Annual Waterfowl Counts in South-West Western Australia - 1989/90

by

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Technical Report No. 29
July 1992

Published by the
Department of Conservation and Land Management
PO Box 104 Como, W.A. 6152

ISSN 0816-6757

Marianne Lewis ..... Editor
Raelene Hick and Jan Rayner ..... Page preparation
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Abstract

A total of 190 109 waterfowl were counted in 1070 wetlands in south-west Western Australia in November 1989 and 141 734 waterfowl were counted in 1075 wetlands in March 1990 in a program conducted jointly by the Department of Conservation and Land Management and the Royal Australasian Ornithologists Union. Extrapolation of the data suggests that the number of waterfowl in the south-west was approximately 1 000 000 over the 1989/90 summer. Species counted were the Black Swan, Eurasian Coot, 11 species of native duck and four species of exotic duck, goose and swan. The species with the largest estimated population in November was the Australian Shelduck (240 495) and in March it was the Pacific Black Duck (219 026). During both surveys the majority of birds occurred on lakes. In November the southern central wheatbelt and Swan Coastal Plain were the areas containing most birds. In March the distribution through the south-west was more even.

Totals of 140 waterfowl nests and 815 broods were recorded in November, mostly on lakes.

INTRODUCTION

In the late 1960s and early 1970s, annual counts of waterfowl made during aerial surveys in September or October were used to determine duration of the duck-hunting season and bag limits in Western Australia. In the late 1970s and early 1980s depth gauges were installed in approximately 100 wetlands in the South West and Eucla Land Divisions. Since then, measurements of water depths in September and November, together with rainfall data, have been used in determining duck-hunting regulations (Lane and Munro 1983; Lane 1985). Aerial surveys were discontinued after 1979. However, the need for annual counts of waterfowl for purposes of waterbird conservation, management of duck hunting, and identification of important wetlands was still recognized (Lane 1981). Therefore, from 1986 to 1988 inclusive the Department of Conservation and Land Management (CALM) funded March counts of ducks, swans and coots in south-west Western Australia by the Royal Australasian Ornithologists Union (RAOU) (Jaensch and Vervest 1988a,b). In those counts volunteers surveyed a large number of wetlands from the ground while CALM staff surveyed some of the larger or more inaccessible wetlands from the air.

Four other waterfowl counting programs began in Australia during the 1980s. In 1981 the Office of the Supervising Scientist began aerial surveys in the Alligator Rivers Region of the Northern Territory (Morton *et al.* 1990a,b). In 1983 the Conservation Commission of the Northern Territory began annual aerial surveys of other major waterfowl habitats in the northern part of the Northern Territory (Bayliss and Yeomans 1990a,b). Also in 1983, at the instigation of the Council of Nature Conservation Ministers (CONCOM), annual aerial surveys began in eastern Australia (Braithwaite *et al.* 1986). That project is now coordinated by the National Parks and Wildlife Service of New South Wales (Kingsford *et al.* 1990). In 1987 the RAOU, with assistance from the Victorian Field and Game Association, was commissioned by the Department of Conservation and Environment to undertake annual ground surveys in Victoria (Peter 1990).

In November 1988 a new CALM/RAOU waterfowl counting program began in south-west Western Australia. Although in many respects an extension of the 1986-1988 March counts (Jaensch and Vervest 1988a,b), the new program uses a fixed set of wetlands for survey, has a larger aerial survey component and, most importantly, includes November counts each year as well as March counts (Halse *et al.* 1990). Approximately 160 RAOU-coordinated volunteers and CALM staff conduct surveys. The rationale for the program is based on the following:

(1) As wetlands in south-west Western Australia are drained, altered or become increasingly saline, it is likely that waterbird numbers will decline. Ducks, swans and coots form the dominant component of the waterbird community and long-term monitoring of their abundance will indicate trends in waterbird

numbers, both overall and in the regions most affected by habitat alteration.

(2) Because ducks may, at times, be hunted (a hunting season was declared in January-February 1990) information on population trends of game species is required for proper management.

The program has four specific objectives:

(1) To provide an index of annual abundance of ducks, swans and coots in south-west Western Australia.

(2) To examine regional distribution of the species each year in relation to wetland conditions.

(3) To compare regional distribution and types of wetlands used during the breeding season and in late summer.

(4) To estimate actual numbers of ducks, swans and coots in south-west Western Australia by extrapolating results from the wetlands surveyed.

SURVEY DESIGN

Species counted

As in the previous CALM/RAOU waterfowl counting project (Jaensch and Vervest 1988a,b), 13 native and four species of exotic waterfowl were counted:

Black Swan	*Cygnus atratus*
Freckled Duck	*Stictonetta naevosa*
Australian Shelduck	*Tadorna tadornoides*
Pacific Black Duck	*Anas superciliosa*
Grey Teal	*A. gibberifrons*
Chestnut Teal	*A. castanea*
Australasian Shoveler	*A. rhynchotis*
Pink-eared Duck	*Malacorhynchus membranaceus*
Hardhead	*Aythya australis*
Maned Duck	*Chenonetta jubata*
Blue-billed Duck	*Oxyura australis*
Musk Duck	*Biziura lobata*
Exotic ducks, geese and swans	Domestic varieties of Mallard *Anas platyrhynchos*, Muscovy *Cairina moschata*, Greylag Goose *Anser anser* and Mute Swan *Cygnus olor*
Eurasian Coot	*Fulica atra*

It is difficult to distinguish female Chestnut Teal, and males in eclipse plumage, from Grey Teal. Therefore, most observers on the ground counted only 'coloured' males whereas aerial observers counted all Chestnut Teal. No attempt was made to correct ground counts because it was sometimes difficult to determine whether observers had counted coloured males or all birds. As a result, figures given for Chestnut Teal in this paper are under-estimates.

Counting dates

Counts were made during nine-day periods (two weekends and the intervening week) at the end of the breeding season, *viz* 18-26 November 1989, and in early autumn when the birds were congregated in 'summer' refuges, *viz* 10-18 March 1990.

Wetlands surveyed

Using map coordinates, the area to be surveyed in the South West and the south-western part of the Eucla Land Divisions was divided into 20' blocks (Fig. 1) at the outset of the current project (Halse *et al.* 1990). The inland limit of the area to be surveyed generally corresponded with the extent of predictably filled wetlands in the south-western part of the State. Brief accounts of the types of wetlands that occur in the area are given by Halse *et al.* (1990, in press (a)).

A set of 1247 wetlands was selected to be surveyed each year. As far as possible, two permanent lakes with potential as drought refuges, two lakes (often seasonal) with potential as breeding sites, five farm dams and two sections of river were surveyed in each 20' block, giving a maximum of 11 wetlands per block. In some blocks not all wetland types were present and fewer wetlands were selected. In a few blocks no wetlands were selected (Fig. 1). Where a block was particularly rich in one type of wetland and depauperate in others, we sometimes increased the sample size of one wetland type, e.g. river sections, but never exceeded a total of 11 wetlands in a block.

In addition to the lakes, dams and river sections selected, all major estuaries[1] between Kalbarri and Esperance were surveyed because in some years they contain very large numbers of birds in

1. We use the term 'estuary' in a colloquial sense to include several wetlands, most notably Vasse-Wonnerup Estuary, that are not truly estuarine.

November or March (Jaensch and Vervest 1988a,b; Halse *et al.* 1990). It is difficult to devise a satisfactory method of counting only some estuaries and yet obtaining a meaningful index of waterfowl abundance in all estuarine systems. For the same reason, provided we were left with a reasonable mix of wetland types and did not exceed 11 wetlands per block, all wetlands known at the outset of the project to support large aggregations of waterfowl or high numbers of one species (Jaensch and Vervest 1988a,b) were included in the set of wetlands to be surveyed. Table 1 shows the number of wetlands actually surveyed in November and March.

For analysis of the distribution of waterfowl and its relation to rainfall, 11 'regions' were delineated (Fig. 1). Each region consisted of 14-16 blocks containing surveyed wetlands, except for Walpole region, which contained 13 full blocks and five part blocks on the coast.

Survey methods

Most wetlands were surveyed from the ground by RAOU observers or CALM staff using binoculars or a telescope. In some cases a boat or canoe was used to traverse the wetlands. Techniques used to count waterfowl were based on those described by Jaensch *et al.* (1988).

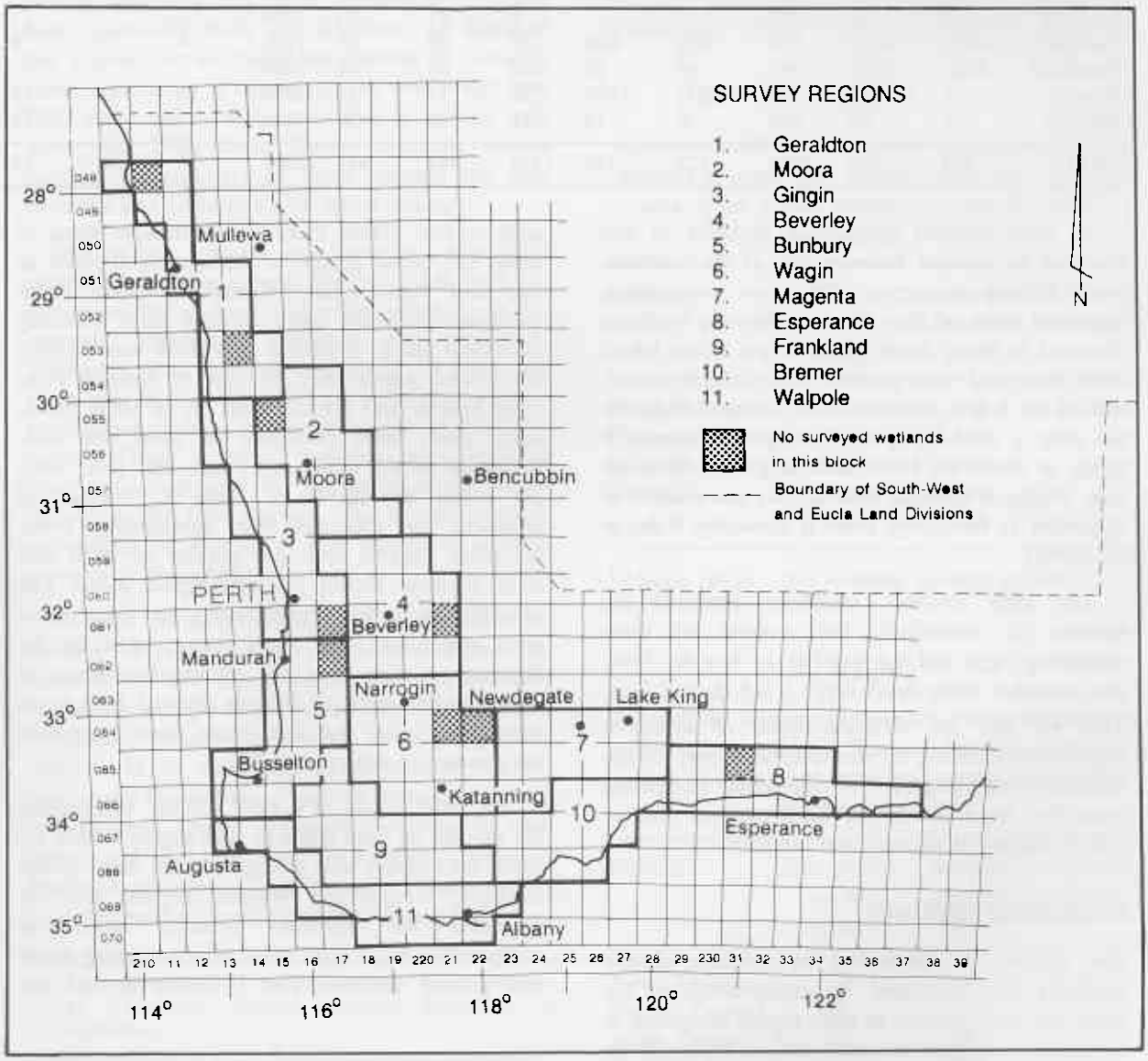

Figure 1

The area surveyed in the annual waterfowl counts and the regions recognized within the surveyed area. The 20' blocks comprising the regions are marked.

Table 1

Number of waterbodies of each type surveyed in each region in November 1989 and March 1990 compared with the number of wetland 'units' (see text) of each type identified from the topographic maps. Figures in parentheses represent the number of atypical waterbodies counted. Counts from atypical wetlands were added directly to the extrapolations.

Region	Lake			River			Dam			Estuary		
	Nov 89	Mar 90	Units	Nov 89	Mar 90	Units	Nov 89	Mar 90	Units	Nov 89	Mar 90	Units
Geraldton	31	35	464	9	8	69	12	13	100	1	2	6
Moora	46(1)	51(1)	651	2	2	42	43	51	1000	-	-	-
Gingin	82(5)	73(5)	400	14	12	110	28	26	100	1	1	3
Beverley	28(1)	25(1)	102	18	15	105	57	46	1500	-	-	-
Bunbury	40(4)	41(4)	384	17(2)	17(2)	198	40	38	200	3	3	6
Wagin	43(7)	37(6)	209	19(1)	19(1)	112	59	65	1500	-	-	-
Magenta	45	44	350	-	-	5	57	57	1500	-	-	-
Esperance	49(5)	42(5)	650	7(3)	6(3)	57	39	35	1500	4	4	4
Frankland	26(2)	48(2)	343	14	23	288	46	60	3000		-	
Bremer	36	32	232	18(3)	17(3)	219	37	33	1500	10	10	10
Walpole	36	35	206	9	10	135	36	30	2000	7	8	13
TOTAL	462	463	3991	127	129	1340	454	454	13900	26	28	42

In most cases a block was allocated to one observer or divided between two if the wetlands were difficult to survey. Observers were given annotated maps of their block(s) showing wetlands allocated to them. Some of the larger inland lakes, some lakes and river sections with difficult access, and all the larger estuaries were surveyed from the air over a four-day period using a Cessna 172 flying at about 60 knots at a height of 30 m or less. Wetlands counted from the air are marked in Appendix 1; the survey route is shown by Halse *et al.* (1990).

For each wetland, observers recorded the number of waterfowl, the number of nests containing eggs and the number of broods. They also recorded water depth (dry, <0.5 m, <1.0 m, ≥ 1.0 m) and the different types of emergent vegetation occurring in the inundated part of the wetland. The categories of vegetation recognized were live trees or shrubs, dead trees or shrubs, rushes, sedges or grasses, and samphire.

Estimating numbers

The number of waterfowl in southern-western Australia was estimated by extrapolation of the count for each species in each region according to the number of birds in each wetland type and the proportions of waterbodies of each type that were surveyed.

Topographic maps (1:100 000) were used to estimate the number of lakes and river sections in each region. Where there were extensive areas of small salt lakes, groups of lakes were counted as one 'unit' because this reflected the nature of the surveyed wetlands more closely than counting individual lakes. A similar procedure was adopted for rivers, where long sections of flowing river were broken into several units or, in some cases, small pools were combined to form one unit. Estimates of the numbers of lake and river units per region are shown in Table 1. Because of grouping, our estimates were substantially lower for some regions than the number of lakes and river sections shown on topographic maps. For example, there are approximately six times more river pools and two times more lakes in the Esperance region than our estimated numbers of survey units; maps of Bremer showed four times more river pools and eight times more lakes than the number of survey units.[2]

We used results of a 1970 survey[3] to calculate the number of farm dams in each region (Table 1). Little information was available about dams in the Bunbury, Gingin and Walpole regions and we estimated the numbers present, based on comparisons made with other regions during aerial and ground surveys. The 1970 survey did not

2 J.A.K. Lane, Department of Conservation and Land Management, unpublished data.

3. Water Resources on Farms at 31 March 1970. Unpublished report by Commonwealth Bureau of Census and Statistics, Perth, 1971.

cover all the Frankland region and we guessed the number of dams present around Manjimup. Because the number of dams has increased in some areas during the past 20 years, we assumed an annual increase of 1 per cent over the past 15 years for the Magenta and Bremer regions and an annual increase of 2 per cent over the past 20 years for the Esperance region.[4]

Comparison between waterfowl numbers on randomly chosen dams counted from the air and numbers on dams counted from the ground suggested that the choice of dams for ground surveys (made by observers in November 1988) was biased towards dams that were likely to contain waterfowl. When dams were abundant ground observers had more opportunity to select dams containing birds and therefore, we assumed that counts over-estimated the number of birds on dams by a factor of two in regions with fewer than 2000 dams and by a factor of four in regions with more than 2000 dams. These correction factors brought the numbers of birds counted per dam from the ground in line with aerial estimates.

Waterfowl counts in estuaries were not extrapolated: all major estuaries were surveyed and our observations show that other estuaries do not support significant numbers of waterfowl. Similarly, there were approximately 25 lakes and river sections that supported much larger waterfowl populations than other wetland units in the same region. These 'atypical' wetlands were excluded from the calculations for extrapolation and added directly to the final number. The formula used to extrapolate the number of each species in lakes in a region is given below.[5]

Similar formulae were used to calculate the number of birds in river pools and dams. The method of converting counts to estimates of population size presented in this paper is still being developed. Its accuracy depends on sampling error, which will be calculated in subsequent reports[6] and, more importantly, on how representative the survey units are of wetlands occurring in each region and how accurately the number of wetlands has been calculated. Estimates may change slightly as better wetland inventories become available.

4. These are conservative assumptions based on data supplied by I.A. Laing, Western Australian Department of Agriculture.

5. Estimated no. of sp. A =
$$\frac{\text{(no. of sp. A in typical lakes surveyed)}}{\text{no of typical lakes surveyed}} \times$$
total no. of typical lakes + no. of sp. A in atypical lakes.

6. Preliminary analysis of data from November 1990 produced 95 per cent confidence limits for abundant species that were <10 per cent of estimated population size.

RAINFALL AND WETLAND CONDITIONS

Except for a narrow belt along the coast from Albany to east of Esperance, annual rainfall in 1989 was below average in the area covered by the annual waterfowl counts and overall wetland conditions were comparatively dry (Table 2, Fig. 2). Only 85 per cent of waterbodies contained water in November 1989 compared with 96 per cent in the same period in 1988.

Conditions changed markedly over summer because of heavy rains on 28-29 January 1990 that exceeded 100 mm over most of the wheatbelt (Fig. 3). January rainfall in the North Central district was the highest on record (Table 3; Bureau of Meteorology 1990). In the south-western corner of

Table 2

Annual rainfall for 1989 in the five meteorological districts in south-west Western Australia within the area of the annual waterfowl count (Bureau of Meteorology 1990).

District	1989 rainfall (mm)	Average rainfall (mm)	Decile range[(a)]
North Coastal	300	396	2
Central Coastal	676	849	2
South Coastal	829	909	3
North Central	300	357	3
South Central	375	435	3

[(a)]decile range 2-3 = below average rainfall

Table 3

Rainfall for January 1990 in the five meteorological districts in south-west Western Australia within the area of the annual waterfowl counts (Bureau of Meteorology 1990).

District	Jan 1990 rainfall (mm)	Average rainfall (mm)	Decile range[(a)]
North Coastal	74	11	10
Central Coastal	68	9	10
South Coastal	32	17	9
North Central	92	11	10
South Central	96	13	10

[(a)]decile range 10 = very much above average rainfall
8-9 = above average rainfall

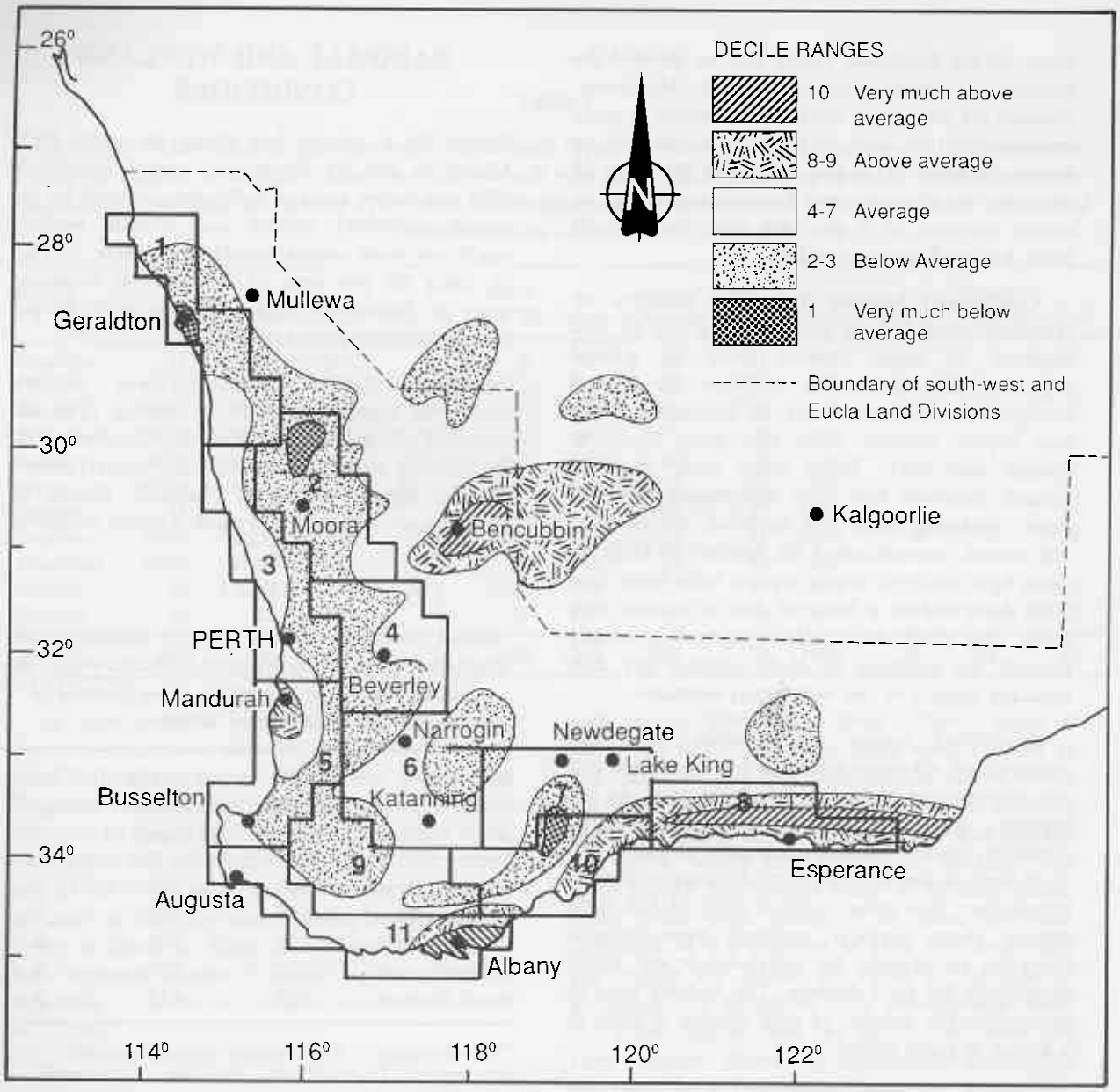

Figure 2

Decile ranges for the rainfall between January and October 1989 (inclusive) in south-west Western Australia.

the survey area and in parts of the Geraldton and Esperance regions rainfall was not as exceptional and conditions there were not unusual (Fig. 4). Overall, however, surface water was widespread and 86 per cent of surveyed wetlands contained water in March 1990 compared with 81 per cent in March 1989.

Slightly more wetlands contained water in March 1990 than November 1989, in contrast to the 15 per cent reduction over summer the previous year (Fig. 5). The March 1990 conditions were attributable to widespread flooding in the inland regions of Magenta, Moora, Wagin and, to a lesser extent, Beverley (Fig. 4). In coastal areas that received lower January rainfall some wetlands containing water in November were dry in March.

WETLAND VEGETATION

Vegetation records from the 1988/89 and 1989/90 surveys were reviewed and each wetland was assigned to a vegetation category reflecting the 'dominant' type of vegetation in the inundated

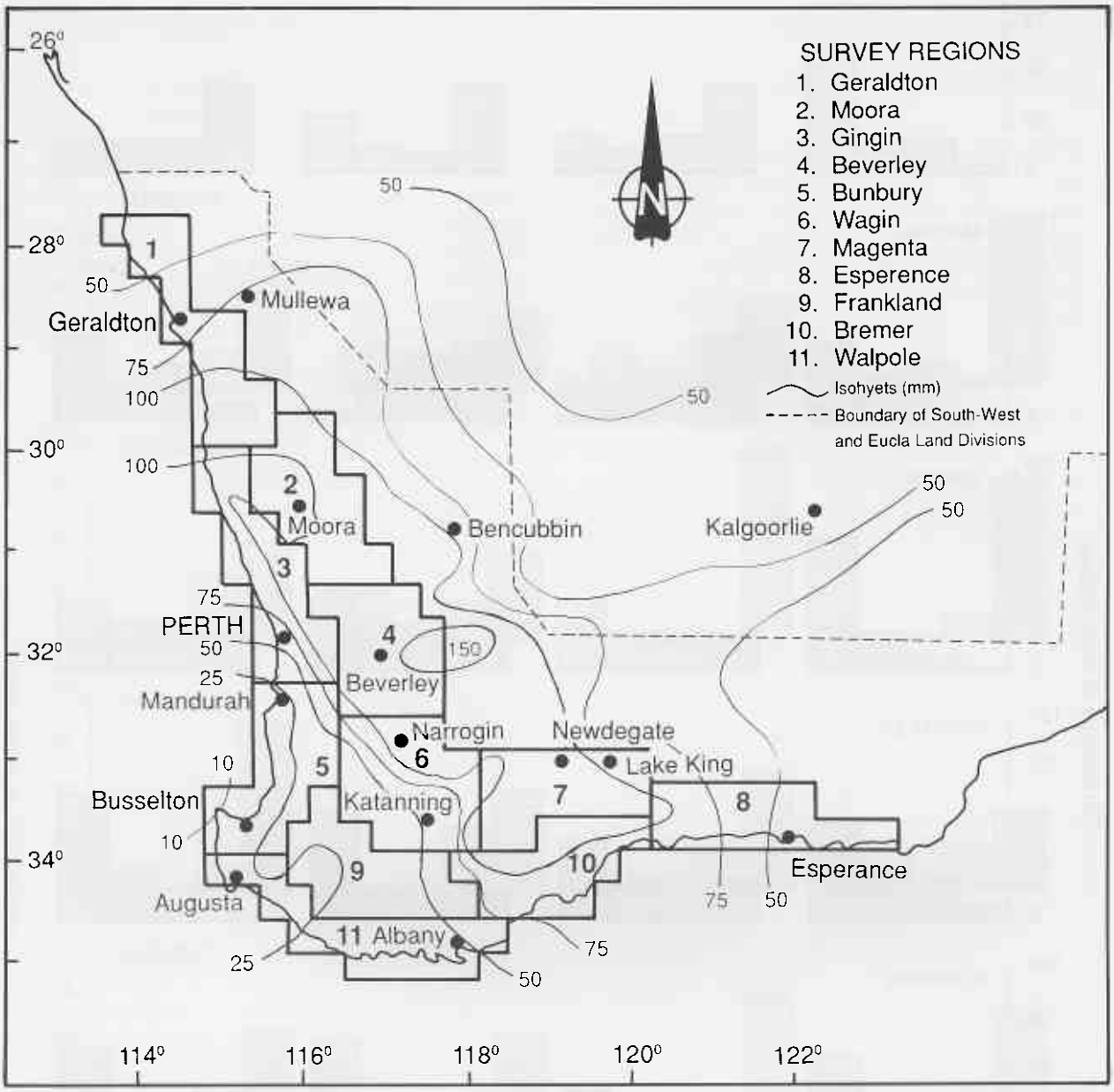

Figure 3

Rainfall (mm) in south-west Western Australia in January 1990.

area. Table 4 summarizes the vegetation characteristics of wetlands surveyed in 1989/90.

Decisions about vegetation categories of wetlands were sometimes arbitrary because of differences in extent of flooding during different surveys, variation between observers in the vegetation types they recorded as present and the paucity of surveys. The vegetation categories of a few wetlands may be changed in future years as a result of better guidelines being provided to observers and more data being gathered but this should not affect the validity of the general patterns in Table 4.

In both November 1989 and March 1990, 'live trees' was the most common vegetation type in surveyed lakes. Many lakes in the 'live trees' category also contained sparse rushes or sedges and a few dead trees but live trees covered more of the flooded area. The 'dead trees' category usually occurred in saline lakes where salt had killed most of the trees in the inundated area; samphire occurred around the lake margin with live trees (and sometimes rushes) on the landward side of the samphire. A few freshwater lakes were also classified as having 'dead trees'. These generally occurred on farmland and had a sparse stand of trees killed by waterlogging in the centre and a variable amount of rush or sedge around the edge. Where rushes or sedges were more extensive and visually dominant, the wetland was classified as 'sedges'.

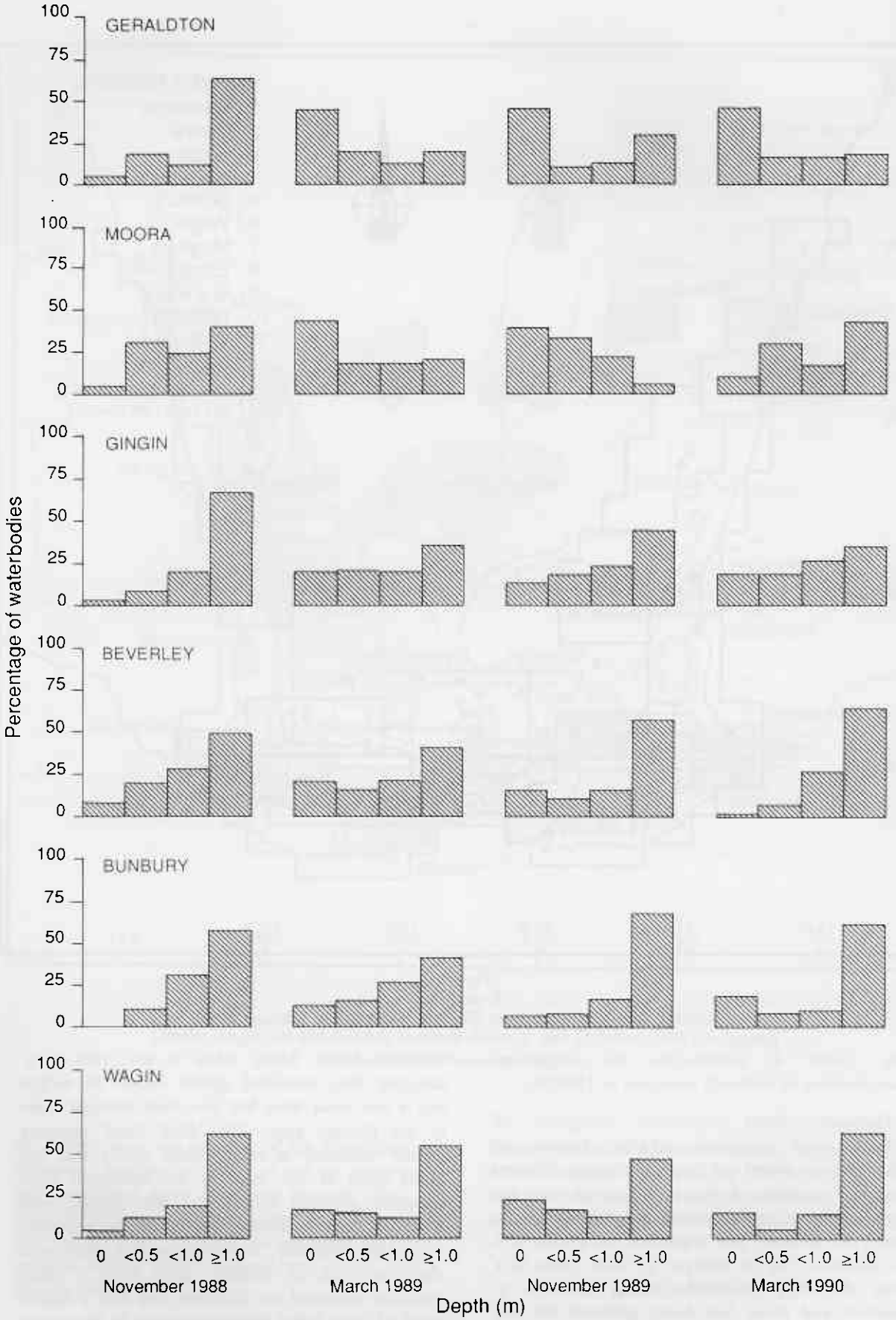

Figure 4

Percentage of waterbodies containing various depths of water in different regions during the 1988/89 and 1989/90 annual waterfowl counts.

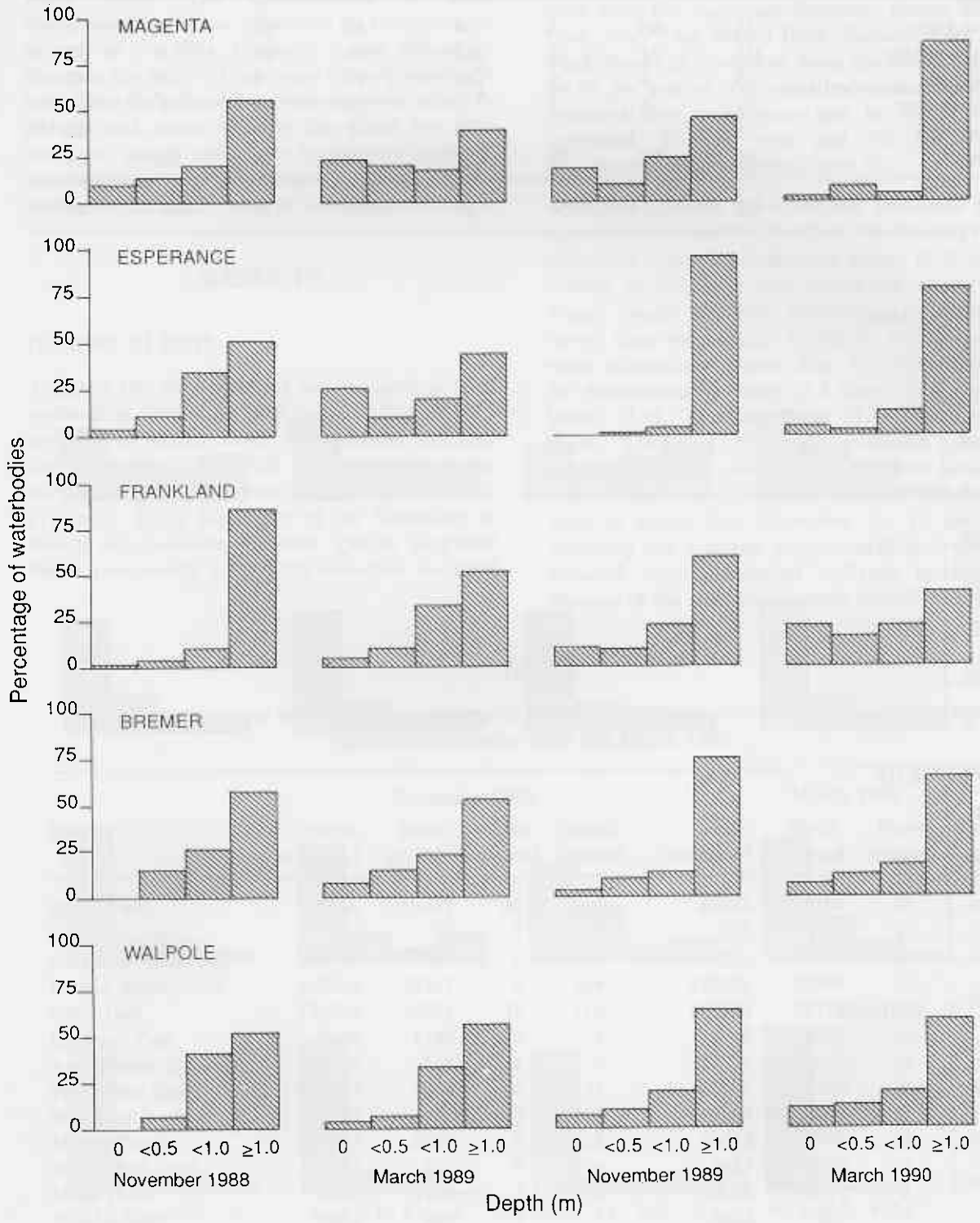

Figure 4 cont'd

Table 4

Percentage of the different types of waterbody surveyed in the annual waterfowl counts in 1989/90 supporting various categories of vegetation.

	November 1989				March 1990			
Vegetation	Lake	River	Dam	Estuary	Lake	River	Dam	Estuary
Live trees	33	40	4	4	30	35	4	3
Trees/sedges	16	24	3	33	16	26	3	31
Sedges	15	8	9	44	17	8	8	42
Dead trees	21	6	2	-	20	7	3	-
Samphire	5	-	-	8	5	-	-	10
Open	10	22	82	11	12	24	82	14
N	462	127	454	27	463	129	454	28

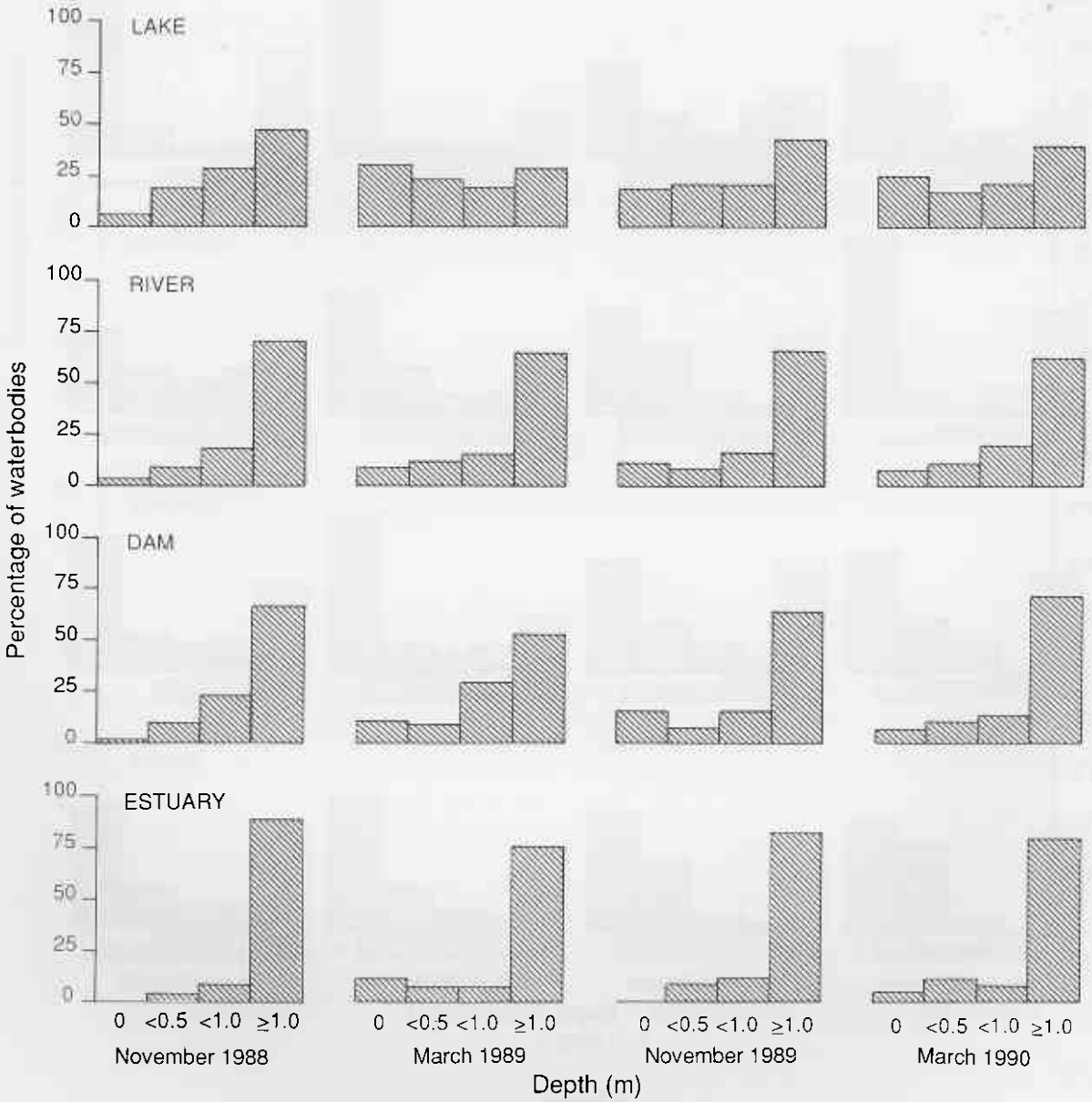

Figure 5

Percentage of waterbodies of each type containing various depths of water during the 1988/89 and 1989/90 annual waterfowl counts.

The 'trees/sedges' category was expected to contain only waterbodies with dense stands of both sedges and trees in the water, such as occur along many rivers. The characteristics of these waterbodies should be influenced by rushes/sedges as well as live trees. However, it was difficult to ascertain the relative importance of each vegetation type from the information observers were asked to provide and some wetlands that fitted the 'live trees' or 'sedges' categories better were probably misclassified as 'trees/sedges'. Most 'open' wetlands were either dams or saline lakes.

RESULTS

Number of birds

Totals of 190 109 waterfowl were counted in 1070 wetlands in November 1989, and 141 734 in 1075 wetlands in March 1990. Extrapolation indicated that there were about 800 000 waterfowl in the surveyed area in November and 850 000 in March (Table 5). Using the higher of the November or March extrapolations for each species suggested that approximately 1 000 000 waterfowl occurred in south-west Western Australia during the summer of 1989/90.

The six most abundant species for both survey dates were the Australian Shelduck, Pacific Black Duck, Grey Teal, Maned Duck, Eurasian Coot and Black Swan. In November these species accounted for 95 per cent of both waterfowl counted and the estimated total population, and in March they comprised 93 per cent and 92 per cent, respectively, of each figure (Table 5).

Higher numbers of Australian Shelducks (2.7 times more), Maned Ducks (2.0), Hardheads (1.9), Grey Teal (1.6) and Pink-eared Ducks (1.5) were counted in November than March but, except for Maned Ducks, estimated populations for the two survey dates were similar (Table 5). March counts were substantially higher than November counts for Australasian Shovelers (3.2 times more), Musk Ducks (1.9), Eurasian Coots (1.8) and Pacific Black Ducks (1.5) and estimated March populations were also higher. Numbers counted were a smaller proportion of estimated population sizes in March than November for all species, indicating that a greater proportion of each species occurred outside surveyed wetlands in March. Because of the extensive summer rainfall, surveyed

Table 5

Estimated number of birds and actual number of birds, nests and broods counted for each waterfowl species in November 1989 and March 1990.

Species	November 1989				March 1990			
	Birds estimated	Birds counted	Nests counted	Broods counted	Birds estimated	Birds counted	Nests counted	Broods counted
Black Swan	32560	12432	29	328	49863	15291	0	2
Freckled Duck	73	13	0	1	125	22	0	0
Australian Shelduck	240495	87929	1	46	177951	32055	0	1
Pacific Black Duck	107766	22127	9	104	219026	33790	0	0
Grey Teal	186593	39284	31	110	146545	24728	0	3
Chestnut Teal	2448	1196	0	2	5019	1591	0	0
Australasian Shoveler	3436	648	1	0	11421	2055	0	2
Pink-eared Duck	14773	5044	10	34	13177	3325	0	1
Hardhead	4183	760	2	9	3904	407	0	2
Maned Duck	129611	6612	0	25	66418	3373	0	0
Blue-billed Duck	3155	610	0	9	4457	736	0	4
Musk Duck	6067	1289	1	14	12010	2452	0	0
Exotic ducks	2471	427	1	3	3893	469	0	2
Unidentified ducks	30	22	0	0	5363	310	0	0
Eurasian Coot	64641	11716	55	130	128024	21130	3	3
TOTAL	798302	190109	140	815	847196	141734	3	20

wetlands had a greater drought-refuge function in November, after a comparatively dry winter, than in March.

Distribution between wetland types

In both November and March almost 70 per cent of the estimated south-west waterfowl population occurred on lakes, 20 per cent on dams, 6 per cent or 7 per cent on river pools and at least 5 per cent on estuaries (Table 6). Raw counts over-estimated the importance of estuaries by a factor of approximately five and under-estimated the importance of dams by a factor of between six and nine.

Examination of the distributions of individual species showed that the Maned Duck stood out as the only species for which the bulk of the estimated population occurred outside lakes - 75 per cent occurred on dams. Species such as the Freckled Duck, Pink-eared Duck and Blue-billed Duck were essentially restricted to lakes but approximately 40 per cent of the Chestnut Teal population occurred on rivers or estuaries (Table 6). The Pacific Black Duck was probably the most flexible of the native species in use of wetland types with 60 to 65 per cent of the estimated population on lakes, 15 to 16 per cent on rivers, 12 to 22 per cent on dams and 2 to 9 per cent on estuaries on the two survey dates.

Distribution between regions

The regions utilized most by waterfowl were Wagin, Bunbury, Gingin and Esperance (Tables 7 and 8). In November the Wagin region contained 20 per cent of the estimated number of birds in the south-west, Bunbury 18 per cent and Gingin 14 per cent. In March birds were more evenly distributed; Gingin and Esperance contained the largest numbers of birds (13 per cent each) while Wagin and Frankland each contained 12 per cent.

The distributions of most species were similar to the pattern for total waterfowl numbers. Chestnut Teal exhibited the most pronounced geographical bias, with approximately 80 per cent of birds occurring in the Esperance and Bremer regions in both November and March (Tables 7 and 8). Roughly half the populations of Blue-billed Ducks and exotic ducks occurred in the Gingin region in both surveys. For most other species the regions with most birds differed between surveys.

Table 6

Distribution of estimated numbers of waterfowl species by wetland type in November 1989 and March 1990. Total numbers counted in each wetland type are given for comparison.

Species	November 1989				March 1990			
	Lake	River	Dam	Estuary	Lake	River	Dam	Estuary
Black Swan	25308	137	1583	5532	43036	338	1216	5272
Freckled Duck	73	-	-	-	111	14	-	-
Australian Shelduck	203815	5539	14716	16425	125150	5449	43000	4352
Pacific Black Duck	69647	16147	12554	9418	130674	36016	48077	4259
Grey Teal	130070	9948	39114	7460	118071	6309	20885	1280
Chestnut Teal	1283	546	79	540	3042	893	26	1058
Australasian Shoveler	3040	138	254	4	11254	131	-	35
Pink-eared Duck	14478	-	294	2	13115	-	49	13
Hardhead	3643	337	198	5	3634	83	186	-
Maned Duck	21541	12692	95217	161	7351	8545	50463	58
Blue-billed Duck	3087	44	25	-	4436	-	20	1
Musk Duck	5398	285	372	11	11496	116	250	148
Exotic ducks	1977	424	12	58	1748	810	1270	66
Unidentified ducks	10	-	-	20	5320	44	-	-
Eurasian Coot	50802	2790	9953	1096	101756	5144	19391	1733
TOTAL	534173	49027	174371	40732	580194	63894	184833	18275
COUNT	136986	7909	4482	40732	107509	11095	4963	18275

Table 7

Estimated number of birds of each species in each region in November 1989.

	REGION										
Species	Geraldton	Moora	Gingin	Beverley	Bunbury	Wagin	Magenta	Esperance	Frankland	Bremer	Walpole
Black Swan	151	246	5959	767	8476	2762	2707	7079	2593	341	1479
Freckled Duck	-	-	62	-	11	-	-	-	-	-	-
Australian Shelduck	7885	11355	37018	11903	35024	32569	21215	41664	10491	19448	11922
Pacific Black Duck	3591	2927	18332	5438	40265	1562	715	7854	13685	1567	11829
Grey Teal	6783	13271	13991	22812	29239	51977	14680	12054	14550	4572	2664
Chestnut Teal	15	63	5	48	90	18	70	918	130	1043	46
Australian Shoveler	-	29	1137	47	37	1539	31	307	-	50	259
Pink-eared Duck	958	969	2728	777	319	5100	366	3099	110	278	69
Hardhead	54	72	2034	236	1039	134	31	281	-	106	196
Maned Duck	215	2154	9062	22896	17227	50977	1565	2774	10624	4919	7198
Blue-billed Duck	15	58	1390	8	892	12	-	516	-	7	258
Musk Duck	279	43	1388	110	1583	12	23	1624	602	60	342
Exotic ducks	-	637	1360	393	76	6	-	-	-	-	-
Eurasian Coot	1221	1779	17416	4097	6900	10324	3282	9107	7636	1573	1306
TOTAL	21167	33603	111882	69532	141178	156992	44685	87277	60421	33964	37568

Table 8

Estimated number of birds of each species in each region in March 1990

	REGION										
Species	Geraldton	Moora	Gingin	Beverley	Bunbury	Wagin	Magenta	Esperance	Frankland	Bremer	Walpole
Black Swan	2337	1646	11436	1129	3561	6115	2545	9591	2888	557	8058
Freckled Duck	-	-	6	14	-	42	64	-	-	-	-
Australian Shelduck	17833	24237	7988	8923	5864	36651	21120	10094	27959	13869	3413
Pacific Black Duck	5337	10445	43607	9448	47374	9799	1941	20408	43555	6956	20154
Grey Teal	23516	19818	7183	8784	5996	33293	25602	9782	4130	4721	3720
Chestnut Teal	-	188	-	-	68	204	32	2618	582	1328	-
Australasian Shoveler	17	31	1393	-	253	500	135	6239	30	94	2727
Pink-eared Duck	40	1424	1712	593	-	1169	3238	4401	7	582	12
Hardhead	17	-	782	21	20	47	644	2110	71	15	176
Maned Duck	250	574	4681	22217	5748	4678	6488	1264	7610	4278	8630
Blue-billed Duck	-	326	2395	102	93	-	111	926	201	90	213
Musk Duck	464	322	3726	54	851	188	111	3692	1610	198	793
Exotic ducks	-	143	1745	1663	265	6	-	-	-	-	71
Eurasian Coot	626	4904	26938	2888	1937	10036	11741	42467	14716	2414	9357
TOTAL	50437	64058	113592	55836	72030	102728	73772	113592	103359	35102	57324

Distribution between habitats

The number of birds counted in wetlands supporting various categories of vegetation is shown in Table 9; there appeared to be preferences for wetlands in the 'dead trees' and 'sedges' categories (they represented 11 and 13 per cent, respectively, of wetlands and contained 25 and 30 per cent of birds) and avoidance of 'open' wetlands (42 per cent of wetlands, 8 per cent of birds).[7] In this overview, however, vegetation categories were confounded with wetland types and results should be interpreted cautiously. For example, most 'open' wetlands were dams and the reason that low numbers of birds were counted may have been that dams, rather than open habitats, were avoided.

Table 9

Number of waterfowl counted in each habitat type in 1989/90.

Habitat	November	March
Live trees	38465	32059
Trees/sedges	22742	23810
Sedges	57443	30061
Dead trees	48315	34237
Samphire	8679	10808
Open	14548	10867
TOTAL	190192	141842

Among lakes, which had the most diverse vegetation of all the types of wetland surveyed, the total number of waterbirds counted in the different vegetation categories more-or-less reflected the abundance of those categories (Fig. 6). In contrast, all species showed strong preferences for, or avoidance of, some vegetation categories. This is illustrated in Figure 6 but the habitat preferences shown, which were not always consistent between November and March, must be interpreted cautiously, because a small change in the number of birds in a rarer category of vegetation (e.g. 'samphire') can have a marked effect on the apparent preference for that habitat type.

7. Results of statistical tests of habitat preferences are not presented because significant deviations from expected frequencies were observed, because of large sample sizes, even when the percentage difference from expectation was very small. Habitat preferences were inferred only when scanning the data showed large differences between the number of birds expected in a habitat type and the number that occurred there.

In general, Black Swans appeared to use lakes with all vegetation categories, Australian Shelducks used lakes with vegetation typical of higher salinities and Pacific Black Ducks preferred live, non-halophytic vegetation although they showed preference for samphire in November. This latter result reflects the occurrence of 1000 birds in Lake Muir during that survey. Grey Teal and Pink-eared Ducks preferred dead trees; Chestnut Teal showed a preference for lakes dominated by samphire although they also occurred extensively in lakes dominated by trees. The habitat preferences of Australian Shovelers and Maned Ducks were difficult to interpret; they were probably avoiding wetlands with little emergent vegetation and, as a consequence, avoiding very high salinities. Hardheads preferred wetlands with trees although in March they also showed a preference for 'samphire', which reflected their occurrence in shallow, samphire-fringed lakes near Lake Grace during that survey. Blue-billed Ducks, Musk Ducks and Eurasian Coots showed a preference for lakes with trees or sedges, although Eurasian Coots appeared to have weaker habitat preferences than the other two species.

Numbers of birds on individual wetlands

The principal difference in numbers of birds counted on individual wetlands in November and March was the lack of very large concentrations of birds in March. It appeared that no surveyed wetland was acting as a summer drought-refuge (see Fig. 7b). Otherwise the pattern of occurrence was similar during both surveys; approximately 40 per cent of wetlands contained no birds (often because they were dry) and most of those with birds contained fewer than 100 (Fig. 7a).

Wetlands with high numbers of birds

The 15 wetlands containing the highest numbers of waterbirds in both the November and March surveys are listed in Table 10. Vasse-Wonnerup Estuary contained the highest number of birds in November (16 090) and Lake Clifton contained most in March (5572). Vasse-Wonnerup Estuary, Peel-Harvey Estuary, Lake Gore, Lake Clifton, Beverley Lakes, Thomsons Lake and Lake Coomelberrup were in the top 15 wetlands in both surveys.

Twelve of the wetlands in the November list were lakes and three were estuaries; in March there were two river sections, three estuaries and ten lakes. Wetlands with high numbers of birds

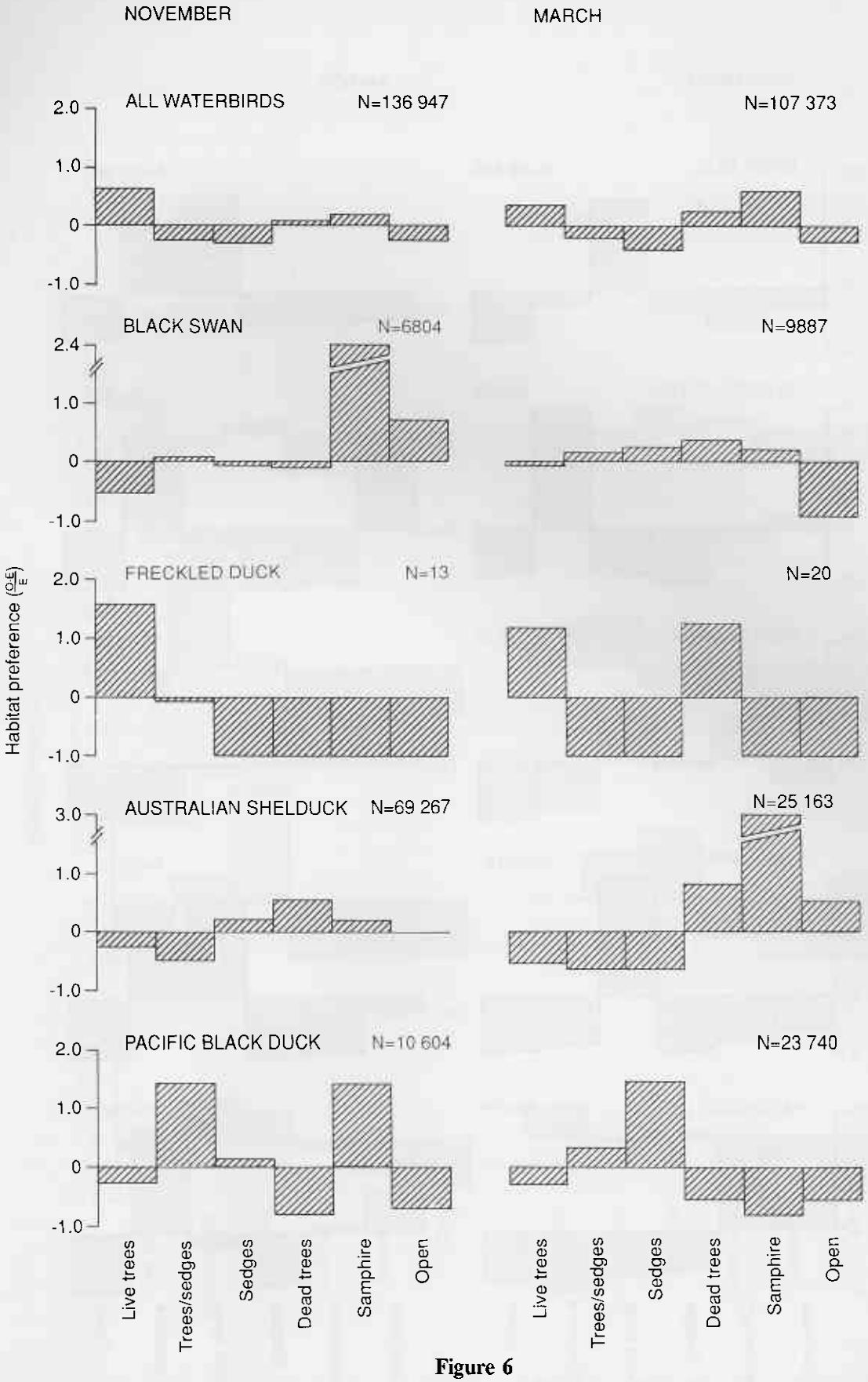

Figure 6

Habitat preferences of waterfowl species during the annual waterfowl counts in 1989/90. Preference for each vegetation type calculated as (O-E)/E where O was observed number of birds in each vegetation type and E was number expected if occurrence were proportional to the number of waterbodies of each vegetation type. Values of (O-E)/E are not symmetrical about zero.

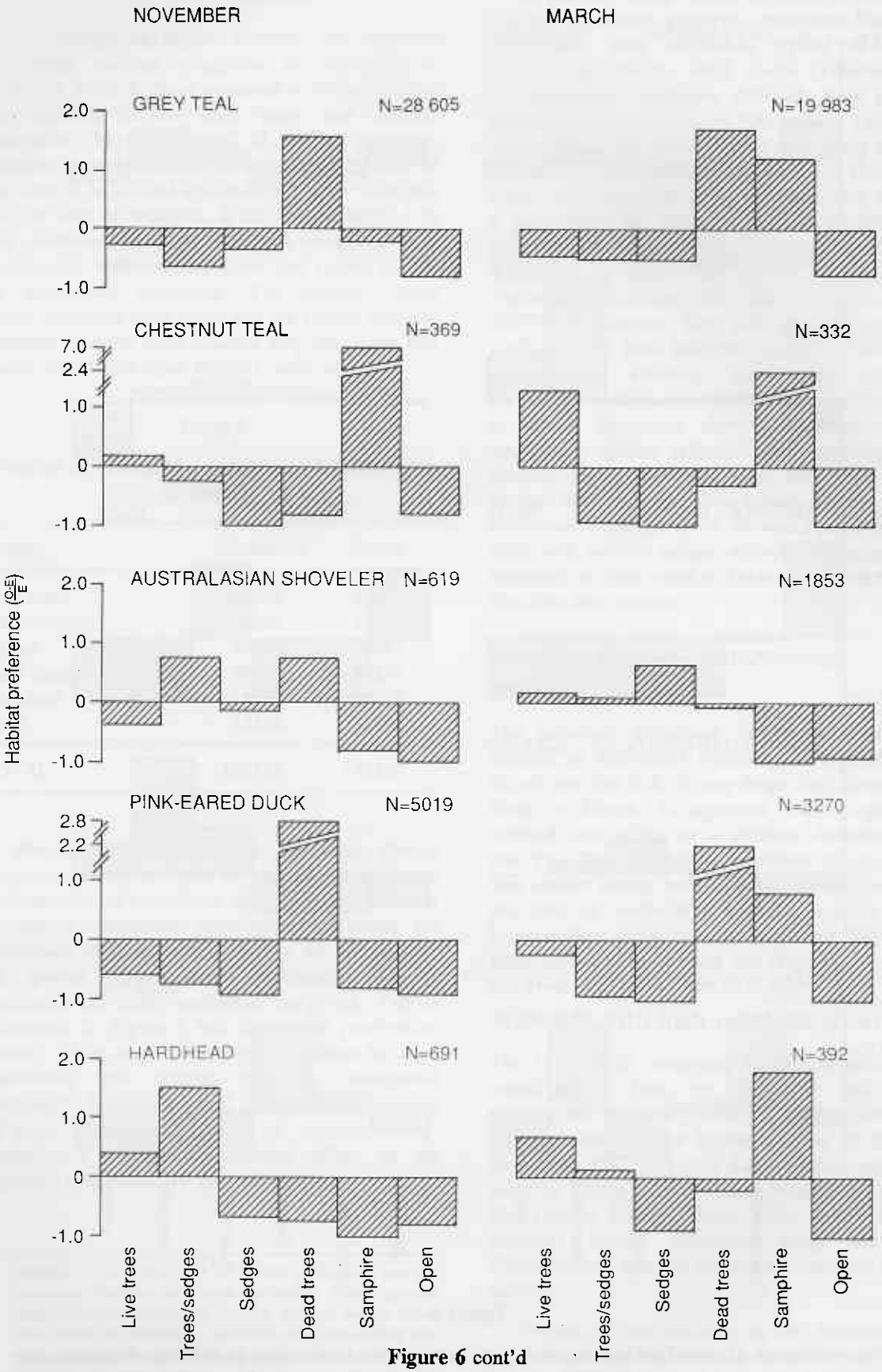

Figure 6 cont'd

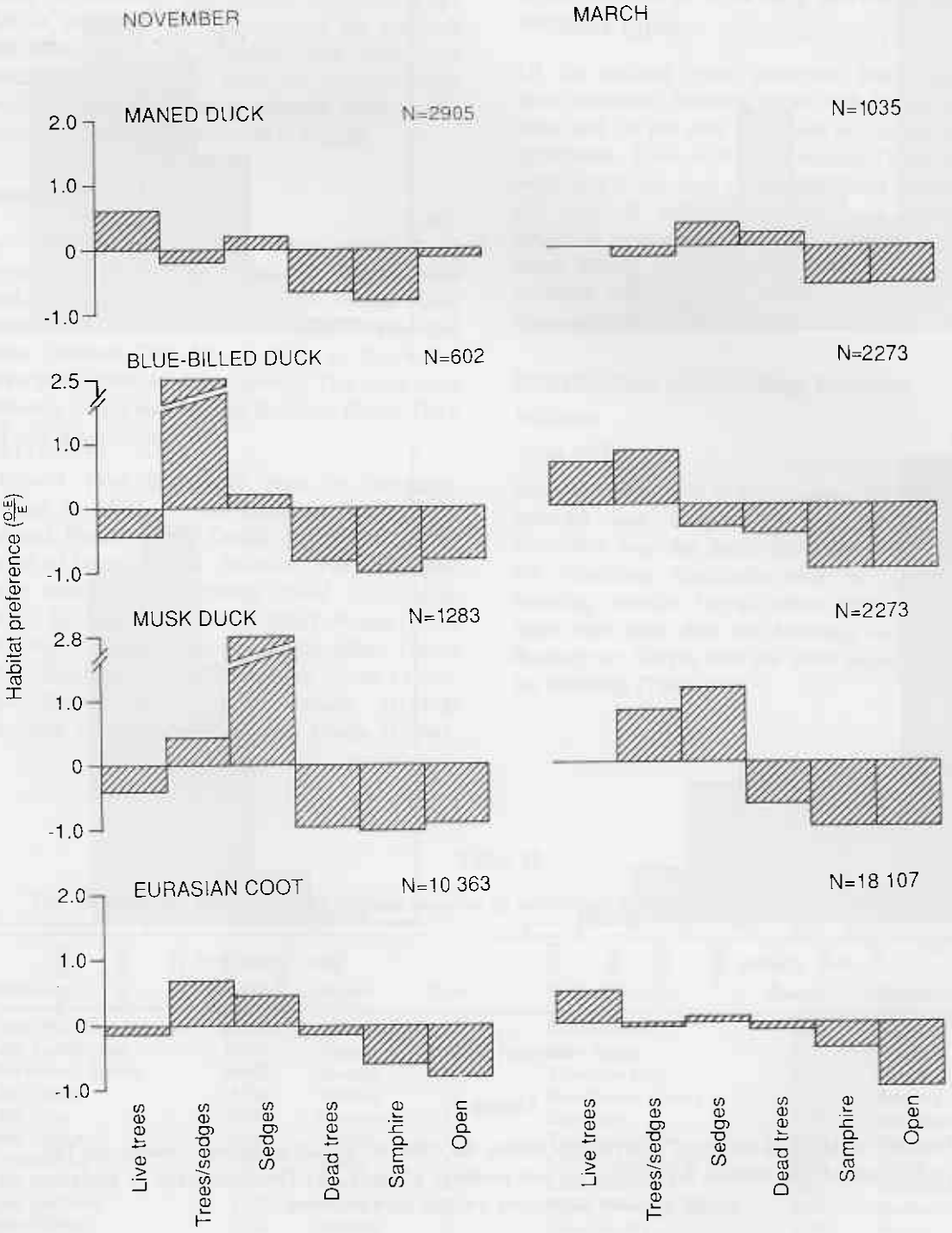

Figure 6 cont'd

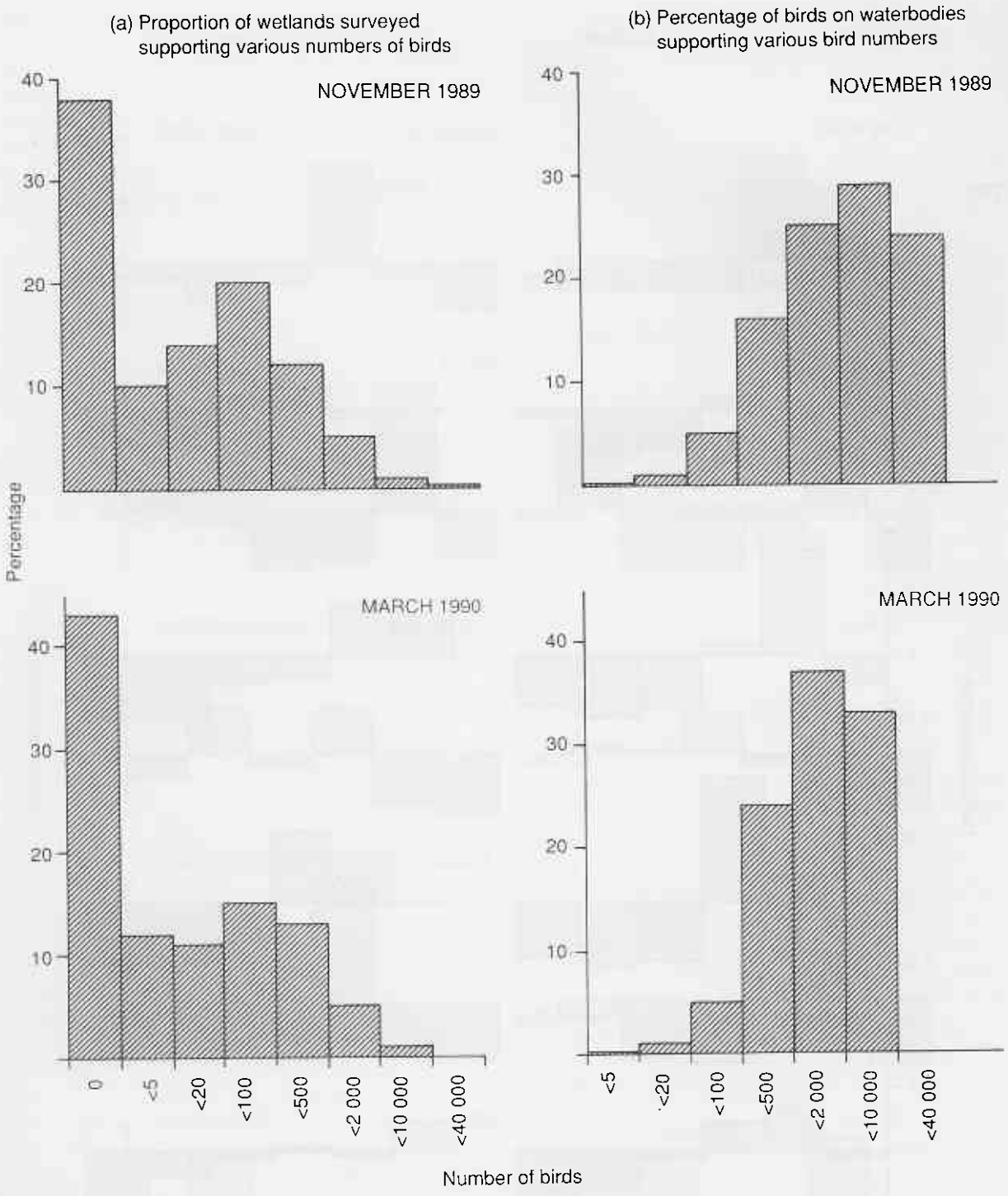

Figure 7

Number of birds in surveyed waterbodies during the 1989/90 annual waterfowl counts. (a) The percentage of waterbodies supporting various numbers of birds. (b) The percentage of birds on waterbodies supporting various bird numbers.

were concentrated in the Bunbury region in November (six of the top 15 occurred there) but were spread more evenly in March.

Wetlands with the three highest counts for each species in November and March, respectively, are listed in Appendix 2. Thirty-six of the wetlands were lakes, six were estuaries, five were river sections and one was a dam. All regions except Geraldton were represented although there was a concentration of listed wetlands in Gingin.

Amount of breeding

The majority of breeding was recorded in November when 140 nests and 815 broods were found. Only three nests and 20 broods were recorded in March (Table 5). No nests of Freckled Ducks, Chestnut Teal, Maned Ducks or Blue-billed Ducks were found in either survey. The nests most commonly found belonged to Eurasian Coots, Grey Teal and Black Swans.

Broods most commonly seen in November belonged to Black Swans, Eurasian Coots, Grey Teal and Pacific Black Ducks. In relation to the number of birds counted, however, Freckled Duck broods were most frequently found (ratio of 1 brood : 13 adults). Broods of Black Swans (1:38) were very common. Broods of Blue-billed Ducks (1:68), Hardheads (1:84), Eurasian Coots (1:90), Musk Ducks (1:92), exotic ducks (1:142), Pink-eared Ducks (1:148), Maned Ducks (1:264), Grey Teal (1:357), Pacific Black Ducks (1:481) and Chestnut Teal (1:598) were less common while Australian Shelduck broods (1:4085) were scarce.

Distribution of breeding between wetland types

Of the wetland types surveyed, lakes were the most important breeding areas with 76 per cent of nests and 59 per cent of broods occurring there in November. River sections contained 15 per cent of nests and 6 per cent of broods, dams contained 7 per cent of nests and 9 per cent of broods. Estuaries contained few nests (2 per cent) but many broods (26 per cent); their importance for breeding was largely a result of being the main brood-raising area for Black Swans (Table 11).

Distribution of breeding between regions

The majority of nest and brood records in November occurred in the Bunbury (35 per cent of records) and Gingin (27 per cent) regions. Geraldton was the most important breeding area for Australian Shelducks with 44 per cent of breeding records. For all other species for which there were more than two breeding records, either Bunbury or Gingin was the most important region for breeding (Table 12).

Table 10

The 15 wetlands supporting the highest number of waterfowl in November 1989 and March 1990.

	NOVEMBER 1989				MARCH 1990			
	Wetland	Number	Region	Type	Wetland	Number	Region	Type
1	Vasse-Wonnerup Estuary	16090	Bunbury	E[a]	Lake Clifton	5672	Bunbury	L
2	Lake Dumbleyung	14954	Wagin	L	Lake Eganu	3570	Moora	L
3	Peel-Harvey Estuary	14487	Bunbury	E	Thomsons Lake	3397	Gingin	L
4	Lake Preston	8716	Bunbury	L	Peel-Harvey Estuary	3211	Bunbury	E
5	Lake Gore	7741	Esperance	L	Lake Gore	3025	Esperance	L
6	Lake Guraga	7694	Gingin	L	Racecourse Lake	3004	Frankland	L
7	Coyrecup Lake	6064	Wagin	L	Lake Coomelberrup	2942	Wagin	L
8	Lake Muir	4705	Frankland	L	Lake Shaster	2881	Esperance	L
9	Lake McClarty	3197	Bunbury	L	Vasse-Wonnerup Estuary	2837	Bunbury	E
10	Lake Clifton	2852	Bunbury	L	Lake Norring	2537	Wagin	L
11	Beverley Lakes	2720	Beverley	L	Coblinine River Flats	2456	Wagin	R
12	Namming Lake	2696	Gingin	L	Wilson Inlet	2397	Walpole	E
13	Thomsons Lake	2532	Gingin	L	Byenup Lagoon	2392	Frankland	L
14	Lake Coomelberrup	2493	Wagin	L	Beverley Lakes	2327	Beverley	L
15	Leschenault Inlet	2130	Bunbury	E	Amarillo Pool	2133	Bunbury	R

[a]Wetland types: E = estuary, L = lake, R = river

Table 11

Distribution of breeding by waterfowl species among wetland types in south-west Western Australia in November 1989.

Species	Lake		River		Dam		Estuary	
	Nests	Broods	Nests	Broods	Nests	Broods	Nests	Broods
Black Swan	25	133	1	4	-	4	3	187
Freckled Duck	-	1	-	-	-	-	-	-
Australian Shelduck	-	35	-	5	1	5	-	1
Pacific Black Duck	1	65	4	14	4	14	-	11
Grey Teal	24	62	4	6	3	32	-	10
Chestnut Teal	-	1	-	1	-	-	-	-
Australasian Shoveler	1	-	-	-	-	-	-	-
Pink-eared Duck	10	32	-	-	-	2	-	-
Hardhead	2	8	-	1	-	-	-	-
Maned Duck	-	7	-	7	-	9	-	2
Blue-billed Duck	-	9	-	-	-	-	-	-
Musk Duck	1	14	-	-	-	-	-	-
Exotic ducks	-	2	1	-	-	-	-	1
Eurasian Coot	42	112	11	11	2	7	-	-
TOTAL	106	481	21	49	10	73	3	212

Table 12

Distribution of breeding (nests and broods combined) by waterfowl species among regions in south-west Western Australia in November 1989.

Species	REGION										
	Geraldton	Moora	Gingin	Beverley	Bunbury	Wagin	Magenta	Esperance	Frankland	Bremer	Walpole
Black Swan	1	-	58	18	219	21	1	9	5	1	24
Freckled Duck	-	-	1	-	-	-	-	-	-	-	-
Australian Shelduck	21	-	4	1	7	5	4	2	2	1	-
Pacific Black Duck	1	-	39	3	51	1	1	1	5	3	8
Grey Teal	6	4	19	14	32	31	6	9	11	4	5
Chestnut Teal	-	1	-	-	-	-	-	-	1	-	-
Australasian Shoveler	-	-	-	-	-	1	-	-	-	-	-
Pink-eared Duck	1	4	14	5	-	4	1	12	-	2	1
Hardhead	-	-	9	1	1	-	-	-	-	-	-
Maned Duck	4	-	8	-	6	1	2	-	2	-	2
Blue-billed Duck	-	-	5	-	3	-	-	-	-	-	1
Musk Duck	-	-	11	-	4	-	-	-	-	-	-
Exotic ducks	-	-	3	1	-	-	-	-	-	-	-
Eurasian Coot	3	4	103	29	8	6	6	9	7	10	-
TOTAL	37	13	274	72	331	70	21	42	33	21	41

Distribution of breeding between habitats

Very few breeding records (6 per cent) came from open wetlands or those containing only samphire in the inundated area. In general, more complex vegetation appears to be required for suitable breeding habitat although small numbers of birds bred near, and raised broods on, open freshwater dams.

The distribution of breeding by individual species was examined only for lakes, which comprised the wetland type supporting most breeding. The breeding data were too sparse to draw conclusions about habitat preferences of individual species but, overall, more waterbird breeding was recorded from lakes containing live or dead trees than from lakes with other types of vegetation (Table 13).

Table 13

Distribution of breeding within lakes according to vegetation category in south-west Western Australia in November 1989. N = nests, B = broods

Species	Live trees		Trees/sedges		Sedges		Dead trees		Samphire		Open	
	N	B	N	B	N	B	N	B	N	B	N	B
Black Swan	1	27	12	65	2	16	10	19	-	1	-	5
Freckled Duck	-	-	-	1	-	-	-	-	-	-	-	-
Australian Shelduck	-	3	-	6	-	1	-	24	-	1	-	-
Pacific Black Duck	1	20	-	30	-	9	-	5	-	-	-	1
Grey Teal	13	17	-	11	7	15	4	18	-	1	-	-
Chestnut Teal	-	1	-	-	-	-	-	-	-	-	-	-
Australasian Shoveler	-	-	-	-	-	-	1	-	-	-	-	-
Pink-eared Duck	3	12	-	4	-	3	7	9	-	-	-	4
Hardhead	-	1	2	7	-	-	-	-	-	-	-	-
Maned Duck	-	2	-	2	-	2	-	1	-	-	-	-
Blue-billed Duck	-	4	-	5	-	-	-	-	-	-	-	-
Musk Duck	1	3	-	11	-	-	-	-	-	-	-	-
Exotic ducks	-	1	-	1	-	-	-	-	-	-	-	-
Eurasian Coot	24	44	9	39	1	11	8	11	-	-	-	7
TOTAL	43	135	23	182	10	57	30	87	-	3	-	17

DISCUSSION

More waterfowl were counted in November 1989 (190 109) than November 1988 (147 757, Halse *et al.* 1990). We believe this was the result of less rain in winter 1989, which caused drier wetland conditions. The lack of water in ephemeral and seasonal wetlands caused more birds to move onto coastal estuaries and large 'drought-refuge' lakes in November 1989, when 24 per cent of waterfowl occurred on wetlands containing >10 000 birds compared with 8 per cent in November 1988.

In contrast to the November counts, far fewer birds were counted in March 1990 (141 734) than March 1989 (354 791, Halse *et al.* 1990). We consider it most likely that this was the result of the widespread rain in January 1990 (Fig. 4, Table 3) and the subsequent movement of birds on to recently flooded wetlands. Halse *et al.* (1990) predicted that a lower proportion of birds would be counted in wet years because a smaller proportion of recently flooded wetlands are counted than the estuaries and large lakes that contained most birds in March 1989. The two March counts are not an accurate reflection of actual numbers in the two years.

Using the current methodology, based on the November 1989 and March 1990 counts the estimated population of waterfowl in south-west Western Australia in summer of 1989/90 was approximately 1 000 000 birds. Applying the same calculations to data from 1988/89 suggests the population in summer of 1988/89 was approximately 1 400 000 birds (Table 14), which is twice the estimate given by Halse *et al.* (1990, p.15) whose extrapolation factors were too low. The factors used by Halse *et al.* (1990) were based on the impressions of waterfowl researchers about the distribution of birds and had no quantified basis.

The apparent decline in waterfowl populations in south-west Western Australia of 400 000 birds between the summers of 1988/89 and 1989/90 may have been the result of:

(a) downward bias introduced into the counting and extrapolation procedure in March 1990 owing to flooded conditions

(b) recruitment from breeding being insufficient to replace mortality incurred between years

(c) emigration.

The counts do not provide data to test these hypotheses but it is possible to speculate on their likelihood using available information. Water extended well beyond the usual March boundaries of some wetlands in 1990 and, in many cases, adjacent areas that had not been counted during previous surveys were flooded. In this situation many observers counted only the main wetland or had logistical problems obtaining complete counts

Table 14

Estimated number of waterfowl of each species in south-west Western Australia in November 1988 and March 1989.

Species	Nov 88	March 89
Black Swan	18180	66105
Freckled Duck	719	323
Australian Shelduck	177045	230896
Pacific Black Duck	60807	266144
Grey Teal	110825	449825
Chestnut Teal	1258	9758
Australasian Shoveler	3971	28860
Pink-eared Duck	4225	43018
Hardhead	8147	12631
Maned Duck	108584	125054
Blue-billed Duck	1666	5683
Musk Duck	3118	11291
Exotic ducks	2823	4690
Eurasian Coot	28755	181205
TOTAL	530121	1435483

of the flooded area because access was restricted. The extrapolation procedure usually assumed the entire wetland 'complex' had been counted and the degree of under-estimation resulting from incomplete counts is unknown. Another possible cause of under-estimation was that ephemeral waterbodies (such as roadside pools and flooded paddocks) were not included in the surveys. Usually this would affect only estimates of numbers in November but in 1990 it may have affected March estimates as well for some species. It is because there will always be water in some ephemeral waterbodies in November that March counts should provide better estimates of population size for most species.

Assuming that counting methods did not cause significant under-estimation of waterfowl numbers in the summer of 1989/90, a possible reason for the decline in estimated numbers was failure of recruitment to replace mortality. The annual rates of mortality in adult Pacific Black Ducks and Grey Teal are approximately 40 per cent but vary considerably between years (Halse *et al.* in press (b)). Rates are probably similar for other species[8] and waterfowl populations decline rapidly in dry years as a result of high mortality rates and poor breeding success (Braithwaite 1975). There were 47 per cent fewer records of breeding in November 1989 than in November 1988 (Halse *et al.* 1990), suggesting that 1989 was a poor year for breeding. Breeding success in Maned Ducks is known to be less in years of low rainfall (Kingsford 1989).

The third possible reason for the decline in estimated waterfowl numbers in 1989/90 was that some birds may have moved out of south-west Western Australia because of dry conditions in late 1989. Grey Teal are known to move long distances to escape drought Frith (1962); Grey Teal banded in south-west Western Australia have moved more than 3000 km to the Kimberley and eastern States.[9] Of the four species that appeared to decline most between 1988/89 and 1989/90, there is evidence to suggest that Grey Teal, Pink-eared Ducks (Frith 1977) and Hardheads (Jaensch and Vervest 1988a) move extensively; only Australasian Shovelers are regarded as sedentary (Frith 1977).

The most dramatic feature of the 1989/90 surveys was the dispersal of birds that followed the heavy rains of January 1990 and the consequent lack of concentrations of birds in drought-refuges in March. The numbers of birds per wetland in March were lower than in any previous March survey for all wetland types (Fig. 8). The dispersal of birds in 1990, combined with high rainfall outside the survey area in January (e.g. east of the Beverley region, Fig. 3) provides additional support for the idea that emigration was partly responsible for the low count in March 1990.

It has been suggested that duck-shooting may contribute to declines in waterfowl populations in south-west Western Australia (Payne 1990) but this is unlikely to have been an important factor in 1989/90. The estimated number of game birds killed by hunters during the 1990 hunting season was only 15 000 - 30 000,[10] yet game species declined by 350 000 (30 per cent). Non-game species declined by 72 000 (27 per cent). Halse *et al.* (in press (b)) found no evidence that hunting affected mortality rates of Pacific Black Ducks or

8. Mortality rates have been calculated by Norman (1970, 1971a, 1971b, 1973) for Australian Shelducks, Maned ducks and Hardhead but, because the life-table analyses he used are now considered to provide biased estimates, his rates should be used cautiously.

9. Halse, S.A., Diepeveen, D.A. and Munro, D.R. (in prep). Recoveries of Grey Teal and Pacific Black Ducks banded in south-western Australia 1952-1976.

10. Department of Conservation and Land Management files.

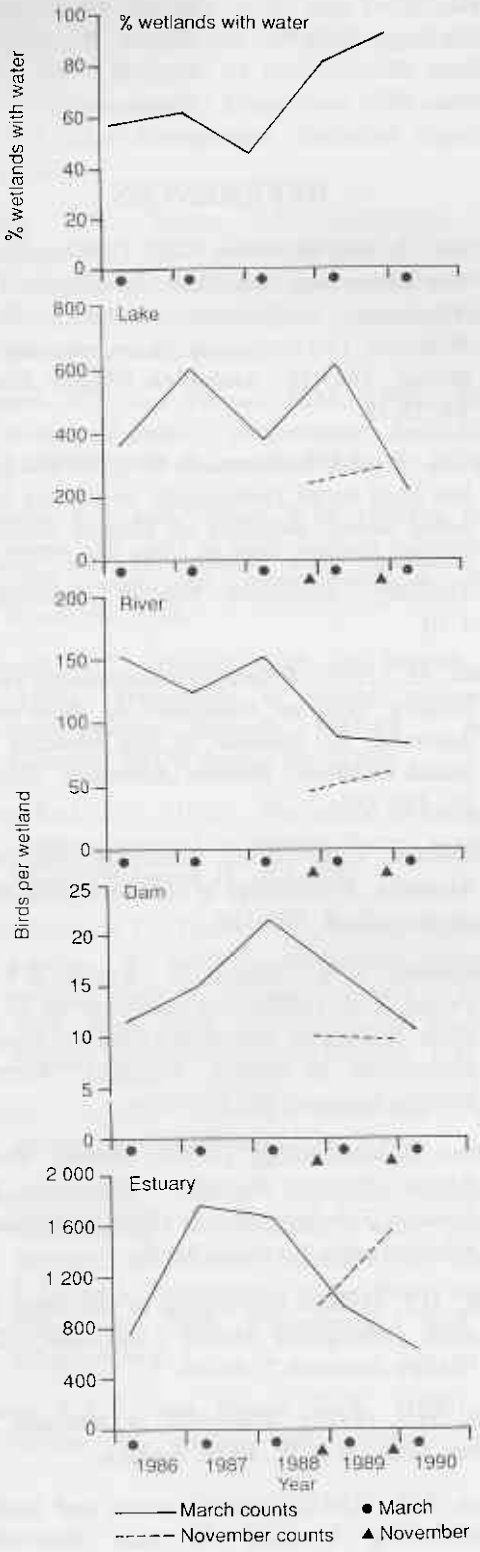

Figure 8

The number of birds per wetland unit during annual waterfowl counts between 1986-90 compared with the percentage of depth-gauged wetlands containing water in January (1986-89) or March (1990) (J.A.K. Lane, D.R. Munro and S.A. Halse unpublished data).

Grey Teal at a regional level during the 1970s when hunting pressure was greater than in 1990[11].

In spite of the January rains and the fact that at least Grey Teal exhibited testicular response to the rainfall within two weeks[12], there were fewer breeding records in March 1990 (23) than March 1989 (92). This was surprising, given that widespread breeding was recorded after similar rains in February 1955 (Serventy and Marshall 1957) and January 1982 (Bekle 1983), and that there were follow-up rains in February and March 1990 (Bureau of Meteorology 1990).

ACKNOWLEDGEMENTS

Rob Turner was a very skilful pilot during the aerial surveys; Chris Wilder entered the waterfowl data on computer. Mike Choo provided advice on programming as well as writing some of the software used and Ian Laing provided information about the number of dams in the survey area. Most of the funding for this project was provided by duck-shooters' licence fees (via the Nature Conservation and National Parks Trust Fund) and through observers meeting their own costs. We wish to thank the following observers who participated in the counts:

Abbott, J.	Agar, G.
Baker, G.	Barrett, B.
Bell, A.	Bellairs, B.
Bentley, P.	Bigwood, C.
Blewett, M.	Blyth, J.
Boughey, J.	Bremner, M.
Broadhurst, L.	Brockman, N.
Brooke, J.	Buchanan, B. & A.
Burbidge, A.	Bush, T.
Carr, B.	Carter, D.
Clark, H.	Clay, P.
Clegg, M.	Congreve, P. & D.
Cooke, A.	Crane, J.
Curry, S.	Danks, A.
DeCampi, G.	Denny, R.

11. Average number of licensed hunters between 1971/72 and 1976/77 was 5503, number of licensed hunters in 1989/90 was 3301 (J.A.K. Lane, unpublished data).

12. Testes of 40 Grey Teal examined on 14 January 1990 were assessed as stage 7 or 8 (regressing, see Halse 1985) and follicles in ovaries were <2 mm in diameter whereas testes of 25 Grey Teal seen on 10-11 February were classed as Stage 6 (breeding) and ovaries contained follicles up to 4 mm in diameter. No response was evident in the gonads of six Australian Shelduck examined on 10-11 February.

Donohoe, J.
Doyle, F.
Durrell, P.
Edwards, U.
Ewert, J.
Fermaner, H.
Fleay, J.
Godfrey, N.
Graham, M.
Green, O.
Hall, R.
Hamersley, B.
Harrison, L.
Haythornthwaite, K.
Hill, S.
Hopkins, V.
Hunt, J.
Jacoby, P.
Jasper, R.
Jones, A. & R.
Keogh, S.
Kneebone, B.
Leighton, P.
Lupton, L.
Malone, B.
Masters, J.
Mattner, J. & C.
McRoberts, B. & K.
Meredith, B.
Millar, D.
Moir, R.
Morgan, D.
Motteram, R.
Nash, D.
Nurick, J.
Page, E.
Parry, C.
Paynter, R.
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Richter, C.
Rigby, R.
Robinson, N.
Roocke, A.
Rose, A.
Rule, D.
Sandstrom, D.
Scott, K.
Sedgwick, E.
Shannon, G
Silvester, L.
Singleton, E.
Smith, R.
Start, J. & H.
Taylor, J. & A.
Turpin, M.
Van Delft, R. & C.
Watkins, D.
Dowson, J.
Duff, N.
Dyer, G.
Egerton-Warburton, P.
Fairbairn, K.
Fernie, L.
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Goodale, B.
Green, J.
Hale, B.
Halse, N.
Hamilton, N.
Hartley, B.
Higham, M.
Hodgson, P.
Howden, P.
Hutchinson, J.
James, D.
Jennings, P.
Keighley, W.
Kingston, D.
Lane, J.
Lloyd, J.
Mack, P.
Margrain, C. & T.
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McGuire, M.
Mercer, C.
Metcalfe, E.
Milne, E.
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Rule, R.
Scarff, A.
Scott, S.
Shadbolt, K.
Shannon, P
Sinderberry, P.
Skipsey, L.
Standring, I.
Talbot, J. & V.
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Appendix 1

Master list for annual waterfowl counts. The wetlands are arranged in a north-south, east-west sequence according to survey blocks (see Fig. 1) and the numbers of waterfowl counted in November and March are shown (blanks indicate wetlands were not counted). Wetlands surveyed from air are indicated by an asterisk. For wetland types: D = dam, E = estuary, L = lake, R = river. For vegetation: D = dead trees, M = trees/sedges, O = open, R = sedges, S = samphire, T = trees.

Block	Wetland	Type	Vegetation	Nov Count	Mar Count
048-210	KALBARRI SEWERAGE PONDS	D	O	96	156
048-210	MURCHISON RIVER ESTUARY	E	O	1	0
048-210	WITTECARA SWAMP	L	S	90	0
048-212	FOUR-MILE POOL (MURCHISON RIVER)	R	R	19	18
048-212	TEN-MILE POOL (MURCHISON RIVER)	R	R	84	2
049-211	SEAVIEW SOUTH-WEST LAKES	L	R	64	139
049-211	URINA CREEK SWAMP	L	O		
049-211	UTCHA SWAMP	L	T	138	48
049-212	BINNU WEST ROAD LAKE	L	T	10	0
049-212	WELD EAST LAKE	L	O	0	
050-212	BOWES RIVER MOUTH	R	T	5	90
050-212	DAM 1 050-212	D	O	0	0
050-212	DAM 2 050-212	D	R		0
050-212	EASTBROOK POOL	R	M	2	3
050-212	MIAMA SOUTH-EAST LAKE	L	T	23	39
051-212	DAM 1 051-212	D	O		
051-212	DAM 2 051-212	D	O		
051-212	DAM 3 051-212	D	O		
051-212	FIG TREE SOUTH POOL	R	O	2	120
051-212	GREENOUGH ESTUARY	E	S		267
051-212	ROCKY POOL LAKE	L	O		0
051-212	ROCKY POOL WEST	R	T		23
051-213	BEETALYINNA POOLS	R	T	32	
051-213	BLUE POOLS	R	T	28	
051-213	DAM 1 051-213	D	O		
051-213	ELLENDALE POOL	R	M	35	0
051-213	WHICHERINA DAM	D	O	11	
051-214	EVES LAKES	L	O	0	0
051-214	HABITONS LAKES	L	O	0	0
051-214	LAKE COOLANGATTA	L	O	0	0
051-214	NAGADE LAKES	L	D	458	58
052-213	BOOKARA LAKE	L	D	2	0
052-213	BOOKARA NORTH LAKE	L	D	0	0
052-213	BUTCHER-HENRY SWAMP	L	O	0	0
052-213	ELLERY POOL	R	O		0
052-213	FORSYTHE SWAMP	L	T		210
052-213	MONDARRA SWAMP	L	O	0	0
052-214	BURMA ROAD LAKE	L	O		0
052-214	DAM 1 052-214	D	O		
052-214	DAM 2 052-214	D	O		
052-214	HEATON SWAMP	L	O		0
052-214	MENDARA POOL	R	O		0
053-213	ARRAMALL LAKE	L	O	19	2
053-213	ARROWSMITH LAKE	L	O	31	0

Block	Wetland	Type	Vegetation	Nov. Count	Mar. Count
053-215	DAM 1 053-215	D	O	0	0
053-215	DAM 2 053-215	D	O	0	0
053-215	RUBBISH TIP LAKE	L	O	0	103
053-215	YANDANOOKA LAKE A	L	D	0	88
053-215	YANDANOOKA LAKE B	L	O	0	0
053-215	YARRA YARRA POND 1	L	O	0	1476
054-213	DAM 1 054-213	D	O		0
054-213	GREEN LAKE	L	O	180	0
054-213	INDOON HOMESTEAD LAKE (RUSHY)	L	M	16	0
054-213	INDOON HOMESTEAD SWAMP	L	T	0	0
054-213	LAKE INDOON	L	T	12	0
054-213	LAKE LOGUE	L	T		0
054-213	SOUTH LOGUE SWAMP	L	T	0	0
054-213	WHITE LAKE (ENEABBA)	L	R	0	0
054-213	YANGET LAKE	L	T	0	0
054-214	ARRO LAKE	L	R	0	0
054-214	DAM 1 054-214	D	O	0	0
054-214	DAM 2 054-214	D	O	0	0
054-214	DAM 3 054-214	D	O	0	0
054-214	DAM 4 054-214	D	O	40	0
054-214	DAM 5 054-214	D	O	0	0
054-215	DAM 1 054-215	D	O	0	0
054-215	DAM 2 054-215	D	O	0	3
054-215	YARRA YARRA POND 2	L	S	0	1126
054-215	YARRA YARRA POND 3	L	S	0	29
054-215	YARRA YARRA POND 4	L	S	0	0
054-216	CAPAMAURA SWAMPS	L	D	0	795
054-216	DAM 1 054-216	D	O	0	0
054-216	DAM 2 054-216	D	O	0	0
054-216	EGANU FIREBREAK NORTH LAKE	L	D	0	112
054-216	EGANU FIREBREAK SOUTH LAKE	L	D	0	5
054-216	TOUCHE NORTH LAKES	L	R	318	66
054-216	TOUCHE SALT LAKE	L	D		2
054-216	TOUCHE SOUTH LAKE	L	R	0	15
054-216	WASH (COOROW) POOL	R	O	0	5
054-216	WINCHESTER WEST LAKES	L	S	0	449
054-217	BEAUTIFUL LAKE	L	O	0	0
054-217	DAM 1 054-217	D	O	0	2
054-217	LITTLE NEDO LAKE	L	O	0	0
055-213	COCKLESHELL FIRST LAKE	L	T	0	0
055-213	DAM 1 055-213	D	O	0	0
055-213	DAM 2 055-213	D	T	33	0
055-213	JURIEN SWAMP	L	T	0	
055-213	TYRERS SWAMP	L	M	122	66
055-214	BITTER POOL NORTH	R	T	0	0
055-214	CANOVER SWAMP	L	R	0	0
055-214	DAM 1 055-214	D	O	0	
055-214	DAM 2 055-214	D	O	0	0
055-214	DAM 3 055-214	D	O	44	1
055-214	DAM 4 055-214	D	O	0	0
055-214	DAM 5 055-214	D	O	0	0
055-214	MUNBINEA NORTH SWAMP	L	M	34	135
055-214	MUNGAGARRA SWAMP	L	M	3	88
055-216	CALLEEN LAKE	L	D	549	41
055-216	DAM 1 055-216	D	O	2	0
055-216	DAM 2 055-216	D	R	0	0

Block	Wetland	Type	Vegetation	Nov. Count	Mar. Count
055-216	GLENROY SOUTH LAKE	L	D	44	45
055-216	HUNTS LAKE	L	D	26	29
055-216	LAKE EGANU	L	D	395	3570
055-216	LAKE PINJARREGA	L	D	0	830
055-216	SCOTTS SOUTH-WEST LAKE	L	D	603	0
055-216	WONJAN LAKE	L	T	0	105
055-217	DAM 1 055-217	D	O	0	2
055-217	DAM 2 055-217	D	O	0	0
055-217	DAM 3 055-217	D	O	0	0
055-217	DAM 4 055-217	D	O	0	0
055-217	DAM 5 055-217	D	O	0	0
055-217	KORODONG SWAMP	L	D	0	0
055-217	LAKE VIEW NORTH LAKES	L	D	0	368
055-217	MARTINJINNI EAST LAKE	L	D	0	2
055-217	WENDOUREE LAKE	L	D	0	2
056-213	THETIS LAKE	L	O	0	0
056-213	WEALACUTTA POOL	R	R	33	30
056-214	BIBBY NORTH SWAMP	L	T	0	0
056-214	DAM 1 056-214	D	R	0	0
056-214	DAM 2 056-214	D	O	0	0
056-214	DAM 3 056-214	D	T	0	1
056-214	JETTY SOUTH SWAMP NORTH	L	R	135	0
056-214	JETTY SOUTH SWAMP SOUTH	L	O	0	0
056-214	TWYATA POOL	R	M	0	0
056-215	DAM 1 056-215	D	O		0
056-215	DAM 2 056-215	D	O		0
056-215	DAM 3 056-215	D	O		2
056-215	DAM 4 056-215	D	O		0
056-215	DAM 5 056-215	D	O		0
056-215	WOLBA WOLBA WELL LAKE	L	R		175
056-215	YALLALIE WELL LAKE	L	T		0
056-216	COOMBERDALE WEST SWAMPS	L	S	0	450
056-216	DAM 1 056-216	D	O	0	1
056-216	DAM 2 056-216	D	O	0	0
056-216	DAM 3 056-216	D	O	0	2
056-216	NAMBAN RESERVE SWAMP	L	T	0	0
056-216	PRICE'S EAST AND WEST LAKES	L	R		116
056-216	PRICES ROAD LAKE	L	R	120	
056-216	RACECOURSE LAKE	L	D	0	675
056-216	SREETS WEST SWAMP	L	T	0	0
056-216	STREETS SWAMP NORTH	L	M	0	0
056-216	STREETS SWAMP SOUTH	L	T	0	0
056-217	CARWOOLA NORTH-WEST LAKE	L	O		0
056-217	DAM 1 056-217	D	O		5
056-217	DAM 2 056-217	D	O		18
056-217	DAM 3 056-217	D	O		0
056-217	DAM 4 056-217	D	O		0
056-217	DAM 5 056-217	D	O		0
056-217	EDAWA LAKES	L	R		264
056-218	DAM 1 056-218	D	O	0	2
056-218	DAM 2 056-218	D	O	26	1
056-218	DAM 3 056-218	D	O	22	
056-218	DAM 4 056-218	D	O	16	
056-218	DAM 5 056-218	D	O	0	
056-218	DAMBORING SIDING LAKE	L	S	0	22
056-218	WANEARY LAKE	L	S	0	2

Block	Wetland	Type	Vegetation	Nov. Count	Mar. Count
057-214	CARO SWAMP	L	T	20	12
057-214	CARO WEST POOL (MINYULO BROOK)	R	T	5	36
057-214	GARBA CARO SWAMP	L	T	0	
057-214	GARBA GARBA SWAMP	L	T	0	
057-215	CRACKERS SWAMP	L	M	55	63
057-215	DAM 1 057-215	D	O	0	0
057-215	HURSTVIEW LAKE	L	T	1502	349
057-215	LAKE GURAGA	L	O	7694	0
057-215	MOOCHAMULLA POOLS	R	T	11	4
057-215	NAMMEGARRA ROAD EAST SWAMP	L	R	2	0
057-215	NAMMEGARRA ROAD WEST SWAMP	L	M	0	0
057-215	NAMMING LAKE	L	T	2696	842
057-215	PETES POND	L	D	3	34
057-216	BARBERTON WEST SWAMP	L	T	0	0
057-216	BOXALL SWAMP	L	M	0	0
057-216	DAM 1 057-216	D	O	2	0
057-216	DAM 2 057-216	D	O	0	0
057-216	DAM 3 057-216	D	O	0	0
057-216	DAM 4 057-216	D	O	0	2
057-216	DAM 5 057-216	D	O	0	0
057-216	KOODJEE SWAMP	L	R	129	9
057-217	DAM 1 057-217	D	O	0	0
057-217	DAM 2 057-217	D	O	0	9
057-217	DAM 3 057-217	D	O	16	16
057-217	DAM 4 057-217	D	O	0	4
057-217	DAM 5 057-217	D	O	0	4
057-217	NOONDA LAKE	L	O	0	0
057-217	SPREADALONG LAKES	L	D	0	
057-218	DAM 1 057-218	D	O	0	0
057-218	DAM 2 057-218	D	O	0	4
057-218	DAM 3 057-218	D	O	41	38
057-218	DAM 4 057-218	D	O	0	21
057-218	HINDS LAKE	L	O	0	0
057-218	KONDUT EAST LAKES	L	R	208	89
057-218	NINAN LAKE	L	D	0	0
057-218	NINAN SOUTH SWAMP	L	R	0	0
057-218	RUPERT LAKES	L	O	0	52
058-214	KARAKIN NORTH LAKE	L	O	6	0
058-215	BARRETT-LENNARD LAKE	L	T	817	396
058-215	BLYTHS LAKE	L	T	324	93
058-215	CALADENIA LAKE	L	T	2	0
058-215	DAM 1 058-215	D	M	2	0
058-215	DAM 2 058-215	D	O	0	2
058-215	GREENWOOD NORTH-EAST SWAMP	L	T	15	0
058-215	KAWIGIN POOL	R	O	7	6
058-215	LITTLE BOOTINE SWAMP	L	T	37	332
058-215	WANERIE ROAD SWAMP	L	T	116	84
058-215	WHITE LAKE (GINGIN)	L	M	121	0
058-215	YURINE SWAMP	L	T	3	0
058-216	BULLINGARRA LAKE	L	T	0	0
058-216	CUMMUNGUP POOL	R	M	150	388
058-216	DAM 1 058-216	D	O	44	41
058-216	DAM 2 058-216	D	O	0	2
058-216	DAM 3 058-216	D	O	3	7
058-216	DAM 4 058-216	D	O	6	31
058-216	DAM 5 058-216	D	O	0	10

Block	Wetland	Type	Vegetation	Nov. Count	Mar. Count
058-216	FOOTBALL LAKE	L	T	146	52
058-216	LAKE WANNAMAL	L	T	961	684
058-216	LOWER MOGUMBER POOL	R	O	8	59
058-216	TAYLORS LAKES	L	T	403	448
058-217	DAM 1 058-217	D	O	0	0
058-217	DAM 2 058-217	D	O	0	0
058-217	REDGUM SWAMP	L	T	0	0
058-217	YARRAWINDAH POOL	R	T	16	27
058-218	BOLGART - SMITH LAKE	L	O	8	30
058-218	BOLGART EAST LAKE NORTH	L	D	0	33
058-218	DAM 1 058-218	D	O	2	0
058-218	DAM 2 058-218	D	O	0	0
058-218	DAM 3 058-218	D	R	0	2
058-218	DAM 4 058-218	D	R	0	0
058-218	DAM 5 058-218	D	O	0	0
058-218	RIFLE RANGE LAKE	L	D	0	30
058-218	WROTH LAKE	L	R	0	13
058-219	BOOKERBIDEY SWAMPS	L	R	44	14
058-219	DAM 1 058-219	D	O	15	2
058-219	DAM 2 058-219	D	O	0	0
058-219	DAM 3 058-219	D	O	0	0
058-219	DAM 4 058-219	D	O		0
058-219	DAM 5 058-219	D	O	14	0
058-219	KOOMBEKINE WEST LAKE	L	D		202
058-219	LAKE WALYORMOURING	L	D	2	100
058-219	NAMBLING LAKE	L	D	0	35
058-219	TWINE EAST LAKE	L	S	0	0
059-215	CHITNA ROAD DAM 059-215	D	M	45	
059-215	DEEPWATER LAGOON	L	O	102	
059-215	DIAMOND ISLAND REACH (MOORE RIVER)	R	M	0	
059-215	LAKE NOWERGUP	L	M	583	
059-215	LOCH MCNESS	L	R	76	
059-215	PIPIDINNY SWAMP	L	R	142	29
059-216	DAM 1 059-216	D	O	0	0
059-216	DAM 2 059-216	D	O	8	10
059-216	DAM 3 059-216	D	O	0	0
059-216	DAM 4 059-216	D	O	5	0
059-216	DAM 5 059-216	D	O	0	0
059-216	GINNIBY EAST POOL	R	O	0	132
059-216	GOYAMIN POOL	R	D	9	9
059-216	LAKE BAMBUN	L	M	156	
059-216	LAKE CHANDALA	L	T	395	31
059-216	LAKE CHITTERING	L	T	1709	1979
059-216	LAKE MUNGALA	L	O	66	
059-217	BIN-DEW LAKE	L	D	3	10
059-217	LONG POOL (AVON RIVER)	R	T	11	21
059-217	LOVERS LANE POOL (AVON RIVER)	R	T		0
059-217	NINE-MILE DAM 059-217	D	O	13	0
059-217	REDBANK - MILLARD POOL (AVON RIVER)	R	T	36	141
059-217	SANDSPRING NORTH DAM 059-217	D	R		
059-217	SANDSPRING WEST LAKE	L	T	0	
059-217	SINCLAIR DAM 059-217	D	T	29	7
059-217	STONEY-BROKE DAM 059-217	D	O	5	28
059-218	CLARKES LAKES A AND B	L	D	1197	384
059-218	GALE - HAMERSLEY LAKE	L	D	59	
059-218	GLEN AVON DAM A 059-218	D	T	85	150

Block	Wetland	Type	Vegetation	Nov. Count	Mar. Count
059-218	GLEN AVON DAM B 059-218	D	O	0	0
059-218	GLEN AVON DAM C 059-218	D	O	10	38
059-218	HERRIDGE LAKE	L	D	56	10
059-218	KATRINE POOL (AVON RIVER)	R	M	444	128
059-218	LYNWOOD DAM 059-218	D	O	0	0
059-218	NORTHAM WEIR POOL (AVON RIVER)	R	M	455	329
059-218	PARNHAMS LAKE	L	R	1423	409
059-218	WOODENDALE TOP DAM 059-218	D	O	6	
059-219	COOKES DAM 059-219	D	O	62	131
059-219	DAM 1 059-219	D	O	0	
059-219	DAM 2 059-219	D	R	0	0
059-219	DAM 3 059-219	D	O	0	
059-219	DAM 4 059-219	D	O	0	
059-219	HILLSIDE LAKES	L	D	153	189
059-219	MEENAAR LAKE	L	R	45	41
059-219	SADLER ROAD LAKE	L	D	188	49
059-220	DAM 1 059-220	D	O	0	
059-220	DAM 2 059-220	D	O	0	
059-220	DAM 3 059-220	D	O	0	
059-220	DAM 4 059-220	D	O	26	
059-220	DAM 5 059-220	D	O	0	
059-220	MASTERS LAKE	L	D	33	
059-220	NOONYING LAKE	L	D	40	
059-220	YOUERING SOUTH LAKE	L	D	1	
060-215	ERINDALE ROAD POND	L	R	44	30
060-215	HERDSMAN LAKE	L	R	162	803
060-215	LAKE CLAREMONT	L	T	226	118
060-215	LAKE GWELUP	L	M	447	1279
060-215	LAKE JOONDALUP	L	M	394	
060-215	LAKE MARIGINIUP	L	R	38	31
060-215	LAKE MONGER	L	M	653	1329
060-215	MABEL TALBOT PARK LAKE	L	O	52	154
060-215	PERRY LAKES	L	M	293	457
060-215	SHENTON PARK LAKE	L	O	292	198
060-215	WEEBILL - SPOONBILL PONDS	L	O	59	124
060-216	AITKEN - NEWBURN POND	L	R	83	104
060-216	AMIENS POOL	R	D	0	
060-216	BAYSWATER SANCTUARY SWAMP	L	D	101	137
060-216	DOG SWAMP	L	R	114	157
060-216	EMU - BALLAJURA LAKES	L	R	482	704
060-216	HERNE LAKE	L	R	25	27
060-216	HYDE PARK LAKES	L	M	188	377
060-216	JANDABUP LAKE	L	R	8	115
060-216	SWAN RIVER ESTUARY	E	M	614	1116
060-216	SYDNEY ROAD SWAMP	L	O	0	0
060-216	TOMATO LAKE	L	M	346	447
060-217	DAM 1 060-217	R	O	30	6
060-217	DAM 2 060-217	D	D	8	13
060-217	DAM 3 060-217	D	D	19	64
060-217	DAM 4 060-217	D	O	2	1
060-217	DAM 5 060-217	D	O	68	80
060-217	LAKE LESCHENAULTIA	L	R	36	
060-217	MANARING LAKE	L	M	2	0
060-217	RED SWAMP	L	R	21	21
060-218	CHAPEL POOL (AVON RIVER)	R	T	253	202
060-218	DAM 1 060-218	D	O	16	0

Block	Wetland	Type	Vegetation	Nov. Count	Mar. Count
060-218	DAM 2 060-218	D	O	0	0
060-218	HAMERSLEY POOL (AVON RIVER)	R	T	118	19
060-218	SPENCERS CREEK (WEISNER DAM) 060-218	D	D	76	25
060-219	DAM 1 060-219	D	O		
060-219	DAM 2 060-219	D	O		
060-219	DAM 3 060-219	D	O	0	
060-219	DAM 4 060-219	D	O	10	
060-219	DAM 5 060-219	D	O	14	
060-219	DUCK POOL	R	T	18	
060-219	KELLY POOL	R	O	7	79
060-219	WONOBBING POOL	R	T		
060-220	BADJALING NORTH POOL (SALT RIVER)	R	D		0
060-220	DAM 1 060-220	D	O		1
060-220	DAM 2 060-220	D	O		35
060-220	DAM 3 060-220	D	O		3
060-220	DAM 4 060-220	D	O		0
060-220	DAM 5 060-220	D	O		0
060-221	DAM 1 060-220	D	O		0
060-221	DAM 2 060-220	D	O		0
060-221	DAM 3 060-220	D	O		20
060-221	DAM 4 060-220	D	O		52
060-221	DAM 5 060-220	D	O		20
060-221	KEVILLS LAKES	L	D		114
060-221	KWOLYIN SOAK LAKE	L	R		0
060-221	SHACKLETON SOUTH-WEST LAKE	L	O		0
061-215	BIBRA LAKE	L	M	836	918
061-215	HOPE ROAD SWAMP	L	R		89
061-215	LAKE COOLOONGUP	L	O	138	1039
061-215	LAKE KOGOLUP	L	M	186	731
061-215	LAKE RICHMOND	L	M		69
061-215	LITTLE RUSH LAKE	L	M	8	2
061-215	MANDOGALUP (WATTLEUP) LAKE	L	T	198	206
061-215	MANNING LAKE	L	T	71	13
061-215	NORTH LAKE	L	T		161
061-215	THOMSONS LAKE	L	R	2532	3397
061-215	YANGEBUP LAKE	L	T	1470	1284
061-216	BLUE GUM LAKE	L	D	118	155
061-216	BOORAGOON LAKE	L	T	249	205
061-216	CANNING CITY OFFICE PONDS	L	M	71	153
061-216	CANNING RIVER (KENT-FOOTBRIDGE)	R	T	43	383
061-216	FORREST - LIDDELOW SWAMP	L	M	339	0
061-216	GIBBS ROAD SWAMP	L	T	152	6
061-216	LAKE FORRESTDALE	L	M	563	746
061-216	MARY CARROLL PARK LAKE	L	M	141	245
061-216	MCDOUGALL PARK LAKE	L	M	85	232
061-216	NICHOLSON - OXLEY SWAMP	L	M	244	0
061-218	BAYATYNE POOL	R	T	0	
061-218	BURALONG POOL	R	T	2	
061-218	BUTCHERS POOL (DALE RIVER)	R	T	35	
061-218	DAM 1 061-218	D	R	4	
061-218	DAM 2 061-218	D	O	76	
061-218	DAM 3 061-218	D	O	0	
061-218	DAM 4 061-218	D	M	13	
061-218	DAM 5 061-218	D	O	81	
061-218	OAKOVER POOL (AVON RIVER)	R	T	18	
061-218	THOMAS SWAMP	L	R	102	

Block	Wetland	Type	Vegetation	Nov. Count	Mar. Count
061-219	BURNSIDE LAKE	L	D	229	28
061-219	CORBEDING SWAMP	L	T	105	104
061-219	DAM 1 061-219	D	O	1	24
061-219	DAM 2 061-219	D	O	0	0
061-219	DAM 3 061-219	D	O	9	2
061-219	DAM 4 061-219	D	O	47	42
061-219	DAM 5 061-219	D	O		0
061-219	MAITLAND SWAMP	L	D	339	91
061-219	MURRAYS SWAMP	L	R	449	181
061-219	ROBINS POOL	R	D	41	34
061-219	WANNERING POOL	R	D	39	55
061-220	BEVERLEY LAKES*	L	D	2720	2327
061-220	DAM 1 061-220	D	O	0	2
061-220	DAM 2 061-220	D	O	0	2
061-220	DAM 3 061-220	D	O	0	0
061-220	DAM 4 061-220	D	O	13	0
061-220	DAM 5 061-220	D	O	0	21
061-220	LAKE MEARS*	L	D	1192	147
061-220	MILLS NORTH SWAMP	L	D	176	36
061-220	MILLS SOUTH SWAMP	L	D	170	138
061-220	MORBINING WEST LAKE	L	D		
061-220	QUALEM DOWNS LAKE*	L	D	541	73
062-215	AMARILLO POOL (SERPENTINE RIVER)*	R	T	357	2133
062-215	BARRAGHUP SWAMP	L	T	33	13
062-215	BEENYUP SWAMPS	L	T	199	76
062-215	BLACK LAKES (SE OF GEOGRUP)*	L	R	1879	480
062-215	CARRABURMUP SWAMP	L	T	605	0
062-215	GEOGRUP POOL (SERPENTINE RIVER)*	L	R	37	121
062-215	GREY ROAD SWAMP	L	M	698	0
062-215	GUANARUP POOL (SERPENTINE RIVER)	R	M	0	180
062-215	MURRAY RIVER (DELTA TO PINJARRA)	R	M	801	1704
062-215	PEEL-HARVEY ESTUARY*	E	R	14487	3211
062-215	YALBANBERUP NORTH-WEST DAM 062-215	D	R		0
062-215	YALBANERUP POOL (SERPENTINE RIVER)*	R	M	16	191
062-216	BIG SEC SWAMP	L	M	144	126
062-216	DAM 1 062-216	D	O	41	0
062-216	DAM 2 062-216	D	O	13	34
062-216	DAM 3 062-216	D	O	0	0
062-216	DAM 4 062-216	D	O	3	7
062-216	DAM 5 062-216	D	R	14	0
062-216	DAM 6 062-216	D	R	0	12
062-216	DAM 7 062-216	D	O	12	0
062-216	WEST CORIO SWAMP	L	T	401	9
062-216	YANGEDI SWAMP	L	M	104	0
062-218	DAM 1 062-218	D	O	3	0
062-218	DAM 2 062-218	D	D	38	2
062-218	DAM 3 062-218	D	O	6	0
062-218	DAM 4 062-218	D	R	22	2
062-218	DAM 5 062-218	D	O	0	1
062-218	DAM 6 062-218	D	O	4	0
062-218	GINBONGING POOL	R	T	0	0
062-219	DAM 1 062-219	D	O	0	0
062-219	DAM 2 062-219	D	O	0	0
062-219	DAM 3 062-219	D	O	0	0
062-219	HORSESHOE LAKE	L	M	0	0
062-219	NAPPING POOL	R	M	0	4

Block	Wetland	Type	Vegetation	Nov. Count	Mar. Count
062-219	PUMPHREYS POOL	R	M	11	0
062-219	UAMBINE POOL	R	T	0	0
062-220	DAM 1 062-220	D	O	0	0
062-220	DAM 2 062-220	D	O	14	0
062-220	DAM 3 062-220	D	O	0	0
062-220	DAM 4 062-220	D	O	8	0
062-220	DAM 5 062-220	D	O	0	2
062-220	GLEN MORREL SWAMP	L	D	0	2
062-220	KALAROO EAST SWAMPS	L	D	165	172
062-221	DAM 1 062-221	D	O	0	
062-221	DAM 2 062-221	D	O	0	
062-221	DAM 3 062-221	D	O	0	
062-221	DAM 4 062-221	D	O	0	
062-221	DAM 5 062-221	D	O	0	
062-221	LAKE BROWN*	L	D	176	286
062-221	LAKE NONALLING*	L	D	99	416
062-221	LAKE YEALERING*	L	D	642	501
063-215	DAM 1 063-215	D	O	0	1
063-215	DAM 2 063-215	D	O	99	20
063-215	EAST OF GOODALE LAKE	L	M		174
063-215	FISHERMANS WEST SWAMP	L	T	0	0
063-215	GOODALE SANCTUARY LAKES	L	M		7
063-215	HARVEY RIVER (LOWER REACH)*	R	M	11	75
063-215	LAKE CLIFTON*	L	R	2852	5672
063-215	LAKE MCLARTY*	L	M	3197	1988
063-215	LAKE MEALUP*	L	M	755	677
063-215	LAKE PRESTON*	L	R	8716	865
063-215	PEPPERMINT EAST SWAMP	L	R	0	0
063-216	BAKER STREET SWAMP	L	R	11	0
063-216	COOLUP WEST LAKE A	L	R	49	0
063-216	COOLUP WEST LAKE B	L	R	26	0
063-216	CORNUCOPIA LAKE	L	T	57	0
063-216	DAM 1 063-216	D	R	0	28
063-216	DAM 2 063-216	D	O	0	
063-216	HAMEL FOREST SWAMP	L	M	2	0
063-216	LOGUE NORTH POOL (YARLOOP)	D	R	56	143
063-217	CAMBALLING POOL	R	T	2	9
063-217	DAM 1 063-217	D	O	22	3
063-217	DAM 2 063-217	D	R	46	0
063-217	DAM 3 063-217	D	O	0	0
063-217	LOWER HOTHAM POOL	R	T	14	18
063-217	MURRAY RIVER POOL	R	M	13	3
063-217	SADDLEBACK SWAMP	L	M	0	0
063-218	DAM 1 063-218	D	O	27	0
063-218	DAM 2 063-218	D	O	40	0
063-218	DAM 3 063-218	D	O	20	2
063-218	DAM 4 063-218	D	O	5	0
063-218	DAM 5 063-218	D	O	31	2
063-218	DUMBITMOONY POOL	R	O	3	0
063-218	MORAMOCKING POOL	R	M	0	3
063-219	BOYAMUCKING POOL	R	M		5
063-219	DAM 1 063-219	D	T		53
063-219	DAM 2 063-219	D	O		3
063-219	DAM 3 063-219	D	O		2
063-219	DAM 4 063-219	D	O		1
063-219	DAM 5 063-219	D	O		42

Block	Wetland	Type	Vegetation	Nov. Count	Mar. Count
063-220	CARRABENING POOL	R	D	0	0
063-220	DAM 1 063-220	D	R	69	2
063-220	DAM 2 063-220	D	O	0	0
063-220	DAM 3 063-220	D	O	0	0
063-220	DAM 4 063-220	D	O	0	0
063-220	DAM 5 063-220	D	D	4	10
063-220	NOMANS LAKE*	L	D	0	287
063-221	BILLY LAKE*	L	D	95	2010
063-221	BOKAN LAKE*	L	D	0	251
063-221	DAM 1 063-221	D	O		9
063-221	DAM 2 063-221	D	O		0
063-221	DAM 3 063-221	D	O		0
063-221	DAM 4 063-221	D	O		0
063-221	DAM 5 063-221	D	O		0
063-221	IBIS LAKE*	L	D	0	313
063-221	LAKE TAARBLIN*	L	O	0	0
063-221	LAKE TOOLIBIN*	L	T	0	257
063-221	LAKE WALBYRING*	L	T	0	158
064-215	BRUNSWICK RIVER (RIDLEY'S)	R	M	16	29
064-215	DAM 1 064-215	D	R	0	0
064-215	DAM 2 064-215	D	R	6	0
064-215	DAM 3 064-215	D	R	4	0
064-215	DAM 4 064-215	D	R	0	0
064-215	DAM 5 064-215	D	R	0	0
064-215	DUNN ROAD SWAMP	L	M	7	0
064-215	GUNYAH POOL	R	M	120	
064-215	KEMERTON LAKES	L	M	21	145
064-215	LESCHENAULT INLET*	E	R	2130	521
064-215	ROSAMEL SWAMP	L	T	119	0
064-215	WELLESLEY ROAD SOUTH SWAMP	L	M	46	3
064-216	BENGER SWAMP	L	M	723	0
064-216	HARVEY SEWERAGE PONDS	D	O	191	309
064-217	COLLIE NORTH-EAST POOL	R	T		0
064-217	DELAYNEY POOL	R	O		0
064-218	DAM 1 064-218	D	O		
064-218	DAM 2 064-218	D	T		
064-218	DAM 3 064-218	D	T		
064-218	DAM 4 064-218	D	O		
064-218	MEEKING NORTH LAKE	L	T		
064-218	MEEKING WEST SWAMP A	L	T		
064-218	MEEKING WEST SWAMP B	L	T		
064-218	NAMINE LAKE	L	T		
064-219	CARBERDINE POOL	R	T	5	0
064-219	DARDADINE SOUTH-EAST LAKE	L	T	112	0
064-219	DUFFS DAM 064-219	D	O	10	0
064-219	HALLS DAM 064-219	D	O	14	0
064-219	KAINS DAM 064-219	D	T	7	0
064-219	KONDENING POOL	R	M	2	0
064-219	ROSES DAM 064-219	D	T	26	2
064-219	ROVIE LAKE	L	D	47	105
064-219	SARGEANTS DAM 064-219	D	T	99	258
064-219	WANAKING POOL	R	T	6	1
064-219	WIESE LAKE	D	D	167	141
064-220	BALLAGIN POOL	R	O	6	17
064-220	BUNGON POOL	R	O	56	4
064-220	DAM 1 064-220	D	O		0

Block	Wetland	Type	Vegetation	Nov. Count	Mar. Count
064-220	DAM 2 064-220	D	O	0	0
064-220	DAM 3 064-220	D	O	0	0
064-220	DAM 4 064-220	D	O	2	0
064-220	DAM 5 064-220	D	O	0	0
064-220	LAKE GUNDARING*	L	D	2012	939
064-220	LITTLE WHITE LAKE*	L	D	9	172
064-220	WAGIN LAKE	L	D	445	0
064-220	WHITE LAKE (NARROGIN)*	L	O	0	0
064-223	BIG LAKE*	L	O	0	399
064-223	BM 282 LAKE*	L	T	0	786
064-223	CEMETRY LAKE*	L	S	0	306
064-223	DAM 1 064-223*	D	O	0	0
064-223	DAM 2 064-223*	D	O	0	0
064-223	DAM 3 064-223*	D	O	0	0
064-223	DAM 4 064-223*	D	O	0	0
064-223	DAM 5 064-223*	D	O	0	24
064-223	RUINS LAKE NORTH*	L	D		416
064-223	RUINS LAKE SOUTH*	L	D	0	1093
064-224	DAM 1 064-224*	D	O	0	2
064-224	DAM 2 064-224*	D	O	2	0
064-224	DAM 3 064-224*	D	O	28	40
064-224	DAM 4 064-224*	D	O	0	21
064-224	DAM 5 064-224*	D	O	0	0
064-224	LAKELAND NAT. RES. (MALLEE HILL ROAD) LAKE	L	T	0	30
064-224	RINGAMERE LAKE*	L	D	0	160
064-225	DAM 1 064-225*	D	O	0	0
064-225	DAM 2 064-225*	D	O	0	0
064-225	DAM 3 064-225*	D	O	0	0
064-225	DAM 4 064-225*	D	O	0	3
064-225	DAM 5 064-225*	D	O	2	20
064-225	LAKE BIDDY*	L	D	183	370
064-225	LAKE HILL*	L	S	0	0
064-225	RODGER LAKE*	L	D	21	352
064-226	DAM 1 064-226*	D	O	0	0
064-226	DAM 2 064-226*	D	O	0	0
064-226	DAM 3 064-226*	D	O	0	0
064-226	DAM 4 064-226*	D	O	25	2
064-226	DAM 5 064-226*	D	O	5	1
064-226	UPSON DOWNS LAKE*	L	T	0	19
064-227	BANGOR LAKE*	L	O	0	0
064-227	DAM 1 064-227*	D	O	0	0
064-227	DAM 2 064-227*	D	O	0	5
064-227	DAM 3 064-227*	D	O	0	5
064-227	DAM 4 064-227*	D	O	0	19
064-227	DAM 5 064-227*	D	O	0	2
064-227	DUNN ROCK SKI LAKE*	L	T	157	40
064-227	KATHLEEN NATURE RESERVE LAKE*	L	O	0	0
064-227	LAKE PALLARUP*	L	S	0	0
064-227	SUGG LAKE*	L	D	5	110
064-228	BAANGAR HILL LAKE*	L	S	152	0
064-228	DAM 1 064-228*	D	O	0	0
064-228	DAM 2 064-228*	D	O	0	25
064-228	DAM 3 064-228*	D	O	0	0
064-228	DAM 4 064-228*	D	O	1	0
064-228	DAM 5 064-228*	D	O	15	2
064-228	STENNETS LAKE*	L	D	212	379

Block	Wetland	Type	Vegetation	Nov. Count	Mar. Count
065-213	DAM 1 065-213	D	O	0	0
065-213	DAM 2 065-213	D	D	24	3
065-213	DUNN BAY LAKE	L	M	16	0
065-213	QUINDALUP SIDING LAKE	L	T	148	0
065-214	BUSSELTON POOL	R	T	353	
065-214	NEW RIVER SWAMP	L	T	461	
065-214	VASSE-WONNERUP ESTUARY*	E	R	16090	2837
065-215	CAPEL SOUTH SWAMPS	L	M	115	0
065-215	DAM 1 065-215	D	O		
065-215	DAM 2 065-215	D	O		
065-215	DAM 3 065-215	D	O		
065-215	DODSON POOL	R	O	25	27
065-215	MCCARLEYS SWAMP	L	T	135	149
065-215	PUNCHBOWL (BUNBURY BIG) SWAMP	L	R	153	334
065-215	SCOTTS POOL A	R	R	0	24
065-215	SCOTTS POOL B	R	T	2	0
065-215	WANERAGUP LAKE	L	T	271	0
065-216	DAM 1 065-216	D	O	11	31
065-216	DAM 2 065-216	D	O	29	50
065-216	DAM 3 065-216	D	O	6	38
065-216	DAM 4 065-216	D	O	38	54
065-216	DAM 5 065-216	D	O	4	17
065-216	MINNINGUP POOL (COLLIE RIVER)	R	R	0	0
065-217	COLLIE BURN POOL	R	M		0
065-217	DAM 1 065-217	D	O		0
065-217	DAM 2 065-217	D	O		0
065-217	DUDERLING POOLS	R	O		0
065-217	NGARTIMINNY LAKES	L	R		52
065-218	BOONINUP NORTH POOL	R	T	44	18
065-218	CAPERCUP SOUTH LAKE	L	T		62
065-218	DAM 1 065-218	D	M	5	9
065-218	DAM 2 065-218	D	R	59	25
065-218	DAM 3 065-218	D	O	0	2
065-218	DAM 5052 065-218	D	R	30	0
065-218	DAM 5814 065-218	D	R	37	0
065-218	DURANILLIN SWAMP	L	M		160
065-218	GLENORCHY POOL	R	T	66	0
065-218	LAKE TOWERRINNING	L	D	123	374
065-218	MOODIARRUP SWAMPS	L	D	94	0
065-219	DAM 1 065-219	D	O	60	0
065-219	DAM 2 065-219	D	O	36	2
065-219	DAM 2992 065-219	D	R		
065-219	DAM 3 065-219	D	O	3	2
065-219	DAM 4 065-219	D	O	0	2
065-219	DAM 5 065-219	D	O	0	2
065-219	DEADMANS LAKES	L	D	888	0
065-219	FITZES SWAMP	L	T	1736	818
065-219	KOOLBOOKING SWAMP	L	D	25	0
065-219	SIX MILE POOL	R	O	97	12
065-219	WANDIBIRRUP POOL	R	O	117	66
065-220	BOKARING YATE SWAMP*	L	D	1998	120
065-220	DAM 1 065-220	D	O	0	
065-220	DAM 2 065-220	D	O	7	
065-220	DAM 3 065-220	D	O	0	
065-220	LAKE FLAGSTAFF	L	D	812	
065-220	LAKE MARTINUP	L	D	212	

Block	Wetland	Type	Vegetation	Nov. Count	Mar. Count
065-220	LAKE MIRIPIN	L	D	155	
065-220	LAKE NORRING*	L	D	30	2537
065-220	LAKE PARKEYERRING*	L	D	615	811
065-220	LAKE WARDERING	L	D	790	
065-220	RIVERDALE WEST POOL	R	O	0	
065-221	CASUARINA LAKE*	L	D	450	333
065-221	COBLININE RIVER FLATS*	R	D	1834	2456
065-221	CORACKINE LAKE	L	D	344	112
065-221	DAM 1 065-221	D	O	0	2
065-221	DAM 2 065-221	D	O	0	2
065-221	DAM 3 065-221	D	O	0	2
065-221	KAILAGUP LAKE	L	T	21	0
065-221	LAKE COOMELBERRUP	L	D	2493	2942
065-221	LAKE DUMBLEYUNG*	L	D	14954	836
065-222	DAM 1 065-222*	D	O	0	0
065-222	DAM 2 065-222*	D	O	10	0
065-222	DAM 3 065-222*	D	O	0	0
065-222	DAM 4 065-222*	D	O	25	0
065-222	DAM 5 065-222*	D	O	0	10
065-223	DAM 1 065-223*	D	O	0	0
065-223	DAM 2 065-223*	D	O	0	0
065-223	DAM 3 065-223*	D	O	0	0
065-223	DAM 4 065-223*	D	O	0	0
065-223	DAM 5 065-223*	D	O	0	4
065-223	LAKE ALTHAM*	L	S	0	587
065-223	SKIPSEYS LAKE	L	O		0
065-223	WILLOUGHBY SWAMP A*	L	S	602	437
065-223	WILLOUGHBY SWAMP B*	L	S	717	798
065-224	BRYDE NORTH SWAMP	L	T	0	45
065-224	CLAIRES LAKE	L	D	0	343
065-224	DAM 1 065-224	D	O	0	2
065-224	DAM 2 065-224	D	O	0	0
065-224	DAM 3 065-224	D	O	0	0
065-224	DAM 4 065-224	D	O	0	0
065-224	DUNCOMBE BEND LAKE	L	D	70	0
065-224	LAKE BRYDE	L	T	11	0
065-224	NEVE ROAD LAKE	L	O	480	4
065-224	PINGARNUP LAKE	L	S	12	0
065-224	THOMAS ROAD LAKES	L	S	272	0
065-225	DAM 1 065-225	D	O	0	35
065-225	DAM 2 065-225	D	O	0	0
065-225	DAM 3 065-225	D	T	8	0
065-225	EAST BRYDE NATURE RESERVE LAKE	L	T	26	82
065-225	GRANT - WILLIAMS EAST SWAMP	L	T	0	15
065-225	SALT LAKE SOUTH-EAST OF LAKE BRYDE	L	D	0	64
065-226	ANEMBE NORTH LAKE	L	T	35	40
065-226	COBHAM LAKE	L	O	0	
065-226	DAM 1 065-226	D	O	2	0
065-226	DAM 2 065-226	D	O	0	0
065-226	DAM 3 065-226	D	O	0	0
065-226	PAGE - GILES LAKE	L	T	23	45
065-227	DAM 1 065-227	D	O	0	0
065-227	DAM 2 065-227	D	O	0	0
065-227	NATURE RESERVE 31424 YATE SWAMP	L	T	0	0
065-227	WINDMESH NORTH-WEST LAKE	L	T	175	18
065-228	CARLINGUP POOL (JERDACUTTUP RIVER)	R	T		

Block	Wetland	Type	Vegetation	Nov. Count	Mar. Count
065-228	DAM 1 065-228	D	O	0	0
065-228	DAM 2 065-228	D	O	0	2
065-228	DAM 3 065-228	D	O	0	0
065-228	DAM 4 065-228	D	O		
065-228	DAM 5 065-228	D	O		
065-228	LAKE CHIDNUP*	L	D	634	731
065-229	DAM 1 065-229	D	O	0	0
065-229	DAM 2 065-229	D	O	0	0
065-229	DAM 3 065-229	D	O	10	0
065-229	FENCE EAST YATE SWAMP	L	O		
065-230	DAM 1 065-230	D	O	57	0
065-230	DAM 2 065-230	D	O	2	0
065-230	DAM 3 065-230	D	O	0	0
065-230	WEST POINT YATE SWAMP	L	T	226	80
065-232	DAM 1 065-232	D	O	0	0
065-232	DAM 2 065-232	D	O	0	0
065-232	FIELDS - GRIFFITH MAIN SWAMP	L	T	80	37
065-232	FIELDS - GRIFFITH SOUTH SWAMP	L	T	37	7
065-233	DAM 1 065-233	D	O	0	3
065-233	DAM 2 065-233	D	O	0	0
065-233	DAM 3 065-233	D	O	0	0
065-233	GIBSON NORTH RUBBISH LAKE	L	T	2	2
065-233	TEANO LAKE	L	D	104	71
065-234	CAMPBELLS ROAD NORTH LAKE	L	O	0	0
065-234	DAM 1 065-234	D	O	0	0
065-234	DAM 2 065-234	D	O	0	0
065-234	DAM 3 065-234	D	O	0	0
065-234	GIBSON ROAD (ESPERANCHO) SWAMP	L	T	43	0
065-234	JENABILLUP ROAD LAKE	L	O	74	2
066-213	DAM 1 066-213	D	O	24	87
066-213	DAM 2 066-213	D	O	12	14
066-213	DAM 3 066-213	D	O	12	0
066-213	DAM 4 066-213	D	O	3	0
066-213	DAM 5 066-213	D	O	26	4
066-213	DAM 6 066-213	D	O	30	0
066-213	DAM 7 066-213	D	O	4	4
066-214	DAM 1 066-214	D	T		0
066-214	DAM 2 066-214	D	O	24	0
066-214	DAM 3 066-214	D	O	117	4
066-214	DAM 4 066-214	D	O	73	11
066-214	LYNWOOD LAKE	L	M	391	61
066-214	NGAMBURNUP SWAMP	L	T	179	98
066-214	REINSCOURT FARM LAKES	L	O	288	45
066-214	THE BROADWATER	L	T	97	0
066-215	CAMBRAY POOL	R	T	2	0
066-215	DAM 1 066-213	D	M	52	
066-215	ELLIS POOL	R	T	5	6
066-215	NANNUP NORTH-EAST SWAMP	L	R	0	0
066-215	NANNUP TOWN SWAMP	L	R	0	0
066-215	RUSHYS SWAMP	L	R	20	0
066-216	DAM 1 066-216	D	O	0	0
066-216	DAM 2 066-216	D	O	0	0
066-216	DAM 3 066-216	D	O	0	0
066-216	DAM 4 066-216	D	O	0	0
066-216	DAM 5 066-216	D	O	0	0
066-216	MARINUP POOL	R	O		35

Block	Wetland	Type	Vegetation	Nov. Count	Mar. Count
066-216	QUONGUP POOL	R	O		0
066-216	SPRING GULLY SWAMP	L	O		0
066-217	DAM 1 066-217	D	O	0	0
066-217	DAM 2 066-217	D	R	1	0
066-217	DAM 3 066-217	D	M	29	0
066-217	DAM 4 066-217	D	M	2	0
066-217	DAM 5 066-217	D	R	0	0
066-217	MANDALUP POOL	R	T	14	0
066-217	WINNEJUP POOL	R	O	8	0
066-217	WOODSTOCK POOL	R	O	3	2
066-218	DAM 1 066-218	D	O		16
066-218	DAM 2 066-218	D	O		2
066-218	DAM 3 066-218	D	O		8
066-218	EULIN SOUTH LAKE	L	R		0
066-218	PENWORTHAM POOL	R	M		2
066-218	QUALEUP LAKES	L	R		0
066-218	TRIGWELL POOL	R	M		12
066-218	WILDHORSE SWAMP	L	T		0
066-219	CHANGERUP NORTH LAKE	L	T	455	0
066-219	CHANGERUP POOL	R	O	19	5
066-219	DAM 1 066-219	D	O	0	0
066-219	DAM 2 066-219	D	O	0	0
066-219	DAM 3 066-219	D	O	0	0
066-219	DAM 4 066-219	D	O	52	
066-219	DAM 5 066-219	D	O	23	
066-219	FAIRFIELDS LAKES	L	M	3	0
066-219	MAYDALLING LAKES	L	D	736	0
066-219	MINNINUP POOLS (MURRIN BROOK)	R	T		
066-219	RUSHY LAKE	L	T	114	0
066-220	CHADWICKS DAM 066-220	D	T	9	0
066-220	CHERRY TREE POOL	R	T	0	0
066-220	DAM 1 066-220	D	O	0	0
066-220	KANGAROO EAST DAM 066-220	D	O	68	0
066-220	MARAGOONDA POOLS	R	T	4	4
066-220	NGOPITCHUP SWAMP	L	T	0	0
066-220	WHITE GUM DAM 066-220	D	O	35	2
066-221	COYRECUP LAKE*	L	D	6064	379
066-221	DAM 1 066-221	D	O	0	0
066-221	DAM 2 066-221	D	O	4	0
066-221	DAM 3 066-221	D	O	0	0
066-221	DAM 4 066-221	D	O	0	0
066-221	DAM 5 066-221	D	O	0	0
066-221	EWLYAMARTUP LAKE*	L	D	84	437
066-221	HOTKER-DOUGLAS WEST LAKE	L	D	0	8
066-221	MORLEY CREEK SWAMP	L	D	6	48
066-221	PERINGILLUP POOLS	R	D	54	34
066-221	TWONKAWILLING POOL	R	T	43	21
066-222	CARALLEN NORTH-WEST SWAMP	L	D	35	559
066-222	DAM 1 066-222	D	O	5	4
066-222	DAM 2 066-222	D	O	2	0
066-222	DAM 3 066-222	D	O	0	2
066-222	DAM 4 066-222	D	O	1	28
066-222	KWOBRUP EAST SWAMP	L	D	3	232
066-223	CARRAMAR LAKE	L	T	1015	314
066-223	DAM 1 066-223	D	O	7	0
066-223	DAM 2 066-223	D	O	2	0

Block	Wetland	Type	Vegetation	Nov. Count	Mar. Count
066-223	DAM 3 066-223	D	O	2	0
066-223	WIGBORO NORTH SWAMP	L	D	173	0
066-223	WIGBORO SOUTH SWAMP	L	D	23	60
066-224	CAIRLOCUP WEST LAKE	L	S	195	0
066-224	DAM 1 066-224	D	O	14	0
066-224	DAM 2 066-224	D	O	0	12
066-224	DAM 3 066-224	D	O	0	0
066-224	DAM 4 066-224	D	O	0	0
066-224	EL DORADO PARK SWAMP	L	T	21	14
066-224	MAGNER NORTH-EAST LAKE A	L	T	0	
066-224	MAGNER NORTH-EAST LAKE B	L	T	0	
066-224	ONGERUP ROAD SWAMP	L	T	35	52
066-224	YAALUP LAGOON	L	T	0	293
066-225	DAM 1 066-225	D	O	6	12
066-225	DAM 2 066-225	D	O	0	0
066-225	DAM 3 066-225	D	O	0	0
066-225	OLD JERRAMUNGUP POOL (GAIRDNER RIVER)	R	O	15	0
066-226	DAM 1 066-226	D	O	2	0
066-226	DAM 2 066-226	D	O		15
066-226	FARAWAY LAKES	L	T	4	
066-227	DAM 1 066-227	D	O	16	
066-227	DRUMMOND HILL LAKE EAST*	L	T	311	2
066-227	DRUMMOND HILL LAKE WEST*	L	T	0	0
066-228	CULHAM INLET*	E	M	690	1027
066-228	FOULDS DAM 066-228	D	O	0	
066-228	HAMMERSLEY INLET*	E	S	293	1
066-228	PHILLIP RIVER (LOWER REACH)*	E	M	107	136
066-228	STEERE FORD SOUTH SWAMP	L	T	97	
066-228	WITHAMS LAKE	L	T	84	
066-229	DAM 1 066-229	D	R	2	
066-229	DAM 2 066-229	D	O	0	
066-229	DAM 3 066-229	D	O	2	
066-229	DIAMOND NORTH-EAST SWAMP	L	T	0	
066-229	DUNNS EAST SWAMP	L	M	0	
066-229	HILLVIEW SOUTH LAKE	L	T	18	
066-229	JERDACUTTUP RIVER (LOWER REACH)*	R	M	11	195
066-229	JERDERCUTTUP WEST LAKE*	L	T	515	1684
066-229	KUNDIP NORTH POOL (JERDACUTTUP RIVER)	R	T	5	
066-229	MASON SOUTH LAKE A	L	T	2	
066-229	MASON SOUTH LAKE B	L	T	0	
066-230	COWERUP (SKI) LAKE	L	T	296	60
066-230	DAM 1 066-230	D	O	6	28
066-230	DAM 2 066-230	D	O	2	0
066-230	DAM 3 066-230	D	R	31	0
066-230	DAM 4 066-230	D	O	0	0
066-230	LAKE SHASTER*	L	S	1258	2881
066-230	MIDDLE ROAD LAKE A	L	T	44	49
066-230	MIDDLE ROAD LAKE B	L	T	9	71
066-230	OLDFIELD (MUNGLINUP) ESTUARY*	E	M	0	62
066-230	PARRIUP CENTRAL LAKE*	L	T	12	459
066-230	PARRIUP LAKE NORTH	L	T	2	18
066-230	SPRINGBOARD POOL (OLDFIELD RIVER)	R	M	9	38
066-231	ALLORA LAKE	L	T	153	301
066-231	DAM 1 066-231	D	O	0	0
066-231	DAM 2 066-231	D	O	0	0
066-231	DAM 3 066-231	D	O	12	0

Block	Wetland	Type	Vegetation	Nov. Count	Mar. Count
066-231	FUSS ROAD NATURE RESERVE SWAMP	L	T	64	33
066-231	NEDS CORNER - HIGHWAY LAKE	L	T	173	39
066-231	STOKES INLET*	E	T	1148	1730
066-231	TORRADUP INLET*	E	M	2	73
066-231	TORRADUP NORTH LAKE*	L	T	114	87
066-232	BARKERS INLET*	E	R	3	471
066-232	COOMALBIDGUP SWAMP	L	T	57	14
066-232	DAM 1 066-232	D	O	0	0
066-232	DAM 2 066-232	D	O	1	0
066-232	DAM 3 066-232	D	O	0	2
066-232	HIGHWAY SOUTH POOL (LORT RIVER)	R	M	4	7
066-232	LAKE KUBITCH*	L	T	403	1349
066-232	LAKES GIDONG AND CARBUL*	L	T	486	560
066-232	LORT RIVER (LOWER REACH)*	R	M	192	28
066-232	QUAGI ROAD SWAMP	L	T	35	9
066-232	YOUNG RIVER (LOWER REACH)*	R	M	40	88
066-233	DALYUP TC SWAMP	L	M	21	30
066-233	DAM 1 066-233	D	O	0	0
066-233	DAM 2 066-233	D	O	0	100
066-233	DAM 3 066-233	D	O	0	0
066-233	GRAHAMS POOL (DALYUP WEST RIVER)	R	T	2	23
066-233	LAKE GORE*	L	T	7741	3025
066-233	MAINBENUP WEST LAKE	L	T	334	458
066-233	MONJINUP LAKE	L	M	2	3
066-233	MORTIJINUP LAKE*	L	M	586	37
066-233	NAMBARUP WEST SWAMP	L	T		49
066-233	QUALLILUP LAKE AND SWAMPS*	L	T	252	1390
066-234	BANNITUP LAKE*	L	M	14	51
066-234	DAM 1 066-234	D	O	0	0
066-234	ESPERANCHO LAKE	L	T	65	
066-234	HARLANDS DAM 066-234	D	M	52	46
066-234	LAKE WARDEN*	L	T	55	203
066-234	MCKENZIES DAM 066-234	D	R	32	8
066-234	MULLET LAKE*	L	T	1202	815
066-234	PLOWMANS ROAD SOAK SWAMP	L	R	12	0
066-234	SHARK LAKE	L	R	3	13
066-234	WHEATFIELD LAKE*	L	T	42	622
066-234	WOODY LAKE*	L	T	84	523
066-235	BOYATUP SOUTH-EAST SWAMP	L	M	3	
066-235	BOYATUP WEST SWAMP	L	T	35	24
066-235	COOLINUP SWAMP	L	T	235	
066-235	DAM 1 066-235	D	O	0	0
066-235	DAM 2 066-235	D	O	0	0
066-235	DAM 3 066-235	D	O	0	
066-235	FISHERIES - OVENS SWAMP	L	O	46	0
066-235	FISHERIES - RANCHO LAKE	L	T	89	0
066-235	RANCHO SOUTH SWAMP	L	T		
066-236	DAM 1 066-236	D	O	0	0
066-236	DAM 2 066-236	D	O	0	0
066-236	DAM 3 066-236	D	O	0	0
066-236	DANIELS - MERIVALE SWAMP	L	T	46	64
066-236	HOWICK LAKE	L	T	0	2
066-237	BOOLENUP LAKE	L	O		
066-237	MORTUP (EWARTS) LAKE	L	M		
067-213	DAM 1 066-213	D	R	0	9
067-213	DAM 2 066-213	D	O	3	0

Block	Wetland	Type	Vegetation	Nov. Count	Mar. Count
067-213	DAM 3 066-213	D	O	11	0
067-213	DAM 4 066-213	D	R	33	0
067-213	DAM 5 066-213	D	O	0	0
067-213	DAM 6 067-213	D	O	2	62
067-213	HARDY INLET*	E	M	424	534
067-214	BLACKWOOD RIVER (LOWER REACH)*	R	M	35	6
067-214	SCHROEDER POOL	R	T	0	3
067-214	SCOTT RIVER (LOWER REACH)*	R	M	28	8
067-214	SWAN LAKE AND DEADWATER*	L	R	0	213
067-215	DON SWAMP	L	R	4	0
067-215	FOUR - BLACK SWAMP	L	R	0	0
067-215	JALBARAGUP POOL	R	M		130
067-215	JALBARAGUP SWAMP	L	R		0
067-215	LINDSAYS DAM 067-215	D	O		2
067-215	PEPPERMINT FLAT POOL	R	T		0
067-216	DAM 1 067-216	D	M		2
067-216	DAM 2 067-216	D	D		3
067-216	DAM 3 067-216	D	O		0
067-216	DAM 4 067-216	D	O		0
067-216	DAM 5 067-216	D	M		144
067-216	DAM 6 067-216	D	M		78
067-216	DAM 7 067-216	D	D		51
067-216	WILGARUP SWAMP	L	M		145
067-216	YORNUP WEST LAKES	L	T		0
067-217	CODARUP LAKES	L	T		132
067-217	CORBALUP SWAMP	L	M		0
067-217	DAM 1 067-217	D	M	95	208
067-217	DAM 2 067-217	D	R	5	21
067-217	DAM 3 067-217	D	R	5	6
067-217	DAM 4 067-217	D	O	0	0
067-217	DAM 5 067-217	D	R	28	51
067-217	DAM 6 067-217	D	O		17
067-217	DAM 7 067-217	D	O		0
067-217	KEPALARUP LAKE	L	M		13
067-217	YACKERLUP SWAMP	L	R	8	8
067-218	CAUSEWAY DAM 067-218	D	O		
067-218	COOTAYERUP DAM 067-218	D	O		2
067-218	DAM 1 067-218	D	R		
067-218	DAM 2 067-218	D	R		0
067-218	DAM 3 067-218	D	O		5
067-218	MINNINUP DAM 067-218	D	O		0
067-218	MOORINUP LAKE	L	O		0
067-218	MULLIDUP POOL	R	T		0
067-218	TOLKERLUP WEST SWAMP	L	O		0
067-219	DAM 1 067-219	D	O	0	0
067-219	DAM 2 067-219	D	O	10	0
067-219	DAM 3 067-219	D	O	0	
067-219	DAM 4 067-219	D	T	2	
067-219	DAM 5 067-219	D	O	0	134
067-219	MANGELUP SWAMP	L	T	2	0
067-219	MONGETUP POOL	R	T	15	8
067-219	TAMBALLUP POOL	R	T	36	4
067-219	UPPER YERIMINUP POOL	R	T	37	51
067-219	WAUDELILLUP SWAMP	L	M	101	139
067-220	BOYACUP POOL	R	O	40	11
067-220	CAMPUP POOL	R	O	181	91

Block	Wetland	Type	Vegetation	Nov. Count	Mar. Count
067-220	DAM 1 067-220	D	O	5	0
067-220	DAM 2 067-220	D	O	0	0
067-220	DAM 3 067-220	D	O	3	4
067-220	DAM 4 067-220	D	O	0	0
067-220	DAM 5 067-220	D	O	0	2
067-220	GORDON-SHAMROCK LAKE	L	T	20	0
067-220	LUSCOMBE LAKE	L	R	39	0
067-220	OLD TERLINGA POOL (GORDON RIVER)	R	R	28	16
067-220	TERLINGA WEST SWAMP	L	R	172	0
067-221	BOORAKUP NORTH LAKE	L	O		0
067-221	DAM 1 067-221	D	O		2
067-221	DAM 2 067-221	D	O		0
067-221	DAM 3 067-221	D	O		2
067-221	KYLOBUNUP POOL	R	O		15
067-221	MADJENAPURDAP LAGOONS	L	O		0
067-221	NEWTON SOUTH LAKE	L	T		214
067-221	RACECOURSE LAKE	L	O		3004
067-221	TOM SOUTH LAKE	L	T		293
067-221	WATERGARRUP POOL	R	D		4
067-222	CHEEPANUP LAKE	L	D	177	4
067-222	DAM 1 067-222	D	D	18	0
067-222	DAM 2 067-222	D	O	0	2
067-222	DAM 4 067-222	D	O	0	65
067-222	ILLALONE NORTH LAKE	L	O	79	0
067-222	KYBELUP POOL	R	O	25	15
067-222	LAKE ANDERSON	L	D	2	0
067-222	MABINUP SALT LAKE	L	S	0	460
067-222	NORTH STIRLING ROAD LAKE	L	T	138	0
067-222	OLIVERS WEST LAKE	L	T	16	275
067-222	YETEMERUP DAM LAKE	L	T	67	0
067-223	BLUE HILLS POOL	R	T	4	14
067-223	DAM 1 067-223	D	O	0	4
067-223	DAM 2 067-223	D	O	0	0
067-223	DAM 3 067-223	D	O	0	0
067-223	MAILEEUP SOUTH POOL	R	O	0	0
067-223	OMEEHANS POOL	R	D	0	0
067-223	QUORBANDAMOONGERUP POOL	R	O	0	
067-223	SANDLEWOOD POOL	R	O	7	0
067-223	YARDUP NORTH POOL	R	T	4	7
067-224	BOX-ONG POOL	R	T	2	0
067-224	CAUSEWAY POOL	R	T	8	0
067-224	DAM 16 067-224 (NORMANS ROAD)	D	O	0	0
067-224	DAM 17 067-224 (NORMANS ROAD)	D	O	0	0
067-224	DAM 18 067-224 (SHEARERS ROAD)	D	O	36	
067-224	DAM 19 067-224 (SHEARERS ROAD)	D	O	0	
067-225	ARALINGA NORTH-EAST SWAMP*	L	T	14	2
067-225	AVOCA SWAMP	L	T	24	2
067-225	DAM 1 067-225	D	O	0	0
067-225	DAM 2 067-225	D	O	0	0
067-225	DAM 3 067-225	D	O	45	0
067-225	DAM 4 067-225*	D	O	2	9
067-225	DAM 5 067-225*	D	O	0	17
067-225	MINVALARA LAKE	L	T	137	156
067-225	YELLILUP SWAMP*	L	T	45	160
067-226	DAM 1 067-226	D	O	2	0
067-226	DAM 2 067-226	D	R	12	49

Block	Wetland	Type	Vegetation	Nov. Count	Mar. Count
067-226	GORDON INLET*	E	S	173	296
067-226	MANDETTA POOL	R	M	1	4
067-226	MANDETTA SW SWAMP	L	T	76	48
067-226	MARLAMERUP POOL	R	M	1	0
067-227	CHARLES BAY INLET*	E	R	12	399
067-227	DEMPSTER INLET*	E	O	184	5
067-227	FITZGERALD INLET*	E	O	1265	448
067-227	FITZGERALD RIVER (LOWER REACH)*	R	T	907	338
067-227	MARY RIVER ESTUARY*	E	R	8	117
068-215	DONNELLY RIVER ESTUARY*	R	M	1	0
068-215	LAKE JASPER*	L	M	138	5
068-215	LAKE QUITJUP (QUILLAIJUP)*	L	M	20	8
068-215	LAKE SMITH*	L	R	0	0
068-215	LAKE WILSON*	L	R	0	0
068-216	DAM 1 068-216	D	T	29	32
068-216	DAM 2 068-216	D	M	29	118
068-216	DAM 3 068-216	D	M	30	3
068-216	DAM 4 068-216	D	O	15	75
068-216	DAM 5 068-216	D	D	9	30
068-216	DAM 6 068-216	D	D	10	156
068-216	NORTHCLIFFE SOUTH POND	L	R	14	0
068-216	YEAGARUP LAKE	L	M	0	0
068-217	BOONWINUP POOL	R	T	3	7
068-217	CHURBICUP SWAMP	L	R	45	114
068-217	CUTTING POOL	R	T		0
068-217	DAM 1 068-217	D	O	4	5
068-217	DAM 2 068-217	D	R	3	2
068-217	DAM 3 068-217	D	T	4	1
068-217	DAM 4 068-217	D	O		
068-217	UNBAP POOL	R	T	0	0
068-218	BYENUP LAGOON*	L	R	607	2392
068-218	LAKE MUIR*	L	S	4705	1448
068-218	LITTLE UNICUP LAKE	L	R	2	0
068-218	TORDIT-GARRUP LAGOON*	L	S	210	1249
068-218	UNICUP LAKE	L	R	20	0
068-218	UNICUP SOUTH SWAMP	L	R	1	8
068-219	BANGALUP POOL	R	T	3	
068-219	BLACK WATTLE SWAMP	L	D	130	
068-219	HIGGINS DAM 068-219	D	O	40	
068-219	MARRIOTS DAM 068-219	D	O	0	
068-219	NETLEY - NARDARUP LAKE	L	D	135	26
068-219	ROCKS PADDOCK DAM 068-219	D	O	2	
068-219	TANK PADDOCK DAM 068-219	D	O	0	
068-219	TOOTANELLUP LAGOON	L	M	1	0
068-219	WEST VINEYARD DAM 068-219	D	O	0	
068-219	YARNUP LAGOON	L	R		0
068-220	BIG POORRARECUP LAGOON	L	R		60
068-220	CARABUNDUP LAKE	L	M		57
068-220	DAM 1 068-220	D	O	5	0
068-220	DAM 2 068-220	D	O	2	80
068-220	DAM 3 068-220	D	O	4	0
068-220	DAM 4 068-220	D	O	0	0
068-220	KATHERINE LAKE	L	T	98	110
068-220	KWORNICUP LAKE	L	D	39	816
068-220	MURDELLUP LAGOON	L	R		16
068-220	NUNIUP LAKE	L	R	22	20

Block	Wetland	Type	Vegetation	Nov. Count	Mar. Count
068-220	ORONGORUP NORTH SWAMP	L	R		166
068-221	DAM 1 068-221	D	O	50	0
068-221	DAM 2 068-221	D	O	0	0
068-221	DAM 3 068-221	D	O	0	0
068-221	DAM 4 068-221	D	M	26	28
068-221	DAM 5 068-221	D	R	0	0
068-221	LAKE MATILDA	L	M	274	390
068-221	MARTAGALLUP LAKE	L	T	35	1120
068-221	MEENULUP WEST SWAMP	L	D	42	16
068-221	MOORILURRUP LAKE	L	R	10	11
068-221	ROUND SWAMP	L	M	90	0
068-221	SHELDERTON - STIRLINGS SWAMP	L	D	16	10
068-222	CHILLINUP WEST LAKE	L	O	0	0
068-222	DAM 1 068-222	D	O	0	0
068-222	DAM 2 068-222	D	O	6	57
068-222	DAM 3 068-222	D	O	4	3
068-222	DAM 4 068-222	D	O	10	0
068-222	KAMBALLUP POOL	R	O	20	7
068-222	TAKALARUP POOL	R	O	2	14
068-222	WOODLANDS NORTH LAKE	L	O		0
068-223	DAM 1 068-223	D	O	14	
068-223	DAM 2 068-223*	D	O	0	0
068-223	DAM 3 068-223*	D	O	3	7
068-223	DAM 4 068-223*	D	O	0	0
068-223	GNOWANGERUP 26264 SOUTH LAKE*	L	S	0	0
068-223	GNOWELLEN WEST SWAMP	L	T	15	13
068-223	KOJANEERUP SWAMP*	L	M	207	764
068-223	KORUP SWAMP	L	M	10	6
068-223	QUARDERWARUP LAKE*	L	S	0	0
068-223	TWO MILE LAKE*	L	T	507	0
068-223	TWO MILE WEST LAKE*	L	O	9	0
068-224	CHILLINUP POOL (PALLINUP RIVER)*	R	T	9	104
068-224	DAM 1 068-224	D	T	0	12
068-224	DAM 2 068-224*	D	O	0	92
068-224	DAM 3 068-224*	D	O	2	4
068-224	DAM 4 068-224*	D	O	0	0
068-224	DAM 5 068-224*	D	O	2	6
068-224	JUNCTION POOL (PALLINUP RIVER)*	R	O	2	0
068-224	MARRA POOL (PALLINUP RIVER)*	R	R	7	26
068-224	METTLER LAKE	L	M	4	64
068-224	PALLINUP RIVER (LOWER REACHES)*	R	R	9	348
068-224	YUNGUNUP POOL (PALLINUP RIVER)*	R	R	2	18
068-225	BEAUFORT INLET*	E	R	173	310
068-225	COROMANDEL SOUTH LAKE*	L	T	90	24
068-225	DAM 1 068-225	D	O	0	0
068-225	DAM 2 068-225	D	O	0	7
068-225	JENNELLA EAST LAKE	L	T	72	26
068-225	JENNELLA NORTH LAKE	L	T		
068-225	LAKE HILLIUP*	L	T	41	12
068-225	PARNAROO EAST SWAMP	L	M	60	8
068-225	TOOCALUP SWAMP	L	O		
068-226	CARDIMINUP LAKE	L	M	466	121
068-226	DAM 1 068-225	D	O	4	0
068-226	DAM 2 068-225	D	O	0	0
068-226	DAM 3 068-226	D	O	0	0
068-226	GNORNBUP SWAMP	L	T	21	10

Block	Wetland	Type	Vegetation	Nov. Count	Mar. Count
068-226	GRAVEL PIT LAKE	L	T	68	8
068-226	HUNTER RIVER INLET*	E	M	35	7
068-226	LAKE TORRUP (OCUMUP)*	L	T	700	178
068-226	TOZER SOUTH-WEST LAKE	L	T	0	
068-226	WARRAMURRUP NORTH SWAMPS	L	M	0	1
068-226	WELLSTEAD ESTUARY*	E	M	33	78
069-216	CHALIGARUP LAKE	L	T		
069-216	DAM 1 069-216	D	R	11	75
069-216	DAM 2 069-216	D	M	8	1
069-216	FLORENCE LAKE	L	M		
069-216	SAMUEL LAKE	L	T		
069-217	BROKE INLET*	E	R	694	595
069-217	LAKE MARINGUP*	L	M	23	38
069-218	DAM 1 069-218	D	O		
069-218	DAM 2 069-218	D	O		
069-218	DAM 3 069-218	D	O		
069-218	HAZELVALE POOL	R	O		
069-219	BREAK POOL	R	M		
069-219	DAM 1 069-219	D	R	0	
069-219	DAM 2 069-219	D	O	20	
069-219	DAM 3 069-219	D	T	9	36
069-219	DAM 4 069-219	D	O	12	1
069-219	IRWIN INLET*	E	R	764	847
069-219	NILE POOL	R	T		
069-219	OWINGUP SWAMP*	L	M	544	301
069-219	SURPRISE LAKE*	L	M	0	12
069-219	UPPER BOW SWAMP	L	M		
069-220	BLUE LAKE	L	T	8	
069-220	BRYN AVON POOL	R	T	31	
069-220	DAM 1 069-220	D	R	0	4
069-220	DAM 2 069-220	D	R	0	23
069-220	DAM 3 069-220	D	R	0	0
069-220	DAM 4 069-220	D	M	18	0
069-220	DAM 5 069-220	D	T	0	0
069-220	DENMARK RIVER (LOWER REACH)	R	T	33	4
069-220	RAINTREE LAKE	L	T	14	8
069-220	WILSON INLET (INCL. EASTERN LAGOON)*	E	M	1222	2397
069-221	BAXTER SWAMP	L	O	13	52
069-221	CHORKERUP WEST LAKE	L	O		0
069-221	DAM 1 069-221	D	O	2	0
069-221	DAM 2 069-221	D	O	0	0
069-221	DAM 3 069-221	D	O	0	0
069-221	DAM 4 069-221	D	O	0	3
069-221	DAM 5 069-221	D	O	0	13
069-221	EYRIE LAKE	L	R	347	1158
069-221	NYANDYEETUP LAKE	L	R	1804	
069-221	TOWNSEND SWAMP	L	R	20	143
069-221	YANNERLIP SWAMP	L	R	0	0
069-222	BENNETT - TAKENUP SWAMP	L	O		
069-222	CORIMUP LAKE	L	M	65	
069-222	DAM 1 069-222	D	T	72	
069-222	DAM 2 069-222	D	O	7	
069-222	DAM 3 069-222	D	R	0	
069-222	FISH TRACK LAKE	L	T	0	
069-222	GARDNER LAKE	L	M	190	42
069-222	KALGAN RIVER (LOWER REACH)	R	R	0	25

Block	Wetland	Type	Vegetation	Nov. Count	Mar. Count
069-222	OYSTER HARBOUR*	E	R	243	704
069-222	TEN MILE SWAMP	L	R	7	46
069-222	YAKAMIA SWAMP	L	R	15	
069-222	YELLANUP LAKE	L	O		
069-223	BUNDILLA SWAMP	L	R	5	1
069-223	DAM 1 069-223	D	R	0	0
069-223	DAM 2 069-223	D	O	16	5
069-223	DAM 3 069-223	D	O	11	1
069-223	KYEWONG SW SWAMP	L	R		0
069-223	LAKE PLEASANT VIEW	L	R	6	0
069-223	MULLOCULLOP LAKES	L	T	37	44
069-223	NEWLANDS NORTH-EAST SWAMP	L	T	63	3
069-223	NEWLANDS SWAMP	L	R	9	6
070-218	FRANKLAND RIVER (LOWER REACH)*	R	M	1	1
070-218	NORNALUP INLET*	E	R	24	13
070-219	BOAT HARBOUR LAKE	L	M	3	246
070-219	FICIFOLIA ROAD SWAMP	L	T	0	12
070-219	PARRY INLET*	E	R	20	21
070-220	NENAMUP SWAMP	L	M	822	160
070-220	SAIDE LAKE	L	R	10	105
070-221	DAM 1 070-221	D	O	0	
070-221	DAM 2 070-221	D	O	11	
070-221	GRASMERE (LAKE POWELL)*	L	M	683	1002
070-221	TORBAY INLET*	R	M	38	38
070-221	TORBAY LAKE AND DRAIN*	L	M	58	55
070-222	ALBANY PORT WETLAND (LOCKYER BAY)	E	O		188
070-222	SEPPINGS LAKE	L	M	50	47

Appendix 2

The number of wetlands in which each native species occurred (N) and the three wetlands supporting the highest number of each species in November 1989 and March 1990. Regions and wetland types are given below the main body of the table. Privately-owned wetlands are marked with an asterisk.

Species	N	1	2	3
November 1989				
Black Swan	189	Vasse-Wonnerup Estuary 2421	Peel-Harvey Estuary 1430	Lake Guraga 986
Freckled Duck	5	Lake Chandala 6	Lake Chittering 3	Crackers Swamp 2
Australian Shelduck	306	Lake Dumbleyung 12417	Lake Preston 8639	Lake Gore 7563
Pacific Black Duck	373	Vasse-Wonnerup Estuary 4264	Peel-Harvey Estuary 2278	Lake Muir 1074
Grey Teal	387	Peel-Harvey Estuary 5025	Coyrecup Lake 2478	Vasse-Wonnerup Estuary 2254
Chestnut Teal	51	Fitzgerald River (lower reach) 325	Stokes Inlet 244	Fitzgerald Inlet 230
Australasian Shoveler	47	Lake Martinup 212	Lake Nowergup 108	Thomsons Lake 52
Pink-eared Duck	96	Coyrecup Lake 2015	Lake Coomelberrup 1250	Hurstview Lake 282
Hardhead	67	Hurstview Lake 122	Lake Chittering 93	Lake Forrestdale 79
Maned Duck	280	Busselton Pool 301	Emu-Ballajura Lakes 260	Lake Chandala 238
Blue-billed Duck	45	Lake Forrestdale 95	Thomsons Lake 95	Benger Swamp 50
Musk Duck	117	Lake Clifton 580	Benger Swamp 47	Lake McLarty 37
Eurasian Coot	268	Thomsons Lake 1970	Vasse-Wonnerup Estuary 1006	Lake Chittering 644
March 1990				
Black Swan	194	Wilson Inlet 1324	Peel-Harvey Estuary 941	Stokes Inlet 838
Freckled Duck	7	Yaalup Lagoon 5	Lake Toolibin 5	Lake Pinjarrega 5
Australian Shelduck	353	Racecourse Lake 3000	Lake Shaster 2567	Lake Norring 2021
Pacific Black Duck	387	Lake Clifton 4308	Byenup Lagoon 1945	Murray River (delta to Pinjarra) 1474
Grey Teal	291	Beverley Lakes 1551	Amarillo Pool 1265	Coblinine River Flats 1224
Chestnut Teal	47	Stokes Inlet 404	Fitzgerald Inlet 270	Beaufort Inlet 138
Australasian Shoveler	67	Eyrie Lake 395	Lake Coomelberrup 300	Parriup Central Lake 150
Pink-eared Duck	72	Lake Eganu 800	Lake Coomelberrup 700	Lake Pinjarrega 220
Hardhead	47	Lake Chittering 60	Willoughby Swamp A 53	Allora Lake 36
Maned Duck	200	Emu-Ballajura Lakes 193	Cooke's Dam, 059-219 125	Murray River (delta to Pinjarrega) 109
Blue-billed Duck	38	Yangebup Lake 159	Lake Monger 120	Jerdacuttup West Lake 83
Musk Duck	122	Lake Clifton 510	Bibra Lake 228	Yangebup Lake 130
Eurasian Coot	232	Lake Gore 2170	Thomsons Lake 2030	Jerdacuttup West Lake 1442

Appendix 2 (*continued*)

NOTE		
*Allora Lake	Esperance	L[a]
Amarillo Pool	Bunbury	R
Beaufort Inlet	Bremer	E
Beverley Lakes	Beverley	L
Bibra Lake	Gingin	L
Busselton Pool	Bunbury	R
Lake Chandala	Gingin	L
Lake Chittering	Gingin	L
Lake Clifton	Bunbury	L
Coblinine River Flats	Wagin	R
*Cooke's Dam, 059-219	Beverley	D
Lake Coomelberrup	Wagin	L
Coyrecup Lake	Wagin	L
Crackers Swamp	Gingin	L
Lake Dumbleyung	Wagin	L
Lake Eganu	Moora	L
Emu-Ballajura Lakes	Gingin	L
*Eyrie Lake	Walpole	L
Fitzgerald Inlet	Bremer	E
Fitzgerald River (lower reach)	Bremer	R
Lake Forrestdale	Gingin	L
Lake Gore	Esperance	L
Lake Guraga	Gingin	L
*Hurstview Lake	Gingin	L
Jerdacuttup West Lake	Esperance	L
Lake McLarty	Bunbury	L
Lake Martinup	Wagin	L
Lake Monger	Gingin	L
Lake Muir	Frankland	L
Murray River (delta to Pinjarra)	Gingin	R
*Lake Nowergup	Gingin	L
Lake Norring	Wagin	L
Parriup Central Lake	Esperance	L
Peel-Harvey Estuary	Bunbury	E
Lake Pinjarrega	Moora	L
Lake Preston	Bunbury	L
*Racecourse Lake	Frankland	L
Lake Shaster	Esperance	L
Stokes Inlet	Esperance	E
Thomsons Lake	Gingin	L
Lake Toolibin	Wagin	L
Vasse-Wonnerup	Bunbury	E
*Willoughby Swamp A	Magenta	L
Wilson Inlet	Bremer	E
Yaalup Lagoon	Magenta	L
Yangebup Lake	Gingin	L

[a]Wetland types: D = dam, E = estuary, L = lake, R = river

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