

FORESTS DEPARTMENT

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Address all correspondence: Conservator of Forests
Your ref:

Our ref: H.O. 920/62
Inquiries: MR O. LONERAGAN

AUGUST 20TH, 1974.

The Director
Fisheries and Fauna Department
Fauna Research
108 Adelaide Terrace
PERTH 6000.

FOR ATTENTION: DR. A. BURBIDGE

CONSERVATION THROUGH RESERVES COMMITTEE

I enclose the following information supporting liaison and earlier recommendations:

1. Superintendent Havel's Report on Cocanarup Reserve.
2. Mr Loneragan's Report and Recommendations on 1.
3. Current Report on Conservation of Forest Reserves, Species and Recommendations.

RECOMMENDATIONS:

1. Standards of objectives would need to be established for legislation and understanding of purpose.
2. The level of importance of standards would need to be evaluated by acceptable methods to resolve understanding of intentions.
3. Long term scientific investigations of standards would need to be implemented to prevent misrepresentation of law and management, and to reduce complexity to manageable proportions.
4. Funds. A Commonwealth Government subsidy is a right to be claimed from past and present capital values for the repair and maintenance of forested and other utilised lands.

B.J. Beggs
B.J. BEGGS
CONSERVATOR OF FORESTS.

per *Loneragan*
SILVICULTURIST.

OL:EM.

Enc. 1.1 — 1.3
and Appendices
Detail 2.1 — 2.3

MEMO ON

COCANARUP TIMBER RESERVE (no. 30795, Lands Act)

FORMERLY SANDALWOOD RESERVE (95/25, Forests Act).

At the request of the Deputy Conservator I have gone through the departmental file dealing with this topic. In order to acquaint myself with the problem, I prepared a resume of past correspondence, which is included to save time for whoever has to deal with it in future.

The basis for any discussion of the potential of the reserve for the conservation of flora and fauna is, at this stage, the as yet incomplete report by Mr O. Loneragan. The vegetation map, a rough copy of which was attached to the preliminary report on folios 166, is now complete, and a copy is appended herewith. Also attached is the legend and table intended to accompany the map, which formerly formed folio 184.

The essence of the reports and the maps is as follows:

The reserve has a total area of 8988 ha of which 3389 ha has been affected by wildfires to a sufficient degree, or sufficiently recently not to have returned fully to maturity. A small area of 37 ha is cleared. The tallest vegetation type (20 m) occupies 779 hectares, and has developed to maturity. It is mainly composed of salmon gum (*Eucalyptus salmonophloia*) in association with jam (*Acacia acuminata*). Salmon gum is characteristic of loam or sandy loam soils of the valleys, jam extends on to the adjacent stony ridges. Lower woodland, below 10 m high, occupies much of the remaining valley sites. The total area of this type is 4032 ha, approximately one third of which is affected by fire. Mallee and heath shrublands occupy 4140 ha, chiefly on slopes and uplands. Nearly two thirds of this type is fire-affected.

Although the scrublands are botanically rich the outstanding feature of the reserve are its salmon-gum and jam woodlands, which are normally associated with more recent and hence more fertile soils. In the early stages of agricultural expansion in W.A. this type was the first choice of farmers for clearing, with the result that virtually no extensive area of this type remains. I have specifically checked this point with the authorities involved with conservation of Flora and Fauna. The coastal reserves of Fitzgerald River and Barren Ranges are too close to the sea for this vegetation type to occur in them. The large Lake Magenta Fauna reserve consists predominantly of mallee shrubland. What salmon gum is found in it occurs near the lakes and is not associated with jam (Burbidge, F. & F. pers. comm.). The proposed large Flora and Fauna reserve at Hyden-Dragon Rock is predominantly a dissected upland with only a minor tongue of salmon gum woodland extending into it (Marchant, W.A. Herbarium, pers. comm.). Forest Reserve no. 20346, recently inspected by Messrs Edmiston and Humphreys, contains no extensive areas of salmon gum woodland (unpublished dept. report). In light of this, the Cocanarup Timber Reserve stands out as the largest remnant of the formerly extensive salmon gum-jam woodland. It also contains the rather unusual combination of salmon gum-swampy yate woodland. This is one of the reasons why the area has been recommended for reservation by the Conservation Through Reserves Committee. The other reason is the confirmed presence in the area of the relatively rare tammar (*Macropus eugenii*) referred to on folio 126, of this file. Although the trapping by Fisheries and Fauna staff in 1973 did not discover any rare species of fauna, large number of birds and reptile species were recorded.

2.

In view of this development, the decision on the future of the reserve will obviously be based on the submission of Reserves Committee. However it is recommended that the Forests Department should support the creation of a Fauna and Flora Reserve in the area. Review of past dealings with the Ravens-thorpe Shire Council reveals that they have supported all past requests for conversion of parts of the reserve to conditional purchase leases, and but for the opposition by our department the reserve would long have ceased to exist. Their protest-ations about the need for permanent fence post resource therefore lack conviction, and in the opinion of agricultural officers even lack sound economic sense, in that in view of high labour costs hardwood posts are no longer competitive with treated pine posts or star steel pickets.

It is important that should the Timber Reserve be converted to a Flora and Fauna reserve, adequate provisions should be made for its protection against fire, and the protection of neighbour-ing farmers against invasion by vermin from within the reserve, as recommended by Loneragan. At present, the reserve is viewed as an asset by the local population. This will no longer be the case after the conversion, and failure to manage and protect the reserve would soon negate the benefits of the reservation.



J.J. HAVEL
SUPERINTENDENT, RESEARCH.

JJH:EM
Como Research
22/7/74

ANNUAL REPORT

O.W. Loneragan

CONSERVATION OF FOREST RESERVES AND SPECIES.

An important purpose of this work is the preservation of the of the ecotypes and gene pools of the native species. Management reserve areas of the original ecosystems therefore have been selected to provide reference points for subsequent stages of development. 'Proposals for Reservation of some Inland Ecotypes.' (August 1973) in six reserves of 37 000 hectares in total area near Kalgoorlie has been published by the Department. Preservation through reserves is important following the revocation of 685 253 hectares of Timber Reserves, no longer required for inland industries (1971 Annual Report).

FIELD INVESTIGATIONS AND REPORTS.

Field evaluations of irreplaceable management areas and reports with recommendations for conservation of the natural biology and environment have been made covering extensive areas of the Southwest and Ereman Botanical Provinces, viz:

1. Inland ecotypes of the Ereman Botanical Province:
 - 1.1 Comet Vale - 7057 ha of Eucalyptus and Acacia ecotypes, dissected mineral hills and saltlake (L. Goongarrie).
 - 1.2 Mack's Tree Mulga and Wongi Sandalwood - 58486 ha contains the diffuse boundary where part of the two most important plant formations of Australia meet, mulga and gum, plus 100 000 sandalwood trees (to 2 metres height growth approx.).
 - 1.3 Sandalwood Regeneration Kalgoorlie, Res. W.P. 20/73. Five field plots, established 1974 are at Jeedamya, Gindalbie, Bullock Holes, Calooli and Kalgoorlie Arboretum. Treatments include fenced x unfenced, cultivated x uncultivated, natural x artificial sowing with the aim of determining requirements for establishment of sandalwood.
 - 1.4 Goldfields Regeneration Plots in Ballast Pits, Res. W.P. 17/74 - ten field plots, located 1974 by O.I.C. Kalgoorlie along the standard gauge railway to Lefroy have been registered for monitoring.
2. Ecotypes of the Southwest Botanical Province:
 - 2.1 Cocanarup Reserve 30795 - 8988 ha.
Seven communities include irreplaceable remnant consociations of jam (Acacia acuminata) and salmon gum (E. salmonophloia) and residual reptile populations listed by biologists.
 - 2.2 Ravensthorpe Coastal System extending from the vermin fence to the Jerdacuttup Paper Bark Lakes of a wetland formation.
 - 2.3 Ravensthorpe Hills System is a natural arboreta of some 40 Eucalyptus sp. with some unique species at from 10-30 km of Ravensthorpe.
 - 2.4 Munglimup Reserve contains attractive breakaway and woodland communities (Eucalyptus gardneri and platypus; E. occidentalis and Acacia acuminata).

- 2.5 Busselton Sunklands - 43860 ha. Six localities have been defined and evaluated as reference areas of the original biology and environment. Recommendations have been made for reconciliation and inclusion of findings in the Sunklands Pine Working Plan.
- 2.6 Scott River - Hardy Inlet Coastal Reserves - 2118 ha. Observations and recommendations have been made and reported briefly on methods of handling access into reserves, the zoning of mining, of alienation and use of sand dunes, preservation of the native flora and of the vulnerability of susceptible species to Phytophthora cinnamomi.
- 2.7 Collie Forest Localities - 17444 ha. Reconnaissance has been made, observations reported and recommendations submitted for reconciliation with requirements of local management for conservation, scientific study and development of biological, geological and scenic features of the forest environment in West Collie (5720 ha), the Collie Basin (2950 ha) and East Collie (6900-8774 ha).

LABORATORY

1. Seed Testing Standard seed testing showed reliability of viability for -

23 Acacia sp. of \pm 8 percent
 62# Eucalyptus sp. \pm 14 percent
 22 Pinus \pm 7 percent.

The viability of sandalwood seed in cracked seed coats before sowing in the field trials was 65 (\pm 15) percent.

2. Field Identification Kits for Eucalypts. Herbarium material and photographs of tree form and bark of Eucalyptus species in the Southwest and Eremean Provinces continue to be assembled in order to facilitate identification of species and to maintain reliable collection of seed in the field.

O.W. Loneragan
 O.W. LONERAGAN
 SILVICULTURIST.

OL:EM
 Como Research
 30/7/74.

DISTRIBUTION: 1. Mr B. White, Como
 2. O.I.C. Kalgoorlie.

RECOMMENDATIONS (refer ^{protection} ~~list~~ of study areas)

I recommend the financial means, facilities and organisation, requires to be constructed to assist appropriate authorities as follows -

1. Maintain reserve systems surrounded by private property, within the protection organisation of bushfire control board and emergency services.
2. Maintain reserve systems in State Forests within the protection organisation of the Forests Department.

O.W. Loneragan 21/12/73
 O.W. LONERAGAN
 SILVICULTURIST

CONSERVATOR OF FORESTS
PERTH.

COCANARUP RESERVE 30795 (8988 hectares).

A mosaic of types of vegetation structure has been prepared from road reconnaissance and interpretation from air photos. The approximate areas for 7 vegetation types (4 woodland and 3 shrubland) according to subdivision by the main access roads are listed in the attached table and legend. The woodland types do not occur in existing reserves and should be preserved. Fine stands of Eucalyptus salmonophloia to 20 m height growth on loamy soils and of jam (Acacia acuminata) on the adjacent stony ridges are remnant stands. For this reason every effort must be made to implement managed protection and dedication as flora reserve.

PROTECTION

1. Fire From 30 to 60 percent of these woodlands are fire-damaged and over half the shrublands are burnt by haphazard fires. Requirements for protection of attractive woodlands from damage therefore are to manage prescribed burning in the adjoining shrubland.
2. Vermin Fifty emus were sighted in farm and woodland during reconnaissance. Observations made by the adjoining farmer are that he is a minority and the buffer, who is expected to provide the task force for the rest of the community in order to control emus, kangaroos, rabbits, dingoes, foxes.

RECOMMENDATION

I recommend the financial means should be obtained which will assist the appropriate authority to maintain, protect, repair, develop and improve Flora Reserves in the Ravensthorpe Shire.

O.W. Loneragan
O.W. LONERAGAN
SILVICULTURIST.

OL:EM
Como Research
21/12/73.

ATTENTION: SUPERINTENDENT RESEARCH.

Refers (1) other details, also 17/12/73

(2) revision of estimates, 26/3/73.

RECOMMENDATIONS (refer ^{protection} list of study areas) *Biannual Report* -

I recommend the financial means, facilities and organisation, requires to be constructed to assist appropriate authorities as follows -

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O.W. Loneragan
O.W. LONERAGAN
SILVICULTURIST
21/12/73.

APPENDICES - DETAIL CO CANARUP RESERVE DATA.

1. Exploratory map of vegetation structure and legend.
2. Legend of exploratory sampling and trapline enumeration of tree and shrub species.
3. Enumeration of mammals, birds and reptile species provided by Mr N. McKenzie.



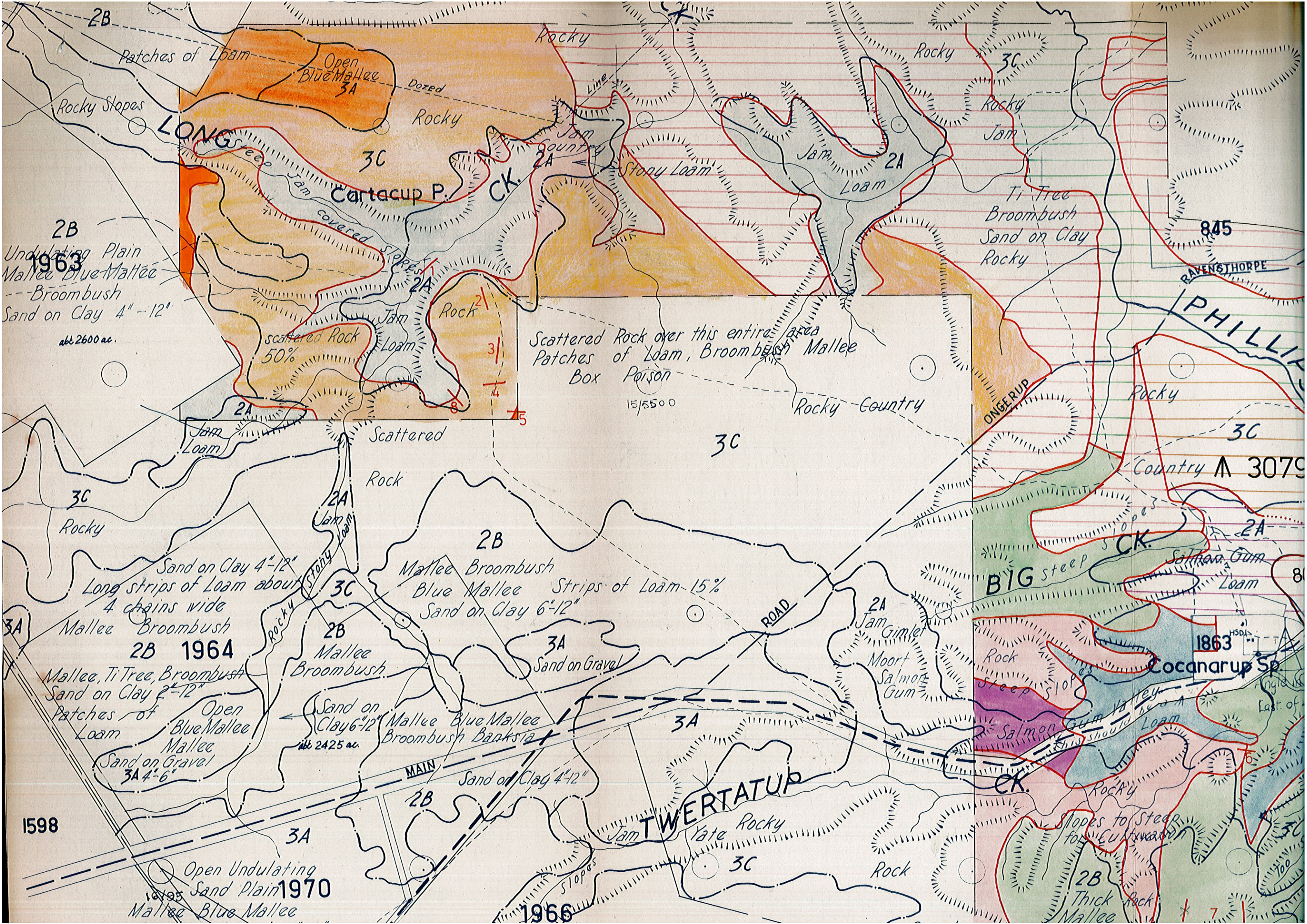
Figure - Trapline Reserve 30795.

Dugite (*Demansia nuchalis affinis*) held by Ken Youngson with Norm McKenzie and Keith Morris, Fauna Research. Background Yate (*Eucalyptus occidentalis*) on Long Creek tributary of Phillips River, 20 November, 1973.

DISTRIBUTION: Director of National Parks
Hackett Drive, CRAWLEY.

Conservator of Forests, PERTH.

Attached Detail 2.1 — 2.3.



2B

1963
Undulating Plain
Mallee Blue Mallee
--- Broombush
Sand on Clay 4"-12"
abt 2600 ac.

LONG

3C

Cartacup P.

CK.

Scattered Rock over this entire area
Patches of Loam, Broombush Mallee
Box Poison
15/5500

3C

Rocky Country

Ti Tree
Broombush
Sand on Clay
Rocky

845

RAVENSTHORPE

PHILLIP

Country A 3079

3C

Rocky

2B

Mallee Broombush
Blue Mallee Strips of Loam 15%
Sand on Clay 6"-12"

ROAD

Sand on Clay 4"-12"
Long strips of Loam about
4 chains wide
Mallee Broombush

2B 1964

Mallee, Ti Tree, Broombush
Sand on Clay 2"-12"
Patches of Loam

Open Blue Mallee
Mallee

Sand on Gravel
3A 4"-6"

1598

3A

Open Undulating
Sand Plain
Mallee Blue Mallee
1970

MAIN

Sand on Clay 4"-12"

Sand on Clay 6"-12"
Mallee Blue Mallee
Broombush Banksia
abt 2425 ac.

2B

TWERTATUP

Yate Rocky

3C

2A Jam Gimlet
Moort Salmon Gum

BIG

steep

CK.

Rock

Steep Slopes

Salmon Gum

Loam

CK.

Rocky

Slopes to Steep
for Cattle

2B

Thick Rock

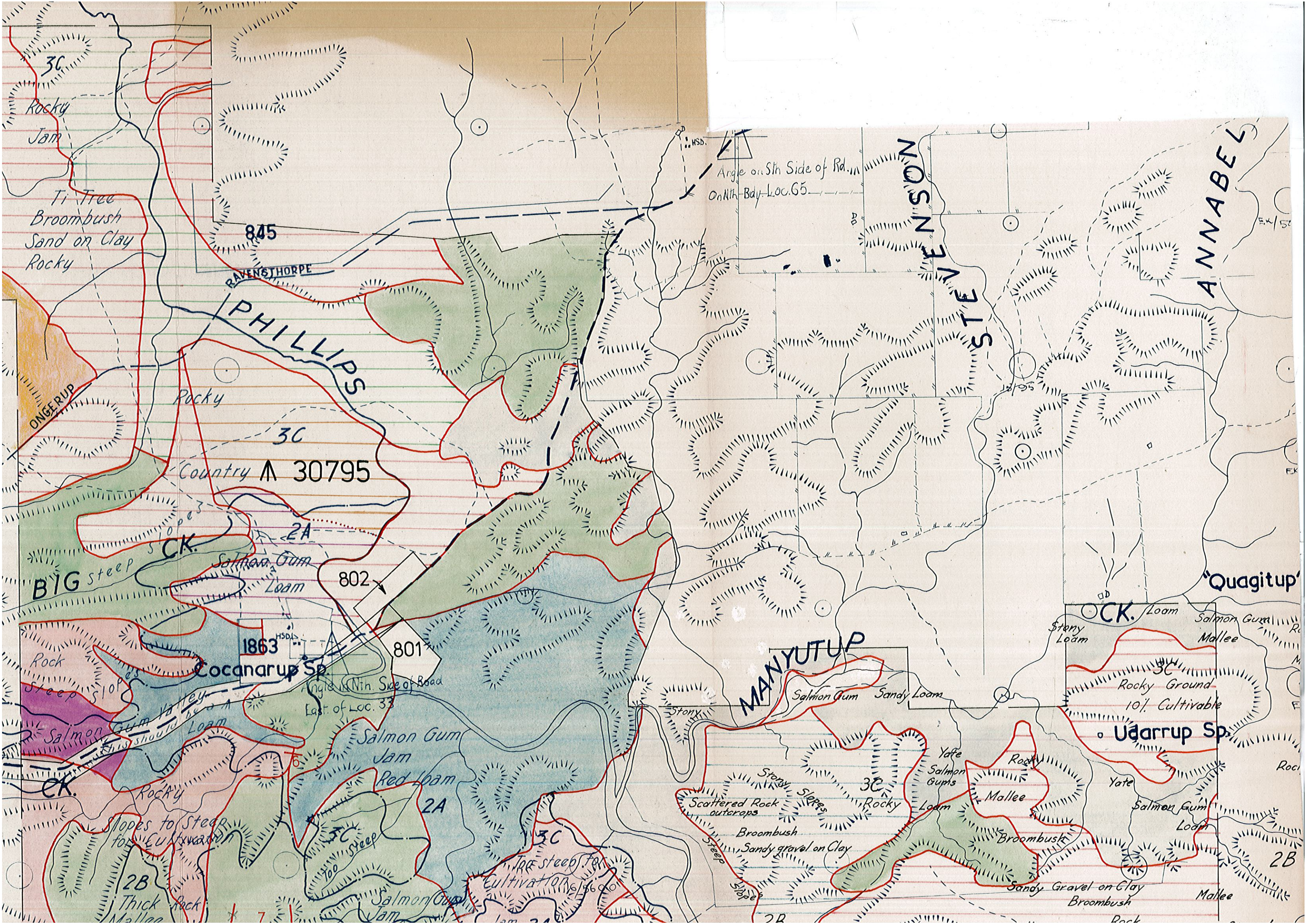
Mallee

1863

Cocanarup Sp.

East of

1966



33°45'
119°45'

LEGEND

2A	Salmon Gum, Gimlet, Jam Loam to Sandy Loam
2B	Mallee, Blue Mallee, Broombush, Ti-Tree, Moort, Banksia Needlebrush, Claybush. Sand on Clay 4"-12" 40% of 2B is Shallow Sand (2") on domed Clay
3A	Mallee, Blue Mallee, Broombush, Blackboy, Banksia Sand on Clay 12"-36" Sand on Gravel 4"-36"
3B	Blue Mallee, Banksia, Scrub. Sand over 36"
3C	Rock or Ironstone
Scattered Box Poison throughout entire area	

280,000

COCANARUP RESERVE 30795 VEGETATION STRUCTURE

- (1) DAMAGED OR BURNT & IMMATURE SINCE FIRE.
(2) DEVELOPED MATURE.

(HEIGHT IN METRES)

WOODLAND

CLEARED

MEDIUM WOODLAND (ABOVE 10m)

WOODLAND SCRUB (BELOW 10m)

LOW WOODLAND, BUSH, HEATH
(BELOW 10m)

MALLEE WOODLAND (BELOW 10m)

SHRUBLAND

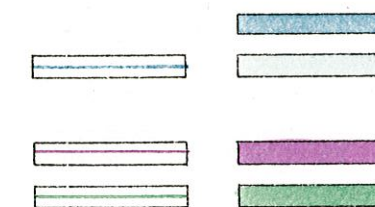
MALLEE SCRUB (ABOVE 2m)

MALLEE AND HEATH (ABOUT 2m)

LOW MALLEE AND HEATH (BELOW 2m)

(1)

(2)



TOTAL

TOTAL WOODLAND AND SHRUBLAND

TOTAL

TRAPLINES

(AREA)

(1)

349

139

581

1069

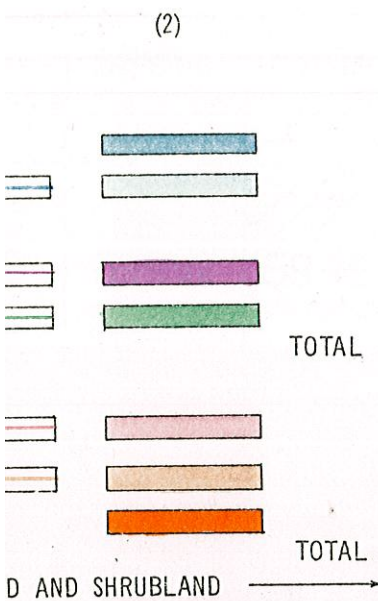
2032

288

2320

3389

P RESERVE 30795
TION STRUCTURE
E SINCE FIRE.



(AREA IN HECTARES)

(1)	(2)	TOTAL
		37
	779	779
349	1475	1824
139	58	197
581	1430	2011
1069	3742	4848
2032	503	2535
288	1161	1449
	156	156
2320	1820	4140
3389	5562	8988



~~TYPING~~
~~A COPIES PLEASE~~

TABLE 1.
CO CANARUP RESERVE, RAVENSTHORPE

190

20-21 NOVEMBER 1973

EXPLORATORY SAMPLING OF VEGETATION STRUCTURE AND COMPOSITION

STRUCTURE		WOODLAND - TREES, HIGH MALLEE AND SCRUB				SHRUBLAND(S) LOW MALLEE, BUSH AND HEATH(Z)			ROCK
HEIGHT OF UPPER STRATA		ABOVE 10m (M)	BELOW 10m (L)			ABOVE 2M	ABOUT 2M	BELOW 2M	OR
ON AIR PHOTO	IN FIELD	Medium Woodland	Mallee Woodland	Woodland Scrub	Low Woodland Bush, Heath	Mallee Scrub	Low Mallee Bush, Heath	Low Mallee Heath	OTHER BURNT
COLOUR		black	black	grey	grey	dark grey (e)	pale grey (x)	grey	light grey OR flared
SPECKLE PATTERN		coarse	fine-medium	fine-medium	irregular	irregular	irregular	coarse	
DENSITY OF MAIN STRATA	(%)(suffix)								
	80+ c	trees	mallee						
	50+ i	trees		scrub	scrub	bush	bush	heath	
	20+ g	scrub		trees	bush	mallee	heath	bush, mallee	
Structure symbol		M ML	L	L	LS	SL	SZ	ZS	
Composition (prefix)		e ea	e	x or ae	x				
		Eucalyptus	Eucalyptus			Eucalyptus	Eucalyptus	Eucalyptus	
		salmonophloia oleosa	salmonophloia oleosa		E. salmonophloia	(salmonophloia)		anceps	
		Acacia	anceps annulata				incrassata (annulata)		
		acuminatum	calycogona	A. acuminata	E. tetragona	(tetragona)	tetragona	E. tetragona	
		Santalum	gracilis			flocktoniae	spathulata		
		spicatum	mutans			focunda	mutans	focunda	
		Callitris	ovularis	Casuarina		(redunca)	redunca		
		preisii	redunca	neglecta			uncinata		
		E. occidentalis	C. preisii	E. occidentalis	E. occidentalis	(E. occidentalis)			
Trapline No. (see attached list 5)		No. 6, 7 Manyutup CK (Southwest)	No. 1. (8) Long Creek	Twentatup CK (centre)	(2) 3, 4 (8) north west	(2) (5)	(5)		

TRAPLINE 6 and 7

SPECIES OF SOUTH SECTION OF COCANARUP RESERVE.

Trapline 6. Crosses creek. Canopy 40ft in places.
Mainly 20ft to 25ft. Water present.

Eucalyptus occidentalis
Eucalyptus oleosa
Eucalyptus calycogona
Acacia acuminata
Callistemon phoeniceus
Phyllanthus calycinus
Halgania lavandulacea
Eremophila decipiens
Olearia muelleri
Beyeria leschenaultii
Daviesia chordophylla
Mel. species
Eucalyptus ovularis
Eucalyptus redunca

Trapline 7. Canopy 15ft. Dry.

Acacia glaucoptera
Eucalyptus nutans
Eucalyptus anceps
Eucalyptus oleosa
Grevillea pauciflora
Melaleuca cuticularis
Lepidosperma tuberculatum
Hakea verrucosa
Calytrix tetragona
Mel. species
Santalum acuminatum

NORTH SECTION TRAPLINE SPECIES

Trapline 1 - also see Trapline 8.

Canopy Height 50ft Granite Rocks to Phillip
River, Long Creek. Low Woodland.

Eucalyptus occidentalis
Casuarina huegeliana
Acacia acuminata
Astarta fascicularis
Melaleuca viminea
Leptospermum ellipticum
Gahnia decomposita
Billardiera lehmanniana

North Section Trapline Species cont.

Trapline 2.

Trapline 2 consisted of two types both ends were the same but centre section was low vegetation over shallow granite sheet. Bracketed which was also distributed over other area.

Melaleuca viminalis	}	Granite
Daviesia pacyphylla		
Mirbelia ovata		Heath
Calytrix brachyphylla		
Casuarina campestris		
Borya nitida	}	Low
Cheiranthra filifolia		
Eucalyptus anceps		Mallee
Eucalyptus foecunda		
Melaleuca uncinata		

Predominant species were Melaleuca uncinata and Casuarina campestris.

Trapline 3. / Broombush type 4ft to 6ft.

Calothamnus quadrifidus
 Hakea erinaceae
 Daviesia pachyphylla
 Leptospermum ellipticum
 Leptospermum spinescens
 Hakea incrassata
 Melaleuca uncinata
 Casuarina campestris
 Eucalyptus tetragona
 Borya nitida
 Gastrolobium hookeri
 Acacia affin. sulcata
 Melaleuca scabra
 Jacksonia sp.

Trapline 4.

Red Basic Soil Dry Creek.

Hakea erinaceae
 Melaleuca uncinata
 Eucalyptus annulata (mallee)
 Eucalyptus occidentalis (mallee) sparse.
 Eucalyptus oleosa
 Petrophile divaricata
 Borya nitida
 Wilsonia humilis
 Templetonia retusa
 Cassytha melantha
 Hakea commutata

North Section Trapline Species cont.

Trapline 5. Granite Rock. Dry.

Melaleuca uncinata
Hakea incrassata
Casuarina campestris
Calothamnus quadrifidus
Hakea erinaceae
Leptospermum ellipticum
Daviesia pachyphylla
Melaleuca elliptica
Eorya nitida
Hakea marginata
Microcorys exserta
Verticordia pennigera
Melaleuca sp.
Thryptomene australis
Hibbertia gracilipes
Gahnia decomposita

Trapline 8. Near granite o/c and water. See Trapline 1.

Melaleuca elliptica
Santalum spicatum
Melaleuca uncinata
Calothamnus quadrifidus
Casuarina campestris
Phyllanthus calycinus
Eucalyptus occidentalis (mallee and sparse)
Lepidosperma resinosum
Verticordia pennigera
Prostanthera campbellii

FROGS AND REPTILES FROM 16 mi. W. OF RAVENSTHORPE
(PHILLIPS RIVER) 19-22 NOVEMBER, 1973.

LEPTODACTYLIDAE

Litoria cyclorhyncha	(2)
Crinia	(2)

GEKKONIDAE

Phyllodactylus marmoratus	(4)
Crenadactylus ocellatus	(3)
Phyllurus milii	(1)
Diplodactylus vittatus	(3)

AGAMIDAE

Amphibolurus ornatus	(2)
Amphibolurus maculatus griseus	(7)
Amphibolurus barbatus minor	(1)

SCINCIDAE

Morethia obscura	
Hemiergis peronii	(3)
Hemiergis initialis	(2)
Lerista distinguenda	(2)
Tiliqua occipitalis	(1)

ELAPIDAE

Demansia affinis	(1)
Denisonia gouldii	(2)

PHILLIPS RIVER MAMMAL LIST

NOVEMBER 1973

NATIVE

Grey Kangaroo	Macropus fuliginosus
Little Bat	Eptesicus pumilus

INTRODUCED

House mouse	Mus musculus
European rabbit	Oryctolagus cuniculus
European fox	Vulpes vulpes

KENT RIVER BIRD LIST

NOVEMBER, 1973

Emu	<i>Dromaius novaehollandiae</i>
Brown Hawk	<i>Falco berigora</i>
Common bronzewing	<i>Phaps chalcoptera</i>
White-tailed Black Cockatoo	<i>Calyptorhynchus baudini</i>
Western Rosella	<i>Platyercus icterotis</i>
Port Lincoln Parrot	<i>Barnardius zonarius</i>
Kookaburra	<i>Dacela gigas</i>
Australian pippit	<i>Anthus novaeseelandiae</i>
Black-faced Cuckoo-Shrike	<i>Coracina novaehollandiae</i>
Broad-tailed Thornbill	<i>Acanthiza apicalis</i>
Yellow-rumped Thornbill	<i>Acanthiza chrysorrhoa</i>
Red-capped Robin	<i>Petroica goodenovii</i>
Grey Fantail	<i>Rhipidura fuliginosa</i>
Restless Flycatcher	<i>Seisura inquieta</i>
Golden Whistler	<i>Pachycephala pectoralis</i>
Yellow-rumped Pardalote	<i>Pardalotus zanthopygus</i>
Purple-gaped Honeyeater	<i>Meliphaga cratitua</i>
White-naped Honeyeater	<i>Melithreptus lunatus</i>
Tawny-crowned Honeyeater	<i>Gliciphila melanops</i>
Black-faced Wood Swallow	<i>Artamus cinereus</i>
Grey Currawong	<i>Strepera versicolor</i>
Western Magpie	<i>Gymnorhina dorsalis</i>
Australian Raven	<i>Corvus coronoides</i>