

SOME NATURE RESERVES OF THE WESTERN AUSTRALIAN  
WHEATBELT

PART 5 : BRUCE ROCK SHIRE

B.G. MUIR

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## SOME NATURE RESERVES OF THE BRUCE ROCK SHIRE

B.G. MUIR

1978

## INTRODUCTION

Bruce Rock Shire lies in the eastern-central wheatbelt and has an area of about 2722 square km. There are 29 Nature Reserves within the Shire, totalling about 48.26 square km or ca 1.8% of the area of the Shire. The largest Nature Reserve in the Shire is only ca 851 ha (Reserve 25979) and the smallest ones only 2 ha (Reserve 14520 and 15199). Eighteen of the 29 Reserves are less than 100 ha in area. Four of the Reserves have "A" classification, A22261 (Belka), A23187 (Nangeen Hill Wildlife Sanctuary), A24505 and A25062. One of these (A23187) is vested in the Western Australian Wildlife Authority (W.A.W.A.) and another (A22261) in the Bruce Rock Shire. The remaining 2 "A" class reserves are unvested. Of the other 25 Nature Reserves in the Shire 3 are vested in W.A.W.A. and 3 in the Shire. The rest are unvested and have no particular protection.

This survey took place in April 1978 and consisted of brief examinations of 17 Reserves: 976, 978, 12277, 14194, 16104, 16288, 16493, 17420, 19138, 22792, A24505, A25062, 25884, 25979, 27108, 27452 and 30969. A report on each of the Reserves is appended.

## METHODOLOGY

Physical characteristics of the reserves were obtained directly from the most recently available lithographs as published by the Department of Lands and Survey, and interpreted from observations made on the reserves.

Reserves were examined by vehicle where tracks were available, or on foot. Local knowledge and air-photographs were consulted to find areas of particular interest. Only a very short time could be spent on each reserve, the smaller ones being examined in 1 or 2 hours, the larger ones in a full day.

Vegetation was classified using Muir's (1977) system (Table 1), which was designed specifically for describing wheatbelt vegetation. In the presentation of the abbreviated descriptions (in section titled "Vegetation") capital letters in descriptive terms refer to specific classes of life form, height and canopy cover as used in the classification.

TABLE 1: VEGETATION CLASSIFICATION AS USED IN WHEATBELT SURVEY

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



As the survey period on any reserve was very brief only the commonest plant species could be noted. Any species in which less than 3 individual plants were encountered within a space of 10-15 minutes examination of the vegetation were considered uncommon and are not listed. As much of the survey work was carried out rapidly and in unfavourable seasons, many plants were not flowering and so identifications were made from foliage alone. Only if an important dominant plant was not recognised were specimens bought back to the laboratory for examination.

Soil was examined very briefly and classified according to Northcote's (1971) texture groups and Munsell (1954) colour terms.

Fire history was determined from observation of the area, appearance of air-photographs and information from nearby farmers.

Fauna were not specifically sought, but some species (usually the most obvious) were encountered while examining vegetation. The lists provided are only a small fraction of the species present on nearly every reserve examined. Scats, footprints, burrows, nests and other indirect evidence is used only where identification is certain. Observations by farmers are used if considered reliable.

Opinions and recommendations expressed in these reports are entirely those of the author and are based on extensive experience in vegetation mapping and description in the wheatbelt, and association with faunal and habitat studies conducted by suitably qualified researchers.

## RESULTS AND DISCUSSION

The features of each reserve can be summarised as follows:

Reserve 976 - ca 58 ha, mostly granite outcrop, important conservation reserve, anthropological and historic interest.

Reserve 978 - ca 40 ha, all Jam woodland, important conservation reserve, historic interest.

Reserve 12277 - ca 40 ha, Gimlet, Salmon Gum and Jam woodlands, important conservation reserve particularly for birds.

Reserve 14194 - ca 65 ha, granite outcrop, woodlands and shrubland, numerous habitat types present, important conservation reserve.

Reserve 16104 - ca 108 ha, heaths, mallee and woodland, rich in plant species, isolation makes it very important for transient birds.

Reserve 16288 - ca 4 ha, Wandoo woodland, heavily grazed and disturbed, little value.

Reserve 16493 - ca 54 ha, Gimlet, York Gum woodlands and a salt lake, important

conservation reserve.

Reserve 17420 - ca 30 ha, Jam woodland, disturbed, of little value but not suitable for any other form of land use.

Reserve 19138 - ca 81 ha, Gimlet and York Gum woodlands, shrubland and granite outcrop, rich in plant species, very important for transient birds, would benefit by inclusion of adjacent water Reserve.

Reserve 22792 - ca 228 ha, woodland, mallee, 4 types of heath, rich in plant species and fauna, may contain some plant species at their geographic limits, may be one of the best reserves in this region, reclassification to "A class" recommended.

Reserve A24505 - ca 447 ha, salt flats, very important for waterfowl and soil conservation. Illegal rubbish tip at north end of Reserve is disturbing main waterfowl area.

Reserve A25062 and 25979 - ca 297 ha and 852 ha respectively, salt flats with mosaic of woodlands, mallee and shrublands. Extensive use by fauna, very important for water fowl.

Reserve 25884 - ca 752 ha, salt flats with mosaic of woodland shrubland and heath, fairly diverse flora, important for birds, particularly waterfowl, some recreational use.

Reserve 27108 - ca 232 ha, salt flat with patchy woodlands and shrubland, some sandplain. Fairly Martin nests under bridge, also important for other fauna, would benefit from inclusion of sandplain at nearby Yarding Siding.

Reserve 27452 - ca 39 ha, shrubland, supports Southern Scrub-robin and other birds, would benefit from inclusion of Reserve 27451 to increase area of shrubland.

Reserve 30969 - ca 283 ha, salt flats, important for soil conservation and supports some fauna.

Of the 17 Reserves examined, 6 were mostly salt marsh and 2 mostly granite outcrop. The remaining 9 were woodlands or mixed vegetation and support a variety of flora and fauna. All the reserves have considerable conservation value except perhaps 16288 which has been included into a farm and heavily grazed and disturbed, and 17420 which has limited value because of disturbance but is unsuitable for any other form of land use. I strongly recommend that Reserve 22792 be classified "A" and efforts be made to obtain adjacent uncleared land for inclusion into the Reserve.

Owing to the number of Reserves, and their scattered distribution, they probably contain representatives of at least the major vegetation types and many of the plant species more widely distributed before agriculture. Some plant species were recorded in this survey which are absent or poorly represented in

collections in the Western Australian Herbarium. This indicates the need for a detailed biological study in the Bruce Rock Shire in order to obtain more information on these species before reserve insularity eliminates them.

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#### ACKNOWLEDGEMENTS

The Western Australian Herbarium provided access to collections and assistance in identifying plants. The Department of Fisheries and Wildlife have allowed me the use of some of this data as part requirement of an Honours Thesis.

Reserve 976

Pikaring Hill Reserve

Located ca 17 km SSE Pantapin Siding and shown on lithograph 2433-IV, C1-2.

Background.

Originally gazetted 1 June 1893 as a reserve for "Water for Travellers and Stock" and had an area of 40.5 ha. It was increased on 23 August 1907 to 57.5 ha and again on 1 August 1919 to 58.2747 ha. It remains at this size but was reclassified to "Protection of Indigenous Flora" on 9 November 1956. The granite outcrop on the Reserve is officially called Pikaring Hill and was one of a series of campsites for travellers going to the goldfields along the track now known as the Old Beverley Road.

Physical characteristics.

Reserve 976 is approximately rectangular, ca 0.9 km long (E-W axis) by about 0.7 km broad (N-S axis). Its total perimeter is 3.33 km. The Reserve has an area of 58.2747 ha and is 305 m above sea level (ASL) at its lowest point and 350 m ASL at its highest.

Vegetation.

There are 4 major associations on the Reserve. Salmon Gum woodland: Mature Salmon Gum trees as a Woodland with scattered shrubs but no distinct understory. Sheoak woodland: Huegells Sheoak Dense Low Forest A over Ti-tree Thicket.

Granite outcrop: Mostly bare granite with patches of Borya nitida or scattered shrubs. Areas of dense Acacia lasiocalyx trees where soil is poorly drained or sparse. Jam woodlands on soil covered slopes.

Cleared area: Scrub rolled about 10 years before this survey. Well established regrowth of Jam and Sheoak to 3 m tall.

Plant Species.

Twenty species of plants were recorded. The presence of Banksia prionotes trees in the Sheoak woodland is of interest as this species normally grows on deep well drained yellow sands. The soil where the species grows on this reserve is shallow granite derived sandy clays with abundant supplies of water from runoff of rain from the granite. The plants may however be others from nearby sandplains which are now cleared. Eight species are exploited by the wildflower seed trade.

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#### Weeds

Ptilotus polystachys and Solanum nigrum (Black Nightshade) were the only weed species recorded. These species were sparse and only occurred where water pooling was greatest.

#### Fire history

There is no evidence of fire within the last 20-30 years. The scrub rolled area was not burnt.

#### Fauna

Port Lincoln Parrot (Platycercus zonarius): common.

Galah (Cacatua roseicapilla): common.

Red-capped Robin (Petroica goodenovii): pair in woodland.

Western Shrike-Thrush (Colluricincla harmonica rufiventris): calling in Sheoak woodland.

White-browed Babbler (Pomatostomus superciliosus): common.

Australian Raven (Corvus coronoides): common in woodland.

Amphibolurus ornatus (Ornate Dragon): common on granite.

Helioporus albopunctatus (Spotted Burrowing Frog): in gravel pit.

#### Exotic Fauna

Rabbit dung and scratchings were common.

#### Firebreaks and fences

Absent except for W, N and E sides adjacent to paddocks. Firebreaks were in adjacent farmland, not on the Reserve. The S boundary is unfenced and bordered by a roadway.

#### Human usage

A small gravel pit is present on the SW side of the rock. There is evidence of the area being used occasionally for barbecues and picnics and for trail-bike riding, although environmental damage is minimal. Timber has been removed from the Salmon Gum woodland and old records indicate that much timber was removed from the Reserve and surrounding uncleared land in the past.

#### Adjacent uncleared land

Absent at present; old records indicate that there was abundant uncleared woodland adjacent to the Reserve in 1936.

Remarks.

Reserve 976 has some anthropological and historic interest. Near the trigonometric station is a small gnamma hole which local legend suggests was of some significance to the aborigines. Additionally, a spring (currently dry) was present, and was an important site for water for travellers and stock passing east from Beverley to the goldfields along the Old Beverley Road, which lies immediately S of the Reserve.

Opinion.

Being isolated and supporting woodlands and dense thickets, Reserve 976 is of considerable importance as a rest area for migrating birds. The regenerating areas and gravel pit are now merging well into the surrounding bushland and provide immature woodland association and a temporary pool of water.

The historic interest of the site as well as its recreation provision for local farmers makes its retention of importance culturally as well as biologically. I recommend that Reserve 976 be vested in the Western Australian Wildlife Authority and that signs be erected at its SW and SE corners to indicate that flora and fauna are protected on the Reserve.

APPENDIX I

VEGETATION DETAILS RESERVE 976.

Salmon Gum woodland

Eucalyptus salmonophloia, mature, stratum 16-24m tall, 10-30% canopy cover. There is no understory except scattered plants of Acacia microbotrya, Dianella revoluta, Dodonaea bursariifolia, Lomandra effusa, Phebalium tuberculatum and Stipa elegantissima. Scattered E. loxophleba to 8m tall are present. Soil light brown, fine sandy loam. Poorly drained.

Sheoak woodland

Casuarina huegeliana trees, mature to senescent, 3-10m tall, 70-100% canopy cover over Leptospermum erubescens, mature, 3-4m tall, 30-70% canopy cover. Other species recorded were Acacia acuminata, A. microbotrya, A. saligna, Banksia prionotes, Borya nitida, Guichenotia ledifolia and Stypandra imbricata. Soil is pinkish grey, sandy clay. Well drained but abundant runoff.

Granite outcrops

Most of the granite outcrop was bare except for occasional pockets of Borya nitida or scattered plants of Casuarina huegeliana, Dodonaea attenuata, Kunzea pulchella or Stypandra imbricata. On some slopes (particularly the western) soil pockets had developed sufficiently to support sparse Acacia acuminata woodlands or scattered trees (see plate 3). Where runoff was excessively high, Acacia lasiocalyx trees to 5m tall and 70-100% canopy cover developed, often over an understory of Spartochloa scirpoidea grass 0.5m tall, 30-70% canopy cover.

Cleared area

Cleared areas had a cover of Acacia acuminata or Casuarina huegeliana trees, 1-3m tall, 30-70% cover.

# Reserve 976

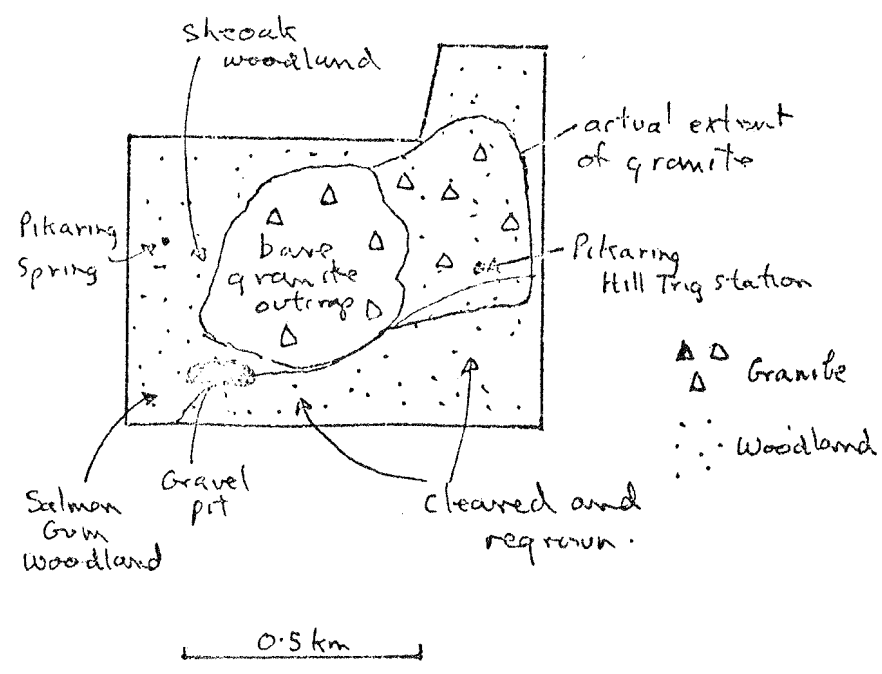




Plate 1. Reserve 976 showing Sheoak woodland with pockets of Ti-tree thicket. View SW from densest into sparser areas.

Plate 2. Reserve 976 showing patches of Acacia lasiocalyx and scattered shrubs and bare granite outcrop.

Plate 3. View NE up rock face of Reserve 976 showing scattered Jam trees on accumulated soil pockets.

Plate 4. View N into Salmon Gum woodland.

## Reserve 978

Located ca 36 km SW of Bruce Rock Townsite and shown on lithograph 2433-1, C2.

### Background

Originally gazetted 1 June 1893 as reserve for "Water for travellers and stock". This was converted to "Golf ~~links~~" on 25 August 1939 and vested in the Bruce Rock Shire. It was subsequently considered unsuitable for golf links and was charged to "Conservation of Flora" on 27 July 1962 but was not vested in any controlling body.

### Physical characteristics

Reserve 978 is roughly square, has an area of 40.4686 ha and a perimeter of ca 2.5 km. The highest altitude on the Reserve is 310 m above sea level (ASL) on the E side and the lowest ca 295 m ASL on the W side. A watercourse runs through the Reserve from the E side to the NW corner.

### Vegetation

Only one association, Jam woodland, is present on the Reserve. Portions of the Jam have scattered York Gum as emergents, and there are a few Gimlet and York Gum trees along the W boundary. Small granite outcrops or pavement are scattered throughout. The whole Reserve is densely covered with introduced grasses, primarily Avena sativa fatua. Shallow watercourses cross the Reserve in several places and grass is dense along their banks. Portions of the Reserve, particularly SE of the road, have linear banks which may have been man-made disturbance, but large trees and grass obscure their origin. These areas accumulate water after heavy rain, and grass growth is dense. W of Walyaling Spring some areas have been cleared for stock and have begun to regrow. There is little grass in these areas but a dense cover of Euphorbia australis and Erodium cygnorum weeds binds the ground surface.

### Plant species

Sixteen plant species were recorded 5 of which are exploited by the wildflower seed trade.

### Weeds

Apart from abundant grasses throughout the Reserve there is extensive development of Erodium cygnorum, Euphorbia australis and Ptilotus potystachys.

None of these are weeds of agricultural importance.

#### Fire

No evidence of fire within the last 20-30 years.

#### Fauna

Port Lincoln Parrot (Platycercus zonarius): common in woodland.

Black Faced Cuckoo Shrike (Coracina novaehollandiae): one seen in Jam woodland.

Weebill (Smicrornis brevirostris): in York Gums.

Singing Honeyeater (Meliphaga virescens): in flowering Acacia microbotrya.

White-eared Honeyeater (M. leucotis): in flowering A. microbotrya.

Yellow Throated Miner (Manorina flavigula): in York Gums.

Australian Raven (Corvus coronoides): common.

Pseudophryne guentheri: in creek.

#### Exotic fauna

Rabbits are common. A dog carcass was present in Walyaling Spring.

#### Firebreaks and Fences

Perimeter fences and firebreaks in adjacent farmland on all sides of the Reserve. There is a central, bitumenised road which effectively divides the Reserve into two more or less equal portions. It forms an effective central firebreak.

#### human usage

About 10% of the Reserve has been cleared of understory at some time, presumably to provide stock holding areas. Additionally, the area surrounding Walyaling Spring has been cleared and contains many tracks, an old road and a disused tank and stand. Walyaling Spring itself is a stone lined well ca 2-3 m diameter and 1-2 m deep. Water was present in April although the area had recently had heavy rain. A rotted dog carcass floating in the well suggests that water had been present for several weeks prior to these rains. It is thus possible the well retains water all year, even in dry years. Timber (probably fence posts) had been cut from the Jam woodland.

Adjacent uncleared land

None within some distance of the Reserve.

Remarks

Walyaling Spring is a historic landmark, being one of the more important watering places for travellers and stock using the Old Beverley Road, the modern form of which passes through the Reserve.

Opinion

Reserve 978, being isolated, is of considerable importance as a roosting and feeding site for migratory birds. Additionally, the abundant flowering of Acacia acuminata and A. microbotrya on the Reserve is an important food source for honeyeaters, as illustrated by the 3 species found during this survey. The many small watercourses in the Reserve provide refuge for frogs and water supply for mammals and birds. The Reserve also has historic interest. I recommend that Reserve 978 be vested in the Western Australian Wildlife Authority.

APPENDIX 2

VEGETATION DETAILS RESERVE 978

Only one association is present on Reserve 978, an Acacia acuminata woodland. It has two variants however, as described below.

Acacia acuminata trees, 3-5 m tall, 10-30% canopy cover, without any emergent Eucalyptus loxophleba trees. Understory is absent except for scattered plants of Acacia microbotrya, Bassia diacantha, Dianella revoluta, Hakea decurva, Lomandra effusa, Rhagodia nutans, R. spinescens and Stipa trichophylla. On the W side of the Reserve the A. acuminata canopy becomes taller (4-7 m tall) and less dense (2-10% canopy cover) and there are scattered Eucalyptus loxophleba trees to 22 m tall. In these areas there is still no development of understory but scattered Argyroglossis turbinata, Dianella revoluta, Exocarpus aphyllus, Hakea preissii, Lepidosperma gracile and Stylobasium australe were present.

On the extreme W side of the Reserve the remains of extensive E. salubris and E. loxophleba woodlands form a narrow belt of trees adjacent to uncleared land.

Soil on most of the Reserve is pinkish grey sandy clay, moderately drained. In the areas where E. loxophleba is best developed it is light brownish grey, clay loam and where E. salubris is prominent tends more towards red, fine sandy clay loam. The latter areas are poorly drained.

Reserve 928

woodland

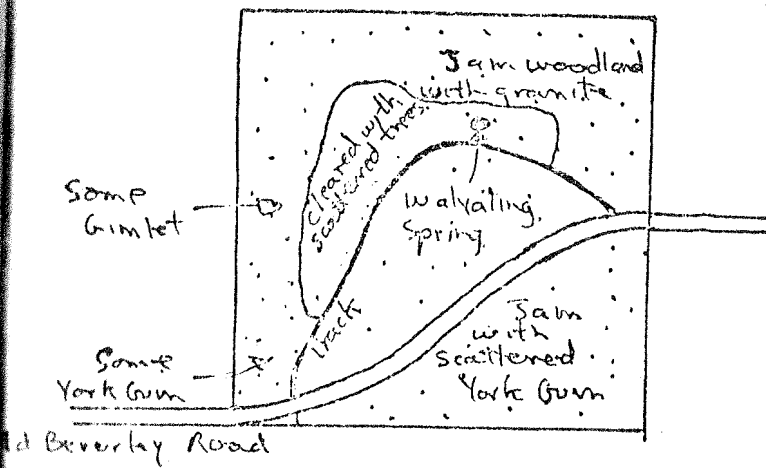


Plate 5. Reserve 978 showing cleared areas with scattered Jam and

Plate 6. Areas of Jam woodland and scattered granite outcrop and pavement.  
This vegetation covers most of the Reserve. 18



Plate 7. View W into York Gum woodland on Reserve 978.

Reserve 12277

Located ca 1.6 km NE Bruce Rock Townsite and shown on lithograph 2534-III, BC 2.

Background

Originally set aside on 13 August 1909 and vested in the Bruce Rock Road Board on 10 May 1912 as a reserve for "Water". The Reserve was converted to "Conservation of Flora" on 24 May 1957 and remained vested in the Bruce Rock Road Board. This vesting was revoked on 26 March 1970 and the classification was changed to "Sewerage and Protection of Flora". The Reserve remained unvested.

The classification "Sewerage and Protection of Flora" is the consequence of a series of events which began in 1959 when the Bruce Rock Hospital required an effluent disposal site. Reserve 12277 was suggested by the Bruce Rock Road Board as being suitable as it was a disused gravel pit and of sandy gravel nature. Subsequently the site was used for sewage disposal until 1969. The Reserve was inspected by the Divisional Surveyor in 1970 and he suggested that the classification be changed to "Shire Requirements" as there were sewage effluent ponds, a dam, a clay pit and a motor-bike scramble track on the site. This proposal was rejected but a compromise was made in the classification "Sewerage and Protection of Flora".

Physical characteristics

Reserve 12277 is square, 40.4686 ha in area and has a perimeter of ca 2.5 km. The highest part of the Reserve is at the N end, with an altitude of ca 290 m above sea level (ASL) and the lowest part of the S end with an altitude of ca 280 m ASL.

Vegetation

Only two associations are present on the Reserve. The majority is covered with Eucalyptus salubris (Gimlet) Low Woodland A over Acacia merrallii Open Dwarf Scrub D and scattered Eucalyptus salmonophloia (Salmon Gum) trees.

The N end of the Reserve adjoins the granite outcrop "Bruce Rock" from which the townsite takes its name. Surrounding the Rock and occupying the northern quarter of the Reserve is an association of Acacia acuminata (Javel) Open Low Woodland A with no understory.

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## Plant species

Twenty-six species were recorded, of which 9 are exploited by the wildflower seed trade. A Grevillea and a Bassia species of uncertain affinity were collected.

## Weeds

Weeds are virtually absent except in the areas of maximum disturbance such as along track edges, and around the dam and gravel pits. By far the greatest weed development is in gravel pits which were used for sewage effluent. The high nitrogen content present during their use (now 9-10 years ago) has enriched the soil to the extent that even now the weed growth in the pits is far in excess of what is normally found as a result of just increased water availability. Weed species recorded were as follows: Amaranthus albus (Tumbleweed), A. sp 2, Digitaria sanguinalis (Crab grass), Eragrostis cilianensis (Stink-grass), Polygonum aviculare (Wire weed), Salsola kali (Prickly saltwort) and Sonchus oleraceus (Sow thistle).

## Fire

No evidence of fire within the last 20-30 years.

## Fauna

Port Lincoln Parrot (Platycercus zonarius): possibly old nest sites - birds numerous.

Galah (Cacatua roseicapilla): old nests and a few birds noted.

White-backed Swallow (Cheramoeca leucosterna): flying above Reserve.

Tree Martin (Hirundo nigricans): nestbuilding in senescent Gimlet.

Black Faced Cuckoo Shrike (Coracina novaehollandiae): calling.

Weebill (Smicrornis brevirostris): in eucalypts.

Western Silvereye (Zosterops lateralis gouldii): in eucalypts.

White-fronted Chat (Epthianura albifrons): on W side Reserve.

Zebra Finch (Peophila guttata): several on fences S of Reserve.

Grey Butcher Bird (Cracticus torquatus): 2 seen E side Reserve.

Australian Raven (Corvus coronoides): nest seen.

Pseudophryne occidentalis: in clay pit and old dam.

## Exotic species

Rabbit scats and scratchings were present throughout. Dog footprints were noted in mud at several places through the Reserve.

#### Firebreaks and fences

Fences on N and E boundary of Reserve and narrow firebreaks in adjacent farmland. W and S boundaries are adjacent to roadways and are unfenced.

#### Human usage

Extensive throughout the Reserve. Timber cutting has taken place in both Jam and Gimlet associations. Numerous tracks of cars and motorbikes are present in a network in all parts of the Reserve.

By far the greatest disturbance on the Reserve is a dam (which doesn't hold water) and a number of gravel and clay pits with their associated heaps of topsoil. The pits and dam have effected ca 20% of the Reserve's area.

#### Adjacent uncleared land

Absent except for ca 1 ha of water reserve near the SW corner of Reserve 12277 and the uncleared land on the immediate vicinity of Bruce Rock, contiguous with the N boundary of the Reserve (about 5 ha and grazed).

#### Opinion and recommendations

The mature to senescent woodlands on this Reserve are important for nest sites of a number of species of bird and, being fairly isolated, are probably important resting and breeding sites for migratory species. As weed spread from the gravel pits is slow and the understory appears to be relatively intact there seems to be little point in filling in the pits. Additionally they are providing habitats for frogs and watering points for birds. I recommend that Reserve 12277 be vested in the Western Australian Wildlife Authority and that a sign be erected on the SW corner of the Reserve indicating that Flora and Fauna are protected.

APPENDIX 3

VEGETATION DETAILS RESERVE 12277

Gimlet woodland

Eucalyptus salubris trees, mature to senescent, stratum 4-16 m tall, 10-30% canopy cover over Acacia merrallii and mixed shrubs, mature, 0.5 m tall, 2-10% canopy cover. Some E. salubris are emergent to 24 m tall and there are scattered E. salmonophloia trees emergent to 22 m tall. Other plant species present were: Acacia erinacea, A. merrallii, Bassia affin. diacantha, Cassia nemophylla, Carpobrotus edulus, Chenopodium pumilio, Daviesia acanthoclona, Dianella revoluta, Eucalyptus redunca, Exocarpus sparteus, Grevillea acuaria, G. huegellii, Rhagodia nutans and Santalum acuminatum.

The E side of the Reserve has the E. salubris to 24 m tall and the E. salmonophloia more abundant and emergent to 28 m tall. Understory species were: Acacia acuminata, Bassia sp. 10, Carpobrotus edulus, Maireana brevifolia, Olearia revoluta, Pittosporum phylliraeoides, Rhagodia preissii and Santalum acuminatum. Soil reddish brown, sandy clay. Poorly drained.

Jam Woodland

Acacia acuminata trees, mature, stratum 2-5 m tall, 2-10% canopy cover. Scattered Eucalyptus loxophleba trees are present. There is no understory but the following species are present: Acacia lasiocalyx, Lomandra effusa, Santalum spicatum, Stipa elegantissima. Soil reddish brown, fine sandy clay loam. Moderately to poorly drained.

Reserve 12277

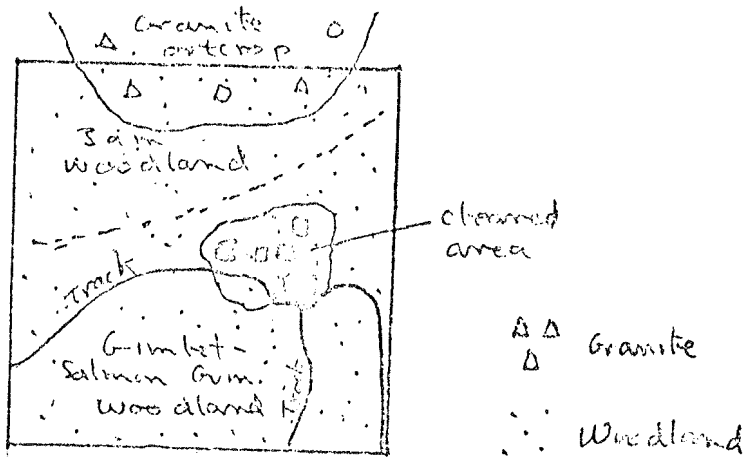


Plate 8. Reserve 12277 showing Gimlet woodland with scattered Salmon Gums. View SE from W side of Reserve.

Plate 9. Gravel pits used 9-10 years ago for sewage effluent and now supporting extensive weed growth, mostly within the confines of the runoff they provide.

Reserve 14194

Located ca 50.5 km SW of Bruce Rock Townsite and shown on lithograph 2433-1, AB1-2.

Background.

Originally gazetted 21 June 1912 for "Water". The Reserve was vested in the Bruce Rock Roads Board on 10 September 1937 but this was revoked when the Reserve was made "Conservation of Flora" on 18 May 1962. The Reserve is currently unvested.

Physical characteristics.

Reserve 14194 is roughly rectangular, minus the NE corner. It is ca 1.3 km long (E-W axis) by ca 0.6 km broad (N-S axis) and has a total perimeter of ca 3.6 km. The area is 65.0532 ha. The highest portion of the Reserve is the SW corner, being 330 m above sea level (ASL) and the lowest portion the NE side which is 290 m ASL.

Vegetation

About half the Reserve is granite outcrop, the remaining portion having 4 associations.

Wandoo woodland: occupies flat clayey areas on E and W extremities of the Reserve. Association is Open Low Woodland A over Very Open Low Sedges.

Sheoak woodland: Dense Low Forest A of Huegel's casuarina on a shallow watercourse.

Mallee patch: small area of Eucalyptus sp. 2. Dense Shrub Mallee.

Tamma thicket: Tamma Thicket with no understory developed; at base of granite rock runoff areas.

Plant species

Thirty-three species of plants were recorded of which 12 are exploited by the wildflower seed trade. A Dodonaea and a Eucalyptus of uncertain affinities were collected.



## Weeds

Scarce, mostly in rubbish tip and in wet areas around granite base. Common species are the grasses Avena sativa fatua and Briza maxima and the broad-leaved weeds Ptilotus polystachys and Euphorbia australis.

## Fire

No evidence of fire within the last 20-30 years.

## Fauna

Port Lincoln Parrot (Platycercus zonarius) : common.

Galah (Cacatua roseicapilla) : small flock flying over Reserve.

Western Shrike Thrush (Colluricincla harmonica rufiventris):  
1 seen in Wandoo woodland.

Australian Raven (Corvus coronoides) : several seen.

Helioporus albopunctatus (Spotted Burrowing Frog) : common  
in runoff area from granite.

Neobatrachus pelobatoides : in runoff area from granite.

Amphibolurus ornatus (Ornate Dragon) : common on granite outcrop.

## Exotic fauna

Rabbits are present throughout the Reserve.

## Firebreaks and fences

The W, S & E sides of the Reserve are fenced and have perimeter firebreaks in adjacent farmland. The N boundary is contiguous with a roadway.

## Human usage

A small gravel pit has removed some of the natural vegetation adjacent to the N side of the granite outcrop and appears to have been used recently. Access provided by the pit has allowed rubbish dumping to extend into the Reserve. Trail bikes have been used on the granite outcrop and have damaged Borya nitida bound soil patches, allowing gully erosion to begin. There are two shallow wells in the Sheoak woodland. Sand has blown into the Reserve on the W boundary.

## Adjacent uncleared land

None except road verges.

#### Remarks

The wells in the Sheoak woodland provided water for travellers when the Old Beverley Road, which passes along the N boundary of the Reserve, was used as a main road to the goldfields.

#### Opinion and recommendations

Reserve 14194 is of importance as a rest site for migrating birds as well as providing an important refuge for resident wheatbelt species. The Reserve has quite high habitat diversity, considering its size, and the runoff areas provide refuges for frogs and aquatic invertebrates. Damage caused by trail bikes is leading to removal of some of the densest thickets of Ti-tree and their use on the Reserve must be restricted before a major erosion problem develops. The stand of mallee, referred to in this report as Eucalyptus sp. 2 has been tentatively identified as E. websterana. There is, however, some considerable doubt to this identification and there is a high probability that it is an undescribed species.

I recommend that Reserve 14194 be vested in the Western Australian Wildlife Authority, that further removal of gravel be prohibited and that a sign be erected near the entrance to the gravel pit indicating that soil removal, rubbish dumping and use of trail bikes is prohibited on the Reserve.

APPENDIX 4

VEGETATION DETAILS RESERVE 14194

Wandoo woodland

Eucalyptus wandoo trees, mature to senescent, 8-16 m tall, 2-10% canopy cover. Some trees emergent to 20 m tall and scattered patches of Acacia acuminata trees 3-5 m tall, locally up to 4% canopy cover. Understory is Loxocarya pubescens 20 cm tall, 2-10% canopy cover. Other plant species recorded were: Arthropodium preissii, Astroloma serratifolium, Borya nitida, Dianella revoluta, Glischrocaryon roei, Lepidosperma gracile and Lomandra effusa. Soil was grey, sandy clay loam. Poorly drained.

The small area of wandoo woodland on the W side of the Reserve was slightly more mature but had less understory. Commonest species present were Casuarina huegeliana, Dampiera spicigera, Harperia lateriflora, Lepidosperma tenue, Leptospermum erubescens and Loxocarya pubescens.

Sheoak woodland

Casuarina huegeliana trees, 8 m tall, 70-100% canopy cover. Scattered wandoo present. No understory except scattered Dodonaea sp. 2, Lepidosperma tenue and Loxocarya pubescens. Association is small and situated on a shallow watercourse flowing off the granite outcrop. Soil was pinkish grey, sandy loam. Well drained.

Mallee patch

Eucalyptus sp. 2. shrub mallee 2-11 m tall, 70-100% canopy cover. Area is very small, being only about 200 square metre in area. The only species found in the association were Billardiera variifolia and Loxocarya pubescens and the grasses Avena sativa fatua and Briza maxima.

Tamua thicket

Casuarina campestris shrubs, mature, 2-4 m tall, 30-70% canopy cover. Understory was absent except for scattered shrubs of Acacia leptoneura, Banksia crispiflora, Hakea scoparia, Melaleuca elliptica and M. platycalyx. Soil was pale brown, sandy loam. Well drained.

Granite outcrop

Shallow soil pockets had Borya nitida or Stypandra imbricata present, and deeper soils, patches or thickets of Acacia lasiocalyx, Casuarina huegeliana, Dianella revoluta, Dodonaea attenuata, Lepidosperma drummondii, Leptospermum erubescens, Melaleuca fulgens, M. radula and M. macronycha.

## Reserve 14194

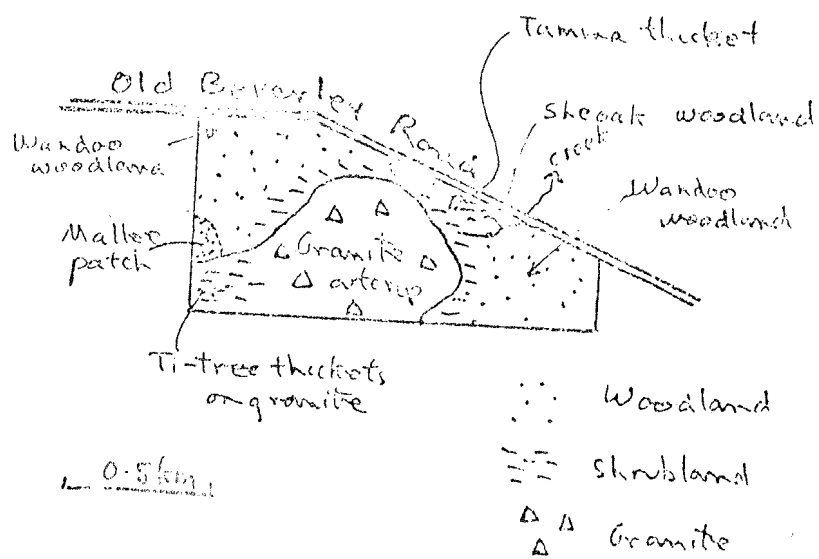


Plate 10. Reserve 14194. View E from top of granite outcrop showing runoff areas and woodland beyond.

Plate 11. View N into Wandoo woodland with some Jam on E side of Reserve 14194.

Plate 12. Casuarina huegeliana woodland along water course on NE side of granite outcrop on Reserve 14194.

Plate 13. Mallee patch (Eucalyptus sp. 2.) on NW corner of Reserve 14194.

Plate 14. Leptospermum erubescens (Ti-tree) thicket at SW corner of granite outcrop. This thicket is typical of the denser portions of lithic shrubland being destroyed by erosion along trail bike wheel ruts.



Reserve 16104

Located ca 35 km SW of Bruce Rock Townsite and shown on lithograph 2433-1, C2.

Background

Reserve not gazetted but was "Excepted from leasing and occupation" at a date unspecified. No reason was given. The Reserve was then gazetted for "Conservation of Flora" on 15 June 1962.

Physical characteristics

Reserve 16104 is triangular, has an area of 107.9853 ha and a perimeter of ca 5.8 km. The highest point on the Reserve is the SE side with an altitude of 340 m above sea level (ASL) and the lowest is the W side with an altitude of ca 320 m ASL.

Vegetation

Four associations are present on the Reserve. These are 2 heaths, a mallee and a woodland.

Tamma heath: Casuarina campestris (Tamma). Low Scrub B over mixed shrubs Low Heath D.

Melaleuca heath: Melaleuca uncinata (Broombush), M. densa and Leptospermum erubescens (Ti-tree) Heath B.

Mallee: Eucalyptus cylindriflora (White Mallee) and E. redunca (Black Marlock) Dense Shrub Mallee.

Woodland: Eucalyptus wandoo (Wandoo) Low Woodland A with a patchy understorey of Ti-tree.

Plant species

Fifty-nine plant species were recorded, of which 14 are exploited by the wildflower seed trade. A Eucalyptus, Hakea, Lepidosperma and Myrtaleum of uncertain affinities were collected.

None were recorded.

## Fire

No evidence of fire within the last 20-30 years.

## Fauna

Port Lincoln Parrot (Platycercus zonarius): in woodland.

Galah (Cacatua roseicapilla): common in woodland.

Tree Martin (Hirundo nigricans): flying over woodland.

Magpie-lark (Grallina cyanoleuca): in woodland.

Grey Butcher Bird (Cracticus torquatus): flying over heath.

Australian Raven (Corvus coronoides): common.

## Exotic fauna

There are abundant signs of rabbits and a feral cat was seen on the Reserve.

## Firebreaks and fences

The W and SE sides of the Reserve are fenced and have narrow fire breaks in adjacent farmland. The N boundary is adjacent to a roadway and is unfenced. A track passing from the NW corner to the middle of the SE side forms an effective central firebreak.

## Human usage

Some timber has been removed from the wandoo woodland. There is a gravel and sand pit in the Tamma heath.

## Adjacent uncleared land

None within some distance of the Reserve.

## Opinion

Reserve 16104 contains excellent representative areas of 2 types of heath as well as mallee and woodland. It is also quite rich in plant species, many of which are represented in the heath. The isolation of the Reserve makes it of considerable importance to transient birds as a resting and feeding site.

I recommend Reserve 16104 be retained in its present state, that further removal of gravel be prohibited and that it be vested in the Western Australian Wildlife Authority.

APPENDIX 5

VEGETATION DETAILS RESERVE 16104

Tamma heath

Casuarina campestris shrubs, mature, 0.5-1.5 m tall, 10-30% canopy cover over mixed shrubs 0.5 m tall, 30-70% canopy cover. Scattered Eucalyptus sp. to 3 m tall are present. Other species recorded were: Acacia acanthoclada, A. dielsii, Baeckea heteranthera, Borya nitida, Calothamnus quadrifidus, Casuarina microstachya, Chamaexeros fimbriata, Choretrum glomeratum, Comesperma scoparia, Cryptandra pungens, Dryandra cirsioides, Gastrolobium spinosum, Grevillea integrifolia, Hakea circumalata, H. incrassata, Harperia lateriflora, Hibbertia uncinata, Leucopogon dielsianus, Loxocarya fasciculata, Melaleuca cordata, M. spathulata, M. uncinata, Mesomelaena uncinata, Persoonia striata, Petrophile drummondii, P. ericifolia, Synaphaea polymorpha, Verticordia chrysantha, Xanthorrhoea nana. Soil yellow, sandy loam with 20% laterite pebbles. Well drained.

Melaleuca heath

Melaleuca uncinata, Melaleuca densa and Leptospermum erubescens, shrubs, mature, 1.5 m tall, 30-70% canopy cover. There are scattered Eucalyptus foecunda and E. redunca mallee to 3 m tall. Other species recorded were: Acacia dielsii, Baeckea heteranthera, Brachyloma concolor, Casuarina microstachya, Choretrum glomeratum, Cryptandra pungens, Dryandra cirsioides, Gastrolobium spinosum, Hakea circumalata, H. affin. subsulcata, Harperia lateriflora, Loxocarya fasciculata, Melaleuca spathulata, Mesomelaena uncinata, Petrophile ericifolia. Soil light yellowish brown, clay loam, well to moderately drained.

Mallee

Eucalyptus cylindriflora, E. redunca shrub mallee, mature, 4-9 m tall, 10-100% canopy cover. Also recorded were: Acacia erinacea, A. orbifolia, Eucalyptus transcontinentalis, Loxocarya pubescens, Melaleuca scabra var. subserulata, M. uncinata and Trymalium affin. ledifolium. Where canopy is more open Melaleuca undulata and Olearia muelleri occur. Soil was red, sandy clay. Poorly drained.

Woodland

Eucalyptus wandoo trees, mature, 8-14 m tall, varying from 5-30% canopy cover. Understory virtually absent except for small localised patches of Leptospermum erubescens which reach 10-30% canopy cover within their

limits. Other plant species recorded were: Acacia glaberrima, Astroloma epacridis, Borya nitida, Casuarina acutivalvis, Comesperma scoparia, Daviesia teretifolia, Dianella revoluta, Eucalyptus cylindriflora, Gastrolobium crassifolium, G. trilobum, Grevillea huegellii, Hakea lissocarpha, Lepidosperma gracile, L. sp., Lomandra effusa, Loxocarya pubescens, Melaleuca densa, Santalum acuminatum. Soil light grey, clayey sand. Poorly drained.

Reserve 16104

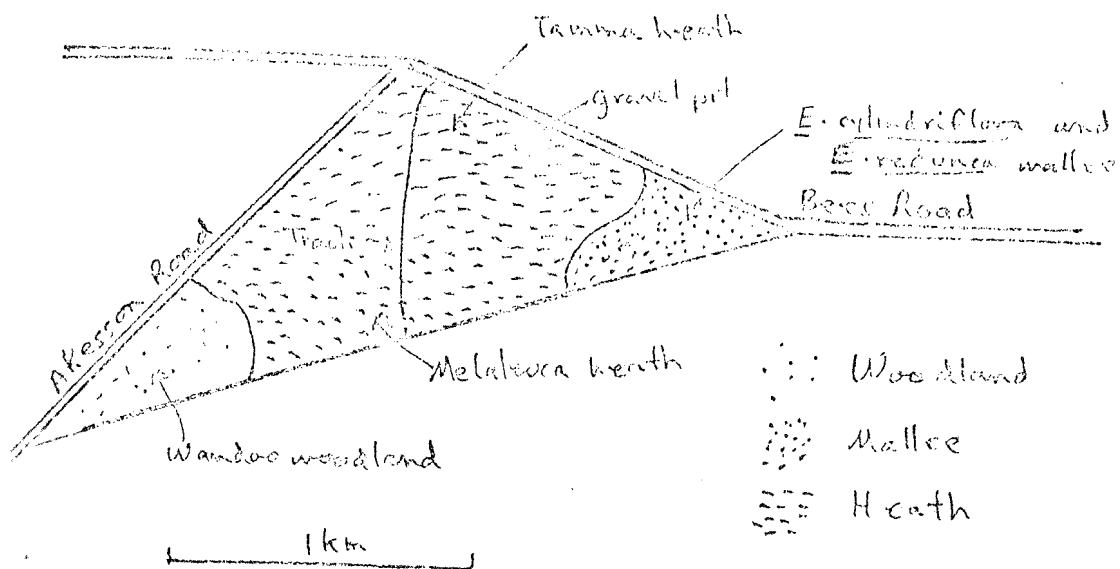


plate 15. View NE across Tamma heath on Reserve 16104.

plate 16. View E across Melaleuca heath on Reserve 16104.

Plate 17. Reserve 16104 showing Eucalyptus cylindriflora stand.

Plate 18. View E into wandoo woodland on Reserve 16104.

Reserve 16288

Located ca 1 km NW of Kwolyin Townsite and shown on lithograph 2434-11, A2-3.

Background

Originally gazetted 28 January 1916 as a "Cemetery Site" for the town of Kwolyin. The site was never used and was converted to "Conservation of Flora" on 27 July 1962.

Physical characteristics

The Reserve is square, with a perimeter of ca 0.8 km and an area of 4.0469 ha. The Reserve is flat and has a shallow creek crossing its NW corner.

Vegetation

A single association of Eucalyptus wandoo (Wandoo) Low Woodland A is present. Understory is completely absent.

Plant species

Only E. wandoo and Acacia acuminata trees were present.

Weeds

Abundant grasses.

Fire

Probably not for a long time: refer Human Usage and Remarks section.

Fauna

None recorded.

Exotic Fauna

Heavily grazed by sheep and possibly pigs.

Firebreaks and fences

None except farm boundaries - refer Human Usage.



Human usage

The entire Reserve has been incorporated into farmland (C.G. 372) and has been used for grazing stock for many years. Pig pens and a shed are built on its N edge.

Adjacent uncleared land

None: some similar woodland on the E side of the Kwolyin Road East.

Remarks

The owner of C.G. 372 has apparently considered the Reserve part of his property and has been using it accordingly for many years. All under-story has been destroyed and is still grazed by sheep.

Opinion and recommendations

I recommend legal action be taken against the farmer owning the adjacent land. Too frequently farmers feel that reserves are extensions of their properties, to use as they wish. If no action is taken word will quickly spread through the farming community (as it has in the past) that the profits from using reserved land far outweigh the meagre "punishment" received for such misuse. As long as this situation continues reserves will be abused.

Appendix 6

Reserve 16288

The single association is of Eucalyptus wandoo trees, mature to senescent, 4-10 m tall, 10-30% canopy cover. No understory but seasonal growth of grasses. Occasional Acacia acuminata and E. loxophleba trees near the NW corner.

Plate 19. View W into Wandoo woodland on Reserve 16288. Note complete lack of understory.

Reserve 16493

Red Lake Reserve

Located ca 13.5 km SE of Babakin Siding and shown on lithograph 2533-IV, A3.

Background

Originally gazetted 3 September 1920 as a Water Reserve. This was changed to "Sports and Show Ground" on 3 September 1950 and then to "Conservation of Flora" on 27 July 1962.

Physical characteristics

Reserve 16493 is roughly square, minus the NW corner. It has an area of 54.4302 ha and a total perimeter of ca 3.1 km. The Reserve is relatively flat, the whole area being ca 260 m above sea level. The lake is about 2 m lower than the surrounding bushland.

Vegetation

Only two associations are present on the Reserve. The majority is Eucalyptus salubris Open Woodland with an understory of either Hakea sp. 3. and Santalum acuminatum (Quandong) Open Low Woodland B or Melaleuca hamulosa Open Scrub.

The other large association is Eucalyptus loxophleba (York Gum) Low Forest A.

Scattered patches of Melaleuca hamulosa Scrub are present and traces of a mallee association are left near the gravel pit.

Plant species

Thirty-one plant species were recorded, of which 6 are exploited by the wildflower seed trade. A Baeckea and Hakea of uncertain affinities were collected.

Seeds

Scattered throughout gravel pit and woodland. Mostly just germinating and not identified.

Fire

No evidence of fire within the last 20-30 years.

## Fauna

Grey Kangaroo (Macropus fuliginosus): droppings common.  
Crested Pigeon (Ocyphaps lophotes): flying NW side.  
Port Lincoln Parrot (Platycercus zonarius): in woodland.  
Black Faced Cuckoo Shrike (Coracina novaehollandiae):  
2 seen in woodland.  
White-browed Babbler (Pomatostomus superciliosus):  
several in Melaleuca scrub.  
Magpie-lark (Grallina cyanoleuca): several seen in woodland.  
Grey Butcher Bird (Cracticus torquatus): 1 seen near roadway.  
Western Magpie (Cracticus tibicen dorsalis): 2 seen in gravel pit.  
Australian Raven (Corvus coronoides): common.

## Exotic fauna

Some rabbit scats were noted.

## Firebreaks and fences

None except on adjacent farmland. The W boundary is adjacent to a roadway and is unfenced.

## Human usage

Some rubbish has been dumped near the E side of the Reserve and includes household rubbish, sheep carcasses and bags of wheat. Some timber has been removed from the gimlet woodland. A small gravel pit is present on the SW corner of the Reserve and is currently being used as a blue-metal dump by the local shire.

The Lake margin has been used extensively as a race course about 10 years ago and there are remains of a lean-to hut near the Lake edge. The Lake is not currently used for recreation.

## Adjacent uncleared land

Entirely absent.

## Opinion and recommendations

The gimlet woodland on this Reserve is worth retaining as its under-  
story is relatively intact and, on the whole, little disturbed. Some old  
trees contain nest hollows and are used by birds. They also provide

important roosting and feeding areas for transient and migratory birds. The Lake supports waterfowl throughout most of the year as water is usually present even in dry seasons.

I recommend that Reserve 16493 be vested in the Western Australian Wildlife Authority and that signs be erected to indicate that Flora and Fauna are protected and that rubbish dumping is prohibited.

APPENDIX 7

VEGETATION DETAILS RESERVE 16493

Gimlet-Quandong woodland

Eucalyptus salubris trees, mature to senescent, 12-18 m tall, 2-10% canopy cover over Hakea sp. 3. and Santalum acuminatum trees, mature, stratum 2-4 m tall, 2-10% canopy cover. Other species recorded were: Acacia merrallii, Eucalyptus gracilis, Lomandra effusa, Olearia muelleri, Rhagodia preissii, Stipa elegantissima, Templetonia sulcata. Soil reddish brown, sandy clay loam. Poorly drained.

Gimlet-Melaleuca woodland

Eucalyptus salubris trees, mature to senescent, stratum 12-20 m tall, ca 2-3% canopy cover over Melaleuca hamulosa shrubs, mature, stratum 4 m tall, 2-10% canopy cover. Other plant species present were: Acacia colletioides, Baeckea sp., Bassia affin. diacantha, Enneapogon caerulescens, Eremophila {decipiens, Exocarpus sparteus, Rhagodia nutans, Santalum acuminatum, Stipa elegantissima. Soil light red, sandy clay loam. Moderately to poorly drained.

York Gum woodland

Eucalyptus loxophleba trees, mature, stratum 8-14 m tall, 30-70% canopy cover. Scattered E. salubris present. Also recorded were: Acacia multispicata, Bassia affin. diacantha, Cheiranthra parviflora, Olearia muelleri, Santalum acuminatum, Westringia rigida brachyphylla. Soil pale red, loam. Moderately drained.

In addition to the three major associations there are several small patches of Melaleuca hamulosa shrubs, 2-3.5 m tall, 10-30% canopy cover. A small exposure of granite on the SW corner of the Lake has Melaleuca hamulosa to 5 m tall and 70-100% canopy cover. Scattered Acacia acuminata, Arthrocnemum halocnemoides and M. thyoides are present.

The area around the gravel pit has some Eucalyptus foecunda, Daviesia anthoclada, Atriplex paludosa graciliflora and Trymalium affin. ledifolium present. These may be remnants of a small area of mallee on gravelly soil, the majority of which has been destroyed by gravel removal.

Reserve 16493

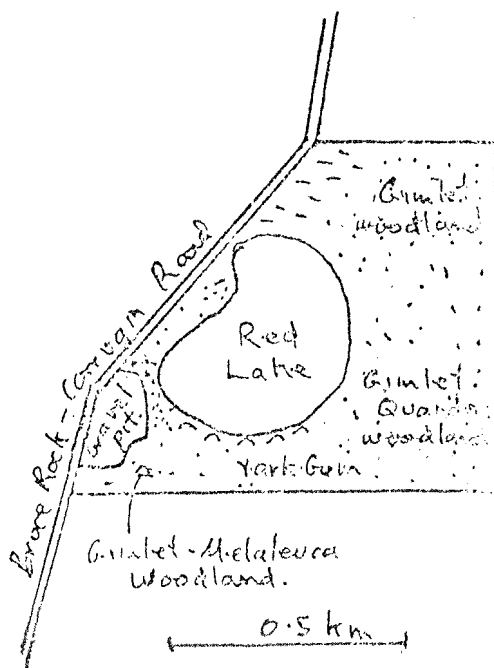




Plate 20. View N across Red Lake. Reserve 16493.

Plate 21. York Gum woodland. View E.

Reserve 17420

Located ca 18 km SW Bruce Rock Townsite and shown on lithograph 2534-111, A3.

Background

Originally gazetted 26 March 1920 as a Reserve for "Hall Site and Recreation" and was 10.1215 ha in area. The Reserve was increased to 30.3514 ha on 4 March 1938 and its purpose was changed to "Conservation of Flora" on 18 May 1962.

Physical characteristics

Reserve 17420 is roughly square, minus the SW corner. Its area is 30.3514 ha and its total perimeter ca 1.9 km. The S side is highest being ca 285 m above sea level (ASL) and the N side lowest, being ca 270 m ASL.

Vegetation

The only association present was Acacia acuminata (Jam) Open Low Woodland A with no understory except dense seasonal stands of grass and Waitzia acuminata everlastings.

Plant species

Seven plant species recorded, 3 of which are exploited by the wildflower seed trade.

Weeds

Common where water collects along road verges or in hollows in the ground surface. All were present as very immature plants. Species were Arctotheca calendula, Brassica tournfortii, Chenopodium pumilio and Ursinia anthemoides.

Fire

No evidence, but the nature of the understory is such that fires in the grassy understory would probably not damage trees or leave many signs to indicate their frequency.

Port Lincoln Parrot (Platycercus zonarius): common.

Galah (Cacatua roseicapilla): common.

Australian Raven (Corvus coronoides): common.

Exotic Fauna

None recorded.

Firebreaks and fences

Both present on adjacent farmland (N, E and S sides). The SW side of the Reserve are protected from fire by a roadway.

Human usage

Understory may have been cleared or heavily grazed at some time. Some timber has been removed.

Adjacent uncleared land

Water Reserve 13502, of ca 34 ha is uncleared and there is several ha of Gimlet and Salmon Gum woodland adjacent to the Reserve.

Opinion and recommendations

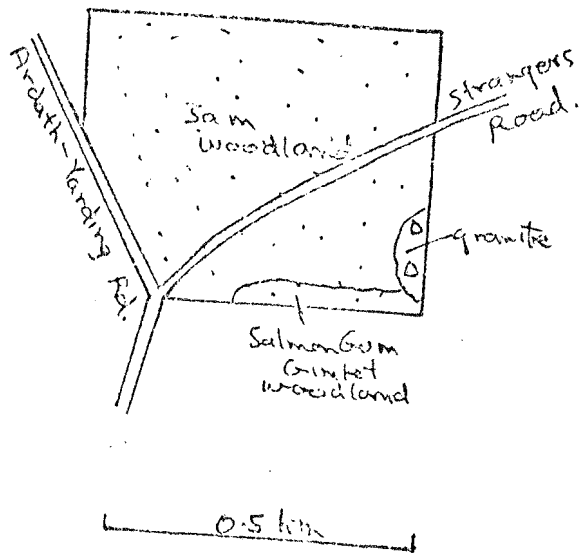
Reserve 17420 is in poor condition and of limited area, but has little value for any other form of land use. It presents no problems for weed or vermin control and is a useful rest site for transient birds. I recommend it be vested in the Western Australian Wildlife Authority.

APPENDIX 8

VEGETATION DETAILS RESERVE 17420

The whole Reserve is covered with a single association of Acacia acuminata trees, mature to senescent, stratum 3-7 m tall, 2-10% canopy cover. Understory is virtually absent except for a dense seasonal cover of grasses and Asteraceae particularly Waitzia acuminata. Other species recorded were Eucalyptus loxophleba, Hakea decurva and Lomandra effusa. The southern end of the Reserve borders on a Eucalyptus salmonophloia and E. salubris woodland 6-20 m tall, 10-30% canopy cover. Soil mostly reddish brown, sandy loam. Well drained.

# Reserve 17420



- Woodland.
- △△ Granite areas

## Reserve 19138

Located ca 10 km SE of Bruce Rock Townsite and shown on lithograph 2534-111, C4.

### Background

Originally gazetted 11 December 1925 as "Resting Place for Travellers and Stock" and vested in the Bruce Rock Roads Board on 15 January 1926. The vesting was revoked on 18 May 1962 and the title changed to "Conservation of Flora".

### Physical characteristics

Reserve 19138 is approximately rectangular, minus the SE corner. It has an area of 80.9371 ha and a total perimeter of ca 3.9 km. The highest portion of the Reserve is the S end, being ca 310 m above sea level (ASL) and the lowest portion the N end at ca 285 m ASL.

### Vegetation

There are 4 associations present on the Reserve. Gimlet-Salmon Gum Woodland: Eucalyptus salubris (Gimlet) and E. salmonophloia (Salmon Gum) Woodland or in localised areas, Forest. No understory. York Gum Mallee: Eucalyptus loxophleba (York Gum) Very Open Tree Mallee over Acacia acuminata (Jam) Open Low Woodland B.

Tamma shrubland: Casuarina campestris (Tamma) Open Scrub.

Granite areas: very open area of granite pavement and small outcrops with scattered trees and shrubs. A few areas of high runoff from the granite have Melaleuca spp. Dense Thicket.

### Plant species

Twenty-five plant species were recorded, of which 10 are exploited by the wildflower seed trade.

### Soils

Virtually absent except in cleared area and in areas of highest runoff. Polystachys polystachys and grasses are most abundant.

No evidence of fire within the last 20-30 years.

## Fauna

- Port Lincoln Parrot (Platycercus zonarius): common.  
Galah (Cacatua roseicapilla): 2 pairs seen.  
Rainbow Bird (Merops ornatus): flock of ca 20 over York Gums.  
White-browed Babbler (Pomatostomus superciliosus): flock of 6 in shrubland.  
Zebra Finch (Peophila guttata): about 20 on fence.  
Dusky Wood Swallow (Artamus cyanopterus): 2 seen in woodland.  
Australian Raven (Corvus coronoides): several in woodland.

## Exotic

Few rabbit scats noted - virtually absent.

## Firebreaks and fences

Fences and narrow firebreaks are present on adjacent farmland completely surrounding Reserves 19138 and 13057 (adjacent Water Reserve). The two Reserves are not separated by a fence.

## Human usage

There has been a small area cleared on the SW corner of the Reserve and some timber removed from the woodland.

## Adjacent uncleared land

The only adjacent uncleared land is Water Reserve 13057 of ca 64 ha. This Reserve is entirely Gimlet-Salmon Gum woodland and is little disturbed.

## Remarks

Reserves 19138 and 13057 are inaccessible except along a rough track marked as Coodarin Road on the lithograph.

## Opinion

Reserve 19138 preserves quite a high diversity of plant associations and species, considering its small size. As well as being isolated in itself, woodland formations of this type are few in the area. The Reserve must be of crucial importance as a rest site for migrating birds. The Reserve also supports quite a few birds permanently, especially those inhabiting woodland and mallee associations. I strongly recommend that attempts be made to secure Water Reserve 13057 as part of the Flora and Fauna Reserve and that both be vested in the Western Australian Wildlife Authority.

APPENDIX 9

VEGETATION DETAILS RESERVE 19138

Gimlet-Salmon Gum Woodland

Eucalyptus salubris and E. salmonophloia trees, mature to senescent, stratum 4-16 m tall, 10-30% canopy cover (locally up to 50%) with no understory. Some E. salmonophloia emergent to 20 m tall. No understory but scattered Acacia merrallii, Borya nitida, Dianella revoluta, Lomandra effusa, Rhagodia preissii and Santalum spicatum are present. Soil red, fine sandy clay loam. Poorly drained.

York Gum mallee

Eucalyptus loxophleba tree mallee, mature, stratum 4-9 m tall, 2-10% canopy cover over Acacia acuminata trees, mature, 2-5 m tall, 2-10% canopy cover. Other species recorded were: Borya nitida, Casuarina campestris, Grevillea paniculata, Lomandra effusa, Santalum acuminatum, S. spicatum, Stylobasium australe. Soil light grey, fine sandy clay loam. Poorly drained.

Tamma shrubland

Casuarina campestris shrubs, mature, stratum 1-3 m tall, 2-10% canopy cover. Other plant species present were: Acacia acanthoclada, Bassia affin. diacantha, Borya nitida, Calytrix fraseri, Cryptandra myriantha, Dianella revoluta, Jacksonia furcellata, Loxocarya pubescens, Stylobasium australe, Stypandra imbricata. Soil reddish yellow, fine sandy loam with traces of laterite. Well drained.

Granite area

Scattered small outcrops or pavements of granite with shallow soil cover. Scattered shrubs and trees present. Acacia lasiocalyx, Eucalyptus loxophleba, Lomandra effusa, Olearia revoluta, and Santalum spicatum. Runoff from the granite has produced a few wet patches with Melaleuca hamulosa and M. acuminata shrubs, 2-4 m tall, 70-100% canopy cover.



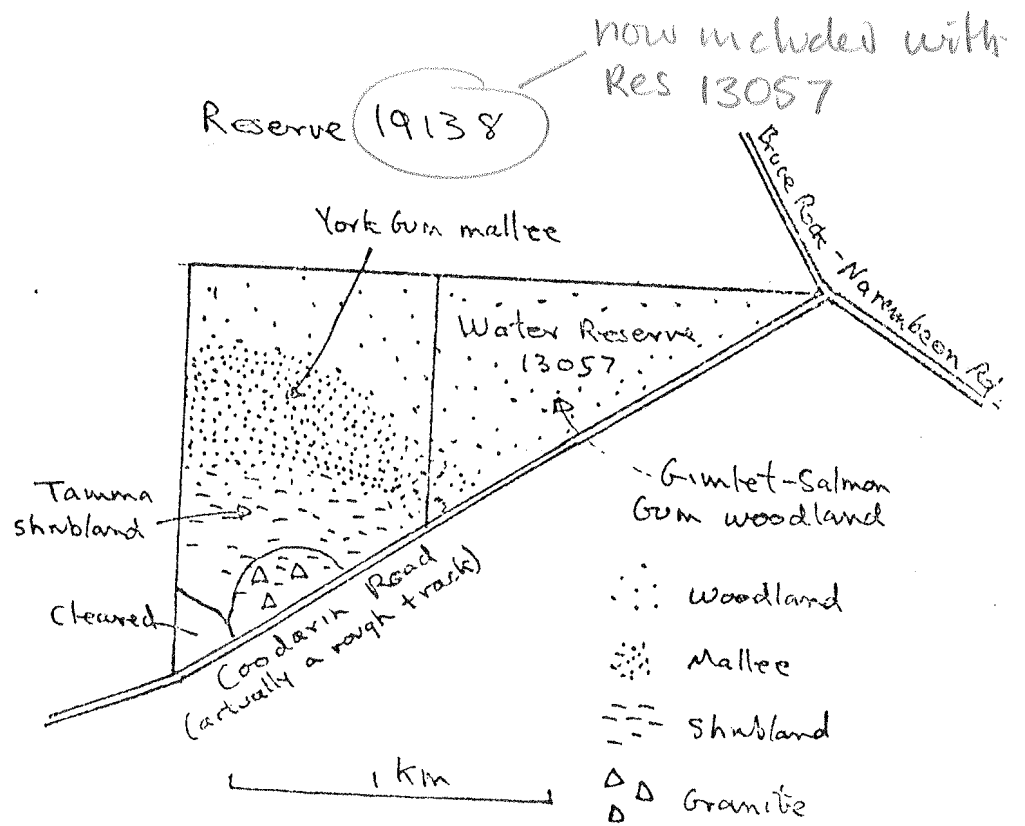


Plate 22. Reserve 19138. View N in York Gum mallee association on lower ground.

Plate 23. View NW into Melaleuca thicket. Note abundant seedlings although vegetation has not been burnt for 20-30 years.

Reserve 22792

Located ca 25.5 km NNW Corrigin Townsite and shown on lithograph 2433-1, A2.

Background

Originally gazetted 30 April 1948 for "Public Utility" and was 283 ha in area. Its vesting was then changed to "Conservation of Flora" on 15 June 1962. It was decreased in size to 279 ha on 7 June 1968 by creating extensions to road 13636; then to 260 ha on 2 July 1971 by excluding Avon Loc. 28350. It was later increased to its present area of 227.5208 ha on 18 August 1972 by inclusion of Avon Loc. 28456. No reasons were given for the addition or subtraction of these Locations.

Physical characteristics

Reserve 22792 is roughly L shaped and 227.5208 ha in area. The N-S oriented arm is ca 2.7 km long by ca 0.6 km wide, and the E-W oriented arm ca 3.1 km long by ca 0.4 km wide. The total perimeter is ca 11.4 km. The lowest part of the Reserve is the NW corner, being ca 330 m above sea level (ASL). The SW corner rises to 370 m ASL and there is a decline to the E end of the Reserve to ca 350 m ASL on the SE corner.

Vegetation

The vegetation of the Reserve is varied, comprising Wandoo woodland with 2 types of understory, a mallee association and 4 types of heath. The tall mixed heath is of particular interest as it carries 6 species I have not encountered in the Tammin, Kellerberrin, Merredin or Narembene Shires to the N and E and thus appears to represent a heath type (or at least species assemblage) more commonly found further to the south (refer Muir 1976, 1977 a, b). Further examination may show that Reserve 22792 is at the northern limit of the range of these species and as such is of considerable scientific importance in evolutionary and genetic studies. The major associations are as follows.

Wandoo woodland: Woodland over Tamma and Ti-tree Low Scrub A over Macaranga pubescens Very Open Low Sedge.

Mallee areas: "Sand Mallee" Dense Shrub Mallee with no understory.

Tamma heath: Tamma Dense Heath A with no understory.

Tall mixed heath: Mixed Low Heath C with no particular dominant but Leptocarpus ferrugineus and Banksia sphaerocarpa prominent.

Low mixed heath: Mixed Dense Low Heath D with some emergent Tamma shrubs.

Melaleuca heath: Melaleuca subtrigona and Ti-tree Dense Low Heath C with emergent mallee in patches.

#### Plant species

Eighty-seven plant species were recorded, of which 16 are exploited by the wildflower seed trade. Six species recorded are of uncertain affinities. These were an Acacia, Micromyrtus, Phebalium (2 species) and 2 of indeterminate family. Several species are possibly near the northern limit of their range.

#### Weeds

None were recorded.

#### Fire

No evidence of fire. Local farmer (Mr Copestakes) informs me that the Reserve was burnt ca 30 years ago.

#### Fauna

Grey Kangaroo (Macropus fuliginosus): common.

Western Brush Wallaby (Macropus irma): farmer informs me that they were very common until about 5 years ago when a lot of clearing occurred. They still exist on the Reserve but are becoming scarce.

Wedgetail Eagle (Aquila audax): nest site on uncleared land adjacent to E end Reserve.

Crested Pigeon (Ocyphaps lophotes): 8 on W boundary of Reserve.

Port Lincoln Parrot (Platycercus zonarius): common.

Galah (Cacatua roseicapilla): common.

Mulga Parrot (Platycercus varius): 3 seen in heaths.

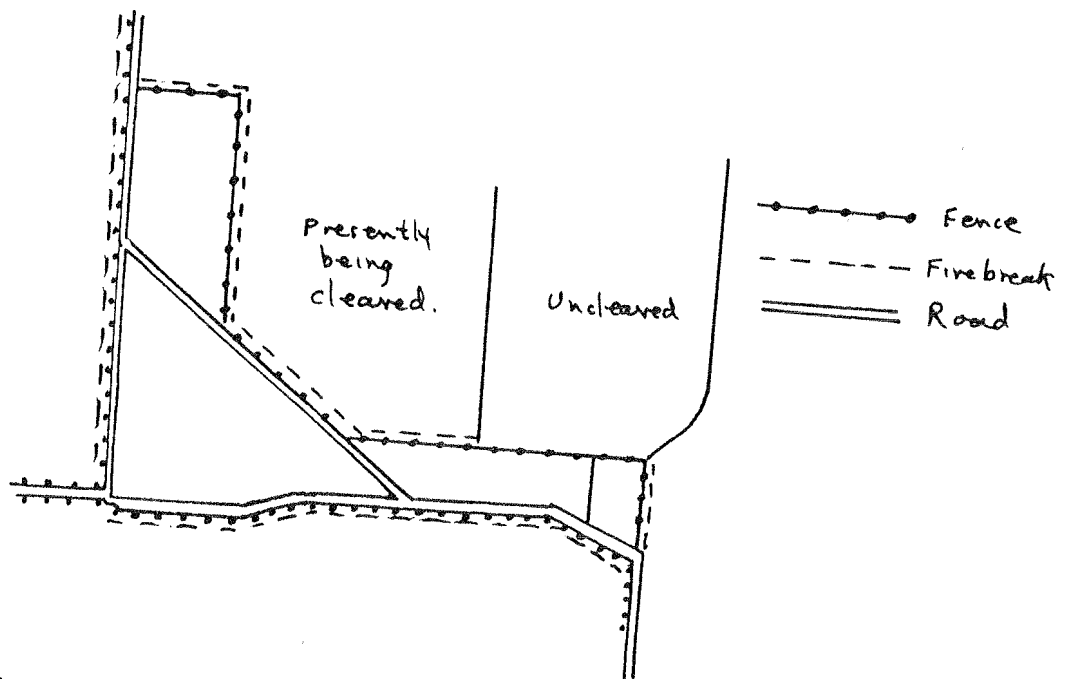
Black-faced Cuckoo-shrike (Coracina novaehollandiae): 2 seen in wandoo woodland NW end.

White-fronted Chat (Epthianura albifrons): in heath.

#### Terrestrial fauna

Rabbits and foxes are abundant on the Reserve.

## Firebreaks and fences



## Human usage

Mr Copestakes uses the area to show visitors wildflowers.

## Adjacent uncleared land

About 300 ha of uncleared woodland (mostly Wandoo) adjoins the E end of the S arm of the Reserve. This is part of Avon loc. 23980. The land between this uncleared portion and the Reserve is currently being cleared, except for a small area surrounding Boolanelling Spring. There is also ca 19 ha of uncleared woodland which is part of Avon Location 28350 and is immediately E of the S arm of the Reserve.

## Opinion and recommendations

I feel this is one of the finest Reserves I have encountered in this 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. It could also contain the most northern and eastern limits of a plant assemblage found further to the south.

Unfortunately clearing to the E of the Reserve is partly completed, however there still remains about 300 ha of woodland connected to the SE corner. If this could be added to the Reserve it would increase its area by over 500 ha. It may even be worth entertaining the idea of resuming the cleared land between the woodland and the Reserve before agriculture progresses too far (it was being ploughed for the first time in April 1978).

I strongly recommend that the purchase of adjacent uncleared land be considered and that the Reserve be classified "A". I also recommend that Reserve 22792 be vested in the Western Australian Wildlife Authority.

APPENDIX 10

VEGETATION DETAILS RESERVE 22792

Wandoo woodland

Eucalyptus wandoo at N end of Reserve is mature 12-20 m tall, 10-30% canopy cover over Casuarina campestris and Leptospermum erubescens shrubs, 0.5 - 2 m tall, 10-30% canopy cover over Loxocarya pubescens sedge, 20 cm tall, 2-10% canopy cover. Other plant species recorded were Astroloma serratifolium, Borya nitida, Conostephium preissii, Dodonaea attenuata, Dryandra vestita, Eucalyptus albida, Gastrolobium spinosum, Grevillea huegelli, Hakea lissocarpa, H. scoparia, Harperia lateriflora, Lepidosperma gracile, Lomandra effusa, Melaleuca adnata, Phebalium sp. 13 and Santalum acuminatum. Soil is pink, clay loam. Poorly drained. E. wandoo associations at the S end of the Reserve are mostly 8-12 m tall and 10-30% canopy cover over Loxocarya pubescens 10-30% cover. All the species listed above are present as scattered plants. Additionally, Alyxia buxifolia was common.

Mallee areas

Eucalyptus eremophila and scattered E. albida, E. oleosa var oleosa and E. redunca shrub mallee, mature, 3-4.5 m tall, 70-100% canopy cover over mixed shrubs (no particular dominant) 0.5 m tall, 2-10% canopy cover. Also recorded were: Acacia glaberrima, A. orbifolia A. sp. 15, Bertya cunninghami, Dodonaea attenuata, Dryandra affin. vestita, Gastrolobium crassifolium, Hakea scoparia, Lepidosperma gracile, L. affin. pruinosa, Leptospermum erubescens, Leucopogon conostephioides, Melaleuca acuminata, M. adnata, M. densa, M. affin. spathulata, M. uncinata, M. undulata, Micromyritus affin. rosea, Phebalium sp. 12, P. sp. 13. Soil yellowish brown, sandy clay loam. Poorly drained.

Tamua heath

Casuarina campestris shrubs, mature, 1-2 m tall, 70-100% canopy cover. This is a modification of the low mixed heath (see below) where the emergent C. campestris has become particularly dense. Understory is absent but the more versatile species from the low mixed heath are present.

Tall mixed heath

Mixed shrubs, no particular dominant, mature, 1 m tall, 30-70% canopy cover. Species recorded were: Banksia sphaerocarpa, Beaufortia incana,

Cassytha pubescens, Casuarina humilis, Dryandra cirsioides, D. ferruginea, Eucalyptus macrocarpa, Family indet. 17, Gastrolobium spinosum grandiflorum, Hakea baxteri, H. gilberti, H. incrassata, Hibbertia pungens, H. verrucosa, Isopogon drummondii, I. polycephalus, Leptospermum spinescens, Persoonia striata, Petrophile ericifolia, P. seminuda, Pityrodia bartlingii, and Xanthorrhoea nana. Soil is yellow, sandy clay loam with ca 50% laterite. Well drained.

#### Low mixed heath

Mixed shrubs, no particular dominant, mature to senescent, 0.5 m tall, 70-100% canopy cover. Some areas with Casuarina campestris emergent to 1 m tall. As density of the emergents increases the association merges into Tamma heath. Other plant species recorded are listed below. Acacia acuaria, Andersonia affin. lehmanniana, Beaufortia micrantha, Borya nitida, Calectasia cyanea, Casuarina humilis, Dampiera spicigera, Dodonaea affin. caespitosa, Dryandra cirsioides Family indet. 16, Hakea incrassata, Harperia lateriflora, Isopogon teretifolius, Leptospermum erubescens, Leucopogon dielsianus, L. minutifolius, Loxocarya fasciculata, Melaleuca spathulata, Mesomelaena uncinata, Persoonia striata, Petrophile drummondii, P. ericifolia, Pimelia sylvestris, Synaphaea petiolaris, S. polymorpha, Xanthorrhoea nana. Soil is very pale brown, sandy loam. Well drained.

#### Melaleuca heath

Melaleuca affin. subtrigona and Leptospermum erubescens shrubs, mature, 0.5-1 m tall, 70-100% canopy cover. Emergent Eucalyptus foecunda to ca 4 m tall, ca 1-2% canopy cover. Other species recorded were: Astroloma serratifolium, Beaufortia micrantha, Comesperma scoparia, Eucalyptus redunca, E. macrocarpa, Gastrolobium spinosum, Grevillea petrophiloides, Hakea circumalata, H. subsulcata, Hibbertia verrucosa, Isopogon polycephalus, Lepidosperma affin. drummondii, Melaleuca cordata and M. uncinata. Soil pale brown, sandy loam. Well drained

In localised areas the E. foecunda may reach 3-4% canopy cover, and in these areas the following species are also present: Adenanthos argyraea, Dryandra cirsioides, Grevillea excelsior, Hakea incrassata and Melaleuca spathulata.



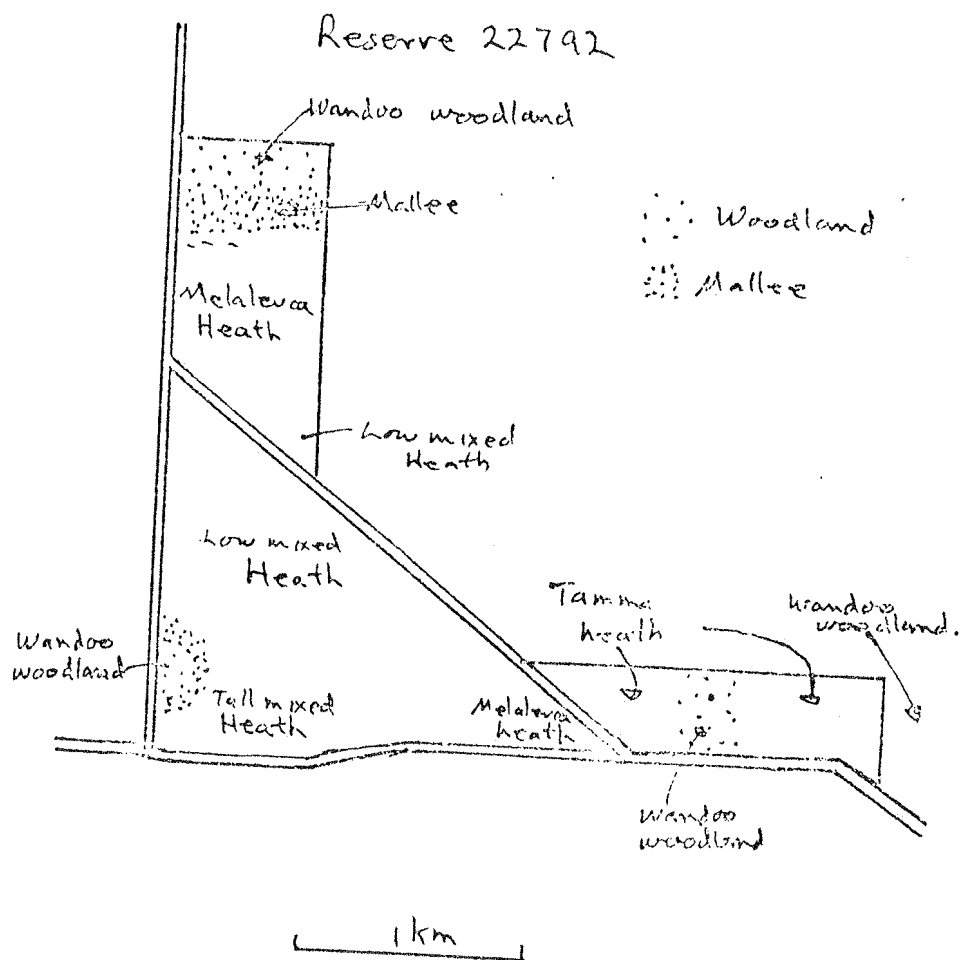


Plate 24. Reserve 22792. View E in Wandoo woodland at N end of Reserve showing patchy understory of shrubs and sedge cover.

Plate 25. Reserve 22792. View N in Wandoo woodland with the understory almost absent. This is typical of wandoo stands at the S end of the Reserve.

Plate 26. Reserve 22792. View E in Eucalyptus eremophila mallee area.

Plate 27. Reserve 22792. Tamma heath association at S end of Reserve.  
View NE towards uncleared land adjacent to Reserve.

Plate 28. View N across tall mixed heath on SW corner of Reserve 22792.  
Note rounded shrubs of Dryandra ferruginea, Banksia sphaerocarpa etc.

29. View SE across low mixed heath in central W side of Reserve 22792. In the distance the emergent Tamma shrubs are becoming denser and eventually merge into Tamma heath.

plate 30. View SE into Melaleuca heath association showing area of denser emergent Eucalyptus foecunda and scattered E. macrocarpa on Reserve 22792.

plate 31. View from Pikaring Hill Reserve towards Reserve 22792 showing distribution of woodlands and heath and adjacent uncleared land beyond.

## Reserve A24505

Located ca 4 km due N of Shackleton Siding and ca 30 km W of Bruce Rock Townsite. Shown on lithograph 2434-11, AB23.

### Background

Originally gazetted 3 August 1956 for "Conservation of Flora" and classified "A". The area of the Reserve at this time was ca 176 ha. It was increased (no date given) to ca 311 ha by the addition of Avon Locations 338 and 400 and then again on 12 October 1962 by the addition of Avon Location 407, bringing its present area to 447.1725 ha.

### Physical characteristics

Reserve A24505 is roughly linear, ca 5.6 km long by ca 0.6 km wide at its narrow SE portion and ca 1.5 km wide at its NW end. It is oriented approximately NW to SE. It has a total perimeter of ca 15 km (including rubbish site 19801) and an area of 447.1725 ha (the rubbish site is an additional 20 ha). The Reserve is very flat and about 240 m above sea level. Maximum topographic variation over the area of the Reserve is about 2 m.

### Vegetation

Reserve A24505, like most salt flats, is relatively simple structurally and floristically. Only three associations are present. 1. Eucalyptus loxophleba (York Gum) Open Woodland over Atriplex nummularium Dwarf Scrub C. 2. Melaleuca uncinata (Broombush) and M. hamulosa Thicket.

3. Arthrocnemum spp. (Samphire) salt flat varying from bare ground to Dense Low Heath D.

### Plant species

Eight species of plants were recorded, 4 in York Gum woodland, 2 in Broombush thicket and 2 in salt complex.

Absent except in immediate vicinity of rubbish tip where there was abundant development of Amaranthus albus (Tumble weed), Chenopodium pumilio (Wild Mint), Portulaca oleracea (Purslane) and Raphanus raphanistrum (Wild Radish).

## Fire

No evidence of fire in any area. It is doubtful that the samphire flats could support a fire at any time.

## Fauna

White-faced Heron (Ardea novaehollandiae): 2 on lake.

Mountain Duck (Tadorna tadornoides): about 20 on lake.

Grey Teal (Anas gibberifrons): about 200 on lake.

Common Sandpiper (Tringa hypoleucos): 3 on lake.

Black Winged Stilt (Himantopus himantopus) } ca 300 on lake.

White-headed Stilt (H. h. leucocephalus) }

Willy Wagtail (Rhipidura leucophrys): common in samphires and shrubland.

White-fronted Chat (Epthianura albifrons): common in samphires.

Australian Raven (Corvus coronoides): common, particularly around rubbish tip near lake.

## Exotic fauna

Indications of rabbit, fox and dog are present.

## Firebreaks and fences

Firebreaks are entirely absent, but probably unnecessary due to the nature of the vegetation. The Reserve is unfenced except where adjacent to farmland.

## Human usage

There has been a considerable amount of soil fill dumped on the salt flats immediately W of the road N from Shackleton. By far the greatest environmental damage is to a lake on the N end of the Reserve and which is an important feeding ground for waterfowl. At the time of this survey (April 1978) over 500 birds of 6 species were present on the lake and local farmers indicate that at some times of the year many thousands of ducks and other waterfowl congregate there. The lake is currently being filled in by expansion of a rubbish tip on the N end of the Reserve. This tip is illegal as there is no record of a portion of land being alienated from Reserve A24505 and a rubbish disposal reserve (19801) already exists to the SE of location 410.

Apart from gradually filling in the lake, paper and other debris has blown into the lake from the rubbish site and leaching of chemicals has begun to alter the aquatic environment.

#### Adjacent uncleared land

Many square kilometers of salt flats extend to the N and SE of the Reserve.

#### Opinion and recommendations

Reserve A24505 is of particular importance as it is probably one of the most extensive tracts of remarkably uniform (structurally and floristically) salt flat vegetation in the wheatbelt. Additionally the lake at the N end of the Reserve is a significant refuge for waterfowl and is currently endangered by land filling and rubbish disposal. The extensive tracts of salt land in the Bruce Rock Shire indicate that minimal disturbance to samphire and woodland complexes such as those on this Reserve is essential for soil conservation. I recommend that Reserve A24505 be vested in the Western Australian Wildlife Authority, that signs be erected on it to indicate that Flora and Fauna are protected and that shooting is not allowed. I also recommend that action be taken immediately to prevent further destruction and pollution of the lake system at the N end of the Reserve. Enquiries should be made to stop rubbish dumping at this site and have it redirected to the Sanitary Disposal Site (Reserve 19801) already set aside for the purpose.



APPENDIX 11

VEGETATION DETAILS RESERVE A24505

York Gum woodland

Eucalyptus loxophleba trees and tree mallee, mature to senescent, 6-18 m tall, 2-10% canopy cover over Atriplex nummularium shrubs, mature, 1 m tall, 10-20% canopy cover. Other species recorded were: Hakea preissii and Templetonia sulcata.

Broombush thicket

Melaleuca uncinata and M. hamulosa shrubs, mature, 2-3 m tall, 30-70% canopy cover.

Salt flat

Arthrocnemum halocnemoides shrubs 30 cm tall, varying from almost 0 to ca 80% canopy cover. Arthrocnemum bidens common on slightly raised areas within the salt flat.

## Reserve A 21505

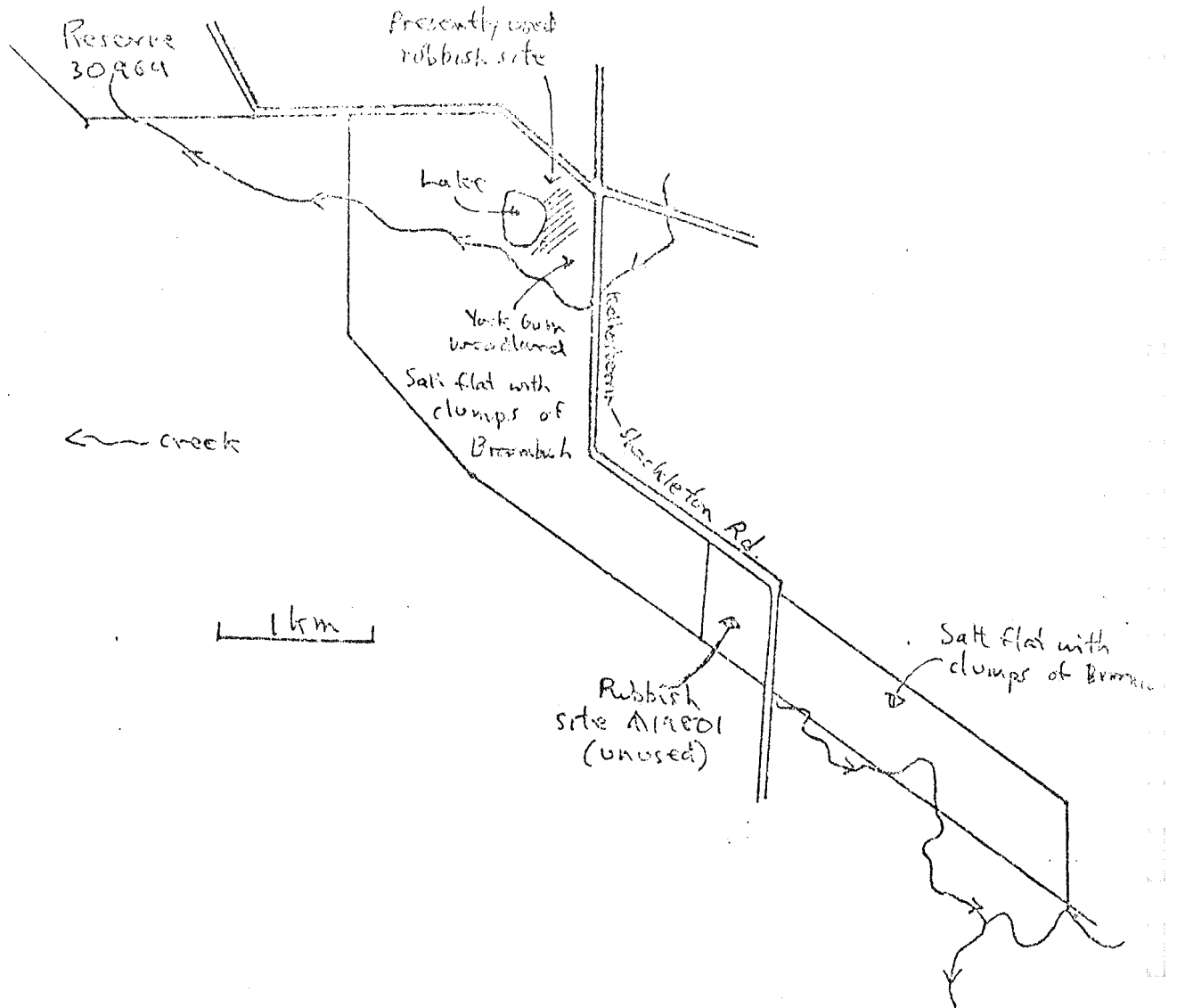


Plate 32. View SW on Reserve A24505 showing extensive tracts of very uniform salt marsh.

Plate 33. Reserve A24505 showing rubbish being used as land fill on the edge of a shallow lake at the N end of the Reserve. The white "patches" in the lake are flocks of up to 100 each of Black Headed and Banded Stilts.

## Reserves A25062 and 25979

Located ca 13.5 km E Babakin Siding and ca 32 km NE of Corrigin Townsite. Shown on lithograph 2533-IV, BC2.

### Background

Reserve A25062 was opened up for selection in 1952 but there were no applicants. The Reserve was then set aside for "Conservation of Flora" and classified 'A' on 8 August 1958.

Reserve 25979 was gazetted on 14 July 1961 for "Conservation of Flora".

### Physical characteristics

Reserve A25062 is roughly square, 297.1936 ha in area and has a perimeter of ca 5.1 km plus another 1.6 km contiguous to Reserve 25979. Reserve 25979 is elongate, irregular triangular, 851.9999 ha in area and has a perimeter of ca 18 km plus 1.6 km contiguous to Reserve A25062. Total perimeter of the two Reserves is thus ca 24.7 km. Both Reserves are very flat and average ca 260 m above sea level. Maximum topographic variation over the area of the Reserves would probably not exceed 3 m. Both Reserves are considered together in this report.

### Vegetation

Both Reserves are covered with an intricate mosaic of 4 main associations, according to topography and drainage.

Gimlet woodland: Eucalyptus salubris (Gimlet) Open Woodland with no understorey. Scattered E. gracilis (Yorrell) trees along the margins of the salt flats.

Mallee areas: Eucalyptus affin. redunca Open Tree Mallee over mixed scattered shrubs.

Melaleuca hamulosa stands: Melaleuca hamulosa Open Low Woodland A or Open Scrub over mixed shrubs Dwarf Scrub C.

Salt flats: Arthrocnemum species (Samphire) varying from Open Dwarf Scrub to Dense Low Heath D with marginal areas of scattered shrubs.

## Plant species

Thirty-four species of plants were recorded, of which 8 are exploited by the wildflower seed trade. Two species of Eucalyptus, an Eremophila, a Hakea and a Rhagodia of uncertain affinities were collected.

## Weeds

None were recorded except abundant Double-gee (Emex australis) on edges of paddocks.

## Fire

No evidence of fire within the last 20-30 years. Much of the Reserve would be totally protected from fire by surrounding salt flats.

## Fauna

- Grey Kangaroo (Macropus fuliginosus): 6 seen in woodland.  
Echidna (Tachyglossus aculeatus): droppings in woodland.  
Australian Pelican (Pelecanus conspicillatus): nearby farmer informs me that pelicans are common on lakes at the S end of Reserve 25979.  
Black Swan (Cygnus atratus): 21 seen on lake on E side Reserve 25979. Nearby farmer informs me that they breed in several places on the Reserve.  
Mountain Duck (Tadorna tadornoides): 4 pairs on lake and several calling over woodland.  
Grey Teal (Anas gibberifrons): about 10 on lakes.  
Wedgetail Eagle (Aquila audax): nest in woodland on E side Reserve 25979. Farmer indicates it was used in 1976.  
Red-capped Dotteral (Charadrius ruficapillus): common on samphire flats.  
Common Sandpiper (Tringa hypoleucos): 3 on creek margin.  
Port Lincoln Parrot (Platycercus zonarius): common in woodland.  
Galah (Cacatua roseicapilla): several in woodland.  
Tawny Frogmouth (Podargus strigoides): heard at night.  
Tree Martin (Hirundo nigricans): several flying over woodland.  
Willy Wagtail (Rhipidura leucophrys): common.  
White-browed Babbler (Pomatostomus superciliosus): small flocks in shrubland.  
Weebill (Smicrornis brevirostris): in eucalyptus.  
Grey Butcher Bird (Cracticus torquatus): 2 seen in woodland, 1 in shrubland.

#### Exotic fauna

Rabbit scats are widespread throughout the Reserves but there is little evidence of warrens. Dog footprints were seen on the mudflats in several areas. A local farmer indicates that there are occasional foxes in the area.

#### Firebreaks and fences

Fences and narrow firebreaks are peripheral to the whole Reserve, adjacent to farmland.

#### Human usage

Timber has been removed from the woodland associations.

#### Adjacent uncleared land

Extensive areas of uncleared salt marsh are present to the N and S of the Reserves.

#### Opinion

Both Reserves A25062 and 25979 support an excellent example of complex mosaiced vegetation in the Bruce Rock Shire. Even in the brief survey carried out here a quite extensive list of fauna was collected. Additionally good stands of woodland are preserved and several other types of vegetation represented. The importance of this pair of Reserves for migratory birds as a rest site and for water fowl is also obvious.

I recommend that Reserves A25062 and 25979 be united into one large Reserve for the Conservation of Flora and Fauna and declared 'A' class. I also recommend that they be vested in the Western Australian Wildlife Authority.

APPENDIX 12

VEGETATION DETAILS RESERVES A25062 and 25979

Gimlet woodland

Eucalyptus salubris trees, mature, 12-24 m tall, 2-10% canopy cover. Other plant species recorded were: Acacia graffiana, Dianella revoluta, Eucalyptus sp. 1, Gastrolobium crassifolium, Lomandra effusa, Melaleuca eleutherostachya, Templetonia sulcata.

Scattered E. gracilis trees were present along lake margins. Soil is reddish brown, sandy clay. Poorly drained.

Mallee areas

Eucalyptus affin. redunca tree mallee, mature, stratum 4-7 m tall, 10-30% canopy cover over mixed shrubs to 1 m tall, ca 1-2% canopy cover. Also recorded were: Acacia colletioides, A. graffiana, A. merrallii, Dianella revoluta, Exocarpus sparteus, Melaleuca hamulosa, Rhagodia nutans, R. spinescens.

Melaleuca hamulosa stands

Melaleuca hamulosa trees and shrubs, mature, 6-7 m tall, 2-10% canopy cover over mixed shrubs (no particular dominant) 1 m tall, 10-30% canopy cover. Other plant species collected were: Acacia colletioides, A. graffiana, A. ligulata, A. merrallii, Argyroglottis turbinatus, Carpobrotus edulus, Dianella revoluta, Enchylaena tomentosa, Eremophila clarkii, E. sp., Exocarpus sparteus, Hakea preissii, H. sp. 3., Lycium australe, Melaleuca acuminata, M. hamulosa, M. uncinata, Rhagodia spinescens, Santalum acuminatum.

Soil in both the mallee areas and Melaleuca hamulosa stands is pinkish grey, fine sandy clay loam. The mallee area is better drained than the Melaleuca stand.

Salt flats

Arthrocnemum halocnemoides and A. bidens shrubs, 30 cm tall form a variable cover from 0-80% canopy cover. Margins of these salt flats carry patchy shrubland of: Disphyma blackii, Eucalyptus spathulata, Hakea preissii, Lycium australe, Melaleuca hamulosa, M. thyoides, Rhagodia nutans, R. sp., Sclerostegia moniliformis and Templetonia sulcata.

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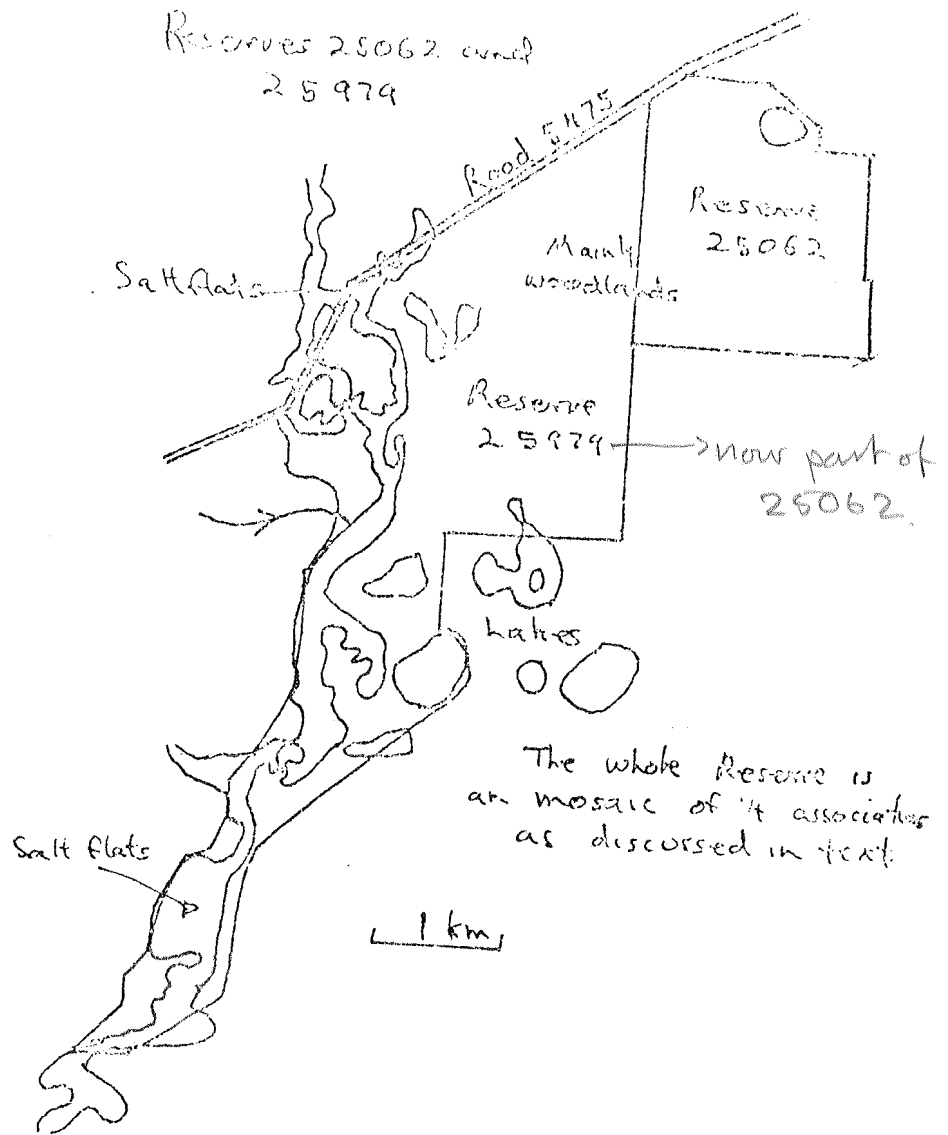




Plate 34. Melaleuca hamulosa "woodland" on Reserve 25979.

Plate 35. View NE into Gimlet woodland.

Plate 36. Lake on Reserve 25979; surrounded by salt marsh to the W and Gimlet woodland to the N and E. When this photograph was taken several Black Swans were feeding on the lake.

37. Salt flat area showing patchy shrubland.

Reserve 25884

Located ca 5.5 km SE Ardath Siding and ca 21 km S of Bruce Rock Townsite. Shown on lithograph 2533-IV, BCL.

Background

Originally gazetted 17 March 1961 for Conservation of Flora. At this time the Reserve was ca 867 ha in area. The Reserve was decreased in area to 725 ha in 3 May 1963 and later increased to its present area of 752.1512 ha on 11 September 1964.

Physical characteristics

Reserve 25884 is irregularly rectangular, ca 4 km long (N-S axis) and ca 1.9 km broad (E-Waxis). The total perimeter is ca 15.1 km and the area 752.1512 ha.

The whole Reserve is flat, being about 255 m above sea level and with a topographic variation of about 2-3 m over its entire area.

Vegetation

The entire Reserve is covered with an intricate mosaic of 4 associations. The distribution of these associations was controlled by minor variations in topography. The lowest areas (seasonally flooded) support samphire flats, the low sandy rises carry woodland with marginal stands of Acacia heath, and damp depressions within the woodland and some lake margins carry Melaleuca thicket.

The associations are described below.

Yorrell woodland: Eucalyptus gracilis (Yorrell) Open woodland over mixed Open Dwarf Scrub C.

Melaleuca thicket: Melaleuca uncinata (Broombush) or M. eleutherostachya Thicket.

Acacia heath: Acacia spp. Open Low Scrub B.

Salt marsh: Arthrocnemum spp. (Samphire) Open Dwarf Scrub D, Dense D or Low Heath D.

### Plant species

Twenty-eight species of plants were collected of which 5 are exploited by the wildflower seed trade. An Acacia and an Arthrocnemum of uncertain affinities were collected.

### Weeds

Occasional unidentified weed species in woodland areas.

### Fire

No evidence of fire within the last 20-30 years although some of the cleared areas may have been burnt.

### Fauna

Grey Kangaroo (Macropus fuliginosus): Scats common.

Mountain Duck (Tadorna tadornoides): several on salt lakes or flying over Reserve.

Port Lincoln Parrot (Platycercus zonarius): several in woodland.

Galah (Cacatua roseicapilla): several in woodland.

Tree Martin (Hirundo nigricans): common in woodland.

White-browed Babbler (Pomatostomus superciliosus): several small flocks in shrublands.

Weebill (Smicrornis brevirostris): common in eucalypts.

### Exotic Fauna

Rabbit diggings and scats are common on higher ground throughout the Reserve.

### Firebreaks and fences

Entirely absent except fences of adjacent farmland.

### Human usage

Some timber has been removed from the woodland areas. The lake at the N end of the Reserve is used by local farmers and others as a water taking area. Some areas of the Reserve have been cleared and allowed to regrow (see map).

Opinion

Reserve 25884 provides quite a diverse and mosaic area of vegetation which probably supports quite a rich faunal assemblage. It would also be of importance as a rest site for migratory birds and a significant feeding area for waterfowl. The lake at the N end of the Reserve has important recreational uses for local people, and is used extensively by waterfowl in winter and during week days when the public are absent.

I recommend that the Reserve be retained in its present state and be vested in the Western Australian Wildlife Authority.

APPENDIX 13

VEGETATION DETAILS RESERVE 25884

The Reserve is a complex mosaic of several associations, the primary components of which are set out below.

Yorrell woodland

Eucalyptus gracilis trees and tree mallee, mature, stratum 12-16 m tall, 2-10% canopy cover over mixed shrubs (no particular dominant) 0-1 m tall, ca 2% canopy cover. Other plant species recorded were: Acacia colletioides, A. ligustrina, A. spathulifolia, Alyxia buxifolia, Argyroglottis turbinatus, Exocarpus sparteus, Grevillea acuaria, Lomandra effusa, Lycium australe, Olearia muelleri, O. revoluta, Podolepis capillaris, Rhagodia nutans, Santalum acuminatum. Soil is reddish brown, sandy clay. Poorly drained.

Melaleuca thicket

Melaleuca uncinata and/or M. eleutherostachya shrubs, mature, stratum 4-6 m tall, 70-100% canopy cover. No other species were recorded in these thickets. Soil is pinkish grey, sandy clay loam. Poorly drained.

Acacia heath

Acacia ligulata, A. colletioides and Olearia revoluta, mature, stratum 1-1.5 m tall, ca 2-10% canopy cover. Other species recorded were: Acacia erinacea, A. merrallii, A. sp. 12, Bassia affin. diacantha, Gastrolobium crassifolium, Lomandra effusa, Melaleuca uncinata, Podolepis capillaris, Stipa elegantissima. Soil is pinkish grey, sandy clay. Poorly drained.

Salt marsh

Arthrocnemum holocnemoides, A. bidens, A. pergranulatum and A. sp. shrubs, 30 cm tall, varying from 0-ca 50% canopy cover.

There were also small, scattered patches of gimlet woodland present. These stands were mostly 12-24 m tall and ca 2-10% canopy cover.

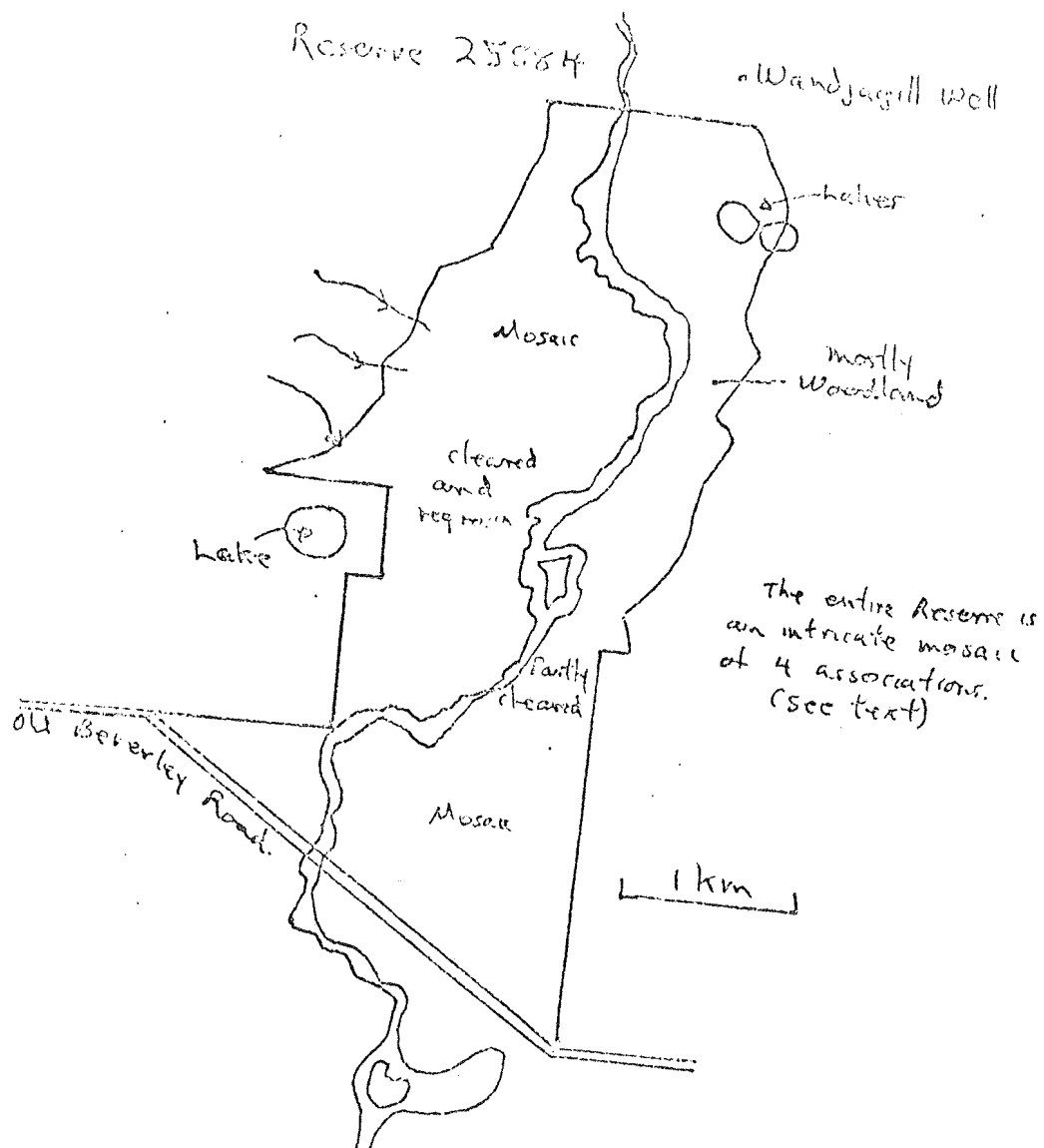


Plate 38. Reserve 25884 showing a typical stand of Eucalyptus gracilis woodland.

Plate 39. Reserve 25884. View NE into Acacia heath association.



Reserve 27108

Located ca 1 km E of Yarding Siding and ca 16 km WSW of Bruce Rock Townsite. Shown on lithograph 2434-11, C3-4.

Background

Originally gazetted 10 January 1964 as reserve for "Conservation of Flora".

Physical characteristics

Reserve 27108 is approximately rectangular, ca 2.2 km long (N-S axis) by ca 1.1 km broad (E-W axis) and has a total perimeter of ca 6.3 km and an area of 231.7382 ha. The Reserve is flat, about 245 ~~m~~ above sea level and has minor topographic differences of up to 3-5 m within its boundary on the NW side, the rest rarely exceeding a difference of 1-2 m.

Vegetation

Eucalyptus affin. redunca Open Low Woodland A over Melaleuca eleutherostachya Open Scrub occupies sandy, flat areas raised about 0.5-1 m above the surrounding salt flat. The salt flats are extremely uniform, composed almost entirely of Arthrocnemum spp. (Samphire) Dense Low Heath D.

The NW side of the Reserve has a narrow belt of sandplain heath which is a remnant of a once extensive area of sandplain to the N. The association is Eremaea pauciflora and Grevillea hookerana Low Heath C.

Plant species

Fifty-six plant species were recorded, of which 14 are exploited by the wildflower seed trade. A Lepidosperma, Leptocarpus and Phebalium of uncertain affinities were collected.

Weeds

None recorded apart from scattered Euphorbia australis and Ursinia anthemoides in the woodland.

## Fire

No evidence of fire in the woodland or on the saltflat. It is possible that the sandplain heath association has been burnt within the last 20-30 years.

## Fauna

Mountain Duck (Tadorna tadornoides): 3 flying over Reserve.  
Fairy Martin (Hirundo ariel): recent nests under Culvert (see Remarks).  
Yellow-rumped Thornbill (Acanthiza chrysorrhoa): common in eucalypts.  
White-fronted Chat (Epthianura albifrons): common on samphire areas.  
An unidentified wader was noted on a lake at the NW corner.  
Helioporus albopunctatus (Spotted Burrowing Frog): calling from several parts of the Reserve.

## Exotic fauna

Rabbit scats and scratchings are found throughout the Reserve.

## Firebreaks and fences

Firebreaks and fences are present adjacent to farmland but are absent on the W and N sides.

## Human usage

There is a small sand pit on the NW corner of the Reserve. The sandplain heath may be regrowth following scrubrolling.

## Adjacent uncleared land

There is extensive saltflats to the W and SE of the Reserve and an area of ca 150 ha of Banksia prionotes and Xylomelum angustifolium (Woody Pear) to the NW of the Reserve. The sandplain woodland area is the least disturbed and most diverse of any sandplain I have encountered in the wheatbelt. Sandplain woodland was not represented on any other Reserve I have examined in the Bruce Rock Shire.

## Remarks

An important record on this Reserve is that of a number of Fairy Martin (Hirundo ariel) nests beneath a bridge. The bridge was rebuilt about 3-4 years ago and the nests, together with several Welcome Swallow

(H. neoxena) nests have been built since that time. This is therefore a confirmed record of Fairy Martin breeding in the wheatbelt in recent times. Storr (pers. comm.) indicates that sightings of the bird in the wheatbelt in recent times are rare and confirmed breeding records even rarer.

An intact nest is illustrated in plate 42. It is built directly onto concrete and steel supports of the bridge.

#### Opinion and recommendations

Reserve 27108 is a marked contrast to Reserve A24505 (see this report), situated ca 12 km to the W. Reserve A24505 was extremely simple and uniform in structure except for considerable variation in density of Samphire. Reserve 27108 by comparison is complex in terms of open lakes, saltflats and patches of woodland as well as marginal bands of sandplain heath. The samphires are dense and vary little in canopy cover over their area.

The area of sandplain woodland N of Yarding Siding is of considerable scientific and aesthetic value, being of attractive appearance and rich in profusely flowering species.

Any disturbance to the Reserve or nearby farmland which might cause a drop in water flow beneath the bridge where the Fairy Martins breed may cause the nests to become more accessible to predators.

I recommend that Reserve 27108 be vested in the Western Australian Wildlife Authority and that action be taken to look into the possibility of enlarging the Reserve by the addition of the sandplain woodland on Yarding railway reserve and on Reserve 20076 (Public Utility).

APPENDIX 14

VEGETATION DETAILS RESERVE 27108

Woodland

Eucalyptus affin. redunca trees and tree mallee mature, 8-11 m tall, 2-10% canopy cover over Melaleuca eleutherostachya shrubs, mature to senescent, 2-4 m tall, 0-10% canopy cover. Other plant species recorded were: Acacia colletioides, A. liquistrina, A. merrallii, A. affin. sorophylla, Bassia affin. diacantha, Beaufortia micrantha, Billardiera variifolia, Carpobrotus edulus, Clematis microphylla, Conostephium preissii, Dianella revoluta, Disphyma blackii, Enchylaena tomentosa, Exocarpus sparteus, Labichea lanceolata, Lepidosperma affin. pruinsum, Loxocarya pubescens, Melaleuca uncinata, Olearia revoluta, Phebalium sp. 14, Ptilotus polystachys, Rhagodia nutans, Santalum acuminatum. Soil is pinkish grey, light sandy clay loam. Poorly drained.

Sandplain heath.

Eremaea pauciflora, Grevillea hookerana shrubs, immature, 1 m tall, 30-70% canopy cover. Also recorded were: Acacia desertorum, A. pulchella var glaberrima, Adenanthos argyraea, Borya nitida, Burtonia gompholobioides, Carpobrotus edulus, Cassytha pubescens, Cryptandra pungens, Dampiera spicigera, Dianella revoluta, Eucalyptus redunca, Gahnia polyphylla, Harperia lateriflora, Jacksonia furcellata, Lepidosperma tenue, Leptocarpus sp. Leptospermum erubescens, Melaleuca scabra, M. spathulata, M. subtrigona, Mesomelaena uncinata, Micromyrtus rosea, Olearia axillaris eremicola, Persoonia coriacea, Petrophile ericifolia, Rhagodia spinescens, Santalum acuminatum, Sollya heterophylla, Stipa elegantissima, Verticordia brownii, Xylomelum angustifolium. Soil is reddish yellow, loamy sand. Excessively drained but shallow water table.

Salt flat

Arthrocnemum halocnemoides and A. bidens shrubs 30 cm tall, 70-100% canopy cover.

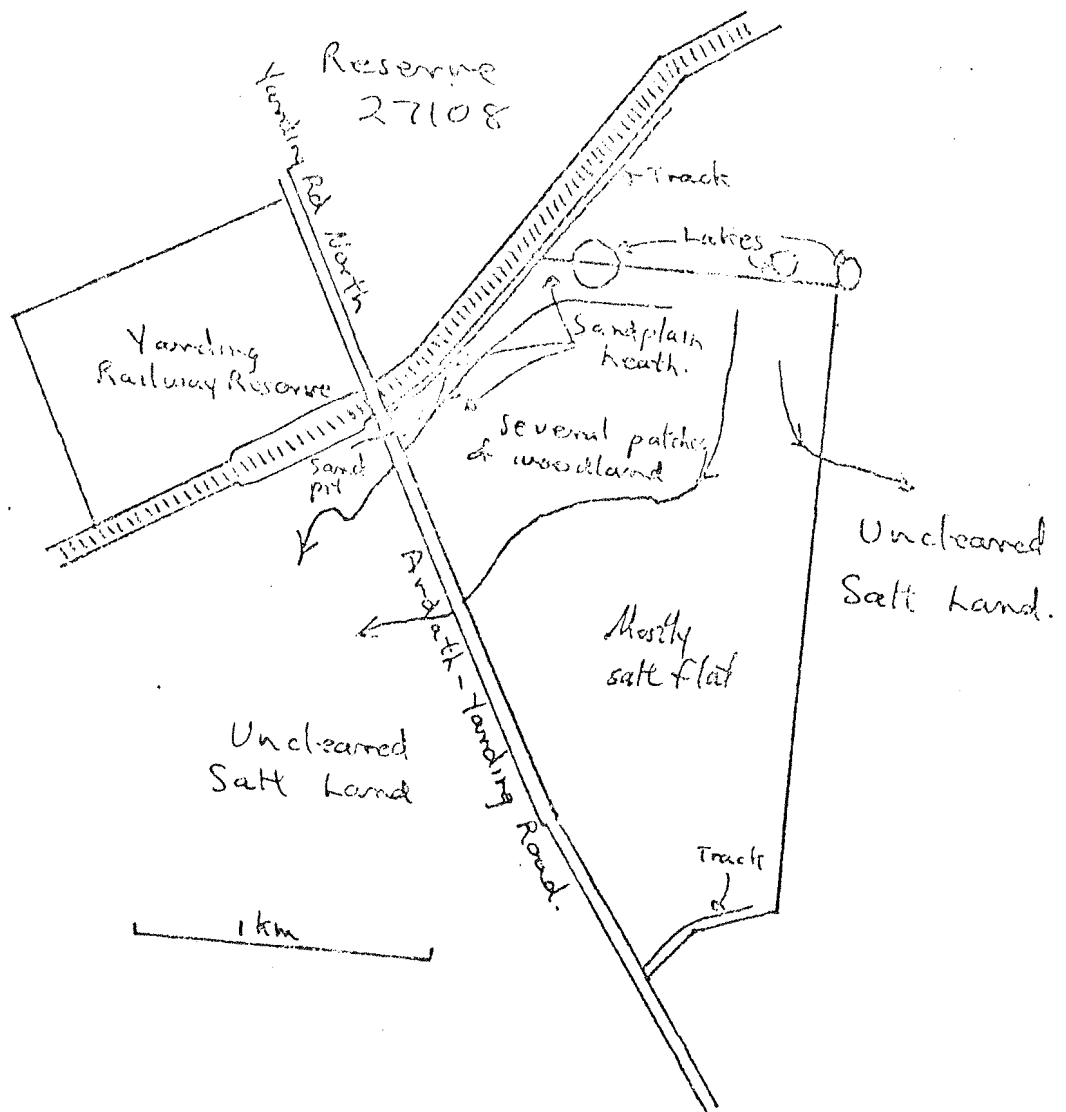


Plate 40. View E on Reserve 27108 showing the extensive, uniform, very dense Arthrocnemum spp. (Samphire) flats.

Plate 41. View E showing the sandplain heath on the N margin of Reserve 27108 and the lake development beyond.

Plate 42. Nest of Fairy Martin (Hirundo ariel) attached to concrete and metal supports of a bridge. The bridge carries part of Yarding Road North, which is on the W side of Reserve 27108.

## Reserve 27452

Located ca 1 km W of Jura Siding and ca 11 km NNE of Bruce Rock Townsite.  
Shown on lithograph 2534-111, Cl.

### Background

Originally gazetted 19 March 1965 for "Conservation of Flora".

### Physical characteristics

Reserve 27452 is roughly rectangular, ca 0.7 km long (E-W axis) by ca 0.5 km broad (N-S axis) and has a total perimeter of ca 2.7 km. The area of the Reserve is 39.4973 ha. The highest point is the SE corner 320 m above sea level (ASL) and the lowest point the NW corner at ca 300 m ASL.

### Vegetation

The majority of the Reserve is relatively flat and on a single soil type and so the vegetation is fairly homogenous. The southern and western portions of the Reserve are Casuarina campestris (Tamma) Thicket over Grevillea integrifolia (and several other species of shrubs) Open Scrub.

A shallow watercourse on the N boundary of the Reserve has Acacia signata and Melaleuca uncinata (Broombush) Thicket with scattered emergent Eucalyptus drummondii shrub mallee.

### Plant species

Twenty-six plant species were recorded, of which 10 are exploited by the wildflower seed trade.

### Weeds

None were recorded.

### Fire History

No evidence of fire with the last 20-30 years.



## Fauna

Echidna (Tachyglossus aculeatus): scats noted.  
Port Lincoln Parrot (Platycercus zonarius): 1 in eucalypts.  
Galah (Cacatua roseicapilla): 5 flying over Reserve.  
Southern Scrub Robin (Drymodes brunneopygius): heard calling in dense scrub.  
Australian Raven (Corvus coronoides): 2 feeding on roadside.

## Exotic fauna

Rabbit scats were present, mostly along the road edges.

## Firebreaks and fences

The E and S sides of the Reserve are fenced and have firebreaks in the adjacent farmland. The N boundary is contiguous to Reserve 27451 (gravel) and the W boundary to a roadway.

## Human usage

A cleared roadway about 20-30 m E of the roadway was never developed and has regrown to ca 1.5 m tall. Drains along the roadside lead water from the road surface into the Reserve in several places.

## Adjacent uncleared land

The Gravel Reserve (27451) has the same vegetation as Reserve 27452 and is about 25 ha in area.

## Opinion

Reserve 27452 is little disturbed and has a fair area of a vegetation type not represented well elsewhere in the Shire. It also supports Southern Scrub-robin, a species becoming increasingly rare in the wheatbelt. I recommend that Reserve 27452 be left in its present state, that, if possible, Reserve 27451 (Gravel Reserve) be included within its boundaries and that both be vested in the Western Australian Wildlife Authority.

APPENDIX 15

VEGETATION DETAILS RESERVE 27452

Scrub - S end Reserve

Casuarina campestris shrubs, mature, 4-5.5 m tall, 30-70% canopy cover over Grevillea integrifolia var. linearis, shrubs, mature, 0.5-2 m tall, 2-10% canopy cover. At the eastern end of the association (SE corner of Reserve) Acacia neurophylla becomes abundant. Other plant species recorded were: Acacia signata, Astroloma serratifolium, Calothamnus gilesii, Casuarina corniculata, Grevillea paradoxa, Hakea multilineata, Micromyrtus racemosa, Persoonia teretifolia. Soil was yellow, sandy clay with ca 50% laterite pebbles. Well drained.

Watercourse

At the northern limits of Reserve 27452, near the boundary with Reserve 27451 is a shallow watercourse in a gently sloping depression. The association along this watercourse (W side Reserve) is Acacia signata and Melaleuca uncinata shrubs, 2-3.5 m tall, 30-70% canopy cover. Scattered Eucalyptus drummondii are present to 5 m tall. Other plants recorded were: Acacia dielsii, A. graffiana, Baeckea heteranthera, B. muricata, Brachysema daviesioides, Cryptandra myriantha, Ecdeiocolea monostachya, Eucalyptus loxophleba, E. redunca, Leptospermum erubescens, Melaleuca cordata, Micromyrtus racemosa, Phebalium tuberculatum, Santalum acuminatum. Soil was yellow, sandy clay with ca 20% laterite pebbles. Poorly drained.

Regrowth

An area of regrowth has developed along an old roadway parallel to the Bruce Rock-Merredin Road and now has Acacia signata, Melaleuca uncinata and Casuarina acutivalvis shrubs, immature, 0.5-1.5 m tall, 30-70% canopy cover. Other species and soil as listed for Scrub - S end Reserve (above).

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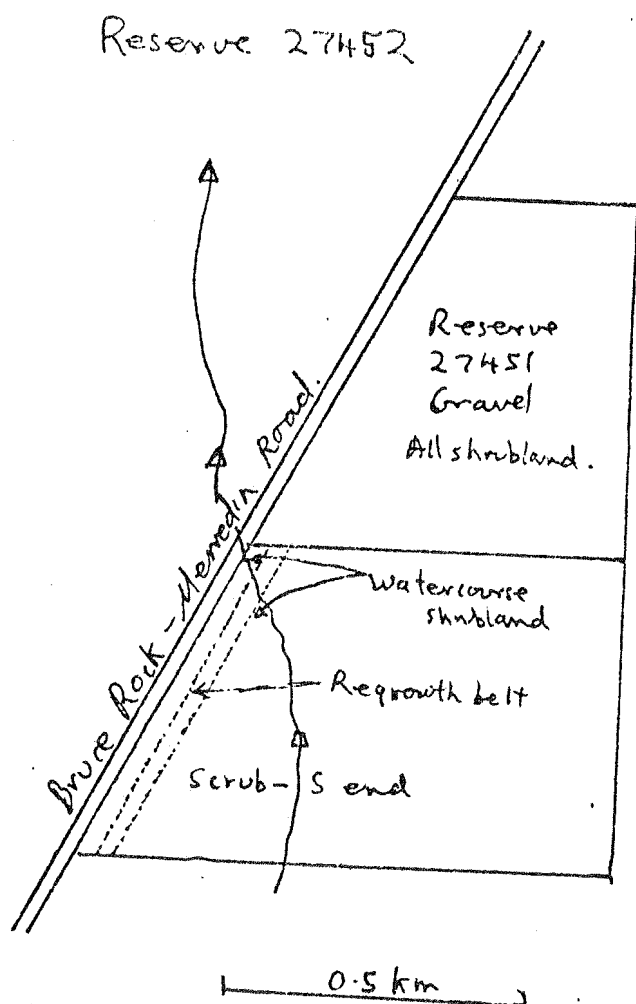


Plate 43. View E into Tamma - Casuarina corniculata thicket on Reserve 27452 showing a very open area, the rest being too dense to photograph adequately.

Reserve 30969

Located ca 6 km NNE of Kwolyin Siding and shown on lithograph 2434-11, A2.

Background

Before 1971 a sheep grazing lease covered the Reserve area and this was revoked on 27 August 1971 when the land was reclassified for "Protection of Flora".

Physical characteristics

Reserve 30969 is roughly rectangular, ca 3 km long (NW-SE axis) by ca 1 km broad (NE-SW axis) and has a total perimeter of ca 8 km and an area of 283.0043 ha. The Reserve is very flat and about 230 m above sea level. There are minor topographic variations of 1-2 m within its boundaries.

Vegetation

Arthrocnemum spp (Samphire) salt flat varying from bare ground to Low Heath D. Scattered clumps of Melaleuca hamulosa occur on low mounds.

Plant species

Only 3 species were recorded. Refer to colour plates of Reserve A24505 for impressions of the vegetation.

Weeds

None recorded

Fire

Being mostly samphire flats the Reserve would not support a fire.

Fauna

Welcome Swallow (Hirundo neoxena): nesting under bridge.  
White-fronted Chat (Epthianura albifrons): common in samphires.  
Australian Raven (Corvus coronoides): feeding on rabbit carcass on roadside.

Exotic fauna

Rabbit scats and a carcass were noted.

Firebreaks and fences

Absent.

Human usage

None noted except a water flow meter which is built over the creek at the NW corner of the Reserve.

Adjacent uncleared land

Extensive salt marsh to the NW and SE of the Reserve. Directly N of the NW end of the Reserve are Reserves 11038 (ca 31 ha) and 11046 (ca 29 ha) for "Conservation of Flora and Fauna". Both are granite outcrops with areas of Acacia acuminata (Jam), A. lasiocalyx and Eucalyptus loxophleba (York Gum) woodland.

Opinion and recommendation

Apart from the flora and fauna of the Reserve it is advantageous to maintain it in its present form to assist in soil conservation. I recommend that Reserve 30969 be retained in its present state and be vested in the Western Australian Wildlife Authority.

