Assessment of conservation values at Blackboy Hollow (Leeuwin-Naturaliste National Park) adjacent to location 1295.

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Summary

The area of National Park adjacent to location 1295 was found to be of very high conservation significance. Three Leeuwin Ridge endemics were recorded from the south western corner of reserve 8432 including a new population of *Caladenia excelsa* (Declare Rare Flora). The vegetation of the area was found to be diverse and represents the only know locations of long unburnt examples of these types on the ridge. The area contains fauna habitat in excellent condition and is likely to contain populations of declared rare fauna.

Further urgent survey of the *Caladenia excelsa* is needed to determine distribution and population size.

Background

A brief survey was undertaken on 4th November 1997 to assess the conservation significance of the National Park lands adjacent to location 1295 with particular attention to the south east corner of the area shown on CALM 1: 50000 as Reserve 8432.

During the survey the perimeter of Reserves 8432 and 15426 were traversed as was the southern boundary of location 1295 and the eastern boundary of the park east of location 1295 (Map 1). The major vegetation types were identified and species lists compiled for those types likely to be impacted by the proposed development.

Because only a brief inspection was possible, no fauna trapping was done.

Vegetation

The vegetation of the study area is closely correlated with geomorphology (Tille & Lantzke 1990, Anon 1990). The main vegetation units seen were:

- the shrublands on the parabolic Holocene dunes (southern portion of Reserve 8432, location 1295 and northern portion of 8433), dominated by species such as *Agonis flexuosa, Acacia cochlearis, Melaleuca acerosa, Spyridium globulosum* and with a rich herb layer.
- *Agonis flexuosa* forest and *Agonis flexuosa – Dryandra sessilis* woodlands on deeper Spearwood soils on the southern boundary of Reserve 8432 abutting the parabolic Holocene dunes.
- Jarrah – *Agonis* woodlands on the eastern boundary of reserve 8432 and 15426 on Spearwood and Gracetown land systems.
- *Dryandra sessilis* thicket and scrubs on western boundary of reserve 8432 and 15426 on shallow Spearwood sands over Tamala limestone.
- Jarrah – *Banksia ilicifolia* woodland in small patches along the eastern boundary of the reserve east of location 1295. This community type is much more common on the private property on the flats to the east of the present boundary.

The study area therefore contains a rich diversity of habitats all in very good condition. No significant weed invasion was seen within the vegetation units, although a significant number of weed taxa were recorded associated with roads and fence lines. None of these vegetation communities is restricted to the study area but this area is of very high scientific interest as it is the only long unburnt area (>40 years, P. Hanley, pers. comm.) known to us on the Leeuwin Ridge.

In spite of the generally excellent condition of the vegetation in the study area, on the coastal areas to the west, significant invasion by *Ehrharta villosa* was observed on the more mobile dunes. Provided the dunes remain undisturbed it is unlikely that this species will spread further east.

Flora

Species lists were compiled for four vegetation types adjacent to location 1295 (Shrublands on Holocene dunes, *Agonis* Forest, *Agonis – Dryandra* Woodland, & Jarrah – *Agonis* Forest). A total of 155 taxa in 54 families were recorded reflecting the diverse nature of this area. These species lists are far from complete and further survey could be expected to considerably increase the lists.

Three taxa of conservation significance were encountered. All are restricted to the Leeuwin Ridge. A new population of Declared Rare Flora (*Caladenia excelsa*) was located on the eastern boundary of reserve 8432 c. 250 m north of location 1295. This taxon is known from only a few populations on the Leeuwin Ridge between Cape Naturaliste and Margaret River; most populations are found along Caves Road. The population at Blackboy Hollow was found in the Jarrah – *Agonis* woodland and is within the proposed impact zone. Clearly a detailed survey is needed to determine the extent of the population before any works are undertaken. Such a survey would need to be carried out in spring when accurate determination of the species can be made.

Stylidium lowrieanum was also collected in the impact zone within reserve 8432. This taxon is only known from eight collections scattered along the ridge between Cape Naturaliste and Forest Grove. It was located in the *Agonis* forest and was locally abundant. All of the *Agonis* forest appears to be within the proposed impact zone.

The form of *Haloragis digyna* that is recorded from Leeuwin Ridge is considered to be taxonomically distinct from real *H. digyna* which occurs in the Esperance area (GJ Keighery, pers. comm.) There is a large population of this taxon in the Holocene parabolic dunes along the south of reserve 8432.

Fauna

The long unburnt and undisturbed nature of the vegetation at Blackboy Hollow suggests that a number of mammal species may be present. A range of possible refuge sites were apparent, including the large "skirts" on the numerous large plants of *Xanthorrhoea.* These would provide ideal refuges for some small and medium size mammals such as Pygmy Possum or Ringtail Possum. Any increase in the risk of fire would reduce the availability of refuge sites for these species and increase mortality. However, modification of the habitat in the national park near the proposed development is unlikely to pose a threat to the regional survival of most vertebrate species, although the effect on declared threatened species would be greater, albeit unknown.

It is not known whether any threatened species do occur at the site, but three declared threatened mammals occur in the Leeuwin-Naturaliste region: Chuditch, Quenda and Ringtail Possum. Each of these species is known to occur in the Prevelly-Margaret River area, and our inspection of the Blackboy Hollow area leads us to think that each of these species could occur in the south-eastern portion of this block, and possibly into location 1295. Any disturbance leading to opening up of the vegetation in this area (eg increased fire frequency) would result in increased risk to survival of animals of these species occurring in the vicinity, through increased exposure to predation (foxes or dogs).

The declared threatened Baudin's Black-Cockatoo *Calyptorhynchus baudinii* was recorded in Jarrah communities at the site, but it is unlikely to breed here. It is not likely that other declared threatened birds would be found at the site.

However, Boodjidup Brook, which runs east-west immediately to the south of Location 1295, was the last recorded location of the Noisy Scrub-bird (in 1889) before it was re-discovered at Two Peoples Bay, near Albany, in 1961 (Danks *et al.* 1996). Boodjidup Brook therefore has considerable historic significance with respect to scrub-birds. Furthermore, the Devil's Pool area on Boodjidup Brook (c. 750 m from the proposed development) has been considered as a translocation site for Noisy Scrub-birds, as it still contains apparently suitable habitat. If scrub-birds were released here, they would probably also utilise some of the area extending up drainage lines north of the pool, where there is dense

Lepidosperma gladiatum and *L. angustatum* under *Agonis*, *Spyridium* and other shrubs. This would bring them to within 500 m or less of the proposed development.

The possibility of releasing scrub-birds at Boodjidup Brook will be reconsidered following completion of the current translocation to the Darling Range site. However, the susceptibility of scrub-birds to fire (eg Smith1977, 1985) means that if the proposed development goes ahead, the fire risk would be far too great to allow the Boodjidup area to be used as a translocation site.

Conclusions

The National Parks lands adjacent to location 1295 are clearly of high conservation significance

- The south east corner of reserve 8432 contains populations of three Leeuwin Ridge endemics including a newly discovered population of *Caladenia excelsa* (Declared Rare Flora)
- The reserves contain a diversity of vegetation types all in very good condition with no significant weed invasion. These vegetation types are believed to be restricted to the Leeuwin Ridge.
- Reserve 8432 is likely to contain populations of declared rare fauna, but detailed survey would be required to confirm their presence.
- An area on Boodjidup Creek, immediately south of the proposed development, has been considered as a translocation site for Noisy Scrub-birds, but if the development proceeds, this would pose too great a risk to allow a translocation to be undertaken.
- The reserves are of significant scientific interest as they represent the only long unburnt examples of these vegetation types on the Leeuwin Ridge.

It is recommended that urgent further survey be carried out to determine the extent of the population of *Caladenia excelsa*. This will need to be done in spring when accurate identification is possible.

References

Anon. (1990) Prevelly Park Development Guidelines – Sussex Locations 815 & 1295.Shire of Augusta – Margaret River Planning Department.

Danks, A., Burbidge, A.A., Burbidge, A.H. and Smith, G.T. (1996) Noisy Scrub-bird Recovery Plan. Wildlife Management Program No. 12 (CALM, Perth).

Smith, G.T. (1977) The effect of environmental change on six rare birds. Emu 77: 173-179.

Smith, G.T. (1985) Population and habitat selection of the Noisy Scrub-bird (*Atrichornis clamosus*), 1962-1983. Australian Wildlife Research 12: 479-485.

Tille, P. and Lantzke, N. (1990) Busselton-Margaret River-Augusta land capability study. Western Australia. Dept. of Agriculture. Division of Resource Management

Appendix 1. Species list for four vegetation types in Leeuwin – Naturaliste National Park in the vicinity of location 1295. (Hd = Shrublands on Holocene Dunes, Ag = *Agonis* Forest, Ag/D = *Agonis* – *Dryandra* Woodland, J/Ag = Jarrah – *Agonis* Forest)

Family	*Naturalised*	*Taxon Name*	*Hd*	*Ag*	*Ag/D*	*J/Ag*
Amaranthaceae						
		Ptilotus sp	+	+		
Anthericaceae						
		Agrostocrinum scabrum				+
		Johnsonia lupulina				+
		Sowerbaea laxiflora	+	+		
		Tricoryne elatior	+			
Apiaceae						
		Daucus glochidiatus	+			
		Eryngium palustris MS	+			
		Eryngium pinnatifidum	+		+	
		Homalosciadium homalocarpum				+
		Platysace tenuissima				+
		Trachymene pilosa	+		+	+
		Xanthosia huegelii				+
Araceae						
	*	Zantedeschia aethiopica	+	+		+
Asphodelaceae						
		Bulbine semibarbata		+		
Asteraceae						
	*	Arctotheca calendula	+			
		Brachyscome iberidifolia	+		+	+
		Craspedia sp		+		+
		Helichrysum cordatum			+	
	*	Hypochaeris glabra				+
		Lagenifera huegelii		+		+
		Millotia tenuifolia	+		+	
		Olearia axillaris	+		+	
		Podolepis gracilis	+			
		Podolepis lessonii		+		
		Podotheca angustifolia	+		+	
	*	Senecio elegans	+			
		Senecio lautus	+		+	+
	*	Sonchus oleraceus	+		+	
		Sonchus sp.		+		
		Waitzia citrina				+
Brassicaceae						
	*	Heliophila pusilla	+		+	
Caryophyllaceae						
	*	Petrorhagia velutina	+			

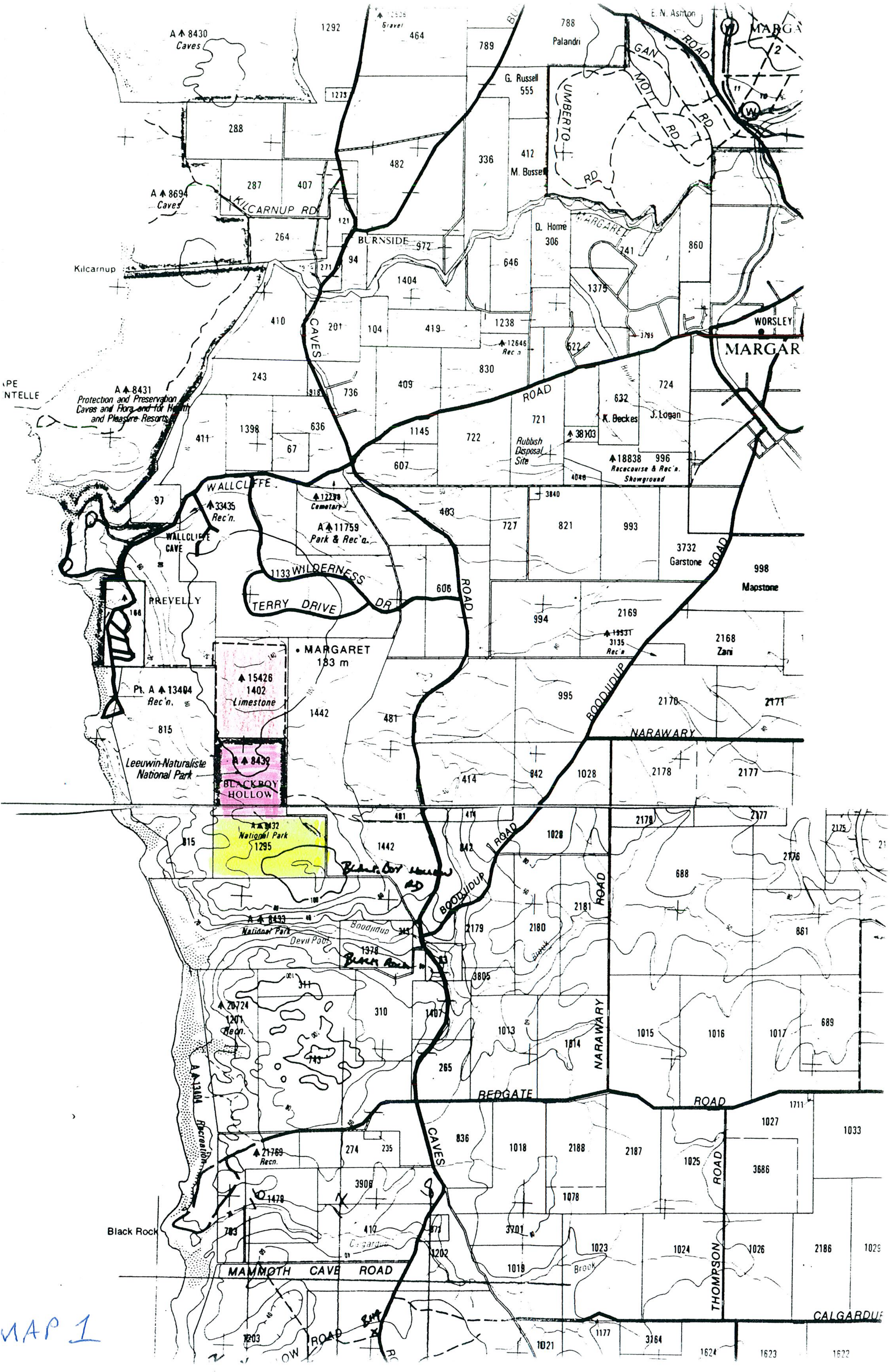
Centrolepidaceae						
	Centrolepis drummondiana		+			
Chenopodiaceae						
	Rhagodia baccata	+				
Colchicaceae						
	Burchardia congesta					+
Crassulaceae						
	Crassula colorata	+	+			+
Cyperaceae						
*	Isolepis marginata	+				
	Lepidosperma angustatum	+	+			+
	Lepidosperma gladiatum	+	+	+		
	Tetraria octandra	+				
Dasypogonaceae						
	Dasypogon bromeliifolius					+
Dennstaedtiaceae						
	Pteridium esculentum					+
Dilleniaceae						
	Hibbertia cuneiformis	+	+			
	Hibbertia grossulariifolia	+				
	Hibbertia hypericoides		+			+
	Hibbertia racemosa	+				
Droseraceae						
	Drosera occidentalis					+
Epacridaceae						
	Andersonia spp					+
	Astroloma sp.					+
	Conostephium preissii					+
	Leucopogon australis	+				
	Leucopogon sp					+
	Leucopogon verticillatus					+
	Lysinema ciliatum					+
Euphorbiaceae						
	Phyllanthus calycinus	+				+
	Poranthera microphylla		+	+		+
Gentianaceae						
*	Centaurium erythraea	+				
Geraniaceae						

	Geranium retrorsum	+			
*	Pelargonium capitatum		+		
Goodeniaceae					
	Scaevola nitida	+		+	
Haemodoraceae					
	Anigozanthos manglesii			+	
	Conostylis aculeata	+			+
	Phlebocarya ciliata				+
Haloragaceae					
	Haloragis aff. digyna	+		+	
Iridaceae					
	Patersonia occidentalis		+		+
Lauraceae					
	Cassytha sp.	+			
Lobeliaceae					
	Isotoma hypocrateriformis		+		
	Lobelia tenuior	+		+	
Loganiaceae					
	Mitrasacme paradoxa				+
Mimosaceae					
	Acacia cochlearis	+			
	Acacia cyclops	+			
	Acacia littorea	+		+	
	Acacia pulchella				+
	Acacia saligna				+
Myrtaceae					
	Agonis flexuosa		+	+	+
	Agonis juniperina	+			
	Eucalyptus calophylla				+
	Eucalyptus marginata		+		+
	Hypocalymma angustifolium				+
	Kunzea recurva				+
	Melaleuca acerosa	+		+	+
	Melaleuca thymoides				+
Orchidaceae					
	Caladenia excelsa MS				+
	Caladenia flava				+
	Caladenia sp.		+		
	Elythranthera brunonis				+
	Pterostylis recurva				+
	Thelymitra sp.				+

Orobanchaceae						
	*	Orobanche minor	+			
Papilionaceae						
		Bossiaea disticha		+		+
		Bossiaea linophylla		+		+
		Daviesia inflata				+
		Gompholobium aristatum				+
		Gompholobium tomentosum				+
		Hardenbergia comptoniana		+		+
		Jacksonia horrida	+	+		+
	*	Melilotus indicus				+
		Pultenaea reticulata				+
		Templetonia retusa	+			
	*	Trifolium campestre	+			
Pittosporaceae						
		Billardiera candida	+		+	
Poaceae						
	*	Aira caryophyllea	+	+		
	*	Briza minor				+
	*	Bromus diandrus	+			
		Danthonia sp.				+
		Dichelachne crinita				+
	*	Ehrharta villosa	+			
	*	Lagurus ovatus	+			
	*	Lolium rigidum	+			
	*	Lolium aff. rigidum	+			
		Poa drummondiana	+			
		Stipa flavescens	+		+	
Polygalaceae						
		Comesperma virgatum	+			
		Comesperma volubile				+
Polygonaceae						
		Muehlenbeckia adpressa	+	+	+	
Portulacaceae						
		Calandrinia sp 1		+		
		Calandrinia sp 2		+		
Primulaceae						
	*	Anagallis arvensis	+	+		
Proteaceae						
		Banksia grandis		+		+
		Banksia ilicifolia				+
		Conospermum capitatum				+

		Dryandra nivea	+			
		Dryandra sessilis			+	
		Hakea prostrata	+			
		Hakea ruscifolia				+
		Persoonia longifolia		+		+
Ranunculaceae						
		Clematis microphylla	+			
Restionaceae						
		Anarthria prolifera				+
		Anarthria scabra				+
		Loxocarya flexuosa	+		+	+
Rhamnaceae						
		Spyridium globulosum	+	+	+	
Rubiaceae						
		Opercularia hispidula				+
Rutaceae						
		Boronia crenulata				+
		Diplolaena dampieri	+			
		Eriostemon spicatus				+
Santalaceae						
		Exocarpos sparteus	+			
Scrophulariaceae						
	*	Bellardia trixago	+			
	*	Dischisma arenarium	+	+	+	
	*	Parentucellia latifolia	+			
Solanaceae						
		Anthocercis littorea			+	
Stackhousiaceae						
		Stackhousia monogyna	+	+		+
		Tripterococcus brunonis				+
Stylidiaceae						
		Levenhookia stipitata		+		+
		Stylidium brunonianum				+
		Stylidium calcaratum				+
		Stylidium fasciculatum	+			
		Stylidium lowrieanum		+		
		Stylidium piliferum				+
		Stylidium violaceum		+		
Thymelaeaceae						
		Pimelea ferruginea	+			

	Pimelea rosea	+		+	+
	Pimelea spectabilis				+
Urticaceae					
	Parietaria debilis	+	+		
Xanthorrhoeaceae					
	Xanthorrhoea preissii	+	+	+	+
Zamiaceae					
	Macrozamia riedlei		+		+



A 8430 Caves
A 8694 Caves
KILCARNUP RD
Kilcarnup
BURNSIDE
CAVES
A 8431 Protection and Preservation Caves and Flora and for Health and Pleasure Resorts
WALLCLIFFE
WALLCLIFFE CAVE
33435 Rec'n.
12238 Cemetery
A 11759 Park & Rec'n.
WILDERNESS DR
TERRY DRIVE
PREVELLY
MARGARET 183 m
15426 1402 Limestone
Pt. A 13404 Rec'n.
Leeuwin-Naturaliste National Park
A 8432
BLACKBOY HOLLOW
A 8432 National Park 1295
A 8433 National Park
Devil Pool
20724 1201 Recn.
A 13104 Recreation
21769 Recn.
Black Rock
MAMMOTH CAVE ROAD
CAVES ROAD
BOODJIDUP ROAD
NARAWARY
NARAWARY ROAD
REDGATE ROAD
THOMPSON ROAD
CALGARDUP
G. Russell 555
Palandri
E. N. Ashton
UMBERTO RD
M. Bussell
D. Home 306
MARGARET
WORSLEY
12646 Rec'n
Rubbish Disposal Site
18838 996 Racecourse & Rec'n. Showground
K. Beckes
J. Logan
3732 Garstone
998 Mapstone
2168 Zani
19531 3135 Rec'n

MAP 1