VEGETATION SURVEY OF BOOLANELLING

NATURE RESERVE.

Prepared for:

Reserve Management Officer

Pingelly Management District

Department of Conservation and Land Management.

Anne Coates

Consultant Botanist

83B Palmerston Street

Mosman Park WA 6012

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1.0 INTRODUCTION

1.1 DESCRIPTION OF PROJECT

Boolanelling Nature Reserve (668.8153 ha) is one of the largest Nature Reserves in the Bruce Rock Shire and the Western or Central Wheatbelt. The reserve has no major areas of granite outcropping or salt lakes and is thus one of the largest blocks of central wheatbelt vegetation.

Part of the reserve was surveyed by B.G. Muir in 1978, but a more detailed analysis, and total reserve coverage is required to fully document the vegetation. In his report B. Muir (1978) stated that Boolanelling Nature Reserve was one of the finest reserves he had encountered in that region of the wheatbelt. It carries a rich vegetation both structurally and floristically and represents some of the dominant vegetation types of the region prior to clearing.

The objective of this project is to undertake an extensive vegetation survey of the reserve.

1.2 PROJECT REQUIREMENTS

The specific objectives of the vegetation survey as set out in the Consultancy offer and agreement are as follows:-

(a) Produce a vegetation map for the reserve of the floristic/structural vegetation types identified. The map should also include dominant geomorphological features such as granite rocks and stream lines.

(b) Provide a series of association descriptions, based on Muir (1977) with floristic clarification, which cover the range of associations found on the reserve. The site of each description should be recorded on the appropriate vegetation map.

(c) Identify vegetation types, or specific sites which require management considerations.

(d) Collect and identify a representative sample of the flora of the reserve, and lodge any flowering specimens with the W.A. Herbarium, and voucher specimens with the Reserve Management Office, Pingelly. Compile a flora species list.

(e) Record the identity, location and estimated population size of any gazetted rare plant, or other plants of interest (restricted distribution) which may occur on the reserve.

1.3 LOCATION

Boolanelling Nature Reserve (No. 22792) is located in the South West corner of the Bruce Rock Shire, approximately 25.5 km north north-west of Corrigin townsite (figure 1).

1.4 PHYSICAL ENVIRONEMENT

A) Geology and Soils

Beard (1980) describes the geology of the Corrigin area in which the reserve is situated. The area is part of the Yilgarn Block a very ancient rigid "Shield" area composed mainly of Archaen granite and gneiss with some altered volcanics and sediments.

Over the millions of years since the Yilgarn Block was first formed, it has been levelled by glaciation and traversed by sluggish meandering rivers. When the climate became drier and more seasonal, rivers degenerated to chains of salt lakes, and although weathering continued there was no removal of the resultant products. Hence, valleys have been gradually filling up, as rivers no longer flow through the area. The landscape is therefore gently undulating and of low relief, the only exception being occassional granite outcrops.

The soils of this area have been mapped in Sheet 5 of the Atlas of Australian Soils (Northcote et. al., 1967). Northcote et. al. describes the area as gently undulating to rolling terrain with some ridges and uneven slopes, and with the variable presence

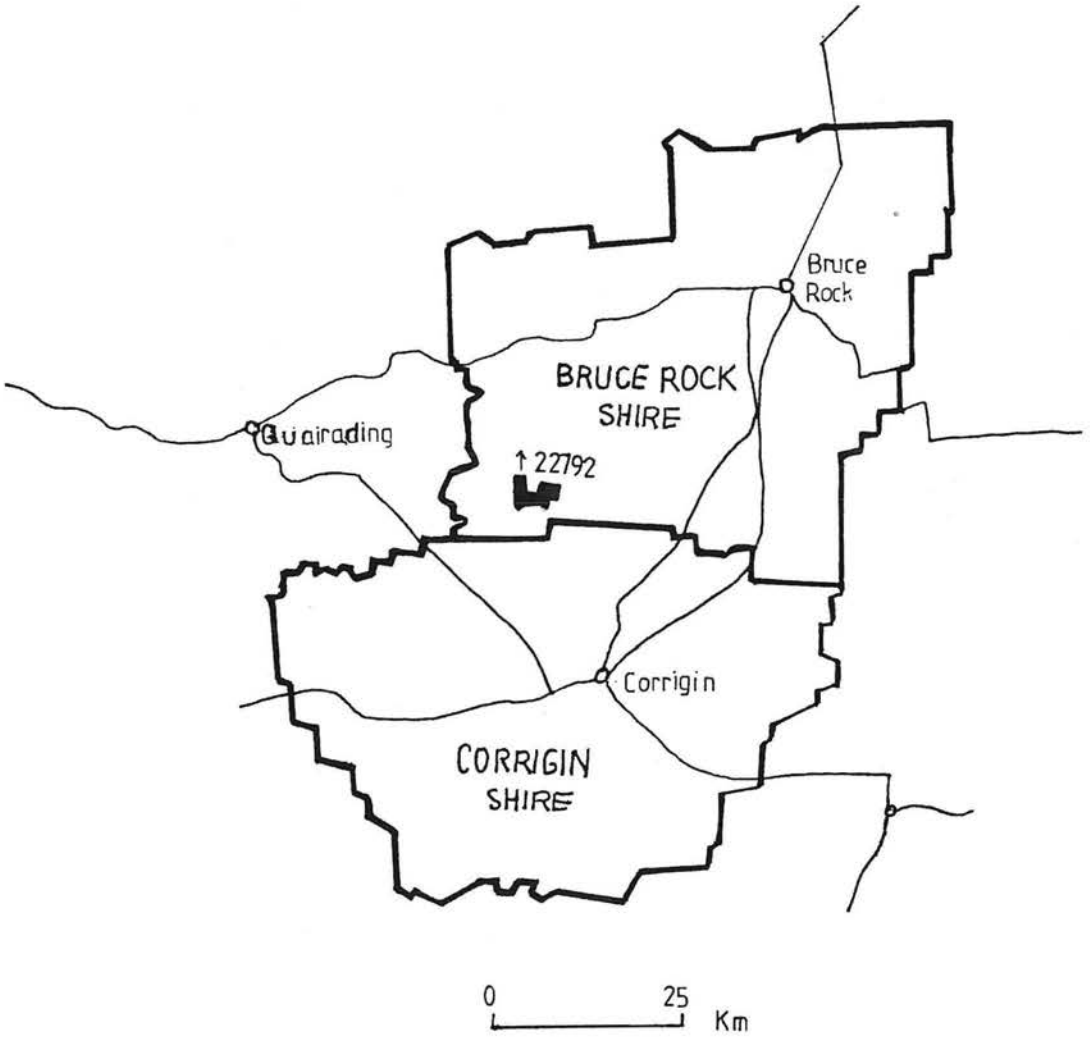


Figure 1. Location of Boolanelling Nature Reserve (22792)

of lateritic mesas and buttes and granitic tors and bosses. The chief soils of the area are hard alkaline yellow mottled soils. Shallow and often stony or gritty sandy soils form a soil scree around areas of bare rock.

B) Climate

The area has a typical wheatbelt climate with hot dry summers and mild wet winters. Meteorological data from Corrigin Post Office is given in Table 1. The region of the reserve is characterised by an average yearly rainfall of 379 mm. Most of the rain is received in winter from May to August with occassional thunderstorms in late summer and early autumn. Winters are mild with the mean temperature of the coldest month above 10° C. The mean temperature of the hottest month exceeds 25° C and absolute maxima above 40° C occur.

Beard (1980) classes the Corrigin regime with it's 7 dry months as Dry Warm Mediterranean.

TABLE 1. SUMMARY OF METEOROLOGICAL DATA RECORDED AT CORRIGIN (FROM BUREAU OF METEROLOGY 1985).

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN or TOTAL
Mean Rainfall (mm)	11	17	23	23	49	65	62	49	30	24	14	12	379
No. Rainy Days	2	3	3	5	10	13	15	12	9	7	4	2	85
Mean Max. Temp. °C.	32.5	31.4	28.6	23.6	19.5	16.3	15.2	16.1	18.6	22.8	27.0	30.8	23.5
Mean Min. Temp. °C.	16.0	16.1	14.3	10.9	7.3	6.4	5.1	4.5	5.6	8.2	11.3	14.2	10.0
Rel. Humidity % 3pm.	25	28	31	41	49	61	61	55	47	34	27	24	40.0

1.5 RESERVE HISTORY

The Boolanelling Nature Reserve was originally gazetted on the 30th April, 1948 for "Public Utility" and was 283 ha in area. It's purpose was then changed to "Conservation of Flora" on 15th June, 1962. It was decreased in size to 279 ha on 7th June, 1968 by creating extensions to road 136.36, then to 260 ha on 2nd July, 1971 by excluding Avon location 28350. It was later increased to 277.5 ha on 18th August, 1972 by inclusion of Avon location 28456. No reasons were given for the addition or subtraction of these locations. On 12th October, 1979 the purpose was changed to Conservation of Flora and Fauna and was vested in the Western Australian Wildlife Authority.

In 1979 Reserve Management Officer Ken Wallace examined uncleared land adjacent to Boolanelling Reserve and recommended the purchase of some of this land by the Department of Fisheries and Wildlife. On 15th February, 1982, Avon location 28350 and portions of Avon locations 23980 and 25760 were purchased and added to the reserve to realise the present area of 668.8153 ha.

1.6 PHYSICAL FEATURES OF THE RESERVE

Boolanelling Nature Reserve (22792) is irregular in shape with a total perimeter of ca 18.3 km . Gravel roads run along the southern and western boundries and Copestakes road runs through the western portion.

The reserve is surrounded by privately owned land most of which has been cleared and is used for cropping and as pasture for stock. Uncleared land adjoining the reserve is shown in Figure 2.

The reserve lies between 330 and 380 m above sea level. The highest point is a laterite hill in the centre towards the northern boundary. There is a decline to 340 m ASL at the eastern boundary, 350 m at the S-E end and 330 m at the N-W corner. (Figure 3).

The tracks in the eastern section were made before the purchase of this land by the Department in 1982 and are now becoming overgrown in places. There are some areas of exposed granite mainly in the eastern section.

FIGURE 2.

BOOLANELLING NATURE RESERVE 22792 — PHYSICAL FEATURES

SCALE 1 : 20 000

1 cm = 200 m

AREA 668.8153 ha

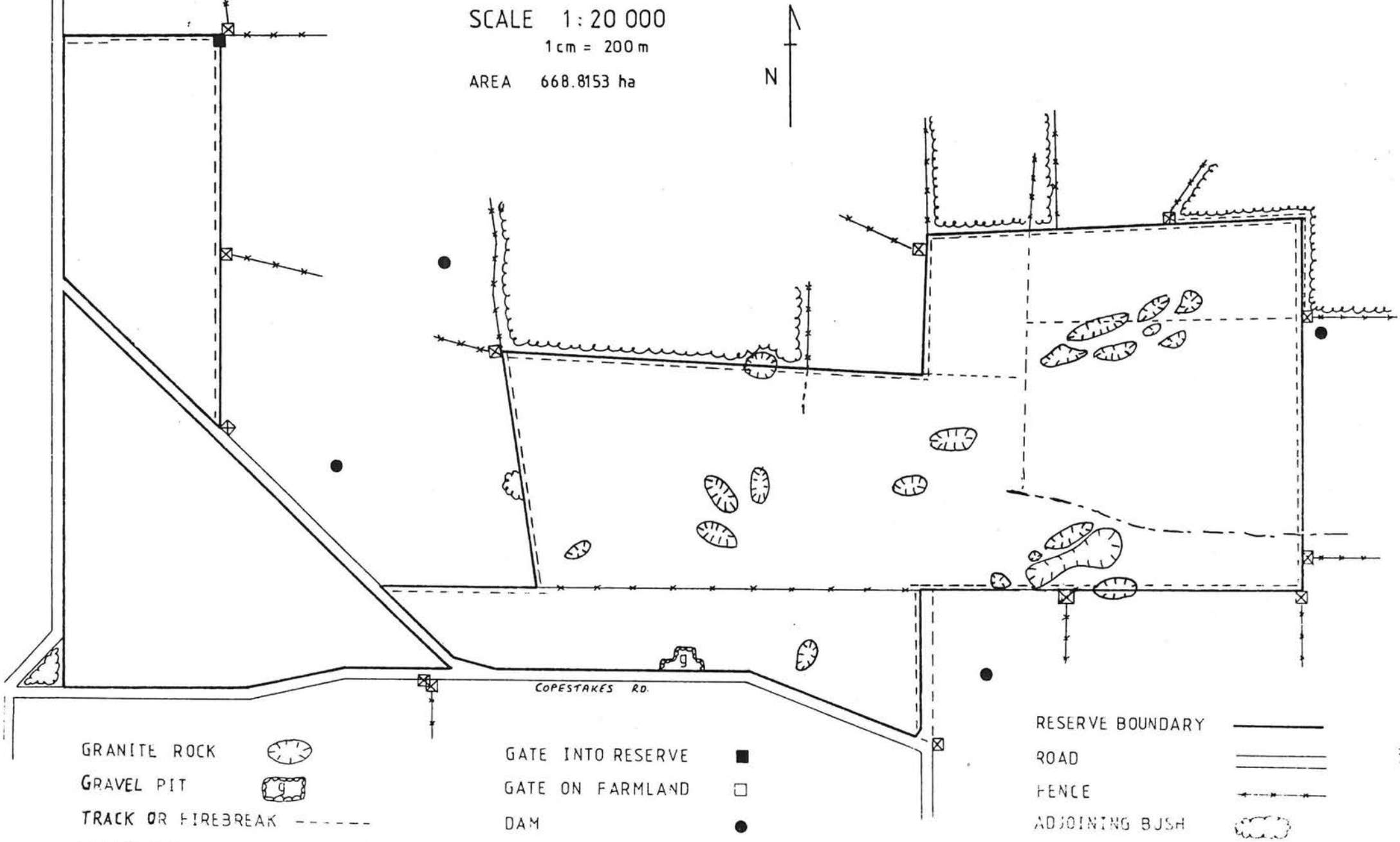
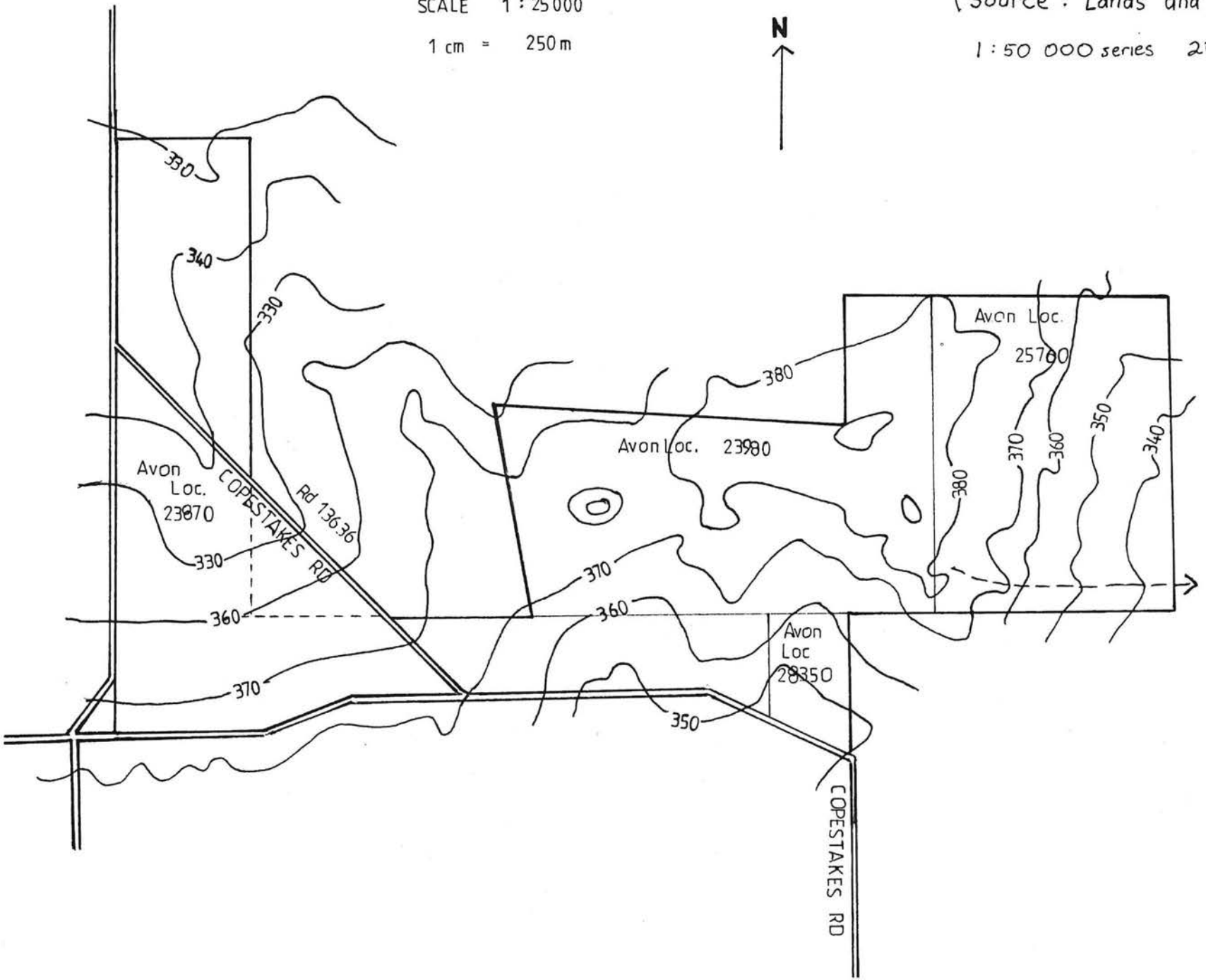


FIGURE 3. BOOLANELLING NATURE RESERVE. (22792) Cadastral Information & Contour Lines

SCALE 1 : 25000

1 cm = 250 m

(Source : Lands and Survey 1 : 50 000 series 2433-1)



No permanent water exists on the reserve, temporary watercourses are shown in Figure 2.

1.7 FIRE HISTORY

Evidence of fire in the form of burnt "Stays" of *Allocasuarina huegeliana* were found on granite outcrops examined towards the eastern boundary. This area was added to the reserve in 1982 and was probably burnt at least 15 to 20 years ago.

No evidence of fire was found in other sections of the reserve. B. Muir (1978) reports information gained from a local farmer (Mr Copestakes) which indicates that the reserve was burnt ca 30 years ago.

2.0 METHOD

The reserve was visited on two occassions for a total of seven days during April, 1985.

The vegetation survey was based on the use of aerial photographs, Lands and Survey Department 1:40,000 scale black and white. The photographs were examined under a stereo viewer and approximate boundries of vegetation types drawn on the photographs. Areas thus delineated were examined in the field and the vegetation and soils at selected sites described.

Vegetation was classified using Muirs (1977) system (Table 2) which was designed specifically for describing wheatbelt vegetation.

Voucher specimens of most plant species were collected and taken to the Western Australian Herbarium for identification. Most specimens were collected at the selected vegetation sites, but a number were collected outside these areas.

Due to time limitations a few areas were not examined in detail and these were mapped directly from aerial photographs and information gained from brief visits in the field.

TABLE 2. MUIR SYSTEM OF VEGETATION CLASSIFICATION

LIFE FORM/HEIGHT CLASS	CANOPY COVER			
	DENSE 70-100% d	MID-DENSE 30-70% c	SPARSE 10-30% i	VERY SPARSE 2-10% r
T Trees >30m	Dense Tall Forest	Tall Forest	Tall Woodland	Open Tall Woodland
M Trees 15-30m	Dense Forest	Forest	Woodland	Open Woodland
LA Trees 5-15m	Dense Low Forest A	Low Forest A	Low Woodland A	Open Low Woodland A
LB Trees <5m	Dense Low Forest B	Low Forest B	Low Woodland B	Open Low Woodland B
KT Mallee tree form	Dense Tree Mallee	Tree Mallee	Open Tree Mallee	Very Open Tree Mallee
KS Mallee shrub form	Dense Shrub Mallee	Shrub Mallee	Open Shrub Mallee	Very Open Shrub Mallee
S Shrubs >2m	Dense Thicket	Thicket	Scrub	Open Scrub
SA Shrubs 1.5-2.0m	Dense Heath A	Heath A	Low Scrub A	Open Low Scrub A
SB Shrubs 1 0-1.5m	Dense Heath B	Heath B	Low Scrub B	Open Low Scrub B
SC Shrubs 0.5-1.0m	Dense Low Heath C	Low Heath C	Dwarf Scrub C	Open Dwarf Scrub C
SD Shrubs 0.0-0.5m	Dense Low Heath D	Low Heath D	Dwarf Scrub D	Open Dwarf Scrub D
P Mat plants	Dense Mat Plants	Mat Plants	Open Mat Plants	Very Open Mat Plants
H Hummock Grass	Dense Hummock Grass	Mid-Dense Hummock Grass	Hummock Grass	Open Hummock Grass
GT Bunch grass >0.5m	Dense Tall Grass	Tall Grass	Open Tall Grass	Very Open Tall Grass
GL Bunch grass <0.5m	Dense Low Grass	Low Grass	Open Low Grass	Very Open Low Grass
J Herbaceous spp.	Dense Herbs	Herbs	Open Herbs	Very Open Herbs
VT Sedges >0.5m	Dense Tall Sedges	Tall Sedges	Open Tall Sedges	Very Open Tall Sedges
VL Sedges <0.5m	Dense Low Sedges	Low Sedges	Open Low Sedges	Very Open Low Sedges
X Ferns	Dense Ferns	Ferns	Open Ferns	Very Open Ferns
Mosses, liverwort	Dense Mosses	Mosses	Open Mosses	Very Open Mosses

3.0 RESULTS

3.1 VEGETATION

Boolanelling Nature Reserve is situated in the Avon Botanical District. Beard (1980) places the reserve in the Pikaring Vegetation System and more specifically the area is described as *Allocasuarina* thicket with scattered wandoo.

Twenty one vegetation types were found on the reserve and are described in the following pages. These include 5 types of woodland, 4 types of Mallee, 9 types of heath and 3 vegetation types associated with granite outcrops.

A list of species recorded at each site can be found in Appendix 2.

A) Woodland Formations

SITE 21. Gimlet woodland with scattered Salmon Gums.

Key Description: Woodland on pink clay loam, poorly drained.

Stratum 1. *Eucalyptus salubris* trees with scattered *Eucalyptus salmonophloia* trees emergent. Mature to senescent, stratum 15-20 m, emergents to 25 m, 10-30% cover.

Comments. Scattered shrubs <2% canopy cover are also present along with *Eucalyptus gracilis*, *Eucalyptus loxophleba*, *Eucalyptus myriadena* and *Eucalyptus wandoo*.

This vegetation type also occurs at site 29. Here the gimlet is immature, stratum 4-12 m, and *Eucalyptus myriadena* and *Eucalyptus gracilis* were not recorded.

Photograph 1. Gimlet woodland with scattered salmon gum.

SITE 2. Wandoo woodland Type 1.

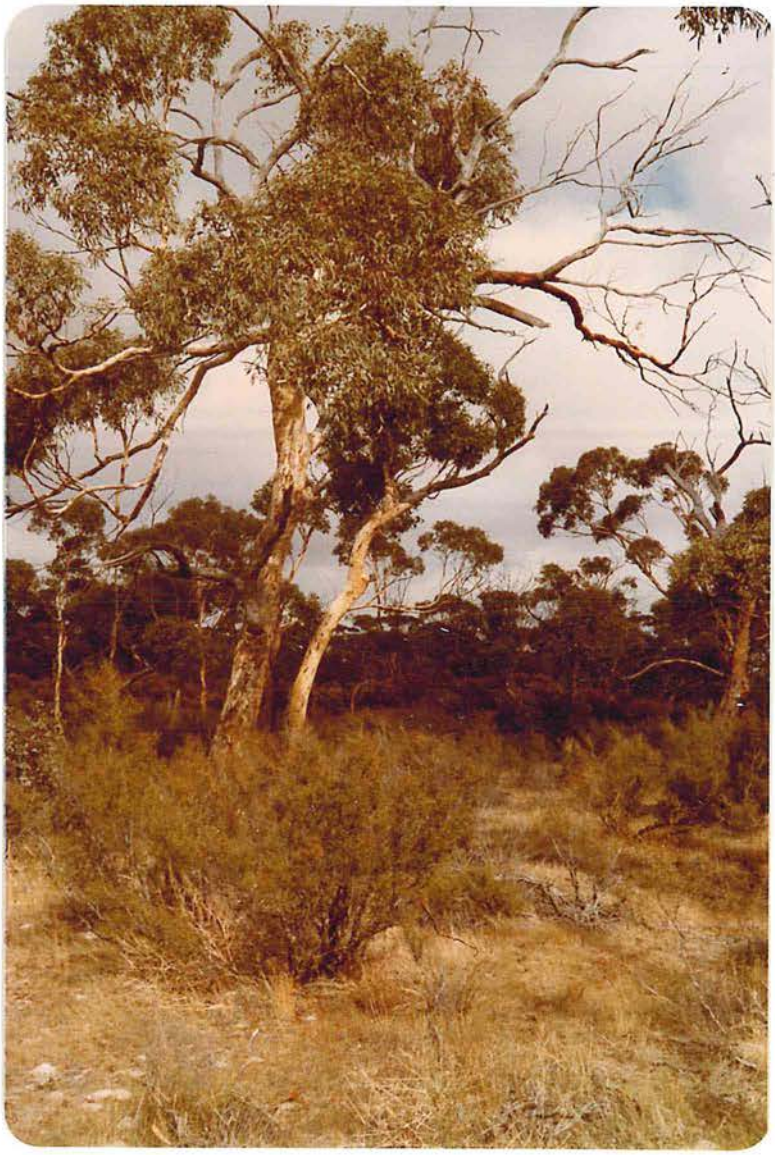
Key description. Woodland over low Scrub A over very Open Low Sedge on pink, clay loam, poorly drained.

Stratum 1. *Eucalyptus wandoo* trees. Mature, stratum 12-20 m, 10-30% cover.

Stratum 2. *Allocasuarina campestris* and *Leptospermum erubescens* shrubs. Mature , stratum 0.5 - 2 m, 10-30% canopy cover. Other species present, scattered, 0.5-1 metre.

Stratum 3. *Loxocarya pubescens* sedge, 20cm tall, 2-10% canopy cover.

PHOTOGRAPH 2. Wandoo woodland with *Allocasuarina* and *Leptospermum* (Type 1).



SITE 18. Wandoo woodland Type 2.

Key description. Woodland over open low sedge on pink, clay loam, poorly drained.

Stratum 1. *Eucalyptus wandoo* trees, stratum 8-12 m, 10-30% cover.

Stratum 2. *Loxocarya pubescens* sedge, 20 cm tall 10-30% cover.

Comments. Scattered shrubs are also present in this vegetation type cover <2%.

PHOTOGRAPH 3. Wandoo woodland with the understorey almost absent (Type 2). Note weed invasion.

SITE 1. Mixed woodland.

Key description. Low Forest A on pink, clay loam, poorly drained.

Stratum 1. *Eucalyptus wandoo*, *Eucalyptus sp.*, *Eucalyptus anceps*, *Eucalyptus celastroides*, *Eucalyptus calycogona*, *E. aff. occidentalis* trees and mallee forms with emergent *E. salmonophloia* trees. Mature and immature species present, stratum 8-15 m, emergents to 20 m, 30-70% cover.

Comments. Scattered shrubs <2% cover were also present in this vegetation type.

PHOTOGRAPH 4. Mixed woodland with scattered Salmon Gums.

SITE 22. *Eucalyptus astringens* woodland.

Key description. Low Forest A on pink clay loam ca 80% laterite.

Stratum 1. *Eucalyptus astringens* with scattered *E. wandoo* trees, stratum 8-12 m, 30-70% cover.

Comments. *Eucalyptus anceps* and *Eucalyptus flocktoniae* are present on the edge of this vegetation type with scattered shrubs.

PHOTOGRAPH 5. Mallet woodland with scattered wandoo.
The photograph was taken from the top of a lateritic hill.

B) Mallee areas

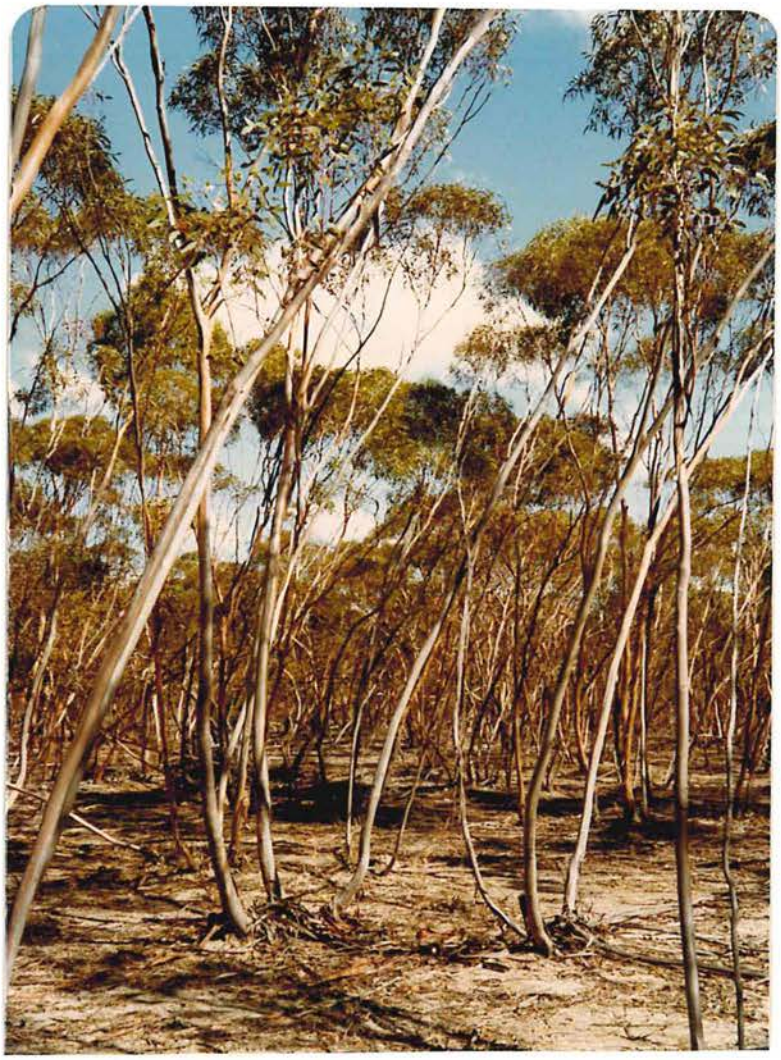
SITE 3. Mallee type 1.

Key description. Dense tree mallee on pale brown, sandy clay loam, poorly drained.

Stratum 1. *Eucalyptus eremophila*, *Eucalyptus celastroides* and *Eucalyptus flocktoniae* mallee. Stratum 4-8 m, 70-100% canopy cover.

Comments. Scattered shrubs, cover <2% also occur in this association.

PHOTOGRAPH 6. Mallee area type 1. *Eucalyptus flocktoniae* in foreground *Eucalyptus eremophila* and *Eucalyptus celastroides* in the background.



SITE 4. Mallee type 2.

Key description. Dense tree mallee over Open Dwarf Scrub D on yellowish brown, sandy clay loam, poorly drained.

Stratum 1. *Eucalyptus eremophila*, *Eucalyptus anceps* and *E. aff. redunca* mallee. Mature, stratum 3-5 m, 70-100% cover.

Stratum 2. Mixed shrubs (no particular dominant) stratum 0.0-0.5 m, 2-10% cover.

Comments. This vegetation type was also recorded at Site 13.

PHOTOGRAPH 7. Mallee area type 2. *Eucalyptus aff. redunca* is in the foreground (rough bark).

SITE 32. Mallee type 3.

Key description. Dense tree mallee on pale brown, sandy clay loam.

Stratum 1. *Eucalyptus calycogona*, *E. celastroides*, and *E. anceps* mallee. Stratum 4-6 m, 70-100% cover.

PHOTOGRAPH 8. Mallee type 3. *Eucalyptus calycogona*, *Eucalyptus celastroides* and *E. anceps*.

SITE 10. Mallee type 4.

Key description. Tree Mallee over Open Dwarf Scrub C over open low sedges on light brown sandy loam.

Stratum 1. *Eucalyptus albida* mallee. Stratum 3-8 m, 30-70% cover.

Stratum 2. Mixed shrubs, stratum 0.5 - 1.0 m, cover 2-10%.

Stratum 3. *Loxocarya pubescens*. 20 cm tall 10-30% cover.

C) Heath

SITE 5. *Melaleuca* heath.

Key description. Dense low heath C on pale brown, sandy loam, well drained.

Stratum 1. Mixed shrubs with *Melaleuca ? spathulata* and *Leptospermum erubescens* prominant. Mature, stratum 0.5 - 1 metre, 70-100% cover with emergent *Eucalyptus albida* to ca 4 metre tall <2% cover.

Comments. This vegetation type was also found at site 14, although species typical of the tall mixed heath were also recorded at this site.

PHOTOGRAPH 9. *Melaleuca* heath with emergent *Eucalyptus albida*.

SITE 8. Low mixed heath.

Key description. Dense Low Heath D on very pale brown, sandy loam, well drained.

Stratum 1. Mixed shrubs, no particular dominant. Mature to senescent, stratum 0.0-0.5 m, 70-100% cover. *Allocasuarina campestris* emergent to 1 metre, <2% cover.

PHOTOGRAPH 10. Low mixed heath.

SITE 7. Mixed heath with emergent *Eucalyptus macrocarpa*.

Key description. Low Heath C on very pale brown, sandy loam, well drained.

Stratum 1. Mixed shrubs, no particular dominant, *Beaufortia micrantha*, *Dryandra cirsioides* and *Melaleuca leptospermoides* prevalent. Mature, stratum 0.5 - 1.0 metre, 30-70% cover with *Eucalyptus macrocarpa* emergent to 3 metre, cover <2%.

Comments. The vegetation at Site 16 has the same structure as that found above but also contains species found in the tall and low mixed heath areas. It therefore appears to be a transition zone.

PHOTOGRAPH 11. Mixed heath with emergent *Eucalyptus macrocarpa*.

SITE 15. Tall mixed heath.

Key description. Low Heath C on yellow, sandy clay loam with ca 50% laterite, well drained.

Stratum 1. Mixed shrubs, no particular dominant but *Dryandra ferruginea*, *Banksia sphaerocarpa* and *Petrophile* sp., prominant. Mature, stratum 0.5 - 1.0 metre, 30-70% cover.

PHOTOGRAPH 12. Tall mixed heath.

SITE 17. *Dryandra horrida* heath.

Key description. Low heath C on light yellow-brown sandy loam, well drained.

Stratum 1. Mixed shrubs with *Dryandra horrida* prominent. Mature, stratum 0.5-1 metre, 30-70% cover with emergent *Grevillea excelsior* to 4 metres, <2% cover.

PHOTOGRAPH 13. *Dryandra horrida* heath.

SITE 35. *Eremaea pauciflora* and *Leptospermum erubescens* heath.

Key description. Low Heath C on light brown sandy loam.

Stratum 1. *Eremaea pauciflora* and *Leptospermum erubescens* shrubs. Stratum 0.5 - 1 metre; 30-70% cover.

PHOTOGRAPH 14. *Eremaea pauciflora* and *Leptospermum erubescens* heath.

SITE 31. Tamma heath Type 1.

Key description. Heath B over Open Dwarf Scrub C on light brown sandy loam ca 40% laterite.

Stratum 1. *Allocasuarina campestris* shrubs. Immature, 1.0-1.5 metres, 30-70% cover.

Stratum 2. Mixed shrubs stratum 0.5-0.1 m cover 2-10%.

Comments. This vegetation type was also recorded at sites 31 and 33. It appears from the aerial photographs that this area was cleared at least 10-15 years ago. On the western side of this section is a small area of *Dryandra* heath with *Dryandra cirsioides*, *Hakea gilbertii*, *Beaufortia micrantha* and *Petrophile ericifolia* prominant. Stratum 0.5 - 1 m, 70-100% cover. This area was too small to include on the vegetation map.

SITE 11. Tamma heath type 2.

Key description. Heath A over Open Dwarf Scrub D on pale brown sandy loam with patches of ca 20% laterite.

Stratum 1. *Allocasuarina campestris* shurbs. Stratum 1-2 metres, 30-70% cover.

Stratum 2. Mixed shrubs. Stratum 0.0-0.5 m, 2-10% cover.

Comments. This vegetation type also occurred at sites 6 and 9. The *Allocasuarina campestris* appears to become more dense in areas where lateritic pebbles are found.

PHOTOGRAPH 15. Tamma heath type 2.

SITE 19. Tamma heath type 3.

Key description. Low Scrub A over Low heath C over open low sedges on yellow brown sandy loam 50% laterite.

Stratum 1. *Allocasuarina campestris* shrubs. Mature, stratum 1.5-2.0 m, 10-30% cover with emergent *Eucalyptus macrocarpa* and *Grevillea excelsior* to 3 metres.

Stratum 2. Mixed shrubs. Mature, stratum 0.5 - 1.0 m 30-70%.

Stratum 3. *Mesomelaena preissii* sedge, 0.5 m tall, 10-30% cover.

Comments. This vegetation type was also recorded at sites 23 and 30.

PHOTOGRAPH 16. Tamma heath type 3.

D) Granite outcrops

SITE 28. Exposures of bare rock. Where the outcrop is subsurface a cover of *Borya nitida* was recorded. Scattered shrubs were recorded on shallow coarse loam surrounding the outcrop on the edge of the *Allocasuarina* thicket.

SITE 28. Tamma thicket type 1.

Key description. Low Woodland A over dense thicket on brown sandy loam.

Stratum 1. *Allocasuarina huegeliana* trees. Stratum 5-8 metres, cover 10-30%.

Stratum 2. *Allocasuarina campestris* shrubs. Stratum 2-3 metres, 70-100% cover.

Comments. This vegetation type was also recorded at site 34.

PHOTOGRAPH 17. Granite outcrops showing the tamma thicket in the background. The photograph was taken from the top of the exposed granite.

SITE 20. Exposures of bare rock. Where the outcrop is subsurface a cover of *Borya nitida* was recorded. Scattered shrubs were recorded on the edge of the *Allocasuarina* thicket.

SITE 20. Tamma thicket type 2.

Key descriptions. Dense thicket on brown sandy loam.

Stratum 1. *Allocasuarina campestris* shrubs. Mature, stratum 2-4 m, 70-100% cover with emergent *E. wandoo* to 8 m, cover <2%.

Comments. This vegetation type also occurred at sites 24, 25, and 26 but *Eucalyptus wandoo* was not recorded at these sites. At site 25 *Leptospermum aff. erubescens* and *Melaleuca uncinata* were prominant.

SITE 27. Tamma thicket type 3.

Key description. Dense heath A on pale brown sandy loam.

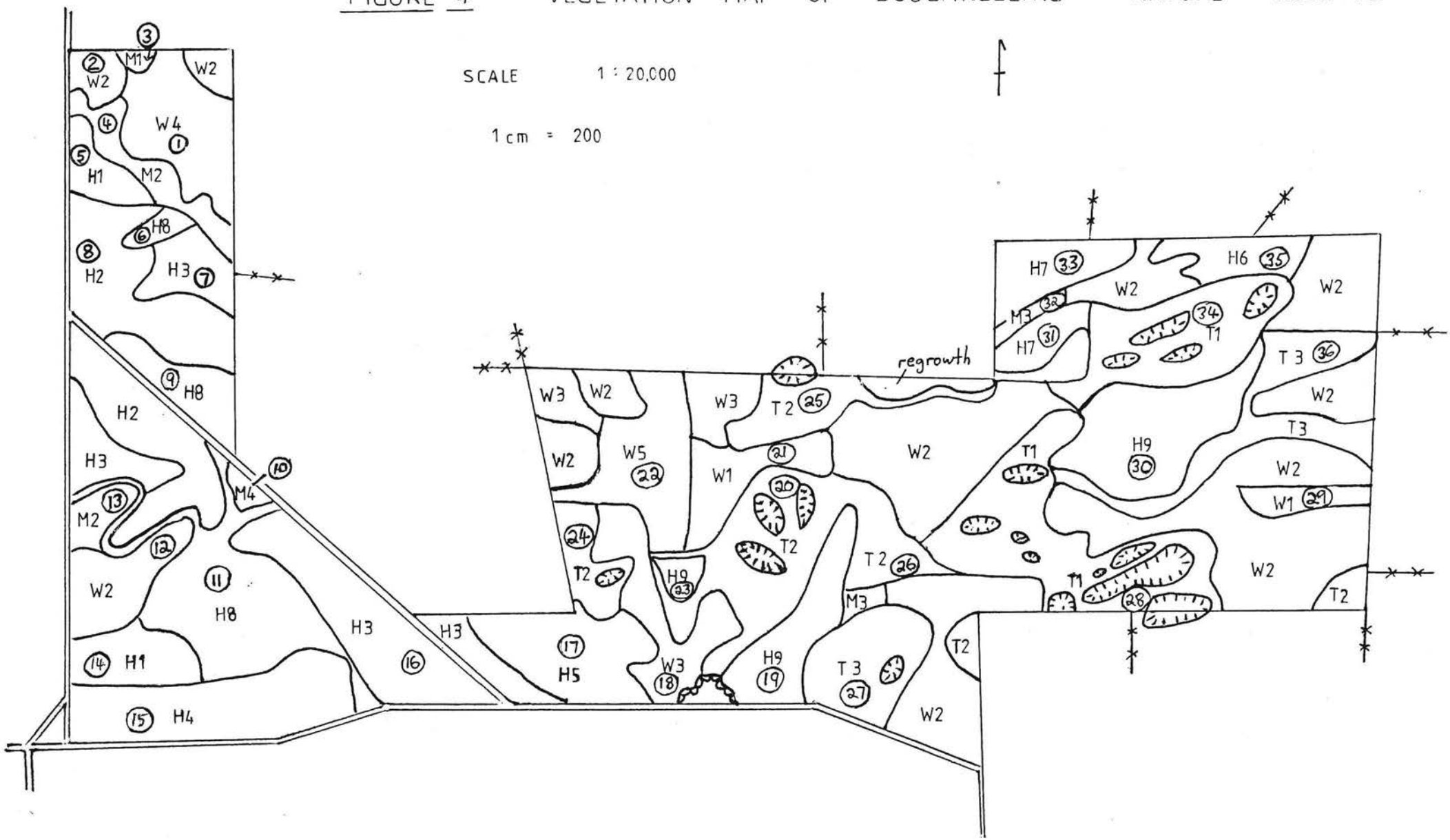
Stratum 1. *Allocasuarina campestris* shrubs. Stratum 1-2m 70-100% cover.

Comments. The vegetation type was also recorded at site 36.

FIGURE 4 VEGETATION MAP OF BOOLANELLING NATURE RESERVE

SCALE 1 : 20,000

1 cm = 200



3.2 FLORA

The number of native plant species recorded during the survey was 178. This probably only represents about 60% of the total flora of the reserve, as many species would not have been recorded due to the limitations of the survey.

These limitations include lack of flowering material because of the time of year in which the survey had to be conducted. This meant the identity of some plants was uncertain, plants that are inconspicuous when not in flower may have been missed and many annual herbs and geophytes were not found. Also time limitations meant that not all sections of the reserve were examined in detail especially some areas of Tamma heath and thicket. Two to three days collecting in the spring is suggested.

Myrtaceae, Proteaceae, Papilionaceae and Mimosaceae were the most abundant amongst the dicotyledons, and monocotyledons are dominated by Cyperaceae. The number of plant species recorded in each family is as follows:

Myrtaceae	52
Proteaceae	40
Papilionaceae	12
Mimosaceae	10
Cyperaceae	9

The floristic diversity of the reserve can be estimated at approximately 28.4 species/km^2. This large number of species per square kilometer reflects the large area of the reserve which is covered by heath but should be regarded with caution. As Muir (1977) points out such estimates depend on the distribution of vegetation types within the reserve boundaries and reserve size both of which are largely a matter of chance. Tutanning Reserve which has been intensively studied and is in a higher rainfall area has a floristic diversity of 22 species/km^2.

SPECIES OF INTEREST

No gazetted rare plants were found on the reserve but the following species are of interest.

Daviesia pachyloma

Crisp (1985) recorded *Daviesia pachyloma* as rare with a maximum geographical range of <100 km and confined entirely or mostly to roadsides in otherwise cleared land.

This species was found in the mixed woodland area surrounding site 1, usually under Mallee and was only occassionally seen in this vegetation type.

Daviesia ? purpurascens

This species was not in flower at the time at which the survey was conducted and therfore the identity of the material collected is not certain. However, *Daviesia purpurascens* has been reported by Crisp (1985) as endangered with a maximum geographical range of <100 km and confined entirely or mostly to roadsides in otherwise cleared land. It is therefore worth noting that this species may occur on this reserve. The specimen was collected near site 3 under mallee.

Dryandra horrida

Leigh et al (1981) describe *Dryandra horrida* as vulnerable but not presently endangered with know populations limited in range (usually <100 km). Herbarium specimens lodged in the W.A. Herbarium have been collected from localities ranging from 20 miles north of Meckering to Corrigin.

This species is common on the reserve occuring in most of the heath vegetation types.

Eucalyptus gardneri

Leigh et. al. (1981) describes *Eucalyptus gardneri* as not currently considered endangered or vulnerable with a range > 100 km but occurring only in small populations which are mainly restricted to highly specific habitats.

Only one mallee was seen on the reserve near site 14.

Hakea baxteri

Leigh et. al. (1981) place *Hakea baxteri* in the same category as *Eucalyptus gardneri*, occurring only in small populations which are mainly restricted to highly specific habitats but not considered endangered or vulnerable at the present time. However, Leigh et. al. do not record this species as occurring in national parks or other declared reserves.

Hemigenia viscida

Rye (1982) reports this species as geographically restricted with a range < 100 km. Herbarium specimens examined at the W.A. Herbarium were collected from Tammin and Wongan Hills only. Leigh et. al. (1981) also describes this species as poorly known but suspected of being rare and geographically restricted. Only three plants of this species were seen near site 16.

Xanthorrhoea nana

Leigh et. al. (1981) report *Xanthorrhoea nana* as vulnerable with a range >100 km but occurring only in small populations which are restricted to highly specific habitats. This species was common in most of the heath vegetation types.

Leigh et. al. (1981) described *Cryptandra leucopogon* and *Flatysace commutata* as poorly known species with a geographical range of less than 100 km. *Cryptandra leucopogon* is now represented by 24 specimens in the W.A. Herbarium ranging from Wickepin to Ravensthorpe. *Flatysace commutata* is represented by only five specimens collected from Tammin, Albany, Stirling Range, Cranbrook and Esperance.

3.3 MANAGEMENT CONSIDERATIONS

a) Weed and Animal Control.

As yet weeds are not a problem in the reserve although they are beginning to invade some areas adjacent to cleared farm land. These areas include woodlands where little understorey is present, the low mixed heath surrounding site 8 and the granite outcrop area surrounding site 28.

It is unlikely that these weeds will increase significantly in number if the area is left undisturbed.

Rabbits and foxes are abundant on the reserve. The size of animal pest populations and the extend of weed invasion should be monitored from time to time. If numbers increase steps should be taken to control these pests in order to protect the reserve environment and its flora and fauna.

b) Protection from Fire.

It is important to exclude fire from the reserve for the protection of rare and geographically restricted species (on which the effect of fire may not be known) and fire sensitive species such as Salmon Gums. Also to maintain animal habitats and areas of scientific interest. A firebreak has been constructed around the perimeter of the reserve adjoining farmland where no roads occur (north and east boundaries). This fire break should be maintained but the effects on weed numbers and erosion should be monitored.

Areas of exposed granite rock on the reserve form natural fire breaks but these areas are only small. There is little litter build up in the woodland areas but closed associations of tamma thicket and heath will be fire sensitive.

c) Areas of Scientific Interest

The rare species of *Daviesia* reported in the flora section occur in woodlands and mallee areas in the north-west section of the reserve. The woodlands are also of interest because of the large number of *Eucalyptus* species occurring in a relatively small area.

The heaths in the western section of the reserve are also of interest. Most of the rare or geographically restricted species reported in the flora section occur in this area. Muir (1977) reports that the reserve may be of considerable scientific importance in evolutionary and genetic studies in reference to the tall mixed heath which contains species commonly found further to the south.

The heaths in the western section are surrounded by gravel roads which means easy access, however the reserve is relatively isolated away from main roads and is little used by the public.

d) Gravel Pit.

The gravel pit on Copestakes Road should be closed and the area rehabilitated.

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ACKNOWLEDGEMENTS

I am extremely grateful to the following people:-

Dr. I. Brooker and Dr. S. Hopper for identification of the *Eucalyptus* species and Mr B. Maslin for the identification of the *Acacias*.

The curator of the W.A. Herbarium for permission to consult the collection.

Debbie Reading for her word processing and her time and patience and Mr M. Trudgeon for the use of his word processor.

APPENDIX 1.

FLORA SPECIES LIST FOR THE BOOLANELLING NATURE RESERVE.

MONOCOTYLEDONS

	Specimen voucher number.
POACEAE	
*Aira cupaniana	168
*Avena fatua	
*Bromus ? rubens	
Spartochloa scirpoidea	277
Stipa ? trichophylla	
CYPERACEAE	
Caustis dioica	214
Lepidosperma angustatum	360
Lepidosperma drummondii	195,267
Lepidosperma gracile	226
Lepidosperma pruinosum	276
Lepidosperma pubisquameum	227,249,310
Lepidosperma tenue	260,365
Lepidosperma sp. aff. tuberculatum	284
Mesomelaena preissii	197
RESTIONACEAE	
Ecdeiocolea monostachya	209
Harperia ? lateriflora	
Loxocarya pubescens	
XANTHORRHOEACEAE	
Lomandra effusa (recorded by Ken Atkins)	
Xanthorrhoea nana	

PHORMIACEAE

Dianella revoluta
Stypandra imbricata

ANTHERICACEAE

Borya nitida
Laxmannia paleacea 286

HAEMODORACEAE

Conostylis petrophiloides 302
Haemodorum laxum 287

IRIDACEAE

Patersonia juncea 336
Patersonia occidentalis 246

DICOTYLEDONS

CASUARINACEAE

Allocasuarina campestris 254
Allocasuarina huegeliana
Allocasuarina humilis
Allocasuarina microstachya

PROTEACEAE

Adenanthos argyreus 224
Banksia attenuata
Banksia sphaerocarpa var. caesia 194
Conospermum stoechadis 353
Dryandra cirsioides 185
Dryandra conferta 352

Dryandra ferruginea	219
Dryandra fraseri	274
Dryandra horrida	229
Dryandra nivea	213
Dryandra vestita	186
Grevillea eryngioides	
Grevillea excelsior	184
Grevillea integrifolia	225
Grevillea ? paniculata	165
Grevillea patentiloba	145
Grevillea ? petrophiloides	341
Grevillea pritzellii	296
Hakea baxteri	
Hakea circumalata	200
Hakea falcata	258
Hakea gilbertii	183
Hakea incrassata	190
Hakea lissocarpha	
Hakea platysperma	
Hakea scoparia	180
Hakea subsulcata	323
Hakea trifurcata	
Isopogon divergens	216
Isopogon polycephalus	179
Isopogon scabriusculus	272
Isopogon villosus	221b
Petrophile brevifolia	188
Petrophile ericifolia	189
Petrophile trifida	191
Petrophile sp. nov.	221a
Persoonia coriacea	212
Persoonia striata	192
Synaphaea petiolaris	
Synaphaea polymorpha	

SANTALACEAE

Leptomeria ? preissiana	
Santalum acuminatum	
Santalum murrayanum	150

LORANTHACEAE

Amyema miquelii (recorded by Ken Atkins)	

LAURACEAE

Cassytha pomiformis	345

PITTOSPORACEAE

Billardiera bicolor	248

MIMOSACEAE

Acacia acuminata	
Acacia densiflora	349
Acacia erinacea	143
Acacia flavopila	148
Acacia lasiocalyx	270
Acacia lasiocarpa var. sedifolia	163
Acacia multispicata	266
Acacia phaeocalyx	351
Acacia sphacelata	265
Acacia sp. nov. (rigida m/s)	297

PAPILIONACEAE

Chorizema ? aciculare	261
Daviesia ? benthamii	160
Daviesia nudiflora	264
Daviesia pachyloma	146
Daviesia ? purpurascens	147b
Daviesia teretifolia	
Daviesia sp. aff hakeoides	246
Gastrolobium spinosum	
Gastrolobium trilobum	

Jacksonia nematoclada	347
Oxylobium parviflorum	149
Pultenaea capitata	230

RUTACEAE

Diplolaena microcephala var. drummondii	280
Phebalium tuberculosum var. tuberculosum	170,178
Phebalium tuberculosum var. megaphyllum	173

POLYGALACEAE

Comesperma scoparium

SAPINDACEAE

Dodonaea bursariifolia	147a,155
Dodonaea pinifolia	334
Dodonaea viscosa ssp. angustissima	156

RHAMNACEAE

Cryptandra leucopogon	326

STERCULIACEAE

Lysiosepalum involucratum	172

DILLENIACEAE

Hibbertia ? verrucosa	332

MYRTACEAE

Beaufortia ? bracteosa	233
Beaufortia incana	
Beaufortia micrantha var. puberula	182

Melaleuca ? scabra	328
Melaleuca ? spathulata	203
Melaleuca spicigera	174,288
Melaleuca ? subtrigona	322
Melaleuca uncinata	
Melaleuca undulata	162
Verticordia brownii	
Verticordia chrysantha	268
Verticordia densiflora	335
Verticordia pennigera	241

HALORAGACEAE

Glischrocaryon aureum	368

APIACEAE

Platysace commutata	354

EPACRIDACEAE

Andersonia lehmanniana spp. pubescens	339
Astroloma serratifolium	
Astroloma ? pallidum	252
Astroloma sp. aff. epacridis	291,319,320
Leucopogon dielsianus	231
Leucopogon minutifolius	324
Lysinema ciliatum	346

APOCYNACEAE

Alyxia buxifolia	305

CHLOANTHACEAE

Pityrodia bartlingii	
Pityrodia ? terminalis	

LAMIACEAE

Hemigenia viscida	355
Westringia rigida	151

OROBANCHACEAE

* Orobanche minor	

ASTERACEAE

Chrysocoryne pusilla	294
Olearia muelleri	140
Olearia revoluta	293
Podolepis capillaris	292
*Ursinia anthemoides	
Waitzia acuminata	

*significes introduced species

APPENDIX 2

LIST OF PLANT SPECIES RECORDED AT VEGETATION SITES.

SITE 1. Mixed Woodland.

Acacia erinaceae
Acacia flavopila
Acacia lasiocarpa var. sedifolia
Borya nitida
Chrysocoryne pusilla
Daviesia pachyloma
Daviesia ? purpurescens
Dianella revoluta
Dodonaea bursariifolia
Dodonaea viscosa ssp. angustissima
Eucalyptus anceps
Eucalyptus calycogona
Eucalyptus celastroides
Eucalyptus sp. aff. occidentalis
Eucalyptus ? salubris
Eucalpytus salmonophloia
Eucalyptus wandoo
Grevillea patentiloba
Lepidosperma pubisquameum
Loxocarya pubescens
Lysiosepalum involucratum
Melaleuca acuminata
Melaleuca lateriflora
Melaleuca spicigera
Melaleuca uncinata
Melaleuca undulata
Olearia muelleri
Olearia revoluta
Oxylobium parviflorum
Phebalium tuberculosum var. megaphyllum
Santalum acuminatum
Santalum murrayanum
Stipa ? tricophylla
Westringia rigida
*Ursinia anthemoides

SITE 2. Wandoo woodland Type 1.

•Aira cupaniana
Allocasuarina campestris
Astroloma serratifolium
Borya nitida
*Bromus rubens
Calytrix leschenaultii
Dianella revoluta
Dodonaea viscosa ssp. angustissima
Gastrolobium spinosum
Grevillea ? paniculata
Grevillea patentiloba
Hakea lissocarpha
Hakea trifurcata
Harperia lateriflora
Leptospermum erubescens
Loxocarya pubescens
Melaleuca adnata
Melaleuca uncinata
Melaleuca undulata
Phebalium tuberculosum var. tuberculosum
*Ursinia anthemoides
Waitzia acuminata

SITE 3. Mallee area Type 1.

Daviesia ? benthamii
Eucalyptus celastroides
Eucalyptus eremophila
Eucalyptus flocktoniae
Eucalyptus redunca var. subangusta
Melaleuca acuminata
Melaleuca adnata
Melaleuca spicigera
Melaleuca undulata
Olearia muelleri

SITE 4. Mallee area type 2.

Acacia flavopila
Astroloma aff. epacridis
Borya nitida
Dodonaea bursariifolia
Dodonaea viscosa ssp. angustissima
Eucalyptus anceps
Eucalyptus eremophila
Eucalyptus flocktoniae
Eucalyptus aff. redunca
Gastrolobium spinosum
Grevillea patentiloba
Isopogon scabriusculus
Lepidosperma ? tuberculosum
Leptospermum erubescens
Melaleuca adnata
Melaleuca lateriflora
Melaleuca laxiflora
Melaleuca spicigera
Melaleuca uncinata
Melaleuca undulata
Oxylobium parviflorum
Phebalium tuberculosum
Phebalium var. tuberculosum
Phebalium tuberculosum var. megaphyllum
Santalum acuminatum
Santalum murrayanum

SITE 5. Melaleuca heath.

Acacia flavopila
Acacia lasiocarpa var. sedifolia
Adenanthos argyreus
Allocasuarina campestris
Astroloma serratifolium
Astroloma aff. epacridis
Banksia spaerocarpa var. caesia
Beaufortia micrantha var. puberula
Billardiera bicolor
Borya nitida
Hakea falcata
Hakea gilbertii
Hakea incrassata
Hakea lissocarpha
Hakea scoparia
Hakea subsulcata
Isopogon polycephalus
Isopogon scabriusculus
Lepidospermum drummondii
Leptospermum erubescens
Melaleuca cordata
Melaleuca leptospermoides
Melaleuca ? spathulata

Calothamnus quadrifidus
Comesperma scoparium
Dryandra cirsioides
Dryandra vestita
Eucalyptus albida
Eucalyptus foecunda
Eucalyptus incrassata
Eucalyptus macrocarpa
Grevillea excelsior
Grevillea petrophiloides
Gastrolobium spinosum
Hakea circumalata
Melaleuca uncinata
Mesomelaena preissii
Persoonia striata
Petrophile brevifolia
Petrophile ericifolia
Petrophile trifida
Santalum acuminatum
Synaphaea petiolaris
Synaphaea polymorpha

SITE 6. Tamma heath - Type 2.

Allocasuarina campestris
Borya nitida
Daviesia teretifolia
Dryandra cirsioides
Hakea incrassata
Hakea scoparia
Harperia lateriflora
Melaleuca cordata
Melaleuca leptospermoides
Mesomelaeana preissii
Petrophile trifida

SITE 7. Low mixed heath with emergent Eucalyptus macrocarpa.

Adenanthos argyreus
Allocasuarina campestris
Allocasuarina humilis
Allocasuarina microstachya
Banksia spaerocarpa var. caesia
Beaufortia micrantha
Borya nitida
Calothamnus quadrifidus
Caustis dioica
Conostylis stylidioides
Daviesia nudiflora
Daviesia teretifolia
Dryandra cirsioides
Dryandra horrida
Dryandra nivea
Dryandra vestita
Hakea circumalata
Hakea falcata
Hakea gilbertii
Hakea incrassata
Hakea platysperma
Harperia lateriflora
Hypocalymma puniceum
Isopogon divregens
Isopogon polycephalus
Leptospermum erubescens
Leptospermum aff. erubescens
Melaleuca leptospermoides
Melaleuca subtrigona
Melaleuca uncinata
Mesomelaeana preissii
Persoonia coriaceae
Persoonia striata

Ecdeiocolea monostachya
Eremaea pauciflora
Grevillea excelsior
Grevillea integrifolia
Grevillea petrophiloides
Petrophile ericifolia
Petrophile trifida
Synaphaea petiolaris
Xanthorrhoea nana

SITE 8. Low mixed heath.

Acacia lasiocarpa var. sedifolia
Acacia sp. nov.
Allocasuarina campestris
Allocasuarina humilis
Allocasuarina microstachya
Andersonia lehmanniana
Astroloma serratifolium
Banksia sphaeocarpa var. caesia
Beaufortia bracteosa
Beaufortia micrantha
Borya nitida
Calytrix leschenaultii
Calytrix sapphirina
Calothamnus quadrifidus
Calothamnus aff. villosus
Cassytha pomiformis
Caustis diocia
Cryptandra leucopogon
Daviesia aff. hakeoides
Dodonaea pinifolia
Dryandra cirsioides
Eremaea pauciflora
Hakea circumalata
Hakea falcata
Hakea incrassata
Hakea scoparia
Harperia lateriflora
Hibbertia ? verrucosa
Isopogon divergens
Jacksonia nematoclada
Leptomeria ? preissiana
Leptospermum erubescens
Leucopogon dielsianus
Leucopogon minutifolius
Lysinema ciliatum
Melaleuca leptospermoides
Melaleuca ? scabra
Mesomelaena preissii
Patersonia juncea
Persoonia striata
Petrophile ericifolia
Synaphaea polymorpha
Verticordia brownii
Verticordia densiflora
Xanthorrhoea nana

SITE 9. Tamma Heath type 2.

Allocasuarina campestris
Andersonia lehmanniana
Daviesia teretifolia
Hakea incrassata
Lepidosperma gracile
Lepidosperma pubisquameum
Leucopogon dielsiana
Melaleuca leptospermoides
Mesomelaena preissii
Persoonia striata
Petrophile trifida

SITE 10. Mallee area type 4.

Borya nitida
Calothamnus quadrifidus
Calothamnus sp. nov.
Daviesia aff. hakeoides
Hakea circumalata
Hakea incrassata
Hakea lissocarpha
Harperia lateriflora
Leptospermum erubescens
Leptospermum aff. erubescens
Melaleuca subtrigina
Melaleuca uncinata
Mesomelaena preissii

SITE 11. Tamma Heath - Type 2.

Andersonia lehmanniana
Beaufortia micrantha
Borya nitida
Hakea incrassata
Hakea scoparia
Isopogon scabriusculus
Melaleuca cordata
Melaleuca leptospermoides
Melaleuca spicigera
Mesomelaena preissii
Persoonia striata
Synapheae petiolaris

SITE 12. Salmon gum woodland (very small area).

Acacia enriacea
Dodonaea bursariifolia
Eucalyptus salmonophloia

SITE 13. Mallee area - type 2.

Acacia densiflora
Dodonaea viscosa ssp. angustissima
Eucalyptus anceps
Eucalyptus calycogona
Eucalyptus eremophila
Eucalyptus aff. redunca
Leptospermum erbuscens
Melaleuca uncinatum

SITE 14. Melaleuca heath.

Acacia lasiocarpa
Acacia sphacelata
Adenanthos argyrus
Allocasuarina campestris
Allocasuarina humilis
Astroloma ? epacridis
Beaufortia incana
Eucalyptus albida
Eucalyptus foecunda
Eucalyptus gardneri
Gastrolobium spinosum
Hakea gilbertii
Hakea incrassata
Harperia lateriflora

Calothamnus quadrifidus
Daviesia teretifolia
Daviesia aff. hakeoides
Dryandra cirsioides
Dryandra conferta
Dryandra vestita
Eremaea pauciflora
Isopogon polycephalus
Loxocarya pubescens
Mesomelaena preissii
Melaleuca leptospermoides
Petrophile brevifolia
Petrophile ericifolia
Persoonia striata
Verticordia brownii

SITE 15. Tall Mixed Heath.

Acacia phaseocalyx
Adenanthos argyreus
Banksia spaerocarpa var. caesia
Beaufortia incana
Beaufortia micrantha
Calothamnus sanguineus
Cassytha pomiformis
Daviesia aff. hakeoides
Dryandra cirsioides
Dryandra ferruginea
Dryandra horrida
Dryandra vestita
Eucalyptus macrocarpa
Gastrolobium spinosum
Grevillea integrifolia
Hakea baxteri
Hakea falcata
Hakea gilbertii
Hakea incrassata
Hakea scoparia
Hypocalymma puniecum
Isopogon polycephalus
Isopogon villosus
Leptospermum aff. erubescens
Leptospermum spinescens
Lysinema ciliatum
Melaleuca leptospermoides
Melaleuca ? subtrigona
Mesomelaena preissii
Persoonia striata
Petrophile ericifolia
Petrophile sp. nov.
Pityrodia bartlingii
Xanthorrhoea nana

SITE 16. Low mixed heath with emergent Eucalyptus macrocarpa.

Acacia sp. nov.
Adenanthos argyreus
Allocasuarina campestris
Allocasuarina humilis
Allocasuarina microstachya
Beaufortia bracteosa
Calytrix leschenaultii
Daviesia teretifolia
Dryandra cirsioides
Dryandra horrida
Dryandra nivea
Grevillea excelsior
Grevillea integrifolia
Hakea baxteri
Hakea falcata
Hakea platysperma
Leptospermum erubescens
Leptospermum spinescens
Melaleuca leptospermoides
Melaleuca subtrigona
Mesomelaena preissii
Petrophile brevifolia

Dryandra vestita
Eremaea pauciflora
Eucalyptus macrocarpa
Petrophile ericifolia
Pityrodia bartlingii
Pultenaea capitata
Verticordia brownii
Xanthorrhoea nana

SITE 17. Dryandra horrida heath.

Acacia sp. nov.
Adenanthos argyreus
Allocasuarina campestris
Allocasuarina microstachya
Astroloma aff. epacridis
Beaufortia micrantha
Banksia attenuata
Banksia spaerocarpa var. caesia
Calytrix leschenaultii
Caustis diocia
Comesperma scoparium
Conospermum stoechardis
Cryptandra leucopogon
Daviesia nudiflora
Dryandra cirsioides
Dryandra horrida
Dryandra vestita
Eremaea pauciflora
Grevilea eryngioides
Grevillea excelsior
Grevillea integrifolia
Hakea falcata
Hakea incrassata
Hakea scoparia
Harperia lateriflora
Isopogon scabriusculus
Laxmannia paleacea
Lepidosperma angustatum
Leptospermum erubescens
Leucopogon dielsiana
Melaleuca leptospermoides
Mesomelaena preissii
Persoonia striata
Petrophile ericifolia
Pultenaea capitata
Synaphaea petiolaris
Synaphaea polymorpha
Verticordia brownii
Xanthorrhoea nana

SITE 18. Wandoo woodland - type 2.

Acacia lasiocarpa
Allocasuarina campestris
Alyxia buxifolia
Astroloma serratifolia
Astroloma ? pallidum
Astroloma aff. epacridis
Billardiera bicolor
Borya nitida
Calothamnus quadrifidus
Calothamnus aff. villosus
Calytrix leschenaultii
Dodonaea pinifolia
Eucalyptus wandoo
Hakea lissocarpha
Hakea scoparia
Harperia lateriflora
Lepidosperma pubisquameum
Loxocarya pubescens
Melaleuca leptospermoides
Melaleuca uncinata
Patersonia occidentalis
Petrophile trifida

Daviesia aff. hakeioides
Dianella revoluta
Stipa ? trichophylla
*Ursinia anthemoides

SITE 19. Tamma heath - type 3.

Acacia lasiocarpa var. sedifolia
Acacia sphacelata
Astroloma serratifolia
Allocasuarina campestris
Banksia spaerocarpa var. caesia
Beaufortia micrantha
Borya nitida
Daviesia teretifolia
Dryandra cirsioides
Dryandra horrida
Dryandra vestita
Eucalyptus macrocarpa
Gastrolobium spinosum
Grevillea excelsior
Grevillea integrifolia
Hakea circumalata
Hakea falcata
Hakea incrassata
Hakea scoparia
Harperia lateriflora
Isopogon scabrusculus
Lepidospermum drummondii
Lepidospermum ? tenue
Leptospermum erubescens
Loxocarya pubescens
Melaleuca leptospermoides
Melaleuca spicigera
Melaleuca uncinata
Mesomelaena preissii
Petrophile brevifolia
Petrophile ericifolia
Petrophile trifida
Persoonia striata
Synaphaea petiolaris
Xanthorrhoea nana

SITE 20. Granite outcrop.

1. Exposed rock and shallow soil.

Acacia lasiocalyx
Borya nitida
Melaleuca fulgens

2. Tamma thicket - type 2.

Astroloma serratiflium
Banksia spaerocarpa var. caesia
Borya nitida
Dryandra horrida
Hakea scoparia
Harperia lateriflora
Isopogon divergens
Leptospermum erubescens
Melaleuca uncinata
Stipa ? tricophylla
Verticordia chrysantha

SITE 21. Gimlet woodland with scattered Salmon Gums.

Acacia erinacea
Acacia lasiocalyx
Acacia multispicata
Dodonaea bursariifolia
Eucalyptus gracilis
Eucalyptus loxophleba
Eucalyptus mynadena
Eucalyptus salubris
Eucalyptus salmonophloia
Eucalyptus wandoo
Grevillea ? paniculata
Westringia rigida

SITE 22. Mallet Woodland.

Acacia erinacea
Eucalyptus anceps
Eucalyptus astringens
Eucalyptus flocktoniae
Eucalyptus salmonophloia
Eucalyptus wandoo
Gastrolobium spinosum
Grevillea patentiloba
Melaleuca uncinata

SITE 23. Tamma heath - type 3.

Acacia sphacelata
Allocasuarina campestris
Allocasuarina humilis
Allocasuarina microstachya
Caustis dioica
Calothamnus quadrifidus
Chorizema aciculare
Daviesia nudiflora
Daviesia teretifolia
Daviesia aff. hakeoides
Dryandra cirsioides
Dryandra horrida
Dryandra nivea
Eremaea pauciflora
Hakea circumalata
Hakea falcata
Hakea incrassata
Harperia lateriflora
Leptospermum erubescens
Melaleuca leptospermoides
Melaleuca spicigera
Melaleuca uncinata
Mesomelaena preissii
Persoonia coriacea
Persoonia striata
Petrophile brevifolia
Petrophile ericifolia
Petrophile trifida
Pityrodia ? terminalis
Verticordia brownii

SITE 24. Tamma thicket - type 2.

Allocasuarina campestris
Hakea scoparia
Leptospermum erubescens
Melaleuca uncinata

SITE 25. Tamma thicket - type 2.

Allocasuarina campestris
Leptospermum aff. erubescens
Melaleuca uncinata

SITE 26. Tamma thicket - type 2.

Allocasuarina campestris
Astroloma serratifolium
Borya nitida
Hakea scoparia
Harperia lateriflora

SITE 27. Tamma thicket - type 3.

Allocasuarina campestris
Dryandra fraseri

SITE 28. Granite Outcrops.

1. Exposed rock and shallow soils.

Acacia lasiocalyx
* Avena fatua
Astroloma aff. epacridis
Borya nitida
Diplolaena microcephala var. drummondii
Dodonaea viscosa ssp. angustissima
Kunzea pulchella
Lepidosperma pruinosum
Spartochloa scirpoidea
Stypandra imbricata
*Ursinia anthemoides
Waitzia acuminata

2. Tamma thicket type 1.

Allocasuarina campestris
Allocasuarina huegeliana
Borya nitida
Leptospermum aff. erubescens

SITE 29. Gimlet - woodland with scattered Salmon Gums.

Acacia erinacea
Astroloma aff. epacridis
Dodonaea bursariifolia
Eucalyptus salubris
Eucalyptus salmonophloia
Eucalyptus wandoo
Eucalyptus sp.
Olearia revoluta
Oxylobium parviflorum
Podolepis capillaris

SITE 30. Tamma heath - type 3.

Allocasuarina campestris
Banksia spaerocarpa var. caesia
Beaufortia micrantha
Borya nitida
Calothamnus quadrifidus
Dryandra cirsioides
Dryandra horrida
Dryandra nivea
Daviesia nudiflora
Daviesia aff. hakeoides
Eremaea pauciflora
Eucalyptus macrocarpa
Grevillea excelsior
Grevillea integrifolia
Haemodorum laxus
Hakea gilbertii
Hakea incrassata
Hakea lissocarpha
Harperia lateriflora
Lepidosperma drummondii
Leptospermum erubscens
Leptospermum aff. erubescens
Laxmannia paleacea
Leucopogon dielsiana
Mesomelaena preissii
Petrophile ericifolia
Persoonia striata
Pityrodia ? terminalis
Synaphaea petiolaris
Verticordia brownii
Xanthorrhoea nana

SITE 31. Tamma heath - type 1.

Allocasuarina campestris
Andersonia lehmanniana
Beaufortia micrantha
Calytrix leschenaultii
Comesperma scoparia
Daviesia teretifolia
Dryandra cirsioides
Dryandra verstita
Eucalyptus macrocarpa
Gastrolobium spinosum
Hakea gilbertii
Hakea incrassata
Hakea scoparia
Lysinemia ciliatum
Melaleuca leptospermoides
Petrophile ericifolia
Petrophile trifida

SITE 32. Mallee area - type 3.

Eucalyptus anceps
Eucaltyptus calycogonia
Eucalyptus celastioides
Eucalyptus flocktoniae
Eucalyptus aff. redunca

SITE 33. Tamma heath type 1.

Allocasuarina campestris
Allocasuarina microstachya
Astroloma serratifolium
Banksia sphaerocarpa
Beaufortia micrantha
Billardiera bicolor
Comesperma scoparia
Dryandra cirsioides
Gastrolobium spinosum
Grevillea integrifolia
Hakea falcata
Hakea incrassata
Hakea scoparia
Leptospermum erubescens
Leucopogon dielsianus
Lysinema ciliatum
Melaleuca cordata
Melaleuca spicigera
Melaleuca uncinata
Oxylobium parviflorum
Persoonia striata
Petrophile ericifolia
Petrophile trifida

SITE 34. Granite outcrop with tamma thicket type 1.

Allocasuarina campestris
Allocasuarina huegeliana
Borya nitida
Chrysocoryne pusilla
Dryandra fraseri
Eucalyptus ? loxophleba
Leptospermum aff. erubescens

SITE 35. Eremaea pauciflora and Ti-tree heath.

Acacia sp. nov.
Acacia sphacelata
Allocasuarina campestris
Allocasuarina huegeliana
Allocasuarina humilis
Borya nitida
Calothamnus sp.
Calytrix leschenaultii
Caustis dioica
Dryandra nivea
Daviesia aff. hakeoides
Eremaea pauciflora
Harperia lateriflora
Lepidospermum tenue
Leptospermum erubescens
Melaleuca leptospermoides
Mesomelaena preissii
Petrophile brevifolia
Petrophile ericifolia
Persoonia striata

SITE 36. Tamma heath - type 3.

Allocasuarina campestris
Eucalyptus wandoo
Leptospermum aff. erubescens