WESTERN AUSTRALIAN WILDLIFE RESEARCH CENTRE

RESEARCH PROGRAMME SEMINAR

28 April 1981

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1 Wetland Nature Reserves (WNR's) : Monitoring of water depth and quality.

1.1 Objectives

Routine monitoring of the water depth and water quality of selected WNR's in the south-west of the State assists in:

i) annual evaluation of conditions for waterfowl breeding

ii) prediction of summer conditions for waterfowl

iii) determination of seasonal, annual and longer-term variations in water depth and quality - important aspects of the condition of WNR's.

iv) determination of salinity tolerances and preferences of waterbirds for breeding and other purposes.

v) determination of salinity and depth tolerances for other aquatic fauna and flora.

vi) management of particular WNR's e.g. Lakes Chittering, Nonalling, Byenup, Tordit Garrup, Poorginup, Chandala and Benger.

1.2 Procedures

i) Gauge Installation: 14 depth gauges (staffs) were installed during 1980/81, bringing the total number of gauged wetlands to 82. 71 of these are WNR's vested in Western Australian Wildlife Authority.

ii) Monitoring : Depth and salinity have been monitored by Research Staff at two-monthly intervals since November 1978. West Australian Field and Game Association members have provided valuable assistance in monitoring since January 1980.

1.3 Results

All data are now on computer and available on request.

1.4 Conclusions

In conjunction with rainfall statistics, results obtained from the monitoring programme provide a sound basis for season-to-season comparisons of conditions for waterfowl breeding, and for prediction of conditions likely to prevail during impending duck-shooting seasons.

The data gathered have also provided a sound basis for the development of a meaningful salinity classification for WNR's of the south-west (see Research Project 2).

1.5 Proposals for 1981/82

During 1981/82 it is proposed to install depth gauges on a further 20-25 Western Australian Wildlife Authority - vested WNR's in the south-west of the state. This will complete the gauge installation programme. Two-monthly monitoring of water depth by Research Staff, W.A.F.G.A. members, and participators in the waterbird usage study (see Research Project 3) will continue through

1981/82. Salinity and pH will also be monitored.

1.6 Publications 1980/81

A paper presenting results of the monitoring programme to date has been completed and is awaiting publication (see Research Project 4.12).

1.7 Publications 1981/82

It is proposed to publish results of the monitoring programme either yearly or two-yearly.

2 Wetland Nature Reserves : Area of wetland reserved. Salinity and permanence classification.

2.1 Objectives

i) To determine the total area of wetland reserved under the WNR system. (Each WNR may include both wetland and dryland. Although the total area of each WNR was known, the area of wetland included in each WNR was not known)

ii) To develop a salinity and water-permanence classification system for WNR's and to classify each WNR accordingly

2.2 Procedures

i) The boundaries of wetlands contained within each WNR in the South West and Eucla Land Divisions were marked on 1:40,000 black and white aerial photography, with field inspections where necessary.

A digitising computer (Lands Department) was used to calculate the area of wetland reserved.

ii) Water depth and salinity data obtained from the routine monitoring programme (Research Project 1) and from additional visits to non-monitored WNR's were used for the permanence/salinity classification.

2.3 Results

There are 164 WA Wildlife Authority vested WNR's in the South-west and Eucla Land Divisions of Western Australia. The total area of these reserves is 1,184,000 hectares. The total area of wetland included in these reserves is 110,000 ha . A rough (very, at the time of writing) classification is as follows

	PERMANENT		NON-PERMANENT		TOTAL	
	No. of WNR's	Area ha	No. of WNR's	Area ha	No. of WNR's	Area ha.
FRESH (never exceed 1 ppt)	8	5,000	2	500	10	5,500
BRACKISH (exceed 1 ppt, but not 3 ppt)	11	1,000	14	1,000	25	2,000
SALT (exceed 3 ppt)	20	5,000	109	97,500	129	102,500
TOTALS	39	11,000	125	99,000	164	110,000

2.4 Conclusions

Though the total area of fresh or brackish wetlands in the south-west of Western Australia is not known, it is obvious from the results above that only an extremely small proportion is included in WA Wildlife Authority-vested Nature Reserves. Such areas should therefore continue to be given high priority for conservation by acquisition.

2.5 Proposals for 1981/82

The above data will be polished and published.

2.6 Publications 1980/81

None

2.7 Publications 1981/82

One proposed

3 Wetland Nature Reserves : Survey of waterbird usage

3.1 Objectives

i) To provide information on waterbird usage to assist in the management of WNR's and in the resolution of conflicts between different uses.

ii) To assess the role and importance of the WNR system in the conservation of waterbird populations.

iii) To provide appropriate experience for future monitoring of waterbird abundance.

3.2 Procedures

The Royal Australasian Ornithologists' Union is to be funded to co-ordinate this amateur-based survey of waterbird usage of WA Wildlife Authority-vested WNR's in the South-West and Eucla Land Divisions of the State. A four-year study is proposed, commencing April 1981. A Field Officer will be employed by the R.A.O.U. to administer the project. He will have two main roles : to co-ordinate the activities of amateur observers, and to design, test and report on census techniques. Data will be stored and analysed by computer to provide fast and comprehensive feedback to observers.

In the first year of the study a sample group of WNR's will be selected for the development and evaluation of different counting techniques and for training observers in their use. The WNR's chosen will be those known to be good waterbird areas; they will provide a representative range of wetland types; and they will be accessible. Much time will be devoted to training observers in the first year and to the development of suitable survey techniques.

In the 2nd, 3rd and 4th years all WA Wildlife Authority-vested WNR's will be surveyed. Each will be visited at least every 2 months and at times of particular interest (eg. as they dry out in summer). All waterbirds will be censused. As observers become more expert, particular emphasis will be placed on breeding counts and

on the quantitative assessment of which parts of each wetland are most used by which species.

The R.A.O.U. will produce annual summaries of the information obtained and a final report at the end of the four years discussing the methods employed, the results, and their implications for management both of waterbirds and WNR's.

Water levels and water quality (initially salinity and pH) will be monitored during the course of the study (see Research Project 1).

The Minister for Fisheries and Wildlife has approved the expenditure of $93,000 over five financial years to fund the study.

3.3 Results

Project has yet to commence.

3.4 Conclusions

None at this time.

3.5 Proposals for 1981/82

Waterbird Research Staff will be involved in facilitating the study, and will participate in it.

3.6 Publications 1980/81

None

3.7 Publications 1981/82

R.A.O.U. will do the publishing.

4 Wetlands : Other studies and management projects

Waterbird Research Staff were involved in a number of other research and management projects during 1980/81.

4.1 Islands for Waterbirds:

Acting on a proposal by Mr Neville Beeck, WA Wildlife Authority allocated $5,000 for the construction of islands on selected WNR's in the vicinity of Narrogin and Katanning. 44 islands were constructed on Lake Coyrecup in March 1980, and 43 on Little White Lake in April for a total cost of $4,600. It is hoped that these will be used for nesting purposes by waterbirds, particularly ducks. Little rain fell in these areas during the winter of 1980 and the two lakes have been almost continuously dry since construction of the islands. Further monitoring will therefore be needed to determine the success or otherwise of the project.

4.2 Lake Chittering:

The "check structure" (adjustable-height weir) on the outlet from Lake Chittering requires frequent checking and adjustment during winter and spring each year in order to fill the lake without flooding the adjoining landholders' properties.

Since the check structure was installed in April 1977 it has been possible to hold water right through summer, despite the low rainfalls of recent years. Lake Chittering is therefore a most valuable breeding and summer refuge area for waterbirds.

4.3 Lakes Byenup, Poorginup, Tordit-Garrup (Lake Muir Wetland Nature Reserve).

Mines Department require three-monthly monitoring of water depth, salinity and pH of the above lakes so that appropriate conditions can be applied to peat mining leases to be granted in the near future. This monitoring has been carried out by Waterbird Research Staff since April 1977, and will continue during the mining operation.

4.4 Wetland Survey and Acquisition:

It has not been possible for the Waterbird Research section to give sufficient attention to wetland survey and acquisition during 1980/81, due to lack of staff. Some survey work was undertaken in the Gingin to Dongara areas however, and a reserve on Minyulo Brook, west of Cataby, has been proposed to the Lands Department. Research Staff have been involved in a number of other proposals for acquisition of wetlands during 1980/81 including the southern end of Lake Wannamal, Mialla Lagoon, Owingup Swamp, an un-named swamp on south side of Peel Inlet, the east side of Lake Cairlocup, and

Benger Swamp.

Wetland survey and acquisition is at present, a neglected area.

4.5 Farm Dams for Waterfowl

During 1980, Technical Officer Grant Pearson visited the Cunderdin, Narrogin, Harvey and Denmark Agricultural Schools to talk with the students about methods of increasing the suitability of farm dams for breeding waterbirds, particularly game-species of ducks. It is proposed to repeat these talks during 1981. We are encouraging Agricultural Schools, the W.A. Field and Game Association and a small number of interested farmers, to experiment with various types of artificial nest sites for waterbirds in the hope that more suitable designs may be developed. W.A.F.G.A. have already had considerable success with 5 gallon metal drums with both ends half open, and placed in tree forks.

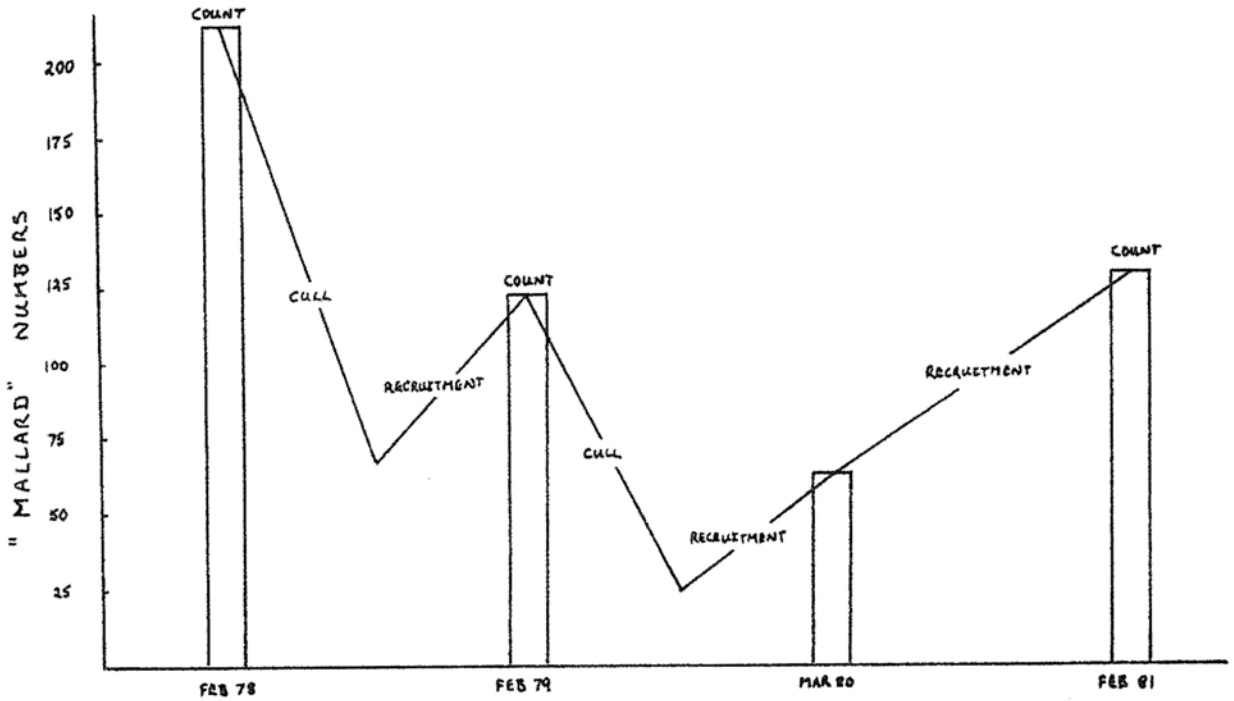
4.6 Aquatic Flora

Dr M. Brock, Tutor in Plant Biology, School of Environmental and Life Sciences, Murdoch University, commenced a study of the ecology of hydrophytes (angiosperms and the larger algae) in salt lakes in Western Australia in September 1980. This work is considered to be of value in increasing our understanding

of the ecology of wetlands and is therefore supported by the Waterbird Research Section. Field work is primarily on WA Wildlife Authority-vested WNR's because water depth and water quality data is available for these wetlands. Collections are made by Dr. Brock during the two-monthly monitoring trips by Research Staff.

4.7 Feral Ducks and Geese

The last cull of feral ducks and geese on metropolitan lakes was in 1979. Lack of man-power prevented a cull being undertaken in 1980. From March 1980 to February 1981 feral "mallard" numbers rose from 63 to 130, muscovy from 7 to 21 and geese numbers fell from 18 to 5.



If sufficient man-power is available in 1981, feral duck and geese numbers will be reduced.

District Wildlife Officers reported small numbers of feral ducks in country areas during 1980 and these have also been reduced.

4.8 Birds of Lakes Jandabup and Forrestdale

Technical Officer Grant Pearson completed a twelve month study (one day per lake every two months) of the above lakes in August 1980, and is preparing a paper for publication this year.

4.9 Duck-Shooting Seasons : Opening-Day Bag-Check Data.

Bag-check data for all shooting seasons since 1972 is currently being re-worked for publication this year.

4.10 Aerial Survey of Waterbird Populations of Eastern Goldfields and Murchison

Rainfall in the pastoral areas of Western Australia was much above average during 1980 and flooding occurred. Aerial surveys of waterbird populations were conducted during September and October, partly as a contribution to the Eastern Goldfields Biological Survey being conducted by Fisheries and Wildlife and the WA Museum. A three-week, follow-up ground survey was also conducted.

A brief paper presenting the findings of the air survey is proposed.

4.11 West Australian Wader Study Group

During the past two years Research Staff have been "handing over" the Branch's wader banding programme to the WA Wader Study Group (amateur ornithologists) which

was formed in 1979. Water Study Group members were instructed in mist-netting and banding techniques during the 1979/80 wader season and have been instructed in cannon-netting techniques this season.

4.12 Determination of Annual Duck-Shooting Seasons

Decisions concerning duck seasons in the south-west of the State (i.e. the South-West and Eucla Land Divisions) are based on annual assessments of conditions for waterfowl breeding. These assessments are based on rainfall data, and on water-depth data derived from the WNR monitoring programme (see Research Project 2). 1980 was another drought year (the fifth consecutive year of below average rainfall in all five Meteorological Districts of the south-west) and a "No Season" was declared. The rest of the state (82% of the total area) remained open to shooting.

4.13 Wetland Creation

The most promising possibility for wetland creation would appear to be the damming of creeks and rivers, particularly the old drainage lines (salt lake chains) of the wheatbelt. These drainage lines have little direct value to present landholders as their salt-laden soils are unsuitable for crops and pastures, and their sparse vegetation is generally unsuitable for grazing. There are also many areas of Crown Land (including WNR's)

along their courses. Because the drainage lines slope very gently, long stretches of water can be created by the construction of quite small dams or weirs. The Salt River, for example, falls only 20 metres in the 85 kilometres from Quairading to 15 kilometres west of Bruce Rock. A 2 metre high wall would therefore back water up for approximately 8.5 kilometres. Beverley Lakes (further downstream along the Salt River) are an excellent example of what can be achieved at very little cost.

The Research Staff will pursue this idea further during 1981/82.

4.14 Publications 1980/81

Technical Officer Don Munro published an article on the "Islands for Waterbirds" project (4.1) in S.W.A.N.S. Vol. 10 (2) 11-13, Summer 1980.

A paper on the determination of duck-shooting seasons (project 4.10) has been completed and is awaiting publication.

4.15 Publications 1981/82

Papers on the determination of the 1981/82 duck shooting season, and the results of opening-day bag checks for each shooting season since 1972 are proposed for 1981/82. A pamphlet on design of artificial nest sites for ducks is also proposed. Grant Pearson will also publish the results of his studies of the birdlife of Forrestdale and Jandabup Lakes.

ADVICE AND COMMITTEE WORK

During 1980/81 approximately 25% of my time was spent on advice and committee work.

I am a member or deputy-member of the following committees:

1. Bird Committee of the Western Australian Wildlife Authority
2. Standing Working Group on Birds of the Council of Nature Conservation Ministers. (Has not met for 4 years)
3. Peel Inlet Management Authority. (Deputy Membership expired April 1981)
4. Planning Committee of PIMA (Deputy Membership expired April 1981)
5. Wetlands Advisory Committee of the Environmental Protection Authority (Meets infrequently)
6. Lake Joondalup Regional Open Space Technical Advisory Committee (Meets infrequently)
7. Field Investigation Committee of the Royal Australasian Ornithologist's Union.