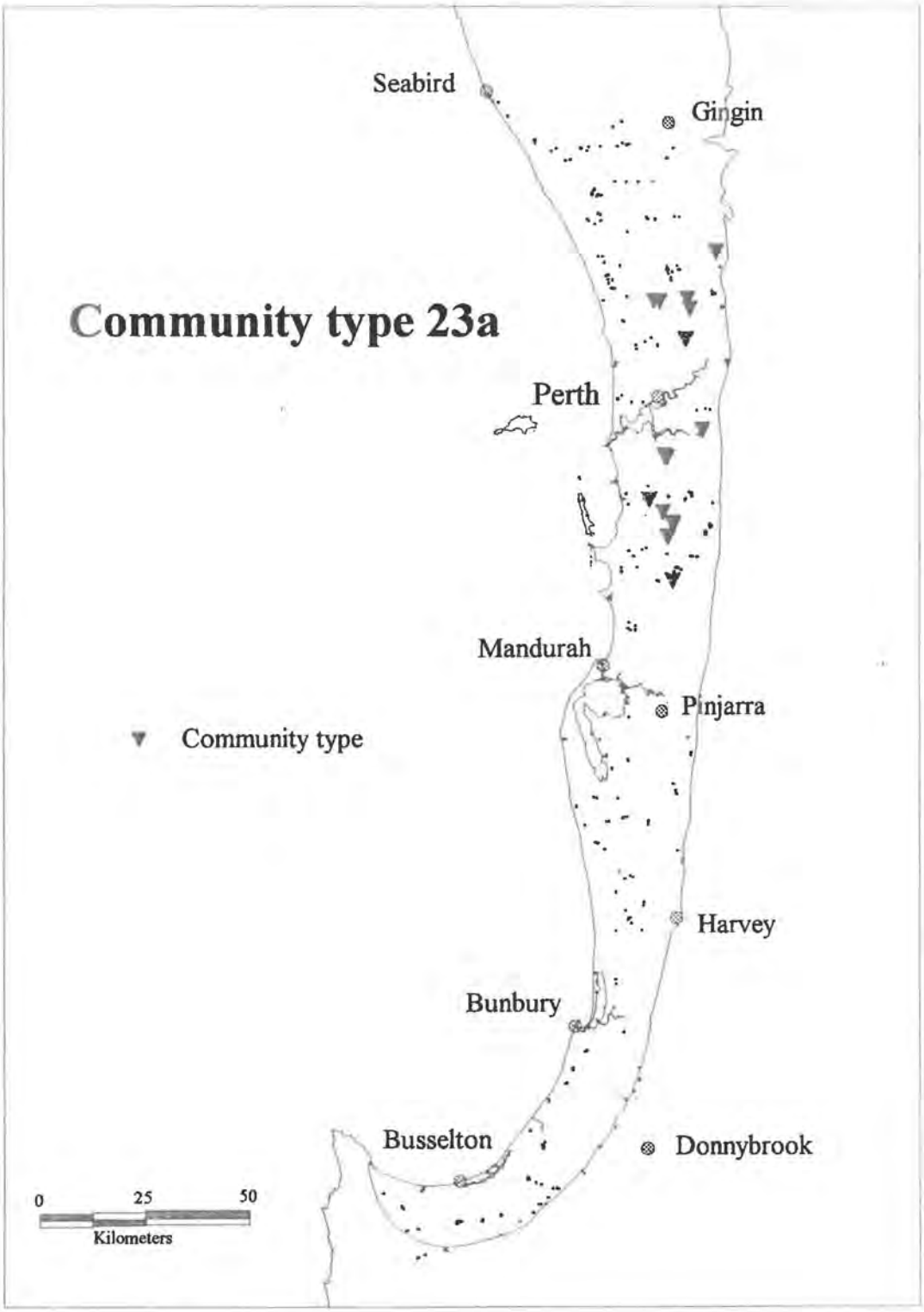
Typical Species:

Trees	Shrubs	Herbs
Banksia menziesii	*Bossiaea eriocarpa*	**Briza maxima*
Banksia attenuata	*Gompholobium tomentosum*	*Burchardia umbellata*
	Leucopogon conostephioides	*Conostylis juncea*
	Petrophile linearis	*Dampiera linearis*
	Scholtzia involucrata	*Drosera erythrorhiza*
		**Hypochaeris glabra*
		Lomandra hermaphrodita
		Lyginia barbata
		Patersonia occidentalis
		Schoenus curvifolius
		Stylidium piliferum
		Trachymene pilosa

Other common species:

Trees	Shrubs	Herbs
	Adenanthos cygnorum	**Aira caryophyllea*
	Calytrix flavescens	*Amphipogon turbinatus*
	Conostephium pendulum	*Centrolepis drummondiana*
	Eriostemon spicatus	*Danthonia occidentalis*
	Hibbertia hypericoides	*Dasypogon bromeliifolius*
	Hibbertia subvaginata	*Drosera menziesii* subsp. *penicillaris*
	Hovea trisperma	**Gladiolus caryophyllaceus*
	Xanthorrhoea preissii	*Laxmannia squarrosa*
		Lepidosperma angustatum
		Loxocarya flexuosa
		Phlebocarya ciliata
		Stipa compressa
		Stylidium brunonianum
		Stylidium repens
		Thysanotus manglesianus/ patersonii complex
		**Ursinia anthemoides*
		Waitzia suaveolens
		Xanthosia huegelii

Mean species richness:	**62.8**	**Structural units**
Mean weed frequency:	**5.2**	low forest A woodland
Mean vegetation condition:	**2**	low woodland A low woodland B
Number of quadrats:	**19**	open low woodland A


Seabird
Gingin
Community type 23a
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 23b

Northern *Banksia attenuata - B. menziesii* woodlands

Reservation Status: Unreserved
Conservation Status: Susceptible

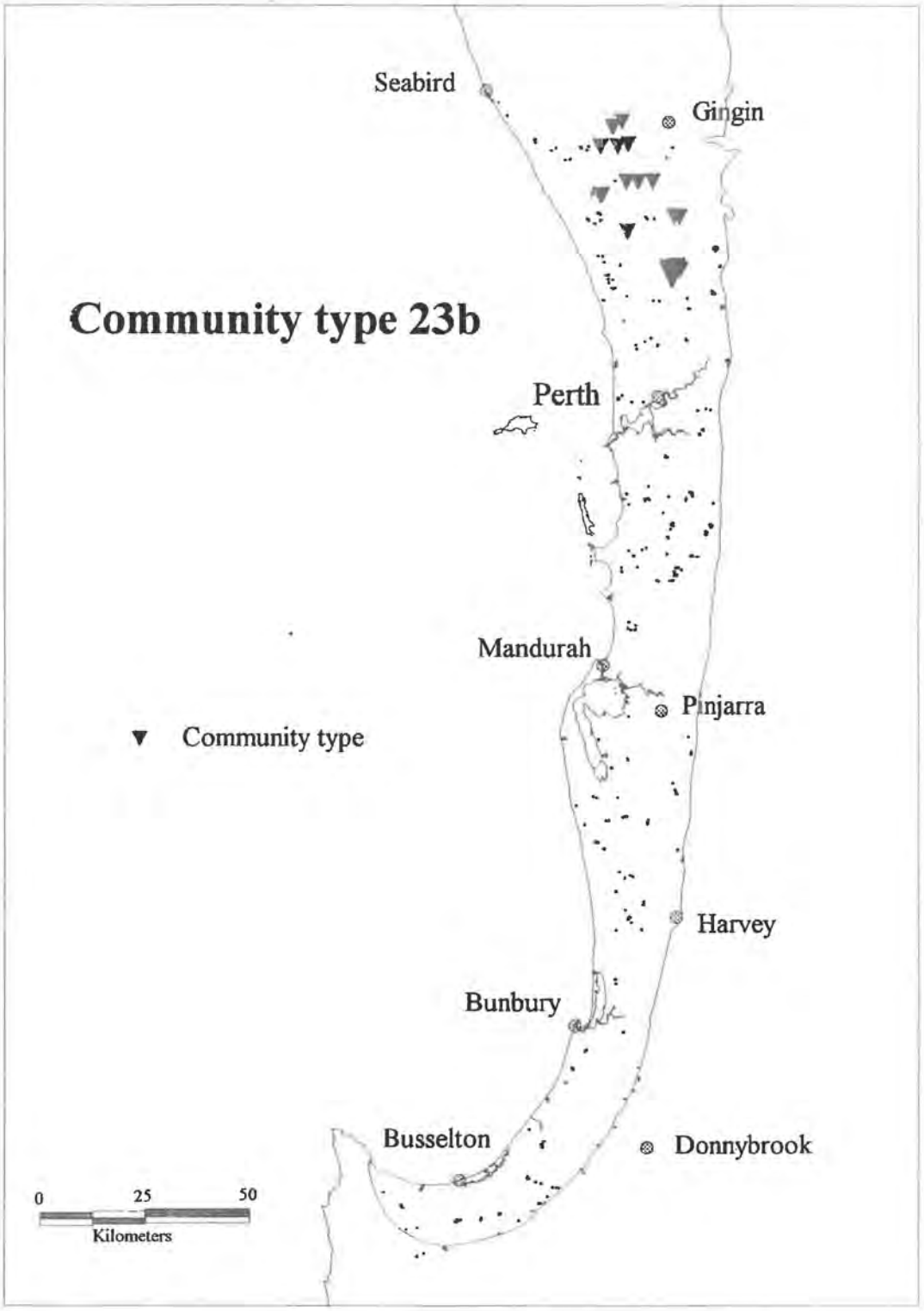
Typical Species:

Trees	Shrubs	Herbs
Banksia attenuata	*Bossiaea eriocarpa*	*Alexgeorgea nitens*
Banksia menziesii	*Calytrix flavescens*	*Anigozanthos humilis*
	Eremaea pauciflora	*Burchardia umbellata*
	Eriostemon spicatus	*Lomandra hermaphrodita*
	Hibbertia subvaginata	*Lyginia barbata*
	Jacksonia densiflora / floribunda complex	*Patersonia occidentalis*
	Petrophile linearis	*Schoenus curvifolius*
	Scholtzia involucrata	*Stylidium repens*
		Xanthosia huegelii

Other common species:

Trees	Shrubs	Herbs
	Acacia pulchella var. *pulchella*	*Amphipogon turbinatus*
	Beaufortia elegans	*Conostylis juncea*
	Conostephium minus	*Dasypogon bromeliifolius*
	Conostephium pendulum	*Drosera erythrorhiza*
	Hibbertia hypericoides	*Drosera menziesii* subsp. *penicillaris*
	Leucopogon conostephioides	*Mitrasacme paradoxa*
	Melaleuca aff. *trichophylla*	*Stylidium brunonianum*
	Stirlingia latifolia	*Stylidium diuroides*
		Stylidium piliferum

Mean species richness:	**53.8**	**Structural units**
Mean weed frequency:	**0.7**	low forest A low woodland A
Mean vegetation condition:	**1.8**	low woodland B open low woodland A
Number of quadrats:	**21**	


Seabird
Gingin
Community type 23b
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 24

Northern Spearwood shrublands and woodlands

Reservation Status: Well reserved
Conservation Status: Susceptible

Typical Species:

Trees	Shrubs	Herbs
		**Anagallis arvensis*
		**Briza maxima*
		**Hypochaeris glabra*
		Lepidosperma angustatum
		Loxocarya flexuosa

Other common species:

Trees	Shrubs	Herbs
	Hardenbergia comptoniana	**Bromus diandrus*
	Melaleuca acerosa	**Cerastium glomeratum*
	Phyllanthus calycinus	*Conostylis aculeata*
	Xanthorrhoea preissii	*Dianella revoluta*
		**Lagurus ovatus*
		Lomandra maritima
		**Petrorhagia velutina*
		**Sonchus oleraceus*
		Stipa flavescens

Mean species richness: **41.8**

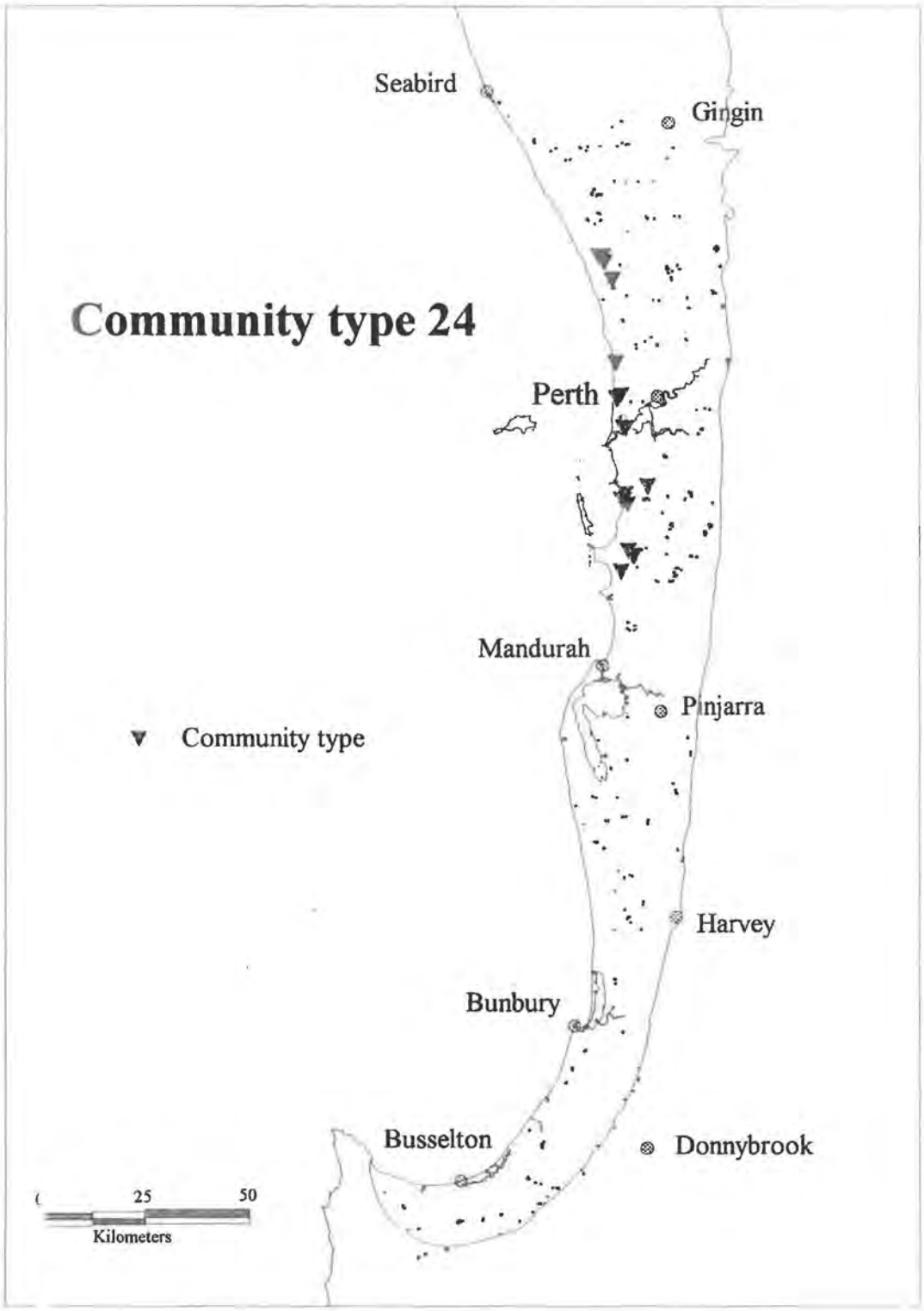
Mean weed frequency: **14.2**

Mean vegetation condition: **3**

Number of quadrats: **25**

Structural units

dense low forest B
low forest A
woodland
low woodland A
dense shrub mallee
open shrub mallee
thicket
dense low heath C
dense low heath D
heath A
low heath C
low heath D
low scrub A
low scrub B


Seabird
Gingin
Community type 24
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
25
50
Kilometers

Community type: 25

Southern *Eucalyptus gomphocephala - Agonis flexuosa* woodlands

Reservation Status: Poorly reserved
Conservation Status: Susceptible

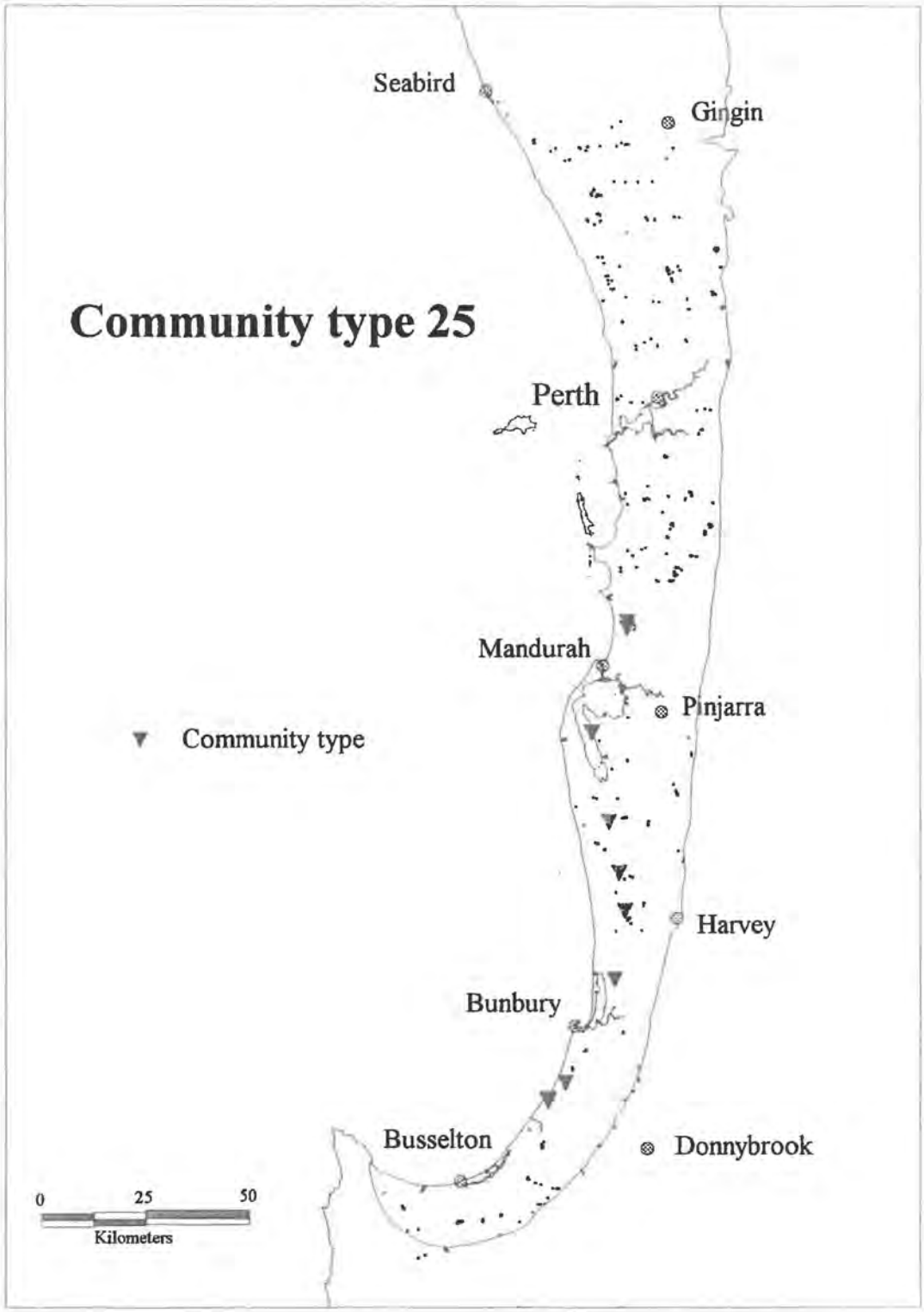
Typical Species:

Trees	Shrubs	Herbs
Eucalyptus gomphocephala	*Hibbertia hypericoides*	**Briza maxima*
	Macrozamia riedlei	**Briza minor*
	Phyllanthus calycinus	*Daucus glochidiatus*
		**Hypochaeris glabra*
		Oxalis perennans
		**Petrorhagia velutina*
		Sowerbaea laxiflora
		Trachymene pilosa

Other common species:

Trees	Shrubs	Herbs
Agonis flexuosa	*Acacia willdenowiana*	**Aira caryophyllea*
	Hardenbergia comptoniana	**Bromus diandrus*
	Leucopogon propinquus	*Caladenia flava*
		Caladenia latifolia
		Conostylis aculeata
		Dichopogon capillipes
		Drosera erythrorhiza
		Geranium retrorsum
		Lagenifera huegelii
		Lepidosperma angustatum
		Lomandra caespitosa
		Microlaena stipoides
		**Orobanche minor*
		**Sonchus oleraceus*
		Stipa flavescens
		**Trifolium campestre*

Mean species richness:	**52.8**	**Structural units**
Mean weed frequency:	**12.9**	low forest A woodland
Mean vegetation condition:	**3.3**	open woodland open tree mallee
Number of quadrats:	**11**	


Seabird
Gingin
Community type 25
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 26a

Melaleuca huegelii - M. acerosa shrublands of limestone ridges

Reservation Status: Unreserved
Conservation Status: Susceptible

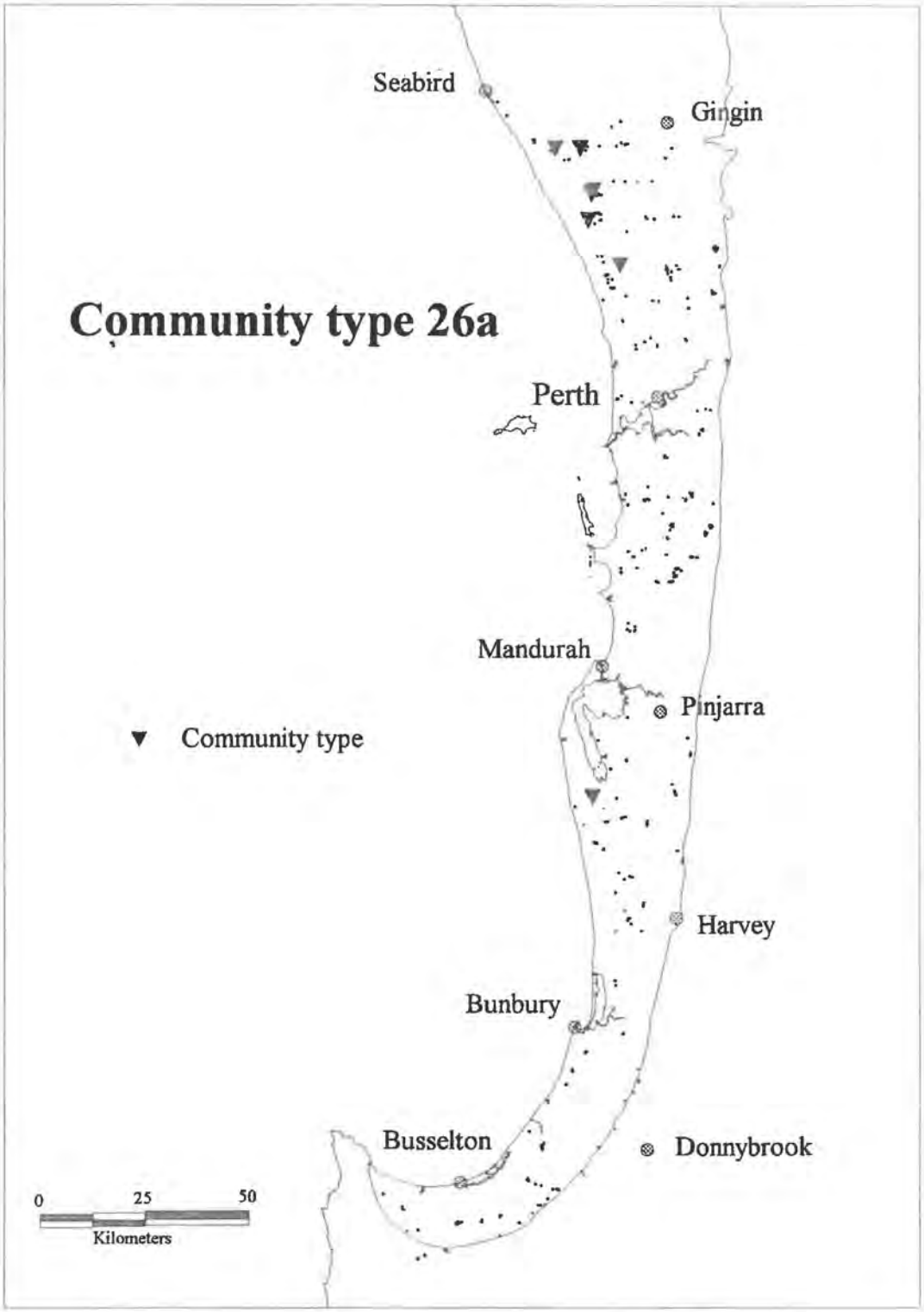
Typical Species:

Trees	Shrubs	Herbs
	Acacia lasiocarpa	*Daucus glochidiatus*
	Dryandra sessilis	*Eriochilus dilatatus*
	Grevillea thelemanniana subsp. *preissii*	**Hypochaeris glabra*
	Melaleuca acerosa	*Loxocarya flexuosa*
	Melaleuca huegelii	*Millotia tenuifolia*
	Trymalium albicans	*Mitrasacme paradoxa*
		**Sonchus oleraceus*
		Stipa flavescens
		Thysanotus manglesianus/ patersonii complex
		Trachymene pilosa
		**Vulpia myuros*

Other common species:

Trees	Shrubs	Herbs
	Dryandra nivea	**Aira caryophyllea*
	Gompholobium tomentosum	**Anagallis arvensis*
	Hardenbergia comptoniana	*Crassula colorata*
	Leucopogon parviflorus	*Danthonia occidentalis*
	Templetonia retusa	**Dischisma arenarium*
		**Heliophila pusilla*
		Hydrocotyle hispidula
		Opercularia vaginata
		Parietaria debilis
		Pterostylis aff. *nana*
		Stipa compressa
		Stylidium maritimum Ms
		Wurmbea monantha

Mean species richness:	**50.2**	**Structural units**
Mean weed frequency:	**8**	dense thicket
		dense heath A
Mean vegetation condition:	**2.1**	dense heath B
		heath A
Number of quadrats:	**11**	heath B
		low heath C
		low scrub B
		open scrub
		scrub


Seabird
Gingin
Community type 26a
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 26b

Woodlands and mallees on limestone

Reservation Status: Well reserved
Conservation Status: Low risk

Typical Species:

Trees	Shrubs	Herbs
	Hibbertia hypericoides	**Aira caryophyllea*
	Xanthorrhoea preissii	*Daucus glochidiatus*
		**Hypochaeris glabra*
		Lagenifera huegelii
		Loxocarya flexuosa
		Millotia tenuifolia
		Trachymene pilosa

Other common species

Trees	Shrubs	Herbs
	Dryandra nivea	**Anagallis arvensis*
	Hardenbergia comptoniana	*Centrolepis drummondiana*
	Hibbertia racemosa	**Cerastium glomeratum*
	Kennedia prostrata	*Crassula colorata*
	Melaleuca acerosa	*Drosera erythrorhiza*
		**Heliophila pusilla*
		Homalosciadium homalocarpum
		Isolepis marginata
		Lepidosperma angustatum
		Microlaena stipoides
		Pterostylis aff. *nana*
		**Sonchus oleraceus*
		Sowerbaea laxiflora
		Thysanotus manglesianus/ patersonii complex
		Wahlenbergia preissii

Mean species richness: 52.7

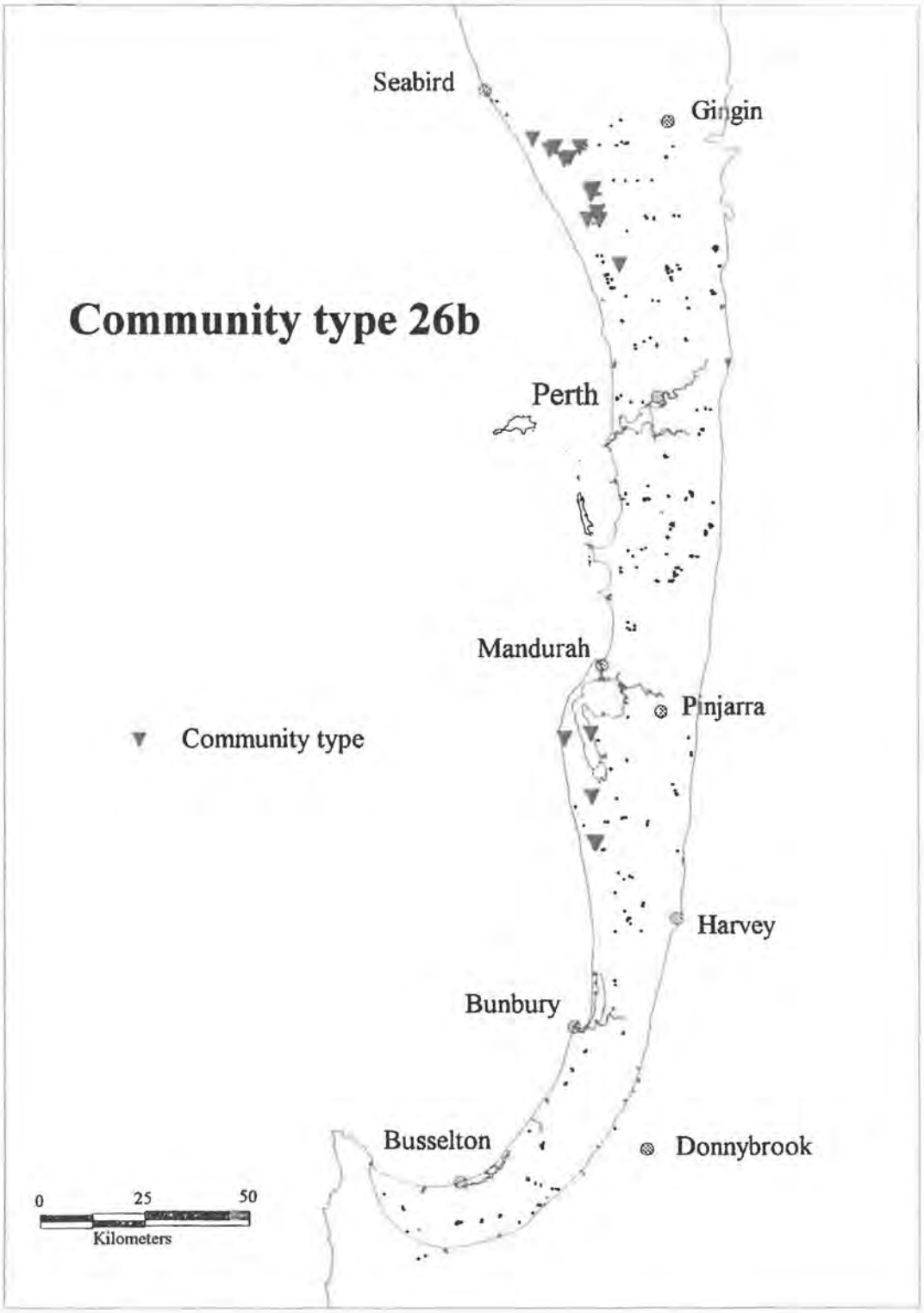
Mean weed frequency: 8.4

Mean vegetation condition: 2.5

Number of quadrats: 19

Structural units

forest
low forest A
woodland
low woodland A
tree mallee
open tree mallee
shrub mallee
very open scrub mallee
thicket
dense heath A
dense heath B
low scrub A


Seabird
Gingin
Community type 26b
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 27

Species poor mallees and shrublands on limestone

Reservation Status: Well reserved
Conservation Status: Low risk

Typical Species:

Trees	Shrubs	Herbs
	Acacia truncata	*Comesperma confertum*
	Astroloma microcalyx	*Lepidosperma angustatum*
	Dryandra nivea	*Lomandra maritima*
	Grevillea thelemanniana subsp. *preissii*	*Loxocarya flexuosa*
		Trachymene pilosa
	Leucopogon parviflorus	
	Lysinema ciliatum	
	Melaleuca acerosa	
	Templetonia retusa	

Other common species:

Trees	Shrubs	Herbs
	Acacia lasiocarpa	*Cassytha flava*
	Hakea trifurcata	*Cassytha glabella*
	Hibbertia hypericoides	*Conostylis aculeata*
	Hibbertia racemosa	*Daucus glochidiatus*
	Hibbertia spicata subsp. *leptotheca*	*Drosera macrantha*
		Opercularia vaginata
	Trymalium albicans	*Poa drummondiana*
	Xanthorrhoea preissii	*Pterostylis* aff. *nana*
		Schoenus lanatus
		Stylidium junceum
		Thysanotus manglesianus/ patersonii complex
		Tricoryne elatior

Mean species richness: 39

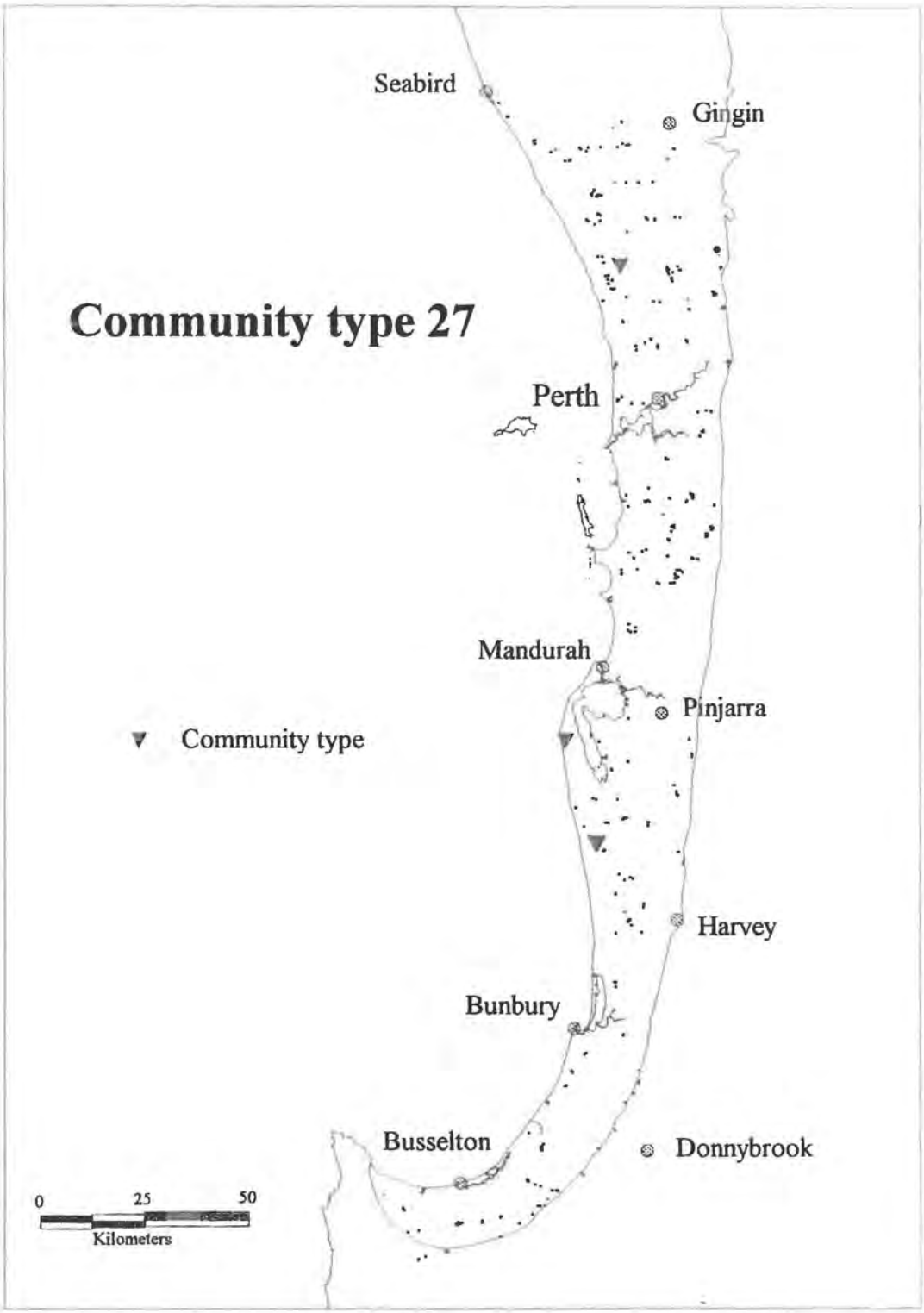
Mean weed frequency: 0

Mean vegetation condition: 1.7

Number of quadrats: 7

Structural units

dense shrub mallee
low heath C
low heath D
low scrub B
open shrub mallee
shrub mallee


Seabird
Gingin
Community type 27
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 28

Spearwood *Banksia attenuata* or *Banksia attenuata - Eucalyptus* woodlands

Reservation Status: Well reserved
Conservation Status: Low risk

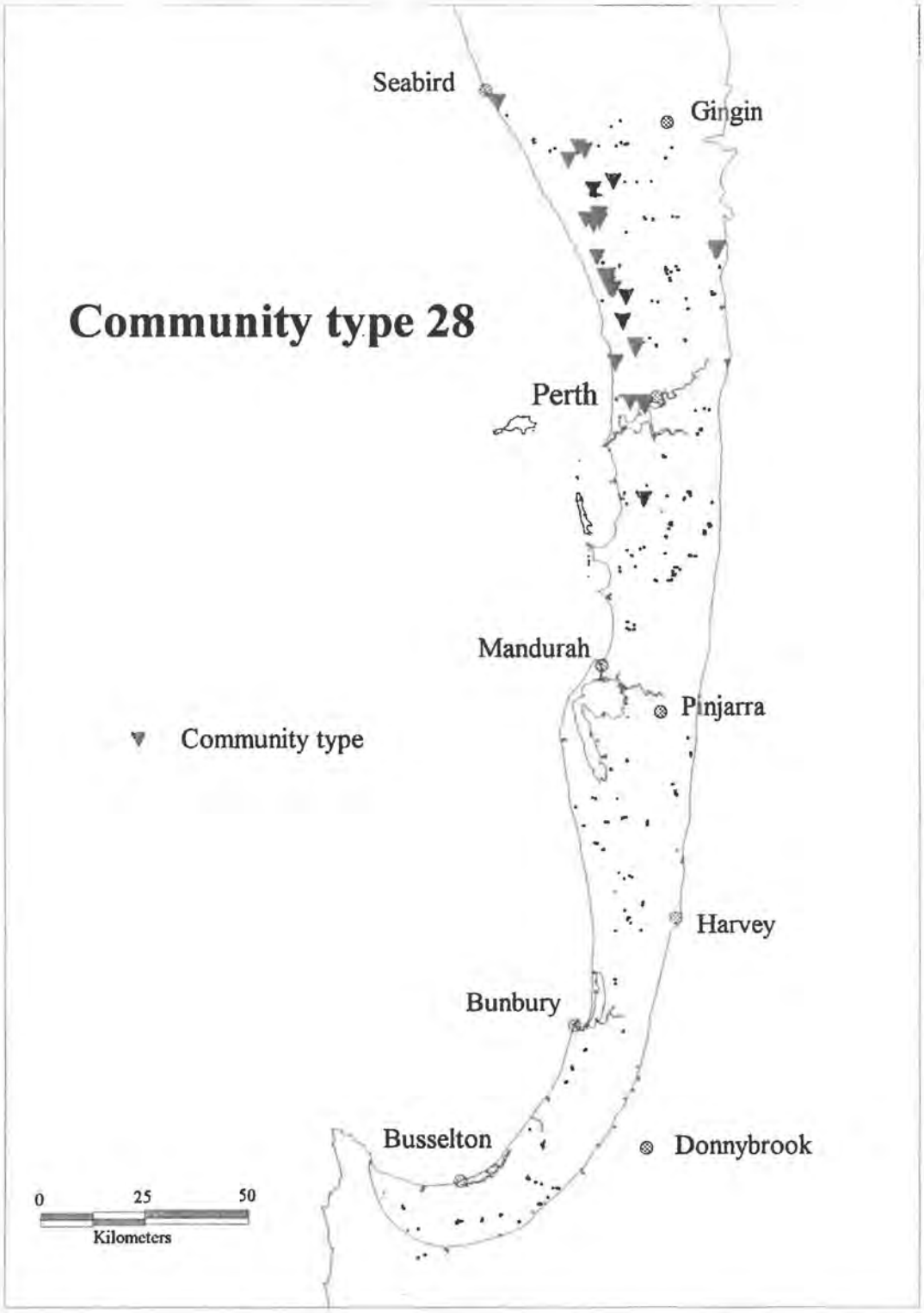
Typical Species:

Trees	Shrubs	Herbs
Banksia attenuata	*Hibbertia hypericoides*	* *Hypochaeris glabra*
	Xanthorrhoea preissii	*Burchardia umbellata*
		Drosera erythrorhiza
		Loxocarya flexuosa
		Mesomelaena pseudostygia
		Trachymene pilosa

Other common species:

Trees	Shrubs	Herbs
	Acacia pulchella var. *pulchella*	**Aira caryophyllea*
	Conostephium pendulum	**Briza maxima*
	Gompholobium tomentosum	**Gladiolus caryophyllaceus*
	Petrophile linearis	*Centrolepis drummondiana*
		Conostylis aculeata
		Conostylis setigera
		Danthonia occidentalis
		Daucus glochidiatus
		Lagenifera huegelii
		Lepidosperma angustatum
		Lomandra hermaphrodita
		Sowerbaea laxiflora
		Stylidium brunonianum
		Thysanotus manglesianus/ patersonii complex
		**Ursinia anthemoides*

Mean species richness:	**55.2**	**Structural units**
Mean weed frequency:	**8**	forest
		low forest A
Mean vegetation condition:	**2.5**	low forest B
		woodland
Number of quadrats:	**38**	low woodland A
		open woodland
		open low woodland A
		dense thicket
		scrub
		low scrub B


Seabird
Gingin
Community type 28
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: **29a**

Coastal shrublands on shallow sands

Reservation Status: Poorly reserved
Conservation Status: Susceptible

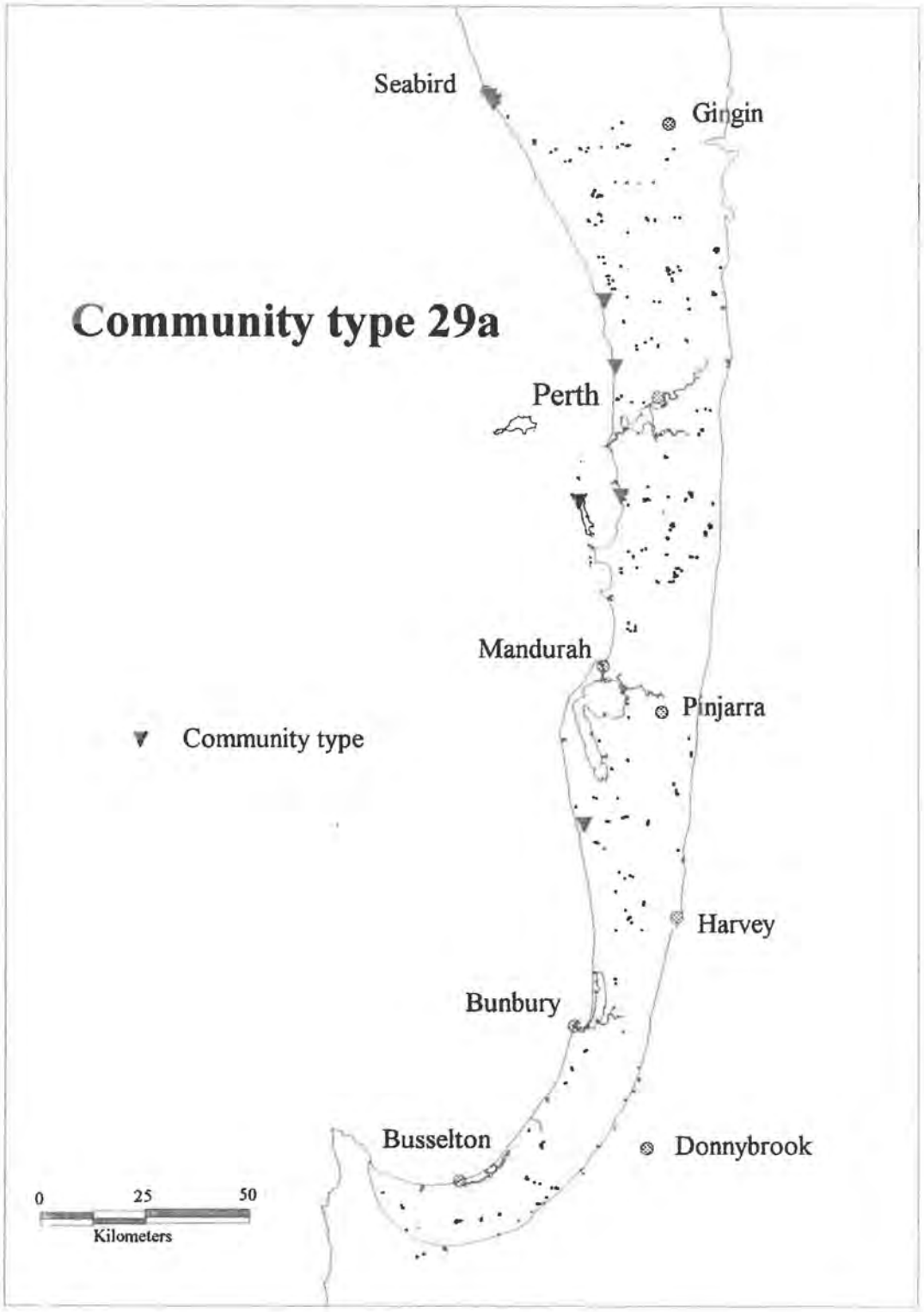
Typical Species:

Trees	Shrubs	Herbs
	Acanthocarpus preissii	*Crassula colorata*
	Rhagodia baccata	*Daucus glochidiatus*
	Spyridium globulosum	*Senecio lautus*
		Stipa flavescens

Other common species:

Trees	Shrubs	Herbs
	Eremophila glabra	**Anagallis arvensis*
	Hardenbergia comptoniana	**Bromus diandrus*
	Leucopogon parviflorus	**Cerastium glomeratum*
	Nemcia reticulata	*Crassula glomerata*
		**Galium murale*
		Parietaria debilis
		Poa porphyroclados
		**Sonchus oleraceus*
		Trachymene pilosa

Mean species richness:	**40.7**	**Structural units**
Mean weed frequency:	**11.2**	low forest A dense low forest A
Mean vegetation condition:	**2.3**	dense heath B dense low heath C
Number of quadrats:	**9**	dense low heath D low heath D


Seabird
Gingin
Community type 29a
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: **29b**

Acacia shrublands on taller dunes

Reservation Status: Poorly reserved
Conservation Status: Susceptible

Typical Species:

Trees	Shrubs	Herbs
	Acacia lasiocarpa	*Daucus glochidiatus*
	Acanthocarpus preissii	**Dischisma arenarium*
	Melaleuca acerosa	*Lepidosperma angustatum*
	Rhagodia baccata	*Lomandra maritima*
		Loxocarya flexuosa
		Poa porphyroclados
		Senecio lautus
		Stipa flavescens
		Trachymene pilosa

Other common species:

Trees	Shrubs	Herbs
	Acacia rostellifera	*Bromus diandrus*
	Gompholobium tomentosum	*Conostylis candicans*
	Hemiandra pungens	*Danthonia occidentalis*
	Leucopogon parviflorus	**Heliophila pusilla*
	Olearia axillaris	*Opercularia vaginata*
	Phyllanthus calycinus	*Schoenus grandiflorus*

Mean species richness: **35.6**

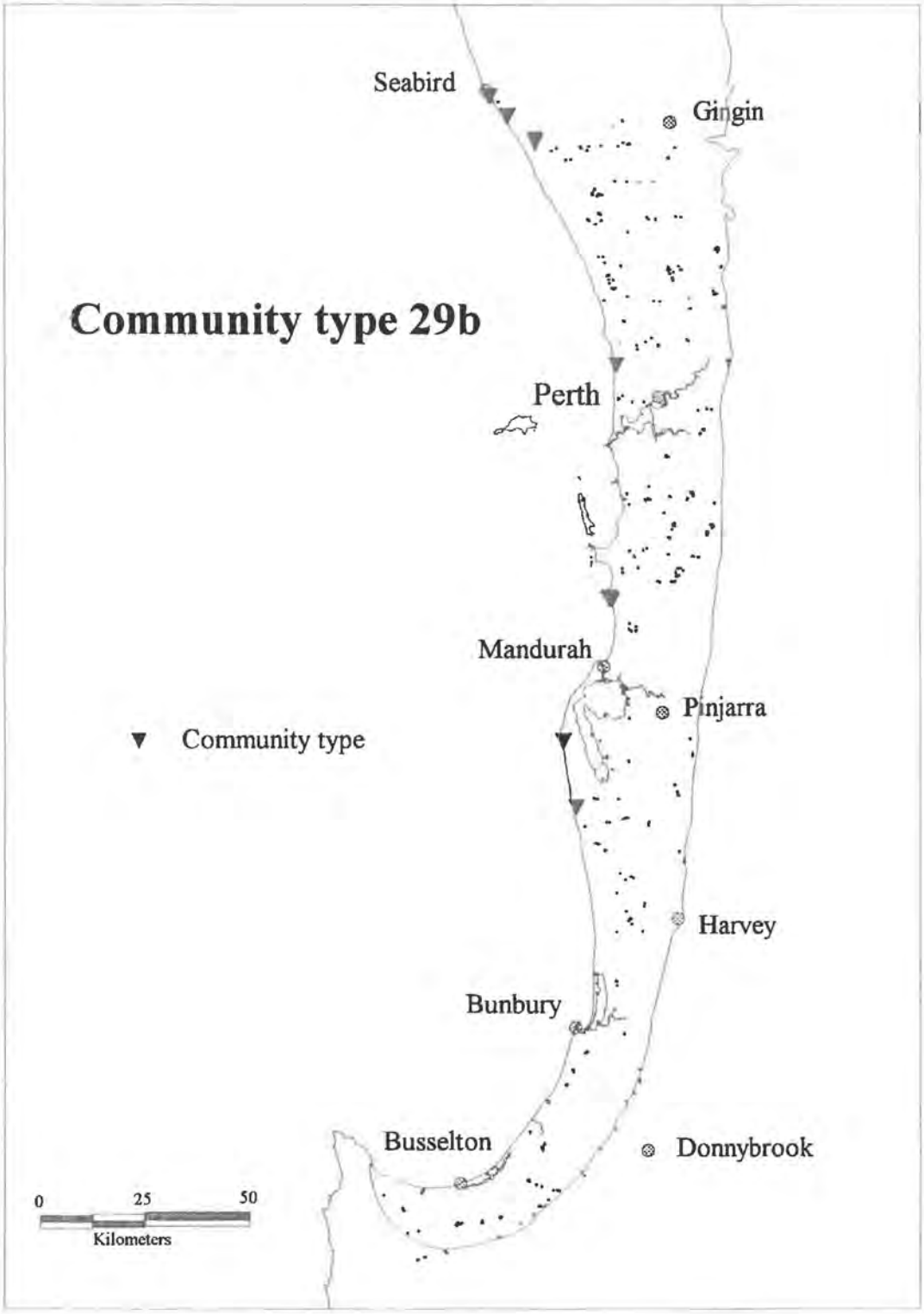
Mean weed frequency: **3.4**

Mean vegetation condition: **1.8**

Number of quadrats: **13**

Structural units

heath A
heath B
low heath C
low heath D
low scrub B
dwarf scrub C
dwarf scrub D
open low scrub A


Seabird
Gingin
Community type 29b
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 30a

Callitris preissii (or *Melaleuca lanceolata*) forests and woodlands

Reservation Status: Poorly reserved
Conservation Status: Vulnerable

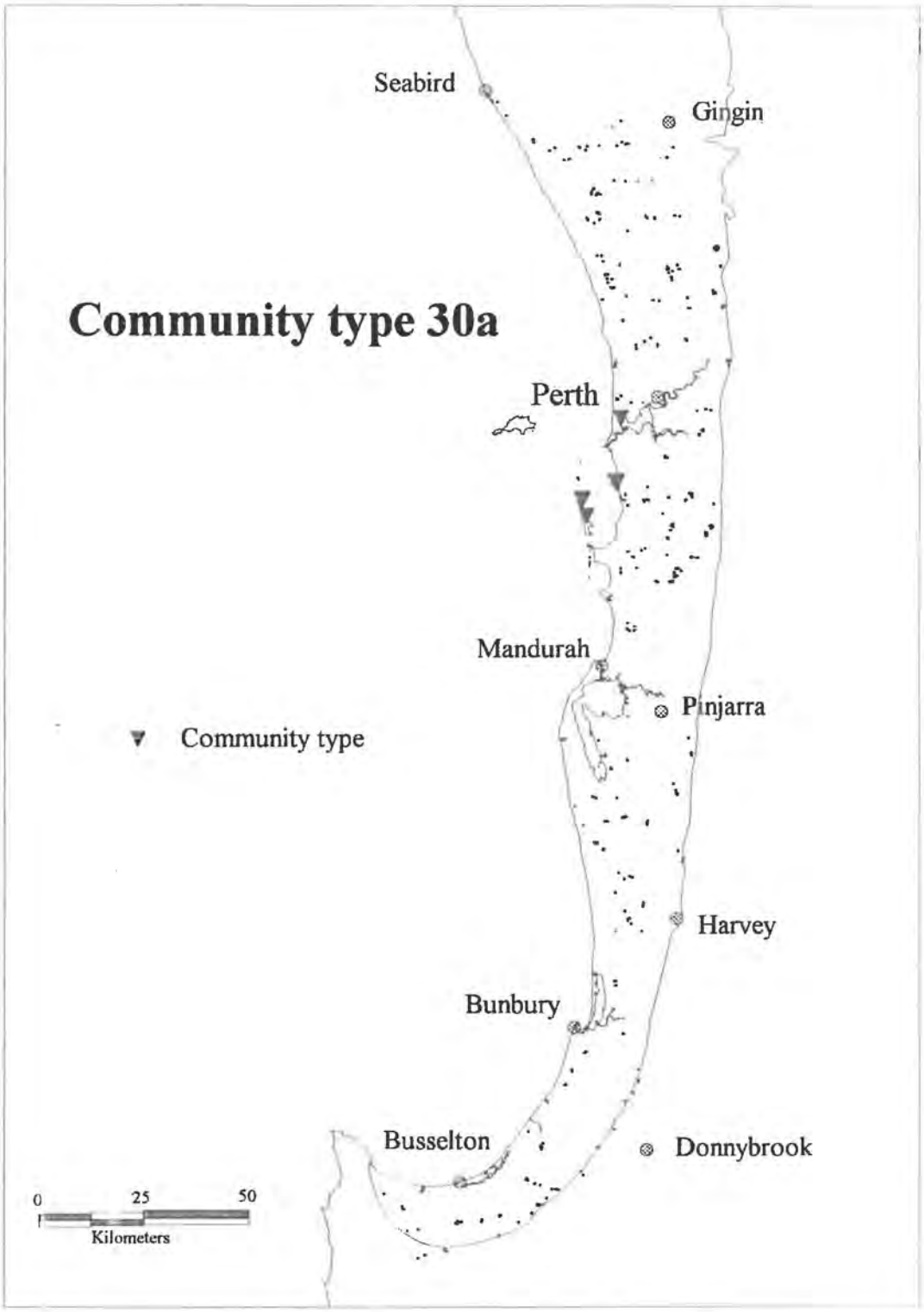
Typical Species:

Trees	Shrubs	Herbs
Callitris preissii	*Spyridium globulosum*	

Other common species:

Trees	Shrubs	Herbs
	Acanthocarpus preissii	**Galium murale*
	Rhagodia baccata	**Myrsiphyllum asparagoides*
		Stipa flavescens
		**Trachyandra divaricata*
		Trachymene pilosa

Mean species richness:	**21.1**	**Structural units**
Mean weed frequency:	**6.3**	forest dense low forest A
Mean vegetation condition:	**3.2**	dense low forest B low forest A
Number of quadrats:	**7**	low woodland A open woodland


Seabird
Gingin
Community type 30a
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: 30b

Quinadalup *Eucalyptus gomphocephala* and / or *Agonis flexuosa* woodlands

Reservation Status: Well reserved
Conservation Status: Susceptible

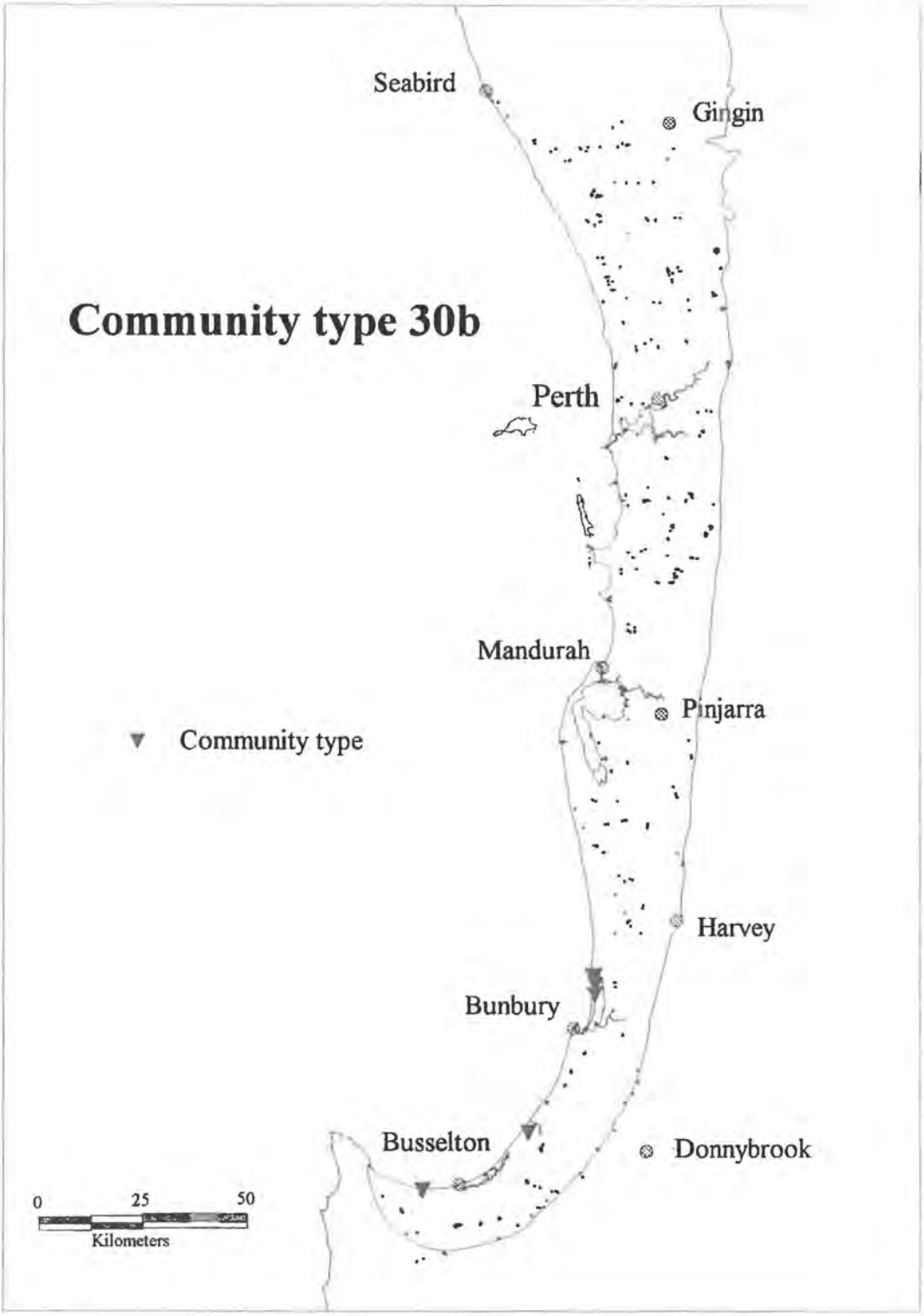
Typical Species:

Trees	Shrubs	Herbs
Agonis flexuosa	*Hardenbergia comptoniana*	*Caladenia latifolia*
	Hibbertia cuneiformis	*Carex preissii*
	Rhagodia baccata	*Galium murale*
	Spyridium globulosum	*Geranium retrorsum*
		Oxalis perennans
		Parietaria debilis
		Trachymene pilosa

Other common species:

Trees	Shrubs	Herbs
	Acanthocarpus preissii	**Anagallis arvensis*
	Leucopogon parviflorus	*Calandrinia brevipedata*
	Phyllanthus calycinus	**Cerastium glomeratum*
	Templetonia retusa	*Dichondra repens*
		Eriochilus dilatatus
		Lepidosperma angustatum
		Microlaena stipoides
		Pterostylis aff. *nana*
		Sonchus oleraceus
		Stipa flavescens
		**Trachyandra divaricata*
		**Zantedeschia aethiopica*

Mean species richness:	**37.6**	**Structural units**
Mean weed frequency:	**7.7**	low forest A dense low forest A
Mean vegetation condition:	**3.1**	woodland open woodland
Number of quadrats:	**8**	dense heath A


Seabird
Gingin
Community type 30b
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Community type: **30c**

Other mallees or scrubs

Reservation Status: Unreserved
Conservation Status: Insufficiently known

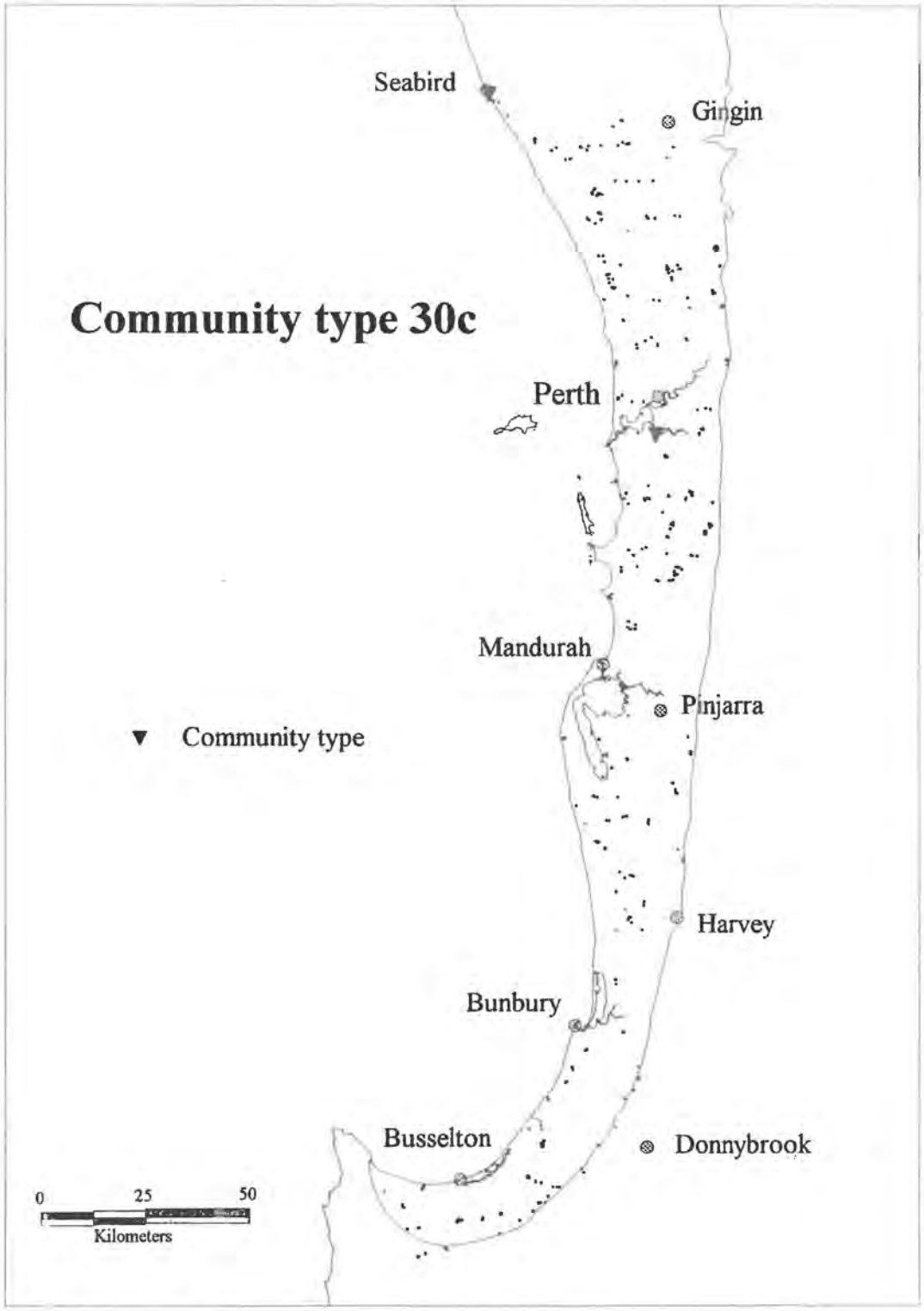
Typical Species:

Trees	Shrubs	Herbs
	Spyridium globulosum	*Daucus glochidiatus* *Dianella revoluta* *Thysanotus manglesianus/ patersonii* complex

Other common species:

Trees	Shrubs	Herbs
	Acacia lasiocarpa *Dryandra sessilis* *Hardenbergia comptoniana* *Olearia axillaris* *Templetonia retusa*	*Caladenia latifolia* **Cerastium glomeratum* **Conyza albida* **Hypochaeris glabra* *Lepidosperma gladiatum* **Oxalis pes-caprae* *Poa porphyroclados* *Pterostylis* aff. *nana* * *Sonchus oleraceus* *Trachymene pilosa*

Mean species richness:	**27.3**	**Structural units**
Mean weed frequency:	**3.7**	shrub mallee thicket
Mean vegetation condition:	**2.7**	scrub
Number of quadrats:	**3**	


Seabird
Gingin
Community type 30c
Perth
Mandurah
Pinjarra
Community type
Harvey
Bunbury
Busselton
Donnybrook
0
25
50
Kilometers

Appendix 2.

Flora list for the southern Swan Coastal Plain.

The list includes all taxa recognised in the survey (Appendix 3). When it was not possible to differentiate between species and subspecific ranks at sites both ranks are listed. See Appendix 3 for a list of taxa amalgamated for the purposes of the analysis.

Explanation of column headings and codes

Conservation code
As defined by the Western Australian Department of Conservation and Land Management (2/2/94).

R: Declared Rare Flora - Extant taxa (= Threatened Flora = Endangered + Vulnerable)
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, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

1: Priority 1 - 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 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 for further survey.

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

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

Proposed Conservation Code
Conservation code as recommended by the current survey. Codes as above.

Endemics
Taxa endemic to the study area (the region south of Seabird and west of the Darling and Whicher Scarps including the colluvial soils along their margins). See Figure 1.

eC	Coastal dunes
eCl	Coastal limestone
eE	Pinjarra plain
ef	Foothills
eI	Ironstone
eP	Entire study area

Range Ends
Taxa for which the study area contains:

N	populations at the northern limit of their known geographic range.
S	populations at the southern limit of their known geographic range.
ND	populations disjunct and north of their known geographic range.
SD	populations disjunct and south of their known geographic range.
D	populations disjunct from their known geographic range.

Geographic limit
Location of range limits as defined above.

Code
Codes used in Appendix 3

Family/taxon	Cons. Code	Prop. Cons. Code	End-emic	Range end	Geographic limit	Code
Adiantaceae						
Adiantum aethiopicum						ADIAET
Cheilanthes austrotenuifolia						CHEAUS
Aizoaceae						
* Carpobrotus edulis						CAREDU
Carpobrotus modestus						CARMOD
Carpobrotus sp. (Hepburn Heights GJK 11518)	1		eC			CARPHEP
Carpobrotus virescens						CARVIR
* Tetragonia decumbens						TETDEC
Tetragonia tetragonoides						TETTET
Amaranthaceae						
Alternanthera nodiflora						ALTNOD
Ptilotus declinatus						PTIDEC
Ptilotus drummondii						PTIDRU
Ptilotus esquamatus						PTIESQ
Ptilotus humilis subsp. humilis				D		PTIHUMHU
Ptilotus manglesii						PTIMAN
Ptilotus polystachyus						PTIPOL
Ptilotus stirlingii						PTISTI
Anthericaceae						
Agrostocrinum scabrum						AGRSCA
Arnocrinum preissii						ARNPRE
Borya scirpoidea						BORSCI
Borya sphaerocephala						BORSPH
Caesia micrantha						CAEMIC
Caesia micrantha (Blue flowered form GJK 10857)						CAEMICBL
Caesia micrantha (Large swamp form BJK & NG 094)			eE			CAEMICSW
Caesia occidentalis						CAEOCC
Chamaescilla aff. spiralis (GJK 12501)		1	eE			CHAAFFSP
Chamaescilla corymbosa						CHACOR
Chamaescilla versicolor						CHAVER
Corynotheca micrantha						CORMIC
Dichopogon capillipes						DICCAP
Dichopogon preissii						DICPRE
Hensmania turbinata						HENTUR
Hodgsoniola junciformis				N	Capel	HODJUN
Johnsonia acaulis						JOHACA
Johnsonia aff. pubescens (GJK 5249)			eP			JOHAFFPU
Johnsonia lupulina						JOHLUP
Johnsonia pubescens						JOHPUB
Laxmannia grandiflora						LAXGRA
Laxmannia ramosa						LAXRAM
Laxmannia sessiliflora subsp. australis						LAXSESAU
Laxmannia squarrosa						LAXSQU
Sowerbaea laxiflora						SOWLAX
Thysanotus aff. pauciflora						THY_PAU
Thysanotus aff. sparteus						THY_SPA
Thysanotus arbuscula						THYARB
Thysanotus arenarius						THYARE
Thysanotus dichotomus						THYDIC
Thysanotus glaucus	4					THYGLA
Thysanotus manglesianus						THYMAN
Thysanotus manglesianus/patersonii complex						THYSPMP
Thysanotus multiflorus						THYMUL
Thysanotus patersonii						THYPAT
Thysanotus pauciflorus						THYPAU
Thysanotus pseudojunceus						THYPSE
Thysanotus sparteus						THYSPA
Thysanotus tenellus						THYTEN
Thysanotus thyrsoideus						THYTHY
Thysanotus triandrus						THYTRI
Tricoryne elatior						TRIELA
Tricoryne humilis						TRIHUM
Tricoryne tenella						TRITEN
Apiaceae						
Actinotus glomeratus						ACTGLO
Actinotus leucocephalus						ACTLEU
Apium annuum						APIANN
Apium prostratum						APIPRO
Centella asiatica						CENASI
Centella cordifolia						CENCOR

Family/taxon	Cons. Code	Prop. Cons. Code	End-emic	Range end	Geographic limit	Code
Daucus glochidiatus						DAUGLO
Eryngium pinnatifidum subsp. palustre Ms	1		eE			ERYPINPA
Eryngium pinnatifidum subsp. pinnatifidum						ERYPINPI
Eryngium subdecumbens Ms	1		eE			ERYSUB
Homalosciadium homalocarpum						HOMHOM
Hydrocotyle alata						HYDALA
Hydrocotyle blepharocarpa						HYDBLE
Hydrocotyle callicarpa						HYDCAL
Hydrocotyle capillaris						HYDCAP
Hydrocotyle diantha						HYDDIA
Hydrocotyle hispidula						HYDHIS
Hydrocotyle medicaginoides						HYDMED
Hydrocotyle pilifera var. glabrata						HYDPILGL
Hydrocotyle pilifera var. pilifera						HYDPILPI
Hydrocotyle scutellifera						HYDSCU
Hydrocotyle tetragonocarpa						HYDTET
Pentapeltis peltigera						PENPEL
Platysace compressa						PLACOM
Platysace haplosciadia						PLAHAP
Platysace juncea				S	Cardup	PLAJUN
Platysace tenuissima						PLATEN
Schoenolaena juncea						SCHJUN
Trachymene coerulea						TRACOE
Trachymene pilosa						TRAPIL
Xanthosia candida						XANCAN
Xanthosia ciliata						XANCIL
Xanthosia huegelii						XANHUE
Xanthosia pusilla						XANPUS
Apocynaceae						
Alyxia buxifolia						ALYBUX
Parsonia diaphanophleba	2	1	eP			PARDIA
Aponogetonaceae						
Aponogeton hexatepalus	R		eE			APOHEX
Araceae						
* Zantedeschia aethiopica						ZANAET
Asparagaceae						
* Myrsiphyllum asparagoides						MYRASP
Asphodelaceae						
Bulbine semibarbata						BULSEM
* Trachyandra divaricata						TRADIV
Asteraceae						
Angianthus aff. drummondii (BJK & NG 013)						ANGAFFDR
Angianthus drummondii						ANGDRU
Angianthus micropodioides	3					ANGMIC
Angianthus preissianus						ANGPRE
* Arctotheca calendula						ARCCAL
* Argyranthemum frutescens						ARGFRU
* Aster subulatus						ASTSUB
Asteridea pulverulenta						ASTPUL
Blennospora aff. drummondii (golden bracts BJK & NG 20)		3	eE			BLEAFFDR
Blennospora drummondii						BLEDRU
Brachyscome bellidioides						BRABEL
Brachyscome iberidifolia						BRAIBE
* Carduus pycnocephalus						CARPYC
* Centaurea melitensis						CENMEL
* Cirsium vulgare						CIRVUL
* Conyza albida						CONALB
* Conyza bonariensis						CONBON
Cotula australis						COTAUS
* Cotula bipinnata						COTBIP
Cotula coronopifolia						COTCOR
Cotula cotuloides						COTCOT
* Cotula turbinata						COTTUR
Craspedia sp. (Perth Flora GJK 13121)						CRASPSP
Craspedia sp. nov. (Waterloo GJK 13110)						CRASPNOV
* Dittrichia graveolens						DITGRA
Gnaphalium indutum						GNAIND
Gnaphalium sphaericum						GNASPH
Gnephosis angianthoides						GNEANG
Gnephosis drummondii						GNEDRU
Gnephosis tenuissima - drummondii complex						GNETENDR

Family/taxon	Cons. Code	Prop. Cons. Code	End-emic	Range end	Geographic limit	Code
* Hedypnois rhagadioloides						HEDRHA
Helichrysum cordatum						HELCOR
Helipterum corymbosum						HELCORy
Hyalosperma cotula						HYACOT
Hyalosperma demissum						HYADEM
Hyalosperma pusillum						HYAPUS
* Hypochaeris glabra						HYPGLAbr
Ixiolaena viscosa				N	Meelon	IXIVIS
Lagenifera huegelii						LAGHUE
Lawrencella rosea						LAWROS
* Leontodon saxatilis						LEOSAX
Leptorhynchos scabrus						LEPSCAb
Millotia myosotidifolia						MILMYO
Millotia tenuifolia						MILTEN
Myriocephalus appendiculatus	3					MYRAPP
Myriocephalus helichrysoides			eE			MYRHEL
Myriocephalus isoetes						MYRISO
Myriocephalus rhizocephalus						MYRRHI
Olearia axillaris						OLEAXI
Olearia elaeophila						OLEELA
Olearia paucidentata						OLEPAU
Olearia rudis						OLERUD
* Osteospermum clandestinum						OSTCLA
Picris squarrosa						PICSQU
Pithocarpa achilleoides	2		e			PITACH
Pithocarpa corymbulosa						PITCOR
Pithocarpa pulchella						PITPUL
Podolepis gracilis						PODGRA
Podolepis gracilis (Swamp form GJK 13126)						PODGRASW
Podolepis lessonii						PODLES
Podotheca angustifolia						PODANG
Podotheca chrysantha						PODCHR
Podotheca gnaphalioides						PODGNA
Pogonolepis stricta						POGSTR
Pseudognaphalium luteoalbum						PSELUT
Quinetia urvillei						QUIURV
Rhodanthe manglesii						RHOMAN
Rhodanthe pyrethrum	3		eE			RHOPYR
Rhodanthe spicata						RHOSPI
Rutidosis multiflora						RUTMUL
Senecio hispidulus						SENHIS
Senecio lautus subsp. dissectifolius						SENLAUDI
Senecio lautus subsp. maritimus						SENLAUMA
Senecio quadridentatus						SENQUA
Siloxerus filifolius						SILFIL
Siloxerus humifusus						SILHUM
* Sonchus asper						SONASP
Sonchus hydrophilus						SONHYD
* Sonchus oleraceus						SONOLE
Trichocline sp. (GJK 6382-glabrous)		1	eE			TRISP
Trichocline spathulata						TRISPA
* Urospermum picroides						UROPIC
* Ursinia anthemoides						URSANT
* Vellereophyton dealbatum						VELDEA
Waitzia aurea						WAIAUR
Waitzia citrina						WAICIT
Waitzia paniculata						WAIPAN
Waitzia suaveolens						WAISUA
Azollaceae						
Azolla filiculoides						AZOFIL
Boraginaceae						
Myosotis australis						MYOAUS
Brassicaceae						
* Brassica tournefortii						BRATOU
* Cardamine hirsuta						CARHIR
* Cardamine paucijuga						CARPAU
* Heliophila pusilla						HELPUS
Lepidium puberulum	4					LEPPUB
Lepidium rotundum						LEPROT
Stenopetalum gracile						STEGRA
Stenopetalum robustum						STEROB

Family/taxon	Cons. Code	Prop. Cons. Code	End-emic	Range end	Geographic limit	Code
Caesalpiniaceae						
Labichea punctata						LABPUN
Callitrichaceae						
Callitriche hamulata						CALHAM
* Callitriche stagnalis						CALSTA
Campanulaceae						
* Wahlenbergia capensis						WAHCAP
Wahlenbergia preissii						WAHPRE
Caryophyllaceae						
* Arenaria serpyllifolia						ARESER
* Cerastium glomeratum						CERGLO
* Corrigiola litoralis						CORLIT
* Minuartia hybrida						MINHYB
* Petrorhagia velutina						PETVEL
* Sagina apetala						SAGAPE
* Sagina maritima						SAGMAR
* Silene gallica						SILGAL
* Silene nocturna						SILNOC
* Spergula arvensis						SPEARV
* Spergularia rubra						SPERUB
* Stellaria media						STEMED
Casuarinaceae						
Allocasuarina fraseriana						ALLFRA
Allocasuarina humilis						ALLHUM
Allocasuarina microstachya				D		ALLMIC
Allocasuarina thuyoides				D		ALLTHU
Casuarina obesa						CASOBE
Centrolepidaceae						
Aphelia cyperoides						APHCYP
Brizula drummondii				N	Bullsbrook	BRIDRU
Brizula muelleri						BRIMUE
Brizula nutans						BRINUT
Centrolepis alepyroides						CENALE
Centrolepis aristata						CENARI
Centrolepis caespitosa	R					CENCAE
Centrolepis cephaloformis subsp. cephaloformis						CENCEPCE
Centrolepis drummondiana						CENDRU
Centrolepis glabra						CENGLA
Centrolepis humillima						CENHUM
Centrolepis inconspicua						CENINC
Centrolepis mutica						CENMUT
Centrolepis pilosa						CENPIL
Centrolepis polygyna						CENPOL
Chenopodiaceae						
Atriplex cinerea						ATRCIN
Atriplex hypoleuca						ATRHYP
* Atriplex prostrata						ATRPRO
* Chenopodium ambrosioides						CHEAMB
* Chenopodium macrospermum						CHEMAC
Chenopodium pumilio				N	Lowlands	CHEPUM
Halosarcia halocnemoides						HALHAL
Halosarcia indica						HALIND
Halosarcia lepidosperma						HALLEP
Rhagodia baccata subsp. baccata						RHABAC
Rhagodia baccata subsp. dioica						RHABACDI
Sarcocornia quinqueflora						SARQUI
Suaeda australis						SUAAUS
Threlkeldia diffusa						THRDIF
Chloanthaceae						
Pityrodia bartlingii				DS	Busselton Forrestfield	PITBAR
Colchicaceae						
Burchardia bairdiae				S	Forrestdale Lake	BURBAI
Burchardia multiflora						BURMUL
Burchardia umbellata						BURUMB
Wurmbea dioica						WURDIO
Wurmbea dioica subsp. aff. alba (GJK 12803)						WURDIO_A
Wurmbea monantha						WURMON
Wurmbea pygmaea						WURPYG
Commelinaceae						
Cartonema philydroides						CARPHI

Family/taxon	Cons. Code	Prop. Cons. Code	End-emic	Range end	Geographic limit	Code
Convolvulaceae						
Dichondra repens						DICREP
Wilsonia backhousei						WILBAC
Wilsonia humilis						WILHUM
Crassulaceae						
Crassula colorata						CRACOL
* Crassula decumbens						CRADEC
Crassula exserta						CRAEXS
* Crassula glomerata						CRAGLO
* Crassula natans						CRANAT
Crassula pedicellosa						CRAPED
Crassula peduncularis						CRAPEDu
* Crassula thunbergiana						CRATHU
Cupressaceae						
Actinostrobus acuminatus				DS	Forrestfield	ACTACU
Actinostrobus pyramidalis						ACTPYR
Callitris preissii						CALPRE
Cuscutaceae						
* Cuscuta epithymum						CUSEPI
Cyperaceae						
Baumea acuta						BAUACU
Baumea arthrophylla						BAUARTh
Baumea articulata						BAUART
Baumea juncea						BAUJUN
Baumea vaginalis						BAUVAG
Bolboschoenus caldwellii						BOLCAL
Carex preissii						CARPRE
Caustis dioica						CAUDIO
Chorizandra cymbaria						CHOCYM
Chorizandra enodis						CHOENO
Cyathochaeta avenacea				N	Bullsbrook	CYAAVE
Cyathochaeta clandestina				N	Landsdale	CYACLA
* Cyperus congestus						CYPCON
* Cyperus eragrostis						CYPERA
Cyperus polystachyos						CYPPOL
* Cyperus tenellus						CYPTEN
Eleocharis acuta						ELEACU
Eleocharis sp. Kenwick (GJK 5179)	1		eE			ELEKEN
Evandra aristata				N	Payne	EVAARI
Evandra pauciflora				N	Anstey Rd	EVAPAU
Gahnia trifida						GAHTRI
Isolepis cernua						ISOCER
Isolepis cyperoides						ISOCYP
* Isolepis hystrix						ISOHYS
Isolepis marginata						ISOMAR
Isolepis nodosa						ISONOD
Isolepis oldfieldiana						ISOOLD
Isolepis producta						ISOPRO
Isolepis setiformis						ISOSET
Isolepis stellata						ISOSTE
Lepidosperma aff. angustatum						LEP_ANG
Lepidosperma angustatum						LEPANG
Lepidosperma carphoides						LEPCAR
Lepidosperma costale						LEPCOS
Lepidosperma gladiatum						LEPGLA
Lepidosperma gladiatum x angustatum						LEPGLAN
Lepidosperma leptostachyum						LEPLEP
Lepidosperma longitudinale						LEPLON
Lepidosperma scabrum						LEPSCA
Lepidosperma sp. (Coastal terete BJK & NG 231)						LEPANGCO
Lepidosperma sp. (Eastern terete BJK & NG 232)						LEPETRE
Lepidosperma sp. E						LEPSPE
Lepidosperma squamatum						LEPSQU
Mesomelaena aff. graciliceps (BJK & NG 146)						MES_GR
Mesomelaena graciliceps						MESGRA
Mesomelaena pseudostygia						MESPSE
Mesomelaena stygia						MESSTY
Mesomelaena tetragona						MESTET
Schoenus aff. brevisetis						SCH_BR
Schoenus aff. laevigatus						SCHAFFLA
Schoenus aff. obtusifolia (EAG 3841)				DS	Melaleuca Park	SCHAFFOB

Family/taxon	Cons. Code	Prop. Cons. Code	End-emic	Range end	Geographic limit	Code
Schoenus aff. tenellus (BJK & NG 110)			eE			SCHAFFTE
Schoenus asperocarpus						SCHASP
Schoenus benthamii	3					SCHBEN
Schoenus bifidus						SCHBIF
Schoenus brevisetis						SCHBRE
Schoenus caespititius						SCHCAE
Schoenus capillifolius	2		eE			SCHCAP
Schoenus clandestinus						SCHCLA
Schoenus cruentus				N	Gosnells	SCHCRU
Schoenus curvifolius						SCHCUR
Schoenus discifer						SCHDIS
Schoenus elegans						SCHELE
Schoenus grandiflorus						SCHGRA
Schoenus humilis						SCHHUM
Schoenus lanatus						SCHLAN
Schoenus latitans				DS	Forrestfield	SCHLAT
Schoenus nanus						SCHNAN
Schoenus natans	R		eE			SCHNAT
Schoenus nitens						SCHNIT
Schoenus odontocarpus						SCHODO
Schoenus pedicellatus						SCHPED
Schoenus pennisetis	1					SCHPEN
Schoenus pleiostemoneus						SCHPLE
Schoenus rigens						SCHRIG
Schoenus rodwayanus						SCHROD
Schoenus sculptus						SCHSCU
Schoenus sp. (BJK & NG 233)						SCHSPNT
Schoenus sp. (brown bracts)						SCHSPBB
Schoenus sp. (Hymus/Waroona - BJK & NG 111)						SCHGREEN
Schoenus sp. 1 (BJK & NG 114)						SCHOSP1
Schoenus sp. 2 (GJK 5739)						SCHOSP2
Schoenus sp. aff. breviculmis						SCH_BRcu
Schoenus subbarbatus						SCHSUBba
Schoenus subbarbatus (Royce 2872)						SCHSUBRO
Schoenus subbulbosus						SCHSUBbu
Schoenus subfascicularis						SCHSUBfa
Schoenus subflavus						SCHSUBfl
Schoenus tenellus						SCHTEN
Schoenus unispiculatus						SCHUNI
Tetraria australiensis	R		eP			TETAUS
Tetraria capillaris						TETCAP
Tetraria octandra						TETOCT
Tricostularia neesii var. elatior						TRINEEEL
Tricostularia neesii var. neesii						TRINEENE
Dasypogonaceae						
Acanthocarpus canaliculatus				S	Anstey Rd	ACACAN
Acanthocarpus preissii				N	Capel NR	ACAPRE
Baxteria australis						BAXAUS
Calectasia cyanea						CALCYA
Calectasia grandiflora				DS	Mundijong Rd	CALGRAnd
Chamaexeros serra						CHASER
Dasypogon bromeliifolius						DASBRO
Dasypogon hookeri						DASHOO
Dasypogon obliquifolius				DS	Cardup	DASOBL
Kingia australis						KINAUS
Lomandra brittanii						LOMBRI
Lomandra caespitosa						LOMCAE
Lomandra drummondii						LOMDRU
Lomandra hermaphrodita						LOMHER
Lomandra integra						LOMINT
Lomandra maritima						LOMMAR
Lomandra micrantha						LOMMIC
Lomandra nigricans						LOMNIG
Lomandra nutans				D		LOMNUT
Lomandra odora						LOMODO
Lomandra pauciflora						LOMPAU
Lomandra preissii						LOMPRE
Lomandra purpurea						LOMPUR
Lomandra sericea						LOMSER
Lomandra sonderi						LOMSON
Lomandra spartea				S	Dardanup	LOMSPA

Family/taxon	Cons. Code	Prop. Cons. Code	End-emic	Range end	Geographic limit	Code
Lomandra suaveolens						LOMSUA
Dennstaedtiaceae						
Pteridium esculentum						PTEESC
Dilleniaceae						
Hibbertia acerosa						HIBACE
Hibbertia aff. helianthemoides				S	Forrestfield	HIBAFFHE
Hibbertia amplexicaulis						HIBAMP
Hibbertia aurea				S	Fish Rd NR	HIBAUR
Hibbertia commutata						HIBCOM
Hibbertia crassifolia				S	Marangaroo M12	HIBCRA
Hibbertia cuneiformis				N	Warnbro Sound	HIBCUN
Hibbertia cunninghamii						HIBCUNn
Hibbertia enervia						HIBENE
Hibbertia glomerata						HIBGLO
Hibbertia huegelii						HIBHUE
Hibbertia hypericoides						HIBHYP
Hibbertia pachyrrhiza						HIBPAC
Hibbertia quadricolor						HIBQUA
Hibbertia racemosa						HIBRAC
Hibbertia rhadinopoda						HIBRHA
Hibbertia serrata						HIBSER
Hibbertia spicata subsp. leptotheca	3			S	Yalgorup	HIBSPILE
Hibbertia stellaris						HIBSTE
Hibbertia subvaginata						HIBSUB
Hibbertia vaginata						HIBVAG
Droseraceae						
Drosera barbigera						DROBAR
Drosera bulbigena			eE			DROBUL
Drosera bulbosa						DROBULos
Drosera erythrorhiza						DROERY
Drosera erythrorhiza subsp. erythrorhiza						DROERYER
Drosera erythrorhiza subsp. squamosa Ms						DROERYSQ
Drosera gigantea subsp. geniculata Ms				N	Lowlands	DROGIGGE
Drosera gigantea subsp. gigantea						DROGIG
Drosera glanduligera						DROGLA
Drosera heterophylla						DROHET
Drosera huegelii						DROHUE
Drosera leucoblasta						DROLEU
Drosera macrantha						DROMAC
Drosera macrantha (Swan coastal plain form BJK & NG 228)			e			DROMACSC
Drosera macrantha subsp. macrantha Ms						DROMACMA
Drosera marchantii subsp. marchantii	4					DROMARMA
Drosera menziesii subsp. menziesii						DROMENME
Drosera menziesii subsp. penicillaris						DROMENPE
Drosera myriantha						DROMYR
Drosera neesii (Pink southern form BJK & NG 096)				N	Lowlands	DRONEEST
Drosera neesii subsp. neesii				N	Twin Swamps	DRONEENE
Drosera nitidula						DRONIT
Drosera nitidula subsp. nitidula						DRONITNI
Drosera occidentalis subsp. australis Ms						DROOCCAU
Drosera occidentalis subsp. occidentalis	4					DROOCCOC
Drosera paleacea						DROPAL
Drosera paleacea subsp. paleacea						DROPALPA
Drosera pallida						DROPALI
Drosera platystigma						DROPLA
Drosera pulchella						DROPUL
Drosera pycnoblasta						DROPYC
Drosera ramellosa						DRORAM
Drosera rosulata						DROROS
Drosera stolonifera						DROSTO
Drosera stolonifera subsp. porrecta						DROSTOPO
Drosera stolonifera subsp. stolonifera						DROSTOST
Drosera subhirtella						DROSUB
Drosera tubaestylis			eE			DROTUB
Elatinaceae						
Elatine gratioloides						ELAGRA
Epacridaceae						
Acrotriche cordata						ACRCOR
Andersonia aff. latiflora (Ironstone BJK & NG 227)		1	eI			ANDAFFLA
Andersonia aristata						ANDARI
Andersonia caerulea						ANDCAE

Family/taxon	Cons. Code	Prop. Cons. Code	End-emic	Range end	Geographic limit	Code
Andersonia heterophylla						ANDHET
Andersonia involucrata						ANDINV
Andersonia lehmanniana						ANDLEH
Astroloma ciliatum						ASTCIL
Astroloma drummondii						ASTDRU
Astroloma microcalyx			eCL			ASTMIC
Astroloma pallidum						ASTPAL
Astroloma stomarrhena						ASTSTO
Astroloma xerophyllum						ASTXER
Brachyloma preissii						BRAPRE
Conostephium minus	4			S	Lowlands	CONMIN
Conostephium pendulum						CONPEN
Conostephium preissii						CONPRE
Leucopogon aff. capitellatus (BJK & NG 156)						LEU_CAP
Leucopogon aff. gracillis						LEU_GRA
Leucopogon aff. nutans						LEUAFFNU
Leucopogon aff. oliganthus						LEUAFFOL
Leucopogon aff. polymorphus						LEUAFFPO
Leucopogon aff. polymorphus (Southern form BJK & NG 158)						LEU_POLS
Leucopogon aff. revolutus						LEUAFFRE
Leucopogon australis						LEUAUS
Leucopogon capitellatus						LEUCAP
Leucopogon conostephioides						LEUCON
Leucopogon cymbiformis						LEUCYM
Leucopogon glabellus						LEUGLA
Leucopogon gracillimus						LEUGRA
Leucopogon kingianus						LEUKIN
Leucopogon leptanthus						LEULEP
Leucopogon nutans						LEUNUT
Leucopogon obovatus						LEUOBO
Leucopogon oldfieldii						LEUOLD
Leucopogon oxycedrus						LEUOXY
Leucopogon parviflorus						LEUPAR
Leucopogon pendulus						LEUPEN
Leucopogon polymorphus						LEUPOL
Leucopogon propinquus						LEUPRO
Leucopogon racemulosus						LEURAC
Leucopogon sprengelioides						LEUSPR
Leucopogon squarrosus						LEUSQU
Leucopogon verticillatus						LEUVER
Lysinema ciliatum						LYSCIL
Lysinema elegans	2			S	Jandakot	LYSELE
Sphenotoma capitatum						SPHCAP
Sphenotoma gracile						SPHGRAci
Styphelia tenuiflora						STYTEN
Euphorbiaceae						
Adriana quadripartita						ADRQUA
Amperea ericoides						AMPERI
Amperea volubilis						AMPVOL
Beyeria cinerea						BEYCIN
* Euphorbia peplus						EUPPEP
* Euphorbia terracina						EUPTER
Monotaxis grandiflora						MONGRA
Monotaxis occidentalis						MONOCC
Phyllanthus calycinus						PHYCAL
Poranthera ericoides						PORERI
Poranthera huegelii						PORHUE
Poranthera microphylla						PORMIC
Pseudanthus virgatus						PSEVIR
Stachystemon axillaris	4					STAAXI
Stachystemon vermicularis						STAVER
Frankeniaceae						
Frankenia pauciflora						FRAPAU
Fumariaceae						
* Fumaria capreolata						FUMCAP
Gentianaceae						
* Centaurium erythraea						CENERY
* Cicendia filiformis						CICFIL
Geraniaceae						
* Erodium botrys						EROBOT
* Erodium cicutarium						EROCIC

Family/taxon	Cons. Code	Prop. Cons. Code	Endemic	Range end	Geographic limit	Code
Erodium cygnorum						EROCYG
* Erodium moschatum						EROMOS
* Geranium molle						GERMOL
Geranium retrorsum						GERRET
* Pelargonium capitatum						PELCAP
Pelargonium littorale						PELLIT
Goodeniaceae						
Anthotium humile						ANTHUM
Anthotium junciforme	4					ANTJUN
Dampiera alata						DAMALA
Dampiera coronata						DAMCOR
Dampiera linearis						DAMLIN
Dampiera trigona						DAMTRI
Goodenia caerulea						GOOCAE
Goodenia eatoniana						GOOEAT
Goodenia micrantha						GOOMIC
Goodenia pulchella						GOOPUL
Lechenaultia biloba						LECBIL
Lechenaultia expansa						LECEXP
Lechenaultia floribunda						LECFLO
Lechenaultia linarioides				S	Cooges	LECLIN
Scaevola anchusifolia						SCAANC
Scaevola calliptera						SCACAL
Scaevola canescens						SCACAN
Scaevola crassifolia						SCACRA
Scaevola glandulifera						SCAGLA
Scaevola lanceolata						SCALAN
Scaevola nitida						SCANIT
Scaevola phlebopetala						SCAPHL
Scaevola repens var. angustifolia						SCAREPAN
Scaevola repens var. repens						SCAREPRE
Scaevola striata						SCASTR
Scaevola thesioides						SCATHE
Velleia trinervis						VELTRI
Verreauxia reinwardtii						VERREI
Gyrostemonaceae						
Gyrostemon subnudus						GYRSUB
Tersonia cyathiflora						TERCYA
Haemodoraceae						
Anigozanthos bicolor						ANIBIC
Anigozanthos flavidus						ANIFLA
Anigozanthos humilis						ANIHUM
Anigozanthos manglesii						ANIMAN
Anigozanthos viridis						ANIVIR
Blancoa canescens				S	Serpentine R	BLACAN
Conostylis aculeata						CONACU
Conostylis aculeata subsp. (Dunsborough)						CONACUDU
Conostylis aculeata subsp. preissii						CONACUPR
Conostylis aculeata x candicans						CONACXCO
Conostylis aurea						CONAUR
Conostylis candicans						CONCAN
Conostylis caricina						CONCAR
Conostylis festucacea subsp. festucacea				S	Anstey Rd	CONFESFE
Conostylis juncea						CONJUN
Conostylis laxiflora						CONLAX
Conostylis pauciflora						CONPAU
Conostylis pauciflora subsp. euryrhipis	1			S	Yanchep	CONPAUEU
Conostylis serrulata						CONSER
Conostylis setigera						CONSET
Conostylis setosa						CONSETo
Haemodorum brevisepalum						HAEBRE
Haemodorum discolor						HAEDIS
Haemodorum laxum						HAELAX
Haemodorum loratum	3			DS	Yarloop	HAELOR
Haemodorum paniculatum						HAEPAN
Haemodorum simplex						HAESIM
Haemodorum sparsiflorum						HAESPA
Haemodorum spicatum						HAESPI
Phlebocarya ciliata						PHLCIL
Phlebocarya filifolia						PHLFIL
Tribonanthes aff. violacea						TRIAFFVI

Family/taxon	Cons. Code	Prop. Cons. Code	End-emic	Range end	Geographic limit	Code
Tribonanthes australis						TRIAUS
Tribonanthes brachypetala						TRIBRA
Tribonanthes longipetala						TRILON
Tribonanthes uniflora						TRIUNI
Tribonanthes violacea						TRIVIO
Haloragaceae						
Glischrocaryon aureum						GLIAUR
Gonocarpus benthammii						GONBEN
Gonocarpus hexandrus						GONHEX
Gonocarpus paniculatus						GONPAN
Gonocarpus pithyoides						GONPIT
Haloragis aculeolata	2					HALACU
Haloragis tenuifolia	1					HALTEN
Myriophyllum drummondii						MYRDRU
Myriophyllum echinatum	1	2	eE			MYRECH
Hyacinthaceae						
* Lachenalia reflexa						LACREF
Hydatellaceae						
Hydatella dioica	2		eE			HYDDIO
Trithuria bibracteata						TRIBIB
Trithuria submersa						TRISUB
Hypoxidaceae						
Hypoxis glabella						HYPGLA
Hypoxis occidentalis						HYPOCC
Iridaceae						
* Babiana disticha						BABDIS
* Ferraria crispa						FERCRI
* Freesia aff. leichtlinii						FREAFFLE
* Gladiolus angustus						GLAANG
* Gladiolus caryophyllaceus						GLACAR
* Hesperantha falcata						HESFAL
* Homeria flaccida						HOMFLA
Orthrosanthus laxus						ORTLAX
Patersonia babianoides						PATBAB
Patersonia juncea						PATJUN
Patersonia limbata				D		PATLIM
Patersonia occidentalis						PATOCC
Patersonia occidentalis (swamp form, NG & ML 544)						PATOCCSW
Patersonia pygmaea						PATPYG
Patersonia rudis						PATRUD
Patersonia umbrosa forma xanthina						PATUMBXA
* Romulea flava						ROMFLA
* Romulea obscura						ROMOBS
* Romulea rosea						ROMROS
* Romulea rosea subsp. rosea						ROMROSRO
* Romulea rosea var. australis						ROMROSAU
* Sisyrinchium exile						SISEXI
* Sparaxis bulbifera						SPABUL
* Watsonia bulbillifera						WATBUL
* Watsonia marginata						WATMAR
* Watsonia meriana						WATMER
Isoetaceae						
Isoetes drummondii						ISODRU
Juncaceae						
* Juncus articulatus						JUNART
* Juncus bufonius						JUNBUF
Juncus caespiticius						JUNCAE
* Juncus capitatus						JUNCAP
Juncus holoschoenus						JUNHOL
Juncus kraussii						JUNKRA
Juncus pallidus						JUNPAL
* Juncus polyanthemus						JUNPOL
Luzula meridionalis						LUZMER
Juncaginaceae						
Triglochin calcitrapum						TRICAL
Triglochin centrocarpum						TRICEN
Triglochin minutissimum						TRIMIN
Triglochin mucronatum						TRIMUC
Triglochin muelleri						TRIMUE
Triglochin procerum						TRIPRO
Triglochin sp. A (Perth Flora BJK & NG 095)						TRIGSPA

Family/taxon	Cons. Code	Prop. Cons. Code	End-emic	Range end	Geographic limit	Code
Triglochin stowardii	2					TRISTO
Triglochin striatum						TRISTR
Triglochin trichophorum						TRITRI
Lamiaceae						
Hemiandra pungens						HEMPUN
Hemigenia barbata				S	Mt Brown	HEMBAR
Hemigenia incana						HEMINC
Hemigenia microphylla						HEMMIC
Hemigenia ramosissima						HEMRAM
Mentha piperata						MENPIP
Westringia dampieri						WESDAM
Lauraceae						
Cassytha aurea var. hirta						CASAURHI
Cassytha flava						CASFLA
Cassytha glabella						CASGLA
Cassytha micrantha				N	Talbot Rd Midland	CASMIC
Cassytha pomiformis						CASPOM
Cassytha pubescens sens						CASPUB
Cassytha racemosa						CASRAC
Lemnaceae						
Lemna disperma						LEMDIS
Lentibulariaceae						
Polypompholyx multifida						POLMUL
Polypompholyx tenella						POLYTEN
Utricularia dichotoma						UTRDIC
Utricularia inaequalis						UTRINA
Utricularia menziesii						UTRMEN
Utricularia violacea						UTRVIO
Linaceae						
Linum marginale						LINMAR
* Linum trigynum						LINTRI
Lindsaeaceae						
Lindsaea linearis						LINLIN
Lobeliaceae						
Isotoma hypocrateriformis						ISOHYP
Isotoma pusilla				S	Waroona	ISOPUS
Isotoma scapigera						ISOSCAp
Lobelia alata						LOBALA
Lobelia gibbosa						LOBGIB
Lobelia heterophylla						LOBHET
Lobelia rhombifolia						LOBRHO
Lobelia tenuior						LOBTEN
* Monopsis debilis						MONDEB
Loganiaceae						
Logania campanulata						LOGCAM
Logania serpyllifolia						LOGSER
Logania serpyllifolia subsp. angustifolia						LOGSERAN
Logania vaginalis						LOGVAG
Mitrasacme palustris	1					MITPAL
Mitrasacme paradoxa						MITPAR
Mitrasacme sp. Southwest (GJK 343)	2			N	Capel	MITSP.
Loranthaceae						
Amyema linophyllum						AMYLIN
Nuytsia floribunda						NUYFLO
Lycopodiaceae						
Phylloglossum drummondii						PHYDRU
Lythraceae						
* Lythrum hyssopifolia						LYTHYS
Malvaceae						
Lavatera plebeia var. tomentosa						LAVPLETO
Lawrencia spicata						LAWSPI
Marsileaceae						
Marsilea sp. (BJK & NG 084)						MARDRU
Pilularia novae-hollandiae						PILNOV
Menyanthaceae						
Villarsia albiflora						VILALB
Villarsia capitata						VILCAP
Villarsia latifolia						VILLAT
Villarsia parnassifolia						VILPAR
Villarsia submersa	4					VILSUB
Villarsia violifolia						VILVIO

Family/taxon	Cons. Code	Prop. Cons. Code	End-emic	Range end	Geographic limit	Code
Mimosaceae						
Acacia alata						ACAALA
Acacia alata var. tetrantha Ms						ACAAFFAL
Acacia applanata Ms						ACAAPP
Acacia auronitens						ACAAUR
Acacia barbinervis subsp. barbinervis				DS	Burnside Rd	ACABARBA
Acacia barbinervis subsp. borealis						ACABARBO
Acacia browniana						ACABRO
Acacia cochlearis						ACACOC
Acacia cyclops						ACACYC
Acacia dentifera						ACADEN
Acacia divergens						ACADIV
Acacia drewiana				S	Lambert Lane	ACADRE
Acacia ericifolia						ACAERI
Acacia extensa						ACAEXT
Acacia flagelliformis	4					ACAFLA
Acacia huegelii						ACAHUE
Acacia incurva						ACAINC
Acacia lasiocarpa var. bracteolata (Long peduncle form)	1		eE			ACALASBR
Acacia lasiocarpa var. lasiocarpa						ACALASLA
Acacia lateriticola						ACALAT
Acacia littorea				DN	Rottnest	ACALIT
Acacia mooreana	2			N	Boyanup	ACAMOO
Acacia myrtifolia						ACAMYR
Acacia nervosa						ACANER
* Acacia paradoxa						ACAPAR
Acacia pulchella (Eagle Bay)				N	Capel	ACAPULEB
Acacia pulchella var. glaberrima						ACAPULGL
Acacia pulchella var. pulchella						ACAPUL
Acacia pulchella var. reflexa Ms						ACAPULRE
* Acacia pycnantha						ACAPYC
Acacia rostellifera						ACAROS
Acacia saligna						ACASAL
Acacia semitrullata	3			N	Yarloop	ACASEM
Acacia sessilis						ACASES
Acacia spathulata						ACASPA
Acacia stenoptera						ACASTE
Acacia teretifolia						ACATER
Acacia tetragonocarpa						ACATET
Acacia truncata				S	Bunbury	ACATRU
Acacia urophylla						ACAURO
Acacia varia var. varia Ms						ACAVARVA
Acacia willdenowiana						ACAWIL
Acacia xanthina				S	Fremantle	ACAXAN
Paraserianthes lophantha						PARLOP
Molluginaceae						
Macarthuria aff. australis (Capel)			eP			MACAFFAU
Macarthuria apetala				S	Jandakot	MACAPE
Macarthuria australis				S	Mandurah	MACAUS
Myoporaceae						
Eremophila glabra						EREGLA
Myoporum caprarioides						MYOCAP
Myoporum insulare						MYOINS
Myrtaceae						
Actinodium cunninghamii						ACTCUN
Agonis flexuosa				N	Bold Park	AGOFLE
Agonis grandiflora						AGOGRA
Agonis linearifolia						AGOLIN
Agonis parviceps						AGOPAR
Astartea aff. fascicularis						AST_FA
Baeckea camphorosmae						BAECAM
Baeckea robusta				S	North Beach	BAEROB
Baeckea tenuifolia		1		S	Mundijong	BAETEN
Beaufortia elegans						BEAELE
Beaufortia macrostemon						BEAMAC
Beaufortia purpurea						BEAPUR
Beaufortia sparsa						BEASPA
Beaufortia squarrosa				DS	Oates Rd	BEASQU
Calothamnus aff. crassus (Royce 84)	1			DN	Smith Rd	CAL_CR
Calothamnus aff. quadrifidus (Ironstone BJK & NG 230)		1	eI			CALAFFQU
Calothamnus graniticus subsp. leptophyllus	2					CALGRALE

Family/taxon	Cons. Code	Prop. Cons. Code	End-emic	Range end	Geographic limit	Code
Calothamnus hirsutus						CALHIRau
Calothamnus lateralis						CALLATe
Calothamnus pallidifolius						CALPALI
Calothamnus quadrifidus						CALQUA
Calothamnus sanguineus						CALSAN
Calytrix angulata				DS	Guthrie Block	CALANG
Calytrix aurea						CALAUR
Calytrix flavescens						CALFLAve
Calytrix fraseri						CALFRA
Calytrix leschenaultii				DS	Capel Williamson Rd	CALLES
Calytrix sapphirina						CALSAP
Calytrix strigosa						CALSTR
Calytrix variabilis						CALVARis
Chamelaucium erythrochlorum Ms	R					CHAERY
Chamelaucium roycei Ms	R		eI			CHAROY
Chamelaucium uncinatum				S	Bold Park	CHAUNC
Conothamnus trinervis				DS	Forrestfield	CONTRI
Darwinia citriodora						DARCIT
Darwinia oederoides						DAROED
Darwinia sp. (Williamson Rd, GJK 12717)	I	R	eI			DARRON
Darwinia thymoides						DARTHY
Eremaea asterocarpa subsp. asterocarpa						EREASTAS
Eremaea asterocarpa subsp. brachyclada		I	ef			EREASTBR
Eremaea fimbriata				DS	Forrestfield	EREFIM
Eremaea pauciflora						EREPAU
Eremaea pauciflora subsp. pauciflora						EREPAUPA
Eremaea purpurea				S	Whiteman Park	EREPUR
Eucalyptus argutifolia	R			S	Yanchep	EUCARG
Eucalyptus calophylla						EUCCAL
Eucalyptus decipiens						EUCDEC
Eucalyptus foecunda				S	Yalgorup	EUCFOE
Eucalyptus gomphocephala				S	Ludlow	EUCGOM
Eucalyptus haematoxylon						EUCHAE
Eucalyptus lanepoolei						EUCLAN
Eucalyptus marginata subsp. elegantella	I	R	ef			EUCMAREL
Eucalyptus marginata subsp. marginata						EUCMARMA
Eucalyptus patens						EUCPAT
Eucalyptus petrensis Ms				S	Yalgorup	EUCPETRE
Eucalyptus rudis						EUCRUD
Eucalyptus todtiana						EUCTOD
Eucalyptus wandoo						EUCWAN
Hypocalymma angustifolium						HYPANG
Hypocalymma ericifolium				N	Lyons block	HYPERI
Hypocalymma robustum						HYPROB
Kunzea aff. micrantha (BJK & NG 040)						KUNAFFMI
Kunzea ericifolia						KUNERI
Kunzea littericola Ms			eE			KUNLIT
Kunzea micrantha				N	Perth	KUNMIC
Kunzea recurva						KUNREC
* Leptospermum erubescens						LEPERU
Leptospermum spinescens						LEPSPIne
Melaleuca acerosa						MELACE
Melaleuca aff. acerosa (GJK 11242)	2		eCL			MELAFFAC
Melaleuca aff. trichophylla						MELAFFTR
Melaleuca bracteosa						MELBRA
Melaleuca cardiophylla				S	Bold Park	MELCAR
Melaleuca cuticularis						MELCUT
Melaleuca hamulosa						MELHAM
Melaleuca huegelii						MELHUE
Melaleuca incana						MELINC
Melaleuca lanceolata						MELLAN
Melaleuca lateriflora var. acutifolia						MELLATAC
Melaleuca lateritia						MELLAT
Melaleuca leptoclada						MELLEP
Melaleuca preissiana						MELPRE
Melaleuca rhaphiophylla						MELRHA
Melaleuca scabra						MELSCA
Melaleuca seriata						MELSER
Melaleuca sp. B (Perth Flora BJK & NG 054)						MELASPB
Melaleuca teretifolia						MELTER
Melaleuca thymoides						MELTHY

Family/taxon	Cons. Code	Prop. Cons. Code	End-emic	Range end	Geographic limit	Code
Melaleuca trichophylla						MELTRI
Melaleuca uncinata						MELUNC
Melaleuca viminea						MELVIM
Pericalymma ellipticum						PERELLip
Pericalymma floridum Ms						PERFLO
Regelia ciliata						REGCIL
Regelia inops						REGINO
Scholtzia ciliata				DS	Yarloop	SCHCIL
Scholtzia involucrata						SCHINV
Verticordia acerosa						VERACE
Verticordia densiflora						VERDEN
Verticordia drummondii						VERDRU
Verticordia habrantha						VERHAB
Verticordia huegelii						VERHUE
Verticordia huegelii var. huegelii						VERHUEHU
Verticordia lindleyi subsp. lindleyi	4		eE			VERLINLI
Verticordia nitens						VERNIT
Verticordia ovalifolia				S	Ellis brook	VEROVA
Verticordia pennigera						VERPEN
Verticordia plumosa						VERPLU
Verticordia plumosa var. pleiobotrya	1		eE			VERPLUPL
Verticordia plumosa var. vassensis	1		eE			VERPLUVA
Olacaceae						
Olax benthamiana						OLABEN
Olax scalariformis						OLASCA
Onagraceae						
Epilobium billardierianum						EPIBIL
Epilobium billardierianum subsp. intermedium						EPIBILIN
Epilobium hirtigerum						EPIHIR
Ophioglossaceae						
Ophioglossum lusitanicum						OPHLUS
Orchidaceae						
Caladenia aphylla						CALAPH
Caladenia arenicola Ms						CALARE
Caladenia attingens subsp. attingens						CALATTAT
Caladenia bicalliata						CALBIC
Caladenia brownii						CALBRO
Caladenia deformis						CALDEF
Caladenia denticulata						CALDEN
Caladenia discoidea						CALDIS
Caladenia ferruginea						CALFER
Caladenia flava						CALFLA
Caladenia flava subsp. flava						CALFLAFL
Caladenia gemmata						CALGEM
Caladenia georgei						CALGEOR
Caladenia hirta						CALHIR
Caladenia huegelii	R		eP			CALHUE
Caladenia latifolia						CALLAT
Caladenia longicauda						CALLON
Caladenia longicauda subsp. calcigena						CALLONCA
Caladenia longicauda subsp. longicauda						CALLONLO
Caladenia marginata						CALMAR
Caladenia menziesii						CALMEN
Caladenia paludosa						CALPAL
Caladenia radiata						CALRAD
Caladenia reptans						CALREP
Caladenia sericea						CALSER
Caladenia speciosa						CALSPEC
Caladenia varians subsp. varians						CALVARVA
Caladenia variegata						CALVAR
Corybas recurvus						CORREC
Cyrtostylis huegelii						CYRHUE
Cyrtostylis robusta						CYRROB
Diuris aff. amplissima						DIUAFFAM
Diuris carinata						DIUCAR
Diuris emarginata						DIUEMA
Diuris laxiflora						DIULAX
Diuris longifolia						DIULON
Diuris micrantha	R		eP			DIUMIC
Drakaea glyptodon						DRAGLY
Elythranthera brunonis						ELYBRU

Family/taxon	Cons. Code	Prop. Cons. Code	End-emic	Range end	Geographic limit	Code
Elythranthera emarginata						ELYEMA
Epiblema grandiflorum						EPIGRA
Eriochilus dilatatus						ERIDIL
Eriochilus dilatatus subsp. dilatatus						ERIDILDI
Eriochilus dilatatus subsp. multiflorus						ERIDILMU
Eriochilus helonomos						ERIHEL
Eriochilus multiflorus						ERIMUL
Leporella fimbriata						LEPFIM
Lyperanthus nigricans						LYPNIG
Lyperanthus serratus						LYPSER
Microtis aff. media						MICAFFME
Microtis atrata						MICATR
Microtis media						MICMED
Microtis media subsp. densiflora						MICMEDDE
Microtis media subsp. media						MICMEDME
Microtis orbicularis						MICORB
Microtis unifolia						MICUNI
* Monadenia bracteata						MONBRA
Prasophyllum aff. holmsii						PRA_HO
Prasophyllum brownii						PRABRO
Prasophyllum drummondii				N	GinGin	PRADRU
Prasophyllum elatum						PRAELA
Prasophyllum fimbria						PRAFIM
Prasophyllum macrostachyum						PRAMAC
Prasophyllum parvifolium						PRAPAR
Prasophyllum plumaeforme						PRAPLU
Prasophyllum plurifera Ms						PRASPLU
Pterostylis aff. nana						PTEAFFNA
Pterostylis aff. nana (limestone form)						PTENANLI
Pterostylis aff. sanguinea						PTEAFFSA
Pterostylis aff. vittata						PTEAFFVI
Pterostylis aspera						PTEASP
Pterostylis barbata						PTEBAR
Pterostylis brevisepala Ms						PTEBRE
Pterostylis concava						PTECON
Pterostylis pyramidalis						PTEPYR
Pterostylis recurva						PTEREC
Pterostylis sanguinea						PTESAN
Pterostylis scabra var. robusta						PTESCARO
Pterostylis seratera var. robusta Ms						PTESERRO
Pterostylis sp. nov. (Paganoni)						PTEPAGA
Pterostylis vittata						PTEVIT
Thelymitra aff. holmesii						THEAFFHO
Thelymitra aff. macrophyllum						THEAFFMA
Thelymitra aff. pauciflora						THEAFFPA
Thelymitra antennifera						THEANT
Thelymitra benthamiana						THEBEN
Thelymitra campanulata						THECAM
Thelymitra canaliculata						THECAN
Thelymitra crinita						THECRI
Thelymitra flexuosa						THEFLE
Thelymitra fuscolutea						THEFUS
Thelymitra macrophylla						THEMAC
Thelymitra mucida						THEMUC
Thelymitra nuda						THENUD
Thelymitra pauciflora						THEPAU
Orobanchaceae						
* Orobanche minor						OROMIN
Oxalidaceae						
Oxalis corniculata						OXACOR
* Oxalis glabra						OXAGLA
Oxalis perennans						OXAPER
* Oxalis pes-caprae						OXAPES
* Oxalis purpurea						OXAPUR
Papilionaceae						
Aotus gracillima						AOTGRA
Aotus procumbens						AOTPRO
Bossiaea eriocarpa						BOSERI
Bossiaea eriocarpa (Large flowered form BJK & NG 229)						BOSERILF
Bossiaea ornata						BOSORN
Bossiaea pulchella						BOSPUL

Family/taxon	Cons. Code	Prop. Cons. Code	End-emic	Range end	Geographic limit	Code
Bossiaea rufa						BOSRUF
Brachysema celsianum						BOSCEL
Brachysema praemorsum						BRAPRA
Brachysema modesta Ms (sp. Treeton BJK & NG 001)	1	R	eI			BRAAFFSE
Brachysema papilio Ms (sp. Williamson GJK 12719)	1	R	eI			BRAWIL
Callistachys lanceolata						CALLAN
Chorizema dicksonii						CHODIC
Chorizema glycinifolium						CHOGLY
Chorizema nanum						CHONAN
Chorizema rhombeum						CHORHO
Chorizema varium	R			S	Seabird	CHOVAR
Daviesia angulata						DAVANG
Daviesia comutata Ms						DAVCOM
Daviesia cordata						DAVCOR
Daviesia costata						DAVCOS
Daviesia decurrens						DAVDEC
Daviesia divaricata						DAVDIV
Daviesia horrida						DAVHOR
Daviesia incrassata						DAVINC
Daviesia inflata				N	Fish Rd NR	DAVINF
Daviesia nudiflora						DAVNUD
Daviesia physodes						DAVPHY
Daviesia podophylla						DAVPOD
Daviesia preissii						DAVPRE
Daviesia quadrilatera						DAVQUA
Daviesia rhombifolia						DAVRHO
Daviesia triflora						DAVTRI
Dillwynia dillwynioides		2	eP			DILDIL
Dillywinia cinerascens Ms						DILCI
Euchilopsis linearis						EUCLIN
Eutaxia virgata						EUTVIR
Gompholobium aristatum						GOMARI
Gompholobium capitatum				N	Capel	GOMCAP
Gompholobium confertum						GOMCON
Gompholobium knightianum						GOMKNI
Gompholobium marginatum						GOMMAR
Gompholobium ovatum						GOMOVA
Gompholobium polymorphum						GOMPOL
Gompholobium preissii						GOMPRE
Gompholobium scabrum						GOMSCA
Gompholobium tomentosum						GOMTOM
Hardenbergia comptoniana						HARCOM
Hovea chorizemifolia						HOVCHO
Hovea elliptica						HOVELL
Hovea pungens						HOVPUN
Hovea trisperma var. grandiflora						HOVTRIGR
Hovea trisperma var. trisperma						HOVTRITR
Isotropis cuneifolia						ISOCUN
Isotropis cuneifolia subsp. glabra Ms		R	eE			ISOCUNGL
Jacksonia aff. floribunda						JACAFFFL
Jacksonia aff. sericea (swamp form)			eP			JACAFFSE
Jacksonia alata						JACALA
Jacksonia angulata						JACANG
Jacksonia condensata						JACCON
Jacksonia densiflora						JACDEN
Jacksonia densiflora / floribunda complex						JACD/F
Jacksonia floribunda						JACFLO
Jacksonia furcellata						JACFUR
Jacksonia lehmannii						JACLEH
Jacksonia restioides						JACRES
Jacksonia sericea	3		eP			JACSER
Jacksonia sp. Busselton (G.J. Keighery 4482) PN	3					JACSP.
Jacksonia sternbergiana						JACSTE
Jacksonia stricta						JACSTR
Kennedia carinata						KENCAR
Kennedia coccinea						KENCOC
Kennedia prostrata						KENPRO
Kennedia stirlingii						KENSTI
Latrobea tenella						LATTEN
* Lotus angustissimus						LOTANG
* Lotus suaveolens						LOTSUA

Family/taxon	Cons. Code	Prop. Cons. Code	End-emic	Range end	Geographic limit	Code
* Lupinus cosentinii						LUPCOS
* Medicago polymorpha						MEDPOL
* Melilotus indicus						MELIND
Mirbelia dilatata						MIRDIL
Mirbelia spinosa						MIRSPI
Nemcia aff. capitata						NEMAFFCA
Nemcia capitata						NEMCAP
Nemcia dilatata						NEMDIL
Nemcia reticulata						NEMRET
Nemcia sp. (Cordate leaves BJK & NG 032)						NEMCOR
Nemcia spathulata						NEMSPA
* Ornithopus compressus						ORNCOM
* Ornithopus pinnatus						ORNPIN
Oxylobium lineare						OXYLIN
Pultenaea ericifolia					Bullsbrook NR	PULERI
Pultenaea ochreata						PULOCH
Pultenaea reticulata						PULRET
Pultenaea skinneri	4		aE			PULSKI
Sphaerolobium aff. macranthum						SPHAFFMA
Sphaerolobium grandiflorum						SPHGRA
Sphaerolobium linophyllum						SPHLIN
Sphaerolobium medium						SPHMED
Sphaerolobium vimineum						SPHVIM
Templetonia biloba						TEMBIL
Templetonia retusa						TEMRET
* Trifolium angustifolium						TRIANG
* Trifolium arvense						TRIARV
* Trifolium campestre						TRICAM
* Trifolium cernuum						TRICER
* Trifolium dubium						TRIDUB
* Trifolium glomeratum						TRIGLO
* Trifolium subterraneum						TRISUBte
* Vicia sativa						VICSAT
* Vicia sativa subsp. sativa						VICSATSA
Viminaria juncea						VIMJUN
Philydraceae						
Philydrella drummondii						PHIDRU
Philydrella pygmaea						PHIPYG
Phormiaceae						
Dianella revoluta						DIAREV
Dianella revoluta var. brevicaulis						DIAREVBR
Dianella revoluta var. divaricata						DIAREVDI
Stypandra glauca						STYGLA
Pinaceae						
* Pinus radiata						PINRAD
Pittosporaceae						
Billardiera aff. ringens (GJK 12977)		1	eCL			BILAFFRI
Billardiera candida						BILCAN
Billardiera parviflora				N	Boyanup	BILPAR
Billardiera variifolia				N	Pickering Brook	BILVAR
Pittosporum phylliraeoides						PITPHY
Pronaya fraseri						PROFRA
Sollya heterophylla						SOLHET
Plantaginaceae						
* Plantago lanceolata						PLALAN
* Plantago major						PLAMAJ
Poaceae						
Agrostis avenacea						AGRAVE
Agrostis plebeia						AGRPLE
Agrostis preissii						AGRPRE
* Aira caryophyllea						AIRCAR
* Aira caryophyllea/cupaniana group						AIRASP
* Aira cupaniana						AIRCUP
* Aira praecox						AIRPRA
Amphibromus neesii						AMPNEE
Amphipogon amphipogonoides						AMPAMP
Amphipogon debilis				N	Beckenham	AMPDEB
Amphipogon laguroides						AMPLAG
Amphipogon turbinatus						AMPTUR
* Anthoxanthum odoratum						ANTODO
Aristida contorta						ARICON

Family/taxon	Cons. Code	Prop. Cons. Code	End-emic	Range end	Geographic limit	Code
Aristida ramosa	1			D		ARIRAM
* Avellinia michelii						AVEMIC
* Avena barbata						AVEBAR
* Avena barbata/fatua						AVENASP
* Avena fatua						AVEFAT
* Briza maxima						BRIMAX
* Briza minor						BRIMIN
Bromus arenarius						BROARE
* Bromus diandrus						BRODIA
* Bromus hordeaceus						BROHOR
* Catapodium rigidum						CATRIG
Cynodon dactylon						CYNDAC
* Cynosurus echinatus						CYNECH
Danthonia acerosa						DANACE
Danthonia caespitosa						DANCAE
Danthonia occidentalis						DANOCC
Danthonia pilosa						DANPIL
Danthonia setacea						DANSET
Deyeuxia quadriseta						DEYQUA
Dichelachne crinita						DICCRI
* Echinochloa crus-galli						ECHCRU
* Ehrharta calycina						EHRCAL
* Ehrharta longiflora						EHRLON
* Eragrostis curvula						ERACUR
Eragrostis elongata						ERAELO
* Glyceria maxima						GLYMAX
* Holcus lanatus						HOLLAN
* Holcus setiger						HOLSET
* Hordeum leporinum						HORLEP
* Lagurus ovatus						LAGOVA
* Lolium multiflorum						LOLMUL
* Lolium perenne						LOLPER
* Lolium rigidum						LOLRIG
Microlaena stipoides						MICSTI
Neurachne alopecuroidea						NEUALO
Neurachne amphipogonoides						NEUAMP
* Parapholis incurva						PARINC
* Paspalum dilatatum						PASDIL
* Pennisetum clandestinum						PENCLA
* Pentaschistis airoides						PENAIR
* Pentaschistis thunbergii						PENTHU
* Phalaris minor						PHAMIN
* Phleum pratense						PHLPRA
* Poa annua						POAANN
Poa drummondiana						POADRU
Poa poiformis						POAPOI
Poa poiformis/porphyroclados						POASP
Poa porphyroclados						POAPOR
* Polypogon monspeliensis						POLMON
Polypogon tenellus						POLTEN
Sporobolus virginicus						SPOVIR
* Stenotaphrum secundatum						STESEC
Stipa campylachne						STICAM
Stipa compressa						STICOM
Stipa elegantissima						STIELE
Stipa flavescens						STIFLA
Stipa macalpinei						STIMAC
Stipa pycnostachya						STIPYC
Stipa semibarbata						STISEM
Stipa semibarbata/campylachne						STISEMGP
Stipa tenuifolia						STITEN
Tetrarrhena laevis						TETLAE
Themeda triandra						THETRI
* Vulpia bromoides						VULBRO
* Vulpia myuros						VULMYU
Podocarpaceae						
Podocarpus drouynianus						PODDRO
Polygalaceae						
Comesperma calymega						COMCAL
Comesperma confertum						COMCON

Family/taxon	Cons. Code	Prop. Cons. Code	End-emic	Range end	Geographic limit	Code
Comesperma flavum						COMFLA
Comesperma integerrimum						COMINT
Comesperma virgatum						COMVIR
Comesperma volubile						COMVOL
Muehlenbeckia adpressa						MUEADP
Muehlenbeckia polybotrya				S	Caraban	MUEPOL
Persicaria prostrata						PERPRO
Persicaria salicifolium						PERSAL
* Rumex acetosella						RUMACE
* Rumex brownii						RUMBRO
* Rumex crispus						RUMCRI
* Rumex pulcher						RUMPUL
Portulacaceae						
Calandrinia brevipedata						CALBRE
Calandrinia calyptrata						CALCAL
Calandrinia corrigioloides						CALCOR
Calandrinia granulifera						CALGRA
Calandrinia liniflora						CALLIN
Portulaca oleracea						POROLE
Primulaceae						
* Anagallis arvensis						ANAARV
Samolus junceus						SAMJUN
Samolus repens						SAMREP
Proteaceae						
Adenanthos cygnorum						ADECYG
Adenanthos intermedius						ADEINT
Adenanthos meisneri						ADEMEI
Adenanthos obovatus						ADEOBO
Banksia attenuata						BANATT
Banksia grandis						BANGRA
Banksia ilicifolia						BANILI
Banksia incana				DS	APB Forrestfield	BANINC
Banksia littoralis						BANLIT
Banksia meisneri var. ascendens	4					BANMEIAS
Banksia menziesii						BANMEN
Banksia prionotes						BANPRI
Conospermum acerosum						CONACE
Conospermum caeruleum subsp. spathulatum Ms						CONCAESP
Conospermum capitatum						CONCAP
Conospermum huegelii				S	Brixton St	CONHUE
Conospermum incurvum						CONINC
Conospermum pedunculatum Ms			eE			CONPED
Conospermum stoechadis						CONSTO
Conospermum stoechadis x triplinervium						CONSXT
Conospermum teretifolium				N	Capel	CONTER
Conospermum undulatum	4	R	eE			CONUND
Dryandra aff. nivea (GJK 6622)		R				DRYAFFNI
Dryandra armata						DRYARM
Dryandra bipinnatifida			E			DRYBIP
Dryandra nivea						DRYNIV
Dryandra sessilis						DRYSES
Dryandra sp. 30 (aff. squarrosa ASG 11657)	1	R	eI			DRYSPIR
Franklandia triaristata	4					FRATRI
Grevillea althoferorum	1			S	Bullsbrook	GREALT
Grevillea bipinnatifida						GREBIP
Grevillea brachystylis subsp. brachystylis	2		eE			GREBRABR
Grevillea crithmifolia				S	Yalgorup	GRECRI
Grevillea elongata	2	R	eI			GREELO
Grevillea endlicheriana						GREEND
Grevillea manglesioides						GREMAN
Grevillea mccutcheonii Ms	1		eI			GREMCC
Grevillea pilulifera						GREPIL
Grevillea pulchella						GREPUL
Grevillea quercifolia						GREQUE
Grevillea thelemanniana subsp. obtusifolia				S	Pinjarra	GRETHEOB
Grevillea thelemanniana subsp. preissii				S	Yalgorup	GRETHEPR
Grevillea thelemanniana subsp. thelemanniana						GRETHETH
Grevillea trifida						GRETRI
Grevillea vestita						GREVES
Grevillea wilsonii						GREWIL
Hakea aff. undulata (BJK & NG 897)	2	4	eCL			HAK_UND

Family/taxon	Cons. Code	Prop. Cons. Code	End-emic	Range end	Geographic limit	Code
Hakea amplexicaulis						HAKAMP
Hakea auriculata				S	Perth	HAKAUR
Hakea candolleana						HAKCAN
Hakea ceratophylla				S	Byford	HAKCER
Hakea conchifolia				S	Forrestfield	HAKCON
Hakea costata						HAKCOS
Hakea cristata						HAKCRI
Hakea cyclocarpa						HAKCYC
Hakea erinacea				S	Perth	HAKERI
Hakea incrassata						HAKINC
Hakea lissocarpha						HAKLIS
Hakea marginata						HAKMAR
Hakea myrtoides	3					HAKMYR
Hakea prostrata						HAKPRO
Hakea ruscifolia						HAKRUS
Hakea stenocarpa						HAKSTE
Hakea sulcata						HAKSUL
Hakea trifurcata						HAKTRI
Hakea undulata						HAKUND
Hakea varia						HAKVAR
Hakea varia (Yellow flw ironstone form BJK & NG 226)	R		eI			HAKVARIR
Isopogon asper						ISOASP
Isopogon drummondii	3			S	Forrestfield	ISODRUm
Isopogon dubius				S	Forrestfield	ISODUB
Isopogon scaber	1			S	Ambergate	ISOSCA
Isopogon sphaerocephalus						ISOSPH
Lambertia multiflora subsp. darlingensis	3			S	Dardanup	LAMMUL
Lambertia propinqua	2			DN	Williamson Rd	LAMPRO
Persoonia angustiflora						PERANG
Persoonia comata						PERCOM
Persoonia elliptica						PERELL
Persoonia graminea				DN	Carbanup	PERGRA
Persoonia longifolia						PERLON
Persoonia saccata						PERSAC
Petrophile biloba						PETBIL
Petrophile brevifolia						PETBRE
Petrophile latericola Ms	1	R	eI			PETLAT
Petrophile linearis						PETLIN
Petrophile macrostachya						PETMAC
Petrophile media var. juncifolius Ms						PETMEDJU
Petrophile seminuda						PETSEM
Petrophile serruriae						PETSER
Petrophile shuttleworthiana						PETSHU
Petrophile squamata						PETSQU
Petrophile striata						PETSTR
Stirlingia latifolia						STILAT
Strangea stenocarpoides						STRSTE
Synaphea ? gracillima x acutiloba						SYNGXA
Synaphea acutiloba	3					SYNACU
Synaphea aff. petiolaris						SYN_PET
Synaphea gracillima						SYNGRA
Synaphea petiolaris						SYNPET
Synaphea petiolaris (trilobe form)						SYNPETTR
Synaphea pinnata	4		eE			SYNPIN
Synaphea polymorpha						SYNPOL
Synaphea sp. (Busselton)						SYNBUS
Synaphea sp. (Fine leaves BJK & NG 247)						SYNSTE
Synaphea sp. (Fish Road GJK & BJK sn)						SYNFISH
Synaphea sp. (Ironstone wedge leaves GJK sn)			eI			SYNWEDG
Synaphea sp. (Oats Road GJK & NG 251)						SYNOATS
Synaphea sp. (Smith Rd BJK & NG 244)						SYNFLO
Synaphea sp. (Whicher Range BJK & NG 036)						SYNWICH
Synaphea spinulosa						SYNSPI
Xylomelum occidentale						XYLOCC
Ranunculaceae						
Clematis linearifolia						CLELIN
Clematis pubescens						CLEPUB
Ranunculus colonorum						RANCOL
Ranunculus pumilio						RANPUM
Ranunculus sessiliflorus var. sessiliflorus						RANSESSE

Family/taxon	Cons. Code	Prop. Cons. Code	End-emic	Range end	Geographic limit	Code
Restionaceae						
Alexgeorgea nitens						ALENIT
Anarthria gracilis						ANAGRA
Anarthria humilis						ANAHUM
Anarthria laevis						ANALAE
Anarthria prolifera						ANAPRO
Anarthria scabra						ANASCA
Chaetanthus leptocarpoides						CHALEP
Harperia lateriflora						HARLAT
Hypolaena exsulca						HYPEXS
Hypolaena fastigiata						HYPFAS
Hypolaena ramosissima						HYPRAM
Lepidobolus preissianus						LEPPRE
Leptocarpus aff. crebriculmis (BJK & NG 236)						LEPAFFCR
Leptocarpus aristatus						LEPARI
Leptocarpus canus						LEPCAN
Leptocarpus coangustatus						LEPCOA
Leptocarpus elegans Ms						LEPELE
Leptocarpus roycei Ms						LEPROY
Leptocarpus scariosus						LEPSCAr
Leptocarpus sp. (large rhizome - Forrestdale Lake, NG & ML 1551)						LEPTFL
Leptocarpus tenax						LEPTEN
Lepyrodia aff. macra (GJK 9848)						LEPYSP
Lepyrodia drummondiana						LEPDRU
Lepyrodia glauca						LEPGLAu
Lepyrodia heleocharoides	3					LEPHEL
Lepyrodia macra						LEPMAC
Lepyrodia muirii						LEPMUI
Loxocarya cinerea						LOXCIN
Loxocarya fasciculata						LOXFAS
Loxocarya flexuosa						LOXFLE
Loxocarya magna Ms	3			N	Wonnerup Rd	LOXMAG
Loxocarya pubescens						LOXPUB
Lyginia barbata						LYGBAR
Meeboldina denmarkica						MEEDEN
Pseudoloxocarya grossa Ms				DN	Carbunup River	PSUGRO
Restio elegans Ms						RESELE
Restio gracilior	3			N	Yoongarilup	RESGRA
Restio leptocarpoides						RESLEP
Restio microcodon Ms				S	Melaleuca Park	RESMIC
Restio serialis Ms				DN	Williamson Rd	RESSER
Restio sinosus Ms				S	Burnside Rd	RESSIN
Restio stenostachyus				S	Lowlands	RESSTE
Restio tremulus						RESTRE
Rhamnaceae						
Cryptandra arbutiflora						CRYARB
Cryptandra humilis				DS	Forrestfield	CRYHUM
Cryptandra mutila				S	Yallingup	CRYMUT
Cryptandra pungens						CRYPUN
* Rhamnus alaternus						RHAALA
Spyridium globulosum						SPYGLO
Spyridium tridentatum						SPYTRI
Trymalium albicans				S	Yalgorup	TRYALB
Trymalium floribundum						TRYFLO
Trymalium ledifolium						TRYLED
Rubiaceae						
* Galium aparine						GALAPA
* Galium divaricatum						GALDIV
* Galium murale						GALMUR
Opercularia apiciflora						OPEAPI
Opercularia hispidula						OPEHIS
Opercularia spermacocea						OPESPE
Opercularia vaginata						OPEVAG
Opercularia vaginata (Ironstone form BJK & NG 238)			eI			OPEVAGIR
* Sherardia arvensis						SHEARV
Rutaceae						
Boronia alata				N	Rottnest Minnim Cove	BORALA
Boronia crenulata						BORCRE
Boronia defoliata				N	Capel	BORDEF
Boronia denticulata						BORDEN
Boronia dichotoma						BORDIC

Family/taxon	Cons. Code	Prop. Cons. Code	End-emic	Range end	Geographic limit	Code
Boronia purdieana						BORPUR
Boronia ramosa						BORRAM
Boronia spathulata						BORSPA
Diplolaena angustifolia				S	Yanchep	DIPANG
Diplolaena dampieri				N	Woodsman Point	DIPDAM
Eriostemon spicatus						ERISPI
Santalaceae						
Exocarpos odoratus				N	Fish Rd NR	EXOODO
Exocarpos sparteus						EXOSPA
Leptomeria cunninghamii						LEPCUN
Leptomeria empetriformis				S	Yalgorup	LEPEMP
Leptomeria ericoides	1					LEPERI
Leptomeria lehmannii	2			N	Yalgorup	LEPLEH
Leptomeria preissiana				N	Bullsbrook	LEPPREs
Leptomeria scrobiculata				N	Ambergate	LEPSCR
Leptomeria spinosa						LEPSPI
Santalum acuminatum						SANACU
Sapindaceae						
Dodonaea aptera						DODAPT
Dodonaea hackettiana	4		eW			DODHAC
Dodonaea viscosa						DODVIS
Scrophulariaceae						
* Bellardia trixago						BELTRI
* Cymbalaria muralis						CYMMUR
* Dischisma arenarium						DISARE
* Dischisma capitatum						DISCAP
Glossostigma diandrum						GLODIA
Glossostigma drummondii						GLODRU
Gratiola peruviana						GRAPER
* Parentucellia latifolia						PARLAT
* Parentucellia viscosa						PARVIS
Veronica aff. calycina (BJK & NG 235)			eC			VERAFFCA
* Veronica arvensis						VERARV
Selaginellaceae						
Selaginella gracillima						SELGRA
Solanaceae						
Anthocercis ilicifolia				S	Mandurah	ANTILI
Anthocercis littorea						ANTLIT
* Solanum americanum						SOLAME
* Solanum nigrum						SOLNIG
Solanum symonii						SOLSYM
Stackhousiaceae						
Stackhousia monogyna						STAMON
Tripterococcus brunonis						TRIBRU
Tripterococcus sp. Cannington (A.S.George 16201) PN	1		eP			TRISP.
Sterculiaceae						
Guichenotia ledifolia						GUILED
Thomasia cognata						THOCOG
Thomasia grandiflora						THOGRA
Thomasia purpurea						THOPUR
Thomasia triphylla						THOTRI
Stylidiaceae						
Levenhookia pauciflora						LEVPAU
Levenhookia pusilla						LEVPUS
Levenhookia stipitata						LEVSTI
Stylidium adnatum						STYADN
Stylidium adpressum						STYADP
Stylidium aff. bulbiferum (Ironstone, BJK & NG 706)		2				STYAFFBUL
Stylidium affine						STYAFF
Stylidium amoenum						STYAMO
Stylidium breviscapum						STYBRE
Stylidium brunonianum						STYBRU
Stylidium brunonianum subsp. minor						STYBRUMI
Stylidium bulbiferum						STYBUL
Stylidium calcaratum						STYCAL
Stylidium canaliculatum				N	Pearce	STYCAN
Stylidium carnosum						STYCAR
Stylidium crassifolium				N	Pearce	STYCRA
Stylidium crossocephalum				S	Wanneroo	STYCRO
Stylidium dichotomum						STYDIC
Stylidium diuroides						STYDIU

Family/taxon	Cons. Code	Prop. Cons. Code	End-emic	Range end	Geographic limit	Code
Stylidium divaricatum				S	Fish Rd NR	STYDIV
Stylidium ecorne						STYECO
Stylidium emarginatum						STYEMA
Stylidium guttatum						STYGUT
Stylidium imbricatum				DN	Payne Rd	STYIMB
Stylidium inundatum						STYINU
Stylidium junceum						STYJUN
Stylidium latericola Ms						STYLAT
Stylidium leptophyllum						STYLEP
Stylidium longitubum	1			S	Mundijong Rd	STYLON
Stylidium macrocarpum						STYMAC
Stylidium maritima Ms				S	White Hill	STYMAR
Stylidium mimeticum	1		eE			STYMIM
Stylidium obtusatum						STYOBT
Stylidium periscelianthum						STYPER
Stylidium perpusillum						STYPERp
Stylidium petiolare						STYPET
Stylidium piliferum						STYPIL
Stylidium preissii				DN	Ken Hurst Park	STYPRE
Stylidium pulchellum						STYPUL
Stylidium repens						STYREP
Stylidium rigidifolium	2		e			STYRIG
Stylidium roseo-alatum						STYROSa
Stylidium roseonanum						STYROS
Stylidium scandens						STYSCA
Stylidium schoenoides						STYSCH
Stylidium spathulatum						STYSPA
Stylidium striatum						STYSTR
Stylidium utricularioides						STYUTR
Thymelaeaceae						
Pimelea argentea						PIMARG
Pimelea calcicola				S	Yalgorup	PIMCAL
Pimelea ferruginea						PIMFER
Pimelea imbricata var. imbricata						PIMIMBIM
Pimelea imbricata var. major			eE			PIMIMBMA
Pimelea imbricata var. piligera						PIMIMBPI
Pimelea leucantha						PIMLEU
Pimelea preissii						PIMPRE
Pimelea rosea				N	Lake Pinjar	PIMROS
Pimelea suaveolens						PIMSUA
Pimelea sulphurea						PIMSUL
Tremandraceae						
Platytheca galioides						PLAGAL
Tetratheca hirsuta						TETHIR
Tetratheca hirsuta (glabrous)						TETHIRSC
Urticaceae						
Parietaria debilis						PARDEB
Valerianaceae						
* Centranthus macrosiphon						CENMAC
Violaceae						
Hybanthus calycinus						HYBCAL
Hybanthus floribundus						HYBFLO
Xanthorrhoeaceae						
Xanthorrhoea acanthostachya				S	Boyanup	XANACA
Xanthorrhoea brunonis						XANBRU
Xanthorrhoea drummondii						XANDRU
Xanthorrhoea gracilis						XANGRA
Xanthorrhoea preissii						XANPRE
Zamiaceae						
Macrozamia riedlei						MACRIE
Zygophyllaceae						
Zygophyllum fruticulosum				S	Port Kennedy	ZYGFRU

Appendix 3.

The full floristic data set of 1410 taxa and 509 sites is listed in Cornell University Condensed Format. The taxa listed below were grouped for the floristic analysis. Species codes follow those in Appendix 2 and site locations follow Apendix 4.

Acacia applanata Ms
Acacia willdenowiana

Acacia pulchella var. glaberrima
Acacia pulchella var. pulchella
Acacia pulchella var. reflexa Ms

* Aira caryophyllea
* Aira caryophyllea/cupaniana group
* Aira cupaniana

* Avena barbata
* Avena barbata/fatua
* Avena fatua

Boronia denticulata
Boronia spathulata

Bossiaea eriocarpa
Bossiaea eriocarpa (Large flowered form BJK & NG 229)

Caladenia flava
Caladenia flava subsp. flava

Caladenia longicauda
Caladenia longicauda subsp. longicauda

Conostylis pauciflora
Conostylis pauciflora subsp. euryrhipis

Dianella revoluta
Dianella revoluta var. divaricata

Drosera erythrorhiza
Drosera erythrorhiza subsp. erythrorhiza
Drosera erythrorhiza subsp. squamosa Ms

Drosera gigantea subsp. geniculata Ms
Drosera gigantea subsp. gigantea

Drosera macrantha
Drosera macrantha subsp. macrantha Ms

Drosera nitidula
Drosera nitidula subsp. nitidula

Drosera paleacea
Drosera paleacea subsp. paleacea

Drosera stolonifera
Drosera stolonifera subsp. porrecta
Drosera stolonifera subsp. stolonifera

Epilobium billardierianum
Epilobium billardierianum subsp. intermedium

Eriochilus dilatatus
Eriochilus dilatatus subsp. dilatatus
Eriochilus dilatatus subsp. Multiflorus

Jacksonia floribunda
Jacksonia densiflora / floribunda complex

Jacksonia densiflora

Lepidosperma aff. angustatum
Lepidosperma angustatum

Lepidosperma leptostachyum
Lepidosperma sp. (Eastern terete, BJK & NG 232)

Logania serpyllifolia
Logania serpyllifolia subsp. angustifolia

Microtis media
Microtis media subsp. densiflora
Microtis media subsp. media

Pericalymma ellipticum
Pericalymma floridum Ms

Poa poiformis
Poa poiformis/porphyroclados
Poa porphyroclados

Pterostylis aff. nana
Pterostylis aff. nana (limestone form)
Pterostylis brevisepala Ms

Rhagodia baccata subsp. baccata
Rhagodia baccata subsp. dioica

* Romulea rosea
* Romulea rosea subsp. rosea
* Romulea rosea var. australis

Schoenus aff. brevisetis
Schoenus aff. laevigatus
Schoenus brevisetis
Schoenus caespititius

Stipa campylachne
Stipa semibarbata
Stipa semibarbata/campylachne

Thysanotus manglesianus
Thysanotus manglesianus/patersonii complex
Thysanotus patersonii

Tricostularia neesii var. elatior
Tricostularia neesii var. neesii

Verticordia huegelii
Verticordia huegelii var. huegelii

Verticordia plumosa
Verticordia plumosa var. pleiobotrya

* Watsonia bulbillifera
* Watsonia meriana

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Swan Coastal Plain dataset
(16i5)                                                                5
    1   34   37   43   63   69   74   75  119  159  164  172  174  193  286  336
    1  365  378  434  461  467  475  502  511  518  555  556  558  559  579  592
    1  605  641  643  657  660  744  761  765  773  837  845  855  856  861  862
    1  869  921  952  986  994 1046 1082 1086 1212 1238 1277 1281 1295 1300 1309
    1 1327
    2   15   27   63   69   74   76  159  193  286  311  314  366  378  449  452
    2  461  475  502  511  518  555  558  595  605  638  641  649  679  681  684
    2  738  746  761  849  854  855  862  863  944  952  998 1000 1086 1140 1218
    2 1232 1285 1295 1298 1299 1300 1352 1427 1431 1432 1434
    3   53   74   83  148  170  227  260  261  288  311  328  332  378  404  457
    3  475  497  526  571  590  595  607  610  645  679  681  702  738  792  797
    3  862  905  908  939  991 1035 1148 1161 1228 1240 1241 1285 1295 1309 1326
    3 1432
    4   15   16   53   56   63   85   90  104  136  170  183  184  232  286  378
    4  388  452  454  511  517  518  553  653  664  679  681  684  734  736  746
    4  769  772  805  809  816  845  856  859  895  900  946  958  991 1010 1034
    4 1035 1086 1095 1131 1172 1178 1193 1203 1253 1257 1269 1302 1351 1383 1431
    4 1432
    5   15   53   63  147  159  183  184  192  193  194  240  286  366  384  388
    5  406  449  461  497  511  518  549  638  641  649  653  661  679  684  735
    5  738  746  761  837  843  845  855  862  868  870  908  946  981  998 1010
    5 1013 1034 1131 1200 1218 1232 1274 1295 1297 1300 1314 1331 1355 1383 1427
    5 1432 1434 1435
    6   18   37   63   65   83  107  124  170  227  260  261  269  311  314  365
    6  378  386  404  463  526  558  595  607  610  645  669  681  684  702  738
    6  783  797  865  868  889  908  981  991 1069 1147 1174 1193 1240 1243 1246
    6 1285 1300 1309 1326 1333 1346 1432
    7    3   15   52   53   59   63   76   85  119  136  159  193  232  286  312
    7  314  336  366  378  388  393  452  461  475  497  511  518  558  561  571
    7  576  595  605  638  641  661  679  681  724  738  797  805  829  845  854
    7  855  862  870  871  905  908  945  952  976  981  990 1010 1034 1061 1131
    7 1207 1212 1224 1228 1233 1240 1246 1267 1269 1297 1299 1300 1302 1308 1404
    7 1431 1432
    8   15   37   53   63   74   84   85  124  146  148  170  227  260  311  312
    8  314  332  378  388  444  463  511  526  553  557  571  590  595  607  610
    8  645  679  681  702  724  738  739  761  782  797  862  868  908  939  981
    8  991 1147 1172 1177 1228 1240 1285 1309 1326 1346 1431 1432
    9    3   15   27   53   63   74   85  111  119  135  136  159  193  232  286
    9  311  328  365  378  388  402  452  461  475  502  511  518  558  605  641
    9  661  679  681  719  724  738  746  835  845  853  855  862  865  869  900
    9  908  939  966  976  981  990  991 1010 1024 1034 1131 1152 1177 1212 1228
    9 1233 1253 1257 1274 1285 1298 1300 1302 1327 1331 1333 1353 1413 1431 1432
    9 1434
   10   15   27   52   53   63   74  119  136  159  184  193  232  286  312  366
   10  376  378  399  402  449  452  461  475  497  511  518  554  555  558  586
   10  605  641  679  681  684  690  738  746  761  827  829  844  845  853  854
   10  862  908  946  952  981  994  998 1034 1086 1131 1177 1218 1232 1253 1295
   10 1298 1299 1300 1327 1346 1427 1432
   11   43   67   69   79  121  135  138  168  172  193  259  265  267  319  324
   11  333  341  342  366  378  390  401  437  450  467  473  475  495  502  518
   11  554  555  586  587  605  627  640  641  665  716  738  744  748  761  762
   11  845  849  853  855  862  868  897  906  908  926  947  978  998  999 1139
   11 1148 1163 1211 1219 1228 1249 1267 1269 1277 1288 1300 1334 1361 1369 1429
   12   50   67   69   79  119  121  135  138  141  172  193  260  267  307  319
   12  324  333  341  342  361  366  390  392  437  450  473  475  493  495  502
   12  522  554  586  587  596  627  640  641  694  713  716  725  744  748  762
   12  820  844  845  849  855  862  868  871  897  906  976  978  998  999 1011
   12 1030 1139 1148 1163 1177 1228 1240 1245 1249 1288 1300 1327 1352 1361 1369
   13  220  262  276  347  545  656  672  763  764  936 1009 1051 1053 1054 1126
   13 1129 1165 1168 1264 1271 1347 1362 1372 1381 1402 1405
   14   95  107  111  161  177  184  220  268  269  283  304  373  440  442  467
   14  551  566  653  667  697  699  729  763  860  886  923 1009 1053 1054 1116
   14 1126 1167 1168 1193 1264 1272 1347 1372 1380 1381
   15   33  124  184  227  269  276  281  347  417  521  568  684  697  699  706
   15  727  766  781  889  892  925 1202 1259 1362 1401 1402 1409
   16   33  135  137  146  214  282  286  307  409  467  530  561  591  681  684
   16  715  740  781  869  877  916  923  991 1193 1240 1331 1339 1377
   17   33  107  124  183  184  214  227  269  274  286  314  378  417  455  521
   17  561  610  655  669  681  684  715  781  827  865  889  902  903  914  923
   17  991 1086 1104 1171 1179 1185 1193 1240 1243 1248 1327 1333 1383 1432
   18   33   49   64  146  180  183  214  274  282  314  348  350  561  669  684
   18  720  740  827  877  902  903  919  923 1044 1058 1083 1096 1116 1124 1225
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18 1325 1339 1377 1411 1413
19   49   64   75   82   95  146  154  161  169  177  183  184  186  220  262
19  269  281  283  286  304  442  451  551  566  655  667  683  684  697  729
19  764  781  827  859  902  903  923  935 1009 1051 1053 1054 1058 1071 1096
19 1155 1167 1168 1185 1193 1256 1264 1268 1327 1339 1349 1372 1386 1409
20   19   64   82  107  154  177  183  184  186  214  238  265  269  281  286
20  304  318  373  378  442  446  451  452  466  526  610  626  667  669  684
20  689  697  729  777  781  788  827  860  889  892  893  894  902  903  914
20  923  924 1009 1014 1053 1071 1155 1167 1168 1185 1193 1202 1256 1262 1325
20 1344 1351 1383 1408
21  119  135  159  172  183  193  197  214  286  311  314  327  378  382  388
21  437  467  479  518  561  627  641  644  666  681  684  719  736  740  762
21  796  844  845  849  853  858  862  868  869  900  978  998 1010 1202 1228
21 1240 1274 1298 1321 1326 1339 1431 1432
22   33   64  143  146  183  191  234  262  265  269  373  409  412  440  451
22  480  568  589  655  681  684  689  691  697  729  741  763  835  840  858
22  859  865  896  903  925  936  978 1049 1060 1071 1115 1118 1193 1202 1305
22 1310 1325 1327 1333 1343 1351 1362 1387 1408
23   60   78  127  131  262  295  347  354  483  689  700  758  859  887  936
23 1013 1259 1359 1362 1402
24   33  143  146  171  183  184  191  220  262  269  304  350  352  440  442
24  451  507  589  662  678  684  691  848  859  919  957  971 1007 1009 1014
24 1049 1051 1096 1161 1171 1185 1203 1259 1266 1305 1310 1350 1377 1408
25   47   53   68   76   79  106  124  135  137  141  217  274  307  314  327
25  350  378  388  402  460  517  561  563  649  650  679  681  845  853  858
25  868  895  923 1010 1172 1178 1240 1267 1269 1326 1339 1352 1377 1431
26  124  147  265  311  463  526  679  783  895  899  991 1304
27   43   50   68   79  135  137  141  172  178  183  193  214  216  274  286
27  314  334  344  382  437  450  492  502  583  641  661  684  720  746  753
27  761  762  774  789  807  828  835  845  863  868  869  876  906  923  998
27 1041 1044 1086 1152 1160 1203 1225 1228 1231 1240 1269 1327 1339 1369 1377
27 1415 1431
28    3   17   37   50   53   68   79  115  135  137  141  164  172  183  193
28  197  216  286  327  333  378  382  388  437  446  450  502  518  561  563
28  627  644  661  679  681  684  687  708  751  753  761  774  807  845  848
28  853  863  895  955  978  998 1010 1058 1086 1154 1169 1240 1245 1267 1269
28 1274 1312 1352 1369 1377 1431 1432
29   20   26   66   69   82  141  183  188  226  229  237  291  314  322  350
29  353  420  422  479  543  561  572  621  623  644  684  697  747  757  762
29  842  847  863  880  948  982 1006 1130 1132 1141 1157 1192 1202 1227 1339
29 1352 1377
30   27   64   66   69   82   98  135  141  183  184  237  314  317  322  334
30  344  409  452  479  514  543  572  621  623  644  661  665  684  690  718
30  757  761  815  847  863  877  880  906  948  955  982  999 1006 1013 1130
30 1139 1157 1202 1227 1240 1260 1348 1352 1377 1431
31    9   20   26   56   82  129  183  184  188  226  255  284  306  314  322
31  350  391  409  422  480  514  524  535  618  621  623  747  761  775  815
31  842  847  863  880  933  948  955  960  982 1006 1015 1043 1157 1202 1227
31 1293 1331 1338 1348
32   26   69   82  183  184  208  284  314  391  409  476  479  513  524  561
32  578  623  684  697  747  761  815  847  863  877  880  885  916  948  982
32 1006 1013 1157 1192 1198 1202 1227 1293 1325 1376
33   20   63  107  171  183  184  269  299  304  325  365  373  427  451  551
33  567  570  589  662  679  684  689  729  742  764  848  908  925  944  955
33 1008 1049 1055 1116 1161 1171 1173 1185 1193 1262 1264 1266 1268 1343 1384
33 1387 1390 1407 1432
34   20   98  133  171  183  193  209  214  260  307  378  381  402  452  475
34  502  507  511  556  564  586  604  641  669  681  684  736  738  761  774
34  851  862  908  916  939  944  955  978 1058 1086 1116 1134 1240 1300 1330
34 1333 1346 1377 1407 1431 1432
35  110  124  171  182  183  184  269  299  304  365  373  451  526  543  567
35  589  689  699  701  729  742  764  766  925  937  973 1008 1021 1049 1116
35 1147 1161 1167 1168 1171 1243 1343 1344 1347 1362 1365 1387 1407
36   60   61   78  110  124  182  184  304  373  507  566  568  589  662  689
36  701  764  783  892  925  937 1008 1021 1049 1051 1054 1113 1116 1161 1243
36 1250 1272 1344 1362 1365 1371 1402 1422
37   20   64  107  133  171  183  184  221  260  269  274  304  336  365  378
37  451  475  479  502  566  570  587  589  600  641  671  738  742  752  761
37  764  862  871  908  923  944  955  976  978 1000 1001 1008 1049 1116 1185
37 1193 1240 1248 1262 1266 1269 1280 1285 1300 1334 1343 1352 1387 1390 1395
37 1407 1408 1431 1432
38    3   27  119  172  183  194  247  314  333  334  336  401  402  437  461
38  475  502  518  543  556  559  586  635  641  660  661  665  736  746  761
38  773  818  863  906  908  926  939  998 1041 1045 1058 1068 1086 1090 1132
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38 1137 1203 1249 1300 1325 1339 1352 1377 1432
39 27 64 67 69 79 91 97 172 183 193 207 240 248 267 274
39 319 336 338 382 401 402 407 437 461 475 511 543 574 631 640
39 641 684 751 752 761 773 784 855 858 906 908 923 960 978 998
39 1041 1058 1132 1137 1164 1203 1225 1242 1339 1377 1409 1411 1415 1432
40 27 35 43 67 79 97 135 141 172 193 240 267 274 307 314
40 333 336 338 378 382 388 407 437 460 543 561 569 640 641 662
40 712 753 761 773 784 795 845 858 863 906 916 923 978 998 1003
40 1044 1090 1132 1137 1155 1160 1164 1225 1240 1267 1269 1331 1339 1344 1377
40 1398
41 33 105 184 192 195 230 269 347 508 521 567 689 697 704 781
41 831 895 903 978 1069 1108 1156 1171 1331 1432
42 17 27 43 50 67 79 97 135 141 172 193 240 245 265 286
42 327 333 336 378 382 388 402 407 437 452 495 502 522 543 561
42 627 631 634 640 641 649 661 681 684 690 713 725 753 774 807
42 844 845 863 868 871 906 978 984 998 1010 1011 1013 1045 1086 1139
42 1154 1160 1225 1228 1240 1267 1269 1274 1288 1321 1377 1409 1410 1431
43 27 43 64 69 79 97 119 172 183 193 209 214 240 267 314
43 333 336 338 382 401 404 451 460 475 502 518 543 555 556 574
43 586 605 631 640 641 661 662 665 684 746 753 759 761 773 774
43 844 906 919 926 939 944 976 978 998 1003 1022 1041 1044 1058 1068
43 1086 1107 1132 1152 1203 1232 1240 1267 1269 1288 1300 1325 1339 1377 1415
43 1431 1432
44 49 64 84 99 107 146 178 183 184 193 259 265 437 475 502
44 561 563 577 591 669 681 684 743 781 868 903 919 939 1009 1135
44 1182 1193 1232 1240 1248 1339 1377 1431 1432
45 49 82 107 124 177 183 184 191 269 347 442 446 451 551 566
45 667 669 689 699 727 730 763 764 884 902 1009 1051 1126 1159 1168
45 1202 1251 1327 1339 1343 1347 1358 1377
46 49 64 84 95 99 107 146 178 183 184 193 234 265 274 281
46 282 304 437 451 502 561 563 577 662 667 671 679 681 759 763
46 781 848 868 882 883 903 919 925 1052 1054 1108 1135 1168 1171 1193
46 1225 1240 1248 1339 1347 1365 1377 1387 1396
47 49 124 178 183 184 192 193 194 260 269 347 348 373 414 437
47 440 443 446 451 507 566 727 763 764 883 884 902 903 1009 1051
47 1116 1126 1135 1159 1202 1203 1224 1243 1327 1343 1347 1421
48 27 69 79 119 133 172 178 193 218 240 286 365 401 437 452
48 461 475 511 556 574 587 600 607 631 635 641 684 688 725 753
48 754 761 828 845 853 906 908 939 955 976 1003 1093 1131 1132 1134
48 1213 1225 1240 1242 1267 1288 1300 1331 1339 1377 1414 1415 1429
49 63 68 111 133 135 172 184 193 194 214 286 311 327 333 378
49 388 397 437 461 467 502 518 631 641 649 661 684 687 746 761
49 841 845 849 854 855 862 863 978 998 1010 1071 1228 1245 1274 1297
49 1325 1330 1339 1369 1434
50 37 119 135 136 159 172 183 193 260 274 286 307 311 327 333
50 378 388 397 437 452 460 518 631 641 650 662 681 684 687 753
50 807 845 849 855 862 863 868 869 877 900 905 919 978 995 998
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ACAAFFALACAALA  ACAAPP  ACAAUR  ACABARBAACABARBOACABRO  ACACAN  ACACOC  ACACYC
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ADEINT  ADEMEI  ADEOBO  ADIAET  ADRQUA  AGOFLE  AGOGRA  AGOLIN  AGOPAR  AGRAVE
AGRPLE  AGRPRE  AGRSCA  AIRCAR  AIRCUP  AIRPRA  ALENIT  ALLFRA  ALLHUM  ALLMIC
ALLTHU  ALTNOD  ALYBUX  AMPAMP  AMPDEB  AMPERI  AMPLAG  AMPNEE  AMPTUR  AMPVOL
AMYLIN  ANAARV  ANAGRA  ANALAE  ANAPRO  ANASCA  ANDAFFLAANDCAE  ANDHET  ANDINV
ANDLEH  ANGAFFDRANGDRU  ANGMIC  ANGPRE  ANIFLA  ANIHUM  ANIMAN  ANIVIR  ANTHUM
ANTILI  ANTJUN  ANTLIT  ANTODO  AOTGRA  AOTPRO  APHCYP  APIANN  APIPRO  APOHEX
ARCCAL  ARESER  ARGERU  ARICON  ARNPRE  ASTCIL  ASTDRU  ASTMIC  ASTPAL  ASTPUL
ASTSTO  ASTSUB  ASTXER  AST_FA  ATRCIN  ATRHYP  ATRPRO  AVEBAR  AVEFAT  AVEMIC
AZOFIL  BABDIS  BAECAM  BAEROB  BANATT  BANGRA  BANILI  BANINC  BANLIT  BANMEIAS
BANMEN  BANPRI  BAUACU  BAUART  BAUARTh  BAUJUN  BAUVAG  BAXAUS  BEAELE  BEAMAC
BEAPUR  BEASPA  BEASQU  BELTRI  BEYCIN  BILAFFRIBILCAN  BILPAR  BILVAR  BLACAN
BLEAFFDRBLEDRU  BOLCAL  BORCRE  BORDEF  BORDEN  BORPUR  BORRAM  BORSCI  BORSPA
BORSPH  BOSERI  BOSERILFBOSORN  BOSPUL  BOSRUF  BRABEL  BRAIBE  BRAPRA  BRAPRE
BRATOU  BRIDRU  BRIMAX  BRIMIN  BRIMUE  BRINUT  BROARE  BRODIA  BROHOR  BULSEM
BURBAI  BURMUL  BURUMB  CAEMIC  CAEMICBLCAEMICSWCAEOCC  CALAFFQUCALANG  CALAPH
CALARE  CALATTATCALAUR  CALBIC  CALBRE  CALBRO  CALCAL  CALCOR  CALCYA  CALDEF
CALDEN  CALDIS  CALFER  CALFLA  CALFLAFLCALFLAveCALFRA  CALGEM  CALGEOR  CALGRA
CALGRAndCALHAM  CALHIR  CALHIRsuCALHUE  CALLAT  CALLATe  CALLES  CALLIN  CALLON
CALLONCACALMAR  CALMEN  CALPAL  CALPALl  CALPRE  CALQUA  CALRAD  CALREP  CALSAN
CALSAP  CALSER  CALSPEC  CALSTA  CALSTR  CALVAR  CALVARVACALVARiaCAREDU  CARHIR
CARMOD  CARPAU  CARPHEP  CARPHI  CARPRE  CARPYC  CARVIR  CASAURHICASFLA  CASGLA
CASMIC  CASOBE  CASPOM  CASPUB  CASRAC  CATRIG  CAUDIO  CENALE  CENARI  CENASI
CENCAE  CENCEPCECENCOR  CENDRU  CENERY  CENGLA  CENHUM  CENINC  CENMAC  CENMEL
CENMUT  CENPIL  CENPOL  CERGLO  CHAAFFSPCHACOR  CHAERY  CHALEP  CHAROY  CHASER
CHAUNC  CHAVER  CHEAMB  CHEAUS  CHEMAC  CHEPUM  CHOCYM  CHODIC  CHOENO  CHOGLY
CHONAN  CHORHO  CHOVAR  CICFIL  CIRVUL  CLELIN  COMCAL  COMCON  COMFLA  COMINT
COMVIR  COMVOL  CONACE  CONACU  CONACUDUCONACUPRCONACXCOCONALB  CONAUR  CONBON
CONCAESPCONCAN  CONCAP  CONCAR  CONFESFECONINC  CONJUN  CONLAX  CONMIN  CONPAU
CONPAUEUCONPED  CONPEN  CONPRE  CONSER  CONSET  CONSETo  CONSTO  CONSXT  CONTER
CONTRI  CONUND  CORLIT  CORMIC  CORREC  COTBIP  COTCOR  COTCOT  COTTUR  CRACOL
CRADEC  CRAEXS  CRAGLO  CRANAT  CRAPED  CRAPEDu  CRASPNOVCRASPSP  CRATHU  CRYARB
CRYHUM  CRYMUT  CRYPUN  CUSEPI  CYAAVE  CYACLA  CYMMUR  CYNDAC  CYNECH  CYPCON
CYPERA  CYPPOL  CYPTEN  CYRHUE  CYRROB  DAMALA  DAMCOR  DAMLIN  DAMTRI  DANACE
DANCAE  DANOCC  DANPIL  DANSET  DARIRON  DAROED  DARTHY  DASBRO  DASHOO  DASOBL
DAUGLO  DAVANG  DAVCOM  DAVCOR  DAVCOS  DAVDEC  DAVDIV  DAVHOR  DAVINC  DAVINF
DAVNUD  DAVPHY  DAVPOD  DAVPRE  DAVQUA  DAVRHO  DAVTRI  DEYQUA  DIAREV  DIAREVBR
DIAREVDIDICCAP  DICCRI  DICPRE  DICREP  DIL"CI  DILDIL  DIPANG  DIPDAM  DIPHUE
DISARE  DISCAP  DITGRA  DIUAFFAMDIUCAR  DIUEMA  DIULAX  DIULON  DIUMIC  DODAPT
DODHAC  DODVIS  DRAGLY  DROBAR  DROBUL  DROBULosDROERY  DROERYERDROERYSQDROGIG
DROGIGGEDROGLA  DROHET  DROHUE  DROLEU  DROMAC  DROMACMADROMACSCDROMARMADROMEN
DROMENMEDROMENPEDROMYR  DRONEE  DRONEESTDRONIT  DRONITNIDROOCCAUDROOCCOCDROPALPA
DROPALl  DROPLA  DROPUL  DROPYC  DRORAM  DROROS  DROSTO  DROSTOPODROSTOSTDROSUB
DROTUB  DRYAFFNIDRYARM  DRYBIP  DRYNIV  DRYSES  DRYSPIR ECHCRU  EHRCAL  EHRLON
ELAGRA  ELEACU  ELEKEN  ELYBRU  ELYEMA  EPIBIL  EPIBILINEPIGRA  EPIHIR  ERACUR
ERAELO  EREASTASEREFIM  EREGLA  EREPAUPAEREPUR  ERIDIL  ERIDILDIERIDILMUERIHEL
ERIMUL  ERISPI  EROBOT  EROCIC  EROCYG  EROMOS  ERYPINPAERYPINPIERYSUB  EUCARG
EUCCAL  EUCDEC  EUCFOE  EUCGOM  EUCHAE  EUCLAN  EUCLIN  EUCMARMAEUCPAT  EUCPETRE
EUCRUD  EUCTOD  EUCWAN  EUPPEP  EUPTER  EUTVIR  EVAARI  EVAPAU  EXOODO  EXOSPA
FERCRI  FRAPAU  FRATRI  FREAFFLEFUMCAP  GAHTRI  GALAPA  GALDIV  GALMUR  GERMOL
GERRET  GLAANG  GLACAR  GLIAUR  GLODIA  GLODRU  GLYMAX  GNAIND  GNASPH  GNEDRU
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GNETENDRGOMARI GOMCAP GOMCON GOMKNI GOMMAR GOMOVA GOMPOL GOMPRE GOMSCA
GOMTOM GONPAN GONPIT GOOCAE GOOEAT GOOMIC GOOPUL GRAPER GREALT GREBIP
GREBRABRGRECRI GREMAN GREPIL GREPUL GREQUE GRETHEOBGRETHEPRGRETRI GREVES
GREWIL GUILED GYRSUB HAEBRE HAEDIS HAELAX HAELOR HAEPAN HAESIM HAESPA
HAESPI HAKAMP HAKAUR HAKCAN HAKCER HAKCON HAKCOS HAKCYC HAKERI HAKINC
HAKLIS HAKMAR HAKMYR HAKPRO HAKRUS HAKSTE HAKSUL HAKTRI HAKUND HAKVAR
HAKVARIRHAK_UND HALACU HALHAL HALIND HALLEP HALTEN HARCOM HARLAT HEDRHA
HELCOR HELCORy HELPUS HEMBAR HEMINC HEMMIC HEMPUN HEMRAM HENTUR HESFAL
HIBACE HIBAFFHEHIBAMP HIBAUR HIBCOM HIBCRA HIBCUN HIBCUNn HIBGLO HIBHUE
HIBHYP HIBPAC HIBQUA HIBRAC HIBRHA HIBSER HIBSPILEHIBSTE HIBSUB HIBVAG
HODJUN HOLLAN HOLSET HOMFLA HOMHOM HORLEP HOVCHO HOVELL HOVPUN HOVTRIGR
HOVTRITRHYACOT HYADEM HYAPUS HYBCAL HYBFLO HYDALA HYDBLE HYDCAL HYDCAP
HYDDIA HYDDIO HYDHIS HYDMED HYDPILGLHYDPILPIHYDSCU HYDTET HYPANG HYPERI
HYPEXS HYPFAS HYPGLA HYPGLAbrHYPOCC HYPRAM HYPROB ISOASP ISOCER ISOCUN
ISOCUNGLISOCYP ISODRU ISODRUm ISOHYP ISOHYS ISOMAR ISONOD ISOOLD ISOPRO
ISOPUS ISOSCA ISOSCAp ISOSET ISOSPH ISOSTE IXIVIS JACAFFSEJACALA JACANG
JACCON JACD/F JACDEN JACFLO JACFUR JACLEH JACRES JACSER JACSP. JACSTE
JACSTR JOHACA JOHAFFPUJOHLUP JOHPUB JUNART JUNBUF JUNCAE JUNCAP JUNHOL
JUNKRA JUNPAL JUNPOL KENCAR KENCOC KENPRO KENSTI KINAUS KUNAFFMIKUNERI
KUNLIT KUNMIC KUNREC LABPUN LACREF LAGHUE LAGOVA LAMMUL LATTEN LAXGRA
LAXRAM LAXSESAULAXSQU LECBIL LECEXP LECFLO LECLIN LEMDIS LEOSAX LEPAFFCR
LEPANG LEPANGCOLEPARI LEPCAN LEPCAR LEPCOA LEPCOS LEPCUN LEPDRU LEPELE
LEPEMP LEPERI LEPETRE LEPFIM LEPGLA LEPGLAN LEPGLAu LEPHEL LEPLEH LEPLEP
LEPLON LEPMAC LEPMUI LEPPRE LEPPREs LEPPUB LEPROT LEPROY LEPSCA LEPSCAb
LEPSCAr LEPSCR LEPSPE LEPSPI LEPSPIneLEPSQU LEPTEN LEPTFL LEPYSP LEP_ANG
LEUAFFNULEUAFFOLLEUAFFPOLEUAFFRELEUAUS LEUCAP LEUCON LEUGLA LEUGRA LEUKIN
LEULEP LEUOBQ LEUOLD LEUOXY LEUPAR LEUPEN LEUPOL LEUPRO LEURAC LEUSPR
LEUSQU LEUVER LEU_CAP LEU_GRA LEU_POLSLEVPAU LEVPUS LEVSTI LINLIN LINTRI
LOBALA LOBGIB LOBHET LOBRHO LOBTEN LOGCAM LOGSER LOGSERANLOGVAG LOLMUL
LOLPER LOLRIG LOMBRI LOMCAE LOMHER LOMINT LOMMAR LOMMIC LOMNIG LOMNUT
LOMODO LOMPAU LOMPRE LOMPUR LOMSER LOMSON LOMSPA LOMSUA LOTANG LOTSUA
LOXCIN LOXFAS LOXFLE LOXMAG LOXPUB LUPCOS LUZMER LYGBAR LYPNIG LYPSER
LYSCIL LYSELE LYTHYS MACAFFAUMACAPE MACAUS MACRIE MEDPOL MEEDEN MELACE
MELAFFACMELAFFTRMELASPB MELBRA MELCAR MELCUT MELHAM MELHUE MELINC MELIND
MELLAN MELLAT MELLATACMELLEP MELPRE MELRHA MELSCA MELSER MELTER MELTHY
MELTRI MELUNC MELVIM MENPIP MESGRA MESPSE MESSTY MESTET MES_GR MICAFFME
MICATR MICMED MICMEDDEMICMEDMEMICORB MICSTI MICUNI MILMYO MILTEN MINHYB
MIRDIL MIRSPI MITPAR MONBRA MONDEB MONGRA MONOCC MUEADP MUEPOL MYOAUS
MYOCAP MYOINS MYRASP MYRDRU MYRECH MYRHEL MYRISO NEMAFFCANEMCAP NEMCOR
NEMDIL NEMRET NEMSPA NEUALO NEUAMP NUYFLO OLABEN OLEAXI OLEELA OLEPAU
OLERUD OPEAPI OPEHIS OPESPE OPEVAG OPEVAGIROPHLUS ORNCOM ORNPIN OROMIN
ORTLAX OSTCLA OXACOR OXAGLA OXAPER OXAPES OXAPUR OXYLIN PARDEB PARINC
PARLAT PARLOP PARVIS PASDIL PATBAB PATJUN PATLIM PATOCC PATOCCSWPATPYG
PATUMBXAPELCAP PELLIT PENAIR PENCLA PENPEL PENTHU PERANG PERCOM PERELL
PERELLipPERFLO PERGRA PERLON PERSAC PETBRE PETLAT PETLIN PETMAC PETMEDJU
PETSEM PETSER PETSHU PETSQU PETSTR PETVEL PHAMIN PHIDRU PHIPYG PHLCIL
PHLFIL PHLPRA PHYCAL PHYDRU PICSQU PILNOV PIMARG PIMCAL PIMFER PIMIMBIM
PIMIMBMAPIMIMBPIPIMLEU PIMPRE PIMROS PIMSUA PIMSUL PINRAD PITACH PITBAR
PITCOR PITPHY PITPUL PLACOM PLAGAL PLAHAP PLALAN PLAMAJ PLATEN POAANN
POADRU POAPOI POAPOR PODANG PODCHR PODDRO PODGNA PODGRA PODGRASWPODLES
POGSTR POLMON POLMUL POLTEN POLYTEN PORERI PORHUE PORMIC PRABRO PRADRU
PRAELA PRAFIM PRAMAC PRAPAR PRAPLU PRASPLU PRA_HO PROFRA PSELUT PSEVIR
PTEAFFNAPTEAFFSAPTEAFFVIPTEASP PTEBAR PTEBRE PTECON PTEESC PTENANLIPTEPAGA
PTEPYR PTEREC PTESAN PTESCAROPTESERROPTEVIT PTIDEC PTIDRU PTIHUMHUPTIMAN
PTIPOL PTISTI PULERI PULOCH PULRET QUIURV RANCOL RANPUM RANSESSEREGCIL
REGINO RESELE RESGRA RESLEP RESMIC RESSER RESSIN RESSTE RESTRE RHAALA
RHABAC RHABACDIRHOPYR ROMFLA ROMOBS ROMROS ROMROSAUROMROSRORUMACE RUMBRO
RUMCRI RUMPUL RUTMUL SAGAPE SAGMAR SAMJUN SAMREP SANACU SARQUI SCAANC
SCACAL SCACAN SCACRA SCAGLA SCALAN SCANIT SCAPHL SCAREPANSCAREPRESCASTR
SCATHE SCHAFFLASCHAFFOBSCHAFFTESCHASP SCHBEN SCHBIF SCHBRE SCHCAE SCHCAP
SCHCIL SCHCLA SCHCRU SCHCUR SCHDIS SCHELE SCHGRA SCHGREENSCHHUM SCHINV
SCHJUN SCHLAN SCHLAT SCHNAN SCHNAT SCHNIT SCHODO SCHOSP2 SCHPED SCHPEN
SCHRIG SCHROD SCHSCU SCHSPBB SCHSPNT SCHSUBROSCHSUBbaSCHSUBbuSCHSUBfaSCHSUBfl
SCHTEN SCHUNI SCH_BR SCH_BRcuSELGRA SENHIS SENLAUBISENLAUMASENQUA SHEARV
SILFIL SILGAL SILHUM SILNOC SISEXI SOLAME SOLHET SOLNIG SOLSYM SONASP
SONHYD SONOLE SOWLAX SPABUL SPEARV SPERUB SPHAFFMASPHCAP SPHGRA SPHGRAci
SPHLIN SPHMED SPHVIM SPOVIR SPYGLO SPYTRI STAAXI STAMON STAVER STEGRA
STEMED STEROB STESEC STICAM STICOM STIELE STIFLA STILAT STIMAC STIPYC
STISEM STISEMGPSTRSTE STYADN STYADP STYAFF STYAFFBUSTYAMO STYBRE STYBRU
STYBRUMISTYBUL STYCAL STYCAN STYCAR STYCRA STYCRO STYDIC STYDIU STYDIV
STYECO STYEMA STYGLA STYGUT STYIMB STYINU STYJUN STYLEP STYLON STYMAC
STYMAR STYMIM STYOBT STYPER STYPERp STYPET STYPIL STYPUL STYREP STYRIG
STYROS STYROSa STYSCA STYSCH STYSPA STYSTR STYTEN STYUTR SUAAUS SYNACU
SYNBUS SYNFLO SYNGRA SYNOATS SYNPET SYNPETTRSYNPOL SYNSPI SYNSTE SYNWICH

SYN_PET TEMBIL TEMRET TERCYA TETCAP TETDEC TETHIR TETHIRSCTETLAE TETOCT
TETTET THEAFFHOTHEAFFMATHEAFFPATHEANT THEBEN THECAM THECAN THECRI THEFLE
THEFUS THEMAC THEMUC THENUD THEPAU THOCOG THOGRA THOPUR THOTRI THRDIF
THYARB THYARE THYDIC THYGLA THYMAN THYMUL THYPAT THYPAU THYPSE THYSPA
THYSPMP THYTEN THYTHY THYTRI THY_PAU THY_SPA TRACOE TRADIV TRAPIL TRIAFFVI
TRIANG TRIARV TRIAUS TRIBIB TRIBRA TRIBRU TRICAL TRICAM TRICEN TRICER
TRIDUB TRIELA TRIGLO TRIGSPA TRIHUM TRILON TRIMIN TRIMUC TRIMUE TRINEEEL
TRINEENETRIPRO TRISP TRISPA TRISTO TRISTR TRISUB TRISUBteTRITEN TRITRI
TRIUNI TRIVIO TRYALB TRYFLO TRYLED UROPIC URSANT UTRDIC UTRINA UTRMEN
UTRVIO VELDEA VELTRI VERACE VERAFFCAVERARV VERDEN VERDRU VERHAB VERHUE
VERHUEHUVERLINLIVERNIT VEROVA VERPEN VERPLU VERPLUPLVERREI VICSAT VICSATSA
VILALB VILCAP VILLAT VILPAR VILSUB VILVIO VIMJUN VULBRO VULMYU WAHCAP
WAHPRE WAIAUR WAICIT WAIPAN WAISUA WATBUL WATMAR WATMER WESDAM WILBAC
WURDIO WURDIO_AWURMON WURPYG XANACA XANBRU XANCAN XANCIL XANDRU XANGRA
XANHUE XANPRE XANPUS XYLOCC ZANAET ZYGFRU
ACTON-1 AMBR-1 AMBR-2 AMBR-3 AMBR-4 AMBR-5 AMBR-6 AMBR-7 AMBR-9 AMBRAL-1
APBF-1 APBF-2 AUSTB-1 AUSTB-2 AUSTB-3 AUSTB-4 AUSTB-5 AUSTB-6 AUSTB-7 AUSTB-8
AUSTRA-1BAMBUN-1BAMBUN-2BAMBUN-3BANK-1 BANK-1A BANK-2 BANK-3 BOLD-1 BOLD-2
BOLD-3 BOLD-4 BRIX-1 BRIX-2 BRIX-3 BRIX-4 BRIX-5 BULL-1 BULL-10 BULL-11
BULL-12 BULL-3 BULL-4 BULL-5 BULL-6 BULL-7 BULL-8 BULL-9 BULLER-1BULLER-2
BULLER-3BURN-1 BURN-2 BURNRD01BURNRD02BYRD-1 C58-1 C58-2 C58-3 C58-4
C71-1 C71-2 C71-3 C71-4 CAPEL-1 CAPEL-2 CAPEL-3 CAPEL-4 CAPEL-5 CAPEL-6
CAPEL-7 CAPEL-8 CAPEL-9 CARAB-1 CARAB-2 CARAB-3 CARB-1 CARB-2 CARB-3 CARB-4
CHIDPT-1CLIF-1 CLIF-2 CLIF-3 CORON-1 CORON-2 CRAMPT-1CRAMPT-2DEJONG-aDEJONG-c
DEPOT-1 DRAIN-1 DUCK-1 DUCK-2 DUCK-3 DUNS-1 ELDO-1 ELLEN-1 ELLEN-2 ELLEN-3
ELLEN-4 ELLEN-5 ELLEN-6 ELLEN-7 ELLIS-1 ELLIS-2 ELLIS-3 FISH-1 FISH-2 FISH-3
FISH-4 FISH-5 FL-1 FL-10 FL-2 FL-3 FL-4 FL-5 FL-6 FL-7
FL-9 GARDEN-1GARDEN-2GARDEN-3GARDEN-4GINGIN-1GINGIN-2GINGIN-3GOLF-1 GUTHR-1
GUTHR-2 GUTHR-3 GUTHR-4 GUTHR-5 GUTHR-6 HARRY-1 HARRY-2 HARRY-3 HARRY-4 HARRY-5
HARRY-6 KEME-1 KEME-2 KEME-3 KERO-1 KERO-2 KING-1 KING-2 KOOLJ-1 KOOLJ-2
KOOLJ-3 KOOLJ-4 KOOLJ-5 KOOLJ-6 KOOLJ-7 KOON-1 KOON-2 LAND-1 LESCH-1 LESCH-2
LESCH-3 LESCH-4 LESCH-5 LESCH-6 LYONS-1 LYONS-2 M53 MANEA-1 MANEA-2 MANEA-3
MEAL-1 MEAL-2 MEELON-1MEELON-2MELA-1 MELA-10 MELA-2 MELA-3 MELA-5 MELA-6
MELA-7 MELA-8 MELA-9 MHENRY-1MHENRY-2MILT-1 MILT-2 MILT-3 MILT-4 MILT-5
MILT-6 MILT-7 MILT-8 MINN-1 MINN-2 MINN-3 MODO-1 MODO-2 MODO-3 MODO-4
MODO-5 MODO-6 MPK01 MPK02 MPK03 MTB-1 MTB-2 MTB-3 MTB-4 MTB-5
MUCK-1 MUCK-2 MUD-2 MUD-3 MUD-4 MUD-5 MUD-6 MUD-7 MUD-9 MYALUP-2
McLART-1NAVB-1 NAVB-2 NAVB-3 NAVB-4 NEER-1 NEER-10 NEER-11 NEER-2 NEER-20
NEER-21 NEER-22 NEER-23 NEER-3 NEER-4 NEER-5 NEER-6 NEER-7 NEER-8 NEER-9
NINE-1 NINE-2 NPRES-1 NWIL-1 NWIL-2 NWIL-3 OATES-1 PAGA-1 PAGA-2 PAGA-3
PAGA-4 PAGA-5 PAGA-6 PAGA-7 PAGA-8 PAYNE-1 PB-1 PB-2 PB-3 PB-4
PB-5 PB-6 PEARCE-1PEARCE-2PEPB-1 PEPGRV-1PEPGRV-2PLINE-1 PLINE-2 PLINE-3
PLINE-4 PLINE-5 PLINE-6 PLINE-7 PRES-1 PTWALT-1Possum1 Possum2 Possum3 Possum4
Possum5 RAAF-1 RAAF-2 RAAF-3 REDL-1 RIVD-1 RIVD-2 RUAB-1 RUAB-2 RUAB-3
RUAB-4 SANDON-1SEAB-1 SEAB-2 SEAB-3 SEAB-4 SEAB-5 SEAB-6 SEAB-7 SEAB-8
SHE-1 SHE-2 SHE-3 SHE-4 SHE-5 SHE-6 SHENT-1 SINT-1 SMITH-1 SVH-1
SVH-2 TAM-1 THOM-2 TRIG-1 TRIG-2 TRIG-3 TRIG-4 TRIG-5 TRIG-6 TWIN-1
TWIN-10 TWIN-11 TWIN-2 TWIN-3 TWIN-4 TWIN-5 TWIN-7 TWIN-8 WABL-1 WABL-2
WABL-3 WABL-4 WAND-1 WARB-1 WARB-2 WARB-3 WARB-4 WARI-1 WARI-2 WATER-1
WATER-2 WATER-3 WATER-4 WATERRD1WELL-1 WELL-2 WHILL-1 WHILL-2 WHILL-3 WHILL-4
WHILL-5 WHITE-1 WHITE-2 WILL-1 WIRR-1 WIRR-2 WONN-3 WONN-4 WONN-5 WONN-6
WOODP-1 WOODP-2 WOODV-1 WOODV-2 YALG-1 YALG-2 YALG-3 YALG-4 YALG-5 YALG-6
YALG-7 YALG-8 YALLIN-1YAN-1 YAN-10 YAN-11 YAN-12 YAN-13 YAN-14 YAN-15
YAN-16 YAN-17 YAN-18 YAN-19 YAN-2 YAN-20 YAN-21 YAN-22 YAN-23 YAN-24
YAN-25 YAN-3 YAN-4 YAN-5 YAN-6 YAN-8 YAN-9 YOON-1 YOON-2 YOON-3
YULE-1 YULE-2 YULE-3 YULE-4 YULE-5 boyan 01boyan 02brick1 brick2 brick3
brick4 brick5 brick6 brick7 brick8 buffer01card1 card10 card11 card12
card13 card2 card3 card4 card5 card6 card7 card8 card9 cool 01
cool 02 cool 03 cool 04 cool 08 cool 09 cool 11 dard01 dard02 dard03 gibson01
gibson02hurst01 hurst02 hurst03 hurst04 hymus01 hymus02 hymus03 hymus04 hymus05
hymus06 iron01 iron02 kelly01 kelly02 kemp01 lamb1 lamb2 low01 low04
low06a low06b low07 low08 low09a low09b low10a low10b low12a low12b
low13a low13b low14a rowe01 rowe02 smith02 smith03 smith04 talb1 talb10
talb11 talb12 talb13 talb2 talb3 talb4 talb5 talb6 talb7 talb8
talb9 waro 01 waro 02 waro 03 waro 04 waro 05 waro 06 welr 01 welr 02 wicher01
will02 will03 will04 wonn01 wonn02 yarl01 yarl02 yarl03 yarl04

Appendix 4.

Plot location, altitude and community type.

SITE	LATITUDE	LONGITUDE	ALTITUDE (m)	COMM. TYPE
ACTON-1	-33.7515	115.2231	40	1a
AMBR-1	-33.7386	115.3208	35	1b
AMBR-2	-33.7381	115.3236	35	2
AMBR-3	-33.7372	115.3306	35	4
AMBR-4	-33.7347	115.3258	35	1b
AMBR-5	-33.7361	115.3350	35	2
AMBR-6	-33.7408	115.3231	75	1b
AMBR-7	-33.7408	115.3225	35	2
AMBR-9	-33.7376	115.3214	35	1b
AMBRAL-1	-33.7392	115.3231	35	1b
APBF-1	-31.9794	116.0003	40	20a
APBF-2	-31.9806	115.9658	40	20a
AUSTB-1	-32.6156	115.7774	5	7
AUSTB-2	-32.6148	115.7779	5	7
AUSTB-3	-32.6158	115.7792	5	11
AUSTB-4	-32.6111	115.7758	5	5
AUSTB-5	-32.6035	115.7806	5	5
AUSTB-6	-32.6018	115.7778	5	5
AUSTB-7	-32.6019	115.7798	5	7
AUSTB-8	-32.6438	115.7811	5	7
AUSTRA-1	-33.2768	115.7345	20	21a
BAMBUN-1	-31.4280	115.8938	20	7
BAMBUN-2	-31.4274	115.8951	20	15
BAMBUN-3	-31.4276	115.8962	20	7
BANK-1	-32.2542	115.8859	20	22
BANK-1A	-32.2563	115.8887	20	13
BANK-2	-32.2554	115.8893	20	23a
BANK-3	-32.2545	115.8860	20	23a
BOLD-1	-31.9526	115.7620	20	24
BOLD-2	-31.9533	115.7643	20	24
BOLD-3	-31.9540	115.7623	20	24
BOLD-4	-31.9458	115.7728	50	24
BOYAN01	-33.4769	115.7607	90	21b
BOYAN02	-33.4593	115.7835	100	1a
BRICK1	-32.2347	115.9983	40	3a
BRICK2	-32.2293	116.0014	40	20b
BRICK3	-32.2320	116.0018	40	3a
BRICK4	-32.2309	116.0019	40	9
BRICK5	-32.2319	115.9992	40	3a
BRICK6	-32.2310	116.0004	40	3a
BRICK7	-32.2271	115.9971	40	3a
BRICK8	-32.2286	115.9954	40	3a
BRIX-1	-32.0306	115.9712	15	8
BRIX-2	-32.0319	115.9700	15	3a
BRIX-3	-32.0318	115.9704	15	8
BRIX-4	-32.0320	115.9695	15	8
BRIX-5	-32.0333	115.9700	15	3a
BUFFER01	-33.5381	115.7335	110	21b
BULL-1	-31.6294	116.0240	75	28
BULL-10	-31.6262	116.0225	75	28
BULL-11	-31.6243	116.0238	75	28
BULL-12	-31.6235	116.0200	60	11
BULL-3	-31.6330	116.0202	75	23a
BULL-4	-31.6320	116.0196	75	28
BULL-5	-31.6283	116.0144	75	5
BULL-6	-31.6258	116.0153	75	7
BULL-7	-31.6244	116.0156	75	5
BULL-8	-31.6250	116.0153	75	7
BULL-9	-31.6282	116.0203	75	28
BULLER-1	-32.8700	115.8283	20	21a
BULLER-2	-32.8735	115.8277	20	21a
BULLER-3	-32.8785	115.8272	20	21c
BURN-1	-31.7367	115.7297	5	29a
BURN-2	-31.7367	115.7306	5	29a
BURNRD01	-32.7223	115.9416	50	20b
BURNRD02	-32.7280	115.9417	50	3b
BYRD-1	-33.1085	115.8085	20	9
C58-1	-32.8616	115.7730	10	4
C58-2	-32.8634	115.7626	10	13
C58-3	-32.8627	115.7636	10	8
C58-4	-32.8611	115.7690	10	10a
C71-1	-33.4107	115.6253	20	11
C71-2	-33.4061	115.6251	20	21a
C71-3	-33.4381	115.6094	20	21a
C71-4	-33.4389	115.6067	20	25
CAPEL-1	-33.5788	115.5454	20	21b
CAPEL-2	-33.5791	115.5450	20	21b

SITE	LATITUDE	LONGITUDE	ALTITUDE (m)	COMM. TYPE
CAPEL-3	-33.5655	115.5490	20	4
CAPEL-4	-33.5770	115.5458	20	13
CAPEL-5	-33.5773	115.5453	20	1b
CAPEL-6	-33.5713	115.5453	20	12
CAPEL-7	-33.5728	115.5465	20	21a
CAPEL-8	-33.5723	115.5418	20	12
CAPEL-9	-33.5724	115.5420	20	12
CARAB-1	-32.6374	115.7190	5	15
CARAB-2	-32.6388	115.7206	5	7
CARAB-3	-32.6394	115.7194	5	11
CARB-1	-33.7059	115.1870	20	1b
CARB-2	-33.6998	115.1830	20	1b
CARB-3	-33.7049	115.1838	20	21b
CARB-4	-33.7063	115.1874	20	1b
CARD1	-32.2441	115.9881	40	20b
CARD10	-32.2496	115.9838	40	6
CARD11	-32.2480	115.9841	40	6
CARD12	-32.2434	115.9842	40	3b
CARD13	-32.2427	115.9842	40	3b
CARD2	-32.2450	115.9869	40	20b
CARD3	-32.2468	115.9863	20	21a
CARD4	-32.2469	115.9864	40	6
CARD5	-32.2497	115.9864	40	20b
CARD6	-32.2495	115.9863	40	20b
CARD7	-32.2496	115.9852	40	21a
CARD8	-32.2508	115.9841	40	20b
CARD9	-32.2505	115.9841	40	20b
CHIDPT-1	-32.0172	115.7781	10	24
CLIF-1	-32.8190	115.6959	40	21a
CLIF-2	-32.8171	115.6874	35	26a
CLIF-3	-32.8165	115.6877	35	26a
COOL01	-32.2833	115.7878	15	17
COOL02	-32.2833	115.7858	15	24
COOL03	-32.2828	115.7853	15	24
COOL04	-32.3201	115.7664	5	17
COOL08	-32.3292	115.7671	10	24
COOL09	-32.3294	115.7677	10	19
COOL11	-32.3287	115.7682	10	17
CORON-1	-32.8701	115.7202	35	21a
CORON-2	-32.8706	115.7265	40	25
CRAMPT-1	-33.0252	115.7436	30	21a
CRAMPT-2	-33.0234	115.7423	30	21a
DARD01	-33.4361	115.7974	120	1a
DARD02	-33.4079	115.7957	70	21b
DARD03	-33.4317	115.7980	130	1a
DEJONG-A	-32.1656	115.8906	30	22
DEJONG-C	-32.1667	115.8922	30	21c
DEPOT-1	-31.7295	115.7902	20	28
DRAIN-1	-32.8198	115.7500	10	21a
DUCK-1	-32.2917	115.8850	40	3c
DUCK-2	-32.2915	115.8841	40	3c
DUCK-3	-32.2915	115.8854	40	9
DUNS-1	-33.6051	115.1003	15	3b
ELDO-1	-31.3585	115.7573	50	23b
ELLEN-1	-31.7522	116.0331	20	8
ELLEN-2	-31.7550	116.0350	20	8
ELLEN-3	-31.7564	116.0331	20	8
ELLEN-4	-31.7567	116.0306	20	8
ELLEN-5	-31.7564	116.0311	20	8
ELLEN-6	-31.7556	116.0350	20	3c
ELLEN-7	-31.7531	116.0371	20	6
ELLIS-1	-32.9305	115.7158	5	17
ELLIS-2	-32.9311	115.7129	5	18
ELLIS-3	-32.9306	115.7153	5	18
FISH-1	-33.7314	115.3884	20	7
FISH-2	-33.7313	115.3890	20	7
FISH-3	-33.7311	115.3882	20	10a
FISH-4	-33.7350	115.3883	20	10a
FISH-5	-33.7360	115.3868	20	2
FL-1	-32.1591	115.9516	20	4
FL-10	-32.1703	115.9347	20	12
FL-2	-32.1585	115.9511	20	10a
FL-3	-32.1642	115.9496	20	8
FL-4	-32.1663	115.9508	20	21a
FL-5	-32.1563	115.9432	20	21c
FL-6	-32.1574	115.9438	20	21c
FL-7	-32.1572	115.9499	20	8

SITE	LATITUDE	LONGITUDE	ALTITUDE (m)	COMM. TYPE
FL-9	-32.1741	115.9341	20	4
GARDEN-1	-32.1686	115.6714	5	30a
GARDEN-2	-32.1743	115.6600	5	29a
GARDEN-3	-32.1724	115.6698	10	30a
GARDEN-4	-32.2051	115.6812	1	30a
GIBSON01	-33.6291	115.6461	70	21b
GIBSON02	-33.6370	115.6512	90	1a
GINGIN-1	-31.4050	115.9114	20	7
GINGIN-2	-31.4052	115.9108	20	7
GINGIN-3	-31.4056	115.9101	20	7
GOLF-1	-31.8292	115.8347	60	20a
GUTHR-1	-33.0807	115.7769	20	4
GUTHR-2	-33.0822	115.7748	20	5
GUTHR-3	-33.0846	115.7732	20	21a
GUTHR-4	-33.0804	115.7795	20	5
GUTHR-5	-33.1094	115.7417	15	21a
GUTHR-6	-33.0929	115.7825	20	21a
HARRY-1	-32.1726	115.8305	20	28
HARRY-2	-32.1722	115.8302	20	28
HARRY-3	-32.1741	115.8292	20	5
HARRY-4	-32.1727	115.8403	20	23a
HARRY-5	-32.1702	115.8372	20	21a
HARRY-6	-32.1708	115.8282	20	11
HURST01	-32.0814	115.8875	30	23a
HURST02	-32.0819	115.8889	30	23a
HURST03	-32.0811	115.8822	30	23a
HURST04	-32.0781	115.8833	30	23a
HYMUS01	-32.3492	115.8568	30	11
HYMUS02	-32.3483	115.8564	50	11
HYMUS03	-32.3501	115.8578	50	21c
HYMUS04	-32.3496	115.8593	50	21c
HYMUS05	-32.3510	115.8631	50	11
HYMUS06	-32.3516	115.8629	50	11
IRON01	-33.8148	115.2203	90	10b
IRON02	-33.8137	115.2212	90	10b
KELLY01	-33.5768	115.6887	70	1a
KELLY02	-33.5768	115.6903	70	21b
KEME-1	-33.2157	115.7369	30	25
KEME-2	-33.2160	115.7398	25	21a
KEME-3	-33.2252	115.7404	15	21c
KEMP01	-33.7666	115.4323	80	1a
KERO-1	-32.2955	115.7999	20	24
KERO-2	-32.2945	115.7983	20	24
KING-1	-31.9691	115.8357	20	28
KING-2	-31.9607	115.8286	20	28
KOOLJ-1	-32.7301	115.7133	5	4
KOOLJ-2	-32.7293	115.7140	5	21a
KOOLJ-3	-32.7268	115.7234	5	21a
KOOLJ-4	-32.7316	115.7234	5	21a
KOOLJ-5	-32.7565	115.7365	5	3b
KOOLJ-6	-32.7563	115.7350	5	10a
KOOLJ-7	-32.7554	115.7356	5	10a
KOON-1	-31.8389	115.8675	70	20a
KOON-2	-31.8361	115.8681	60	20a
LAMB1	-32.1814	116.0060	30	3a
LAMB2	-32.1815	116.0053	30	3a
LAND-1	-31.8208	115.8503	60	20a
LESCH-1	-33.2423	115.6887	5	30b
LESCH-2	-33.2212	115.6897	5	30b
LESCH-3	-33.2010	115.6839	5	30b
LESCH-4	-33.2013	115.6857	5	30b
LESCH-5	-33.2003	115.6897	5	30b
LESCH-6	-33.2003	115.6911	5	17
LOW01	-32.3326	115.9032	15	21c
LOW04	-32.3296	115.9033	15	21a
LOW06A	-32.3215	115.9079	15	21c
LOW06B	-32.3214	115.9098	15	21c
LOW07	-32.3222	115.9144	15	21c
LOW08	-32.3220	115.9154	15	5
LOW09A	-32.3263	115.9225	15	5
LOW09B	-32.3269	115.9222	15	5
LOW10A	-32.3371	115.9106	15	21a
LOW10B	-32.3379	115.9088	15	11
LOW12A	-32.3394	115.9037	15	21a
LOW12B	-32.3393	115.9056	15	21a
LOW13A	-32.3489	115.9009	15	21a
LOW13B	-32.3500	115.8996	15	23a

SITE	LATITUDE	LONGITUDE	ALTITUDE (m)	COMM. TYPE
LOW14A	-32.3501	115.8927	15	4
LYONS-1	-32.9954	115.7663	20	4
LYONS-2	-32.9813	115.7523	50	25
M53	-31.9775	115.9881	99	20a
MANEA-1	-33.3690	115.6591	30	9
MANEA-2	-33.3681	115.6621	30	21a
MANEA-3	-33.3701	115.6576	30	21b
MCLART-1	-32.6938	115.7054	5	13
MEAL-1	-32.6772	115.6871	5	25
MEAL-2	-32.6807	115.6875	20	26b
MEELON-1	-32.6905	115.9349	40	8
MEELON-2	-32.6904	115.9347	40	8
MELA-1	-31.6733	115.8939	60	4
MELA-10	-31.6721	115.9245	60	22
MELA-2	-31.6717	115.8939	70	23b
MELA-3	-31.6717	115.8971	80	23b
MELA-5	-31.6678	115.8941	70	22
MELA-6	-31.6658	115.8935	75	23b
MELA-7	-31.6900	115.9044	60	23b
MELA-8	-31.6956	115.9056	60	23b
MELA-9	-31.6722	115.9276	60	23b
MHENRY-1	-32.0336	115.8589	5	30c
MHENRY-2	-32.0339	115.8583	5	30c
MILT-1	-31.4010	115.6949	45	5
MILT-2	-31.3959	115.7992	55	13
MILT-3	-31.3958	115.7962	40	23b
MILT-4	-31.4095	115.6914	60	28
MILT-5	-31.3978	115.7914	60	14
MILT-6	-31.3935	115.7816	60	21a
MILT-7	-31.4009	115.7695	60	23b
MILT-8	-31.4001	115.7261	60	23b
MINN-1	-33.4738	115.5612	20	25
MINN-2	-33.4733	115.5617	20	25
MINN-3	-33.4789	115.5623	20	25
MODO-1	-32.2377	115.8951	20	4
MODO-2	-32.2280	115.8966	20	21c
MODO-3	-32.2283	115.8990	20	11
MODO-4	-32.2304	115.9022	20	23a
MODO-5	-32.2246	115.9018	20	23a
MODO-6	-32.2261	115.8984	20	4
MPK01	-31.6636	115.9200	70	23b
MPK02	-31.6767	115.9070	70	22
MPK03	-31.6799	115.8970	70	23b
MTB-1	-32.1828	115.7869	30	24
MTB-2	-32.1713	115.7790	20	24
MTB-3	-32.1712	115.7777	20	24
MTB-4	-32.1601	115.7811	20	24
MTB-5	-32.1586	115.7824	20	17
MUCK-1	-31.3470	115.7815	50	23b
MUCK-2	-31.3452	115.7798	50	7
MUD-2	-32.2970	115.9503	40	8
MUD-3	-32.2968	115.9488	40	8
MUD-4	-32.2984	115.9636	40	3a
MUD-5	-32.2981	115.9608	40	3a
MUD-6	-32.2961	115.9464	40	8
MUD-7	-32.2969	115.9451	40	8
MUD-9	-32.2979	115.9600	40	8
MYALUP-2	-33.0652	115.7659	30	25
NAVB-1	-32.1645	115.7679	5	16
NAVB-2	-32.1645	115.7681	5	29a
NAVB-3	-32.1715	115.7709	5	24
NAVB-4	-32.1720	115.7711	5	24
NEER-1	-31.6925	115.7548	30	24
NEER-10	-31.6541	115.7331	70	24
NEER-11	-31.6418	115.7290	40	24
NEER-2	-31.6922	115.7429	30	28
NEER-20	-31.7110	115.7506	50	28
NEER-21	-31.7118	115.7559	70	28
NEER-22	-31.7108	115.7598	70	28
NEER-23	-31.7108	115.7591	70	28
NEER-3	-31.6836	115.7380	30	28
NEER-4	-31.6825	115.7432	30	28
NEER-5	-31.6823	115.7446	30	28
NEER-6	-31.7000	115.7448	30	28
NEER-7	-31.6417	115.7188	30	24
NEER-8	-31.6413	115.7189	30	28
NEER-9	-31.6541	115.7328	70	24

SITE	LATITUDE	LONGITUDE	ALTITUDE (m)	COMM. TYPE
NINE-1	-32.7365	115.7775	20	21a
NINE-2	-32.7386	115.7780	10	21a
NPRES-1	-32.8364	115.6427	40	29b
NWIL-1	-31.3840	115.5606	40	29b
NWIL-2	-31.3858	115.5591	45	26b
NWIL-3	-31.3909	115.5605	50	29b
OATES-1	-33.6869	115.5576	80	21b
PAGA-1	-32.4465	115.8016	10	5
PAGA-2	-32.4547	115.8020	10	13
PAGA-3	-32.4565	115.7998	10	5
PAGA-4	-32.4564	115.7888	30	21a
PAGA-5	-32.4396	115.7833	10	17
PAGA-6	-32.4395	115.7839	10	25
PAGA-7	-32.4394	115.7854	20	21a
PAGA-8	-32.4528	115.7825	10	25
PAYNE-1	-33.7542	115.1944	30	4
PB-1	-32.3860	115.7350	5	19
PB-2	-32.3858	115.7352	5	29b
PB-3	-32.3836	115.7354	5	29b
PB-4	-32.3901	115.7405	5	29b
PB-5	-32.3868	115.7315	5	29b
PB-6	-32.3794	115.7415	5	19
PEARCE-1	-31.6660	116.0303	20	6
PEARCE-2	-31.6667	116.0294	20	3c
PEPB-1	-33.5402	115.5125	15	30b
PEPGRV-1	-31.9944	115.7714	6	30a
PEPGRV-2	-31.9936	115.7714	6	30a
PLINE-1	-31.5568	115.9256	50	23b
PLINE-2	-31.5556	115.9135	70	23b
PLINE-3	-31.5625	115.8625	50	21a
PLINE-4	-31.5600	115.8625	50	4
PLINE-5	-31.5605	115.8437	50	5
PLINE-6	-31.5601	115.8425	50	22
PLINE-7	-31.5565	115.8403	50	21c
POSSUM1	-33.6665	115.2368	5	16
POSSUM2	-33.6651	115.2355	5	16
POSSUM3	-33.6604	115.2380	10	30b
POSSUM4	-33.6616	115.2377	5	30b
POSSUM5	-33.6701	115.2313	5	17
PRES-1	-32.8775	115.6641	20	29a
PTWALT-1	-32.0186	115.7856	10	24
RAAF-1	-31.4782	115.8584	50	23b
RAAF-2	-31.4787	115.8220	70	23b
RAAF-3	-31.4792	115.7906	55	23b
REDL-1	-33.0478	115.8156	20	21a
RIVD-1	-32.9895	115.7805	20	12
RIVD-2	-32.9918	115.7874	25	21a
ROWE01	-32.3504	115.8908	30	11
ROWE02	-32.3505	115.8931	30	4
RUAB-1	-33.6456	115.5061	30	21b
RUAB-2	-33.6456	115.5047	20	21b
RUAB-3	-33.6423	115.5066	20	13
RUAB-4	-33.6471	115.5083	20	7
SANDON-1	-32.0308	115.8706	10	16
SEAB-1	-31.2858	115.4473	10	30c
SEAB-2	-31.2879	115.4468	10	29b
SEAB-3	-31.2888	115.4498	10	29b
SEAB-4	-31.2979	115.4566	10	29a
SEAB-5	-31.2998	115.4574	10	29a
SEAB-6	-31.3018	115.4716	10	28
SEAB-7	-31.3316	115.4936	10	29b
SEAB-8	-31.2874	115.4465	10	29a
SHE-1	-31.4303	115.6373	60	26b
SHE-2	-31.4291	115.6493	50	28
SHE-3	-31.4277	115.6496	50	26b
SHE-4	-31.4037	115.6145	50	26a
SHE-5	-31.4040	115.6143	50	26a
SHE-6	-31.4103	115.6020	40	26b
SHENT-1	-31.9606	115.7978	20	28
SINT-1	-31.5876	115.7939	50	23b
SMITH-1	-33.7976	115.2921	70	10b
SMITH02	-33.7974	115.2895	70	1a
SMITH03	-33.8017	115.2961	70	1a
SMITH04	-33.8070	115.2396	60	10b
SVH-1	-31.6604	115.7744	113	26a
SVH-2	-31.6615	115.7740	90	27
TALB1	-31.8733	116.0469	50	3c

SITE	LATITUDE	LONGITUDE	ALTITUDE (m)	COMM. TYPE
TALB10	-31.8736	116.0433	50	20c
TALB11	-31.8725	116.0444	50	20c
TALB12	-31.8822	116.0464	50	3c
TALB13	-31.8819	116.0464	50	3c
TALB2	-31.8728	116.0492	50	20c
TALB3	-31.8725	116.0481	50	20c
TALB4	-31.8714	116.0469	50	3c
TALB5	-31.8719	116.0469	50	20c
TALB6	-31.8697	116.0469	50	20c
TALB7	-31.8714	116.0447	50	20c
TALB8	-31.8703	116.0439	50	20c
TALB9	-31.8711	116.0425	50	20c
TAM-1	-32.3196	115.8075	30	21a
THOM-2	-32.1440	115.8381	20	24
TRIG-1	-31.8794	115.7593	20	29b
TRIG-2	-31.8830	115.7570	10	29a
TRIG-3	-31.8714	115.7596	10	28
TRIG-4	-31.8743	115.7619	10	28
TRIG-5	-31.8750	115.7605	10	24
TRIG-6	-31.8748	115.7586	10	24
TWIN-1	-31.7197	116.0098	20	6
TWIN-10	-31.7270	116.0111	20	15
TWIN-11	-31.7266	116.0110	20	11
TWIN-2	-31.7200	116.0101	20	6
TWIN-3	-31.7245	116.0140	20	6
TWIN-4	-31.7240	116.0146	20	6
TWIN-5	-31.7251	116.0175	20	15
TWIN-7	-31.7243	116.0138	20	21c
TWIN-8	-31.7253	116.0139	20	21c
WABL-1	-31.4045	115.6770	60	26a
WABL-2	-31.4050	115.6764	40	26b
WABL-3	-31.4042	115.6770	40	26b
WABL-4	-31.4024	115.6741	50	28
WAND-1	-32.2010	115.8754	30	23a
WARB-1	-31.7350	115.9445	70	23a
WARB-2	-31.7342	115.9441	70	22
WARB-3	-31.7570	115.9495	70	23a
WARB-4	-31.7569	115.9469	60	22
WARI-1	-31.8369	115.8128	30	28
WARI-2	-31.8447	115.8139	30	28
WARO01	-32.7904	115.8948	20	3b
WARO02	-32.7897	115.8934	20	3b
WARO03	-32.8122	115.9024	20	8
WARO04	-32.8112	115.9025	20	8
WARO05	-32.8136	115.9045	20	10a
WARO06	-32.8052	115.9006	20	3a
WATER-1	-33.3312	115.7580	20	13
WATER-2	-33.3295	115.7590	20	13
WATER-3	-33.3309	115.7590	20	3c
WATER-4	-33.3308	115.7578	20	8
WATERRD1	-31.4769	115.7615	70	28
WELL-1	-32.2818	115.8214	20	21a
WELL-2	-32.2773	115.8303	20	21a
WELR01	-33.0538	115.8131	20	9
WELR02	-33.0540	115.8131	20	9
WHILL-1	-32.6925	115.6120	20	29b
WHILL-2	-32.6918	115.6114	20	29b
WHILL-3	-32.6918	115.6190	20	27
WHILL-4	-32.6915	115.6195	10	27
WHILL-5	-32.6907	115.6189	5	26b
WHITE-1	-31.8242	115.9394	20	23a
WHITE-2	-31.8273	115.9416	30	4
WICHER01	-33.7387	115.4833	60	1a
WILL-1	-33.7009	115.5383	50	10b
WILL02	-33.7192	115.5180	70	1a
WILL03	-33.7016	115.5326	60	10b
WILL04	-33.7013	115.5500	70	1a
WIRR-1	-31.7408	115.8722	60	23a
WIRR-2	-31.7392	115.8578	60	23a
WONN-3	-33.6673	115.5804	20	9
WONN-4	-33.6670	115.5701	20	10b
WONN-5	-33.6585	115.5405	40	10b
WONN-6	-33.6538	115.5267	40	10b
WONN01	-33.6678	115.5863	20	1a
WONN02	-33.6674	115.5823	20	1b
WOODP-1	-32.1310	115.7559	5	30a
WOODP-2	-32.1329	115.7592	5	30a

SITE	LATITUDE	LONGITUDE	ALTITUDE (m)	COMM. TYPE
WOODV-1	-31.7842	115.7817	40	28
WOODV-2	-31.7819	115.7803	40	28
YALG-1	-32.9149	115.6900	20	26b
YALG-2	-32.9155	115.6908	20	26b
YALG-3	-32.9157	115.6927	40	27
YALG-4	-32.9156	115.6933	40	27
YALG-5	-32.9165	115.6949	30	27
YALG-6	-32.9170	115.6948	30	26b
YALG-7	-32.9179	115.6978	20	26b
YALG-8	-32.9169	115.6983	20	27
YALLIN-1	-33.6716	115.1343	20	1b
YAN-1	-31.5628	115.6961	20	26b
YAN-10	-31.5471	115.7189	70	26b
YAN-11	-31.5461	115.7191	70	26b
YAN-12	-31.5020	115.7052	70	26a
YAN-13	-31.5025	115.7050	70	26a
YAN-14	-31.5045	115.7041	70	26b
YAN-15	-31.5049	115.7041	70	26a
YAN-16	-31.5065	115.7050	65	26b
YAN-17	-31.5063	115.7200	40	22
YAN-18	-31.5044	115.7204	40	22
YAN-19	-31.5074	115.7281	35	23b
YAN-2	-31.5616	115.6937	30	26a
YAN-20	-31.5072	115.7241	45	23b
YAN-21	-31.5089	115.7166	40	14
YAN-22	-31.5070	115.7186	40	22
YAN-23	-31.4958	115.7100	50	26b
YAN-24	-31.4958	115.7091	50	26a
YAN-25	-31.4935	115.7101	40	28
YAN-3	-31.5594	115.6914	20	28
YAN-4	-31.5700	115.7116	30	28
YAN-5	-31.5634	115.7257	60	26b
YAN-6	-31.5625	115.7259	60	28
YAN-8	-31.5496	115.7251	70	28
YAN-9	-31.5478	115.7225	70	28
YARL01	-32.9353	115.9048	35	3c
YARL02	-32.9357	115.9046	35	9
YARL03	-32.9534	115.9182	60	3b
YARL04	-32.9601	115.9154	50	20b
YOON-1	-33.7228	115.4374	20	1b
YOON-2	-33.7230	115.4351	20	2
YOON-3	-33.7247	115.4338	20	7
YULE-1	-32.0239	115.9799	40	23a
YULE-2	-32.0230	115.9788	40	23a
YULE-3	-32.0210	115.9802	40	21c
YULE-4	-32.0221	115.9765	40	10a
YULE-5	-32.0229	115.9792	40	7