

PRELIMINARY VEGETATION SURVEY OF STAR SWAMP AND VICINITY,  
WESTERN AUSTRALIA

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ABSTRACT

*Star Swamp and the adjacent bushland are Perth metropolitan remnants of the once extensive natural vegetation of the Swan Coastal Plain. They presently provide areas for school nature study programmes, a wildland recreational facility and serve as refugia for native plants and animals. This study was designed to provide a floristic survey of the area, a description of the major plant communities and insights into the relationships between these communities and some environmental factors.*

INTRODUCTION

Star Swamp and its surrounding bushlands are located in the Perth metropolitan suburb of North Beach, Western Australia (31°51'S, 115°45'E). Bounded by North Beach Rd., Marmion Ave., Beach Rd., and Hope St., the area provides a refuge for native animals and plants in a region of suburban development (Fig. 1). Application for re-zoning the crown land for residential use has prompted a group of environmentalists and concerned citizens to request that the area be preserved and managed as a flora and fauna reserve (Anon., 1976). The area has been used for nature study by nearby schools, a wildland recreational facility, and the occasional use by trail-bike riders. The area contains numerous sand tracks which restrict its aesthetic quality, but has a variety of vegetational communities and a diversity of plants and animals characteristic of the Swan Coastal Plain.

The vegetation was once part of an extensive system of wetland swamps and adjacent stabilized communities of the Spearwood Dune soils of the Swan Coastal Plain (Seddon, 1972). Most of the wetland communities of the Perth metropolitan area have already been lost to urban development. These originally formed a vegetation type which made up only a very small portion of south-western Australia (Riggert, 1966). The Tuart Woodland and Banksia Woodland communities of the Swan Coastal Plain were once also more widely spread, but today, most of these areas have been lost to agriculture and



Fig. 1. Aerial photograph of the Star Swamp and adjacent bushland and study area of North Beach, Western Australia.

urbanization (Seddon, 1972).

The objectives of the current study were to determine the major plant communities of the area, to characterize these communities in terms of density, frequency and cover of the major species, and to study the relationship between these major plant communities and some factors of the physical environment.

#### METHODS

A reconnaissance of the study area revealed that the vegetation could be partitioned into four major communities based on plant growth form and identity of the most conspicuous species. These were designated Paperbark Woodland, Tuart Woodland, Banksia Woodland, and Open Heath (Fig. 2). Within each community the dominant trees were sampled for frequency and cover. Canopy cover density was sampled using a densiometer (Lemmon, 1956). Cover density of living and dead canopy was recorded separately for each contributing species. One to three line transects were located arbitrarily within each community to sample understorey species cover. Average species cover was determined from ten 2 x 2 m quadrats located along each transect using a stratified random procedure. Frequency was determined as the percentage of quadrats containing a given species. Nomenclature for the species recorded follows Beard (1970), Blackall and Grieve (1974), and Grieve and Blackall (1975). Water quality at Star Swamp was assessed from samples of surface water obtained 8 September 1977 from the main pond and from the street run-off drain. Measures of phosphate phosphorus, organic phosphorus, ammonia, nitrogen, nitrate nitrogen and Kjeldahl nitrogen were made according to standard laboratory procedures (Anon., 1971).

Soil conditions of each plant community were determined from one to three soil profile excavations of each vegetation transect site to a maximum depth of 2 m. A minimum of two replicate samples from each horizon were described in terms of colour (Munsell Color Company, 1954), soil texture (Bouyoucos, 1936), soil moisture at field capacity, soil pH and conductivity. Soil pH and conductivity were measured with glass electrodes (Bear, 1964).

#### RESULTS

A total of 209 species representing 157 genera and 55 families of plants was recorded for the 100 ha study area surrounding Star Swamp (Appendix 1). Of this total, 75 were native to Western Australia, the remainder were alien and most of Mediterranean or South African origin. Herbaceous species predominated with 123 species. Of the 78 species of woody plants recorded, 13 were trees. The most common family was Fabaceae (19 species) followed by the Proteaceae (16), Asteraceae (15), Orchidaceae and Poaceae, each with 13 species and Liliaceae with 12 representatives.

The tree growth form was a major criterion in the arbitrary separation of the plant communities of the study area. Canopy cover density of these communities generally decreased with increasing distance from the pond (Table 1). The Paperbark Woodland canopy stratum was dominated by *Melaleuca rhaphiophylla* (Swamp Paperbark) with *Eucalyptus gomphocephala* (Tuart) an important associate. Of the contribution by Tuart, however, only 46% was

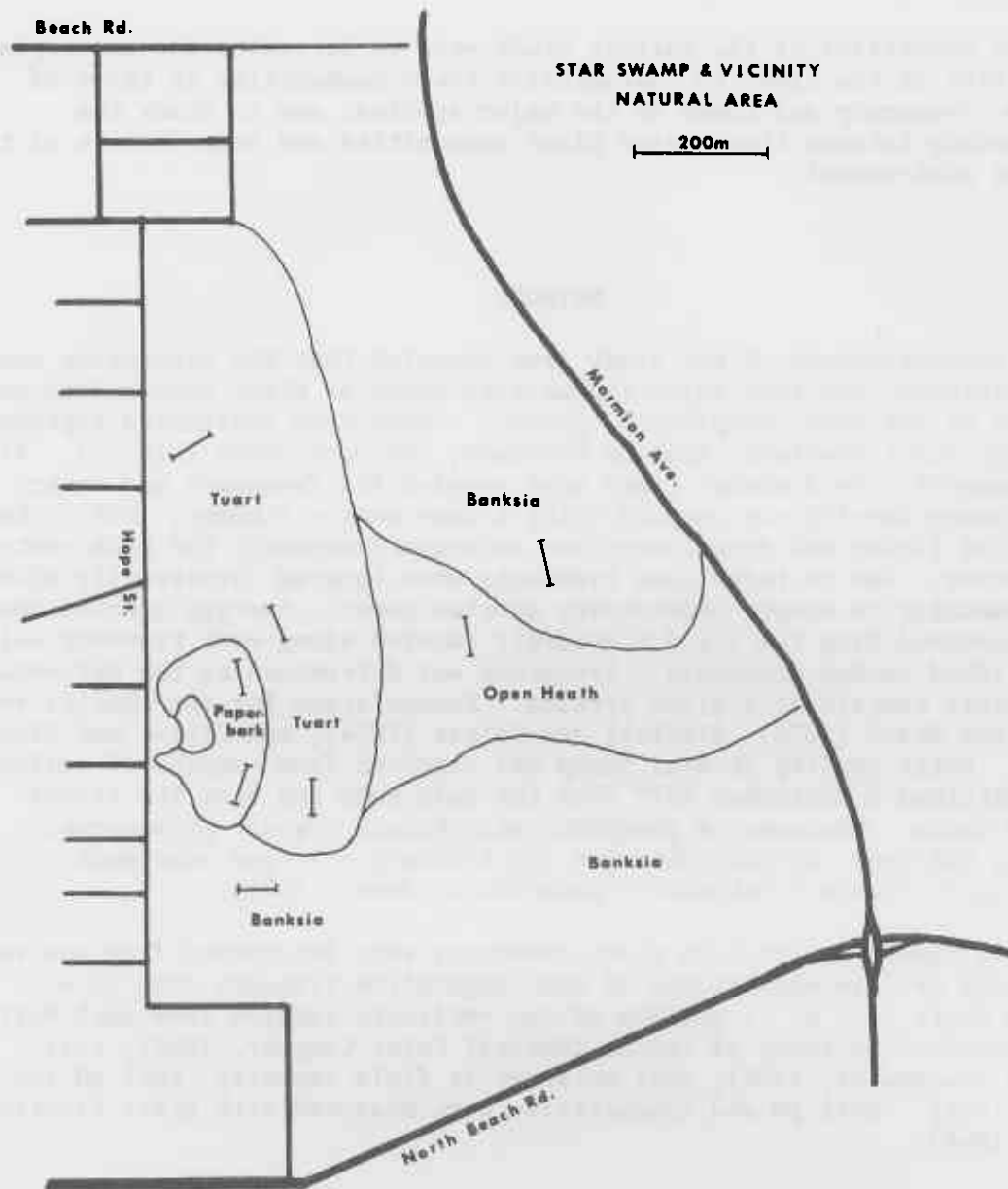


Fig. 2. Map of study area showing the distribution of natural plant communities and locations of the vegetation sampling transects.

living tissue. The Paperbark canopy, on the other hand, was recorded almost entirely as living tissue. From the 50% canopy cover recorded in the Paperbark Woodland community, canopy cover dropped to 33% in the Tuart community. Tuart dominated the canopy density in the samples with *Eucalyptus marginata* (Jarrah) and the occasional *Banksia grandis* (Bull Banksia) and *Eucalyptus calophylla* (Marri) recorded. The 75% living tissue value for Tuart in this community indicated an improvement over the status of Tuart individuals in the Paperbark Woodland. Cover density values for the Banksia Woodland were dominated by three *Banksia* species (*Banksia menziesii*, *B. attenuata*, and *B. prionotes*) with minor contributions by Tuart and *Casuarina fraserana* (Sheoak). The Open Heath community did not have a canopy dominated by tree growth forms.

Table 1. Canopy cover density percentages for living and dead tissue for the major tree species of the study area.

SPECIES	PAPERBARK		TUART		BANKSIA	
	Alive	Dead	Alive	Dead	Alive	Dead
<i>Melaleuca raphiophylla</i>	31.7	4.3	-	-	-	-
<i>Eucalyptus gomphocephala</i>	6.4	7.6	19.5	6.5	2.6	1.4
<i>Eucalyptus marginata</i>	-	-	4.8	0.2	-	-
<i>Banksia</i> (4 species)	-	-	1.0	1.0	16.4	4.6
<i>Casuarina fraserana</i>	-	-	-	-	1.0	0.0
TOTALS	38.1	11.9	25.3	7.7	20.0	6.0

Shrub and herbaceous life-forms contributed to the vegetation structure of the three tree-form dominated plant communities and represented the dominant life-form in the Open Heath regions (Table 2). Understorey species of the Paperbark Woodland tended to be restricted to this community, while a progression of species was found in the remaining communities. Several species were found in the sampling transects of all three upland communities. Ground cover in the Paperbark community was dominated by the sedges *Baumea juncea* and *Gahnia trifida*, and by *Sporobolus virginicus* (Sand couch grass). Of the plant cover, 98% was contributed by species native to the region. Most common species of the Tuart understorey were *Xanthorrhoea preissii* (Blackboy), the shrubs *Jacksonia sternbergiana* and *Pelargonium capitatum* (Wild geranium), and the herbaceous species *Conostylis candidans*, *Ehrharta longiflora* (Veldt grass), *Freesia refracta*, *Lagurus ovatus* (Hare's-tail grass), *Romulea rosea* (Guildford grass) and *Petrorhagia* sp. (Proliferous pink). Percentage plant cover resulting from introduced species was very large at 70%.

In the Banksia community, elements of the understorey included *Xanthorrhoea preissii*, *Jacksonia sternbergiana* and *Dryandra nivea* (Dwarf dryandra). The weedy introduced species *Ehrharta longiflora*, *Avena barbata* (Oat grass), *Hypochoeris glabra* (Smooth cat's-ear) and *Romulea rosea* were also common. The percentage of plant cover from introduced species was 36%. Bare ground was greatly increased in the Banksia community when compared to the two previous communities. Bare ground was also a common characteristic of the Open Heath community. The common shrubs of the Heath sample included *Acacia cyclops*, *Lechenaultia linarioides* (Yellow lechenaultia) and *Grevillea thelemanniana* (Spider-net grevillea). The weedy introduced species, *Ehrharta longiflora*, *Hypochoeris glabra*, *Ursinia anthemoides* and *Lupinus cosentinii* (Sand-plain lupin), were common between the native shrub species. The introduced species have made large inroads into this community with a total of 53% of vegetative cover being accounted for by alien species.

The samples of the water from the inlet drain from the housing development to the west of Star Swamp were generally higher in nutrients measured than samples taken from the main pond (Table 3). Using as indicators, the levels of nitrogen and phosphorus in tables from Sakamoto (1966) (cited in Vollenweider, 1968), Star Swamp is presently classified as a meso-eutrophic lake.

Table 2. Frequency occurrence and percentage cover (in parentheses) of understorey species. An asterisk marks introduced species.

SPECIES	Paperbark	Tuart	Banksia	Heath
<i>Baumea juncea</i>	71 (28)			
<i>Sporobolus virginicus</i>	76 (24)			
<i>Gahnia trifida</i>	65 (18)			
<i>Samolus repens</i>	53 (3)			
<i>Centella asiatica</i>	41 (2)			
<i>Freesia refracta</i> *		67 (14)		
<i>Lagurus ovatus</i> *		40 (9)		
<i>Cerastium glomeratum</i> *		40 (3)		
<i>Medicago sp.</i> *		43 (2)		
<i>Dichopogon strictus</i>		36 (2)		
<i>Vicia sativa</i> *		36 (1)		
<i>Petrorrhagia sp.</i> *		30 (4)		
<i>Macrozamia riedlei</i>		13 (1)		
<i>Xanthorrhoea preissii</i>		40 (8)		
<i>Jacksonia sternbergiana</i>		47 (5)		
<i>Conostylis candicans</i>		60 (2)	38 (2)	
<i>Silene gallica</i> *		33 (3)	62 (1)	
<i>Romulea rosea</i> *		30 (4)	56 (3)	
<i>Sowerbaea laxiflora</i>		23 (1)	31 (1)	
<i>Hibbertia hypericoides</i>		20 (1)	56 (3)	
<i>Acanthocarpus preissii</i>		7 (1)	31 (1)	
<i>Avena barbata</i> *		10 (0)	67 (3)	
<i>Ehrharta longiflora</i> *		87 (12)	88 (3)	100 (19)
<i>Pelargonium capitatum</i> *		63 (7)	38 (1)	25 (2)
<i>Hardenbergia comptoniana</i>		33 (3)	19 (1)	50 (3)
<i>Gladiolus sp.</i> *		13 (0)	81 (2)	75 (2)
<i>Anagallis arvensis var. caerulea</i> *		7 (0)	50 (1)	50 (3)
<i>Dianella revoluta</i>		17 (1)	9 (1)	50 (3)
<i>Ursinia anthemoides</i> *		10 (0)	38 (3)	100 (4)
<i>Dryandra nivea</i>			50 (7)	
<i>Hypochoeris glabra</i> *			50 (4)	100 (6)
<i>Grevillea thelemanniana</i>			19 (1)	75 (4)
<i>Burchardia umbellata</i>			50 (1)	50 (2)
<i>Acacia cyclops</i>				100 (15)
<i>Lechenaultia linarioides</i>				100 (9)
<i>Lupinus cosentinii</i> *				100 (6)
Others	- (8)	- (14)	- (19)	- (4)
Open Water	1 (16)	- --	- --	- --
Bare Ground	- --	- (2)	- (24)	- (18)
Total Vegetative Cover	84%	98%	76%	82%

Table 3. Parameters of water quality of the drain inlet and from the main pond of Star Swamp. Water sampled 8th September, 1977.

Nutrient ( $\mu\text{g/l}$ )	SITE	
	Drain	Main Pond
$\text{PO}_4\text{-P}$	25	8
Organic P	43	40
Total P	68	48
$\text{NH}_3\text{-N}$	312	345
$\text{NO}_3\text{-N}$	10	12
Kjeldahl N	2160	2030

Assessment of the edaphic conditions present in each vegetation community revealed major differences between the Paperbark Woodland and the other three designated communities (Table 4). The fluctuating water table of the Paperbark region has had a major effect on soil development. Soil colours were very dark, indicating that the profile contains large amounts of organic matter. Organic matter percentages also bore this out as did the capacity of the soil to hold water against the pull of gravity. The relatively large silt and clay fractions and the alkaline pH values probably reflect poor leaching due to the high water table in the area. Soil profile conditions in the remaining plant communities were generally comparable except for slightly more alkaline pH values for the Tuart soil horizons and the outcropping limestone of the shallower soils of the Open Heath.

#### DISCUSSION

The establishment, development and survival of a plant community in any area is determined principally by the climate, soil properties and the past history of the potential habitat (Specht, 1960).

The areas of natural bushland occurring within urbanized regions however, are also subject to increased pressures through man's activities. Indicative of this is the nutrient status of the water of Star Swamp which is comparable to the much larger Lake Monger (Atkins *et al.*, 1977) and Lake Joondalup (Congdon and McComb, 1976), two lakes within the Perth metropolitan area. Loch McNess of Yanchep National Park, 50 km to the north of Perth, is much less eutrophic than the metropolitan lakes (Atkins *et al.*,

Table 4. Soil variable data for profiles of the study area

Profile Depth (cm)	Colour	Sand	Silt	Clay	Texture (%)	Organic Matter (%)	Soil Field Capacity (%)	pH	Conductivity ( $\times 10^{-3}$ $\mu\text{hos.cm}^{-1}$ )
<u>Paperbark Woodland:</u>									
0 - 15	Very dark grey	85	12	3		30.8	195	7.9	1.08
15 - 30	Grey	82	14	4		13.9	111	7.9	0.66
30 - 60	Black	92	8	0		41.3	364	7.8	0.73
<u>Tuart Woodland:</u>									
0 - 2	Very dark grey	98	2	0		7.8	39.0	7.6	2.40
2 - 20	Yellowish brown	99	1	0		2.8	25.2	7.6	0.97
20 - 40	Brown	98	2	0		1.6	23.0	7.6	0.79
> 40	Dark grey brown	98	2	0		0.8	19.6	7.6	0.47
<u>Banksia Woodland:</u>									
0 - 1	Black	98	2	0		16.8	67.8	7.4	0.96
1 - 20	Reddish grey	99	1	0		5.6	22.2	7.1	0.21
20 - 40	Reddish brown	100	0	0		2.3	21.4	7.1	0.15
> 40	Brownish yellow	100	0	0		1.2	20.5	7.1	0.09
<u>Heath:</u>									
0 - 1	Black	97	3	0		11.1	29.2	7.6	0.20
1 - 10	Dark grey	96	4	0		3.6	26.7	7.2	0.05
10 - 35	Brown	98	2	0		2.1	25.9	7.2	0.04
> 35	Yellowish brown	98	2	0		2.7	25.1	7.1	0.04



1977). The present concentration of nutrients in the inlet drain at Star Swamp indicates that the main pond will probably become more eutrophic with time unless appropriate action to reduce nutrient input into the lake is undertaken. With increased nutrient concentration in the small volume of Star Swamp, the possibility of algal booms is increased and a resulting depletion of oxygen levels would have severe effects on the aquatic life in the pond. Diversion of run off from developed areas and maintenance of the existing natural vegetation in the catchment would help to prevent further eutrophication of the swamp.

Within the Paperbark fringing Star Swamp, the water-saturated soil profile, high organic matter content and relatively high concentrations of silt and clay particles combine to present a severe habitat which only a relatively few species can tolerate (Bergman, 1959). Species intolerant of the low oxygen concentrations of the rooting zone and changing water levels are excluded from this zone. Tuart individuals in this zone are dying probably due to a general increase in water level noted over the past 25 years. Burton (1976) reports that the average level of Star Swamp has risen approximately 1 m since 1950 and attributes this change to the clearing of land and the subsequent residential development on the western side of the swamp. General observations of numbers of dead stems of Paperbark and Tuart within the present limits of inundation suggest that the Paperbark community has greater ecological capacity to tolerate these past changes. With further land clearing, however, and a continued increase in water levels, the future of this community could be in doubt.

Surrounding the Paperbark community, the lower slopes of the drainage area are dominated by the Tuart Woodland. Tuart has been reported to be restricted to alkaline limestone soils on the western Swan Coastal Plain where it typically develops nearly pure stands (Gardner, 1944). While Tuart is the major canopy dominant in the zone above the region of periodic inundation, introduced species contribute the majority of the ground cover percentage. These species include *Freesia refracta*, *Ehrharta longiflora*, and *Pelargonium capitatum*. The dominance of the understorey by introduced species is indicative of disturbance of the habitat. Although it is unclear whether freedom from man-made disturbance will result in a re-establishment of the native species, it seems clear that increased disturbance will result in an increased population of alien species.

The Banksia Woodland community in general, occurs in areas of the study site topographically above the Tuart Woodland, and is distinguished by less alkaline soils. The absence of Banksia Woodland dominants in the Tuart region could be due to intolerance of the more alkaline conditions. The less dense canopy of the Banksia community is not reflected in the proportion of alien species in the understorey compared, for example, with the Tuart community. This may, however, have resulted from a recent fire in the area of one of the Banksia Woodland sampling transects. It is likely that frequent burning and continued use of the sand tracks will lead to an increase in the ratio of introduced to native species.

Limestone outcropping is the most obvious physical characteristic of the Open Heath habitat, distinguishing it from areas harbouring the Tuart and Banksia communities. The shallow soils and the effects of wind, as evidenced by the wind-pruned appearance of the shrubs, probably indicate that the ridge habitat may be too dry for the arborescent species. *Acacia cyclops*, a common species of the coastal dune community (Smith, 1973), is well adapted to the shallow sandy soils and drying winds of the ridge in the Star Swamp study area and contributes a major share of the plant cover of the Open Heath community. Bare soil is a common attribute of both the Open Heath and the Banksia Woodland communities. These bare areas, accentuated

by human disturbance, present ample opportunity for further invasions by the already established alien herbaceous species *Ehrharta longiflora*, *E. calycina*, *Ursinia anthemoides*, and *Hypochoeris glabra*.

Star Swamp and the adjacent plant communities are remnants of natural bushland in the Perth metropolitan area which, although degraded by urban development, provide areas for educational and recreational use. Rapid eutrophication of the pond and the encroachment of introduced weedy species into the native plant communities can be slowed through a combined process of developing a basic understanding of the relationships of the biological and physical factors of the ecosystem and a plan of management. The management of the area to best provide benefits for both the human and natural environment should be the major goal for the future. The Perth metropolitan area has very few remaining natural bushlands. The preservation of Star Swamp and its environs as a flora and fauna reserve would provide benefits to all citizens of the Perth metropolitan area.

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## APPENDIX 1

## VASCULAR PLANTS OF STAR SWAMP

- KEY:
- a) Habitat - P = Paperbark Woodland  
T = Tuart Woodland  
B = Banksia Woodland  
H = Open Heathland
- b) Life form - C = creeper or climber  
H = herbaceous, non-woody plant  
P = plant of palm-like habit

S = shrub

T = tree

c) Origin (n) = native  
(i) = introduced

Name	Form & Origin	Habitat			
		P	T	B	H
ZAMIACEAE: Zamia palm family <i>Macrozamia riedlei</i> (Gaud.) C.A. Gardn. Zamia palm	P(n)		+	+	
ANGIOSPERMAE: Monocotyledoneae					
TYPHACEAE: Cat-tail rush family <i>Typha orientalis</i> Presl.	H(n)	+			
POTAMOGETONACEAE: Pondweed family <i>Potamogeton pectinatus</i> Linn. Fennel pond weed	H(n)	+			
JUNCAGINACEAE: Arrow grass family <i>Triglochin procera</i> R.Br. Water ribbons	H(i)	+			
<i>Triglochin striata</i> Ruiz & Pav. Streaked arrowgrass	H(i)	+			
POACEAE: (= Gramineae) Grass family					
<i>Avena barbata</i> Link. Bearded oatgrass	H(i)		+	+	+
<i>Briza maxima</i> L. Quaking grass	H(i)	+	+	+	+
<i>Briza minor</i> L. Lesser quaking grass	H(i)		+	+	
<i>Bromus diandrus</i> Curt. Great brome	H(i)		+		+
<i>Cynodon dactylon</i> (L.) Pers. Couch grass	H(i)	+	+		
<i>Ehrharta calycina</i> Sm. Perennial veldt grass	H(i)	+	+	+	+
<i>Ehrharta longiflora</i> Sm. Annual veldt grass	H(i)	+	+	+	+
<i>Gastridium phleoides</i> (Nees & Meyen) C.E. Hubbard Nit grass	H(i)	+			
<i>Hordeum leporinum</i> Link. Barley grass	H(i)	+			
<i>Lagurus ovatus</i> L. Hare's-tail grass	H(i)		+	+	+
<i>Sporobolus virginicus</i> (L.) Kunth. Sand couch	H(n)	+	+		
<i>Stenotaphrum secundatum</i> (Walt.) Kunth. Buffalo grass	H(i)	+			

Name	Form & Origin	Habitat			
		P	T	B	H
<i>Stipa variabilis</i> Hughes Spear grass	H(n)		+		
CYPERACEAE: Sedge family					
<i>Baumea juncea</i> (R.Br.) Palla.	H(n)	+			
<i>Carex preissii</i> Nees	H(n)		+		
<i>Gahnia trifida</i> Labill. Coast saw sedge	H(n)	+			
<i>Lepidosperma gracile</i> R.Br.	H(n)		+	+	
<i>Mesomelaena stygia</i> (R.Br.) Nees Semaphore sedge	H(n)			+	+
<i>Schoenus trachycarpus</i> F. Muell. Rough-fruited bog rush	H(n)		+	+	+
<i>Scirpus maritimus</i> L. Marsh club rush	H(n)	+	+		
<i>Scirpus nodosus</i> Rottb.	H(n)	+			
<i>Scirpus validus</i> Vahl.	H(n)	+			
<i>Tetrariopsis octandra</i> (Nees) C.B. Clarke	H(n)		+		+
RESTIONACEAE:					
<i>Loxocarya</i> sp.	H(n)			+	
JUNCACEAE: Reed family					
<i>Juncus kraussii</i> Hochst	H(n)	+			
LILIACEAE: Lily family					
<i>Arthropodium capillipes</i> Endl.	H(n)		+		
<i>Burchardia umbellata</i> R.Br. Milkmaids	H(n)		+	+	+
<i>Caesia parviflora</i> R.Br. Pale grass lily	H(n)		+	+	+
<i>Corynotheca micrantha</i> (Lindl.) Macbride	H(n)		+	+	+
<i>Dianella revoluta</i> R.Br. Spreading flax lily	H(n)		+	+	+
<i>Dichopogon strictus</i> (R.Br.) J.G. Baker Chocolate lily	H(n)		+		
<i>Laxmannia</i> sp.	H(n)			+	+
<i>Sowerbaea laxiflora</i> Lindl. Vanilla lily	H(n)		+	+	+
<i>Thysanotus asper</i> Lindl. Hairy fringe lily	H(n)		+	+	
<i>Thysanotus patersonii</i> R.Br. Twining fringe lily	C(n)		+	+	+
<i>Thysanotus sparteus</i> R.Br. Fringe lily	H(n)		+	+	+
<i>Tricoryne elatior</i> R.Br. Yellow autumn lily	H(n)		+	+	+
XANTHORRHOEACEAE: Grass tree family					
<i>Acanthocarpus preissii</i> Lehm.	C(n)		+	+	

Name	Form & Origin	Habitat			
		P	T	B	H
<i>Lomandra</i> spp. (probably 3 spp.) Mat rush	H(n)	+	+	+	+
<i>Xanthorrhoea preissii</i> Endl. Black boy, Grass tree	P(n)	+	+	+	
HAEMODORACEAE: Kangaroo paw family					
<i>Anigozanthos humilis</i> Lindl. Cat's paw	H(n)			+	
<i>Anigozanthos manglesii</i> D. Don. Common kangaroo paw	H(n)			+	
<i>Conostylis aculeata</i> R.Br.	H(n)		+	+	+
<i>Conostylis candidans</i> Endl.	H(n)		+	+	+
<i>Haemodorum paniculatum</i> Lindl.	H(n)		+	+	+
IRIDACEAE: Iris family					
<i>Chasmanthe aethiopica</i> (L.) N.E. Br. (= <i>Antholysa aethiopica</i> L.) African Cornflag	H(i)		+		
<i>Ferraria</i> sp.	H(i)	+			
<i>Freesia refracta</i> (Jacq.) Klatt Freesia	H(i)	+	+		
<i>Gladiolus</i> sp. Gladiolus	H(i)		+	+	+
<i>Homeria collina</i> (Thumb.) Vent. One-leaved cape tulip	H(i)	+		+	+
<i>Orthrosanthus laxus</i> (Endl.) Benth. Blue day lily	H(n)			+	
<i>Patersonia occidentalis</i> R.Br. Purple flag	H(n)			+	+
<i>Romulea rosea</i> (L.) Eckl. Guildford grass	H(i)		+	+	+
<i>Sparaxis grandiflora</i> Ker.	H(i)	+			
ORCHIDACEAE: Orchid family					
<i>Caladenia deformis</i> R.Br. Blue fairy orchid	H(n)		+		
<i>Caladenia filamentosa</i> R.Br. Spider orchid	H(n)			+	
<i>Caladenia flava</i> R.Br. Primrose or Cowslip orchid	H(n)			+	
<i>Caladenia huegelii</i> Reichb.f. Green spider orchid, King orchid	H(n)	+			
<i>Caladenia latifolia</i> R.Br. Pink fairies	H(n)		+	+	+
<i>Caladenia menziesii</i> R.Br. Rabbit orchid	H(n)		+		
<i>Caladenia patersonii</i> R.Br. White spider orchid	H(n)		+	+	
<i>Diuris longifolia</i> R.Br. Donkey or Wallflower orchid	H(n)		+	+	+

Name	Form & Origin	Habitat			
		P	T	B	H
<i>Lyperanthus nigricans</i> R.Br. Red beak orchid	H(n)			+	
<i>Microtis</i> sp.	H(n)	+			
<i>Prasophyllum</i> sp. Leek orchid	H(n)	+	+		
<i>Pterostylis scabra</i> Lindl. var. <i>robusta</i> Green shell orchid (Rog.) A.S. George			+		
<i>Pterostylis vittata</i> Lindl. Banded greenhood	H(n)		+	+	
Dicotyledoneae					
CASUARINACEAE: Sheoak family					
<i>Casuarina fraserana</i> Miq. Sheoak	T(n)			+	
<i>Casuarina humilis</i> Otto & Dietr. Dwarf casuarina	S(n)			+	+
PROTEACEAE: Banksia family					
<i>Banksia attenuata</i> R.Br. Narrow-leaved banksia	T(n)			+	
<i>Banksia grandis</i> Willd. Bull banksia	T(n)		+		
<i>Banksia menziesii</i> R.Br. Menzies' banksia	T(n)			+	
<i>Banksia prionotes</i> Lindl. Acorn banksia	T(n)			+	
<i>Dryandra nivea</i> R.Br. Dwarf dryandra	S(n)		+	+	
<i>Dryandra sessilis</i> (R.Br.) Druce Parrot bush	S(n)		+	+	
<i>Grevillea crithmifolia</i> R.Br.	S(n)		+		
<i>Grevillea thelemanniana</i> Hueg. Spider-net grevillea	S(n)		+	+	+
<i>Grevillea vestita</i> (Endl.) Meisn.	S(n)			+	
<i>Hakea prostrata</i> R.Br. Harsh hakea	S(n)		+	+	
<i>Persoonia saccata</i> R.Br. Snottygobble	S(n)		+		
<i>Petrophile linearis</i> R.Br. Pixie mops	S(n)		+	+	
<i>Petrophile macrostachya</i> R.Br.	S(n)			+	+
<i>Stirlingia latifolia</i> (R.Br.) Steud. Blueboy	S(n)			+	+
<i>Synaphaea</i> sp.	S(n)			+	
LORANTHACEAE: Mistletoe family					
<i>Nuytsia floribunda</i> (Labill.) R.Br. Christmas tree	T(n)		+	+	

Name	Form & Origin	Habitat			
		P	T	B	H
POLYGONACEAE: Buckwheat family <i>Emex australis</i> Steinh. Double gee	H(i)		+		
CHENOPODIACEAE: Saltbush family <i>Rhagodia baccata</i> (Labill.) Moq.	S(n)		+		
AMARANTHACEAE: Amaranth family <i>Ptilotus alopecuroideus</i> F. Muell.	H(n)		+		
<i>Ptilotus drummondii</i> (Moq.) F. Muell.	H(n)		+		
GYROSTEMONACEAE: <i>Tersonia brevipes</i> Moq.	S(n)		+		
AIZOACEAE: Pigface family <i>Carpobrotus aequilaterus</i> (Haw.) N.E. Br. Chilean pigface	H(i)		+	+	
PORTULACACEAE: Purslane family <i>Calandrinia corrigioloides</i> F. Muell. ex Benth.	H(n)		+	+	
<i>Calandrinia volubilis</i> Benth.	H(n)		+	+	
CARYOPHYLLACEAE: Chickweed family <i>Cerastium glomeratum</i> Thuill. Mouse-ear chickweed	H(i)		+	+	
<i>Petrorhagia</i> sp. Proliferous pink	H(i)		+	+	
<i>Silene gallica</i> L. French catchfly	H(i)		+	+	+
RANUNCULACEAE: Buttercup family <i>Clematis microphylla</i> DC. Small-leaved clematis	C(n)		+	+	
<i>Ranunculus colonomum</i> Endl. ex al. Common buttercup	H(n)		+		
BRASSICACEAE: (Cruciferae) Cabbage family <i>Heliophila pusilla</i> L.	H(i)			+	
<i>Raphanus raphanistrum</i> L. Wild radish	H(i)		+	+	+
<i>Sinapis arvensis</i> L. ( <i>Brassica sinapistrum</i> ) Charlock	H(i)	+		+	+
DROSERACEAE: Sundew family <i>Drosera erythrorhiza</i> Lindl. Red-ink sundew	H(n)			+	
<i>Drosera macrantha</i> Endl.	C(n)			+	



Name	Form & Origin	Habitat			
		P	T	B	H
CRASSULACEAE: Stonecrop family					
<i>Crassula colorata</i> (Nees) Ostf. Dense stonecrop	H(n)		+	+	+
<i>Crassula</i> sp.	H(n)		+	+	
MIMOSACEAE: Wattle family					
<i>Acacia saligna</i> Wendl. Orange wattle	T(n)	+			
<i>Acacia cyclops</i> A. Cunn. ex G. Don	S(n)				+
<i>Acacia pulchella</i> R.Br. Prickly Moses	S(n)		+	+	+
<i>Acacia stenoptera</i> Benth.	S(n)		+	+	
FABACEAE: (= Papilionaceae, Leguminosae) Pea family					
<i>Bossiaea eriocarpa</i> Benth.	S(n)			+	
<i>Daviesia incrassata</i> Sm.	S(n)			+	
<i>Daviesia juncea</i> Sm.	S(n)			+	
<i>Gompholobium tomentosum</i> Labill. Handsome wedge pea	S(n)			+	
<i>Hardenbergia comptoniana</i> Benth. Native wistaria	C(n)		+	+	+
<i>Hovea trisperma</i> Benth. Hovea	S(n)		+	+	
<i>Isotropis cuneifolia</i> (Sm.) Domin Lamb poison	H(n)			+	
<i>Jacksonia furcellata</i> (Bonpl.) DC.	S(n)		+		
<i>Jacksonia sericea</i> Benth.	S(n)		+		+
<i>Jacksonia sternbergiana</i> Hueg.	S(n)		+	+	+
<i>Kennedia prostrata</i> R.Br. Red runner; Creeping coral pea	C(n)		+	+	+
<i>Lupinus cosentinii</i> Guss. Sand-plain lupin	H(i)		+	+	+
<i>Medicago</i> sp. Medic	H(i)		+	+	+
<i>Melilotus indicus</i> (L.) All. Hexham scent	H(i)	+	+		
<i>Oxylobium capitatum</i> Benth.	S(n)			+	
<i>Templetonia retusa</i> (Vent.) R.Br. Cockies tongue, Bullock bush	S(n)		+		
<i>Trifolium angustifolium</i> L. Narrow-leaf clover	H(i)			+	
<i>Trifolium fragiferum</i> L. Strawberry clover	H(i)	+			
<i>Vicia sativa</i> L. Common vetch	H(i)	+	+	+	
GERANIACEAE: Storks-bill family					
<i>Erodium cicutarium</i> (L.) Ait. Common crowfoot	H(i)			+	+

Name	Form & Origin	Habitat			
		P	T	B	H
<i>Pelargonium capitatum</i> (L.) Ait. Wild geranium	S(i)		+	+	+
OXALIDACEAE: Wood Sorrel family					
<i>Oxalis corniculata</i> L. Yellow wood sorrel	H(i)		+		
<i>Oxalis pes-caprae</i> L. Soursob	H(i)		+		
RUTACEAE: Boronia family					
<i>Eriostemon spicatus</i> A. Rich. Salt and pepper	S(n)			+	
EUPHORBIACEAE: Spurge family					
<i>Adriana quadripartita</i> Gaud. Rare bitter bush	S(n)	+	+		
<i>Monotaxis</i> sp.	S(n)			+	
<i>Phyllanthus calycinus</i> Labill. False boronia	S(n)		+	+	+
<i>Ricinus communis</i> L. Castor oil plant	S(i)	+		+	
<i>Ricinocarpus</i> sp. Wedding Bush	S(n)	+		+	
STACKHOUSIACEAE:					
<i>Stackhousia huegelii</i> Endl.	H(n)		+		
RHAMNACEAE: Buckthorn family					
<i>Spyridium globulosum</i> (Labill.) Benth.	S(n)	+	+		
<i>Trymalium ledifolium</i> Frez.	S(n)		+	+	
DILLENACEAE:					
<i>Hibbertia subvaginata</i> (Steud.) F. Muell. (= <i>H. glaberrima</i> (Steud.) Gilg.)	S(n)			+	
<i>Hibbertia hypericoides</i> (DC.) Benth. Guinea flower	S(n)		+	+	+
<i>Hibbertia racemosa</i> (Endl.) Gilg.	S(n)			+	
VIOLACEAE: Violet family					
<i>Hybanthus calycinus</i> (Steud.) F. Muell. Wild violet	H(n)			+	
THYMELIACEAE: Banjine family					
<i>Pimelea rosea</i> R.Br. Pink banjine, Native rose	S(n)		+		
<i>Pimelea suaveolens</i> (Endl.) Meisn. Yellow banjine	S(n)		+		
MYRTACEAE: Myrtle family					
<i>Baeckea</i> sp.	S(n)		+		+

Name	Form & Origin	Habitat			
		P	T	B	H
<i>Calothamnus sanguineus</i> Labill. Clawflower; Bottlebrush	S(n)		+		+
<i>Chamaelaucium uncinatum</i> Schau. Geraldton wax plant	S(n)			+	
<i>Eucalyptus calophylla</i> R.Br. Marri	T(n)		+		
<i>Eucalyptus gomphocephala</i> DC. Tuart	T(n)	+	+	+	
<i>Eucalyptus marginata</i> Sm. Jarrah	T(n)		+	+	
<i>Melaleuca acerosa</i> Schau.	S(n)			+	
<i>Melaleuca huegelii</i> Endl. Chenille honey myrtle	S(n)		+		+
<i>Melaleuca raphiophylla</i> Schau. Swamp paperbark	T(n)	+			
<i>Melaleuca ? teretifolia</i> Endl.	S(n)	+			
APIACEAE: (= Umbelliferae) Carrot family					
<i>Centella asiatica</i> (L.) Urb. (= <i>Hydrocotyle asiatica</i> L.) Indian pennywort	H(n)	+			
<i>Daucus glochidiatus</i> Sieb. Native carrot	H(n)		+		
<i>Eryngium pinnatifidum</i> Bunge Blue devils	H(n)				+
<i>Homalosciadium verticillatum</i> (Turcz.) Domin	H(n)			+	
<i>Trachymene pilosa</i> Sm. Native parsnip	H(n)			+	
<i>Xanthosia huegelii</i> (Benth.) Steud.	H(n)			+	
EPACRIDACEAE: Australian heath family					
<i>Astroloma pallidum</i> R.Br.	S(n)			+	
<i>Astroloma</i> sp.	S(n)		+		
<i>Conostephium pendulum</i> Benth.	S(n)		+	+	
<i>Leucopogon parviflorus</i> (Andr.) Lindl.	S(n)			+	
<i>Leucopogon propinquus</i> R.Br.	S(n)		+		
PRIMULACEAE: Primula family					
<i>Anagallis arvensis</i> L. Scarlet pimpernel	H(i)	+			
<i>Anagallis arvensis</i> var. <i>caerulea</i> (L.) Gouan. Blue pimpernel	H(i)		+	+	+
<i>Samolus repens</i> (Forst.) Pers.	H(n)	+			
OLEACEAE: Olive family					
<i>Olea europaea</i> L. Olive	T(i)	+			

Name	Form & Origin	Habitat			
		P	T	B	H
LOGANIACEAE: <i>Logania vaginalis</i> (Labill.) F. Muell.	S(n)		+		
LAMIACEAE: (= Labiatae) Mint family <i>Hemianandra pungens</i> R.Br. Snake bush	S(n)				+
SOLANACEAE: Tomato family <i>Anthocercis littorea</i> Labill. Yellow-tail flower	S(n)		+		
<i>Solanum sodomium</i> L. Apple of sodom	S(i)		+		
OROBANCHACEAE: Broom-rape family <i>Orobanche australiana</i> F. Muell. Australian broom-rape	H(n)				+
MYOPORACEAE: Poverty bush family <i>Myoporum apiculatum</i> A. DC. <i>Myoporum tetrandrum</i> (Labill.) Domin	S(n) S(n)		+		+
RUBIACEAE: Coffee family <i>Opercularia vaginata</i> Labill.	S(n)		+	+	+
LOBELIACEAE: Lobelia family <i>Lobelia alata</i> Labill. Angled lobelia	H(n)	+			
<i>Lobelia tenuior</i> R.Br. Slender lobelia	H(n)		+	+	+
GOODENIACEAE: Lechenaultia family <i>Lechenaultia linarioides</i> DC. Yellow lechenaultia	S(n)			+	+
<i>Scaevola canescens</i> Benth. Grey scaevola	S(n)				+
<i>Scaevola paludosa</i> R.Br. Marsh scaevola	S(n)		+	+	
<i>Scaevola</i> sp.	S(n)			+	+
STYLIDIACEAE: Trigger plant family <i>Stylidium brunonianum</i> Benth. Pink-fountain trigger plant	H(n)			+	
<i>Stylidium repens</i> R.Br.	H(n)			+	
ASTERACEAE: (= Compositae) Daisy family <i>Arctotheca calendula</i> (L.) Levyns Capeweed	H(i)		+	+	
<i>Aster subulatus</i> Michx. Bush starwort	H(i)	+			

Name	Form & Origin	Habitat			
		P	T	B	H
<i>Cotula coronopifolia</i> L. Water buttons	H(n)	+			
<i>Craspedia</i> sp. Billy buttons	H(n)		+		
<i>Helichrysum cordatum</i> DC. Heart-leaved everlasting	S(n)		+	+	
<i>Hypochoeris glabra</i> L. Smooth catsear	H(i)			+	+
<i>Hypochoeris radicata</i> L. Flatweed	H(i)	+			
<i>Lagenifera stipitata</i> (Labill.) Druce Common lagenifera	H(n)		+		
<i>Osteospermum clandestinum</i> (Less.) Norl.	H(i)			+	+
<i>Podolepis gracilis</i> (Lehm.) Grah. Slender podolepis	H(n)		+		
<i>Podolepis nutans</i> Steetz. Nodding podolepis	H(n)		+		+
<i>Podotheca angustifolia</i> (Labill.) Less. Sticky longheads	H(n)		+		+
<i>Sonchus oleraceus</i> L. emend. Gouan Common sowthistle	H(i)	+	+		
<i>Ursinia anthemoides</i> (R.Br.) Gaertn. Ursinia	H(i)		+	+	+
<i>Waitzia podolepis</i> (Gaudich.) Steetz.	H(n)			+	+