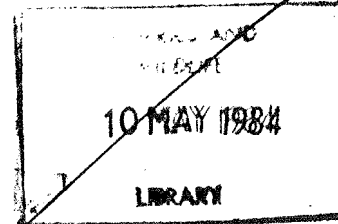


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SOME NATURE RESERVES OF THE WESTERN
AUSTRALIAN WHEATBELT

PART 12: KOORDA SHIRE

B.G. MUIR
Western Australian Museum
1979

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SOME NATURE RESERVES OF THE WESTERN AUSTRALIAN WHEATBELT
PART 12: Koorda Shire

B.G. MUIR

INTRODUCTION

Koorda Shire lies in the eastern-central wheatbelt and has an area of about 2829 square kilometres. There are 13 Nature Reserves within the Shire totalling 21.37 square kilometres or 0.8% of the area of the Shire. The largest Nature Reserve within the Shire is only ca 648 ha (Reserve 14429) and the smallest one only ca 3 ha (Reserve 22312). Eight of the 13 reserves are less than ca 200 ha in size. Only 1 reserve has 'A' classification (A10262) and is vested. All the remainder are unvested.

This survey took place in early December 1978 and consisted of brief examinations of 9 reserves: 9281, 12154, 14429, 16040, 16245, 16867, 23008, 23029 and 24838. 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 reserve.

Reserves were examined by vehicle where tracks were available, and 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 the section titled "Vegetation") capital letters in descriptive terms refer to specific classes of life form, height and canopy cover as used in the classification.

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

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

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 brought 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.

Opinion 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 9281 - ca 93 ha: salt complex; important for soil conservation; contains sedimentary sequences which may be of great geological importance so mining and other disturbances should be prohibited.

Reserve 12154 - ca 23 ha; contiguous with disused Water Reserve 16566; small area of woodland on SW corner, most of rest is Acacia shrubland, particularly on Water Reserve. Some rubbish dumping; very important area for transient bird species; supports Southern Scrub Robin; recommend addition of Water Reserve to the Flora Reserve.

Reserve 14429 - ca 649 ha; predominantly Gimlet-York Gum woodland with areas of mallee and Acacia shrubland; granite outcrops and salt complex contiguous with Reserve; rich in plant species, probably also rich in fauna; recommend 'A' classification.

Reserve 16040 - ca 186 ha; salt complex with some woodland; important for soil conservation; part of area I consider to be of geological importance; mining and other disturbance should be prohibited.

Reserve 16245 - ca 263 ha; mostly shrubland and mallee, contiguous with Water Reserve of 266 ha which is woodland; rich in plant species and fauna; important windbreak for town of Koorda.

Reserve 16867 - ca 243 ha; mostly saltbush flats with some low dunes with trees; much of Reserve is bare salt pans; recommend action be taken to ensure gypsum mining does not occur on the Reserve or in the vicinity.

Reserve 23008 - ca 65 ha; mostly salt flat with an area of York Gum Open Woodland; woodland is plant species rich; important nesting site for birds; important for soil conservation.

Reserve 23029 - ca 162 ha; ~~five~~ associations, a mallee and 4 shrublands, 2 of which are regrowth of different ages; adjacent Water Reserve has granite outcrop; isolated, therefore important for transient bird species.

Reserve 24838 - ca 241 ha; Yorrell and Salmon Gum woodland, marginal shrublands and salt flats; important nesting area for birds, and for soil conservation.

Of the 9 reserves examined most were undisturbed by human influence, except occasionally on contiguous reserves for other purposes, e.g. the damsite on 12154. Most have not been burnt for a long time and are quite rich in species.

Reserve 14429 is particularly rich in associations and plant species and probably supports a rich fauna. It is contiguous with salt complex and granite outcrops which, by their nature, will probably never be cleared. The effective area of the Reserve is thus very large. 'A' classification has been recommended for this Reserve.

All reserves examined are valuable for fauna, particularly transient birds and the salt complex reserves are important for soil conservation.

ACKNOWLEDGEMENTS

Mr. M. Powell assisted in the field. The Western Australian Herbarium provided access to collections and assistance in identifying plants.

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Reserve 9281

Located ca 4 km SE Dukin Siding and ca 17 km due S of Koorda Townsite.
Shown on lithograph 56/80, E4.

Background

Originally set aside 28 April 1905. It was decreased by exclusion of Reserve 14059 on 24 June 1910 and again by exclusion of Reserve 16040 at a date unspecified (probably 2 July 1915 when Reserve 16040 was created). The land was classified for "public use" on 23 March 1956 but was changed to "Conservation of Flora" on 5 June 1959.

Physical characteristics

Reserve 9281 is approximately square, with a total perimeter of ca 5.4 km and an area of 92.6022 ha. Most of the Reserve is probably ca 590 m above sea level similar to that of the lake near Dukin Siding. Altitudinal variation within the Reserve is probably ca 4-5 m.

Vegetation

Almost the whole Reserve is covered with salt complex. Atriplex Low Heath C covers dune tops and slopes; the interdunal flats are bare of vegetation.

Plant species

Only 3 plant species were recorded, although there may be a few more in more isolated parts of the Reserve. Apart from Atriplex ?vesicaria, Stipa elegantissima and Pittosporum phylliraeoides were recorded.

Nest hollows

None recorded.

Weeds

Grasses and some Ptilotus polystachys were recorded on dune crests.

Fire history

The vegetation would probably never support a fire.

Fauna

Only Australian Pipits (Anthus novaeseelandiae) were recorded.

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Exotic fauna

Evidence of sheep and rabbits in some areas.

Firebreaks and fences

Fenced only adjacent to farmland. No firebreaks except roadway.

Human usage

Stock have been run on the area.

Adjacent uncleared land

Salt complex in excess of 1000 ha and Reserve 16040 are contiguous with the Reserve.

Remarks

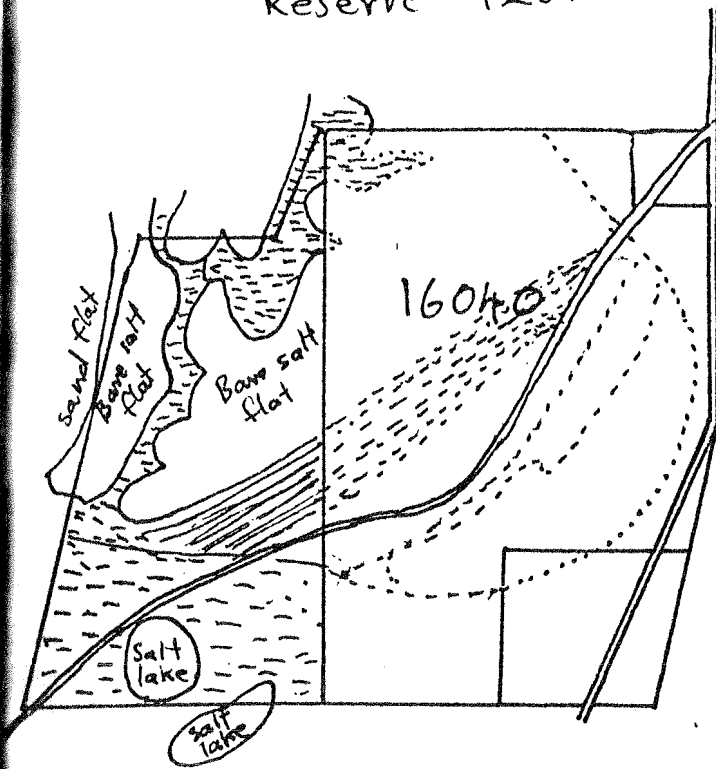
Refer to notes on Reserve 16040.

Opinion and recommendations

Reserve 9281 is vital to soil conservation in an area badly affected by salinity problems. It also has interesting sedimentological structures which may provide information on palaeoclimatology in the region. I recommend Reserve 9281 be retained in its present form, that any development or mining likely to disturb the sediments be prohibited, and that the Reserve be vested in the Western Australian Wildlife Authority.

8A

Reserve 9281



- ≡ Atriplex heath
- ⋯ Yorrel woodland
- /// Parallel dunes

1 km



Plate 1. Some of the salt complex found on Reserves 16040 and 9281. Although not obvious from the photograph the vegetated areas are on dune slopes, and the bare areas in interdunal flats.

Reserve 12154

Located ca 13.5 km SW Koorda Townsite and shown on lithograph 56/80, D3.

Background

Originally 48.5 ha and set aside 7 April 1911 as a Water Reserve, and vested in the Koorda Shire. This vesting was revoked on 10 May 1912 and not revested. The area of the Reserve was decreased on 10 November 1916 to ca 18 ha then increased to ca 32 ha on 9 January 1917. The Reserve was then classified as "Racecourse and recreation" on 29 April 1921. It was decreased to its present size on 6 May 1966 and reclassified at the same time to "Conservation of Flora".

Physical characteristics

Reserve 12154 is "J" shaped, and contiguous with Water Reserve 16566, making a total area of bushland of 57.9467 ha. The perimeter of the two Reserves together is ca 3.1 km. The area of Reserve 12154 is 22.6624. There are no spot altitudes available. There is 2-3 m difference in altitude within the Reserve.

Vegetation

The southern portion of the Nature Reserve has York Gum Woodland, Melaleuca shrubland and Acacia shrubland. Acacia shrubland also extends up the E side, with a small area of Acacia complex on the NE corner.

The Water Reserve is mostly Acacia shrubland with some disturbed areas and mallee around the damsite. Much of the shrubland on the Water Reserve is of the heathy understory type, as described in the appendix.

Plant species

Fifty-four plant species were recorded, 14 of which are exploited by the wildflower seed trade. One species, Prostanthera eckersleyana has not previously been recorded by me in the wheatbelt. It represents a goldfields influence, as it is very common to the east of the wheatbelt.

Nest hollows

Common in York Gum area, but there are very few trees. No young trees are present.

Weeds

Very common around piles of rubbish dumped near SW corner and in rubbish dumps on Water Reserve. Weeds recorded were Brassica tournfortii, Cucumis myriocarpus, Hypochaeris glabra, Ptilotus polystachys and Raphanus raphanistrum.

Fire history

The Reserve has probably not been burnt for at least 30 years.

Fauna

Common Bronzewing (Phaps chalcoptera): 1 on NE corner.

Port Lincoln Parrot (Platycercus zonarius): several in York Gum area.

Galah (Cacatua roseicapilla): feeding amongst rubbish on Water Reserve.

Wagtail (Rhipidura leucophrys): nest in Acacia resinomarginea shrubland.

Southern Scrub-robin (Drymodes brunneopygius): heard calling in Acacia resinomarginea area.

Singing Honeyeater (Meliphaga virescens): 2 in flowering Calothamnus chrysantherus shrub on NW corner.

Exotic fauna

Sheep footprints were noted. Rabbit droppings were common throughout the Reserve.

Firebreaks and fences

No firebreaks, but numerous tracks cross the Reserve. Fenced on all sides except along roadway on W side.

Human usage

Timber has been removed from the wooded area. Numerous tracks cut through the Water Reserve and areas have been cleared around the damsite. Rubbish has been dumped extensively on the Water Reserve and some in the woodland on the SW corner.

Adjacent uncleared land

The Water Reserve ca 35 ha, is the only uncleared land contiguous with Reserve 12154.

Opinion and recommendations

Reserve 12154 is a valuable refuge for fauna, particularly considering its isolation from other bushland. The Water Reserve 16566 is larger than Reserve 12154 and contains quite diverse habitats. The inclusion of the Water Reserve (now disused) with Reserve 12154 would greatly enhance the value of the Reserves for conservation. I recommend that action be taken to combine Reserves 12154 and 16566 under the vesting of the Western Australian Wildlife Authority and that signs be erected near the rubbish tip to indicate further dumping prohibited.

APPENDIX 1
Reserve 12154

Description for both Reserves 12154 and 16566 (adjacent Water Reserve) are presented.

York Gum woodland

Eucalyptus loxophleba trees, 10-14 m tall, 2-10% canopy cover over Acacia mackayana (long-leaf form) and Templetonia sulcata shrubs, 1.5-2.5 m tall, 2-10% cover. Also recorded were Acacia acuminata, Enchylaena tomentosa, Exocarpus sparteus, Maireana brevifolia, Olearia muelleri, Phebalium tuberosum megaphyllum, Rhagodia nutans, R. preissii, Santalum acuminatum, Stipa elegantissima. Soil reddish brown, fine sand clay. Poorly drained.

Acacia shrubland

Acacia resinomarginea shrubs, 3-5 m tall, 30-70% cover over Ecdeiocolea monostachya sedge and mixed shrubs, 0.5 m tall, 2-10% canopy cover. Also recorded were Amphipogon caricinus, Baeckea sp., Chamaexeros fimbriata, Cryptandra pungens, Darwinia purpurea, Grevillea nana, Hakea minyma, Lepidosperma affin. resinosum, Phebalium tuberosum, Santalum acuminatum. Soil yellow brown, sandy loam with ca 70% laterite pebbles. Well to moderately drained.

In some areas the Acacia resinomarginea is shorter (2-4 m tall) and less dense (2-10% cover) and the E. monostachya and mixed shrubs denser (30-70% cover). These areas have a distinctly heathy structure with the following species present. Baeckea crispiflora, B. muricata, Borya nitida, Casuarina acutivalvis, C. campestris, Darwinia purpurea, Dianella revoluta, Eriostemon deserti, Eucalyptus albida, E. transcontinentalis, Gahnia polyphylla, Grevillea paradoxa, Hakea subsulcata, Melaleuca cordata, M. uncinata, Petrophile incurvata, Thryptomene kochii, Waitzia acuminata. Soil in heathy areas is yellow brown sandy clay with 20-40% laterite pebbles. Moderately drained. Disturbed areas in this association, e.g. rubbish dumps had some of the above species and Mirbelia spinosa and Orobanche australis in addition.

Melaleuca shrubland

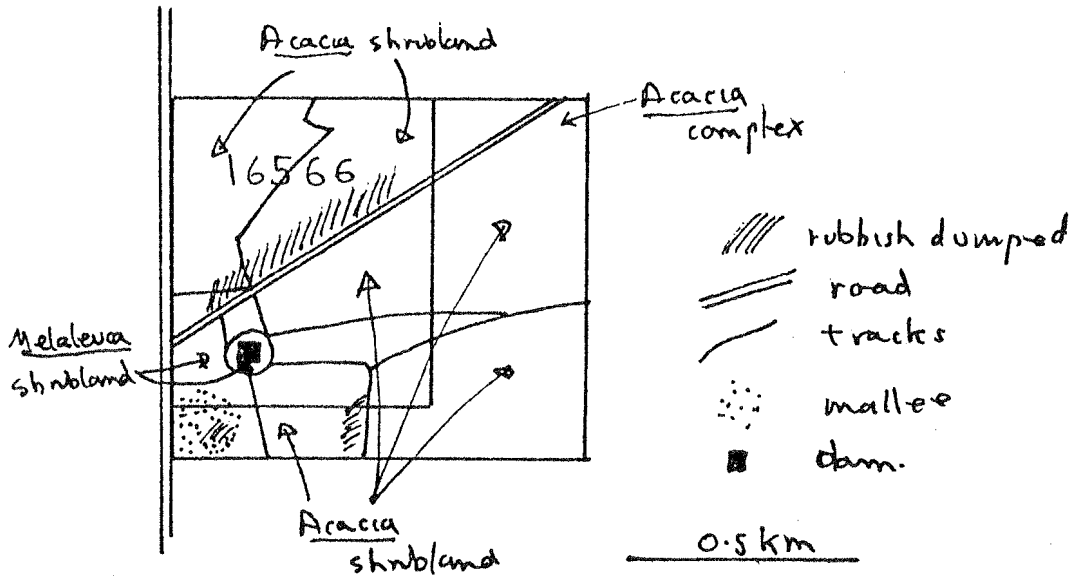
Melaleuca acuminata, M. eleutherostachya and M. pauciflora shrubs, 2-5 m tall, 30-70% cover. There is no understory but the following species are present. Amphipogon debilis, Cryptandra pungens, Ecdeiocolea monostachya, Eriostemon deserti, Hakea minyma, Melaleuca uncinata, Prostanthera eckersleyana, Waitzia acuminata. Soil is yellow brown, sandy clay. Poorly drained.

Northeast corner

Complex mosaic dominated by Acacia resinomarginea, A. stereophylla, Calothamnus chrysanthrus and Thryptomene australis. Occasional Eucalyptus ovularis and E. transcontinentalis present. Also recorded were Acacia dielsii, Astroloma serratifolium, Darwinia purpurea, Dodonaea bursariifolia, Melaleuca cordata, M. eleutherostachya, Olearia muelleri, Phebalium tuberculosum megaphyllum. Soil is pinkish grey, sandy clay. Poorly drained.

14 A

Reserve 12154



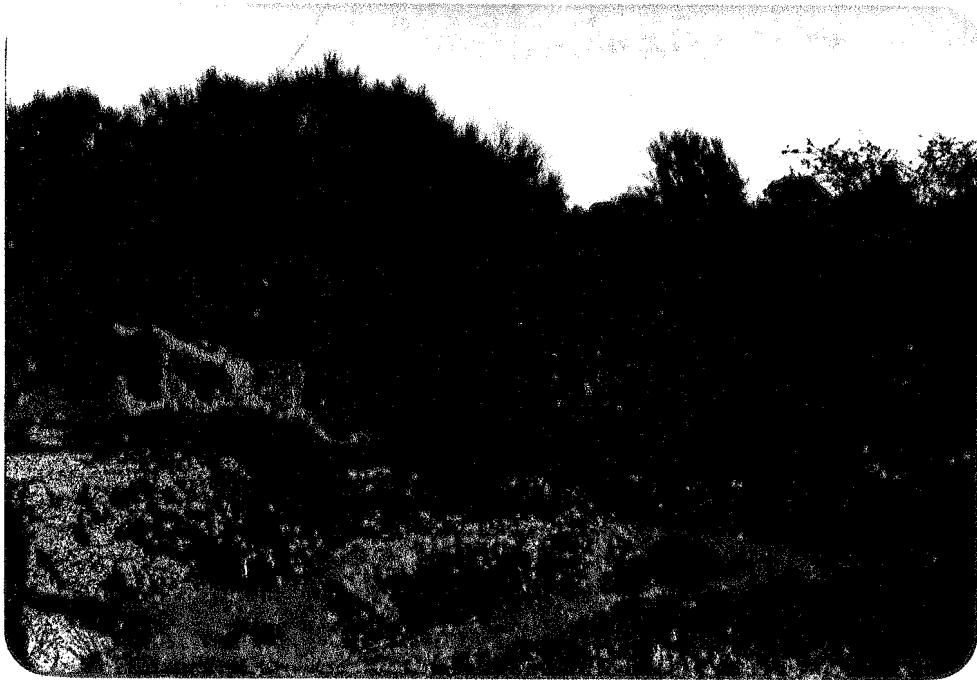


Plate 2. Acacia shrubland typical of much of the Water Reserve and SE portions of Reserve 12154.

Reserve 14429

Located on the S side of Mollerin Lake and ca 8 km SE of Mollerin Siding. Shown on lithograph 65/80, F3-4.

Background

Originally set aside 8 November 1912 as a "Common" and with an area of 711 ha. The area of the Reserve was decreased on 25 October 1929 and again on 9 May 1930. The size after these reductions is not recorded. On 20 April 1956 the classification was changed to "Protection of Flora and Fauna" and at the same time was decreased to its present area.

Physical characteristics

Reserve 14429 is irregular rectangular, about 6.4 km long and 3 km broad. It has a total perimeter of ca 23.8 km and an area of 648.6150 ha. There is a spot altitude of ca 315 m above sea level on the edge of Mollerin Lake, ca 2 km E of the Reserve. The lake edge at the Reserve and the spot altitude are likely to be the same height above sea level. The Reserve is fairly flat and with an altitudinal range of perhaps 30 m, the lowest place being the lake edge.

Vegetation

The major associations are:

- (1) a mosaic of Gimlet-York Gum Open Low Woodland A with very sparse understory and Eucalyptus transcontinentalis-York Gum Very Open Tree Mallee over Melaleuca Open Scrub over Acacia Open Low Scrub B;
- (2) Eucalyptus transcontinentalis-Black Marlock Open Shrub Mallee over mixed Scrub;
- (3) Acacia Dense Thicket over Tamma Open Low Scrub A over Very Open Low Sedges;
- (4) Acacia Open Scrub over Dodonaea and Templetonia Open Low Scrub B on lake margins;
- (5) granite outcrops with scattered shrubs and thickets and areas of bare rock; and
- (6) bare salt lake with marginal samphire flats and inter-lake dunes with Open Scrub.

plant species

Ninety-eight plant species were recorded, of which 24 are exploited by the wildflower seed trade. Several species are from assemblages normally found in the eastern wheatbelt and goldfields.

Nest hollows

Abundant in woodland. Young trees abundant.

Weeds

Very few except in disturbed areas or woodlands and lake edges where water accumulates.

Fire history

No evidence of fire for at least 30 years.

Fauna

Euro (Macropus robustus): 2 seen on golf course at S end Reserve.

Numerous tracks, possibly this species, seen on salt pans.

Emu (Dromaius novaehollandiae): tracks common on salt lake.

Unidentified water-bird tracks: common on lake margins.

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

Galah (Cacatua roseicapilla): common in woodlands along lake margins and feeding on golf course.

Australian Pipit (Anthus novaeseelandiae): seen along road on S side and in salt lake margins.

Western Shrike-thrush (Colluricincla harmonica rufiventris): heard calling in shrubland S end Reserve.

Chestnut Quail-thrush (Cinclosoma castanotum): 1 seen in grass near granite outcrop at SW corner Reserve.

White-browed Babbler (Pomatostomus superciliosus): 6 seen in shrubland on SW side.

Yellow-tailed Thornbill (Acanthiza chrysorrhoa): throughout woodlands and mallee areas and on salt lake margins in shrubland.

Blue Wren (Malurus sp.): 1 seen in shrubland SE corner.

Singing Honeyeater (Meliphaga virescens): 2 seen in mallee at S end Reserve.

Red Wattlebird (Anthochaera carunculata): 2 in woodland NE side, 1 near golf course.

Zebra Finch (Peophila guttata): 12 feeding on golf course.

Australian Raven (Corvus coronoides): several in woodland, at golf course and flying over salt lakes.

Exotic fauna

Sheep tracks seen on salt lakes and in mud in marginal shrublands.
Fox tracks on salt lake.

Firebreaks and fences

Firebreaks and fences only in adjacent farmland. There is a firebreak in very poor condition along the N boundary of the Reserve. A roadway on the S side and cutting across the SW corner is an effective firebreak. A central track from the E side to the SW corner would isolate very mild fires.

Human usage

A small amount of rubbish has been dumped on the Reserve, but has had little effect. The presence of sheep on the Reserve is the result of strays rather than deliberate grazing. The golf links and their associated management probably encourage some use of the southwest portion of the Reserve.

Adjacent uncleared land

There are 1000+ ha of salt complex to the N of the Reserve and some uncleared bushland on the SW side. The bushland totals ca 151 ha and consists of 77 ha in Water Reserve 13920, 40 ha in Recreation Reserve 20276 and 34 ha in Recreation Reserve (golf links) 21703.

Opinion and recommendations

Reserve 14429 supports a wide variety of habitats and is rich in plant species. There are indications that it is also rich in fauna. Good stands of woodland are now a scarce resource in the wheatbelt and large, varied associations of the type on this Reserve invaluable. The other formations present (mostly shrubland) are fairly rich in plant species and mosaic in structure.

All the indications are that this Reserve is very important in the region particularly in view of its isolation from other bushland (with the exclusion of salt complex). I recommend that Reserve 14429 be classified "A" to ensure the maximum protection of the woodland in particular. I also recommend that marginal firebreaks be installed. The Reserve should be vested in the Western Australian Wildlife Authority.

APPENDIX 2
Reserve 14429

The Gimlet-York Gum woodland and Eucalyptus transcontinentalis-York Gum mallee occur as a constantly repeating mosaic.

Gimlet-York Gum woodland

Eucalyptus salubris and E. loxophleba trees 10-12 m tall, ca 10% canopy cover. Scattered E. salmonophloia to 22 m tall present. Understory absent or scattered shrubs to 2% canopy cover and occasional patches of Melaleuca uncinata. Species usually found in this component of the mosaic were: Acacia erinacea, Alyxia buxifolia, Argyrolottis turbinatus, Atriplex paludosa, Bassia diacantha, Cassia nemophylla, Eremophila clarkii, E. oppositifolia, Exocarpus sparteus, Grevillea acuaria, Myriocephalus gracilis, Ptilotus exaltatus, Rhagodia nutans. Soil is pinkish grey light clay. Poorly drained.

Eucalyptus transcontinentalis-York Gum mallee

Eucalyptus transcontinentalis and E. loxophleba tree mallee, 8-16 m tall, 2-10% canopy cover over Melaleuca eleutherostachya and/or M. hamulosa and/or M. uncinata shrubs 3-5 m tall, 2-10% cover (locally up to 40%). There is a third stratum of Acacia acuaria and A. colletioides shrubs 1.5 m tall, 2-10% cover. Scattered emergent Callitris huegellii are present to 7 m tall. They commonly occur in more open areas where the understory is better developed. Other plant species recorded were: Acacia acuminata, A. heteroclita, A. tetragonophylla, Alyxia buxifolia, Borya nitida, Cassia nemophylla, Comesperma volubile, Dianella revoluta, Eucalyptus salubris, Hakea decurva, Olearia pimelioides, Ptilotus exaltatus, Rhagodia nutans, Santalum spicatum, Templetonia sulcata, Waitzia acuminata. Soil is reddish brown, sandy clay. Poorly drained.

Mallee areas

Eucalyptus transcontinentalis and E. redunca shrub mallee, 5-8 m tall, 10-30% cover over mixed shrubs 1-2.5 m tall, 10-30% cover. Other species recorded were: Acacia acuminata, Alyxia buxifolia, Amphipogon debilis, Baeckea sp. 10, Bertya cunninghami, Calothamnus chrysanthus, Cassytha glabella (on Phebalium tuberculatum), Casuarina acutivalvis, C. campestris, Daviesia? sp., Dianella revoluta, Dodonaea bursariifolia, Ecdeiocola uncostachya, Eucalyptus ovularis, Grevillea didymobotrya, Hakea subsulcata, Lepidosperma drummondii, Lomandra glauca collina, Melaleuca seriata,

Olearia revoluta, Persoonia saundersiana, Petrophile incurvata, Phebalium tuberculatum. Soil is yellowish brown, light sandy clay loam. Moderately drained.

Acacia shrubland

Acacia stereophylla, A. resinomarginea shrubs, 2-4 m tall, 70-100% cover over Casuarina campestris shrubs, 1-2 m tall, 2-10% cover over Ecdeiocolea monostachya sedges 0.5 m tall, 2-3% cover. Also recorded were: Baeckea crispiflora, Borya nitida, Brunonia australis, Casuarina campestris, Dianella revoluta, Ecdeiocolea monostachya, Goodenia helmsii, Hibbertia affin. glomerosa, Melaleuca uncinata, Platysace effusa, Thryptomene australis, Thysanotus patersoni. Soil is yellow, sandy loam. Well drained.

Marginal shrubland

Acacia affin. filifolia shrubs, 2-4 m tall, 2-10% cover over Dodonaea attenuata linearis and Templetonia sulcata shrubs, 1.5 m tall, 2-10% cover. Also recorded were: Argyrolottis turbinatus, Atriplex paludosa, Enchylaena tomentosa, Eremophila clarkii, Exocarpus sparteus, Frankenia desertorum, Hakea preissii, Halosarcia affin. halocnemoides, H. leptoclada, Lomandra effusa, Mesembryanthemum crystallinum, Rhagodia spinescens, Sclerostegia moniliformis, Stipa elegantissima, S. hemipogon. Soil red brown, clay loam. Moderately drained. Situated on edge of salt complex.

Granite outcrop

Granite outcrops on the SW of the Reserve are mostly low pavement-like formations with thickets or patchily distributed shrubs. Recorded were Borya nitida, Calothamnus gilesii, Calytrix depressa, Casuarina campestris, Dicrastylis fulva, Eucalyptus ovularis, Glischrocaryon flavescens, Melichrysum lindleyi, Hibbertia affin. glomerosa, Spartochloa scirpoidea, Verticordia chrysanthera.

The granite outcrops on the nearby Water Reserve are larger and more prominent. Stands and single plants of Acacia tetragonophylla and Pittosporum phylliraeoides are present as well as Acacia lasiocalyx, A. microbotrya, Borya nitida, Calothamnus quadrifidus, Cheilanthes tenuifolia, Dodonaea attenuata, D. inequifolia, Grevillea paniculata, Hakea decurva, Kunzea pulchella, Ptilotus obovatus, Santalum spicatum, and Spartochloa scirpoidea.

Lakes and interlake dunes

Salt lakes mostly bare with marginal bands of Arthrocnemum bidens and A. halocnemoides shrubs 0.5 m tall, and up to 70% canopy cover. On slight ridges are clumps of Atriplex sp. 1. Interlake dunes with scattered shrubs of Acacia colletioides and Eremophila mineata together with Acacia filifolia, Dianella revoluta, Disphyma blackii, Dodonaea attenuata linearis, Frankenia desertorum, Halosarcia affin. halocnemoides, H. leptoclada, Sclerostegia moniliformis. Soil red, light clay with abundant gypsum. Poorly drained.

21A

Reserve 14429

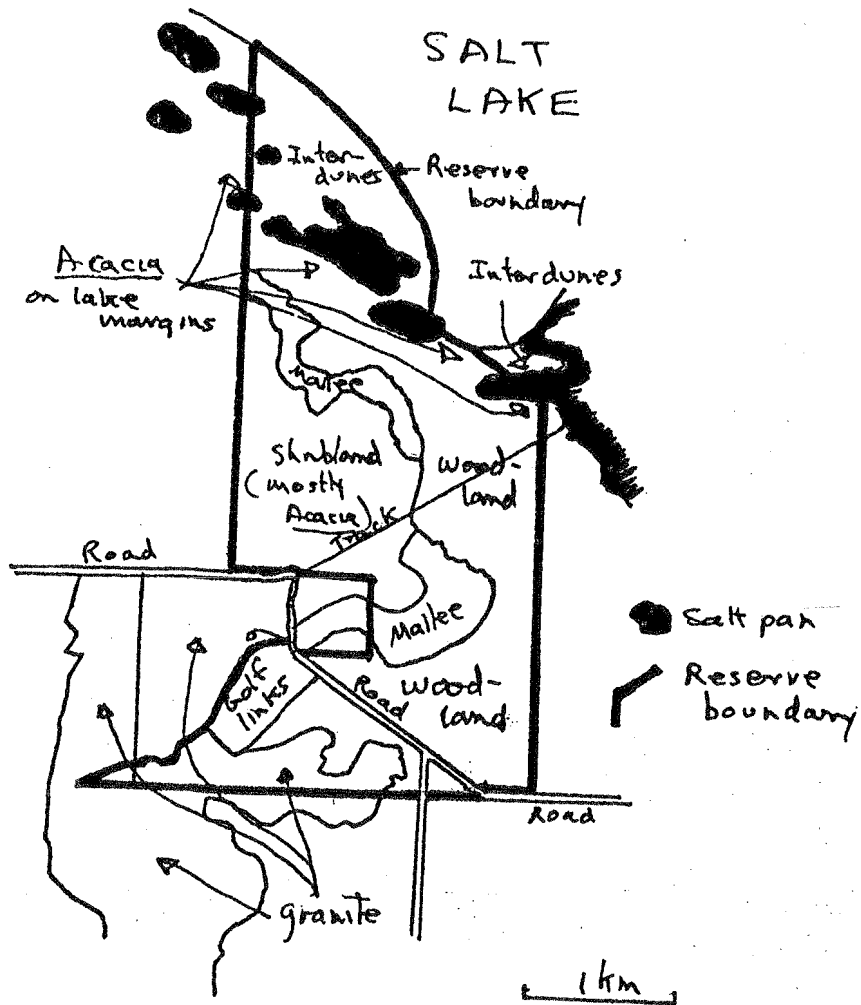




Plate 3. Reserve 14429 showing Gimlet-York Gum woodland with scattered Salmon Gums.



Plate 4. Eucalyptus transcontinentalis-York Gum mallee area. Photograph shows open area where understory is dense and Callitris huegellii developed.



Plate 5. Eucalyptus transcontinentalis-Black Marlock mallee on Reserve 14429.



Plate 6. Acacia dense thicket over Ecdeiocollea.

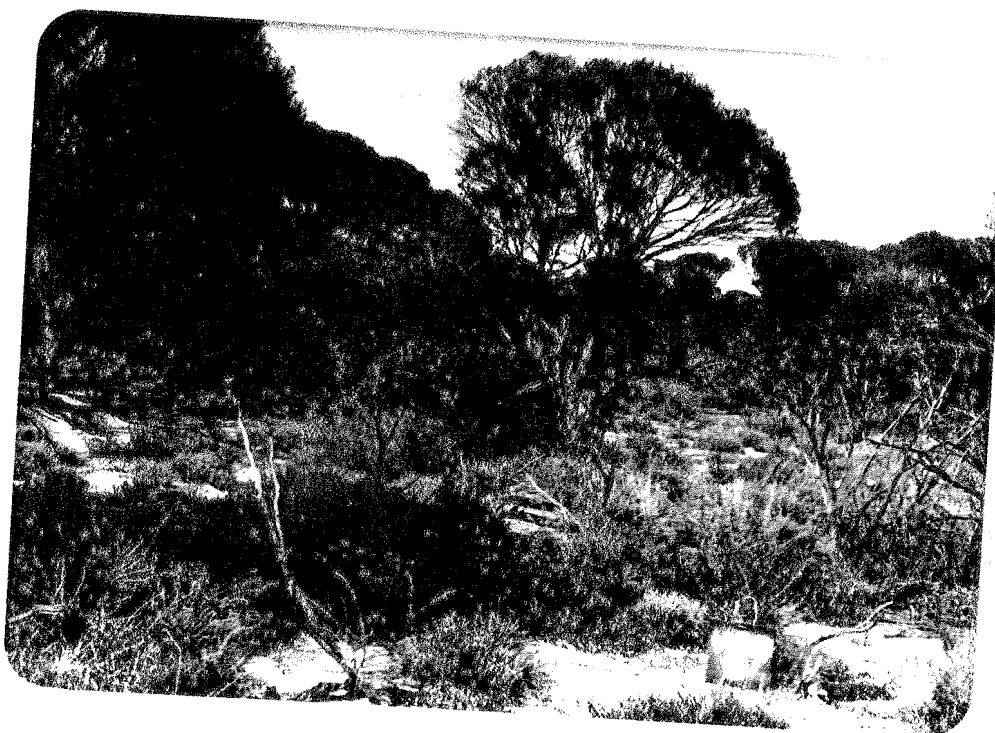


Plate 7. Marginal shrubland of Acacia with an understory comprising mostly chenopods. Reserve 14429.

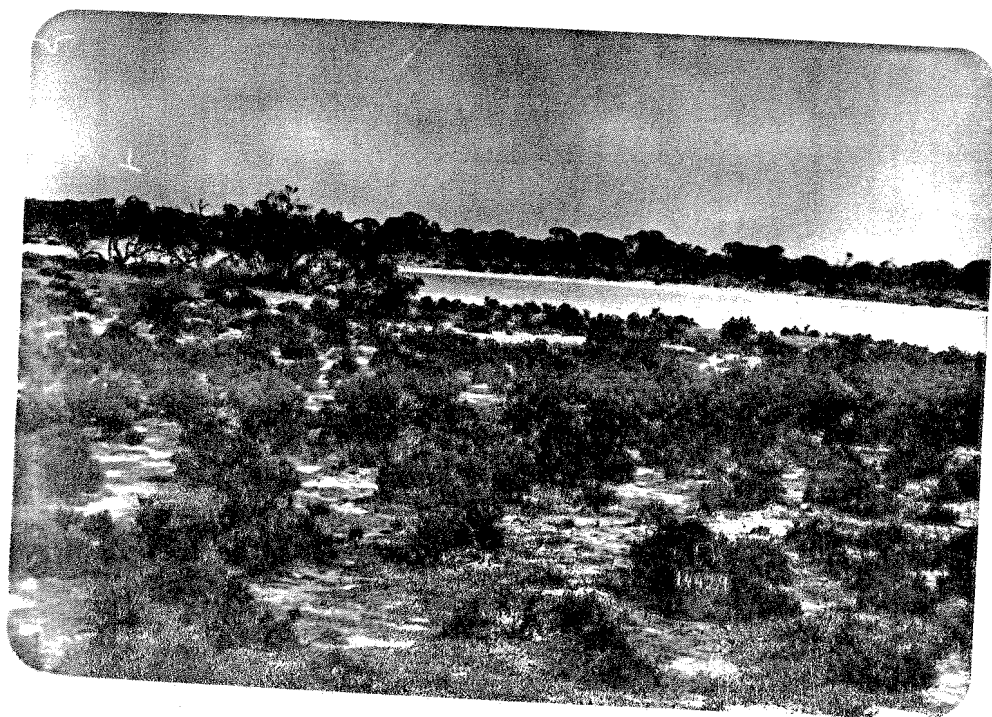


Plate 8. Lake edge, bare salt lake and interlake dune. The dune is covered in scrub and small trees.

Reserve 16040

Located ca 4 km SE Dukin Siding and ca 17 km due S of Koorda Townsite.
Shown on lithograph 56/80; E4.

Background

Originally set aside on 2 July 1915 for "Water". The Reserve was ca 190 ha in area and was vested in the Minister for Water Supply, Sewerage and Drainage.

The area of the Reserve was decreased on 19 July 1918 and again on 1 April 1920 and has remained at this size (186.07740 ha) until the present. Its classification was changed to "Public Use" on 29 March 1956 and then to "Conservation of Flora" on 5 June 1959.

Physical characteristics

Reserve 16040 is irregular rectangular, ca 1.5 km long (N-S axis) by ca 1 km broad (E-W axis). It has a total perimeter of ca 4.8 km and an area of 186.0744 ha. The nearest spot altitude available is Dukin Siding at ca 604 m above sea level. Dukin Siding is probably 10-15 m above the lake level and presumably much of the lake system is at the same altitude.

Altitudinal variation within the Reserve is 3-4 m in the woodland area, 4-5 m in the dunes and 1-2 m over most of the remainder.

Vegetation

Reserve 16040 is predominantly salt complex, with an area of York and Yorrell woodland on the NE corner and S side.

Plant species

Fifteen plant species were recorded, 13 of which were in the woodland area. Four of the recorded species are grasses or weeds.

Tree hollows

Scattered in woodland areas. Very few young trees present.

Weeds

Abundant grass and Ptilotus polystachys mostly in roadside drains, ~~along~~ areas of woodland and on lake margins.

Fire history

There may never have been burnt.

Fauna

- Australian Pipit (Anthus novaeseelandii): common in samphire areas.
 Willie Wagtail (Rhipidura leucophrys): 2 in woodland.
 Chestnut-rumped Thornbill (Acanthiza uropygialis): 5 in woodland.
 Singing Honeyeater (Meliphaga virescens): several in woodland.
 White-fronted Chat (Epthianura albifrons): common in woodland and in samphire flats.
 Australian Raven (Corvus coronoides): several flying over Reserve.

Exotic fauna

Reserve has been grazed by sheep. Rabbits are common.

Firebreaks and fences

No fences except in adjacent farmland. The only firebreak present is the roadway which cuts diagonally through the Reserve, but the area would probably not support a fire.

Human usage

Sheep have been grazed over most of the Reserve and some rubbish has been dumped on the NE corner.

Adjacent uncleared land

1,000+ ha of uncleared salt complex is contiguous with the Reserve. Reserve 9281 is contiguous with the W boundary of Reserve 16040.

Conclusions and recommendations

Apart from the value of the Reserve for conservation of flora and fauna it is probably vital to soil conservation. The whole area is under salt influence and very little uncleared bushland remains in the Reserve apart from that already influenced by increasing salinity. The Reserve is also part of a complex geological structure resulting from progressive drying and dune formation of the salt lake. The sedimentology of the gypsum rich dunes is worthy of study and may lead to information on the microclimatology of the region. I recommend that Reserve 16040 be retained in its present form, that any development or mining likely to disturb the Reserve be prohibited, and that the Reserve be vested in the Western Australian Wildlife Authority.

APPENDIX 3

Reserve 16040

Woodland

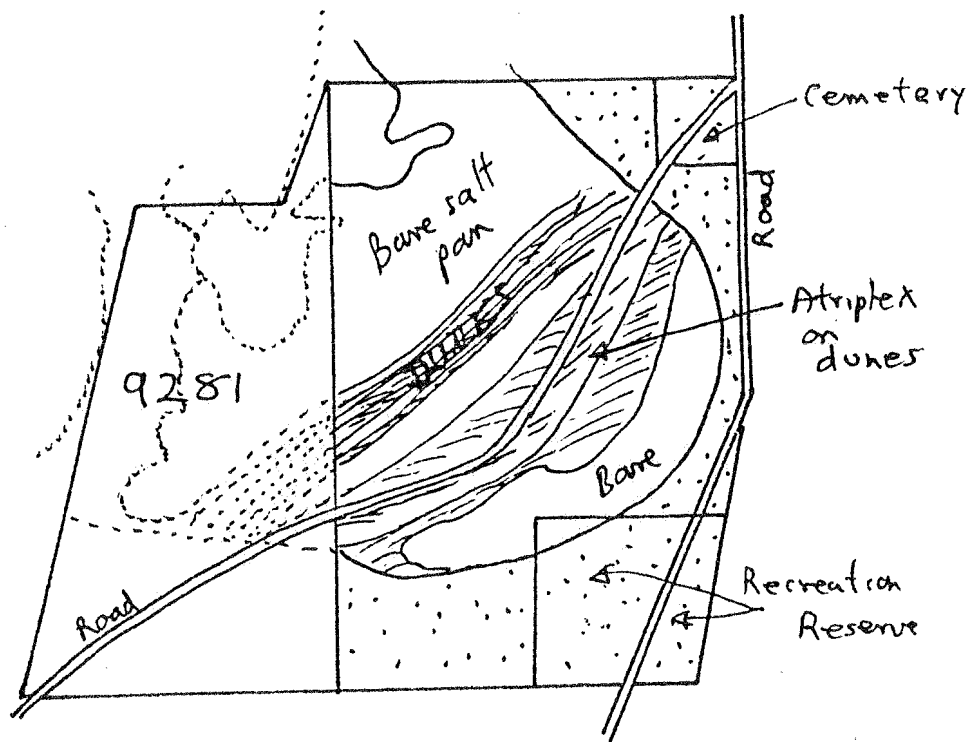
Eucalyptus loxophleba and E. gracilis trees, 8-12 m tall, ca 1-4% cover over Atriplex ? vesicaria shrubs 1 m tall, 30-70% cover. Also recorded were: Acacia colletioides, Enchylaena tomentosa, Lycium australe, Rhagodia nutans, Santalum acuminatum, Templetonia sulcata. The grasses Avena sativa fatua and Stipa hemipogon and the weeds Ptilotus polystachys and Raphanus raphanistrum were abundant. Soil was red, loamy clay. Poorly drained.

Salt complex

Dunes with Atriplex ? vesicaria shrubs 1 m tall, 30-70% cover. Interdunal flats were bare. An occasional Stipa elegantissima grass or Pittosporum phylliraeoides tree was present on the dunes.

27A

Reserve 16040



Yorrel-York Gum woodland

Atriplex heaths

1 km



Plate 9. Woodland with shrubby understory. View S on NE corner of Reserve 16040. Salt complex of the type found on this Reserve is illustrated in plate 1.

Reserve 16245

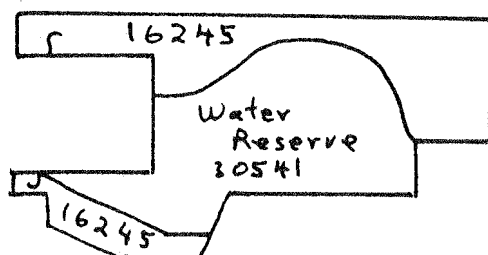
Located immediately N of Koorda Townsite and shown on lithograph 56/80, E2.

Background

Originally set aside 17 December 1915 for "Railways Water Supply". Records relevant to the Reserve are not available between 1915 and 1961 because of damage to the register. There appears to be no other record. The classification of the Reserve was changed to "Conservation of Flora" on 27 October 1961 at which time it had an area of ca 532 ha. Subsequently a dam and catchment for water supply were excluded from the Reserve and vested in the Minister for Water Supply. This caused a reduction in area to 266 ha on 16 October 1970.

Physical characteristics

Reserve 16245 is irregular in shape and is illustrated below.



It has an area of 263.0836 ha but is contiguous with several other Reserves (see Adjacent Uncleared Land) and the effective area of bushland is ca 594 ha. There is a spot altitude of ca 306 m above sea level at Koorda Siding, ca 1 km S of the Reserve. Altitudinal variation within the Reserve is probably ca 15 m.

Vegetation

Reserve 16245 has 2 mallee associations (Shrub Mallee and Very Open Shrub Mallee) and 3 shrubland associations; a Scrub and 2 Dense Thickets. The majority of the Water Reserve is Gimlet Open Low Woodland A.

Plant species

Forty-five plant species were recorded, 13 of which are exploited by the wildflower seed trade.

Nest hollows

Scattered in woodland. Not common.

Weeds

Uncommon, only in disturbed areas and on road verges. Mainly Ptilotus exaltatus and the grass Avena sativa fatua.

Fire history

No obvious evidence of fire except on NW corner which shows evidence of very old fire.

Fauna

Port Lincoln Parrot (Platycercus zonarius): heard and seen at several places on the Reserve.

Galah (Cacatua roseicapilla): common around townsite, on Water Reserve and near Siding.

Rainbow Bee-eater (Merops ornatus): 12 flying over Reserve on E side.

Western Shrike-thrush (Colluricincla harmonica rufiventris): 2 calling N side, 1 in Water Reserve.

White-browed Babbler (Pomatostomus superciliosus): 2 nests in shrubs at N side Reserve.

Singing Honeyeater (Meliphaga virescens): several in flowering Grevillea spp. and Melaleucas on E side Reserve.

Grey Currawong (Strepera versicolor): 1 flying across road on W side Reserve.

Australian Raven (Corvus coronoides): several on Reserve and around Railway Siding.

Exotic fauna

Dogs and cats almost certainly are common invaders from the adjacent townsite, although no evidence was recorded.

Firebreaks and fences

There are marginal firebreaks in poor condition around the N and E sides of the Reserve. Fences are present on sides adjacent to farmland.

Human usage

Several tracks are present and drains which arise in the Water Reserve.

Adjacent uncleared land

The Water Reserve (30541) is joined with the S side of the Reserve and is 265.8405 ha in area. Additionally there is a Recreation Reserve (20135) of 34.9262 ha and a reserve for "Public Utility" (20251) of 29.9467 ha contiguous with Reserve 16245. There is thus a total of ca 331 ha of bushland contiguous with the Reserve.

Opinion and recommendations

Reserve 16245 is very valuable to the town of Koorda as a windbreak during the period when north-westerlies predominate. Being of low rainfall (ca 284 mm/yr, ca 11 inches) the town is prone to dust problems and so retention of bushland in the vicinity is advantageous. Additionally the Reserve contains a variety of habitats and is fairly rich in plant species. It probably also contains a fairly rich fauna. I recommend the Reserve be retained in its present form and that negotiations be made with the controlling bodies of the Water Reserve (under control of the Koorda Shire Council and vested in the Minister for Water Supply, Sewerage and Drainage) to ensure that any changes to the Water Reserve do not adversely affect the Flora Reserve. I also recommend that Reserve 16245 be vested in the Western Australian Wildlife Authority.

APPENDIX 4
Reserve 16245

The Water Reserve (30341) is included in this survey.

Gimlet woodland

Eucalyptus salubris trees, 8-12 m tall, 2-10% cover with scattered E. salmonophloia trees. Second stratum of Melaleuca cymbifolia trees, 2-4 m tall, 2-10% cover. Also recorded were: Acacia acuminata, A. erinacea, A. mackayana, Bassia diacantha, Eremophila oppositifolia, Eucalyptus erythronema, Glyschrocaryon flavescens, Helipterum humboldtianum, Olearia muelleri, Ptilotus exaltatus. Soil red, light clay. Poorly drained.

Black Marlock Mallee

Eucalyptus redunca, E. transcontinentalis and scattered E. ovularis shrub mallee, stratum 5-8 m tall, 2-10% cover. Also recorded were: Acacia colletioides, A. fragilis and A. sp., Amphipogon debilis, Baeckia affin. floribunda, Daviesia nematophylla, Dianella revoluta, Eremophila decipiens, Melaleuca cymbifolia, M. eleutherostachya, Phebalium tuberculosum megaphyllum, Santalum acuminatum, Thryptomene strongylophylla, Waitzia acuminata. Soil pinkish grey, sandy clay. Poorly drained.

Eucalyptus ovularis mallee

Eucalyptus ovularis shrub mallee, 3-6 m tall, 30-70% cover over Beyeria leschenaultii shrubs, 1 m tall, 30-70% cover. Also recorded were: Acacia graffiana, A. sp., Baeckea floribunda, and Micromyrtus sp. Soil pale brown, clay loam. Moderately drained.

Acacia shrubland

Acacia sp. 18 shrubs, 3-5 m tall, 70-100% cover with a patchily distributed understory, mostly of Alyxia buxifolia. Yellow, loamy sand. Well drained.

Casuarina shrubland

Casuarina acutivalvis shrubs, 2-4 m tall, 10-30% cover over Grevillea paradoxa and mixed shrubs, 1.5 m tall, 10-30% cover. Also present were: Acacia neurophylla, Eriostemon deserti and Hakea subsulcata. Soil yellow, loamy sand with ca 29% laterite. Moderately to well drained.

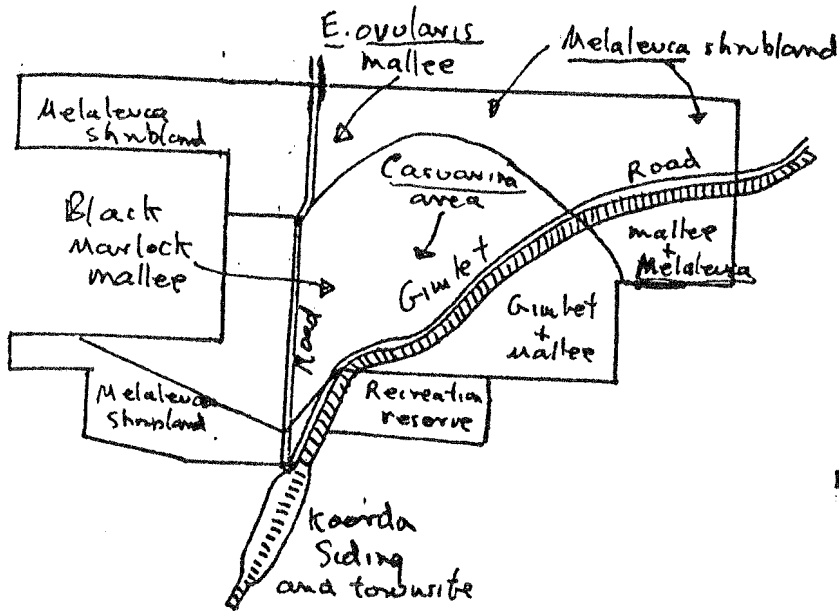
Melaleuca shrubland

The eastern end of the N boundary of the Reserve has a stand of Melaleuca uncinata shrubs, 4-5 m tall, 70-100% cover over Melaleuca laxiflora and M. oldfieldii shrubs to 1 m tall, 2-10% cover. Species recorded in this portion were: Acacia sp. 18, Phebalium tuberculosum and Santalum acuminatum.


To the west of this association the M. uncinata stratum drops to 2-4 m tall but it still 70-100% cover. Understory is absent but Acacia sp. 18, Alyxia buxifolia, Eucalyptus redunca, Hakea coriacea, Melaleuca oldfieldii, Santalum acuminatum and Westringia cephalantha are present.

Soil in both areas is yellow, loamy sand but the eastern portion is moderately drained whereas the western is well drained.

33A



Reserve 16245
and Water Reserve
30541

 Railway line

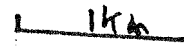
 1 km



Plate 10. Reserve 16245 showing Black Marlock mallee area with patchily distributed understory.



Plate 11. *Eucalyptus ovularis* mallee area. View S from N side Reserve.



Plate 12. Tall dense Melaleuca thicket on NW corner of Reserve 16245.

Reserve 16867

Located ca 2.5 km SW Dukin Siding and 16 km SW of Koorda Townsite.
Shown on lithograph 56/80, DE4.

Background

Originally set aside 22 February 1918 for "Public Utility", then changed to "Conservation of Flora" 25 June 1965.

Physical characteristics

Reserve 16867 is approximately triangular with a total perimeter of ca 7.6 km and an area of 243.2789 ha. The nearest spot altitude is ca 604 m above sea level at Dukin Siding, which is in turn ca 10-15 m above the level of the salt flats. Ridges up to 4 m and low dunes up to 2m above the level of the salt flat are present.

Vegetation

The vegetation is mostly saltbush flats with some low dunes with a few trees. Much of the Reserve is bare salt pans.

Plant species

Nineteen plant species were recorded, all of which are typical of salt effected vegetation.

Nest hollows

Trees are very few in number but those present mostly contain nest hollows.

Weeds

Some grasses, mainly Avena sativa fatua and Aira caryophylla are present on road verges and on sandy dunes.

Fire history

It is unlikely that vegetation of the Reserve would ever support a fire.

Fauna

Footprints of kangaroo were noted on the salt flats.

Galah (Cacatua roseicapilla): several in trees on sand ridge.

Australian Pipit (Anthus novaeseelandiae): several on sand ridge.

Willie Wagtail (Rhipidura leucophrys): 2 in shrubland on sandy ridge.

Singing Honeyeater (Meliphaga virescens): 1 in woodland.

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

Australian Raven (Corvus coronoides): several in wooded areas and flying over Reserve.

Exotic fauna

Sheep have been present on the Reserve. Tracks were visible on the salt flat.

Firebreaks and fences

Fenced adjacent to roadway at N end and adjacent to paddocks. No firebreaks present.

Human usage

Sheep have been run on, or allowed to escape onto, the Reserve.

Adjacent uncleared land

Several thousand hectares of salt flat are contiguous with the Reserve.

Remarks

In the winter period water covers the Cowcowing Lakes and part of the Reserve to a depth of ca 0.4 m. It probably provides an important sanctuary for waterfowl at this time.

Opinion and recommendations

Apart from the value of the Reserve for flora and fauna conservation, particularly in the wet season, it probably has considerable value for soil conservation. Attempts to increase the area of the Reserve in the past have been prevented by the Mines Department, who want to retain the area as a source of gypsum. In my opinion any mining of the area will encourage salt problems, alter water flow in the lake and the consequent sedimentation patterns, and may lead to destruction of the limited areas of woodland. I recommend the Reserve be vested in the Western Australian Wildlife authority.

APPENDIX 5

Reserve 16867

Dunes with Yorrell Trees

Eucalyptus gracilis trees, scattered, up to 14 m tall, over Atriplex vesicaria and scattered Acacia colletioides shrubs 0.5 m tall, 30-70% canopy cover. Other species present were Aizoon quadrifidum, Maireana appressa, Mesembryanthemum crystallinum, M. nodiflorum, Threlkeldia diffusa. Soil pink, sandy clay, gypseous dunes. Poorly drained.

Saltbush flats

Atriplex vesicaria shrubs, 0.5 m tall, 30-70% canopy cover. Also present were Aira caryophylla, Aizoon quadrifidum, Atriplex paludosa, Disphyma blackii, Halosarcia pergranulata, Lycium australe, Maireana amoena, Mesembryanthemum nodiflorum, Rhagodia nutans, Salsola kali, Sclerostegia tenuis, Threlkeldia diffusa. Soil pink, sandy clay, gypseous dunes. Poorly drained, seasonally waterlogged.

Salt flats

Mostly bare with some Arthrocnemum halocnemoides on margins and occasional clumps of A. bidens.

Reserve 16867

38A

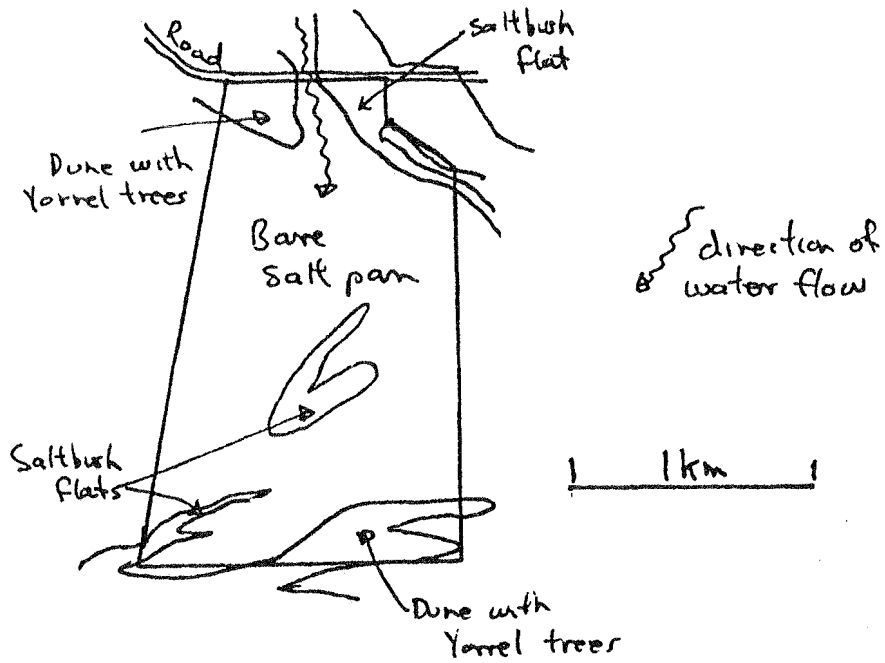




Plate 13. View across saltbush flat with scattered Yorrell trees in background.



Plate 14. Edge of saltbush flat, bare lake and gypseous dune (distant right) with Yorrell trees.

Reserve 23008

Located ca 19 km SW Koorda Townsite and shown on lithograph 56/80, CD4.

Background

Originally set aside for "Conservation of Flora" on 25 November 1949.

Physical characteristics

Reserve 23008 is square, with a total perimeter of 3.2 km and an area of 64.7978 ha. There are no spot altitudes available near the Reserve, but the salt flats are probably about 600 m above sea level. There is about 1 m of variation in the topography of the salt flats. The highest point on the Reserve is the SW corner, ca 4 m above the rest of the land.

Vegetation

The majority of Reserve 23008 is salt flat. The SW corner has York Gum Open Woodland over Open Scrub and Open Dwarf Scrub D. There are marginal heathy or shrubby areas between the woodland and salt flat which are species rich.

Plant species

Fifty-six plant species were recorded of which 13 are exploited by the wildflower seed trade. The woodland area is unusually species rich for this association and area.

Nest hollows

Abundant in wooded areas. No young trees present.

Weeds

Raphanus raphanistrum and grasses common in woodland and on edges of salt falt.

Fire history

Woodland has probably not been burnt for at least 30 years. The salt flats probably would never support fire.

Fauna

Echidna (Tachyglossus aculeatus): scats and diggings in woodland.

Kangaroo: scats seen, mostly on salt flat.

Crested Pigeon (Ocyphaps lophotes): 2 in Melaleuca thickets.

Port Lincoln Parrot (Platycercus zonarius): 6 in woodland, 1 in Melaleuca thicket.

Mulga Parrot (P. varius): pair in woodland.

Galah (Cacatua roseicapilla): 4 in woodland.

Welcome Swallow (Hirundo neoxena): 4 flying over Reserve.

Australian Pipit (Anthus novaeseelandiae): 2 on samphire flats.

Black-faced Cuckoo Shrike (Coracina novaehollandiae): 2 in York Gum mallee.

Willie Wagtail (Rhipidura leucophrys): 2 in woodland, 1 on samphire, 3 in Melaleuca thicket.

Weebill (Smicrornis brevirostris): common in woodland.

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

Black-faced Wood-swallow (Artamus cinereus): 3 dead in tree.

Bobtail Lizard (Trachydosaurus rugosus): 1 live seen in woodland, and a corpse on the salt flat.

Exotic fauna

Rabbit scats common. Sheep footprints and dog footprints and scats in samphire area.

Firebreaks and fences

None present but sparseness of vegetation probably prevents the area burning. Only the SW, N and W sides are fenced.

Human usage

Some timber removed, and small amounts of rubbish dumped. Parts of the Reserve have been regrazed.

Adjacent uncleared land

There is extensive salt lake contiguous with the Reserve.

Opinion and recommendations

The major value of the Reserve probably lies in its helping to prevent further expansion of the salt affected land and as a nesting site for birds utilising hollow limbs and trunks of trees. I recommend Reserve 23008 be retained in its present form and that signs be erected near the SW corner indicating rubbish dumping is prohibited. I also recommend the Reserve be vested in the Western Australian Wildlife Authority.

APPENDIX 6

Reserve 23008

York Gum woodland

Eucalyptus loxophleba trees, 12-16 m tall, 2-10% cover over Templetonia sulcata and Acacia mackayana shrubs, 1-2.5 m tall, 2-10% cover over Atriplex paludosa shrubs, 0.5 m tall, 2-10% cover. There is a seasonal dense cover of the grasses Bromus rubens and Stipa hemipogon. Other species recorded were: Acacia colletioides, A. merrallii, A. signata, Aira caryophylla, Angianthus pusillis, Argyroglossis turbinatus, Bassia diacantha, Darwinia diosmoides, Daviesia nematophylla, Dianella revoluta, Dodonaea attenuata, Enchylaena tomentosa, Eremophila clarkii, Eucalyptus salmonophloia, Exocarpus sparteus, Gnephosis sp., Lycium australe, Olearia muelleri, Podotheca angustifolia, Ptilotis exaltatus, P. obovatus, P. stirlingii, Rhagodia nutans, Santalum acuminatum, Scaevola spinescens, Stipa elegantissima, Templetonia sulcata, Waitzia acuminata, Westringia cephalantha. Soil pink, sandy clay. Moderately to poorly drained.

Salt margins

Clumps of Lomandra glauca collina 0.5 m tall, ca 2% canopy cover with all other species clumped. Other species recorded were: Acacia acuminata, A. eremaea, A. multispicata, Aizoon glabrum, A. quadrifidum, Alyxia buxifolia, Atriplex drummondii, Dianella revoluta, Eucalyptus gracilis, Halosarcia leptoclada, Maireana brevifolia, M. carnosae, Melaleuca hamulosa, M. thuyoides, Mesembryanthemum nodiflorum, Olearia axillaris eremicola, Ptilotus polystachys. Pinkish grey, sandy clay. Poorly drained.

Salt flats

Originally a thicket of Melaleuca uncinata trees, 10-11 m tall, 70-100% cover. Trees now mostly dead and only a heathy layer of succulents remains. Large bare area of mud flat is present. Plant species recorded were: Aizoon glabrum, A. quadrifidum, Argyroglossis turbinatus, Arthrocnemum bidens, Enchylaena tomentosa, Gunniopsis intermedia, Halosarcia leptoclada, Mesembryanthemum nodiflorum, Rhagodia nutans, Salsola kali. Soil grey, loamy sand, poorly drained.

43A

Salt flat

Reserve 23008

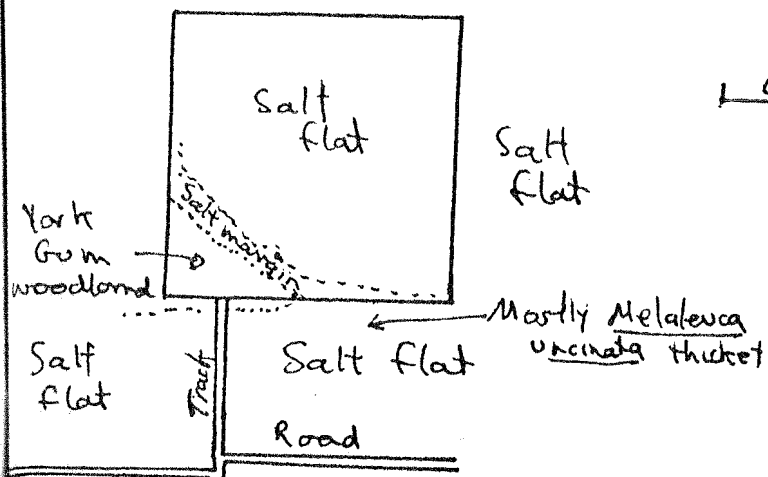




Plate 15. York Gum woodland on Reserve 23008.

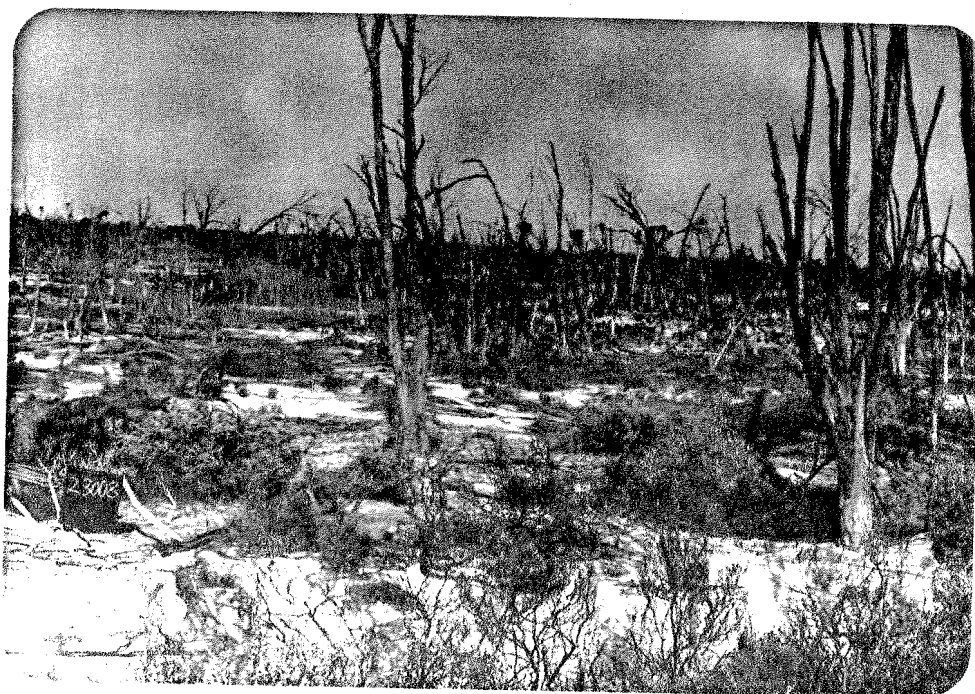


Plate 16. Salt flats originally supporting Melaleuca thicket and now with only succulent heath.

Reserve 23029

Located ca 3 km ENE of Mollerin Siding on N side of Mollerin Lake. Shown on lithograph 65/80, F2.

Background

Originally set aside on 20 January 1950 as a "Common for Travellers and Stock". The Reserve was originally ca 394 ha in area and under the control of the Koorda Shire.

The size was decreased to ca 151 ha on 27 March 1953, increased to ca 162 ha on 13 January 1956, and then decreased again to its present area of 161.5202 ha on 8 April 1960. The classification was changed to "Conservation of Flora" on 14 April 1967.

Physical characteristics

Reserve 23039 is rectangular, ca 1.8 km long (E-W axis) by ca 0.9 km broad (N-S axis). It has a total perimeter of ca 5.3 km and an area of 161.5202 ha. There are 2 small Reserves, 20007 (Water) and 22483 (Sheep Dip) included within the boundaries of the flora Reserve and raise the size of the whole area of bushland to ca 171.3 ha. There is a spot altitude of 320 m above sea level (ASL) at Mollerin Siding and another of 330 m ASL 2 km E of the Reserve. Altitudinal variation within the Flora Reserve and Water Reserve combined is ca 50 m.

Vegetation

Six associations are present.

- (1) York Gum Very Open Shrub Mallee over mixed Heath A.
- (2) Acacia-Grevillea Scrub in old area of regrowth.
- (3) Acacia-Casuarina Thicket over Thryptomene Open Low Scrub B.
- (4) Melaleuca-Casuarina Scrub over Thryptomene Dwarf Scrub C.
- (5) Granite outcrop on Water Reserve, and
- (6) Acacia, Eucalyptus and Hakea as scattered shrubs in area of regrowth following clearing.

Plant species

Fifty-three plant species were recorded, of which 21 are exploited by the wildflower seed trade.

Nest hollows

A few are present in the York Gum mallee area. There are very few young plants present.

Weeds

Mostly small ephemerals in disturbed area and around granite outcrop.

Fire history

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

Fauna

The only fauna recorded on the Reserve were Galah (Cacatua roseicapilla) and Australian Raven (Corvus coronoides) flying overhead. The structural richness of the Reserve suggests that many other species of fauna are probably present.

Exotic fauna

A few rabbit scats were noted.

Firebreaks and fences

Marginal firebreaks are present in adjacent farmland on the N and E sides. There is a roadway on the W side. There are no fences on the W or S boundaries.

Human usage

There is an old sand pit on the Reserve. Some rubbish has been dumped and there is a disused water tank.

Adjacent uncleared land

The Water Reserve (ca 10 ha) and a few ha of uncleared bushland between the Reserve and the railway line are present.

Opinion and recommendations

Reserve 23039 contains a reasonable variety of associations, particularly shrublands and is probably a useful Reserve for small birds which occupy thickets. The area of regrowth supports Acacia and Grevillea spp. which would provide abundant food for birds in the flowering season. As the Reserve is isolated from other bushland it probably provides an important roosting and feeding site for transient species. I recommend that Reserve 23029 be retained in its present form and be vested in the Western Australian Wildlife Authority.

APPENDIX 7
Reserve 23019

York Gum mallee

Eucalyptus loxophleba and E. transcontinentalis shrub mallee, stratum 4-6 m tall and ca 1-3% cover. Second stratum of mixed shrubs, 1-2 m tall, 30-70% cover. Species recorded were Acacia acuaria, A. colletioides, A. erinacea, A. ligustrina, A. mackayana, Alyxia buxifolia, Casuarina huegeliana, Eremophila oppositifolia, Exocarpus sparteus, Hakea decurva, Olearia muelleri, Ptilotus exaltatus, P. obovatus, Santalum spicatum, Scaevola spinescens, Templetonia sulcata. Soil reddish yellow, sandy clay. Poorly drained.

Acacia-Grevillea shrubland

Acacia ligustrina 1.5 m tall and Grevillea excelsior (foliage 2 m tall, flower spikes to 3-4 m tall) and occasional Eucalyptus leptopoda mallee. Overall canopy cover 10-30%. There is an abundant seasonal cover of Amphipogon debilis and Stipa hemipogon grasses of ca 20% which declines to ca 10% in summer. Other species present were: Acacia ligustrina, A. signata, Grevillea didymobotrya, Hakea coriacea (single plant in poor condition), Jacksonia furcellata, Leucopogon hamulosus, Ptilotus obovatus. Soil yellow, sandy clay. Moderately drained.

Acacia/Casuarina shrubland

Acacia sp. and Casuarina acutivalvis shrubs 4-7 m tall, 30-70% canopy cover over Thryptomene affin. kochii, 1-1.5 m tall, 2-10% cover, but patchily distributed. Some Acacia resinomarginea, Astroloma serratifolium, and Eucalyptus leptopoda present. Soil yellow, sandy clay with ca 20% laterite. Well drained.

Melaleuca-Casuarina shrubland

Mostly Melaleuca uncinata, Casuarina acutivalvis and Hakea coriacea shrubland, 2-4 m tall, 10-30% cover over Thryptomene affin. kochii shrubs 1 m tall, 10-30% cover. Acacia ligustrina, A. signata and A. sp. are also present, together with some Casuarina corniculata, Eucalyptus leptopoda and Melaleuca cordata. Soil yellow, sandy clay with ca 20% laterite. Well drained.

In other areas the association becomes M. uncinata, H. coriacea and A. sp. with only scattered Casuarina acutivalvis, 3-5 m tall and 30-70% cover with the T. affin. kochii up to 1.5 m tall and 2-10% cover. This area had

Baeckea sp. 10, Dianella revoluta, Eucalyptus leptopoda, E. redunca, Grevillea sp., Olearia pimelioides and Santalum spicatum present. Soil was yellow fine sandy loam; well drained.

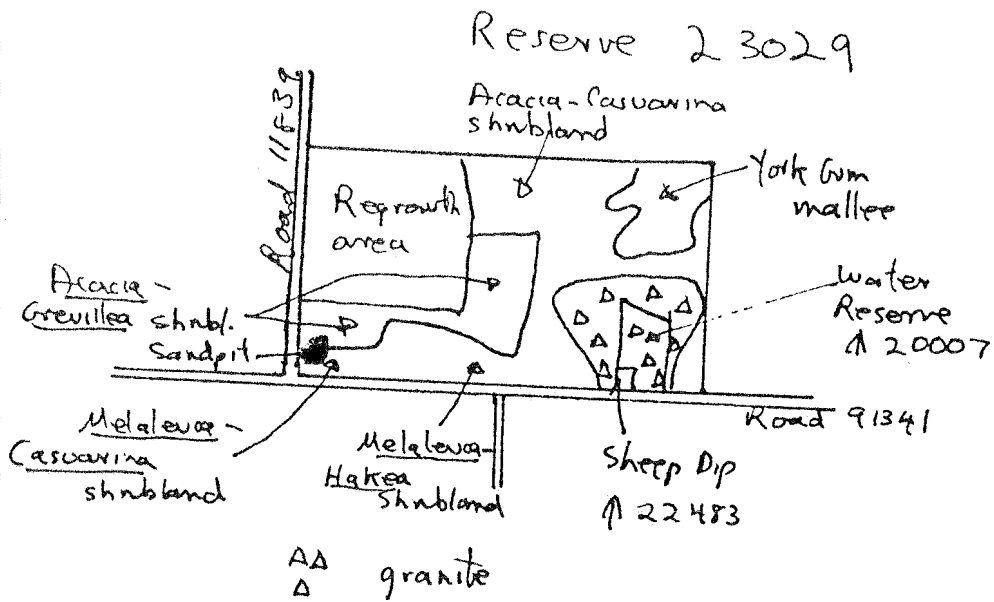
Granite outcrop on Water Reserve

Granite pavement and boulders; with shallow soil pockets and seasonal rockpools. Species present were: Acacia acuminata, Borya nitida, Calandrinia sp., Casuarina campestris, Dianella revoluta, Dodonaea attenuata, Eucalyptus loxophleba, Grevillea paniculata, Kunzea pulchella, Lepidosperma tenue, Melaleuca radula, Spartochloa scirpoidea, Thryptomene australis, Waitzia acuminata.

Regrowth area

Acacia signata, A. sp., Eucalyptus leptopoda, Hakea coriacea and H. decurva scattered shrubs, ca 1% cover, varying from 1 to 3 m tall, Amphipogon debilis and Stipa hemipogon grasses form a dense seasonal cover. Soil yellow, sandy clay. Moderately drained.

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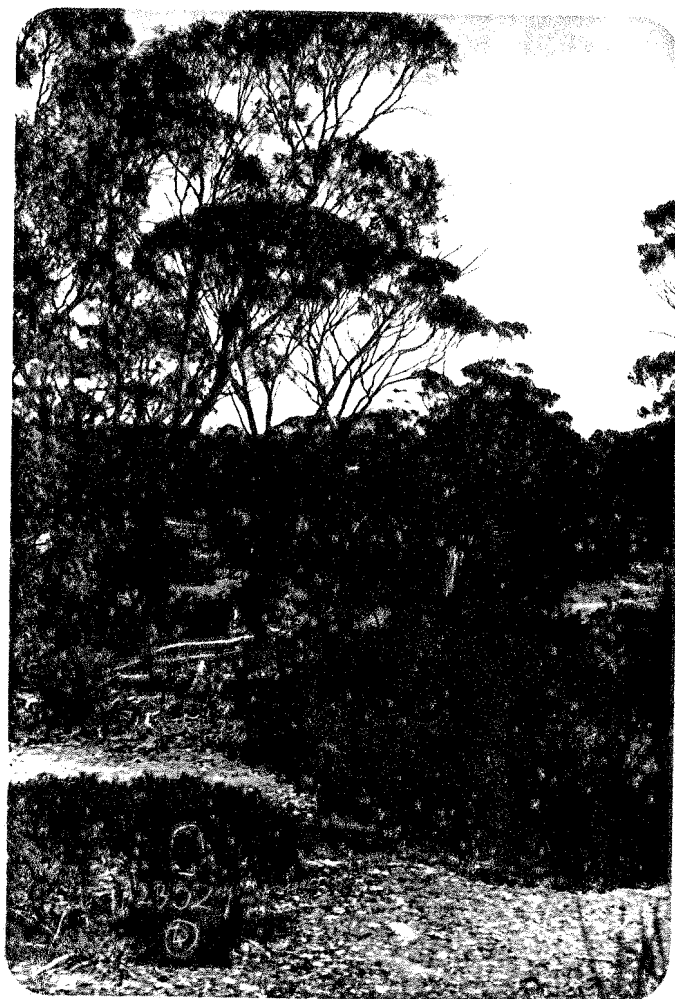


Plate 17. York Gum Mallee association on Reserve 23029 with patchily distributed mixed shrub understory. Acacia mackayana shrubs in foreground.



Plate 18. Melaleuca-Casuarina shrubland with Thryptomene affin. kochii understory.



Plate 19. Regrowth area on Reserve 23029. Note seasonal grasses and clumps of spoil from clearing.

Reserve 24838

Located ca 16 km due W of Koorda Townsite and shown on lithograph 56/80, D2.

Background

Originally set aside 22 November 1957 for "Conservation of Flora".

Physical characteristics

Reserve 24838 is irregular rectangular, ca 2.4 km long (N-S axis) by 0.8 km wide (E-W axis). It has a total perimeter of 7 km and an area of 240.9625 ha. The nearest spot altitude is ca 302 m above sea level ca 1 km NW of the Reserve. Altitudinal variation within the Reserve probably does not exceed ca 5 m.

Vegetation

Yorrel and Salmon Gum Open Woodland with dense grassy understory. Gives way to Melaleuca dominated Scrub over succulents on the lake margins then Samphires on the lake edge. The lakes are seasonally flooded and bare of vegetation.

Plant species

Twenty-nine plant species were recorded, 5 of which are exploited by the wildflower seed trade. The assemblage present reflects the salt influence from the nearby lakes.

Nest hollows

Few in woodland, mostly on NW side.

Weeds

Common in disturbed areas and along tracks. Mostly small ephemerals.

Fire history

No evidence of fire for at least 30 years. Salt complex areas would probably never support a fire.

Fauna

Echidna (Tachyglossus aculeatus): scats and fresh diggings very common in woodland on NE corner of Reserve. Numerous logs show recent occupation by the animals.

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

Galah (Cacatua roseicapilla): several in woodland and flying over Reserve.

Rainbow Bird (Merops ornatus): several flying over Reserve.

Willie Wagtail (Rhipidura leucophrys): 2 in Pittosporum trees, NW side.

Chestnut-rumped Thornbill (Acanthiza uropygialis): common in shrubland areas around salt flats.

Yellow-rumped Thornbill (A. chrysorrhoea): several in shrubland areas around salt flats.

Zebra Finch (Peophila guttata): 12 in Jacksonia furcellata shrubs.

Exotic fauna

Sheep tracks are common, particularly on the E side of the Reserve.

Firebreaks and fences

Fenced on E, S and W sides. Firebreaks in adjacent farmland on E and W sides. A track on the E side and a road on the N side of the Reserve act as firebreaks.

Human usage

Timber has been removed from the wooded areas. Gypsum and sand pits have been dug on the E side of the Reserve. Sheep have been run on the Reserve and a pit provides a water source for bushfire fighting and other purposes.

Adjacent uncleared land

About 1000+ ha of salt complex are contiguous with the N and S ends of the Reserve.

Opinion and recommendations

Reserve 24828 provides an important nesting area for birds. The shrublands are fairly rich in plant species and support several bird species. The Reserve is probably also important for soil conservation in that the vegetation will help to slow salt encroachment onto adjoining farmland. I recommend Reserve 24828 be retained in its present form and be vested in

APPENDIX 8

Reserve 24828

Woodland

Scattered trees of Eucalyptus gracilis and E. salmonophloia to 20 m tall, up to 4% canopy cover. No understory but dense seasonal cover of grasses. Other plant species recorded were: Acacia colletioides, Aizoon quadrifidum, A. glabrum, Arthrocnemum bidens, Gunniopsis intermedia, Jacksonia furcellata, Lomandra glauca collina, Mesembryanthemum crystallinum, M. nodiflorum, Monotaxis lurida, Pittosporum phylliraeoides, Ptilotus exaltatus, Rhagodia nutans, Scaevola spinescens, Stipa elegantissima, Templetonia sulcata. Disturbed areas within the woodland and parts of the understory are covered with a dense growth of Amphipogon caricinus, Stipa hemipogon and occasional clumps of Ptilotus exaltatus. Soil pinkish grey, sandy loam. Poorly drained.

Shrubland on salt flat margins

Mostly Melaleuca hamulosa and M. uncinata shrubs, 4-6 m tall, 10-30% cover but patchily distributed. Understory of succulents, mostly Aizoon quadrifidum, A. glabrum, Mesembryanthemum crystallinum, M. nodiflorum. Stratum 30 cm tall, 2-10% cover. Also recorded were Acacia affin. ligulata, Enchylaena tomentosa, Exocarpus sparteus, Lycium australe, Rhagodia nutans. Soil pinkish grey, sandy loam. Poorly drained with some salt influence.

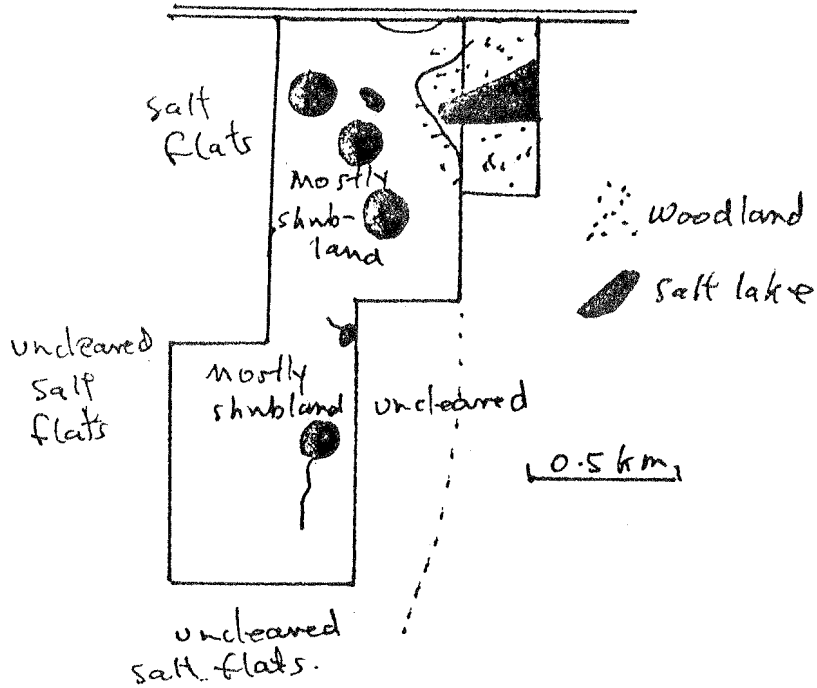
Lake edge

Lake edge had scattered shrubs of Arthrocnemum bidens, A. halocnemoides, Atriplex paludosa, Enchylaena tomentosa, Lycium australe, and Melaleuca hamulosa. Soil as for shrubland but seasonally flooded.

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Reserve ~~24828~~ 24838

Salt flats



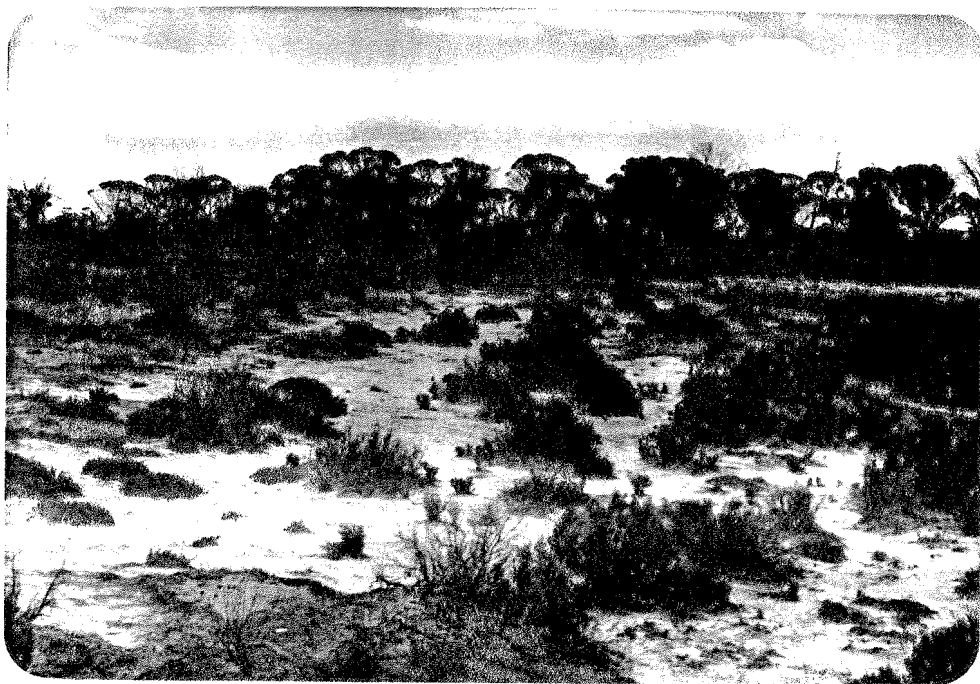


Plate 20. View E from salt flat on Reserve 24838. Foreground is dominated by Samphires with narrow shrubland behind then Yorrell woodland in the background.



Plate 21. Melaleuca shrubland over understory of succulents.