S.W.A.N.S.

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DEPARTMENT OF FISHERIES AND WILDLIFE, PERTH

S.W.A.N.S.

Vol. 6 No. 1

FEBRUARY, 1976

Issued by direction of the Hon. Peter Jones, M.L.A., Minister for Fisheries and Wildlife.

Director of Fisheries and Wildlife: B. K. Bowen, B.Sc.

Conservator of Wildlife: H. B. Shugg, A.A.P.A., A.F.A.I.M.

The support of the public is an essential component in any conservation or reserve management programme—but an informed, educated public is needed to ensure its continuing success.

This publication is designed as a medium by which the various organisations, individuals, and wildlife management personnel may be kept informed of the work being carried out by this department; of departmental policies and directions; and for promoting a better understanding and appreciation of Western Australian wildlife and the role it plays in maintaining a suitable environment in which man can live.

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SPECIAL NOTICE

HONORARY FAUNA WARDENS

Included with this issue is an insert for the information of Honorary Wardens of Fauna. Following the proclamation of the Fauna Conservation Act Amendment Act, all previous appointments of persons as Honorary Wardens of Fauna are being terminated.

Any person previously holding such an appointment and who wishes to continue an active association with the Department should read the Minister's letter and complete the attached pro-forma.

S.W.A.N.S. JOURNAL

Due to a staff work commitment in other areas, this publication (Vol. 6 No. 1) is the first issue since Vol. 5 No. 1, Summer 1975.

IN THIS ISSUE . . . .

MAGPIE GEESE VS AGRICULTURE

During 1975, the Conservator of Wildlife in Western Australia provided his official views in the following statement to the Agriculture Protection Board of W.A., concerning the destruction of Magpie Geese when they conflict with the interests of primary producers in the Kimberly.

Legal Situation

These birds, known scientifically as *Anseranus semipalmata*, are "protected fauna" within the meaning of the Wildlife Conservation Act. This means that, in law, the birds may not be "taken" i.e., killed or captured by any means or disturbed or molested or hunted, except under the authority of a current license issued by the Conservator of Wildlife. The regulations prescribe a number of licenses which can be issued to authorise the taking of protected fauna. One of these is a damage license which can be issued to allow the taking of protected fauna causing damage to property.

Some years ago, magpie geese were treated as game birds and were allowed to be taken for sport during open seasons. However, in more recent times they have been given complete protection and are not included in any open season.

Distribution

Before the advent of white men, magpie geese were likely to occur almost anywhere throughout Australia. Due to changes in the environment, they now no longer, or only very seldom occur in Western Australia outside the Kimberly Land Division. Magpie Geese have been recorded in Papua/New Guinea but these occurrences are probably caused by a few abherrent wanderers.

Reasons for Protection

The species is endemic to Australia and is unique to the sub-family level, that is, it has no near relatives. Views on its taxonomic position differ and the species is held to be of very great scientific interest.

It is an aesthetically pleasing bird of unusual appearance. Although it might be regarded by some as having less than classically attractive features, it has that special appeal which all waterfowl have to a very wide section of the public. Indeed, to many, it has a most appealing appearance.

The species is a vulnerable one described as being sensitive to environmental changes and liable to rapid reductions and local extermination in the face of inroads by settlement or other interference to its habitat. It is slow breeding with an average success barely adequate to maintain existing populations.

Conflict with Agriculture

The ecology of the magpie geese has been studied and documented by a number of workers including H. J. Frith and S. S. J. Davies in the Northern Territory. Mr. R. J. Beeton, of the University of New England, has also studied the species at Kununurra, but the department has not yet seen his doctoral thesis or heard of it being completed. These geese have been reported as occurring in large numbers (greater than 50 000) in Kununurra, but although many complaints of damage caused by them were made, detailed evidence was not well documented. In the period December 14, 1973, to January 31, 1974, a total of 265 geese were destroyed under a damage license in association with efforts to frighten them away from sorghum crops. The greatest number shot on any one day was 60. The birds dispersed on the onset of the wet and were only reported as troublesome in the second half of the year.

Departmental attitude to controls

Frith, in 1959, wrote that the original picture that this bird was a very serious threat to the development and success of rice cultivation was "exaggerated and inaccurate". The climate of opinion today is opposed to the solving of wildlife agricultural conflicts by eradicating wildlife. There would be a very strong public reaction

A flock of Magpie Geese in the air and on the ground at the Ord River.

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against destruction of a protected and vunerable species and some other means of overcoming the conflict would be expected. A cost benefit study which took account of the loss of the birds intrinsic, scientific and tourist or aesthetic values and of the ecological effects to be suffered through the reduction in bird numbers, together with likely benefits from the agricultural development would have to be undertaken.

In considering the desirability of undertaking various forms of agricultural activities, their susceptibility to damage by wildlife must be one of the factors for deciding what crops should be planted. Costs of exclusion by fencing or other acceptable control or remedial measures need to be added to the economic cost of the crop. Where wildlife occurs in pest proportions, it is reasonably safe to say that ecological control should desirably be aimed at the situation which allows a species to reach such numbers rather than trying to control those numbers once they have occurred. In other words, we need to attack the cause rather than the effect.

Departmental experience suggests that predations by wildlife are usually associated with poor agricultural practices and there has been a strong tendency in unsuccessful ventures to blame the wildlife for failures that were really attributable to other causes. The Departments holds the view that it is not reasonable to expect the State to undertake large scale research into population control measures in these circumstances. Attention is drawn to the findings of an interdepartmental group which met at the Western Australian Wildlife Research Centre on January 15, 1974, to consider the alleged problem of magpie geese on the Ord River plains. It is recorded that the group agreed that :—

"To more fully understand the magpie geese population would require a biological research programme costing of the order of $50 000 per year for several years. Before undertaking research of this order of magnitude, the economic justification would have to be clearly demonstrated and, therefore, the group considered that research into the actual value of crop damage sustained under the present conditions was essential.

"The biological research programme would be aimed at providing information on:—

"(i) The relationship of the Ord River Magpie geese to the general northern population.

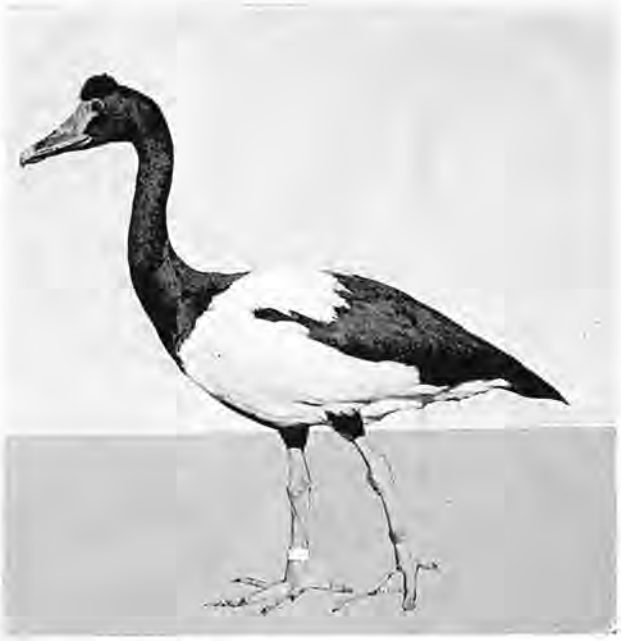
"(ii) The relationship of the Magpie geese population to the overall weather pattern (next year the weather pattern may be such that few Magpie geese appear in the Ord River area).

"(iii) The potential for providing alternative feeding areas, to divert the geese from the commercial crops, which could also be developed as a superb tourist attraction.

"(iv) The potential of Lake Argyle for Magpie geese breeding, and including a monitoring of local breeding at the present time.

"The above comments relate mainly to gross environmental changes that, together, might make the Kununurra area less attractive to geese. The possibility of population control, either by limiting the population to its present size or reducing it, must also be considered. In this context Dr. Davies made the point that given sufficient finance and desire, the population could be reduced drastically or perhaps even eliminated as occurred in the Murray/Darling Catchment area between 1880 and 1920 by the use of poisons and drainage of swamps. The group held the view that such action in the Northern Territory would not be acceptable today but methods of population control should be considered as well as the provision of alternative feeding sites. These might include water level manipulation in breeding areas and selectively applied pesticides."

As a member of the group which reached that concensus. the Conservator of Wildlife supports its findings and re-iterates the need for a cost benefit analyses to show clearly that such a programme would be justified economically, and further stress that it would need to be shown to be politically acceptable.



Magpie Goose (*Anseranus semipalmata*).

APPOINTMENTS

The Hon. Minister for Fisheries and Wildlife has appointed:—

Alan Geoffrey Breeden—*Government Gazette* 17/1/75

Nigel Maxwell Tyler—*Government Gazette* 17/1/75

Ronald Edward Sokolowski—*Government Gazette* 27/3/75

as Wildlife Officers pursuant to Section 19 of the Wildlife Conservation Act 1950–1975.

1974/75 DUCK SHOOTING SEASON

The 1974/75 Duck Shooting Season opened at 6 p.m. on Saturday January 11, 1975 and closed at midnight on April 30, 1975. The season was three weeks longer than the 1974 season and this had been made possible because the wetlands throughout the South-West Land Division had been flooded in most cases or at least attained their maximum depth. There were great numbers of birds on the wetlands and the production of young this season was estimated the maximum possible from the existing stock of mature birds.

During the previous 4–5 years, the stocks of birds had been depleted through poor breeding and migration when drought conditions had prevailed.

The bag limit this season was 10 ducks per person per day out of the nine game species available. A license (fee $2.00) had to be obtained before game birds could be taken and these licenses were obtainable from all district offices of the Department of Fisheries and Wildlife or by post from the Head Office at 108 Adelaide Terrace, Perth. Revenue from these game licenses was paid into the Fauna Conservation Trust Fund which is used for Game Management.

The opening was successful and, in general, the shooters attitude was good. Early shooting was a problem in many areas, but this was, and would always be difficult to alleviate. It was found generally throughout the State, that shooters were frustrated with the extra hour of daylight-saving in the evening and the larger expanses of water. This gave the ducks more chance to disperse when shooting started at 6 p.m. on opening day.

There was an abundance of water and birds at Oak Park, Yealering and Narembeen right through to Esperance and there were still birds around when the opening shoot was over.

The Department's officer in charge of Waterfowl Research, Dr. T. L. Riggert was disappointed at the response from shooters in relation to return of bands and score cards. Twenty-four thousand Black Ducks were banded and only 25 bands had been handed in, and of 5 000 cards issued only 300 had been returned. He believed that the closing of Wannamal, and in particular the late closing of Toolibin, was responsible for the lack of response from shooters. Dr. Riggert added that in future it would probably be necessary for the Wildlife Officers and Waterfowl Research staff to handle research projects without relying on public support. Dr. Riggert said that the main problem areas during the opening were the new closures at Lakes Toolibin and Wannamal. Shooters were reluctant to quit these areas when approached by the Department's Wildlife Officers. Lake Toolibin, approximately 19 km south-east of Wickepin, was closed on December 16 in order to protect five pairs of the rare and endangered Freckled Duck of which one pair was incubating nine eggs.

The closure will in future provide local birds with a refuge within a chain of lakes where shooting is allowed. Also it was the only fresh water lake in the area and supported Egrets, Crested Grebes, Little Grebes and five other species breeding on the lake.

The northern half of Lake Wannamal was closed to shooting this year because of the sighting of a pair of Freckled Ducks last winter and the need for a refuge in the area.

Closure of a section of the Collie River north of the Brunswick and Collie Rivers junction was also considered necessary in order to provide a duck refuge against shooting pressures further upstream.

A total of 6 225 Duck Shooters Licenses were issued for the season.

WILDLIFE CONSERVATION ACT 1950–1975

On December 5, 1975 the Fauna Conservation Act Amendment Act was proclaimed and came into operation as the Wildlife Conservation Act 1950–1975.

Under the new "Act" several name changes have occurred, viz:

The Western Australian Wild Life Authority becomes the Western Australian Wildlife Authority and in abbreviated instances will be known as W.A.W.A.

The Chief Warden of Fauna becomes the Conservator of Wildlife.

Wardens of Fauna become Wildlife Officers.

Honorary Wardens of Fauna become Honorary Wildlife Officers.

Changes in the definitions of reserves are:—

"nature reserve" means an area of land which is vested in the Crown and which the Governor, subject to such conditions and limitations as he thinks fit, reserves to Her Majesty or disposes of in the public interest pursuant to the provisions of paragraph (g) of subsection (1) of section twenty-nine of the Land Act, 1933, for the conservation of indigenous flora or fauna;

"wildlife sanctuary" means an area of land which is the subject of an agreement made between the Minister and the owner of the land for its use as a sanctuary;

(As a result of the above it is no longer permissable for previously known "wildlife Sanctuaries" to be called as such unless an agreement has been entered into with the Minister for Fisheries and Wildlife in accordance with the Wildlife Conservation Act 1950–1975).

The responsibility for the protection of native flora will be taken over by the Department of Fisheries and Wildlife later this year and therefore included in the "Act" is the following reference:

"indigenous flora" means any wildflower, palm, shrub, tree, fern, creeper, vine or other plant which—

(a) is native to the State;

(b) is not growing under cultivation; and

(c) is not a noxious weed,

and includes any part of any indigenous flora and the seeds thereof.

DIBBLERS AT ALBANY

A pair of Australia's rare marsupials, known as Dibblers has been found at Albany.

They were trapped at Cheynes Beach by Dr. Particia Woolley a senior lecturer in Zoology at La Trobe University, Victoria.

The animals are the only ones found since Michael Morcombe re-discovered the species in 1967 after 83 years, of "extinction".

Dr. Woolley is a world expert on the group of marsupials of which the Dibbler (*Antechinus apicalis*) is one member.

In an earlier programme, Dr. Woolley had been allowed to search for and obtain two related species, one of which was the Little Red Antechinus. This animal was shown to be not as rare as had been thought and was well distributed in the Pilbara.

The license to take 3 pairs of Dibblers was issued subject to the conditions that not more than one pair was to be taken from any one locality and that the localities had to be at least 10 km apart. This was to ensure that colonies located were not unduly depleted. A further condition was that the Dibblers remain the property of the State and their ultimate disposal would be decided by the Minister for Fisheries and Wildlife.

Dr. Woolley was allowed to take the Dibblers to La Trobe University where her research is centred. She is working on a special project financed by the Department of Science on the recommendation of the Australian Research Grants Committee and aimed at improving our knowledge of the relationships of this group within the family Dasyuridae—the carnivorous marsupials of which the Tasmanian Tiger was perhaps the largest and best known. Hopefully, this will lead to a successful breeding of Dibblers in captivity with the possibility of re-populating suitable habitat.

The locality where this pair was captured is close to the site of a proposed caravan park at Cheynes Beach.

There are 3 specimens of the Dibbler in the Western Australian Museum which were collected in 1967 and some are held in other Australian Museums, particularly the National Museum, Victoria. About 5 are also held in the British Museum (Natural History) and others at Liverpool, England and Leydon, Holland. Most of these were collected north of Perth (Moore River and Victoria Plains) in the last century, but all the recent finds have been at Cheynes Beach on the south coast east of Albany, and at Jerdacuttup in the Shire of Ravensthorpe.

Dibbler (*Antechinus apicalis*).

SICK & INJURED WILDLIFE

The Department of Fisheries and Wildlife is constantly asked if it does not exist to care for sick and injured wildlife.

As a public servant, the Conservator of Wildlife can only say that the legislation makes no mention of it. Departmental responsibilities are not spelled out in detail but evolve from the overall responsibility to administer the Wildlife Conservation Act and the regulations made under it which are designed primarily to conserve our wonderful wild fauna

Scientific advisers on conservation tell us that the care of sick and injured or derelict fauna does little if anything for conservation of native fauna in the long term and probably reacts to its detriment by saving weaklings or disease-susceptible individuals that stern Nature would sacrifice for the good of the species. Keeping animals in captivity exposes them to diseases that may be transmitted to wild stocks.

Some years ago, an earlier Government decision was taken that if sick or injured wildlife were to be cared for, the appropriate authority might be the R.S.P.C.A. as the organisation had qualified veterinary services available. However, due to a problem outside the control of the R.S.P.C.A. and this Department, the proposal lapsed and the funds were returned by the R.S.P.C.A. to revenue.

The Department would not recommend that any funds be made available to an organisation which used wildlife for commercial purposes. Experience has shown beyond doubt that commercial enterprises of this nature will use the care of sick, injured or derelict fauna as a means and as a cover for obtaining protected species from the wild that they otherwise would not be given authority to hold.

There are many people who look after considerable numbers of birds and kangaroos, etc., without any publicity or thought of assistance. They do this by their own choosing and seek no other reward than the personal satisfaction it gives them.

SCHEDULE OF UNPROTECTED FAUNA

A list of the unprotected fauna in the State of Western Australia appeared in the *Government Gazette* of the 22nd July, 1975. The list was as follows:—

FAUNA CONSERVATION ACT, 1950–1970

Department of Fisheries and Wildlife
Perth, 22nd July, 1975.

F.D. 116/52

THE Minister for Fisheries and Wildlife, pursuant to the powers conferred by section 14 of the Fauna Conservation Act, 1950–1970, does hereby declare that the fauna described in the Schedule to this notice shall be not protected.

Mammals:

- Jungle Kangaroo (Sandy Wallaby), (*Macropus agilis*)
- Gould Flying Fox, (*Pteropus gouldii*)
- Little Flying Fox, (*Pteropus scapulatus*)
- Black Rat (Tree or Ship Rat), (*Rattus rattus*) and (*Rattus alexandrinus*)
- Brown Rat, (*Rattus norvegicus*)
- Mouse, (*Mus musculus*)
- Rabbit, (*Oryctolagus cuniculus*)
- Domestic Cat, (*Felis catus*) (Gone wild)
- Wild Dog (Dingo), (*Canis dingo*)
- Fox, (*Vulpes vulpes*)
- Goat—all species of the genus, (*Capra*) (gone wild)
- Donkey and Horse—all species of the genus, (*Equus*) (gone wild)
- Buffalo—all species of the genus (*Bos*), and related genera (gone wild)
- Camels—all species of the genus, (*Camelus*) (gone wild)
- Pig—all species of the genus, (*Sus*), and related genera (gone wild)
- Palm Squirrel, (*Funambulus pennanti* Wroughton)

Birds

- Indian Turtledove (*Streptopelia chinensis*)
- Senegal Turtledove (*Streptopelia senegalensis*)
- Black Cormorant (*Phalacrocorax carbo*)
- Goshawk (*Accipiter fasciatus*)
- Collared Sparrowhawk (*Accipiter cirrocephalus*)
- Wedge-tailed Eagle (*Euroaetus audax*) (Protected in Shire of Kojonup)
- Little Falcon (*Falco longipennis*)
- White-tailed Black Cockatoo (*Calyptorhynchus baudinii*)
- Galah (*Kakatoe roseicapilla*)
- King Parrot (*Purpureicephalus spurius*)
- Port Lincoln Parrot (Twenty-eight) (*Barnardius zonarius*)
- Western Rosella (*Platycerus icterotis*)
- Budgerygah (*Melopsittacus undulatus*)
- Silvereye (*Zosterops australasiae*)
- Raven (*Corvus coronoides*)
- Little Crow (*Corvus bennetti*)
- Crow (*Corvus cecilae*)
- Domestic Pigeon (*Columba livia*) (gone wild)
- Goldfinch (*Carduelis carduelis*) (gone wild)

Reptiles:

Front-fanged Snakes (Family Elapidae):

(a) Large Venomous Snakes:

- Dugite (*Demansia nuchalis affinis*)
- Gwarder (*Demansia nuchalis nuchalis*)
- Mulga Snake (*Pseudechis australis*)
- Whip Snake or Wyree (*Demansia reticulata*)
- Spotted-headed Snake (*Demansia olivacea*)
- Western Tiger Snake or Norne (*Notechis scutatus occidentalis*)

(b) Small Venomous Snakes:

- Common Death Adder (*Acanthophis antarcticus*)
- Desert Death Adder (*Acanthophis pyrrhus*)
- Rosen's Snake (*Denisonia fasciata*)
- Ringed Snake (*Vermicella annulata*)
- Bandy Bandy (*Rhynchoelaps bertholdi bertholdi*)
- Northern Bandy Bandy (*Rhynchoelaps bertholdi anomalus*)
- Half-ringed Snake (*Brachymorphus semifasciatus*)
- Narrow-banded Snake (*Rhynchoelaps fasciolatus*)
- Five-ringed Snake (*Demansia modesta*)
- Little Whip Snake (*Denisonia gouldii*)
- Black-naped Snake (*Vermicella bimaculata*)
- Black-striped Snake (*Vermicella calonota*)
- Allied Bandy Bandy (*Rhynchoelaps approximans*)
- Crowned Snake or Werr (*Denisonia coronata*)
- White-lipped Snake (*Denisonia coronoides*)
- Spotted Snake (*Denisonia punctata*)
- Northern White-lipped Snake (*Denisonia suta*)
- Red-naped Snake (*Aspidomorphus diadema*)
- Yellow-naped Snake (*Aspidomorphus christieanus*)
- Little Brown Snake (*Elapognathus minor*)
- Mueller's Snake (*Rhinhoplocephalus bicolor*)
- Bardick (*Denisonia curta*)

Peter Jones,
Minister for Fisheries and Wildlife.

2nd July, 1975.

BIRD COMMITTEE FIELD TRIP—1975

As Reported By Mr D. Jennings, Acting Committee Secretary

Members of the Bird Committee of the Western Australian Wildlife Authority met at Lake Toolibin on 17th November, 1975 at the start of a three day survey of lakes in the Arthur River and Beaufort River flats. They also planned to meet representatives of various sporting associations in the area so that a clearer understanding of field problems could be gained, and to hear submissions from the shooters regarding the 1975/76 duck shooting season.

A campsite was established on John Knox's property to the south-east of Toolibin, alongside the Reserve boundary. The Conservator of Wildlife, Mr. H. B. Shugg, led the party, which consisted of Dr. S. Davies, Dr. T. Riggert, Messrs T. Spence, J. Masters, N. Beeck, H. Hall, S. Bowler, D. Arnold and D. Jennings. Wildlife Officers D. Noble and K. Morrison with Technical Officer D. Munro joined Committee members for the survey. Well-known conservationist and wildlife photographer R. Garstone was also a welcome addition to the camping party.

The main emphasis of the survey was Lake Toolibin itself, a lake which had been closed to duck shooting during the 1974/75 season. Those Committee members who had not previously been to the area were given the opportunity to see at first-hand the special qualities which Toolibin possessed.

Following lunch on the first day, members took to the canoes hired for the survey so that a thorough inspection of the lake could be made. This proved to be an upsetting experience for Messrs Shugg and Spence—clothes may be dried, but binoculars tend not to work so well after a dunking. Not to be outdone, Messrs Garstone and Morrison duplicated the feat on the following morning. Morrison was heard to report that the water only came up to his navel, though he was standing on his head at the time. A sense of balance appeared to be a prerequisite for staying above water level. Despite such incidents, the canoes proved their worth once skill in manoeuvring in the strong wind had been acquired.

Committee members and representatives of various sporting associations inspecting a reserve.

Canoeists setting out for survey of Lake Toolibin.

After tea, a bird count revealed that 81 species had been sighted on the Reserve with 20 of these species nesting in the area. Apart from the Freckled Duck, much interest was aroused because of the nesting sites of the White Egret (*Egretta alba*) and the Little Grebe (*Podiceps novaehollandiae*). The lake was confirmed as one of the few known nesting sites of the White Egret south of the Kimberleys.

Early morning saw the canoeists out on the lake again, followed by a most informal Bird Committee meeting on the sand ridge south-east of the lake. Various aspects of the duck shooting season were discussed and a number of recommendations made.

The importance of Lake Toolibin was highlighted by the findings of the survey. It remains the one freshwater lake for at least 30 miles in any direction and, therefore, the only lake in the vicinity on which the Freckled Duck was likely to nest. The White Egret and Little Grebe nestings added weight to the argument for continued closure of the lake to duck shooting. Also, the situation of Lake Toolibin in the lake chain made it ideal as a refuge area, in keeping with Departmental policy that at least one lake in each chain should be set aside as a refuge area. Toolibin is the first major lake in this chain, and is thus the first to fill after rains.

Chef Sam Bowler prepared an early lunch after the meeting, to allow a full afternoon of lake inspections. The fact that some of the campers were ill after returning home was definitely not due to "Sam-onella" infections. Camp was broken just after lunch and the party set out via Mud Hut (Walbyring), Lake Taarblin, Nomans Lake, White Lake and Little White Lake before settling in at Narrogin for the night. From the inspections, it appeared that the water levels in most lakes were down 2 to 3 feet from the high-water marks evident on trees bordering the lakes.

That night, the Committee members met with representatives of the Narrogin Clay Target Association (Inc.), the Field and Game Association, and other shooters

from the Narrogin area. Unfortunately, Mr. Peter Jones, the Minister for Fisheries and Wildlife was grounded in Perth by the fuel crisis and was unable to attend as planned. Comments and suggestions were later passed to the Minister for his consideration and information.

The Comittee re-convened the following morning to consider the suggestions of the Associations' representatives. The recommendations for submission to the Minister were added to those made on the shores of Toolibin.

Tracks were then made to Wagin, east to the small lakes leading in to Gundaring, then to Gundaring itself, thence to Wagin Lake where lunch was devoured alongside the Rubbish Dump Reserve. Lake Parkeryerring was next on the list, followed by a quick dash across to Beaufort Bridge to keep a rendezvous with the Hon. T. Perry, M.L.C. and a party of shooters from the Beaufort River area.

The whole company travelled to Reserve 5456 to inspect its two lakes and to discuss the possibility of opening the lakes to shooting now that they were under Departmental control. It was agreed that such a recommendation be submitted to the Minister, who has since agreed to the request.

Everyone was told to watch their step, as quite a few Tiger snakes had been sighted on previous days. Extra adrenalin pulsing through the system improved eyesight quite remarkably.

Mr. Perry and some of the shooters then accompanied the party for a look at Lake Towerinning, where the group broke up and all headed for home.

Appreciation is expressed to all those who added their particular talents and abilities which helped make the trip a success. The many suggestions that this sort of field survey should be made more than 'just a once-in-a-while effort' are being given serious consideration.

Nesting site on Lake Toolibin

WESTERN AUSTRALIAN WILDLIFE AUTHORITY MEMBERS

It is hereby notified for general information that the Hon. Minister for Fisheries and Wildlife, Mr. Peter V. Jones has, pursuant to the provisions of the Wildlife Conservation Act 1950–75, appointed the seven persons named hereunder as the members of the Western Australian Wildlife Authority, for a term to expire on 31st May, 1977. The Western Australian Wildlife Authority will therefore consist of the following :—

Ex-Officio Members:

- Mr Bernard Kenneth Bowen, Director of Fisheries and Wildlife, Chairman
- Mr Harold Baxter Sandford Shugg, Conservator of Wildlife and Deputy Chairman
- Mr Alfred Richard Tomlinson, Chief Vermin Control Officer
- Mr Bruce James Beggs, Conservator of Forests

Appointed Members:

- Dr John William Green, Botanist of Dalkeith
- Professor Albert Russell Main, Zoologist of Nedlands
- Dr Stephen John James Frank Davies, Zoologist of Mt. Helena
- Dr Barry Robert Wilson, of Waterman
- Mr. Neville Anderson Beeck of Katanning
- Mr Henry George Hall of Dangin, and
- Mr. William Harley Burges Lacy, of Meekatharra

THE PRICE OF ROAST DUCK

In January 1976 three men decided to engage in duck poaching at Hyde Park Lake in the city of Perth.

Although the duck shooting season was in full swing the men did not take the necessary steps of checking the game regulations. They had taken and killed the birds by hand outside of a game reserve and were dressing them for dinner when apprehended.

RESULT: Fined $200 each—with not even a taste.

It will be a joyous day when the fines applied to illegal bird dealers and smugglers will be in the same order of magnitude.

Where is the deterrant to cut out these rackets when the system still allows thousands of dollars profit to be made over and above fines?

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OBSERVATION OF THE FRECKLED DUCK AT LAKE TOOLIBIN

On December 16, 1974 Ray Garstone of Woodanilling accompanied Mr. Tom Spence, Director of the South Perth Zoo and Warden Kevin Morrison on a 2-day field survey of Lake Toolibin, 19 km south-east of Wickepin.

The purpose was to check the bird-life and search for the rare Freckled Duck.

It was pleasing to the party to see the Lake full of water and in good condition after 5 years of drought. Many of the large areas of reeds had disappeared and some trees had died, but all waterfowl had returned to breed.

After hours of searching, a nest was discovered in a dense thicket of Casuarina. So dense was the stand of young trees, that the party had difficulty getting close to the nest and in being able to find their way in and out.

On approach, the brooding female slipped into the water and slowly swam away. The nest was made of sticks and twigs and was built 50 cms above the water in the tangled limb of a fallen tree.

There were nine eggs in the deep nest chamber which was lined with down and compressed neat and firm to the side. Unlike other duck nests, the lining was tidy and not loose.

A hide was built to photograph and observe the bird, which after a short time became very quiet and paid no attention to the intrusion. Up to six hours at a time was spent watching the bird as she sat patiently, only moving every half hour to alter her position or turn the eggs.

Visability from the hide was fair but at no time was a male sighted near the nest. On the first day however, a male Freckled Duck with a bright red basal patch between the nostrils and forehead (evident only in the breeding season) was seen swimming in amongst thick tea-trees at one end of the lake.

During observations two Blue-billed Ducks approached the nest and tried to climb aboard. However the sitting female was content to lean over and ward off the intruders with her beak.

Time spent in the hide was also rewarded with the constant appearance of a Crested Grebe swimming back and forth with a beak full of weed for an intended nest.

Five other pairs of Freckled Ducks were observed on the lake during the excursion but no more nests were found.

Subsequent to the sightings of Freckled Duck and other unique birds, Lake Toolibin was closed to hunting during the game season.

Female Freckled Duck about to resettle on her nest.

The nest from above, note the use of down as a lining.

WILDLIFE OFFICERS' PROBLEMS INVOLVING COMMONWEALTH PROPERTIES

In recent months some officers of the Department of Fisheries and Wildlife have been frustrated in carrying out their duties on land controlled by the Commonwealth. Two instances involved firstly, the taking of wild ducks out of season at an R.A.A.F. Base, and secondly, the keeping of birds without a license on a Weather Station near the Northern Territory border. In each instance, the Wildlife Officer was informed by the Commonwealth Officers that they enjoyed the shield of the Crown in right of the Commonwealth and were not subject to State law.

Whatever the legal situation might be, it is not the desire of the appropriate Commonwealth Departments that State efforts to conserve natural resources should be frustrated if it can be avoided. If the matter cannot be resolved by State Officers talking to the appropriate Commonwealth officers on the spot, then the details are to be referred back to the State office. In matters involving wildlife, fisheries, or the environment, the facts of the dispute are to be reported to the Director or the Conservator of Wildlife and will then be brought to the notice either of, the Secretary of the Department of Environment, Housing and Community Development, Canberra or to Mr. A. G. Bollen, First Assistant Secretary, Fisheries Division, Commonwealth Department of Primary Industry, Canberra. Those officers will then discuss the situation with their colleagues in the other Commonwealth Departments concerned and let the Department of Fisheries and Wildlife, W.A. know how the problem may be resolved.

WHITE-NECKED HERON SIGHTINGS

A bird rare to Western Australia, the White-necked Heron (*Ardea pacifica*) has been sighted during the past year in southern parts of the State. District Wildlife Officer K. Miller advised that numerous sightings had been made in Moora, Gingin, Jurien, Wannamal and Dandaragan areas. Numbers of these long-billed waders have also been seen on the outskirts of Perth and as far afield as the eastern wheatbelt and Margaret River. The birds were also seen at Herdsman Lake and in the air near the Swan River at Maylands. It is believed that the herons had probably migrated from the Northern Territory and Eastern States on the succession of tropical cyclones, in the past year.

As its name implies, the bird has a white neck and head with the rest of its body a dark gun-metal grey, almost black. Sometimes the head and neck could appear darker as a result of feeding in muddy waters.

The white necked species is the second biggest of the Australian herons, smaller than the rare Great-billed Heron and bigger than the White-faced Heron, an elegant blue-grey bird common in the South West and sometimes called the Blue Crane.

The White-Necked Heron is normally a solitary feeder preferring shallow waters and wet grass. When in flight, the species is conspicuous by the white patches at the bend on the underside of its dark wings.

The bird nests mainly in South-eastern Australia but travels north along the coast to feed in tropical rains.

There have been eight recorded "flare-ups" in Western Australia between 1923 and the present, with a few known nestings in the Murchison and Gascoyne areas.

White-necked Heron (*Ardea pacifica*)

Our Diminishing Heritage

The Potoroo is the smallest of the Kangaroo family being about the size of a rabbit and weighing up to 1·5 kg (approximately 3 pounds).

Potoroos are one of the 5 divisions or genera of rat-kangaroos. The three distinct kinds are the Musk Rat kangaroo of Queensland, the Bettongs and their relatives, and Potoroos.

Two species of Potoroos have been recorded from the south west of Western Australia. They are Gilbert's Potoroo (*Potorous tridactylus*), known from near Albany, and the Broad-faced Potoroo (*Potorous platyops*), known from near Goomalling and from between Albany and the Pallinup River. However, neither species has been seen this century. The Department of Fisheries and Wildlife has initiated a search for these animals so that if they do exist, necessary steps can be taken to ensure their survival. Finance has been provided by the Commonwealth Government.

Looking rather like a Bandicoot, the Potoroo is a creature of tussock and densely growing grasses associated with forest or woodlands, or other dense vegetation such as heaths in areas of high rainfall.

Studies in the Eastern States have shown that the animals require the dense natural vegetation of their habitat for protection against their many potential predators.

Potoroos are strictly noctural in their behaviour and unlike the Bandicoots and Wallabies, living in the same area, they stay entirely within their dense cover and do not come out of it to feed in adjacent open pastures. If the habitat is opened up by fire or clearing, Potoroos disappear until the vegetation has recovered. Such species are vulnerable to burning off in bush fire control.

Studies of female Potoroos in captivity have indicated joint or overlapping territories, where there was no fighting. Males on the other hand were always in severe conflict when they were together with a female on heat. Animals observed in wild populations had no wounds or scars, suggesting that in natural situations, they avoid coming into conflict.

In Tasmania it has been established that Potoroos for their small size are quite long-living in the wild and may live for 7 years. From birth it is at least 21 weeks before the young are weaned, and after leaving the pouch at about seventeen weeks, they are running free.

The Potoroo breeds throughout the year in Tasmania. Each female seems to commence breeding when it is about one year old and is also able to breed twice in each year, but the reproductive potential of the Potoroo is low because, like other members of the kangaroo family, it produces one young at a time. Mating may again follow about 4 days after the birth of the first young but the resulting embryo delays development for as long as four and a half months until either the first young is suckling intermittently during its weaning period or it is prematurely lost from the pouch.

Potoroos could easily be confused with:

1. BANDICOOTS (see illustration) but . . .

   A. Potoroos are much smaller (up to 1·5 kg or 3 lbs.) than Quokkas which weigh up to 3 kg or 7 lbs.

   B. The tails of Potoroos are almost as long as their bodies.

      The tails of Bandicoots are much smaller than their bodies.

   C. The lower jaws of Potoroos contain only one pair of large incisors which are separated from the first cheek teeth by a wide gap.

      The lower jaws of Bandicoots contain three pairs of small incisors and a canined tooth occupies the space between them and the first cheek teeth.

   D. The first cheek teeth of Potoroos are very large and of a characteristic shape, quite unlike those of Bandicoots (see illustration).

2. QUOKKAS (see illustration) but . . .

   A. Potoroos are much smaller (up to 1·5 kg or 3 lbs.) than Quokkas which weigh up to 3 kg or 7 lbs.

   B. The feet of Potoroos are slender and covered in short fur.

      The feet of quokkas are more robust and covered in longer fur.

   C. Gilbert's Potoroo has a long, pointed face.
      Quokkas have a short broad face.

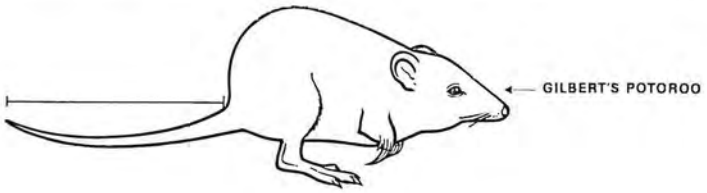
   D. The Broad-faced Potoroo is thought to be a pale sandy or grey colour.
      Quokkas are usually dark brown.

3. WOYLIES (see illustration)

   Woylies are of similar size and build to Potoroos and they have similar dental characters but they can at once be distinguished by their tails; the tails of Woylies have a distinctive brush or crest of black hair near the tip

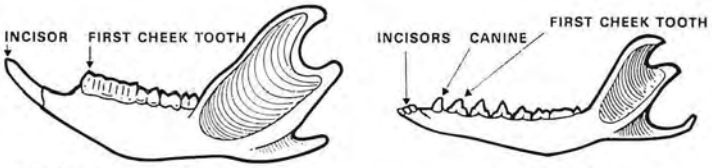
   As we have very little information about the distribution of Woylies we would also welcome any records you have.

   They are known to live in the Tutanning Nature Reserve, East of Pingelly, in the Dryandra State Forest near Narrogin, and in the Tone/Perup River area, east of Manjimup.



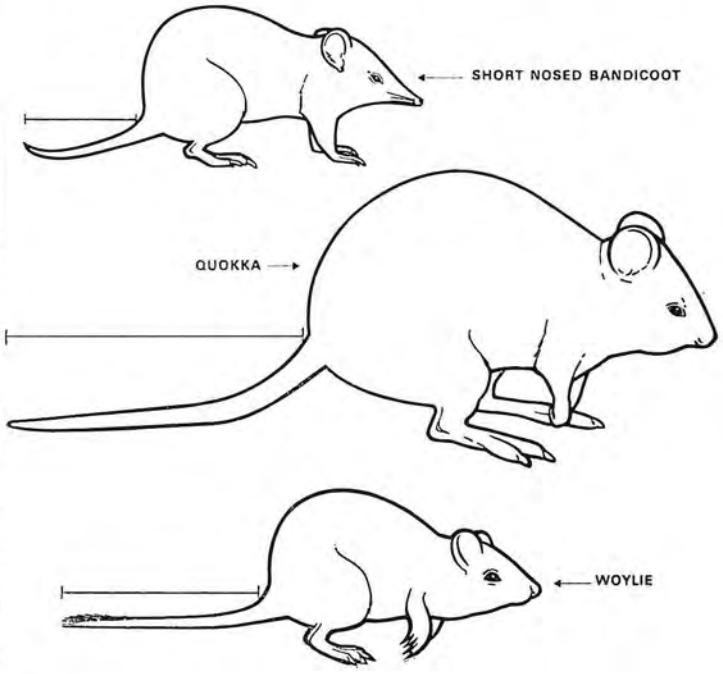
POTOROOS

Potorous tridactylus and Potorous platyops



JAW OF POTOROO (OR WOYLIE) JAW OF BANDICOOT

(Both are diagramatic)



GREAT VICTORIA AND GIBSON DESERT SURVEY

During 1975, staff from the W.A. Wildlife Research Centre, Department of Fisheries and Wildlife, completed some biological survey work in the Great Victoria and Gibson Deserts. Staff from the W.A. Museum and the Peabody Museum, Yale University, also took part. Areas surveyed were:

1. The Queen Victoria Spring Nature Reserve
2. The Plumridge Lakes Area
3. The Neale Junction Area
4. The Baker Lake Area.

The first of these is a Class A Fauna and Flora reserve vested in the W.A. Wildlife Authority. The others are proposed reserves recommended by the Conservation Through Reserves Committee.

Recent excellent seasons in the Deserts have resulted in a great increase in small mammal numbers, and the team found certain species of rodent, e.g. the Desert Hopping Mouse (*Notomys alexis*), the Sandy Mouse (*Pseudomys hermannsburgensis*) and the introduced House Mouse to be particularly common in all areas. One interesting rodent was collected. This was the Brown Desert Mouse (*Pseudomys desertor*). Although this species has been previously collected in W.A. the W.A. Museum had no specimens of it.

The small marsupials collected were of special interest. The outstanding result of the trip was the specimen of the long-tailed Dunnart (*Sminthopsis longicaudata*) collected in the Hann Breakaways south of Warburton. This is only the fifth time this species has ever been collected and the W.A. Museum had only one specimen of it. It is a particularly interesting specimen being the size of a small rat and having a tail over twice as long as the body. It is apparently adapted to living in rocky areas and the tail may be used to assist in balancing the animal when jumping. Other rarely collected species of marsupials which were found during the trip included Troughton's Dunnart, (*Sminthopsis murina ooldea*), the Hairy-footed Dunnart (*Sminthopsis hirtipes*), Ride's Ningaui (*Ningaui ridei*) one of the smallest of the marsupials and a red-eared Antechinus (*Antechinus macdonellensis*).

The leader of the trip, Dr. Andrew Burbidge, said that information gained during the trip would be made available to the Environmental Protection Authority to assist it in its evaluation of the Conservation Through Reserves Committee Report. the results of the expedition will be published shortly in an issue of the Wildlife Research Bulletin.

Ride's Ningaui (*Ningaui ridei*)

APOLOGIES TO HONORARY WILDLIFE OFFICERS

At a recent meeting of the Southern Regional Conservation Council, an Honorary Wildlife Officer made mention that there is very little liaison between Honorary and Departmental Wildlife Officers.

Claims were made that if Wildlife Officers visited districts and Honorary Wildlife Officers more often, it would create better liaison and public relations, and problems could be discussed.

The Conservator of Wildlife agrees that the Department has not held any district conferences for some time and apologies are expressed to all Honorary Wildlife Officers.

It is, however, pointed out that all "active" Honorary Wildlife Officers are contacted from time to time by Wildlife Officers in the field and **all** Honorary Wildlife Officers complaints are investigated.

The situation has been brought about by the pressure on staff time and escalating costs. In W.A. there are 21 Departmental Wildlife Officers to service an area approximately 1/3 rd the size of Europe.

In the last few years public awareness of the need for conservation and environmental protection has increased at such a pace, that the Department's Fauna Branch has been hard pressed to cope with the additional work load and demands of the many groups and organisations involved.

The Department would like to continue its district meetings but financial restrictions make it impossible this year.

However, it is the very fact of conservation awareness and the neglect of it by the ever-increasing populous, that makes the Honorary Wildlife Officer a necessary public contact.

Therefore, under the present conditions, the Department would welcome any attempts by Honorary Wildlife Officers to make contact with district offices in regard to discussing problems or making reports.

CONFINEMENT OF BIRDS

During 1975, a statement in the press said that "there were far too many restrictions and too many inspectors in Western Australia."

In defense of the Wildlife Conservation Act and Regulations, it is pointed out that people with the ultimate of expertise in the various fields associated with wildlife were instrumental in formulating its structure. It is seen to contain all that is necessary for the basic protection of all wildlife in the constant struggle of its own right to live.

Man, as the dominant animal on earth, has a responsibility to look after other species, especially when he makes so many changes to the environment.

While the Department is loath to enforce some of the seemingly insignificant regulations, people are reminded that these regulations are necessary **when investigating obvious cases of neglect and abuse of fauna.**

With this thought in mind the Conservator of Wildlife brings to attention Regulation 30 of the Wildlife Conservation Act 1950–1975.

30. (1) A person shall not keep any bird in a cage for a period longer than 48 hours unless the cage is—

(a) at least 7 times as long as the length of the largest bird in it;

(b) at least 4 times as high as the length of the largest bird in it;

(c) at least 3 times as wide as the length of the largest bird in it; and

(d) so constructed that it—

(i) contains at least five perches, two of which are so situated that they provide an obstruction free flight not less in length than four times the length of the largest bird in such cage, and the other of which perches are so placed as to allow a bird to fly or hop in comfortable stages to the ground and to a roosting perch which is not less than two inches from the roof;

(ii) provides, in the opinion of a Wildlife Officer adequate shelter from wind, rain and sun for all its occupants; and

(iii) has suitable facilities for nesting and protection from predators,

and unless the cage complies in all respects with the succeeding provisions of this regulation.

(2) The perches in a cage in which a bird or birds are kept shall be of wood or other suitable material and shall—

(a) be so placed that no perch is in the zone of droppings below another perch;

(b) be of suitably different diameters to meet the requirements of the birds in the cage; and

(c) be so placed that the largest bird in the cage can pass comfortably under the lowest perch and can roost comfortably on the highest perch.

(3) A cage in which a bird is or birds are kept shall—

(a) be fitted with unspillable containers for water and food which shall be kept filled and securely fastened to the cage or its fittings in such a manner that all birds in the cage can drink or feed freely therefrom and shall be so placed to be clear of the dropping zones under any perch; and

(b) be kept clean and well ventilated and provide shelter from draughts for its occupants."

In his book "King Solomon's Ring", Dr. Konrad Lorenz writes of—"the rarely awoken pity of people for the parrot which, as an originally highly intelligent animal, has deteriorated under the influence of close confinement into a crazy idiot, a very caricature of its former self.

"The larger species of the parrot tribe are not only clever but mentally and bodily uncommonly vivacious and together with the large corvines, they are probably the only birds which can suffer from the state of mind common to human prisoners, namely boredom."

STATE TRAPPING BAN FOR THE NORTHERN ROSELLA

Platycerus venustus (Kuhl)

Reports from various authorities on the Northern Rosella state that it was once plentiful throughout its range of North-Western and Northern Australia from the Kimberley Division, Western Australia, to the Northern Territory/Queensland border. However since the turn of the century the numbers have decreased markedly and predictions are that the decrease will probably continue despite the virtual absence of human interference.

The Northern Rosella is seen in pairs or small parties of up to six or eight birds, usually in the treetops or on the ground searching for seeds. They are more difficult to approach than most of the other Rosellas and, when flushed from the ground, fly to the top most branches of a nearby tree until danger has passed.

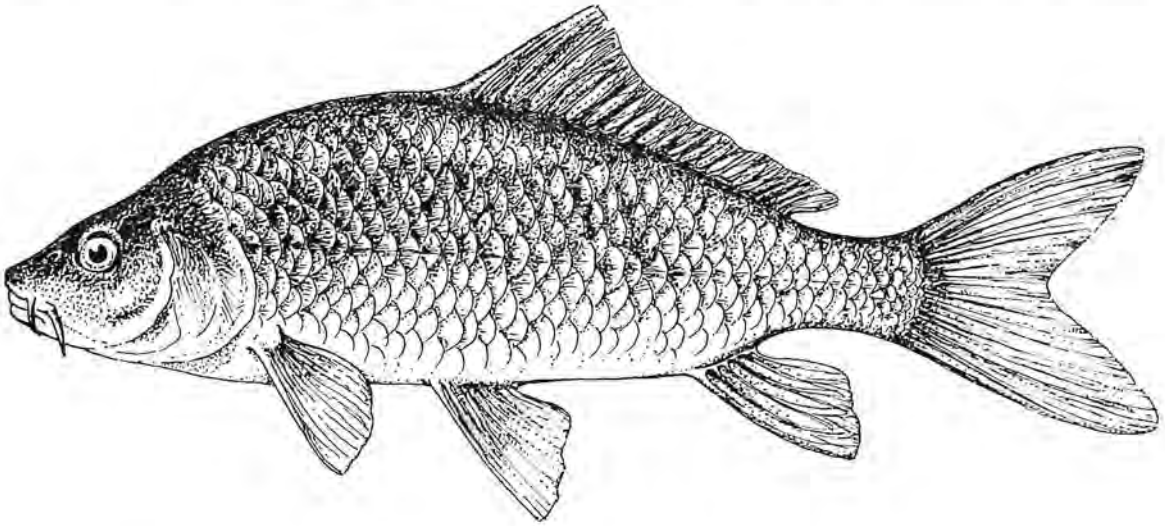
Recent observations of the bird have shown it to be found on any mill between Halls Creek and Wyndham in Western Australia but they are generally scarce and very timid.

Because of the above mentioned status, the Western Australian Wildlife Authority has decided to place a complete ban on the trapping of all wild Northern Rosellas.

The Authority reported that a number of special permits had been issued over the years to allow the taking of the bird from the Kimberleys. These permits were issued with the intention of building up aviary stocks for breeding purposes, which would subsequently reduce the demand on wild stocks.

Concern had been expressed at the number of permits issued in this State as the Northern Rosella population was considerably less than that of the Northern Territory where trapping was not allowed. Members of the Authority agreed that this situation could lead to increased smuggling activity. It was decided that no more permits be issued to trap Northern Rosellas.

CARP SPREADS THROUGHOUT AUSTRALIA



Common or European Carp, *Cyprinus carpio*, are gradually finding their way into all of the Australian inland waterways. So far, because of the geographical barrier separating the east and west of Australia, the Western State is free from the scourge.

The following is an article taken in part from "Australian Fisheries" journal March 1975 and gives the situation that has evolved in Australia, since the thoughtless introduction of this noxious fish.

The bold print is Western Australia's emphasis in the saga.

"CARP was little known in Australia 15 years ago. Today it is established in river systems in Victoria, South Australia and New South Wales, and recently was discovered in farm dams in Tasmania.

The possible threat posed by the fish has been widely debated by fisheries authorities, parliamentarians and anglers and a number of control methods considered. However it is extending its range and eradication is now generally considered impossible.

In 1962 Victoria declared it a noxious fish, ordered its removal from waters in the State and authorised fines up to $1 000 for conveying live carp; last year South Australia appointed its first senior freshwater fisheries biologist—with a special brief to study carp; and the Tasmanian Government recently made an emergency grant of $10 000 to eradicate the fish from farm dams in the north-west, while a bill passed by the Legislative Council imposes fines of up to $1 000 on landowners with carp on their property.

Basis for concern is the well-documented deterioration of native flora and fauna stocks in some bodies of water following the introduction of carp. This concern has been heightened by the fish's rapid rate of spread—the length of the Murray River in South Australia in less than a year for instance—though this has perhaps been the result, to some degree, of man-made changes to the environment.

Mr. A. Dunbavin Butcher, former Director of Victorian Fisheries and Wildlife, described the introduction and establishment of carp in the State as a story of great tragedy and frustration.

'The appearance of European carp in Victorian waters is perhaps the greatest tragedy ever to befall our fresh water environment,' he said.

The carp is native to eastern Asia and reached Europe through Cyprus centuries ago. In 1872 it was introduced to the United States and has since spread to every State except Alaska, indicating its adaptability to widely varying conditions.

The common or European carp (*Cyprinus carpio*) was introduced to Australia in the same year, with the crucian carp *Carassius carassius* and the goldfish *Carassius auratus*, by the Geelong and Western District Acclimatisation Society. The latter two fish have spread into numerous Victorian waters but are not considered a major problem. (Throughout this article, 'carp' refers to *Cyprinus carpio*.)

Carp introduced into Australia were little seen for almost a century. They survived in ornamental ponds in several areas, including the Melbourne Botanic Gardens, and also became established in Prospect Reservoir, a comparatively large body of water supplying domestic water to Sydney (and which shows no ill effects for the presence of the fish).

In Victoria the Fisheries Act of 1958 prohibited stocking of non-indigenous fish (including carp) in public waters but did not prohibit them in private waters.

In 1960 an application was made to the Victorian Fisheries and Wildlife Department for approval to import carp from Germany. The Department discouraged the venture but an advertisement appeared in the country Press in July 1960 inviting inquiries from farmers wanting 'a fast growing and hardy fish suitable for stocking in a majority of dams and ponds'.

The original inquirer had built a series of special ponds in Gippsland and had adult European carp. Another advertisement in May 1961 announced *Cyprinus carpio* were available—and that orders of 1 000 or more would be delivered anywhere in Victoria or the Riverina.

By the end of the month European carp had been liberated in farm dams in many parts of Victoria. In August Mr. Dunbavin Butcher flew to the United States to study the impact of carp there. In December the sale of carp in Victoria was prohibited. But by then the problem was ensuring that the fish did not escape from farm dams into Victoria's river systems.

Widespread debate on the carp led to a State Development Committee inquiry which in turn led to passage of the Noxious Fish Act in May 1962. Anyone having carp in their control was to notify the Department; its officers were allowed to enter private property to destroy the fish; and anyone possessing carp and failing to notify the Department was liable to a fine of $1 000.

A 'carp-kill' program began in May to eradicate the fish before they bred in September-October. It cost 200 man-days and $50 000 to poison more than 1 300 dams throughout the State. Later tests on 200 treated dams did not produce a single live carp.

However about 10 months later carp were found in the Yallourn Storage Dam in the Latrobe Valley. Chemical poisoning failed to get a total kill (as expected) and by early 1964 the fish had bred. By February 1965 they were reported as 'infesting' the dam and appeared downstream.

In the meantime carp were reported from other areas of the Latrobe Valley and according to the Department fish had been stocked secretly and illegally in a number of private waters, without owners' permission.

They also appeared mysteriously in Hazelwood Dam, Lake Gutheridge and Moondarra Reservoir, as well as forestry dams and smaller water storages. It also became obvious that fish had been released in the Latrobe River.

In September 1967 representatives of the Victorian Piscatorial Council, State Electricity Commission, Latrobe Valley Water and Sewerage Board and the Fisheries and Wildlife Department met to discuss carp control. The Department tested mid-water trawl nets unsuccessfully and shelved schemes for seine netting and permanent traps as impractical.

Attention suddenly swung from the far south-east of Victoria to the far north-west when carp were found near Mildura in Lake Hawthorn, a salty irrigation drainage lake connected by a short channel to the Murray River. Fish up to 5 kg were caught and obviously had been put in the lake some years earlier. Carp then were found in the Murray, downstream from the Lake Hawthorn channel.

Carp have since been found in the Yallourn Storage Dam, the Morwell, Tyers, Latrobe, Thomson, McAlister, Avon, Perry, Nicholson, Tambo and Snowy Rivers, Stony and Boggy Creeks, and Gippsland Lakes in south-east Victoria; the Yarra and Maribyrnong Rivers north of Melbourne; and the Murray River from Yarrawonga Weir west, including the tributaries of the Broken, Campaspe, Loddon, and Avoca Rivers and the Laanecoorie Reservoir and Kerang Lakes.

In South Australia carp are found along the length of the Murray River and in Lake Alexandrina. First recorded capture was at the Chowilla Dam site in January 1970. Numerous fish were being caught in the upper Murray River by November of that year and also were reported in the lower reaches—only 10 months after they were first seen in the north.

In Tasmania farmers introduced carp about 10 years ago to control weed growth in dams. They flourished in dams on about 20 farms in the Natone-Stowport area in the north-west. Inland Fisheries Commissioner Mr. D. D. Lynch hopes the fish can be eradicated before escaping to open rivers.

In New South Wales carp have been in the Murrumbidgee irrigation area and the Riverina district for some time and are widespread in the Murray-Darling system.

Carp have not been reported from Queensland but given its known pattern of movement it is expected the fish will eventually reach that State also.

The most serious impact carp have on the habitat is caused by their method of feeding. They feed by sucking up mud and plants from the bottom, ejecting them and selecting food suspended in the water. This keeps the water turbid, in turn inhibiting growth of bottom aquatic plants by reducing light intensity.

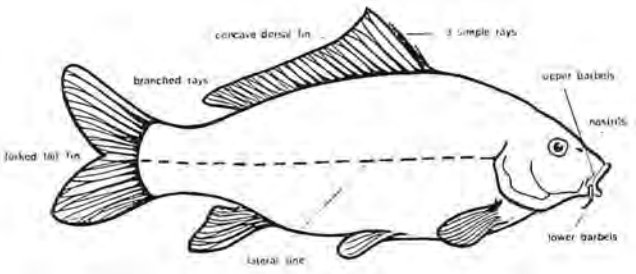
Water conditions produced by carp, particularly in shallow lakes are also believed to encourage blue-green algal blooms, possibly because carp excretions raise the nitrogen level.

Director of the Victorian Ministry for Conservation's Fisheries and Wildlife Division, Mr. J. C. Wharton, considers carp cause most damage in still, shallow water with a muddy bottom. In these conditions it could make the water so turbid no other fish could live there. Vegetation also is destroyed and the water becomes unattractive to water fowl and to man.

Problems have also been reported by officers of the State Rivers and Water Supply Commission with carp fouling drains.

Carp breed mainly during the summer months from September to November in Australia although spawning is said to occur continuously in tropical regions. Main stimulus to breeding seems to be an increase in water temperature to at least 18°C and often local flooding. They breed in tropical countries in water at 32°C. average temperature in fish ponds.

Carp segregate into small groups to spawn, typically one female and two to three males. They prefer shallow recently-flooded sites less than 0·5 m deep but will spawn in up to two metres of water. There is loud splashing during spawning and the water is muddied.



Characteristics of Common Carp.

Males mature in their third or fourth year and females in the fourth or fifth in Canada, although most females in Europe mature within three. Nearly all fish are mature at 40 cm. Fecundity of carp ranges from 13 500 eggs at 20 cm up to three million at over 65 cm. Large females may breed more than once in a season, after an interval of 25 days. The creamy yellow eggs, one or two millimetres in diameter, are laid near the surface on aquatic vegetation. Fertility rate is about 90 per cent. though often less for larger fish.

Hatching at the ideal temperature of 20°C takes 46-144 hours. Prehatching mortality can be 80 per cent. New fry, 4·6–6·2 mm long, sink to the bottom and then attach to plants while the yolk sac is absorbed. They are free swimming and feeding on zooplankton within two to six days and begin phytoplankton feeding at about three weeks. Survival to three weeks generally varies from 20–86 per cent. of egg production.

Growth rate varies with food supply, water temperature and length of growing season. Carp seem to grow faster in Australia than in Europe because of the longer growing period and higher water temperatures. They weigh 1·5–2 kg after two years. Normal life span is about 20 years, when the fish is about 85 cm long and weighs more than 15 kg. Fish of 50 kg have been reported but are rare. The record British carp taken by an angler in 1952 weighed 20 kg. The United States record was also set in 1952 with a 106 cm fish weighing more than 25 kg.

Carp can tolerate poor environmental conditions such as high turbidity (165 000 ppm of silicon dioxide kills juveniles), low oxygen tensions (0·5 cc–1), wide temperature range (5–32°C) and salinity levels which would make water unsuitable for irrigation (0·002 per cent.). Carp are highly tolerant to pollution and are cultivated in sewerage ponds. Carp often will survive where water quality is too low to support any other species.

It is difficult to assess the degree of competition between carp and native species. Carp compete directly for food with other detritus feeders such as fresh water catfish and bony bream, but also destroy the weed beds which harbour the young carnivorous species such as Murray cod and golden perch.

However John S. Lake, former biologist-in-charge of the Inland Fisheries Research Station at Narrandera in New South Wales, argued that man-made changes to the river systems affected native fish far more severely than did introduced species.

Many of the environmental changes which have helped to cause the decline of native species are favourable for carp.

Carp are essentially still-water fish and are suited to the quiet bodies of water formed by locks, which slow the river flow rate. Constant water levels behind locks favour survival of carp eggs, laid on vegetation close to the surface and in danger of being exposed by falling river heights. (One control method is to systematically lower levels in impounded waters during the breeding season.)

Anglers have been particularly vocal about the spread of carp and the possible effect on native species. They commonly regard the fish as vermin which fights poorly when hooked and is not worth eating.

In Europe, by comparison, it is a prized angling species and a popular food fish. (Monks bred it for centuries as a table fish.) One British angling publication described it as 'the biggest, strongest and most wily of all our fresh water species'.

Professor Marcel Huet, Director of the Research Station of Waters and Forests of Belgium, describes the fish as 'wary, crafty, very resistant and difficult to catch'. The flesh was greatly esteemed in many countries and any muddy taste could be removed by soaking fillets in running water.

It is very popular in Asia. *Cyprinus carpio* is widely cultivated along with two groups of cyprinids labelled 'Chinese carp' and 'Indian carp'. It brings higher prices in south-east Asian restaurants than giant perch (barramundi), popularly regarded as Australia's number-one food fish. It is important to village economies.

It has been said, albeit with a certain degree of cynicism, that Australian anglers may one day be grateful for having any fish at all that can survive in our inland waters. Some anglers who have caught the fish say the flesh makes good eating, though it is an acquired taste.

All known eradication techniques throughout the world have either failed or proved impossibly expensive in any but small areas of enclosed water.

Several chemicals have been used in Victoria. Most effective was rotchone but at a cost in chemical alone of about $15 for every 1·24 million litres of water use of this chemical is only practical on a small lake with extremely high fishing potential.

There has been no widespread poisoning in Victoria in recent years because carp have not infiltrated the 'blue ribbon' fishing lakes in the State.

Other possible control methods include:

- fences or dykes to bar adult carp from certain areas, but costs and maintenance would be prohibitive and carp fry could still enter;
- electric barriers, similar to those used in the American Great Lakes to control lampreys might be effective in small channels and waterways, but they would be non-selective and stop native fish as well; and
- water level controls to expose the eggs. Because of the short incubation period and long spawning season water levels would have to be dropped at least once a day for several months. This is impracticable in most areas.

Also considered as a control method is increased commercial fishing . . . . . "

"Much of the current work on carp in Australia consists of the collecting of basic data, such as growth, reproduction, food and behaviour. Its effect on native species (competition, predator-prey relationships, population structure and sizes of native fish species) are also being studied and control methods are being evaluated.

There is exchange of information between the three currently affected States—South Australia, Victoria and New South Wales. Because inland waters are the responsibility of the States the Australian Government has not been directly involved . . . . . "

In the State of Western Australia, legislation has been tightened to control any situation that might arise in regard to noxious fish. The Minister for Fisheries and

Wildlife has the power to assert strong action against the introduction into this State of any species such as European Carp.

Prevention is better than cure.

During 1975 Mr. John Hendry of Mt. Pleasant notified the Department that he had received in error a consignment of koi carp from Singapore. Fisheries and Wildlife Department Officers subsequently destroyed the fish, which had eluded all entry checks into the State.

Appreciation is expressed for Mr. Hendry's responsible and unselfish action in helping to restrict the entry of this unwanted species into Western Australia.

1974/75 MARRON SEASON

The 1974/75 marron season opened at midnight on Sunday December 15, 1974 and closed at midnight on April 30, 1975.

During the 9 months from September 1974 to May 1975 the Inland Fisheries Inspection Unit travelled over 24 000 miles patrolling the dams, lakes and rivers of the South West Land Division of W.A. During this period 60 parties (a total of 85 persons) were apprehended for breaches against the Fisheries Acts and Regulations. In addition a number of people were apprehended by other Inspectors, Fauna Wardens and Honorary Inspectors.

A large proportion of those apprehended were charged with possession of undersized marron while charges of obstruction, non-compliance with conditions of license and no license at all made up the remainder. It was also distressing to note that at least 20 persons were charged with two or more breaches.

During the previous year considerable concern had been expressed by marron fishermen over the use of boats for catching marron. It had been decided therefore to prohibit the use of boats for the 1974/75 season.

Responsible marron fishermen had become concerned at the diminishing number of legal size marron available. However the Department expects that with increased fishing pressure, which is increasing each year, there will be less legal size marron available to each fisherman from the same annual stock.

Various suggestions had been made by fishermen to help overcome the problem. The closing of the season for a trial period of five years throughout the entire range of the marron had been suggested. This had been done for a similar species in Sweden but the experiment was successful only for a short period. As soon as fishing recommenced the larger animals were all removed over a short period and resulted in no more large animals being taken than would have been taken during the preceding five years.

Dr. Noel Morrissy, a senior research officer with the Department of Fisheries and Wildlife, has been studying marron for seven years in the rivers and dams from the Murray River down to the Warren River. Dr. Morrissy's conclusion was that marron were in no real danger of being "fished out" to extinction and that the perpetuation of the species was assured by breeding in the remaining stocks of undersize marron.

However, marron may be endangered from changes in the natural environment. Clearing of land for agriculture and other activities have lowered the environmental quality of the Blackwood River and thereby reduced marron stocks considerably.

It is obvious from field reports that many "sportsmen" took undersize animals. This was to be deplored, not only because of the illegality of the action, but because it was completely unfair to other fishermen who acted responsibly and wanted marron to be allowed to reach an acceptable size.

The Department has a full-time inspection unit in the field, but to increase the number of units would mean a substantial increase in license fees. This was a matter which was receiving Government condideration.

In the meantime it was important for the Department to expand its research activities to obtain an understanding of the southern rivers. By this means it would have a fuller knowledge of what "fished out" means—a term used generally by the public when marron became scarce in a particular area.

Dr. Morrissy's research programme would be intensified in this area and it is quite possible that in the future some areas may be closed as an experiment over a period of years.

Before taking this action, it would be necessary to know and understand what the current situation is under heavy fishing pressure.

HONORARY WILDLIFE OFFICERS QUARTERLY REPORTS

There have been enquiries from some of the 600 Honorary Wildlife Officers in Western Australia requesting news and information from their Quarterly Reports to be printed in S.W.A.N.S.

Generally speaking, the list of common fauna and its status which appears on the front of the reports is not of specific interest value to readers, in that it merely shows whether or not such animals were sighted and in what numbers.

These reports however are of considerable value and interest to the Department and in particular the District Wildlife Officer.

However, should there be any unusual sightings or event to report, then section (q) on the form is provided for further information and recommendation for possible inclusion in S.W.A.N.S.

Only a small percentage of the officers use this section to advise of rare or unusual occurrences.

So that significant and worthwhile information can be reproduced for world-wide distribution in S.W.A.N.S. the following directions which appear on the back of each report must apply.

DIRECTIONS

"Under the various headings in paragraph 2, Honorary Wildlife Officers should indicate the status during the quarter of the species mentioned (if they possess the requisite information) and what effect the local weather and other conditions have had. If you are reporting during an open season (as for ducks), mention the results obtained by local sportsmen. With regard to species

(*continued page* 21.)

SHOOTING & WILDFOWL CONSERVATION IN IRELAND

In early April 1975 I attended the British Ornithologists' Union Annual Conference at Wexford, and I took the opportunity to see something of wildfowl conservation in Ireland. The wildfowl of the Arctic winter in Europe and Ireland receives a share of these, Greenland white-fronted geese, bernicle geese, whooper swans, wigeon, pintail and many other duck species, as well as large numbers of waders. All these birds find food and shelter on the shores, lakes and bogs (swamps) of Ireland, and have for many hundreds of years been the traditional quarry of the shooters.

Wexford, for example, lies on the estuary of a small river, the delta of which has been reclaimed within a sea wall after the manner of the Dutch polders. Two thousand acres of low-lying grassland were added to the coast in the 1850's and now the area is one of the main winter haunts of the Greenland white-fronted geese. Recently the Irish Government, through its Fisheries and Wildlife Service, acquired over 300 acres of this land as a reserve for the birds. Shooting is permitted from January to March on the rest of the land, called the North and South Slobs, depending on whether they are north or south of the river. The shooting is conducted by a private syndicate who work closely with the Fisheries and Wildlife Service and arrange only five shoots a year, siting their guns so that they shoot half the estuary each time. If the North Slobs are used on the first shot, the South Slobs are shot the second time. By regulating in this way a good bag is obtained but the birds are not deprived of a refuge and return in numbers each year, numbers which appear to fluctuate more in relation to the success of the Arctic breeding season than in relation to the shooting pressure at Wexford. Frequently a few individuals of other species accompany the birds to Wexford; a blue snow and a pair of graylags were there last April, grazing happily amongst five thousand white-fronts.

Wildfowl shooting at Wexford is well managed and shows, incidentally, that man-made habitats are not always deserts for wildfowl. Another area that I visited, the Shannon River and its tributaries, gave a different picture. The Shannon meanders slowly down from the Irish midlands to the western coast. Its tributaries, too, especially in their lower courses, are slow-flowing rivers

Little Brozna River, County Offaly.

Spent cartridges from various international shooting parties.

with wide floodplains giving acres of spongy flooded grassland ideal for wintering wildfowl. Recently aerial surveys by the Irish Fisheries and Wildlife Service have shown the ways wildfowl use different sections of these waterways. A small four-mile-long stretch of the Little Brozna River, flowing west into the Shannon from Co. Offaly, is the pick of them, regularly giving the highest counts of wintering wildfowl. Unfortunately a substantial part of this area is under the control of a private syndicate of farmers who have combined to lease the shooting to visiting sportsmen. So great is the attraction of this area to wildfowl that the excellent shooting draws hunters from as far afield as North America and continental Europe. The collection of spent cartridges shown in the photograph was picked up in ten minutes at one butt, and included brands from the U.S.A., Italy, West Germany, France, England and Ireland. Truly an international gathering. The shooting pressure is so intense during the hunting season that the birds must seldom get time to feed and rest. Hunters apparently come for a fortnight's 'sport' and expect to fill every moment with the crack and boom of their guns. They seek not only flighting ducks and geese, but walk the marshes for snipe and waterfowl, as well as beating pheasants and other dry land game. The disturbance to wildlife

caused by this invading horde must be enormous and the numbers of many species that winter there are declining. The shooting season is fixed by tradition and it may surprise many Western Australians to learn that its length does not take into account the success of the previous breeding season. Wildfowl can be so concentrated in frosty weather that they occupy only a fraction of their normal habitat, and yet be shot at in these concentration points if the season is open. Western Australian shooters should be grateful that our wildfowl biologists and administrators work together in controlling duck shooting pressure to the level that the population can take, and avoid the indiscriminate slaughter to which some Irish migratory wildfowl populations are subjected. At least Western Australia does not have to contend with the 'jet-set shooters' who visit Ireland in such numbers.

A happier note was struck for me on a visit to the Kilcoman Wildfowl Refuge. Here, in the southern midlands of Ireland, Mr. and Mrs. Ridgeway have bought an old bog farm of 120 acres and converted it to a delightful wildfowl refuge. The heart of the farm is a lake beside a bog of floating peat. At the edge of this lake the Ridgeways have built an observatory where water fowl can be watched through the year. The swans in the photograph are whoopers, feeding barely 10 feet from the window. The day after this photograph was taken they set off for their Icelandic breeding grounds.

Wild Whooper Swans at Kilcomen wildfowl refuge.

The Ridgeways not only bought the farm and preserved it but persuaded six of their neighbours to prevent shooting on their property, too, so that over seven hundred acres of protected land surrounds the bog. The results of this protection have been dramatic. From being the wintering ground of a few hundred ducks five or six years ago, winter counts now exceed four thousand birds, whooper swans, wigeon, pintail, mergansers, mallard, pochard and even a few Greenland white-fronted geese,

Mr. and Mrs. Ridgeway and Warden Keane, Irish Fisheries and Wildlife Service, examining a drain on the Little Brozna Plains.

a species that was formerly common there but disappeared in the face of persistent shooting. The Ridgeways are not just preserving the waterfowl but trying to learn something of what they eat during their winter stay, and what types of ground they choose for resting, so that the refuge can be managed to attract greater numbers of waterfowl. It has already been found that a few inches more or less water over the bog can make a difference to the duck numbers of many hundreds, and water control is one of the main management problems of the refuge.

Kilcoman Wildfowl Refuge is recognised by the Wildfowl Trust as an important link in the chain of such refuges that give shelter to Arctic wildfowl each year, but it is more than that. It is an example of the success that can be achieved by dedicated people working in a private capacity, with private means, and of the way a private individual's contribution can add to the conservation of an international wildfowl population.

(Cont from Page 19.)

which are considered locally as pests report on the situation during the current quarter.

Information is particularly desired on rare and inconspicuous species such as Brush Wallaby (or kangaroo), Tammar, Quokka, Numbat or Banded Anteater, Rock Wallaby and smaller marsupials such as the Dunnart, if Honorary Wildlife Officers have an opportunity of observing them.

More detailed reports on any species, or criticism of any aspect of fauna conservation, would at all times be most appreciated.

Reports should be submitted as soon as possible after the quarters ending March 31, June 30, September 30 and December 31."

The Department of Fisheries and Wildlife has the job of trying to cope with the huge territorial expanses of Western Australia. The efficient eyes and ears of its Honorary Wildlife Officers are needed to help in the maintenance and protection of the native fauna and its habitat. Good quality reports from the field will help keep S.W.A.N.S. the most informative journal on wildlife in this State.

FERAL CATS

The domestic cat has the unique position of being able to enjoy two worlds, the captive and the wild.

At home the family will see their pet cat as a well fed, warm, and lovable animal completely happy and content in his surroundings. Outside the house the same animal has the complete capability of reverting to its natural instinct by becoming a creature of the shadows that can hunt and kill prey in an instant.

While the domestic cat is maintained and looked after by his adopted family in the city, it can be assumed that his natural maraudings and consequent destruction of native animals is minimal.

On the other hand the domestic cat in rural areas has caused great concern to naturalists and biologists throughout Australia. Since the first settlers came to W.A., cats have become established as a feral species throughout the State.

Early rural pioneers gave their pets the run of the homestead and more often than not, unchecked breeding and semi-wild communities were allowed to establish.

Dr. Andrew Burbidge, Officer in-Charge-of the Department's Wildlife Research Centre at Wanneroo, estimates that the feral cat population reached a peak some 50 years ago and by that time irreparable damage had been done to the indigenous fauna of the State.

The disappearance in some known localities of marsupials such as the Woylie, Numbat and Bandicoot is thought to be directly attributable to feral cats.

Recently a Dibbler was "brought in" by a cat at Jerdacuttup. It was a tremendous discovery, but the animal was "dead-on-arrival".

With most of our small mouse-like mammals being located in all types of habitat throughout the entire State of W.A. it is possible that a species could have been exterminated before being recorded.

In 1974 a biological survey of the Prince Regent River Reserve in the North West Kimberley of W.A. revealed feral cats in areas never before visited by man.

While the State generally has a stable feral cat population, there is no doubt from Honorary Wildlife Officers' Quarterly Reports that certain areas are experiencing a build up in numbers.

The problem of cats is not a new one, especially in the north of the State. Temporary or permanent abandonment of some stations have in the past resulted in cats going bush to the detriment of many Spinifex Pigeons.

Honorary Wildlife Officers in the Mandurah district have reported as many as forty animals scavenging at night on the Council rubbish tip. During the day, Wagtails, Blue Wrens and Robins have been observed being taken in the district by these predators.

The Shire of Kelmscott has also indicated a similar problem and an eradication programme may have to be implemented.

The Department does not see any easy answer to the situation. Feral cats are not declared vermin so there is no requirement that they be destroyed. Killing the animals will raise a storm of objections from many people as it is another of the emotion-charged situations with which we are faced. In the meantime the indigenous fauna suffers again from the effect of an introduced species.

The only time the Department is able to take positive action is when feral cats go on to Nature Reserves. The Wildlife Conservation Act specifically forbids the introduction of any non-indigenous species on to Reserves, and the Department can take appropriate action to destroy such animals.

The following statement was taken in part from a special pamphlet produced by the National Parks and Wildlife Service of N.S.W. and is also applicable in every way to Western Australia.

"The domestic cat gone wild (the feral cat) is a great destroyer of wildlife. It can climb trees, stalk native animals, steal their young and take eggs from nests both in trees and on the ground.

Feral cats can multiply rapidly. Unlike most Australian native animals, the feral cat produces several litters a year with up to eight kittens in each. In the wild in their countries of origin, very few of the young would survive but because the cat is a recently introduced animal in Australia, the natural checks on its population are not present.

One of the main checks on the population of cats is the availability of food. In Australia there is an abundant supply of prey, most of which is easily caught by cats. Not only are cats able to live on birds, small mammals, reptiles and insects but also, because they are so adaptable, they survive on scraps left in picnic areas and garbage tips. From these areas of plenty they maraud into the surrounding natural bush.

Their efficiency as hunters not only means they destroy native birds and animals but they also compete with the native carnivores, which normally fulfil this function.

Cat owners who, for various reasons, no longer wish to keep their pets, frequently prefer to dump them in the bush rather than dispose of them in other ways. They believe it is cruel to destroy surplus cats and kittens. Yet, when these cats are released into the bush, they destroy a great many native birds and animals in their fight for survival.

A cat released in the bush loses the qualities of a domestic pet. It becomes very cunning and ferocious and its muscular system becomes very well developed.

Strangely enough, most dumpers of cats choose national parks and nature reserves for their dumping. This is quite contrary to the aim of such places which is to conserve native animals in their habitat.

If you want to dispose of a cat, ring your local vet, or the R.S.P.C.A. . . . . ".

It is hoped that in time this exotic animal will be eradicated from our bush and that in the future, cat owners will adopt a more responsible attitude with their pets.

RESERVED FOR WILDLIFE

A summary of the number and area of Nature Reserves at 30 June, 1975 is given below. Because the vast majority of native animals and plants cannot persists outside their natural environment the main technique of wildlife conservation must be the setting aside of reserves. The Nature Reserve system, along with National Parks, natural areas of State Forest and other types of protected bushland such as water catchment areas, is the mainstay of wildlife conservation in Western Australia.

The Department of Fisheries and Wildlife has for some time pursued a policy of reserve acquisition. The main source of reserves is from Crown land although the purchase and donation of private land has played a small but significant part.

The most secure Nature Reserves are Class A reserves set aside for the Conservation of Fauna and Flora and vested in the Western Australian Wildlife Authority. Class B and Class C reserves vested in the Authority are somewhat less secure and Class C reserves which are not vested have least security.

The tables show the progressive total set aside in Western Australia as at June, 1975, and are followed by lists of the latest additions, amendments, changes of purpose and vesting.

TOTAL OF NATURE RESERVES IN W.A.

Date	Total Number	Area (ha)	Vested in the W.A. Wildlife Authority	
			No.	Area (ha)
30 June 1975	491	5 103 037	320	4 713 482

SUMMARY OF NATURE RESERVES—30 JUNE, 1975

As at June 30, 1974	454 Reserves	5 033 934·9783 ha
New Reserves 1974/75	38 Reserves	50 946·6293 ha
	492 Reserves	5 084 881·6076 ha
Amendments		+ 18 510·4945 ha
	492 Reserves	5 103 392·1021 ha
Change in Purpose	1 Reserve	— 354·7474 ha
Total	491 Reserves	5 103 037·3547 ha

RESERVES VESTED IN W.A. WILDLIFE AUTHORITY

As at June 30, 1974	281 Reserves	4 626 617·0000 ha
New Reserves 1974/75	29 Reserves	45 331·4090 ha
	310 Reserves	4 671 948·4090 ha
Amendments 1974/75		+ 18 281·4755 ha
	310 Reserves	4 690 229·8845 ha
Existing Reserves Vested	10 Reserves	23 512·2687 ha
Total	320 Reserves	4 713 742·1533 ha

DECLARATION AND AMENDMENT OF RESERVES

New Reserves

Name	Reserve No.	Locality	Plan	Area	Previous Purpose	New Purpose	Vesting	Gazetted
Gnandaroo Island	33216	Exmouth Gulf	95/300	3·059 ha	....	Cons. of Fauna	WAWA	27/3/75
Hill River	33287	Approx. 5 km east of Jurien Townsite	62/80	293 ha	....	Cons. of Flora & Fauna	Not Vested	16/5/75
	33113	East of Salmon Gums	392/80	923·94 ha	....	Cons. of Flora & Fauna	WAWA	31/1/75
Ngalbain	33300	West of Kambalda Town-site Abuts	40/80	Approx. 3 683 ha	....	Cons. of Flora & Fauna	Not Vested	23/5/75
	A32906	West of Three Springs	123/8	Approx. 63 ha	....	Cons. of Flora & Fauna		8/11/74
	A32907	West of Three Springs	94/80	Approx. 51 ha	....	Cons. of Flora & Fauna	Not Vested	8/11/74
Thevenard Island	33174	Approx. 27 km N.W.- of Onslow	Onslow 1:250 000	Approx. 581 ha	....	Cons. of Flora & Fauna	WAWA	14/3/75
	33501	North-east of Salmon Gums	392/80 D1	Approx. 203 ha	....	Cons. of Flora & Fauna	Not Vested	11/7/75
Wongan Hills	33530	10 km N.W. of Wongan Hills	57/80	417 ha	....	Protection of Flora & Fauna	Not Vested	15/8/75
	33455	On Muir Highway North of Lake Muir	443/80	270·4843 ha	....	Cons. of Flora & Fauna	WAWA	11/7/75
Bulgin Rock	8830	6 km E.S.E. of Meckering	26/80	23·91 ha	....	Cons of. Flora & Fauna	WAWA	14/11/75
	33713	11 km west of Lake Hurlstone	374/80	116·77 ha	....	Cons. of Flora & Fauna	Not Vested	14/11/75

Vesting

Name	Reserve No.	Locality	Plan	Area	Purpose	Previous Vesting	New Vesting	Gazetted
	23601	Approx. 6 km North of Marchagee	90/80	581·5 ha	Cons. of Flora & Fauna	Not Vested	WAWA	17/1/75
Tarin Rock	A25711		386/387/80	2010·79 ha	Cons of Flora. & Fauna	Not Vested	WAWA	14/3/75
Collgar	24367	19 km east of Merredin	24/80	816 ha	Cons. of Flora & Fauna	Not Vested	WAWA	18/4/75
Mokami Spring	23686		4/80	481 ha	Cons. of Flora & Fauna	Not Vested	WAWA	30/5/75
Lake Cair-locup	28324		418/80	1 587·62 ha	Cons. of Flora & Fauna	Not Vested....	WAWA	27/6/75
Bulgin Rock	8830		26/80	23·91 ha	Cons. of Flora & Fauna	Not Vested....	WAWA	14/11/75

Change of Purpose

Name	Reserve No.	Locality	Plan	Area	Previous Purpose	New Purpose	Vesting	Gazetted
Dowerin	4244		33/D40	160 ha	Water	Cons. of Flora & Fauna	....	13/4/73
Truslove	16801		402/80	198 ha	Townsite	Cons. of Flora & Fauna	WAWA	14/2/75
Kulikup	18239		415/80	61 ha	Racecourse	Cons. of Flora & Fauna	WAWA	31/1/75
Wamballup	6716 & 11760		444/80		Agric. College	Cons. of Flora & Fauna	....	25/10/74
Mt. Westdale	33188		342/80	Approx. 607 ha	Timber Reserve	Cons. of Flora & Fauna	WAWA	14/3/75
Lake Biddy Water Reserve	17617		388/80	Approx. 40 ha	Water	Cons. of Fauna	WAWA	14/2/75
Mt Hampton	20526 & 32995		6/80 & 23/80	2 262 ha	Water	Water & Cons. of Flora & Fauna	WAWA	20/12/74
	26381	8 km North of Nyabing	408/80	353 ha	Cons. of Flora	Consl of Flora & Fauna	WAWA	30/5/75
Yilliminning	17115	Approx. 25 km east of Narrogin	385/80	170 ha	Timber & Cons. of Flora & Fauna	Cons. of Flora & Fauna	WAWA	14/3/75
Yilliminning	21067	Approx. 25 km east of Narrogin	385/80	Approx. 115 ha	Timber & Cons. of Flora & Fauna	Cons. of Flora & Fauna	WAWA	14/3/75
Cullimbin Well	15794	Approx. 24 km west of Koorda	56 D/40	Approx. 469 ha together	Water	Water & Flora & Fauna	Min. for W.S.S.D.	16/5/75
Cullimbin Well	11688	Approx. 24 km west of Koorda	56 D/40		Water	Water & Flora & Fauna	Min. for W.S.S.D.	16/5/75
Tinkelup	26234	Approx. 30 km N.N.E. of Mt. Many Peaks	450/80	575 ha	Cons. of Flora & Access	Cons. of Flora & Fauna	WAWA	30/5/75
	21287	Approx. 17 km S.W. of Pingelly	378 A/40	202 ha	Timber	Cons. of Flora & Fauna	WAWA	16/5/75
	31746	Esperance	403/80	355 ha	Cons. of Flora & Fauna	Townsite	Esperance Shire	27/6/75
Baandee	12329	Approx. 38 km South of Kununoppin	25/80 & 34/80	41 ha	Townsite Timber & Sheep Dip	Cons. of Flora & Fauna	WAWA	27/6/75
	A9620	Approx. 8 km N.W. of Lake Dumbleyung	408 & 409/80	Approx. 29 ha	Travellers & Stock	Cons. of Flora & Fauna	WAWA	22/2/74
	20095	8 km N.W. of Tutanning Reserve	378/80	Approx. 100 ha	Timber Reserve	Cons. of Flora & Fauna	Not Vested	9/5/75
Wongamine Forest	33697	Approx. 8 miles N.E. of Toodyay	27/80	212·9459 ha	Timber	Cons. of Flora & Fauna	WAWA	31/10/75
Woodenooka	33475		156/80 .... 161/80	1 735 ha	Stock Route	Cons. of Flora & Fauna	WAWA	11/7/75
Tallering	33466		156/80 161/80	5 131 ha	Stock Route	Cons. of Flora & Fauna	WAWA	11/7/75
Gunyiai	23602	South of Marchagee	90/80	121 ha approx.	Protection of Native Flora	Cons. of Flora & Fauna	WAWA	17/10/75

Amendment of Area

Name	Reserve No.	Locality	Plan	Previous Area	New Area	Gazetted
	23756	S.W. corner of Harvey Estuary	380/80 & 383/80	990 ha approx.	1019 ha approx.	25/10/74
Lake Eganu	25210	4 miles West of Marchagee	90/80	1691·58 ha	16928·5 ha	6/12/74
Clackline	32400	Clackline	27/80	429·2 ha	458·9 ha	14/2/75
	32142	West of Wilgarup Townsite	439/80....	197·337 ha	191·204 ha	25/10/74
Nuytsland Wildlife Sanctuary	A27632	Great Australian Bight	3, 12, 13, 15 & 16/300	623035·57 ha	625285·61 ha	8/8/75
Nonalling–White Water Reserve	24428	North of Yealering	377/80....	323·74 ha	497 ha approx.	5/9/75
Lake Cairlocup	28324	Shire of Kent	418/80....	1 009·62 ha	1 587·65 ha	27/6/75
Biljahnie Rocks	29920	3 km South of Karalee	24/300....	About 2 560 acres	1 036·07 ha	14/11/75

WILDLIFE HABITAT THREATENED AT ALFRED COVE

There is only one remaining section of natural foreshore on the Swan River.

If destroyed, the few hundred metres of Alfred Cove in question will mean the disappearance on the Swan River Estuary of a small migratory wading bird, the Greenshank and a rare saltwater snail. The area has also the distinction of having the only existing exposed prehistoric fossil grounds on the estuary.

The Greenshank

Because of past river reclamation, the samphire flats of Alfred Cove provide the only habitat on the Swan River with food sources for the Greenshank. From September to April each year the bird can be seen feeding voraciously in the Cove.

Greenshanks breed in the Arctic summer, nesting in Northern Europe and the isolation of Siberia. Egg-laying begins in May and only two months later the young have taken wing. In August, only three months after breeding, the onset of winter forces the birds and their young on a southward migration.

They have been known to travel the 12 000 km from Siberia to Western Australia in only 75 days, and for this reason the birds are usually emaciated and exhausted on their arrival.

In order to recover and attain the full physical condition needed for their return journey, the Greenshanks must have ready access to a feeding ground with a food supply of the quantity and quality as is found in Alfred Cove.

Greenshanks, as may be seen loafing on the flats of Alfred Cove.

Panorama of Alfred Cove. District of Attadale on left and centre. Perth skyline is on the extreme right.

Alfred Cove provides a food chain in the form of insect larvae, crustaceans (shrimp etc.) annelids (worms) small fish and molluscs (marine snails). The saltwater snail mentioned previously, exists only in this area.

Greenshanks do not eat plants and therefore depend upon animal life for food. It is reasonable speculation that any attempts at pesticidal control of the saltwater mosquito and other insect larvae on Alfred Cove Flats would impair or destroy food chains on which the bird depends.

Large and small animal predators (including Greenshank) of insect larvae could be removed, making the control of mosquitos etc., entirely dependent on pesticides.

Reclamation as a control, would have just as damaging an effect as pecticides in wiping out the biological resources of the Cove, but a further loss would be incurred as is explained in the following.

Fossil Deposits

The Alfred Cove flats are comprised of an unmodified fossil deposit of sea shells some 7 000 years old. The deposit records levels reached by the rise in the sea between 20 and 6 thousand years ago, following the last ice age.

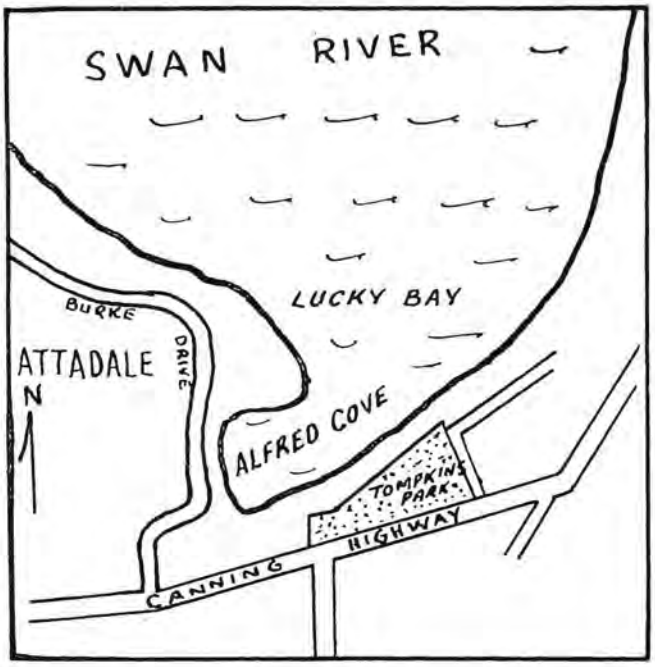
Because of previous reclamation in the Swan River Estuary, Alfred Cove has the only surface deposit left for study by future generations. The Cove therefore, is of geological importance for understanding the evolution of local landscapes.

The aforementioned is a situation of ludicrous repetition within cities of the world today.

Civilization encroaches on the domain of all wild creatures, but with a little thought and pre-planning, the biological diversity and natural resources of a community can be maintained for the education and enlightenment of its people and future generations.

Cities are becoming huge artificial "People Parks" devoid of most indigenous fauna with the exception of a few common species.

Anything of value has a cost, in the case of Alfred Cove with its small amount of insect pest (compared with years ago) the cost is trivial.



Looking north-west across Alfred Cove. Mud flats utilized by Greenshanks are across water on the left. This is the area which has been in the news as a mosquito breeding ground and will be the subject on a research programme next summer. Spraying pesticides over the mud flats to combat the mosquito problem also presents a hazard to the wildlife and marine animals.

RARE AND ENDANGERED SPECIES

Apart from those species scheduled under the Fauna Conservation Act as being "unprotected" in the State of W.A., all fauna is protected everywhere—on private property, Crown Land, State forests and other reserves. The commercial exploitation of unprotected species is regulated.

Severe penalties exist to ensure that the laws governing the protection of our native fauna are observed. Certain species are given additional protection because they are considered to be rare and likely to become extinct. As at June, 1975, these were :—

BIRDS

- Noisy Scrub-bird
- Bristle bird
- Rufous Bristle-bird
- Black Grass Wren
- Western Whipbird
- Ground Parrot
- Night Parrot
- Naretha Blue Bonnet
- Cape Barren Goose
- Freckled Duck
- Patridge Pigeon
- Burdekin Duck
- Red-tailed Tropic-bird
- Peregrin Falcon
- Princess Parrot
- Grass Owl

MAMMALS

- Barrow Island Euro
- Crescent Nail-tailed Wallaby
- Spectacled Hare Wallaby
- Western Hare Wallaby
- Banded Hare Wallaby
- Brush-tailed Rock Wallaby
- Rothschild's Rock Wallaby
- Woylie
- Boodie
- Broad-faced Potoroo
- Gilbert's Potoroo
- Little Barred Bandicoot (Marl)
- Pig-footed Bandicoot
- Dalgite (Rabbit-eared Bandicoot)
- Rusty Numbat
- Dibbler
- Little Red Antechinus
- Long-tailed Dunnart
- White-tailed Dunnart
- Troughton's Dunnart
- Narrow-nosed Planigale
- Kimberley Planigale
- Rock-haunting Ringtail
- Scaly-tailed Possum
- Big-eared Hopping-mouse
- Long-tailed Hopping-mouse
- Dusky Hopping-mouse
- Stick-nest Rat
- White-tipped Stick-nest Rat
- Western Mouse
- Shark Bay Mouse
- Gould's Native-mouse
- Shortridge's Native-mouse
- Dugong

REPTILES

- Short-necked (Western Swamp) Tortoise
- Salt-water Crocodile
- Freshwater Crocodile

(NOTE—The fauna listed above, becomes wholly protected throughout the whole of the State at all times and any person who infringes that protection is liable to a penalty of $1 000).

CHANGE OF ADDRESS

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(Editor.)

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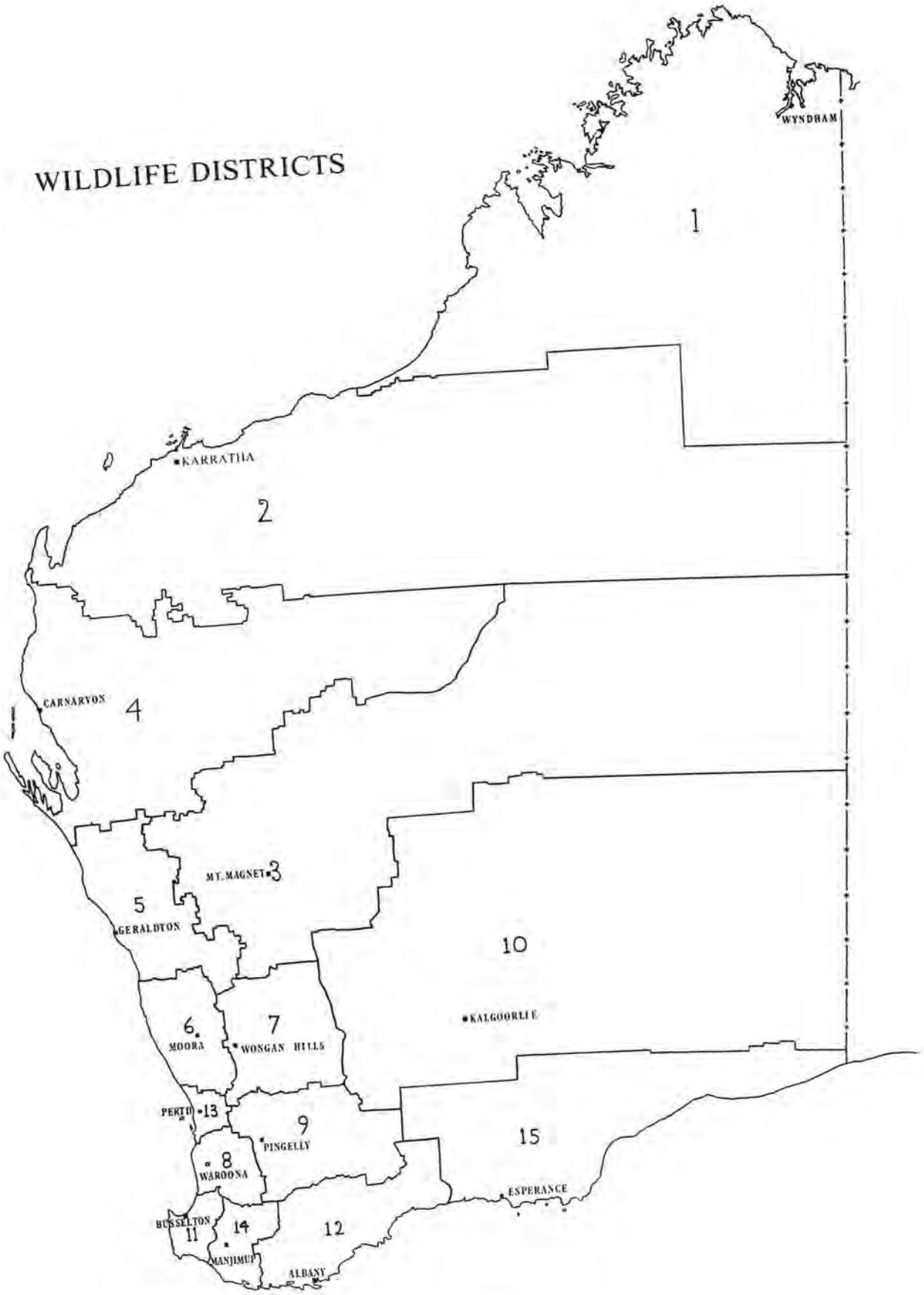

DEPARTMENT OF FISHERIES AND WILDLIFE
DISTRICT OFFICERS

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108 Adelaide Tce., Perth. Tel. 25 5988

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Campion House, 63 Serpentine Road. Tel. 41 4111

BROOME:
Hamersley Street. Tel. 59

BUNBURY:
Stirling Street. Tel. 21 2598

BUSSELTON:
14 Queen Street. Tel. 52 2152

CARNARVON:
16 Robinson Street. Tel. 41 1185

DONGARA:
Carnarvon Street, Port Denison. Tel. 27 1187

ESPERANCE
Wallaceway Centre. Tel. 71 1839

FREMANTLE:
Cliff Street. Tel. 35 6369

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Padbury Street. Tel. 48 1048

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Maritana House, Boulder Road. Tel. 21 4148

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