A SURVEY OF WETLANDS

IN AND ADJACENT TO DUNN ROCK AND LAKE BRYDE NATURE RESERVES

March 1987

For
Wheatbelt Region
Department of Conservation and Land Management

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A Survey of Wetlands
in and adjacent to the Dunn Rock and Lake Bryde Nature Reserves.

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The Consultancy

Following good rainfall in the Dunn Rock Nature Reserve area in 1986, some of the wetlands flooded for the first time in several years. Water skiing and some site development had taken place illegally on one small wetland on Dunn Rock Nature Reserve. In November 1986, Ken Wallace (Regional Manager) saw that it was opportune to collect further information on these wetlands. Consultants were contracted to survey the following:

(1) three small wetlands on Dunn Rock Nature Reserve (Reserve No. 36445);
(2) Lake Ronnerup (Reserve No. 39422);
(3) Lake Bryde (Reserve No. 288667); and
(4) a wetland on Reserve No. 29020.

On each of these wetlands the consultants were to:-

(a) Describe and map the vegetation within and fringing each wetland.
(b) Collect and identify all submerged aquatic plant species.
(c) Collect water samples for salinity, pH and total phosphorous analysis.
(d) Collect a representative sample of the aquatic invertebrates.
(e) Estimate depth of water.
(f) Describe and assess the values of the habitat for feeding and breeding of waterbirds.

A report was to be prepared including the information described in (a) - (f) above together with summaries of the wildlife conservation values of each wetland.

The contract was to involve five days field work and six days office work.

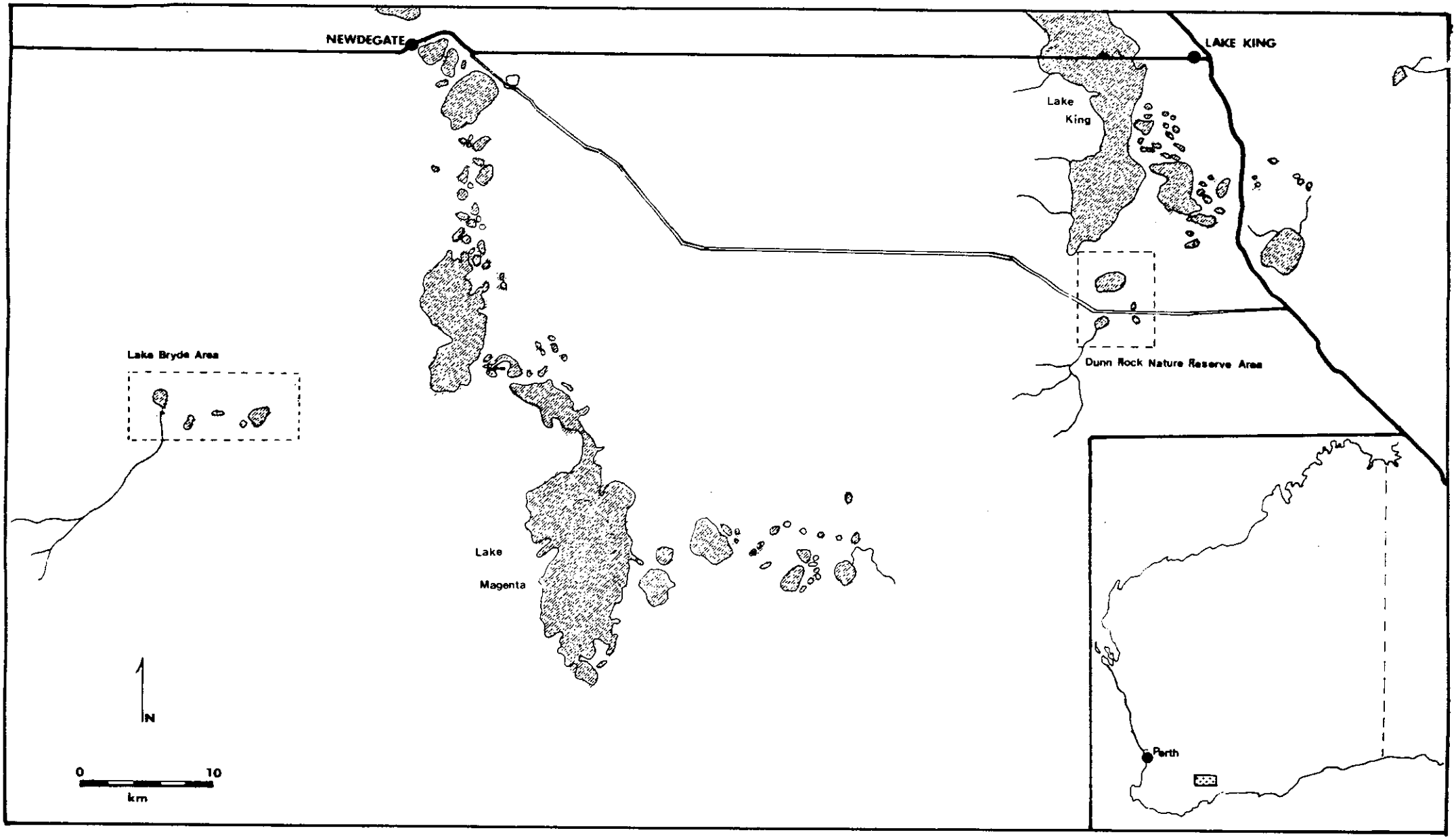


FIGURE 1 LOCATION OF AREA SURVEYED

INTRODUCTION

The wetlands surveyed are located in the south-eastern corner of the Katanning District of the Wheatbelt Region (Figure 1). The wetlands can be divided into two geographical groups:

(a) Dunn Rock Nature Reserve area - "Magdhaba Lake", "Lunette Lake", "Dunn Lake" and Lake Ronnerup;

(b) Lake Bryde area - Lake Bryde and East Lake Bryde.

The wetlands are situated at the "head-waters" of a vast salt lake chain that runs northwest towards Merredin then turns southwest and runs into the Avon River (Mulcahy 1973). In the Kondinin/Lake Grace region the salt lake chain branches into three main forks (Lake Grace, Lake Magenta and Lake King) and a minor fork (Lake Bryde). The Dunn Rock Nature Reserve area wetlands are at the southern end of the Lake King chain.

The salt lakes of the Lake King, Lake Grace and Lake Magenta chains have a low frequency of flooding. In 1986, Dunn Lake flooded for the first time in 10-15 years (Ken Wallace pers. comm.). The distribution of local rainfall, the size of the Lake and its catchment area determine to what extent a wetland is flooded in any year. Low frequency of flooding in this region is caused by low rainfall, little water movement and high evaporation. These factors increase the accumulation of ions from precipitation and therefore the salinity of wetlands (Bayly and Williams 1975).

Water salinity and frequency of flooding are important factors in determining the vegetation of salt lakes. A decrease in aquatic and terrestial plant diversity occurs with an increase in salinity (Bayly and Williams 1975).

Some previous studies have been conducted on the Dunn Rock Nature Reserve and Lake Bryde area wetlands. An outline of information available on the wetlands surveyed is given below.

Wetlands of Dunn Rock Nature Reserve Area

Two previous studies have been conducted on the flora and fauna of Dunn Rock Nature Reserve. The first was a vegetation survey by W.G. Martinick & Associates Pty. Ltd. in early 1984 (Martinick 1984). This report gave special mention to the salt lakes occuring in the north-eastern corner of the Nature Reserve for their diversity of flora and fauna. Included in the report were four vegetation survey sheets describing the vegetation of Lunette Lake. The second study was a survey of the vertebrate fauna of the Dunn Rock Nature Reserve by Andy Chapman in early 1985 (Chapman 1985). Chapman noted a disused Black Swan mound on Dunn Lake, Australian Shelduck and Maned Duck on Dunn Lake after extensive rain and a pair of Hooded Plovers on one of the bare salt lakes.

Lake Bryde

There are four main sources of information on Lake Bryde:

(a) a biological survey of the Shire of Kent, conducted in 1972/73 by the then Department of Fisheries and Fauna (McKenzie 1973),
(b) water level and quality data collected by Wildlife Research,
(c) visitation reports by Department staff, and,
(d) waterbird usage information collected for the South-west Waterbird Project conducted by the Royal Australasian Ornithologists Union under contract to CALM.

Water level and water quality data have been collected every two months, since 1979, by the Waterbird Research Group, Wildlife Research, CALM. Information on the waterbird usage of the lake includes data collected from thirteen different visits during the period 1969 to 1985. A total of 21 species have been recorded with the highest count on any one visit being 431.

Details on water level, water quality and waterbirds of Lake Bryde are given in Appendix 1.

RESULTS OF FIELDWORK

Field work was undertaken between December 18 and 21, 1986, by Doug Watkins and Shapelle McNee. Only one wetland was found to contain water; Dunn Lake on Dunn Rock Nature Reserve. Full information was collected at this wetland, but was restricted to vegetation at the other wetlands. Figure 2 and 3 show the location and names used for the wetlands.

(1) Vegetation

At each wetland the vegetation was assessed using a transect that ran from the centre out to the mallee. The main species of plants were collected and the structure described by means of the Muir classification (Muir 1977). Maps have been produced from ground surveys with further interpretation using aerial photography (Figures 4 - 8). The dominant species in each structure are listed opposite each wetland map.

(2) Water Level and Quality

Water level and quality for the wetlands at the time of the fieldwork are given in Table 1. Samples were collected from Lunette Lake and Lake Ronnerup by digging through the salt crust to the water below.

Table 1 Water Levels and Quality - 21 December 1986

	Dunn Rock	Lunette	Magdhaba	Ronnerup	Bryde	E Bryde
Water depth	1.0	(0.05)*	dry	(0.2)*	dry	dry
Water quality						
pH	9.6	6.48	-	6.48	-	-
Salinity	19.5	314.4	-	288.8	-	-

Figure 2 Location of Magdhaba Lake, Lunette Lake, Dunn Lake and Lake Ronnerup

Source: R.F. 1.50 000 Magdhaba (2831-III) and Lake King (2831-VI)

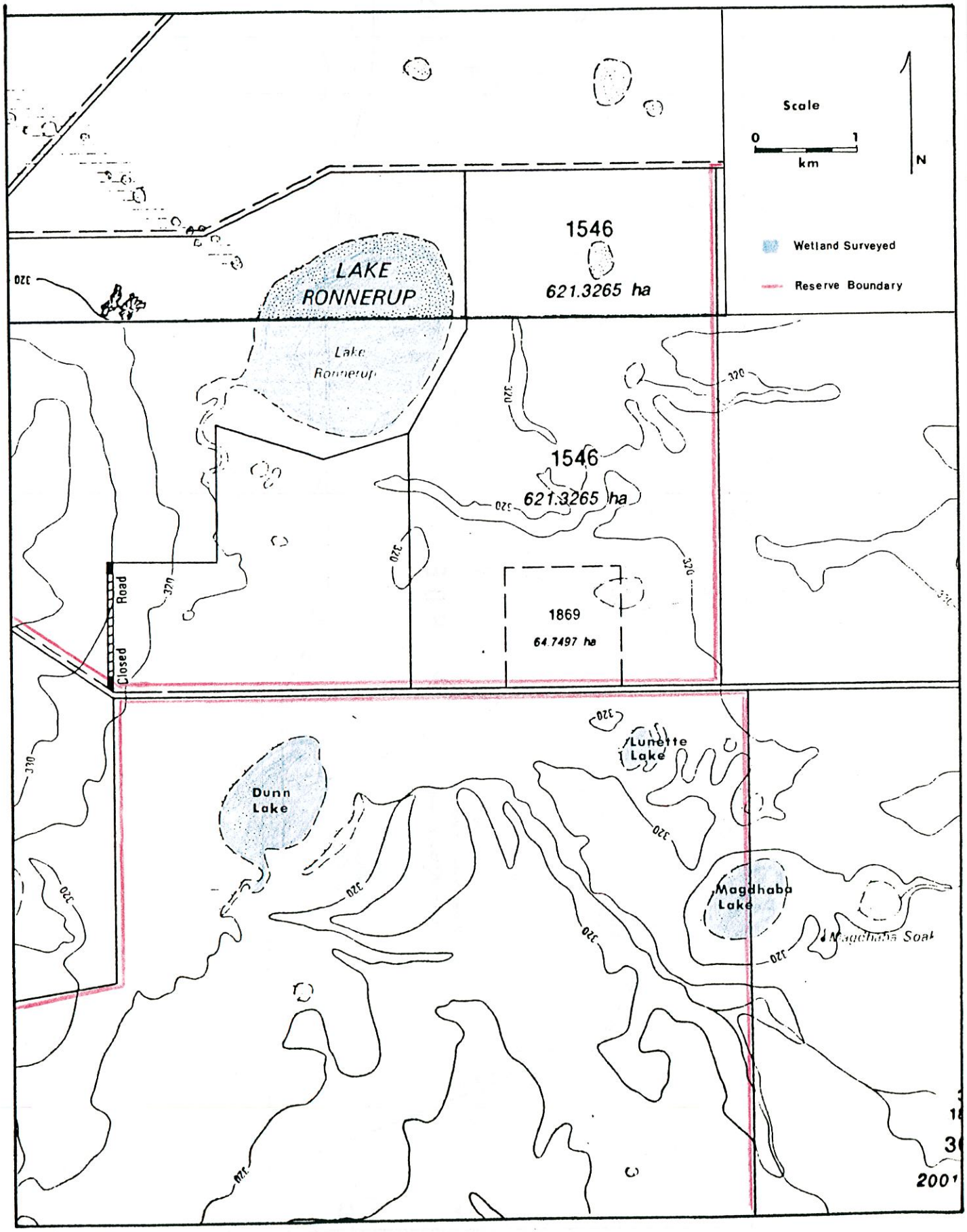


Figure 3 Location of Lake Bryde and East Lake Bryde

Source: R.F. 1.50 000 Lake Bryde (2631-II)

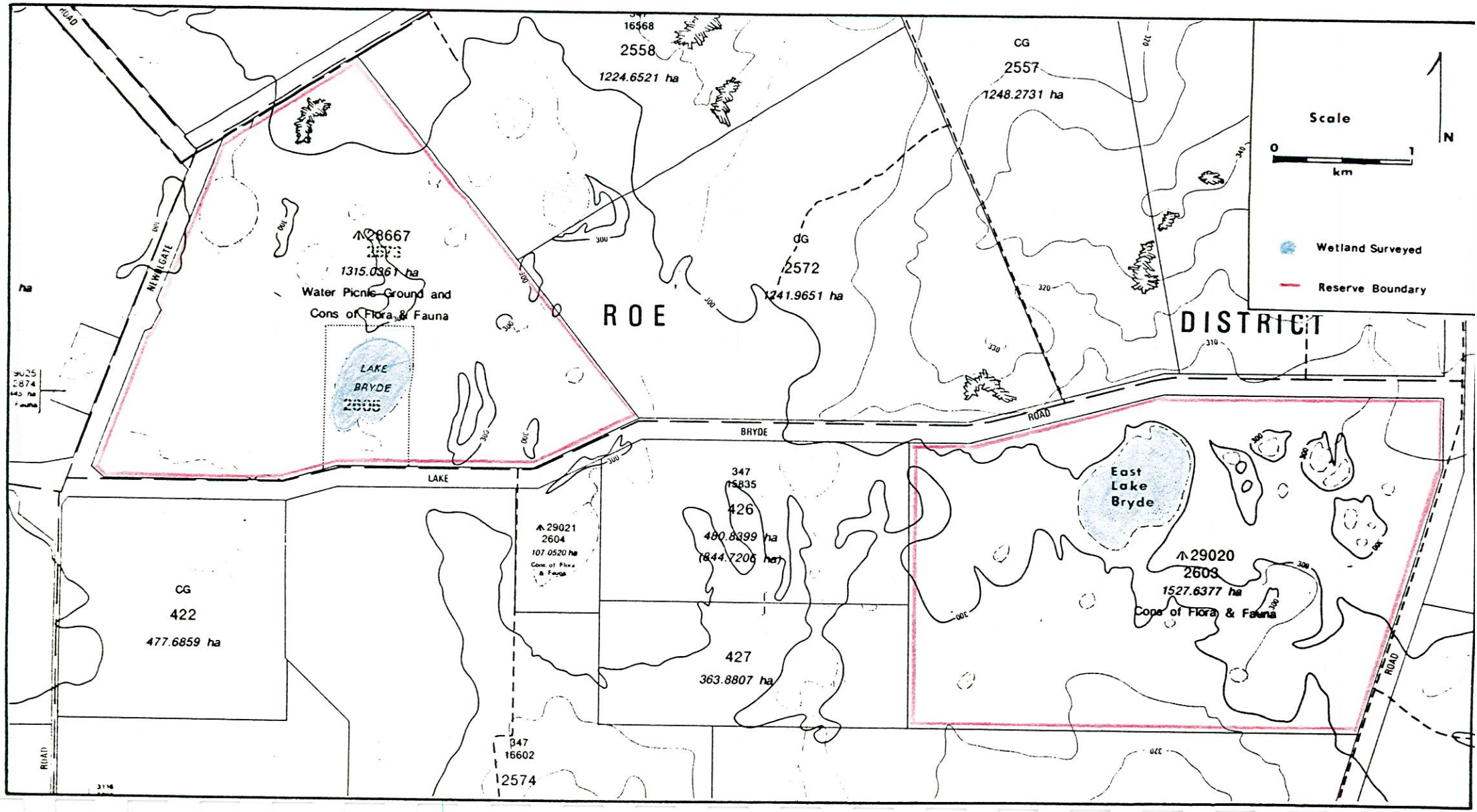


Photo 1 View north across Magdhaba Lake, Dunn Rock Nature Reserve, Dec. 1986

Photo 2 View south across Lunette Lake, Dunn Rock Nature Reserve, Dec. 1986

Photo 3 View east across Dunn Lake, Dunn Rock Nature Reserve, Dec 1986

Photo 4 View of north-east corner of Lake Ronnerup, Dec. 1986

Photo 5 View south-east across Lake Bryde, Dec. 1986

Photo 6 View north-east across East Lake Bryde, Dec. 1986

DUNN ROCK NATURE RESERVE

Magdhaba Lake

Ji	Atriplex vesicaria Halosarcia halocnemoides Sclerostegia moniliformis Sarcocornia quinqueflora
MiJi	Eucalyptus kondininensis Disphyma crassifolium Sclerostegia moniliformis Sarcocornia quinqueflora Frankenia aff. pauciflora
MiSiSDcJi	Eucalyptus kondininensis Melaleuca thyoides Exocarpos aphyllus Atriplex vesicaria Atriplex cf. nana Disphyma crassifolium

Lunette Lake

SrJr	Melaleuca halmaturorum Angianthus tomenentosus Lawrencia squamata Maireana oppositifolia
SrGTiJr	Poa sp. Atriplex vesicaria Halosarcia syncarpa
Ji	Halosarcia halocnemoides Halosarcia syncarpa

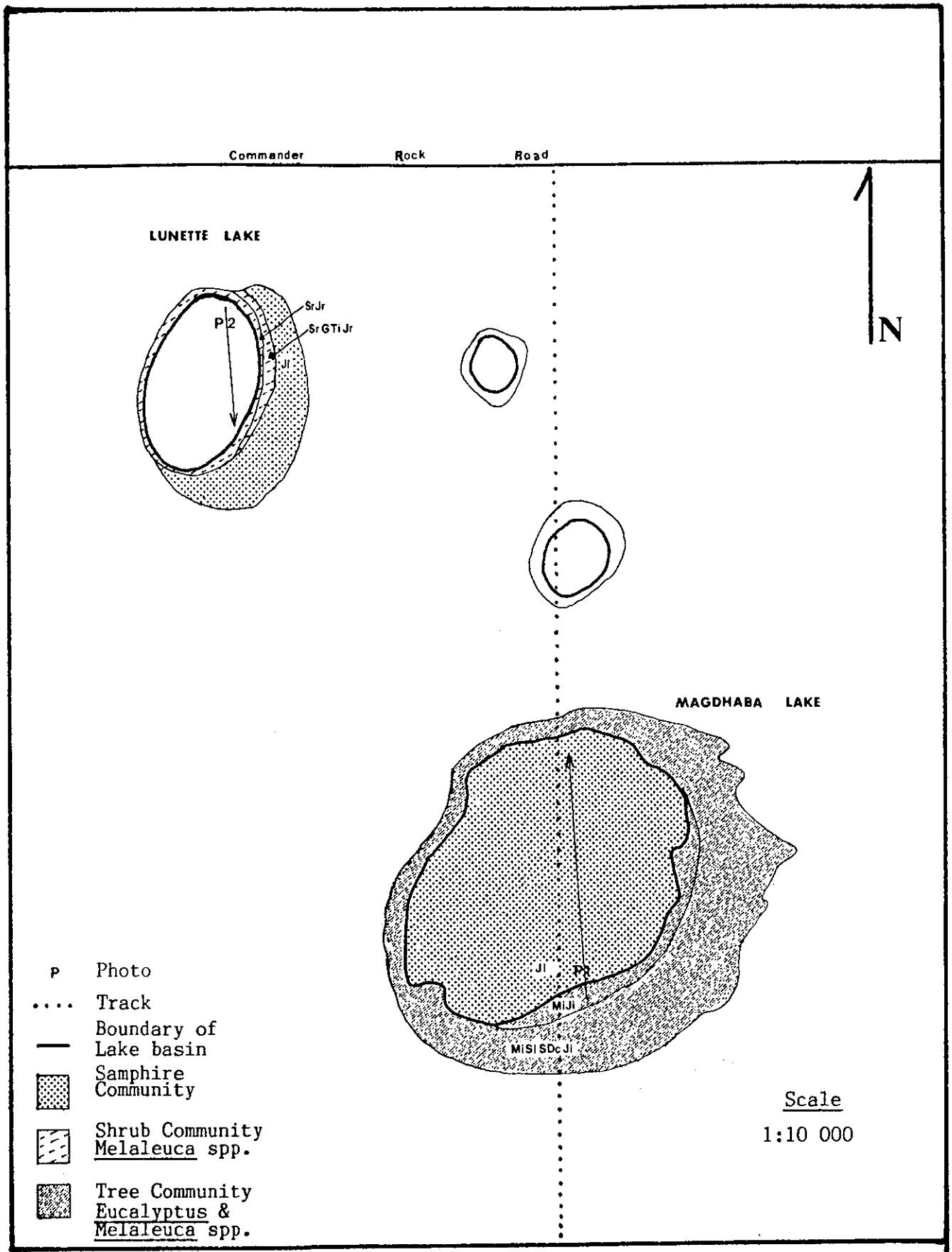
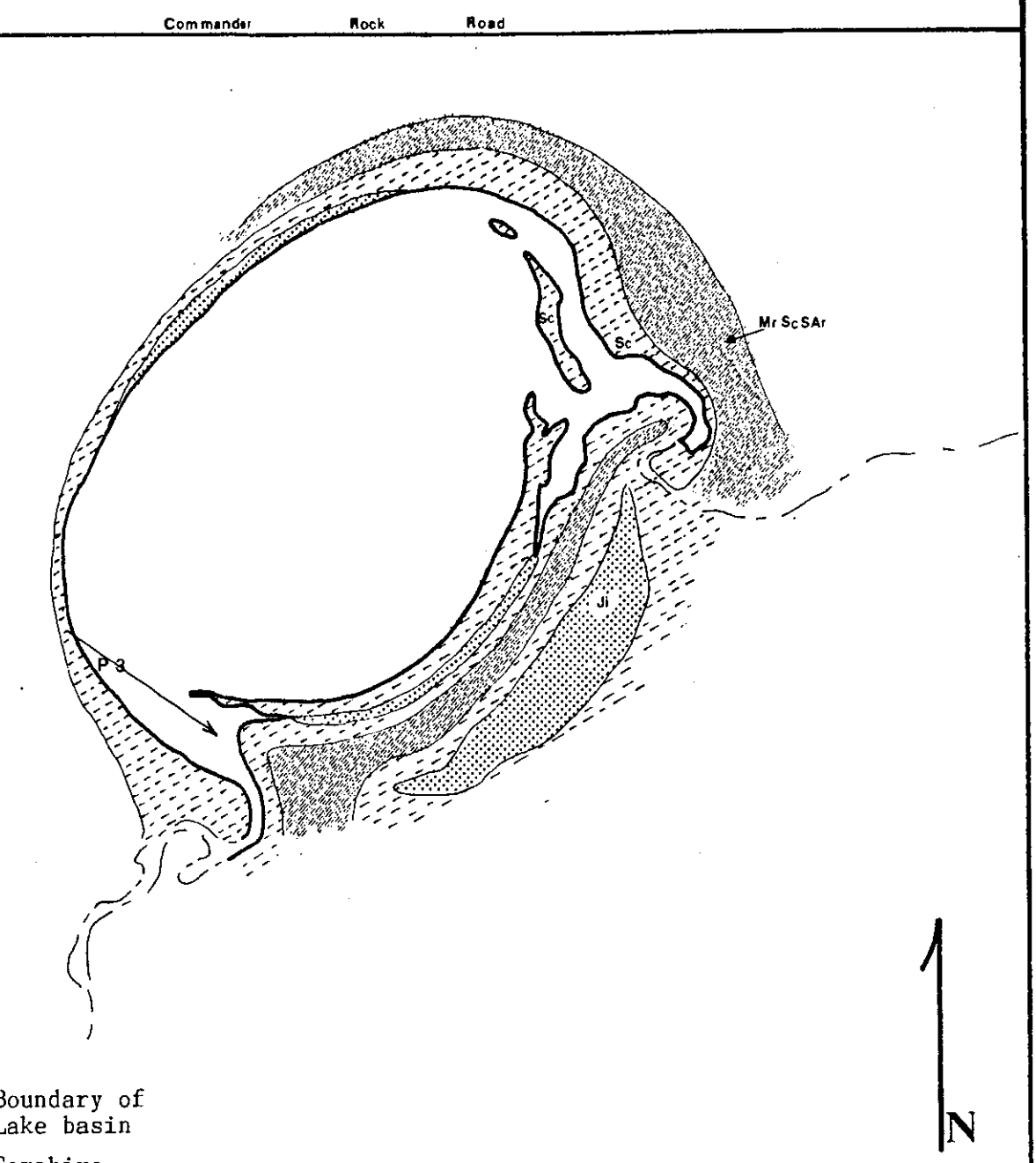


FIGURE 4 Vegetation of Magdhaba Lake and Lunette Lake, Dunn Rock Nature Reserve.

Dunn Rock Nature Reserve

Dunn Lake

Ji	Haloscarcia pergranulata
	Haloscarcia syncarpa
	Lawrencia squamata
	Frankenia aff. pauciflora
	Dishyma crasifolium
Sc	Melaleuca halmaturorum
MrScSAr	Eucalyptus occidentalis
MrSiSAiGTi	Exocarpos aphyllus
	Melaleuca sp.3G
	Melaleuca uncinata
	Melaleuca halmaturorum
	Melaleuca thyoides
	Melaleuca viminea
	Schoenus brevifolius



Boundary of Lake basin

Samphire Community

Shrub Community Melaleuca spp.

Tree Community Eucalyptus & Melaleuca spp.

Seasonal water course

P3 Photo 3

Scale

1:10 000

FIGURE 5 Vegetation of Dunn Lake -Dunn Rock Nature Reserve.

Lake Ronnerup

Jc	Atriplex vesicaria
	Lawrencia squamata
	Halosarcia sp.
	Frankenia aff. pauciflora
	Disphyma crassifolium
SDrGTcJr	Poa sp.
	Schoenus brevifolius
	Cyperaceae
	Maireana oppositifolia
	Halosarcia pergranulata
MrSrSDrGTc	Eucalyptus kondininensis
	Santalum acuminatum
	Acacia saligna
	Atriplex vesicaria
	Allocasuarina corniculata
SBrSDrJc	Maireana erioclada
	Exocarpos aphyllus
	Frankenia aff. pauciflora
	Disphyma crassifolius
MiSDrJr	Eucalyptus occidentalis
	Hakea aff. preissii
	Melaleuca uncinata
	Melaleuca sp.3G
	Scaevola spinescens
	Pittosporum phylliraeoides

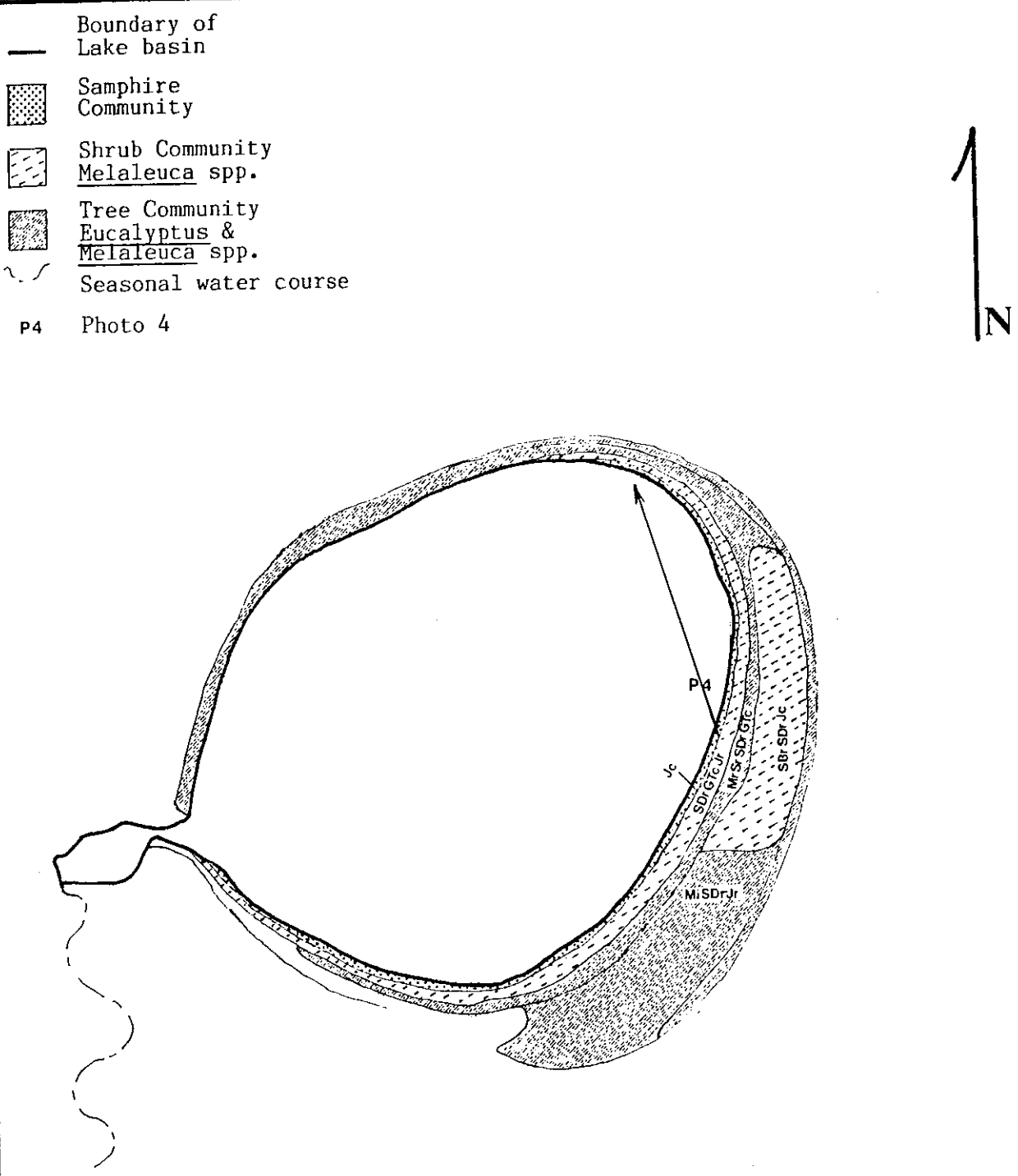


FIGURE 6 Vegetation of Lake Ronnerup

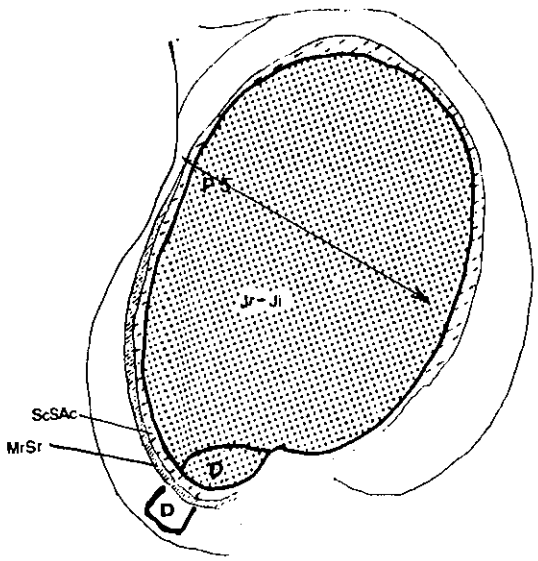
Lake Bryde

Ji	Muehlenbeckia declina
Jr	Tecticornia verrucosa Wilsonia humilis Halosarcia lepidosperma Dishyma crassifolium
ScSAc	Melaleuca lateriflora Melaleuca sp.3G Melaleuca halmaturorum
MrSr	Eucalyptus occidentalis Melaleuca lateriflora
Growing on the Dam:	Maireana brevifolia Spergularia rubra Chenopodium glaucum Muehlenbeckia declina

Lake Bryde East

Ji	Disphyma crassifolim Muehlenbeckia declina Halosarcia aff. pergranulata
SiJr	Disphyma crassifolium Lawrencia squamata Melaleuca halmaturorum Melaleuca sp.3G Melaleuca lateriflora
MrSc	Eucalyptus occidentalis Melaleuca lateriflora

FIGURE 7 Vegetation of Lake Bryde

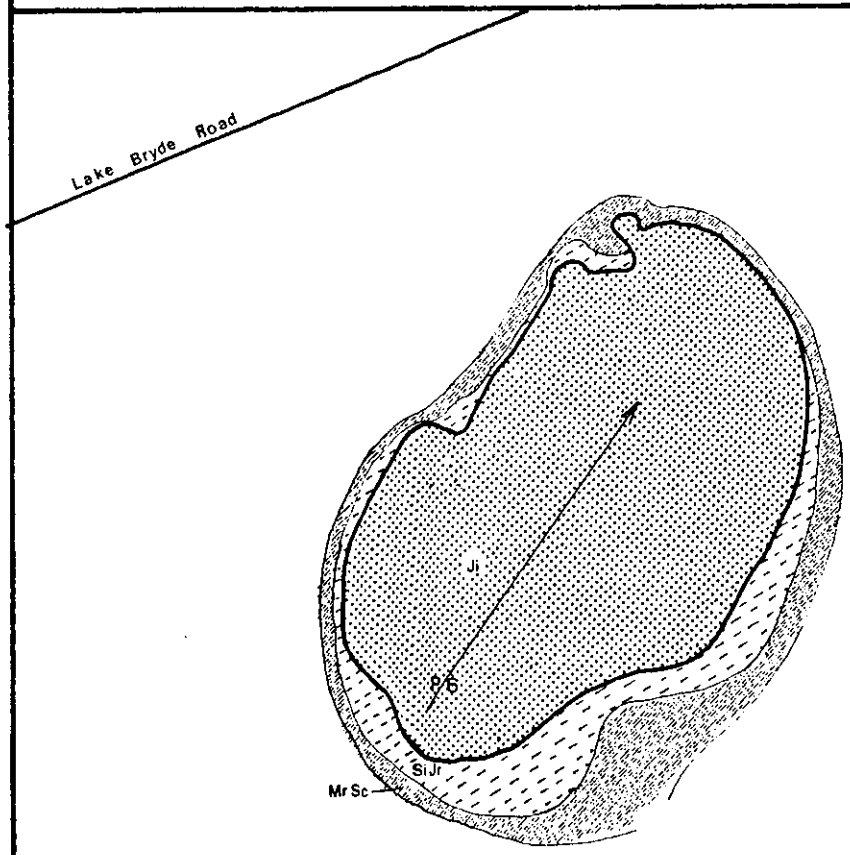


N

P5 Photo 5
Boundary of Lake basin
Samphire Community
Shrub Community Melaleuca spp.
Tree Community Eucalyptus & Melaleuca spp.
D Dam

Lake Bryde Road

Scale
1:16 666



N

P6 Photo 6
Boundary of Lake basin
Samphire Community
Shrub Community Melaleuca spp.
Tree Community Eucalyptus & Melaleuca spp.

Scale
1:16 666

FIGURE 8 Vegetation of East Lake Bryde

(3) Aquatic Vegetation, Aquatic Invertebrates and Waterbirds

(a) Aquatic Vegetation

Two species of aquatic plants were collected at Dunn Lake; Chara sp. and Ruppia tuberosa. Both species were distributed across the lake floor.

(b) Aquatic Invertebrates

Aquatic invertebrates were collected at Dunn Lake using a plankton net and a scoop net. Samples were sorted and identified by Dr Stuart Halse of the Wildlife Research Centre, CALM. Fifteen species were identified (Table 2).

Table 2 Aquatic Invertebrates collected in the Dunn Lake, (19 December 1986)

Species	Abundance in Samples
Crustacea	
Ostracoda	
Australocypris hypersalina	dominant
Mytilocypris henricae	very common
Platycypris baueri	moderately common
Cyprinotus edwardi	moderately common
Copepoda	
Calamoecia clitellata	moderately common
Microcyclops sp.	moderately common
Amphipoda	
Austrochiltonia subtenuis	moderately common
Insecta	
Odonata	
(Zygoptera)	
Austrolestes annulosus	common
Hemiptera	
(Corixidae)	
Agraptocorixa hirtifrons	uncommon
(Notonectidae)	
Anisops occipitalis	common
Anisops thienemann	moderately common
Diptera	
(Chironomidae)	
Chironomus (Chironomus) australis	rare
Chironomus (Cryptochironomus) curtivalva	moderately common
Procladius villosimanus	moderately common
(Stratiomyidae)	
1 sp	uncommon

(c) Waterbirds

Counts of the waterbirds on the Dunn Lake were conducted on December 18 and 19, from a boat. The figures given in Table 3 are the highest count recorded for each species. Survey sheets have been submitted to the RAOU for addition to the South West Waterbird Project database.

Table 3 Waterbird Counts on Dunn Lake

Species / Date	18,19/12/86
Hoary-headed Grebe	6
White-faced Heron	1
Australian Shelduck	32
Pacific Black Duck	4
Grey Teal	44
Pink-eared Duck	7
Maned Duck	5
Musk Duck	1
Eurasian Coot	21
Hooded Plover	2
Red-capped Plover	16
Banded Stilt	1
Totals	140

Two hours were spent looking for nests in the vegetation fringing the wetland. Three old Eurasian Coot nests (this season) and an old Black Swan mound (not used this season) were found on the east edge in flooded Melaleuca halmaturorum.

Immature ducks (ie. juvenile plumage, flightless) of the following species were recorded:

Australian Shelducks - clutches of 1, 2 and 5
Pink-eared Duck - a clutch 2
Grey Teal - 10+

DISCUSSION

It was unfortunate that at the time of the fieldwork only one of the six wetlands was flooded. As a result only a limited assessment can be made of the conservation value of the wetlands. Before discussing the conservation values of the wetlands it is useful to review the information and features of each wetland.

(1) Summary of features and information on each Wetland

(a) Magdhaba Lake

The wetland covers approximatly 25 ha. Half of the wetland is in the Nature Reserve while the other half is privately owned. A track and cleared fenceline cross the middle of the wetland. There does not appear to be any direct drainage into the lake. Vegetation on the lake basin includes two Atriplex spp. and three samphire species. The edge vegetation includes Eucalyptus kondininensis over samphire, saltbush and larger shrubs. The structure of the vegetation in and adjacent to the wetland and lack of salt build-up suggests that the frequency of flooding is lower than that of the other wetlands looked at in the area. No information is available on fauna usage.

(b) Lunette Lake

The wetland covers approximately 7 ha. There does not appear to be drainage into the lake. A large lunette has formed to the east of the centre of the lake. There is no vegetation growing on the lake basin due to having a thick salt crust. Water, 5 mm below the surface in December 1986, was found to have a salinity of 314 ppt. A few Melaleuca halmaturorum plants have established on the lunette together with three halophyte species. Beyond the lunette is a large area of samphire. There are no melaleucas on the edge of the wetland to be flooded when the lake is full. No information is available on fauna usage.

(c) Dunn Lake

The wetland covers approximately 58 ha. The wetland has surface drainage entering from the southwest and east. To the southwest the catchment area is approximately 12 000 ha, most of which is contained on Dunn Rock Nature Reserve and Reserve 36446. The remainder is on farmland. The catchment area to the east is approximately 2 000 ha and is mostly on farmland.

In mid-December 1986, the lake had water to a depth of 1m. It was estimated that earlier in the year the lake had reached a depth of at least 2 m based on the waterline around the edge of the lake. The water had a salinity of 19 ppt and supported the vigorous growth of two aquatic plant species and a high diversity and abundance of aquatic invertebrates. There were 140 waterbirds of 12 species on the lake in mid-December 1986. Eurasian Coot and Black Swan were found to have been using the flooded Melaleuca halmaturorum for nesting. Immature Australian Shelduck, Pink-eared Duck and Grey Teal were also present.

Flooded samphire plants indicate that vegetation existed on the lake basin prior to flooding. An area of samphire on the east side was not flooded in December 1986. Edge vegetation is dominated by melaleucas. Melaleuca halmaturorum occurred furtherest into the lake basin. Eucalyptus occidentalis was dominant on the margin of the lake.

The road into the lake has recently been upgraded. A small area on the western edge of the lake has been cleared and gravelled. This development appears to have been for people to water-ski on the lake.

(d) Lake Ronnerup

Lake Ronnerup is a wetland of approximately 145 ha. It is the southern-most lake in the recently proclaimed Nature Reserve No. 39422. This Nature Reserve stretches north from Dunn Rock Nature Reserve to encompass Lake King. The reserve has an area of 40 105 ha. Surface drainage enters the lake from the southwest corner.

The lake basin has a thick salt crust on its surface. Water sampled 20 cm below the ground in December 1986 had a salinity of 288 ppt. Small lunettes on the east side are vegetated with Eucalyptus kondininensis, Santalum acuminatum, Allocasuarina corniculata and Acacia saligna. Beyond this is either a woodland of Eucalyptus occidentalis or samphire. A limited area of melaleucas would be flooded when the lake is full. No data is available on fauna usage.

(e) Lake Bryde

The lake covers approximately 50 ha. It is situated on a 1 315 ha reserve that is vested in the Water Authority for the purposes of Water, Picnic Ground and Conservation of Flora and Fauna. The catchment for the lake is from farmland to the south. During the years 1979-86 the wetland had a salinity range of 0.1 - 6.3 ppt. which is unusually low for this region. Information collected when the lake was flooded show that it is used by at least 21 species, with up to 431 waterbirds counted on one visit. Six species of waterbirds have been recorded as breeding on the lake; White-faced Heron, Pacific Black Duck, Grey Teal, Pink-eared Duck, Musk Duck and Australian Shelduck (Jaensch in prep.).

Tecticornia verrucosa, Muehlenbeckia declina, Halosarcia lepidosperma dominate the lake basin. The edge vegetation of Melaleuca halmaturorum and Melaleuca sp.3G is restricted to a narrow band by the steep grade of the basin.

The lake is of botanical interest due to the presence of Tecticornia verrucosa. This is the only known location for this species in southwestern Australia (Wilson 1972). The species is more commonly known from mudflats and freshwater claypans in tropical and sub-tropical North-West and Central Australia.

Two dams exist on the south end of the lake. The main dam (northern) was empty in December 1986 and had some vegetation cover including species not found elsewhere on the lake; Spergularia rubra, Maireana brevifolia and Chenopodium

glaucum. The main dam of 37 000 cubic metres was constructed in 1970 by the Public Works Department to act as a supply of water in drought years. The procedure is to fill the dam to a depth of 3 m with water from the lake. There will be a longer retention of water in the dam because of the depth of water. The Water Authority is presently re-evaluating the future of drought supply dams.

In 1978, the Shire of Kent proposed building a boat launching ramp and toilets. In response to this the Public Works Department prohibited boating on the lake because of the effect it might have on water quality. Whilst no facilities have been developed for recreation, there exists numerous tracks, rubbish and picnic sites.

(f) East Lake Bryde

This wetland has an area of 95 ha. Surface drainage enters the lake from the south. The vegetation is similar to Lake Bryde. Muehlenbeckia declina is dominant on the lake basin. Melaleuca halmaturorum and Melaleuca sp.3G occur in a wide band around the edge of the lake. No information is available on fauna usage.

(2) Management Concerns

Three main factors pose threats to the conservation values of the wetlands. These are increasing salinity, recreation and drought water supply.

Increasing salinity will have marked effects on wetlands which at present have low salinities; ie. Dunn Lake, Lake Bryde and East Lake Bryde. There is evidence that salinities are increasing at Lake Bryde (Appendix 1). Other examples of increasing salinity are Lake Toolibin and Lake Towerrinning (Froend 1987). As most of the Dunn Lake catchment will remain uncleared only a limited increase in salinity should occur.

Active recreation is causing disturbance to vegetation and fauna on Dunn Lake and Lake Bryde. While it is possible to prohibit this at Dunn Lake, recreation (Picnic Grounds) is part of the purpose in the case of Lake Bryde and the area is vested in the Water Authority. Some consideration is needed, on a Shire or regional basis, as to which wetlands are available for recreation.

Drought water supply could be adversely affecting fauna usage of Lake Bryde by decreasing the period in which the Lake is flooded. There could be increasing pressure to further develop water storage at the lake at the expense of conservation values.

(3) Conservation Values

The main criteria used in assessing the conservation value of an area are; diversity, rarity, naturalness, area, the threat of human interference and

representativeness (Margules and Usher 1981). Assessment using these criteria requires extensive information on not only the wetlands being assessed, but also the other wetland resources in the area to enable determination of relative value. In the case of these wetlands the assessment of the conservation values is very limited in that information is only available for two of the wetlands when they are flooded.

The following information is available on the resources of the wetlands;

water quality	Dunn Lake, Lake Bryde
water level	Dunn Lake, Lake Bryde
waterbird usage,	Dunn Lake, Lake Bryde
invertebrate fauna	Dunn Lake
vegetation structure	all six wetlands
floristics	all six wetlands

Dunn Lake and Lake Bryde stand out as quite different from the other wetlands. The most significant feature of these wetlands is that they have lower salinities, and in the case of Lake Bryde flood more frequently. Waterbird usage information shows that when flooded these wetlands are used by over 12 species with population levels between 100 and 500. Several species of waterbirds breed in the flooded melaleucas on the margin of the wetlands.

It would be expected that East Lake Bryde would have a similar salinity and waterbird usage to Lake Bryde based on the floristics of the lake basin.

Low salinity wetlands are unusual in this area and this makes Lake Bryde, East Lake Bryde and Dunn Lake of regional importance for conservation.

There is insufficient information on Magdhaba Lake, Lunette Lake and Lake Ronnerup to assess their conservation value. Each wetland is quite different. Magdhada Lake appears to have a lower frequency of flooding and lower salinity than Lunette Lake and Lake Ronnerup. Lunette Lake is interesting in that a lunette has formed across the middle of the lake. This has resulted in a bare salt basin on the west side of the lake and an area of samphire on the east. Melaleucas are colonising the lunette. Lake Ronnerup is characterised by its large size. It has extensive low lunettes on the east side with complex vegetation associations.

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APPENDIX 1

Information on Lake Bryde

(a) Water Level

Table 1.1 Lake Bryde - Water Depth

Month/Year	79	80	81	82	83	84	85	86
Jan.	0	0	0	0	0	1.32	0.50	0
March	0	0	0	0.08	0	1.03	0.25	0
May	0	0	0	0	0	0.95	0.08	0
July	<0.1	<0.2	0.18	0.05	1.0	0.95	0	0
Sept.	0	0	0.08	0.08	1.73	0.98	0	0
Nov.	0	0	0	0	1.54	0.81	0	0

Note: Depth in metres

Additional information on the water level of Lake Bryde can be gleaned from the Lake Bryde Nature Reserve file and this is shown in Table 1.2.

Table 1.2 Lake Bryde Water Depth and Quality - Additional Information

Date	Comments
1968	report of ducks and two Swan being shot
1969	"maximum depth 2-3 ft", local farmer
72/73	waterbirds reported, McKenzie 1973
23/12/75	water levels "good"
11/11/77	"covered - muddy water"
late 11/77	photos show lake very full, possibly 1.5 - 2.0 m.
14/12/77	Reaction faintly alkaline Appearance very cloudy with heavy deposit Colour pale yellow Odor musty T.D.S.(evap) = 1290 mg/1 NaCl (cal. from chloride) = 317 mg/1
3/78	40 Pacific Black Duck
10/78	"fills usually to 1m until Christmas". T.D.S. = 1145 ppm
26/10/78	aerial photo shows lake covered with water "half full"

Rainfall and Flooding of Lake Bryde

Water level and rainfall information can be use to establish under what conditions the lake floods. Sets of data are available on the water depth of the lake and annual rainfall for 11 years (Table 1.3). The rainfall data is from Pingrup, 35 km south-west of Lake Bryde. In examining the relationship between annual rainfall and water depth the data can be divided into three sets;

(a) years in which the lake flooded, (F);
(b) years with water following flooding, (FF) and;
(c) years with negligable water (ie. for less then 4 months), (dry).

Table 1.3 Relationship between Annual Rainfall and Flooding of Lake Bryde

Year	Stage of Flooding	Rainfall	Flood in years when Rainfall >348mm
67	?	317	
68	F	533	Y
69	FF	202	
74	?	473	
75	F or FF	348	Y
76	prob.FF	354	
77	FF	-280	
78	FF	284	
79	dry	239	
80	dry	333	
81	dry	267	
82	dry	350	N
83	F	469	Y
84	FF	316	
85	dry	284	

The data shows that the Lake flooded in three years when the annual rainfall was over 348 mm (1968, 75 and 83). However, in 1982 it did not flood in a year with 350 mm.

As a general guide it can be expected that the Lake will flood in years when the annual rainfall exceeds 350 mm at Pingrup.

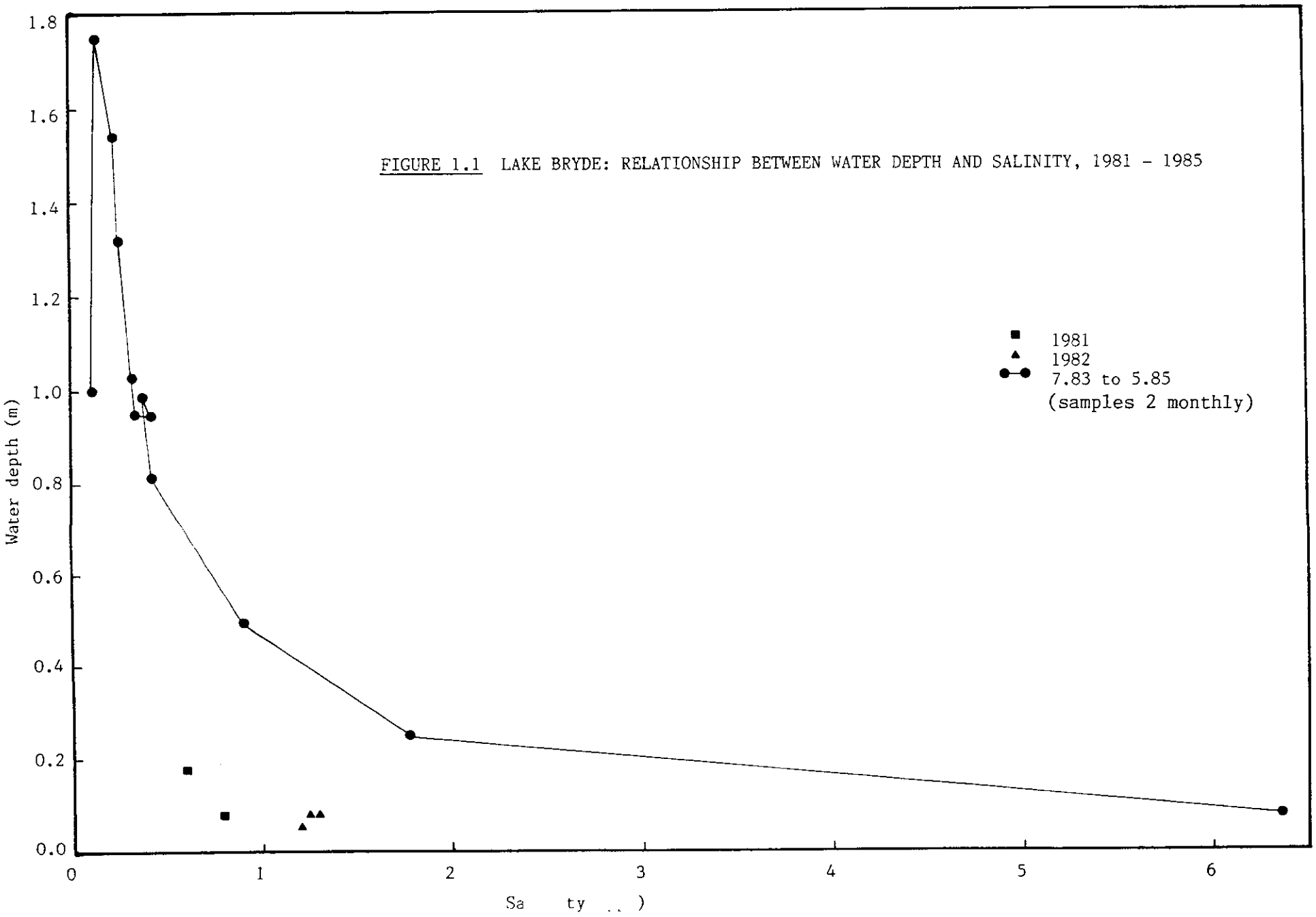

FIGURE 1.1 LAKE BRYDE: RELATIONSHIP BETWEEN WATER DEPTH AND SALINITY, 1981 - 1985

(b) Salinity

Data collected since 1979 shows the salinity levels of Lake Bryde ranging from 0.1 ppt to 6.3 ppt. Salinity levels have tended to be around 1 ppt at water depths of less then 0.2 m.

Table 1.4 Lake Bryde - Salinity

Month/Year	79	80	81	82	83	84	85	86
Jan.						0.26	0.825	
March				1.25		0.322	1.76	
May						0.412	6.30	
July	1.6	1.25	0.6	1.2	0.11	0.355		
Sept.			1.3	0.8	0.154	0.373		
Nov.					0.244	0.438		

Note: Salinity units ppt.

The increase in salinity as the lake dried out after the 1983 flooding is of concern (Figure 1.1). The level of 6.3 ppt in May 1986 is over 5 times higher than in 1981 and 1982. Further evidence for the increasing salinity of the lake can be seen by comparing the salinity levels as the lake filled and dried out in 1983/84;

Date	Depth (m)	Salinity (ppt)
July 1983	1.0	0.11
March 1984	1.03	0.322

(c) Waterbirds

Data on waterbirds using Lake Bryde have been collected during 13 visits over the years 1968-86 (Table 1.5). A total of 21 species have been recorded with a highest count on any one visit of 431.

Table 1.5 Waterbird usage of Lake Bryde

Species / Date	12/69	72/73	3/78	10/84	10/84	7/85	SWWP
Great-crested Grebe		+					4
Australasian Grebe				+			
Australian Pelican		+					
Pacific Heron							2
White-faced Heron	2	+					20
Black Swan	1	+					5
Australian Shelduck	8	+				+	70
Pacific Black Duck	20	+	40	+	2		8
Grey Teal	400	+		+	3		90
Pink-eared Duck					4		8
Hardhead		+					
Maned Duck		+			8		30
Musk Duck							1
Eurasian Coot		+					
Black-tailed Native-hen							3
Red-kneed Dotteral							2
Black-fronted Plover		+					
Black-winged Stilt							2
Red-necked Avocet							3
Greenshank							1
Sharp-tailed Sandpiper							2
Total	431	-	40	-	17	-	NA

Note: SWWP = South West Waterbird Project database, 1981-85.

Other notes on waterbird usage;

1968 - one pair of Swans, "only ones on lake"
23/12/1975 - "no birdlife what-so-ever"
11/11/1975 - "no waterbirds" (aerial survey)
26/10/1978 - "no waterbirds" (aerial survey)
1978 - "little use by waterbirds"

Photo 1.1 View west across Lake Bryde in flood, 26 Oct. 1978

Photo 1.2 View south-east across Lake Bryde in flood, 26 Oct. 1978

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

Please address all enquiries to:

WESTERN AUSTRALIAN WILDLIFE
RESEARCH CENTRE
OCEAN REEF ROAD
WOODVALE
Phone (09) 405 1555

Your Ref:
Our Ref:
Enquiries:

Mr Ken Wallace
CALM
56 Clive Street
Katanning W.A. 6317

Postal Address
PO Box 51
WANNEROO W.A. 6065
Facsimile (09) 306 1641
Telex AA94616

Dear Ken

I have just finished identifying the animals collected by Doug Watkins at Dunn Rock Nature Reserve on 19th December, 1986. There were 15 species present:

Crustacea

Ostracoda

1. Australocypris hypersalina - dominant animal in samples. This species is very difficult to separate from A. insularis; I have sent specimens to Patrick De Deckker for confirmation but perhaps the species is best treated as A. hypersalina/insularis.

2. Mytilocypris henricae - very common.

3. Platycypris baueri - moderately common.

4. Cyprinotus edwardi - moderately common.

Copepoda

5. Calamoecia clitellata - moderately common.

6. Microcyclops sp - moderately common. Several species of Microcyclops occur in saline lakes but published descriptions of species are pretty much inaccessible so at this stage I have not attempted to identify beyond genus.

Amphipoda

7. Austrochiltonia subtenuis - moderately common.

Insecta
Odonata (Zygoptera)

8. Austrolestes annulosus - common.

Hemiptera
(Corixidae)

cont'd....

9. Agraptocorixa hirtifrons - uncommon.

(Notonectidae)
10. Anisops occipitalis - common.

11. Anisops thienemanni - moderately common.

Diptera
(Chironomidae)
12. Chironomus (Chironomus) australis - rare.

13. Chironomus (Cryptochironomus) curtivalva - moderately common.

14. Procladius villosimanus - moderately common.

(Stratiomyidae)
15. 1 sp - uncommon. As far as I am aware no-one in Australia works on this group and there are no keys available, so I cannot take the identification further.

As far as the biological/conservation value of the lake is concerned, there really is not much information for comparison with other lakes. Bearing that in mind, I would make three tentative statements:

1. The species collected are probably all reasonably widespread and can tolerate at least moderate salinity (though at 19 ppt TDS the lake would be near the upper limit for several, some others can withstand >100 ppt). In other words the value of the lake does not lie in the particular species present.

2. The lake has a very high number of species, considering its salinity. Lakes with a salinity of >10 ppt with this diversity are unusual and I feel this is where the biological value of the lake lies.

3. The main reason the lake has a comparatively high number of species is that it supports a lot of insects. I am unable to offer any explanation for this.

Yours sincerely

Stuart Halse.

STUART HALSE

January 20, 1987

c. Mr Doug Watkins

BUREAU OF METEOROLOGY — REPORT OF MONTHLY AND YEARLY RAINFALL BY M.I.S.S. — 1/ 4/86 — PAGE 4742

"+" = RAINFALL BETWEEN 0.1 & 0.4 MM — "-" = MISSING OBSERVATION — ROUNDED TOTALS

STATION : 010627 PINGRUP (PINGRUP POST OFFICE) — 33 32 S, 118 30 E — 350.0 M ELEV

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC		
1926	RAINFALL (MM)	0	11	86	34	35	38	86	27	51	30	19	0	417	
1926	NO OF RAINDAYS	0	3	6	11	8	11	15	12	8	8	4	0		84
1927	RAINFALL (MM)	0	0	44	14	21	62	30	54	67	68	5	1	366	
1927	NO OF RAINDAYS	0	0	12	2	8	13	11	8	13	8	2	1		78
1928	RAINFALL (MM)	27	0	2	38	57	30	95	47	35	15	2	10	358	
1928	NO OF RAINDAYS	6	0	4	4	6	7	15	13	9	9	2	5		80
1929	RAINFALL (MM)	7	6	12	2	59	77	32	32	22	18	92	5	364	
1929	NO OF RAINDAYS	2	2	1	2	12	16	14	11	6	6	8	3		83
1930	RAINFALL (MM)	0	3	76	26	47	93	79	21	33	9	2	14	403	
1930	NO OF RAINDAYS	0	1	6	6	6	16	-	6	-	3	1	2		-
1931	RAINFALL (MM)	0	1	17	26	41	29	55	87	79	8	12	5	358	
1931	NO OF RAINDAYS	0	1	4	6	7	7	17	12	12	5	4	3		78
1932	RAINFALL (MM)	53	8	17	25	77	28	88	84	43	97	2	11	535	
1932	NO OF RAINDAYS	5	5	5	7	11	13	15	-	7	-	2	2		-
1933	RAINFALL (MM)	13	0	35	5	52	61	26	52	27	56	3	22	352	
1933	NO OF RAINDAYS	4	0	6	2	12	15	8	13	6	14	3	3		86
1934	RAINFALL (MM)	5	8	125	32	30	67	61	50	32	29	19	8	444	
1934	NO OF RAINDAYS	3	2	7	7	5	14	17	-	11	7	4	4		-
1935	RAINFALL (MM)	12	5	4	34	28	44	85	59	39	62	1	11	384	
1935	NO OF RAINDAYS	5	4	1	5	8	11	-	12	10	9	2	5		-
1936	RAINFALL (MM)	68	2	5	20	53	73	27	36	14	2	15	21	336	
1936	NO OF RAINDAYS	6	2	1	4	10	14	12	14	6	2	4	4		79
1937	RAINFALL (MM)	2	0	89	12	102	65	16	62	18	9	65	0	416	
1937	NO OF RAINDAYS	1	0	7	3	13	7	6	10	5	5	8	0		65
1938	RAINFALL (MM)	39	0	51	11	34	35	47	39	29	21	5	12	323	
1938	NO OF RAINDAYS	5	0	5	7	8	-	-	-	9	8	2	1		-
1939	RAINFALL (MM)	73	63	3	11	91	42	106	59	9	70	57	2	586	
1939	NO OF RAINDAYS	7	4	2	2	13	14	16	-	3	14	9	2		-
1940	RAINFALL (MM)	7	0	0	7	23	38	45	23	38	17	17	48	259	
1940	NO OF RAINDAYS	3	0	0	3	10	10	9	7	-	6	5	5		-
1941	RAINFALL (MM)	5	1	18	22	18	44	40	45	27	35	10	17	284	
1941	NO OF RAINDAYS	2	1	5	-	-	11	19	9	9	9	3	4		-
1942	RAINFALL (MM)	3	4	75	30	58	28	51	54	41	21	3	30	398	
1942	NO OF RAINDAYS	2	2	7	6	9	9	9	17	8	7	2	5		83
1943	RAINFALL (MM)	34	34	25	35	33	39	34	49	37	10	2	8	380	
1943	NO OF RAINDAYS	2	5	6	8	9	11	12	10	10	1	2	3		80
1944	RAINFALL (MM)	13	0	1	16	52	18	55	57	25	1	5	10	253	
1944	NO OF RAINDAYS	2	0	2	7	12	7	13	-	4	1	2	5		-
1945	RAINFALL (MM)	0	+	29	13	36	177	54	79	29	1	7	4	429	
1945	NO OF RAINDAYS	0	1	6	4	6	17	13	12	7	1	2	1		70
1946	RAINFALL (MM)	5	1	2	6	80	97	99	23	55	13	35	10	384	
1946	NO OF RAINDAYS	1	1	1	5	11	12	17	10	6	3	5	5		77

BUREAU OF METEOROLOGY — REPORT OF MONTHLY AND YEARLY RAINFALL BY H.I.S.S. — 1/ 4/86 — PAGE 4743

STATION : 010627 PINGRUP (PINGRUP POST OFFICE) — 33 32 S, 118 30 E — ROUNDED TOTALS 350.0 M ELEV

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
1962	RAINFALL (MM)	0	15	15	44	58	96	27	24	17	95	16	1	410
1963	NO OF RAINDAYS	0	2	1	11	8	14	9	10	9	15	6	2	85
1964	RAINFALL (MM)	0	2	8	16	8	40	56	36	71	12	18	17	284
1965	NO OF RAINDAYS	0	1	3	9	2	10	12	9	9	6	4	2	67
1966	RAINFALL (MM)	0	42	10	14	18	48	56	52	14	39	23	8	322
1967	NO OF RAINDAYS	0	3	3	3	4	9	14	13	3	9	7	1	69
1968	RAINFALL (MM)	5	0	0	8	81	31	44	12	34	18	8	1	234
1969	NO OF RAINDAYS	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	RAINFALL (MM)	43	28	4	8	51	19	44	22	27	70	14	92	441
1971	NO OF RAINDAYS	4	5	2	8	5	11	6	9	5	6	7	5	67
1972	RAINFALL (MM)	1	2	10	7	69	108	37	26	36	30	36	38	378
1973	NO OF RAINDAYS	1	1	1	4	4	7	8	6	4	9	6	2	57
1974	RAINFALL (MM)	1	5	5	10	92	63	48	19	25	41	16	0	325
1975	NO OF RAINDAYS	1	1	1	2	6	9	12	7	6	6	6	0	56
1976	RAINFALL (MM)	11	8	*	2	55	14	45	38	9	6	14	5	191
1977	NO OF RAINDAYS	2	0	1	1	4	6	8	9	3	5	4	2	45
1978	RAINFALL (MM)	0	238	1	108	31	30	36	92	136	32	0	8	706
1979	NO OF RAINDAYS	0	8	1	1	7	6	7	6	15	8	7	0	67
1980	RAINFALL (MM)	4	9	17	13	54	36	77	7	20	10	18	0	265
1981	NO OF RAINDAYS	1	1	2	2	9	8	10	4	6	3	6	0	52
1982	RAINFALL (MM)	14	9	26	11	46	87	10	29	7	40	0	*	279
1983	NO OF RAINDAYS	4	1	4	2	7	17	4	9	2	8	0	1	59
1984	RAINFALL (MM)	1	16	2	5	56	14	102	35	66	26	19	39	383
1985	NO OF RAINDAYS	1	2	2	2	2	7	5	17	10	9	7	5	70
1986	RAINFALL (MM)	5	38	19	10	9	114	22	38	40	23	66	39	415
1987	NO OF RAINDAYS	2	4	5	4	7	12	10	8	8	9	7	6	80
1988	RAINFALL (MM)	41	1	42	15	69	28	109	21	76	2	18	53	447
1989	NO OF RAINDAYS	3	2	2	2	5	10	11	16	9	11	2	3	77
1990	RAINFALL (MM)	38	9	8	61	5	68	65	89	25	13	0	15	352
1991	NO OF RAINDAYS	10	3	1	1	9	2	12	9	10	6	3	0	60
1992	RAINFALL (MM)	10	13	20	1	65	55	38	63	12	38	7	15	317
1993	NO OF RAINDAYS	1	5	4	1	12	8	11	9	6	8	2	3	70
1994	RAINFALL (MM)	*	21	55	19	78	91	60	69	63	26	18	8	508
1995	NO OF RAINDAYS	1	4	8	4	17	13	13	14	9	4	7	2	96
1996	RAINFALL (MM)	12	36	6	65	7	112	72	82	25	48	13	7	482
1997	NO OF RAINDAYS	4	3	2	2	6	5	19	16	9	10	10	3	90
1998	RAINFALL (MM)	2	2	7	13	60	75	29	45	24	74	62	31	424
1999	NO OF RAINDAYS	4	1	3	4	5	9	5	9	-	9	-	2	-
2000	RAINFALL (MM)	51	29	8	16	7	118	73	31	58	42	8	7	432
2001	NO OF RAINDAYS	3	3	0	4	1	13	7	5	11	5	0	1	53
2002	RAINFALL (MM)	8	6	31	14	88	75	36	38	14	7	4	6	317
2003	NO OF RAINDAYS	0	1	4	5	8	10	7	6	3	1	1	1	47

BUREAU OF METEOROLOGY — REPORT OF MONTHLY AND YEARLY RAINFALL BY M.I.S.S. — 1/ 4/86 — PAGE 4744

STATION : 010627 PINGRUP (PINGRUP POST OFFICE) — '+' = RAINFALL BETWEEN 0.1 & 0.5 MM — '-' = MISSING OBSERVATION — 33 32 S, 118 30 E — ROUNDED TO NEAREST 350.0 M ELEV

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC		
1968	RAINFALL (MM)	49	24	114	57	49	120	42	26	40	10	2	0	533	
1968	NO OF RAINDAYS	5	2	8	7	6	12	8	4	5	2	1	0	58	
1969	RAINFALL (MM)	0	0	27	22	13	53	23	13	27	1	17	6	202	40
1969	NO OF RAINDAYS	0	0	2	6	2	8	4	5	6	1	3	3	40	
1970	RAINFALL (MM)	0	35	1	30	9	87	22	15	53	15	10	6	285	
1970	NO OF RAINDAYS	0	4	1	5	3	10	5	4	11	5	2	2	52	
1971	RAINFALL (MM)	3	25	130	1	44	21	16	37	34	19	150	1	483	
1971	NO OF RAINDAYS	1	5	5	5	7	12	9	-	-	11	9	1	-	
1972	RAINFALL (MM)	3	3	3	3	24	41	54	27	5	6	3	0	176	
1972	NO OF RAINDAYS	2	-	3	7	3	-	11	12	12	5	4	0	-	
1973	RAINFALL (MM)	11	0	+	37	26	46	89	29	52	23	35	6	307	
1973	NO OF RAINDAYS	1	0	29	1	8	9	-	14	9	11	6	1	-	
1974	RAINFALL (MM)	2	3	29	46	121	49	54	44	20	43	60	0	473	
1974	NO OF RAINDAYS	3	1	1	2	7	-	-	10	6	5	-	8	-	
1975	RAINFALL (MM)	0	2	8	67	47	33	49	43	24	42	21	12	348	
1975	NO OF RAINDAYS	0	3	2	10	7	8	9	-	9	6	-	1	-	
1976	RAINFALL (MM)	28	64	0	32	25	17	20	82	38	26	22	2	356	
1976	NO OF RAINDAYS	3	4	0	0	5	4	4	-	9	6	-	2	-	
1977	RAINFALL (MM)	0	12	0	3	48	21	24	50	25	88	-	-	-	
1977	NO OF RAINDAYS	0	4	0	0	1	7	3	6	13	5	7	-	-	
1978	RAINFALL (MM)	14	44	0	9	15	58	60	13	18	15	12	26	284	67
1978	NO OF RAINDAYS	2	3	0	4	5	13	11	6	9	2	4	8	67	
1979	RAINFALL (MM)	11	37	17	5	1	31	36	27	35	18	9	4	259	
1979	NO OF RAINDAYS	2	7	0	44	1	7	11	6	9	-	2	2	-	
1980	RAINFALL (MM)	7	40	0	44	26	42	35	32	9	32	13	51	353	
1980	NO OF RAINDAYS	2	4	0	7	8	12	9	12	7	9	5	4	77	
1981	RAINFALL (MM)	10	34	4	10	60	32	43	29	18	6	17	6	267	
1981	NO OF RAINDAYS	2	2	2	9	8	-	-	12	6	5	6	2	-	
1982	RAINFALL (MM)	107	3	15	0	25	36	12	72	30	8	28	7	330	
1982	NO OF RAINDAYS	7	2	3	0	8	11	10	12	11	5	7	5	81	
1983	RAINFALL (MM)	4	49	10	10	12	128	60	30	36	14	41	67	469	
1983	NO OF RAINDAYS	3	4	3	3	6	17	15	10	-	5	-	8	-	
1984	RAINFALL (MM)	0	5	21	25	73	28	30	46	53	9	28	6	316	
1984	NO OF RAINDAYS	0	2	4	5	14	6	-	-	-	-	-	2	-	
1985	RAINFALL (MM)	5	12	1	26	26	27	67	38	21	28	28	8	286	
1985	NO OF RAINDAYS	-	-	-	-	-	-	-	-	-	-	-	-	-	
1986	RAINFALL (MM)	0	58	-	-	-	-	-	-	-	-	-	-	-	
1986	NO OF RAINDAYS	0	4	-	-	-	-	-	-	-	-	-	-	-	

APPENDIX 4

RAOU SURVEY OF WATERBIRDS. REPORT BY RESERVE. 24 OCT 85

UPDATED MAXIMA BY MONTH, FOR ALL SPECIES RECORDED (LAST PRINTOUT - 11 SEP 85 : THIS DATA SUBMITTED 15 JUL 85)

REGION : NEWDEGATE (33/119)

RESERVE : 110 - LAKE BRYDE

PART : 1 - LAKE BRYDE

RAOU NO.	SPECIES	SVYS RECD	MAX T	RECD P	SVYS BRDG	YEAR QRY	MAXIMUM RECORDED AND BREEDING RECORDS (*=DR,SN,E,YN) JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
060	GCGE	1	4 T		0	A 83-84	0		4 T					0				
169	PCHN	2	2 T		0	A 83-84	0		2 T					1 T				
186	WFHN	3	3 T		1	YA 83-84	0		2 T	1*P				3 T				
		4	20	P	0	YA 84-85	0								1 T	20	12 T	
203	SWAN	1	5 T		0	A 83-84	5 T							0				
207	SHEL	1	2	P	0	A 81-82	2 P											
		1	12 T		0	A 83-84	12 T							0				
		4	70	P	1	YA 84-85	12*T								0	70	34 T	
208	PASD	1	2	P	0	A 81-82	2 P											
		3	8 T		1	YA 83-84	8 T			8*P				0				
		3	7 T		0	A 84-85	0								7 T	2	5 T	
211	GYIL	1	70	P	0	A 81-82	70 P											
		5	90 T		1	YA 83-84	90 T		2 P	30*P				24 T				
		3	30 T		0	A 84-85	30 T								8 T	16	0	
213	PLAC	3	8 T		1	YA 83-84	8 T			6*P				1 T				
		1	5 T		0	A 84-85	5 T								0	0	0	
202	MANO	2	30 T		0	YA 83-84	10 T							30 T				
217	MUSD	2	1	P	1	YA 83-84	0			1*P				0				
055	BTNH	3	13 T		0	YA 84-85	0								0	12	13 T	
132	RKDU	1	2	P	0	A 84-85	0								0	2	0	
146	BBST	1	2	P	0	A 84-85	0								0	2	0	
148	RNAV	1	3 T		0	A 84-85	0								0	0	3 T	
126	GANK	1	1 T		0	A 84-85	0								0	0	1 T	
153	SHTS	1	2 T		0	YA 84-85	0								0	0	2 T	
150	JASS	2	3	P	0	A 83-84	0			3 P				0				

RESERVE : 110 - LAKE BRYDE

PART : 1 - LAKE BRYDE

RAOU NO.	SPECIES	SVYS RECD	MAX T RECD	P	BRDG	QRY	YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
880	DUCK	1	63	T	0	A	84-85	3								0	0	58 T	

SUMMARY : NUMBER OF SURVEYS : 81-82 1N
63-84 1A 1N 2N 1A
84-85 1A 1A 1A 2A

NUMBER OF INDIVIDUALS WHICH USED THE WETLAND TOTALS FOR EACH MONTH (IDENTIFIED SPP ONLY)	81-82	74											
	83-84	133		10	46				59				
	84-85	58								16	124	70	
NUMBER OF SPECIES :	81-82	3											
	83-84	6		4	5				5				
	84-85	3								3	7	7	
NUMBER BREEDING SPP :	81-82	0											
	83-84	0		0	5				0				
	84-85	1								0	0	0	

DATES OF FIRST AND LATEST SURVEY ENTERED IN DATA BANK = 17 JUL 81/12 MAY 85

NUMBER OF SURVEYS ENTERED = 11 (7A)

NUMBER OF SPECIES RECORDED TO DATE = 16. BREEDING SPECIES = 6

MONTHS IN WHICH GREATEST NUMBER OF SPECIES AND GREATEST NUMBER OF BREEDING SPECIES WERE RECORDED SEVERAL / OCT 83

NUMBER OF INDIVIDUALS WHICH USED THE WETLAND
A - LARGEST TOTAL IN ANY ONE SURVEY = 133 (JUL 83)
B - LARGEST TOTAL FOR ANY ONE MONTH = 133 (JUL 83)
C - NO. OF INDIVIDUALS FOR THIS STUDY = 261

MOST ABUNDANT SPECIES = GYTL 90 (JUL 83)
SHEL 70 (APR 85)
MAND 30 (FEB 84)

MOST FREQUENTLY RECORDED SPECIES = GYTL (9 SURVEYS: REPORTING RATE 82%)
WFHN (7 SURVEYS: REPORTING RATE 64%)
PABD (7 SURVEYS: REPORTING RATE 64%)

OBSERVERS JALNSCH P 0A 3R LANE J 1A ON ROBINSON MRS F 4A 1N
JA 0R NEWBEY B & K 1A ON

APPENDIX 5

PLANT SPECIES FOR LAKES IN THE DUNN ROCK AND LAKE BRYDE NATURE RESERVE AREAS

ntified By	Plant Species	Specimem Number
	POACEAE	
W.A. Herbarium	Poa sp.	2B; B11.
	CYPERACEAE	
W.A. Herb.	Schoenus brevifolius	3A; B12.
W.A. Herb.	Cyperaceae sp.	B13.
	CASUARINACEAE	
W.A. Herb.	Allocasuarina corniculata	C13.
	PROTEACEAE	
W.A. Herb.	Hakea aff. preissii	S1.
	SANTALACEAE	
W.A. Herb.	Exocarpos aphyllus	1B; 3B; D11.
W.A. Herb.	Santalum acuminatum	C10.
	POLYGONACEAE	
W.A.Herb.	Muehlenbeckia declina	L6; L8.
	CHENOPODIACEAE	
W.A. Herb.	Atriplex cf. nana	1D;
W.A. Herb.	Atriplex vesicaria	1H; 1C; 2H; A10; C12.
W.A. Herb.	Chenopdium glaucum	L11.
W.A. Herb.	Halosarcia halocnemoides	1G; 2G.
W.A. Herb.	Halosarcia lepidosperma	L7.
W.A. Herb.	Halosarcia pergranulata	B14; 102.
W.A. Herb.	Halosarcia aff. pergranulata	E12.
W.A. Herb.	Halosarcia syncarpa	2E; 2F; 103.
W.A. Herb.	Halosarcia sp.	A11.

W.A. Herb.	Maireana brevifolia	L9; L12.
W.A. Herb.	Maireana erioclada	D10.
W.A. Herb.	Maireana oppositifolia	2K; A13; B10.
W.A. Herb.	Sarcocornia quinqueflora	1K.
W.A. Herb.	Sclerostegia moniliformis	1F.
W.A. Herb.	Tecticornia verrucosa	L4.
	AIZOACEAE	
W.A. Herb.	Disphma crassifolium	1I; 1E; E10.
	CARYOPHYLLACEAE	
W.A. Herb.	Spergularia rubra	L10.
	PITTOSPORACEAE	
W.A. Herb.	Pittosporum phylliraeoides	S5
	MIMOACEAE	
W.A. Herb.	Acacia saligna	C11
	MALVACEAE	
W.A. Herb.	Lawrencia squamata	2I; 2J; 104; A12; E11.
	FRANKENIACEAE	
W.A. Herb.	Frankenia aff. pauciflora	IJ; 105?
	MYRTACEAE	
S. McNee	Eucalyptus kondininensis	3H.
S. McNee	Eucalyptus occidentalis	??.
Watkins & McNee	Melaleuca sp.3G	3G; S3; E14; L2 101.
WTK & McN	Melaleuca halmaturorum	2A; 3E; 106; 107; E13; L3.
WTK & McN	Melaleuca lateriflora	L1; E15.
WTK & McN	Melaleuca thyoides	1A; 3F.
WTK & McN	Melaleuca uncinata	3D; S2.
WTK & McN	Melaleuca viminea	3C; 100.
	CONVOLVULACEAE	
W.A. Herb.	Wilsonia humilis	L5.

	GOODENIACEAE	
W.A. Herb.	Scaevola spinescens	S4.
	ASTERACEAE	
W.A. Herb.	Angianthus tomentosus	2C.

WETLAND	PLANT SPECIMEN NUMBERS
MAGDHABA LAKE	1A - 1K
LUNETTE LAKE	2A - 2K
DUNN LAKE	3A - 3H, 100 - 107
RONNERUP	A10 - A13, B10 - B14, C10 - C13, D10, D11, S1 - S5.
LAKE BRYDE	L1 - L12
EAST LAKE BRYDE	E10 - E15

APPENNDIX 6

WETLANDS OF DUNN ROCK AND LAKE BRYDE NATURE RESERVE AREAS

A COMPARISON OF PLANT SPECIES

Species/Wetland	Ronnerup	MGB	LUN	DUNN	Bryde	E Bryde
Poa sp.	X		X			
Schoenus brevifolius	X			X		
Cyperaceae	X					
Allocasuarina corniculata	X					
Hakea aff. preissii	X					
Exocarpos aphyllus	X	X		X		
Santalum acuminatum	X					
Muehlenbeckia declina					X	X
Atriplex cf. nana		X				
Atriplex vesicaria	X	X	X			
Chenopodium glaucum					X	
Halosarcia halocnemoides		X	X			
Halosarcia lepidosperma					X	
Halosarcia pergranulata	X			X		
Halosarcia aff. pergranulata						X
Halosarcia syncarpa			X	X		
Halosarcia sp.	X					
Maireana brevifolia					X	
Maireana erioclada	X					
Maireana oppositifolia	X		X			
Sarcocornia quinqueflora		X				
Sclerostegia moniliformis		X				
Tecticornia verrucosa					X	
Disphyma crassifolium	X	X		X	X	X
Spergularia rubra					X	
Pittosporum phylliraeoides	X					
Acacia saligna	X					
Lawrencia squamata	X		X	X		X
Frankenia aff. pauciflora	X	X		X		
Eucalyptus kondininensis	X	X				
Eucalyptus occidentalis	X			X	X	X
Melaleuca sp.3G	X			X	X	X
Melaleuca halmaturorum			X	X	X	X
Melaleuca lateriflora					X	X
Melaleuca thyoides	X	X		X		
Melaleuca uncinata	X			X		
Melaleuca viminea				X		
Wilsonia humilis					X	
Scaevola spinescens	X					
Angianthus tomentosus			X			

APPENDIX 7

RESERVE FILES - DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

LAKE BRYDE

016264F3102

Cons. Flora & Fauna, Water, Picnic Ground Res 28667
Cons. Flora & Fauna - Res Nos 29021, 29026
Details
Reserve No.: 288667 Date: 30/10/70
Purpose: Cons Flora & Fauna, Water, Picnic Ground
Area: 3249a-2r-4p
Vesting: Min for Water Supply
Location No.: Roe 2573-2605
Litho: 407/80 F.2.
Local Authority: Nyabing-Pingrup
Size of file - about 70 pages

EAST LAKE BRYDE

015952F3102 (East)

F.P. Act. Roe. Res No. 29020 Loc No. 2603 Lake Bryde
Details
Reserve No.: 29020 Date: 15/3/68
Purpose: Cons Flora and Fauna
Area: 3774a-3r-20p
Vesting: W.A.W.L.A.
Location No.: Roe 2603
Litho: 406/80
Local Authority: Nyabing-Pingrup
Size of file - about 20 pages

DUNN ROCK NATURE RESERVE

017683F3102

Details
Reserve: Lake King Reserve 36445 Formerly Reserve 20346
Created: 01:01:74
Class: 3102
Old Number: WL 19740663
Area: 40 105 ha
Vesting:
Location No: Roe 3073 - 3077 inclusive.
Litho.: 375/80, 369/80, 388/80, 405/80, 405/80
Local Authority: Lake Grace
Size of file - about 10 pages

RESERVE 39422 - Conservation of Flora and Fauna

023336F3102

Details
Reserve No: 39422
Purpose: Conservation of Flora and Fauna

Other files: Wildlife Research - small file on Lake Bryde, water level information.