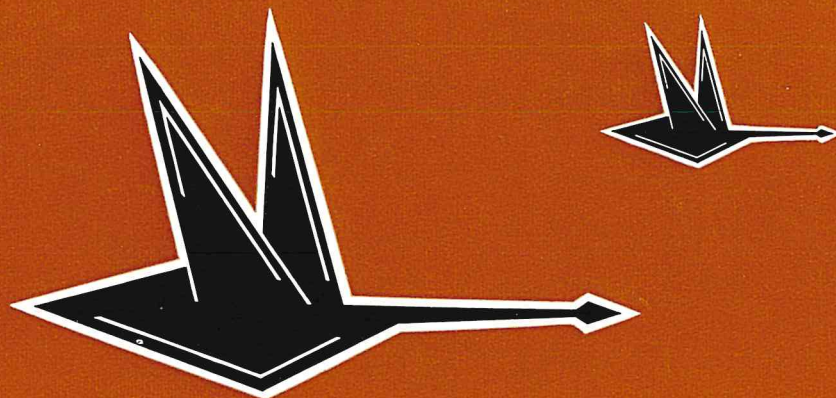


WESTERN AUSTRALIA



S.W.A.N.S.

State
Wildlife
Advisory
News
Service

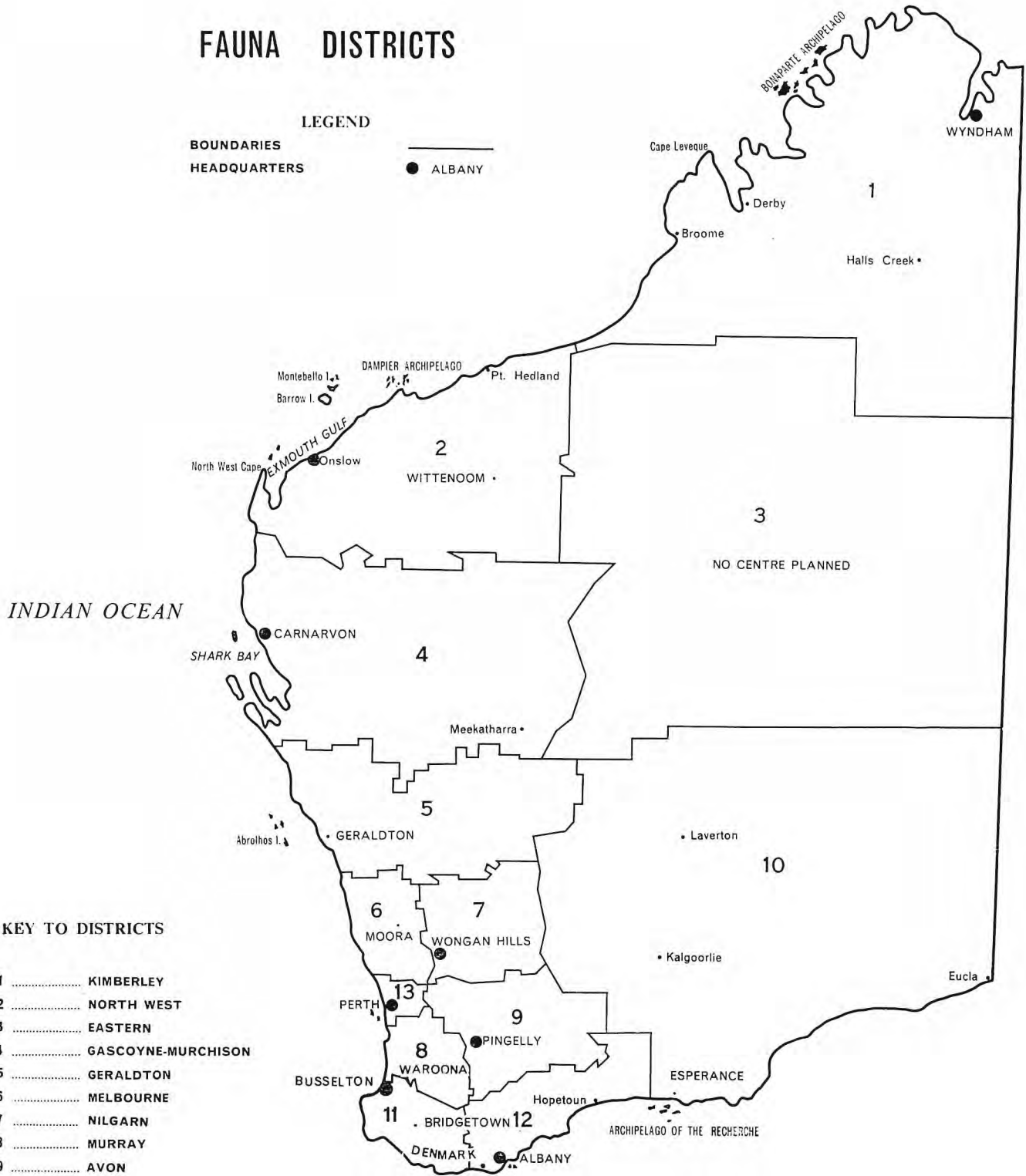
Vol. 2 No. 3

Winter, 1971



FAUNA DISTRICTS

LEGEND
BOUNDARIES —————
HEADQUARTERS ● ALBANY



- KEY TO DISTRICTS**
- 1 KIMBERLEY
 - 2 NORTH WEST
 - 3 EASTERN
 - 4 GASCOYNE-MURCHISON
 - 5 GERALDTON
 - 6 MELBOURNE
 - 7 NILGARN
 - 8 MURRAY
 - 9 AVON
 - 10 EUCLA
 - 11 SOUTH WEST
 - 12 GREAT SOUTHERN
 - 13 METROPOLITAN

S.W.A.N.S

Vol. 2 No. 3

WINTER, 1971

Issued by direction of the Hon. R. Davies,
M.L.A., Minister for Fisheries and Fauna.

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

Chief Warden of Fauna: 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.

S.W.A.N.S. is published quarterly at the conclusion of each season by:

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**Editor: A. C. Waldon,
A.A.I.A. (Dip.), M.P.R.I. (Aust.)**

Assistant Editor: R. F. Ward

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Something to think about....

One of the most familiar clichés in the encyclopaedia of the apocalypse is “the population explosion” The problem of too-many-people underlies all others, a fact summed up in the slogan “Whatever your cause it’s a lost cause unless we control population”.

By 1830, it had taken 200,000 years for the population of the world to reach one thousand million. It took a further one hundred years to reach the figure of two thousand million, and only thirty years more to reach three thousand million. It is estimated that the four thousand million mark will be reached by 1975.

Authors Foerster, Mora and Amiot have stated that if the population of the world continues to increase at the present rate then, on Friday, 13 November, 2026, everyone will be squashed to death!

EDITOR'S NOTE:

Due to lack of support tomorrow has been cancelled.

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TWO PEOPLES BAY MANAGEMENT PLAN

Introduction

Two Peoples Bay Reserve is situated approximately 15 miles east of Albany and is vested in the Western Australian Wild Life Authority. It was set aside for the purpose of "Conservation of Fauna" in April 1966 following the rediscovery of the Noisy Scrub Bird (*Atrichornis clamosus*) in the area in 1961. Subsequently a number of other interesting and rare species have been found to occur there, and these include the Western Whip Bird, the Bristle Bird, the Southern Emu-Wren, the Quokka, the Honey Possum, the Ringtail Possum, the Yellow-footed Marsupial Mouse and the Water Rat.

C.S.I.R.O. officers commenced research on the Noisy Scrub Bird in 1963, and studies have been made firstly of the bird's song, and more recently of its ecology and behaviour. A field station is being erected to facilitate further research work.

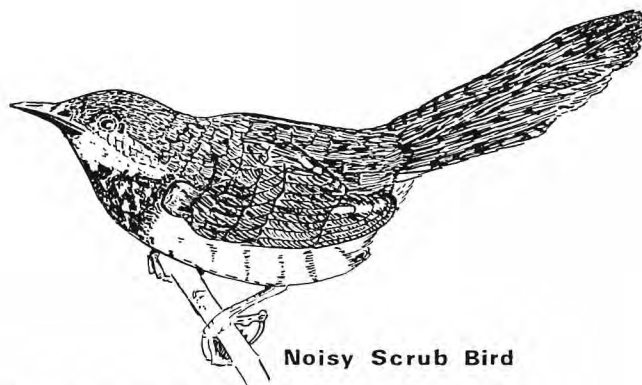
While the main value of the reserve is the rare fauna it contains, it is also very attractive to tourists because of its fame as the locality of the Noisy Scrub Bird, the scenery and the excellent fishing facilities. The high degree of public usage led to the appointment of a ranger in August 1970 who is housed in a cottage near the main beach and picnic area.

The danger of fire is the greatest problem for management personnel. The Noisy Scrub Bird probably remains in the locality because of the lack of frequent fires in the Mount Gardner area, which is protected from prevailing winds from the south-west and east; but fire in the reserve as a whole has been relatively common over the past four years, and the heathland burns easily at almost any time, even immediately after heavy rain. Heath will carry a fire again after only three years regrowth and other types of vegetation are probably similar in this respect.

Another management problem is the continual multiplication of vehicle tracks on the sanctuary. Much of the area is sandy and when a track becomes boggy it is relatively easy to drive across the heath and another track soon results. This problem will continue while there are no good roads on the reserve.

Aims of the Management Plan

The primary aim of any plan for the Two Peoples Bay Wildlife Sanctuary must be to protect and conserve the Noisy Scrub Bird and all other native flora and fauna. Secondly, the plan should allow controlled public usage and provide facilities in such a way that the primary aim of conservation is not compromised. Thirdly, the plan should provide for continuing research to be carried out into the requirements of the fauna, the regeneration of the flora after fire, the effects of fire on the fauna, fire control methods and the impact of human usage on the area.



Noisy Scrub Bird

Management Plan

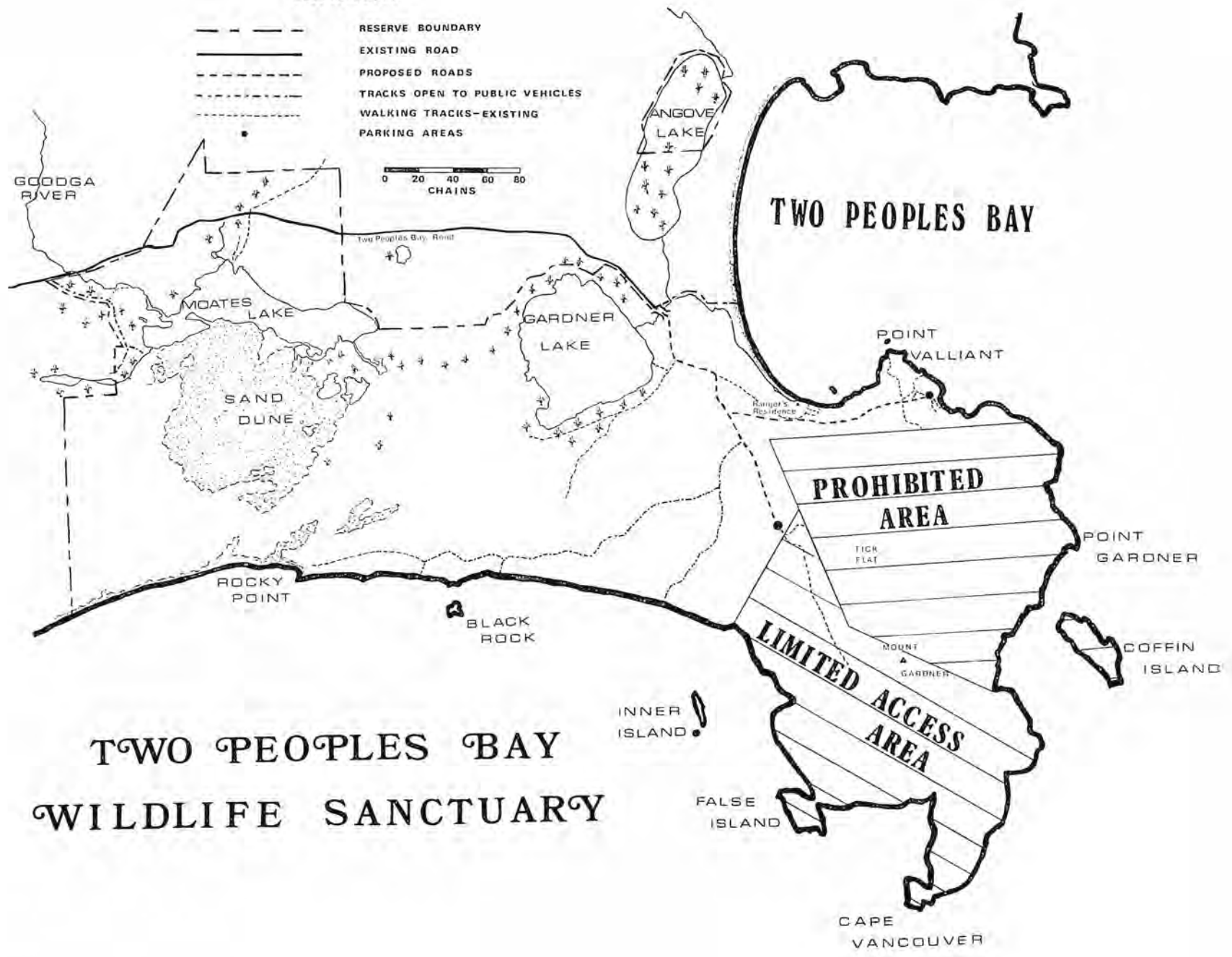
The following recommendations have been made by the Western Australian Wild Life Authority, and approved by the Hon. Minister for Fisheries and Fauna.

1. That roads be constructed from the bridge over Lake Gardner Creek through the reserve, roughly as shown on the map. Parking areas to be constructed at the end of the roads as shown.
2. That apart from these roads, only those tracks which are indicated on the map remain open to public use. No vehicle may use any other track unless authorized by the Chief Warden of Fauna or the resident ranger.
3. That a limited number (approximately six) of barbecue places be constructed in the picnic area near the ranger's cottage. No fires to be lit elsewhere in the reserve.
4. That a toilet-changing room block be built near the picnic area and main beach.
5. That the firebreak system be progressively enlarged so that the perimeter breaks exist on all boundaries, and further internal breaks be created by use of a topper instead of a bull-dozer.
6. That walking tracks be marked out from the area below "Tick Flat" to Mt. Gardner and Cape Vancouver.
7. That research be continued or carried out into—
 - (a) the ecology of the Noisy Scrub Bird and methods of management to ensure its persistence;
 - (b) the effect of fire on the fauna and flora;
 - (c) the number of animals and plants occurring in the reserve.
 - (d) Any other factor which the Officer-in-Charge of Reserve Management deems necessary and practical.
8. That notices be erected on the reserve advertising this plan and the regulations. That a brochure be printed giving details of the reserve and usage of the area.

Following acceptance of this Management Plan the two areas shown on the map were classified as prohibited and limited access areas. Notice of this classification appeared in the *Government Gazette* on June 25, 1971.

LEGEND

- RESERVE BOUNDARY
- EXISTING ROAD
- - - PROPOSED ROADS
- · - · - TRACKS OPEN TO PUBLIC VEHICLES
- · - · - WALKING TRACKS-EXISTING
- PARKING AREAS



TWO PEOPLES BAY WILDLIFE SANCTUARY

LESCHENAULT INLET—ASPECTS OF CONSERVATION

S.W.A.N.S. Vol. 2 No. 1 contained a summarised version of a report on Leschenault Inlet by Dr. N. Morrissy, Research Officer, Department of Fisheries and Fauna. The report described the area and its present utilisation, outlined the hydrological conditions and ecology of the estuary, and discussed guidelines for future development. However, certain aspects can usefully be re-emphasised because of their importance to the particular biological problems involved. The following additional comments and observations have been made by Dr. E. Hodgkin, Reader in Zoology and Mr. G. Smith, Senior Lecturer in Botany, University of Western Australia.

"The inlet is an interdune coastal lagoon, 1½ miles wide and originally 10 miles long. It is separated from the sea by geologically recent dunes only half a mile wide. The greater part of it is very shallow and extensive sand flats are exposed on low tides; even the central channel is only about 6 feet deep.

Engineering activities have made important changes during the last twenty years. Before 1951 the outlet to the sea was at Bunbury, at the extreme southern end of the inlet. At that time tidal exchange in the inlet would certainly have been no greater than now and was probably less. The southern outlet was plugged in 1951 and the new cut made through the dunes almost opposite the mouth of the Collie River.

The Wellington Dam on the Collie River was completed in 1960 and this considerably reduced both volume and duration of river flow.

The construction of the effluent pipe from the La Porte works (1964), across the southern part of the inlet, must have affected circulation within the inlet to some extent because half a mile at the eastern end of the pipe is on solid fill. There have been occasional spillages from the pipe and Dr. Morrissy also reports that there have been seepages from the pipeline along the western shore.

Construction of the new port in 1970 separated a small southern part from the inlet proper. This part now communicates with the sea through the new harbour and tidal exchange has been increased, **but potential contamination from harbour wastes and spillage has increased.**

Daily (astronomic) tides in the inlet are only about half those of the open sea, probably seldom exceeding a foot; nevertheless tidal exchange is great because of the very shallow water. Barometric tides have periods of days and are therefore much less damped; they also have a range of about a foot. Freshwater discharge to the inlet is confined to the winter-spring period, from June to about November. The Collie River is the main source of fresh water and this and the Preston River both enter the inlet almost opposite the cut at the extreme southern end of the inlet. River

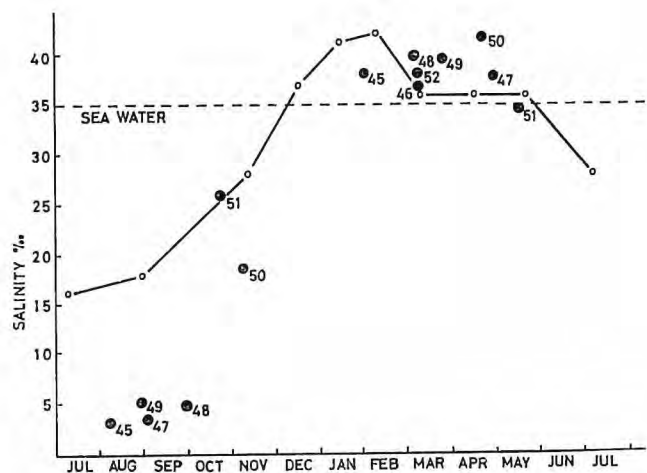
water only enters the main part of the inlet by tidal mixing. However, freshwater drainage from coastal swamps also flows into the head of the inlet. From December to May there is little or no freshwater discharge and the inlet water becomes progressively more salt until it is more salt than the sea.

Thus the hydrological picture is obviously complex and only broad generalisations can be made about it, based on a limited number of observations by C.S.I.R.O. (1945 to 1952) and by T. D. Meagher and E. P. Hodgkin, since 1967. Near the cut, daily salinity changes are great in winter, at times ranging from fresh to sea water salinity (35‰), but in the summer salinity stays fairly constant around sea water salinity.

From Australind northwards there is little daily variation but great seasonal change, though this was much less in 1968-69 (16 to 45‰S) than in 1945-52 (3 to 45‰S), i.e. after opening of the cut and construction of Wellington Dam. It would be valuable to have further data on seasonal salinity changes in the inlet. Temperature fluctuations, both daily and seasonal, are least near the cut and greatest at the northern end (about 11° to 28°C) because of the shallow water there and minimal exchange with the sea.

Another significant variable from the biological point of view is the duration of the low salinity period. In a wet winter salinity is likely to be below 10‰ for five months (June to October), while in a dry winter salinity does not drop much below 20‰ at any time north of the pipe line.

The extreme southern part of the inlet which has recently been isolated by the harbour works will probably show much less hydrological variation than the inlet proper because of its small volume and large tidal exchange.



Salinity (parts per thousand) of Leschenault Inlet water near Australind. Solid circles C.S.I.R.O. samples 1945-51. Open circles 1968-69 (T. D. Meagher)

Aquatic flora and fauna:

Below low water there is a rich growth of the flowering "sea grass" *Halophila* and a few species of marine algae (*Chaetomorpha*, *Cladophora*, *Rhizoclonium*, etc.). These, and the sand and mud provide shelter for an abundant and diverse invertebrate fauna on which crabs, fish and birds all feed. This fauna is more diverse and probably also richer than in either Peel-Harvey inlets or the Swan. The plankton is also abundant. Both plants and animals flourish in spite of the wide variation in salinity, in marked contrast to the sparse bottom fauna and absence of plants in the rivers which are completely fresh in winter.

Salt marshes:

There are extensive salt marshes both in the southern portion and along the margins of the inlet proper. They have a varied and interesting assemblage of halophytic (salt-tolerant) plants—succulent chenopods, sedges, and the she-oak (*Casuarina obesa*). Their roots bind the mud and prevent erosion of the banks by wave action and the wash of boats.

The marshes have been blamed for breeding larvae of the salt-tolerant mosquito *Aedes vigilax*. Where stagnant pools have been dug or enclosed by dumping and filling, as has been done in some places round the inlet, breeding does occur. This is a harmless situation in the inlet proper, but action may need to be taken in the cut-off part of the inlet close to Bunbury if, in fact, such situations have been created. Breeding is not likely to occur in parts of the swamps which are regularly inundated by the tides.

Mangrove (*Avicennia marina*):

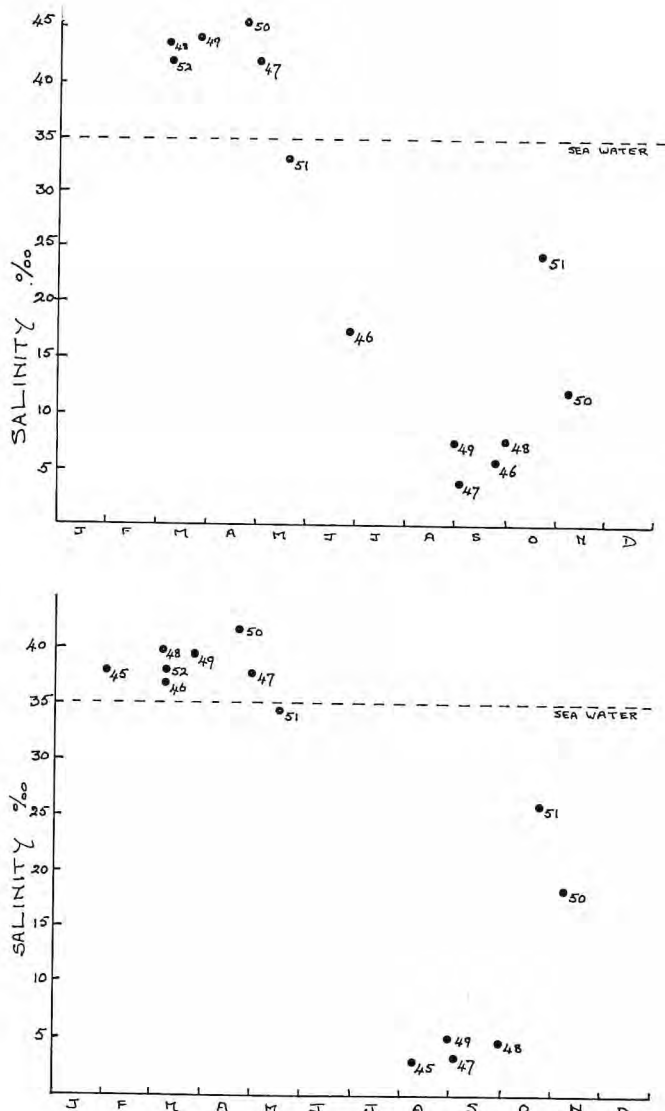
This forms a narrow fringe around salt marshes in the southern part. The trees are healthy and there are seedlings and young plants. Like the salt marsh plants, the mangrove binds the mud. There may well be a special fauna associated with the mangrove, but no study has yet been made of it.

There is another, even smaller, stand of mangrove just north of Waterloo Head. It also is healthy and appears to be maintaining itself, as evidenced by the presence of seedlings and juvenile plants. However, the small size of the stand and encroachment of dune sand make its future hazardous. The track round the foot of the dune is probably the most immediate danger. It would take a bulldozer a few hours only to wipe out the mangrove, on the pretext of upgrading the track.

The western dunes:

These form a peninsula, nearly eight miles long, that is inaccessible by land except by a track through private land at the north end of the inlet.

An extensive and distinctively maritime flora borders the peninsula, with incursions into the woodland of the stable dunes along the several large blow-outs which dissect the peninsula. The principal vegetation is woodland of tuart



Leschenault Inlet surface salinities 1947-52 from C.S.I.R.O. Division of Fisheries Station Lists

(*Eucalyptus gomphocephala*) and Peppermint (*Agonis flexuosa*). This woodland is in a healthy and vigorous condition, no doubt partly because of its isolation from urbanisation. As yet it has suffered little fire damage and is remarkably free from aggressive weeds. In contrast to this situation, is the damage to vegetation in the vicinity of the outlet of the La Porte effluent pipe reported by Dr. Morrissy.

Conservation:

The richness of the plant and animal life of the inlet is attributable to the extensive areas of shallow mud and sand and a salinity régime which is never so extreme as to eliminate the diverse brackish-water fauna. Any extensive dredging and filling or other interference with the bottom must of necessity reduce the productivity of the inlet.

The mangrove is of great botanical interest because this is the only mangrove between the

Gascoyne River (and the Abrolhos Islands) in the north and the Gulf region of South Australia to the south. Its presence emphasises the fact that there are here, environmental conditions which are favourable to some species of tropical plants, and of animals such as the blue-manna crab also. As noted above, both stands are healthy but both are very vulnerable and it would be foolish to assume that the southern stand could safely be destroyed because of the existence of the northern stand. Both should be preserved and, if our suggestion for a dune reserve is accepted, it would be valuable to try to establish another stand along the western shore. Perhaps this might be a useful project for school groups or the Tree Society.

The salt marshes are of considerable botanical interest because of the diversity of salt-adapted species found there. As noted above they also serve to bind the soil as efficiently and more economically than man-made structures. Probably no special interest attaches to the salt marshes of the southern part; there are similar and much more extensive salt marshes around the inlet proper. However, it is unlikely that the mangrove would long survive if they were filled.

Probably even more important, however, is the western dune peninsula. The endemic Peppermint and Tuart and the associated woodland communities of plants and animals have a limited distribution along the west coast only. They are particularly vulnerable at the present time because of the rush to "develop" the coast and the relatively small extent of national parks in this region. Fortunately, as yet the peninsula has suffered little fire damage and is remarkably free of aggressive weeds.

The relative isolation of this stretch of coastal dune, despite its proximity to a large centre of population, the richness and diversity of its vegetation, and its almost virgin condition make it a most suitable area for preservation as a national park or fauna and flora reserve. It is moreover an area of great natural beauty where stark moving dunes alternate with thick forest. Because of its relative isolation it could readily be preserved. It is vulnerable to damage; beach buggies or other vehicles have already invaded the dunes, and sections have been burnt out. More effective protection is required urgently before it is "discovered" by destructive agencies. The peninsula is grazing land and **at the present level of stocking** this is not incompatible with preservation as a park or reserve.

Most of the eastern shore will inevitably be developed, but some of it, where there are salt marshes and fringing woodlands, should be preserved, particularly at the northern end. Some sectors of the shore between the road and high water mark should be fenced against access by vehicles and persons and clearly labelled as natural history refuges.

Finally, there is the need to retain natural habitats close to centres of population so that

students of formal biology and other environmental studies have ready access to field study areas. This aspect applies to Bunbury where the high school has an increasing number of students of the natural sciences; they could well use Leschenault Inlet and its surroundings for field studies of environmental problems which have become part of modern biological education."

BUSTARDS - 1914

In the previous issue of S.W.A.N.S. as part of the series "Our Diminishing Heritage", we highlighted the need to preserve the Australian Bustard (Wild Turkey). Reports from Honorary Wardens support the fact that the range and numbers of this bird continue to decrease, and that there is a real danger of extinction of the species in its natural habitat.

As a result of the article we were delighted to receive an interesting letter from Mr. J. E. Watson of Busselton describing a personal experience which occurred in 1914. Mr. Watson's letter is reproduced below; it does show that the precarious situation of the Bustard was not always so.

"Referring to wild turkeys in the issue of S.W.A.N.S. of Autumn, 1971, Vol. 2, No. 2, and knowing what I do know of this fine bird, I grieve to think that possibly zoos or some wilderness area, if we ever have one set aside, may be the only places where they will survive. You would be interested to know that in early 1914 on river flats about 10 miles from Billunin Pool on the Murchison River, I saw what could possibly have been the greatest concentration of turkeys anyone has ever seen. Whilst diamond drilling with a crew of 10 at a place called Holden's Find in this area, and being supplied each fortnight with stores freighted by camel team, it was part of my job (aged 19 and being the recognised hunter) to augment the tinned meat supply with kangaroo, wild turkey and duck.

"Whilst stalking two turkeys one day I noticed five others fully occupied in moving slowly along picking up something as they moved; and while I watched I became aware of many others doing likewise. I appeared to be on the flank of these birds and level with the foremost, so moving away from them I hastened to get well ahead of them, where I partly concealed myself, knowing the birds were moving towards me. It was then that I noticed that the ground was a mass of black caterpillars, all moving in one direction. In quite a short time I was surrounded by **hundreds** of turkeys all feeding on the caterpillars; as far as I could see the birds were on the move. It was an unbelievable sight even in those far off days when 10 to 20 in a group were often seen."

OPEN SEASON—QUAIL

The following notice appeared in the *Government Gazette* on June 25, 1971:—

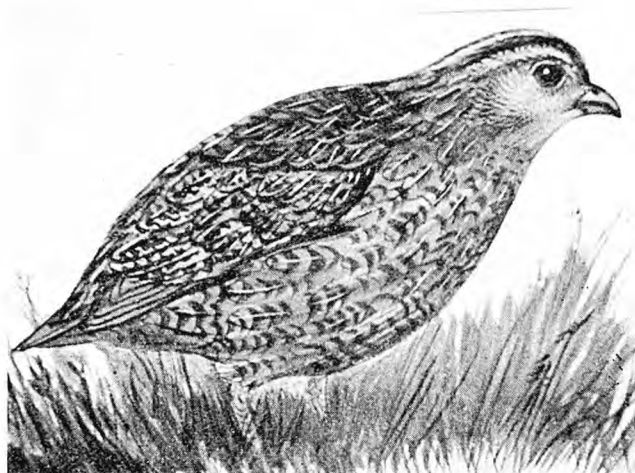
FAUNA CONSERVATION ACT, 1950-1970.

Department of Fisheries and Fauna,
Perth, 22nd June, 1971.

THE Minister for Fisheries and Fauna, acting pursuant to section 14 and section 17B of the Fauna Conservation Act, 1950-1970, hereby declares that—

- (1) Brown Quail (*Synoicus ypsilophorus*) and Stubble Quail (*Coturnix pectoralis*) are game species in all parts of the State in respect of which an open season on those species is declared;
- (2) an open season is declared for—
Brown Quail and Stubble Quail in all parts of the State except—
 - (a) in fauna sanctuaries (other than those classified as shooting or hunting areas under section 12A of the Act), and
 - (b) in State Forests, timber reserves, town reservoirs and all areas where shooting is prohibited under any Act, regulation or by-law;
- (3) the open season for Brown Quail and Stubble Quail commences—
 - (a) in 1971, on the date of publication of this notice in the *Gazette*, and
 - (b) in each succeeding year, on 1st January,and ends on 30th June in each year.

Every person taking quail is required to be licensed, and licenses are available ONLY from the Department's Head Office at 108 Adelaide Terrace, Perth. The license fee is \$2.00.



Brown Quail (*Synoicus ypsilophorus*)



Stubble Quail (*Coturnix pectoralis*). Male in foreground

WILDLIFE TRAFFIC

This is a summary of a report presented by C. L. Boyle at the 6th Biennial Meeting of the International Society for the Protection of Animals, held in London, May 6, 1971. The comments in italics at the end of the summary broadly set out the regulations which operate in Western Australia.

"It ought not to be allowed", follows any description, however objective, of the way in which wild animals are treated for gain. But the human attitude towards the traffic in wildlife is often one of both guilt and complacency and the palliative is the comforting self-assurance that "something is being done about it". In practice, our feelings are aroused to action only by what we see in front of us, usually the ill-treatment of a domestic animal or pet. It is harder to be actively concerned about the ill-treatment of wild animals in remote forests.

From a conservation standpoint attention has been focused on the trade in rare animals, and recent legislation makes it difficult to import some rare animals into Great Britain or the U.S.A. It is hoped that these restrictions are reducing the destruction of these rare animals in the wild, if not they are failing in their purpose.

But even when we combine the most optimistic views of the results of humanitarian and conservation efforts in the advanced countries, we are left with a great gap to fill if we are really to preserve the wildlife of the world. No major importing country places any restriction upon the great bulk of importation of wild animals. Among these large importers are Great Britain, the U.S.A.,

Japan and many countries in Europe. Moreover, these importers do not bother about the animals which pass through their territories in transit. All the while the remaining wild places of the world are being ruthlessly plundered to supply the demands of the animal trade—and, of course, the trade in skins. From the plundered countries the cry is always the same, "Stop the demand and the problem will be solved."

A case can be made out for the importation of exotic animals, for research and education; but such importation should be rigidly controlled. What justification is there for the keeping of exotic pets by private people at the cost of the destruction and cruelty which is caused in the wild by commercial exploitation? We have domestic rabbits, guinea pigs, hamsters, canaries and budgerigars, to say nothing of cats and dogs. What need is there for marmosets, tortoises and African Grey Parrots?

There are no records of total numbers of wild animals imported into Great Britain, or other large importing European countries, but some indication can be obtained by looking at the declared export figures from India alone. These totalled more than four million for the twelve months ending March, 1969. There is little doubt that the figures from the South American continent would be more than this. Who can tell how much destruction and what suffering the whole commercial traffic causes.

Complete control of all wildlife traffic and the total banning of commercial traffic is recommended. This means that the private keeping of wild-caught exotic animals should cease and that no living animal should be imported without a license given by the appropriate authority in the importing country. Under present conditions it would be difficult to control imports properly, but if the demand is drastically reduced the problem will become manageable.

The export of fauna from Western Australia is either prohibited or allowed only under license. Exportation for zoological purposes is allowed only if the recipient zoo is owned or managed by a Government Department or is a non-commercial organisation equipped to house Australian fauna under proper conditions and not engaging in trading in fauna.

The import of animals is strictly controlled by the Commonwealth under the Quarantine and Customs regulations. Licenses to bring fauna into Western Australia are only issued if the importer can satisfy the Chief Warden of Fauna that the other country or State approves the export. Imports are generally prohibited except for zoos, scientific institutions and for aviculture. The import of exotic birds into Australia is entirely prohibited.

In respect of the illegal export or import of fauna, the Fauna Conservation Act provides for a maximum penalty of \$400 for each breach.

I.C.B.P. WORLD CONFERENCE FOR AUSTRALIA

The previous edition of "S.W.A.N.S." contained a review of the resolutions of the XV World Conference of the International Council for Bird Preservation held in September, 1970, in the Netherlands. It is the practice of the I.C.B.P. to hold its World Conference in the same country as the International Ornithological Congress, and either immediately preceding or immediately following the I.O.C.

Exact details of place and date for the XVI World Conference of I.C.B.P. have not yet been determined, but the XVI International Ornithological Congress will be held in the Australian National University at Canberra from 12 to 17 August, 1974.

SWAN RIVER CONSERVATION BOARD APPOINTMENT

The following notice appeared in the *Government Gazette*, July 30, 1971:

Swan River Conservation Act,
1958-1966,
Public Works Department,
Perth, 23rd July, 1971.

It is hereby notified for general information that His Excellency the Lieutenant-Governor in Executive Council, acting under Sections 8 and 9 of the Swan River Conservation Act, 1958-1966, and on the recommendation of the Minister referred to in those Sections, has appointed the following person to be a member of the Swan River Conservation Board, namely:

Thomas Lee Riggert, of Glen Road, Darlington, being a person nominated by the Minister for Fisheries and Fauna.

C. JAMIESON,
Minister for Works.

HONORARY FAUNA WARDEN APPOINTMENTS

ADAMS, Robert; 61 Bluebush Road, Kambalda West 6442.

LINES, George William Robert; 3 Thistle Street, Withers, Bunbury 6230.

PHILP, Donald Keith; Flat 4, 153 Fairway, Nedlands 6009.

WHITE-CHEEKED HONEYEATER

Mr. Brian Hutchison, a Vice-President of the West Australian Naturalists' Club, is making a survey of the White-Cheeked Honeyeater in the metropolitan area.

The bird is not normally found in city areas but reports of its occurrence have been noted since 1968. It has frequented local gardens from January to April or May in recent years. This may be due to the availability of food or to climatic variations, but it will take several years of studying the habits of the bird before it will be possible to say why the pattern of its movements appears to have changed.

The White-Cheeked Honeyeater is about 7 inches long and mainly black with white streaks on its head, back and under-parts. There is a white line above the eye and a broad white patch on the cheek. The wings are black with a conspicuous wax-yellow patch. The tail, bill and legs are also black, but the iris is brown which is the main distinguishing feature between this bird and the yellow-winged honeyeater which has a white iris. It has a distinctive habit, during the nesting season, of towering high above the nesting site and then dropping with closed wings, finishing with a short glide to its perch.

Mr. Hutchison would welcome reports of any sightings of the bird, and these can be sent to him c/o W.A. Naturalists' Club, 63 Meriwa Street, Nedlands 6009.



White-cheeked Honeyeater. (*Meliornis niger*)

AUSTRALIANS OBSERVE U.K. ANTI-POLLUTION METHODS

During a six-week visit in June and July this year, British methods to overcome pollution in the air, at sea and on land were demonstrated to a N.S.W. Minister, and State Government officials from New South Wales and Western Australia. Leading the group was the N.S.W. Minister for Environment Control, Mr. Jack Beale. Accompanying him were Mr. Charles Sinclair, Chief Information Officer in the N.S.W. Department of the Environment; Mr. Eric Coffey, Director of the State Pollution Control Commission in N.S.W.; Dr. William Davidson, Commissioner of Public Health in Western Australia; and Mr. Wallace Pilz, Under Secretary in the Department of the Environment in New South Wales.

The group was taken to two of Britain's principal research establishments at Stevenage in eastern England; the Warren Spring Laboratory, and the Water Pollution Research Laboratory. Scientists at Warren Spring have made a special study of the problems of oil pollution, and the visitors were particularly interested in their new methods of dispersing oil slicks at sea and cleaning beaches.

The establishment is undertaking a national survey of air pollution to find out the seriousness and extent of the problems throughout the country. From preliminary analyses they have reported that there has been a most encouraging decrease throughout the United Kingdom in the ground level concentrations of both smoke and sulphur dioxide in recent years.

At the Water Pollution Research Laboratory, Dr. A. L. Downing, the Director, explained that the staff of nearly 200, including chemists, physicists, biologists and microbiologists, chemical engineers and mathematicians, were working to provide a scientific strategy for the nation.

Their clients included local authorities, river authorities and construction companies, and the work was carried out as part of the research arm of Britain's huge Department of the Environment.

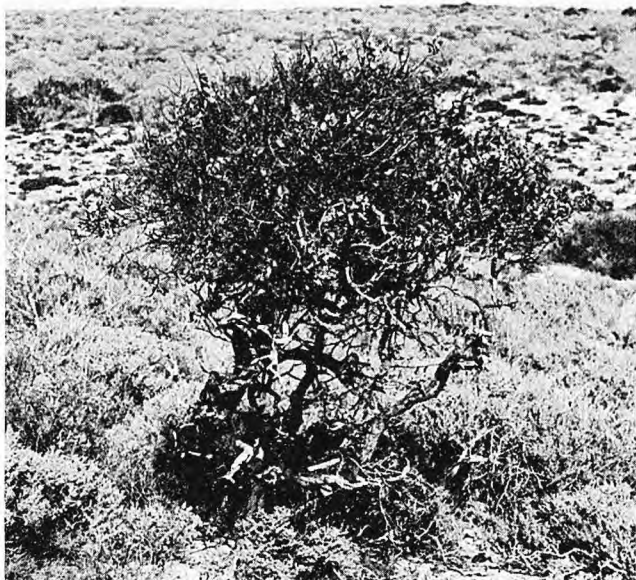
In particular, scientists at the laboratory are concerned with methods of treating all forms of effluent to prevent pollution, and with reclaiming water from sewage.

GOAT ERADICATION— BERNIER ISLAND



In June this year a party of Gurkha soldiers from a battalion on exercise in Western Australia assisted the Department with a goat-shooting expedition to Bernier Island Reserve in Shark Bay.

Bernier Island is the home of the Boodie or Lestueur's Rat-kangaroo (*Betongia lesueur*), the Banded Hare wallaby (*Lagostrophus fasciatus*), the Western Hare-wallaby (*Lagorchestes hirsutus*), the Little Marl or Little Barred-bandicoot (*Peramales bougainville*), the Ashy-grey Mouse (*Pseudomys albocinereus*), the Shark Bay Mouse (*Pseudomys praeconis*), the Little Bat (*Eptesicus pumilus*) and the Lesser Long-eared Bat (*Nyctophilus geoffroyi*). Of these, the four marsupials are very rare, and, with the exception of the Boodie which is also found on Barrow Island, are possibly extinct everywhere but on Bernier Island and neighbouring Dorre Island. Because of the vital importance of preserving these species, both islands are classified as "A" Class Reserves and vested in the Western Australian Wild Life Authority.



Shrub showing grazing damage—Bernier Island. Removal of foliage destroys shelter for marsupials

Goats were introduced to the island in 1899 when about half-a-dozen, including one male, were brought from the mainland and it is possible that more goats were taken to the island in 1908 when a hospital for Aborigines was established. The goat population has flourished to such an extent that approximately 500 have had to be destroyed in the last ten years. The low, spreading vegetation on the island provides the marsupials with shelter during the day, and goats grazing on this vegetation upset the natural ecology of the island and threaten the very existence of the unique fauna. In addition, destruction of the vegetation causes sand blow-outs; the unconsolidated dunes have spread in recent years and cropping of the goat population is periodically necessary to prevent the situation deteriorating further.



Cliffs and rocky terrain of west side of Bernier Island

Several previous visits to the island have decreased the number of goats, but it seems almost impossible to eliminate them completely. The rocky coastal terrain and the dense vegetation make spotting the goats very difficult in the first instance; in these conditions even the mainly white goats have a frustrating habit of disappearing completely. It is possible to walk past a goat at a distance of ten yards and not notice it. Despite the difficulties it is now thought that from an estimated population of well over two hundred (196 were shot) in 1966, the numbers have now been reduced to below twenty-five.

In 1970, Lt. Col. J. L. Chapple, M.B.E., of the 2nd King Edward's VII Own Gurkha Rifles, stationed in Singapore, requested permission to visit the island in an attempt to sight the Banded Hare-wallaby. Due to the battalion's commitments this visit was not possible, but the Department conceived the idea of requesting the Gurkhas to help in the goat eradication exercise, and when the battalion was stationed in Perth this year, the suggestion was again raised. The idea was met with enthusiasm by the Gurkha battalion commander because the exercise would be valuable training for his men in terrain to which they were unaccustomed. The Gurkha soldiers themselves were naturally keen because goat meat is part of their staple diet in Nepal.



Searching for goats. Note sand blow-outs caused by over-grazing

On Monday, 21 June, 1971, a party of 15 soldiers under Major D. J. Agar, accompanied by two members of the Australian Special Air Service Regiment from Campbell Barracks, Swanbourne, and two representatives of the Department, were taken to the island on the fishing vessel "Nelma". During an aerial reconnaissance the previous day twenty-five goats had been seen, and from previous experience this indicated that probably at least double that number were on the island. A base camp was established at Red Cliff Bay on the south-eastern coast of the island and almost immediately a small party set out hunting for goats. None were seen the first day, but plans were made



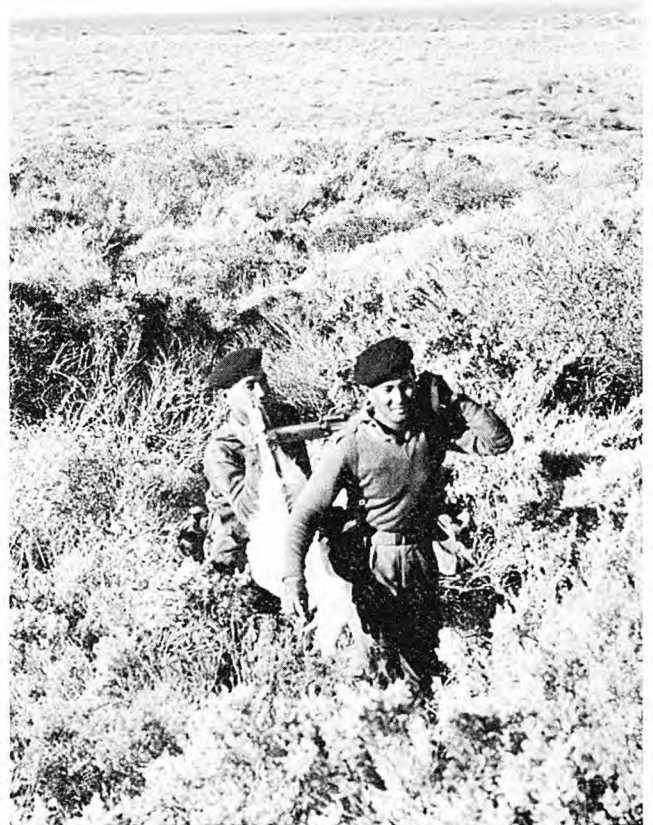
Setting out for the northern end of the island

for organised parties to search systematically on subsequent days. The soldiers worked in groups of two to four and on the third and fourth days were assisted by a spotter plane which directed the searchers to goats where possible.

On the Thursday the "Nelma" took a party of twelve soldiers to the north end of the island. Walking in line across the island this party shot 11 goats which was the most successful day's take. It was estimated that each soldier covered close on eighteen miles searching for and chasing goats on this day; they arrived back at base camp at 10 p.m. The following day the expedition broke camp and returned to Carnarvon on the "Nelma".

During the four days the expedition shot a total of twenty-two goats, four of which were eaten at camp. Three kids were also captured; two were given away and one taken back to Singapore with a view to it becoming the battalion mascot. An aerial survey one month after the trip suggests that less than twenty-five goats now remain on the island. The operation can therefore be considered to have been a success because the reduced numbers should not have a significant effect on the flora and fauna of the reserve for some years.

The Department is very grateful for the assistance and co-operation of Major Agar and the Gurkha battalion throughout the expedition.



Bringing home the supper! A six mile walk through typical vegetation

RECOMMENDATIONS ADOPTED BY THE INTERNATIONAL CONFERENCE ON THE CONSERVATION OF WETLANDS AND WATERFOWL

At Ramsar, Iran, on 3 February 1971

POLLUTION

Recommendation 6. Oil Pollution.

The Conference,

Noting with anxiety the accelerated frequency of oil pollution of the sea by derris and by oil discharge from ships which do not respect the International Convention for the Prevention of the Pollution of the Sea by Oil;

Recommends to the appropriate States and International Organisations that they bring to the attention of competent authorities the primary importance of:

- (a) Ensuring strict supervision on coastal waters, especially in the Caspian Sea, the Baltic Sea, the Kattegat, the North Sea and the Channel;
- (b) Accelerating research into combatting oil pollution; and
- (c) Applying promptly and rigorously the statutory punishments.

Recommendation 7. Pesticides.

The Conference,

Noting with concern the grave danger to wetlands and their flora and fauna represented by the use of persistent pesticides, such as chlorinated hydrocarbons, due to run off, discharge of waste products and deliberate application.

Deploring an apparent tendency for such pesticides although often banned or restricted in the countries of manufacture, to be exported in quantity and even offered for sale at reduced prices to less developed countries, which may lead to the degradation of natural areas including wetlands of international importance.

Recommends that governments both of countries from which such pesticides originate and of those in which their use is not yet fully controlled take all necessary measures to curtail, and wherever possible, ban or severely restrict the sale and use of persistent pesticides.

RESEARCH AND INVESTIGATION

Recommendation 8. Promotion of wetlands research.

The Conference,

Being aware of the serious and deteriorating situation facing waterfowl in many parts of the Palaearctic Region;

Realising the need for improving scientific information for the correct assessment of wetlands for the proposed Wetlands Convention;

Recommends that Governments and all appropriate departments and institutions concerned with natural resources should assist and facilitate wetland research at all levels, and in particular:

- (a) that all countries which do not already carry out regular waterfowl counts on important wetlands should endeavour to do so at least twice a year on dates advised by The International Wildfowl Research Bureau;
- (b) that all countries should assess their wetlands in respect of the need to provide a chain of effective refuges, these being selected for their value for waterfowl as well as permanence despite varying conditions of rainfall in arid areas; and
- (c) that if countries are unable to undertake this work from their own resources they should seek assistance from appropriate international organisations.

Recommendation 9. Promotion of Hunting Research.

The Conference,

Recommends that waterfowl research organisations in different countries should undertake:

- (a) to make every effort to obtain data on the breeding success and productivity of the main species involved;
- (b) to produce general mortality data based on recovery of ringed birds to be compared with other measures of productivity; and
- (c) to carry out special studies on the effect of hunting on wildfowl populations, by means of ringing data and the use and development of realistic hunting kill or capture statistics;

and further recommends that international and national hunters' organisations should:

- (a) encourage sportsmanlike methods in hunting, and stop actions which obviously lead to mass destruction or loss of waterfowl;
- (b) intensify educational measures to improve hunters' knowledge of different species of waterfowl; and
- (c) make hunters aware of their responsibilities for conservation and wise use of waterfowl resources through proper hunting practices.

Recommendation 11. Wetlands and the Man and the Biosphere.

The Conference,

Noting with satisfaction UNESCO'S new programme on "Man and the Biosphere" (MAB) involving the planning of world-wide research into, and the monitoring of, the role and productivity of various ecosystems or major habitats, as a basis for conservation, management, wise utilisation and sustained yield;

Recommends that wetlands in all parts of the world should be brought within the scope of the MAB programme.

MERCURY IN BIRDS

The decrease in wild birds in Sweden has been remarkable since the latter half of the 1950's and some birds of prey became close to extinction. Food contamination was suspected but it was not until 1960 that mercury was discovered in internal organs of dead birds and in eggs that had failed to hatch. In 1964, it was found that Swedish hens' eggs contained more mercury than eggs from other countries because seed treated with methyl mercury was occasionally fed to hens in Sweden. Subsequently Berg, Johnels and Westmark (1966) examined the mercury content of bird feathers in museum specimens and showed the remarkable increase since the mid-1940's. It has since declined following the banning of the use of methyl mercury and dressings in 1966.

An important source of pollution is from slime controlling agents in the pulp and paper industry. Phenyl mercury used for this purpose is degraded after discharge to inorganic mercury which is then converted to methyl mercury by bacterial action. Other important sources are chlorine and caustic factories using mercury electrodes, electrical industries using mercury for various purposes, and the combustion of fossil fuels. Mercury pollution has been found in lakes and rivers that do not receive industrial waste waters and it is suggested that these are contaminated by wind and precipitation.

MURCHISON RIVER CLOSURE

Since Kalbarri is a popular tourist/fishing resort, and the use of nets could deplete the fish population of the Murchison River, it was decided to close the waters to all net fishing. This closure applies to all the waters of the Murchison River, and the waters of the Indian Ocean within a half-mile radius from the northwesternmost point of the southern bank of the river. These waters are now closed to net fishing except for the netting of prawns by hand-trawl nets not more than twelve feet in length. This applies to both amateur and professional fishermen.

Notice of this closure was published in the *Government Gazette*, July 23, 1971.

GALAH TAGGING

Mr. Ian Rowley of the C.S.I.R.O., Division of Wildlife Research, is studying the behaviour and distribution of galahs. 702 have been caught, banded and released. Of these, 200 individuals near Manmanning and 20 in the eastern metropolitan hills area have been marked with harmless coloured plastic tags on each wing. The tags are in six colours (Red, Blue, Yellow, Green, Black and White), bear a letter (E, H, M, V or X) and a number (0-9). The object of the metropolitan tagging is to study the spread of the species in the suburbs, and of that at Manmanning to study social relationships and foraging movements.

The colour, letter and number of the tag, the time, date and place of sighting are all of great value to the programme. Mr. Rowley would appreciate reports of any sightings, and all information can be passed to him at C.S.I.R.O., Clayton Road, Helena Valley (Tel. 74 6356).

N.W. RIVERS CLOSED TO NET FISHING

To conserve stocks of barramundi the following waters are now closed to all net fishing:

All the waters of the Dunham, Bow, Negri, Little Panton, Panton, Nicholson, Elvire, Turner, Salmond, Chamberlain, Cunningham, Margaret, Adcock and Throssell Rivers; that part of the Ord River upstream from Carlton Crossing; that part of the King River upstream from the Water Supply Pumping Station; that part of the Pentacost River upstream from the Pentacost Crossing; and that part of the Fitzroy River south of Langley Crossing. The closure also applies to all tributaries, pools and affluents of all the rivers mentioned above.

Notice of this closure was published in the *Government Gazette*, July, 30, 1971.

SUGGESTED READING

BIRDS

"What Bird is That?"—Neville W. Cayley. 5th Ed. 1968 Sydney, Angus and Robertson.

MAMMALS

"Kangaroos"—H. J. Frith and J. H. Calaby. 1969 Melbourne, Cheshire Pub. Pty. Ltd.

ENVIRONMENT

"The Great Extermination"—Edited by A. J. Marshall. 1966 Melbourne, Heinemann.

MISCELLANEOUS

"Australian Outdoors"—Published monthly by Kenmure Press Pty. Ltd. Annual Sub. \$3.60. Available all booksellers.

Our Diminishing Heritage

THE MAGPIE GOOSE is a unique member of the world's wildlife. It differs considerably from a true goose as is borne out by its scientific name *Anseranas*, which means "duck-geese", and has evolved in such a way that it is specially equipped to live in a tropical swamp, whereas all other geese breed in the Arctic or at high altitudes. This alone makes the magpie goose scientifically interesting and, in addition, it has several peculiar characteristics which overall make it different from other waterfowl. Its most noticeable features are the unique knob on its head and the striking black and white plumage. Also it does not have fully-webbed feet, the primary feathers moult successively rather than simultaneously, and many of the males regularly take two female mates, both of whom lay in the same nest.

The range of the Magpie Goose is at present restricted to a small area in Northern Australia and Southern New Guinea. The bird has long since disappeared from the eastern and southeastern parts of Australia following increasing land utilisation which led to the draining of the swamps which provide the natural habitat. The great droughts at the turn of the century gave greater access to breeding areas by shooters, and birds were also extensively poisoned on the wheat-fields. The number of magpie geese remaining in Australia was estimated (Frith and Davies) as half-a-million in 1961, and it is thought that this population has subsequently remained fairly constant.



However, the magpie goose population is extremely susceptible to interference and any noticeable reduction in numbers is liable to eradicate whole colonies since, once the population begins to decrease, predation becomes an important survival factor. The goose depends on fairly large colonies for effective breeding, and therefore predation will not normally have a harmful effect on populations when there are many goslings and eggs available. In addition, the goose has a low breeding success; only about 30% of the eggs hatch out and possibly only 20% of the goslings survive. Since the mean clutch size for each nest is roughly 9 eggs (regardless of whether one or two geese lay in it), a simple calculation will show that three geese produce half a gosling!



This does not mean that the population must eventually decline, for the figures above were derived from one season's study only, and there are certain to be good and bad years for breeding. Also the magpie goose has a long life span—banded birds have been recovered after 14 years, and they are thought to live even longer. It does mean, however, that the magpie goose population cannot withstand any interference by human agents which might upset the delicate balance of nature. The goose has problems enough with the unavailability of food at critical times of the year and inadequate depths of water for breeding. Young birds cannot fly for ten weeks and therefore have to find food within walking distance, and the goose will not breed at all unless there is water between twelve and twenty four inches in depth. If there is no water at all then ground predators have disastrously easy access to the nests.

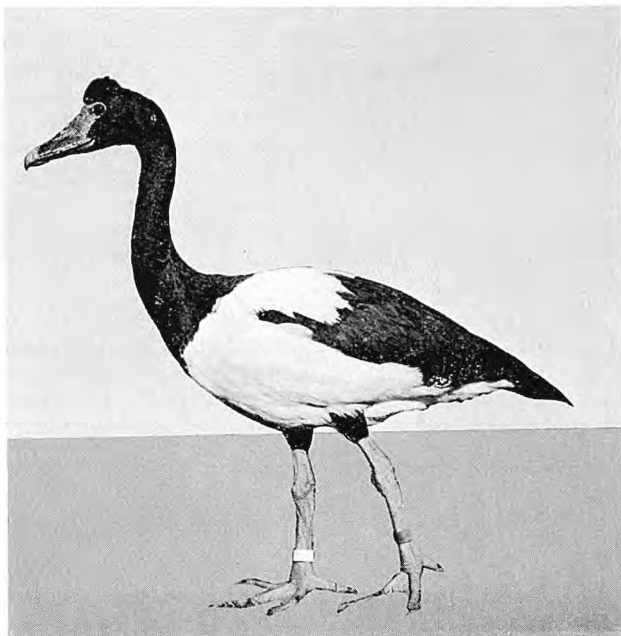
In order to preserve the delicate balance which at present maintains the overall population, there must be no interference with the existing colonies. Despite the protected status of the magpie goose, uncorroborated reports have been received of the poisoning of colonies in Western Australia. If these reports are true, Western Australia could join the growing list of states that over the years have failed to protect this unique species from extinction, and the magpie goose will indeed become a part of our diminishing heritage.

MAGPIE GOOSE

Anseranas semipalmata



Shaded area shows Australian distribution of Magpie Goose



DISTRIBUTION:

Northern Australia—from the Kimberleys to the East Coast of Queensland. Almost completely confined to a very narrow coastal strip and seldom seen more than 40 miles from the coast.

LOOKS:

A large distinctive black and white bird. Sexes are similar in appearance.

Head, neck, back, wings and tail—blackish brown.

Upper wing coverts—white and linking with a white saddle over the mantle.

Rump—white.

Iris—brown.

Beak—reddish brown.

Legs—yellow.

WING SPAN:

Male—1,549 mm. (61 in. approx.).

Female—1,430 mm. (56 in. approx.).

LENGTH:

Male—864 mm. (34 in. approx.).

Female—755 mm. (30 in. approx.).

WEIGHT:

Male—2,766 grms. (6 lb. approx.).

Female—2,071 grms. (4½ lb. approx.).

NESTING:

Nest building and egg laying begin after the main rains of the wet season. The timing depends on the water depth and the composition, density and height of the swamp vegetation. Large open nests are built in swamps right down to the mud below the water and a good deal of grass and water weeds are used to form the foundation which is about two feet in diameter. Eggs average nine per nest and are white and pitted.

DIET:

Grass blades, seeds of swamp grasses and underground bulbs of spike rush.

OPERATION NOAH

When the main Ord River Dam is completed and begins to fill in November or December this year, a Western Australian "Operation Noah" will be set in motion to save the threatened wildlife in the Kununurra area.

A special sub-committee of the Western Australian Wild Life Authority has been making plans and preparations for a rescue operation similar to that undertaken in Africa when the building of the Kariba Dam flooded an area of approximately 2,000 square miles. Members of the sub-committee are the Chief Warden of Fauna, Mr. Harry Shugg; World Authority on Western Australian birds, Dr. Dom Serventy; two farmer-conservationists from the Katanning and Quairading districts, Messrs. Neville Beeck and Henry Hall; and the Deputy Director of the W.A. Museum, Mr. John Bannister.

A brief study of the area has already been made, and the Museum will undertake a further survey in September and October. The survey team will attempt to determine the species, numbers and distribution of the fauna which will be significantly affected by the flooding, and make recommendations to the sub-committee, based on their studies. Investigations are also being carried out to determine the likely extent of flooding and the potential areas of high ground which could become island refuges or suitable relocation areas. Since the extent of the flood area could vary between 200 and 800 square miles depending on the seasonal rains, varying plans will be needed to cover every eventuality.

Final plans for the actual rescue operation cannot be drawn up until the museum survey team have made their recommendations, but since the rescuers must be ready to move at a moment's notice, some of the necessary equipment is already being purchased. Two 17 ft. 6 in. aluminium boats with powerful outboard motors will be used, backed-up by a spotter plane in constant radio contact. The plane will survey the area daily reporting on blind gullies and other difficult areas to which animals have been driven by the rising water. The boats will be manned by strong swimmers capable of going overboard to rescue certain species if necessary. Some animals such as water buffalo will be able to swim out, but kangaroos will be placed in onion bags and trussed tightly enough to prevent them injuring themselves. The smaller animals and snakes will be placed in burlap bags.

The project has been made possible by a Government grant of \$12,500, and private donations from members of the public are also being received. In addition, offers of active help are received daily, which the Department finds most gratifying since it indicates an awareness and sense of responsibility for the survival of our native fauna. It is thought, however that the fully-trained and qualified members of the rescue teams will be able to carry out the operation without additional assistance.

ORD FAUNA SURVEY

A team from the Western Australian Museum will carry out a survey of the Ord River catchment area from September 30th to October 30th. The purpose of the survey is to gain a familiarity with the physiography and biota of the area prior to the filling of the dam in November or December. No survey of this type has been undertaken in this area previously, and the data obtained will be of great value in monitoring any changes which occur in future years as a result of the Ord dam project.

The survey team will endeavour to determine the numbers and distribution of any fauna in the area, and which species could be significantly affected by the rising waters. Close consideration will also be given to those areas which will become island refuges and which species would best be suited to living on these islands.

The Museum party will be led by Dr. Darrell Kitchener, Curator of Mammals, who will study the ecological systems of the area; other members of the team are Mr. Rolly McKay, Assistant Curator of Crustaceans and Fishes, who will study the reptiles and invertebrates, and Dr. Barry Wilson, Curator of Molluscs who will study shell-life and other molluscs. A preliminary survey of the major ecosystems will be made by naturalist Mr. Harry Butler from September 8th to September 20th. Mr. Butler will present his findings to Dr. Kitchener and then join the survey team for the final stages on October 20th. The two members of the Western Australian Wild Life Authority, Messrs. Neville Beeck and Henry Hall, who will lead the Noah team will be with the survey party for a short period familiarising themselves with the area and any animal populations.

The base for the survey will be the line camp of Argyle Downs Station which is situated about 12 miles from the main dam site and has a 6,000 foot airstrip. A Cessna 175 four-seater plane, piloted by Mr. Rick Grave, will generally reconnoitre the area to spot any larger animals and concentrations of animals and radio this information to the ground parties. Transport for members of the survey team will be by landrover as it is anticipated that there will be insufficient water in the dam to necessitate the use of boats at this stage. One landrover will be taken from Perth and two more will be made available at Wyndham.

The results of the survey will be submitted to the Ord Noah sub-committee of the Western Australian Wild Life Authority to enable them to evaluate the need and extent of subsequent rescue operations.

CHANGE OF ADDRESS

To ensure that you receive your future copies of S.W.A.N.S. any change of address should be notified. (*Editor*).

DECLARATION AND AMENDMENT OF RESERVES

NEW RESERVES

Name	Res. No.	Locality	Plan	Area	Previous Use	Purpose	Vesting	Gazettal
Research Station Site	30809	Wanneroo	1a/40	96a. 1r. 27p.	....	Research and Conservation of Flora & Fauna	Minister for Fisheries and Fauna	8-4-71
Palm Springs	30866	15 miles south east of Wyndham	1054/80	5,323 a. ....	....	Protection of Flora & Fauna	W.A.W.L.A.	7-5-71
Bindoo Hill	30844	15 miles west of Mullewa	156/80	abt. 1,200 a.	....	Conservation of Flora & Fauna	....	7-5-71
Wanjarri	A.30897	60 miles south south east of Wiluna	50/300 53/300	13,579 a.	Pastoral lease	Conservation of Flora & Fauna	W.A.W.L.A.	18-6-71

CHANGE OF PURPOSE

Name	Res No.	Locality	Plan	Area	Previous Purpose	New Purpose	Vesting	Gazettal
Chinocup	18803	8 miles west of Pingrup	407/80 418/80	abt. 2,420 a.	Water	Water and Conservation of Flora & Fauna	Minister for Water Supplies, S. & D.	30-4-71
Capamauro	24618	5 miles west of Coorow	90/80 95/80	8,860 a. 1r. 37p.	Flora	Conservation of Flora & Fauna	....	23-4-71
Red Lake	29680	Approx. 50 miles north of Esperance	392/80	204a. 3r. 12p.	Public Recreation	Conservation of Flora & Fauna	W.A.W.L.A.	30-4-71

AMENDMENT OF AREA

Name	Res. No.	Locality	Plan	Previous Area	New Area	Purpose	Vesting	Gazettal
Capamauro	24618	5 miles west of Coorow	90/80 95/80	5,000a.	8,860a. 1r. 37p.	Conservation of Flora & Fauna	....	23-4-71
Kulunilup Lake ...	26677	18 miles north west of Rocky Gully	443/80	1,092a.	1,512a. 1r. 22p.	Conservation of Flora & Fauna	....	8-4-71
Truslove	27955	40 miles north of Esperance	402/80	14,929a.	14,990a.	Conservation of Flora & Fauna	W.A.W.L.A.	23-7-71

VESTING OF RESERVES

Name	Res. No.	Locality	Plan	Area	Purpose	Previous Vesting	New Vesting	Gazettal
	30305	About 50 miles east of Narembeen	6/80	2,102a. 0r. 21p.	Conservation of Flora & Fauna	....	W.A.W.L.A.	7-5-71

AMENDMENT OF CLASSIFICATION

Name	Res. No.	Locality	Plan	Area	Purpose	Previous Classification	New Classification	Vesting	Gazettal
Lake Thompson	A.15556	Jandakot	341a/80	1257a.	Fauna Conservation and Research & Drainage	'C' Class	'A' Class	W.A.W.L.A.	7-8-70

PROTECTION OF INLAND AND TIDAL WATERS AND WETLANDS

In recent months a great deal of attention has been focussed on the need to maintain wetlands, that is watercourses, streams, rivers, lakes and swamps in a healthy state for the well-being of our fisheries and wildlife and also for aesthetic and other purposes.

It has been drawn to the Department's notice that the provisions of the Fisheries Act and Regulations and also of the Fauna Conservation Act and Regulations would appear to have been unwittingly breached in a number of instances. No doubt with the best of intentions, offences have occurred through the use of certain wetlands and watercourses as rubbish dumps, as reservoirs or drains for effluents of various descriptions and also in unauthorised drainage schemes. It is highly desirable, therefore, that the following statutory requirements be drawn to the attention of all officers of authorities and organisations concerned with rubbish, waste or effluent disposal. The relevant laws are as follows:

1. FISHERIES ACT AND REGULATIONS

(It should be noted that, in this section, "fish" means and includes all or any of the varieties of marine or fresh water fishes and crustacea or marine animal life.)

(a) **Regulation 17.** No person shall deposit any filth, refuse, or other deleterious matter in any tidal or inland waters or into any watercourse, whether dry or not, leading into any tidal or inland waters where fish are or are likely to be.

(b) **Regulation 18.** No person shall deposit any filth, refuse, or other deleterious matter, or discharge any matter from mining works, sawmills, gasworks or other manufacturing or boiling-down or wool-washing establishments in any place in a manner which will cause or be likely to cause the destruction of fish in waters near or adjacent to the place in which the matter aforesaid is deposited or discharged or injury to any fishing grounds.

(c) Section 23.

(1) It shall not be lawful by the explosion of dynamite or any explosive substance, or by means of any poisonous or noxious thing, to destroy or take fish in any Western Australian waters: And if any person shall explode any dynamite or any explosive substance in or under such waters, or place or cause to flow thereinto any poisonous or noxious thing, such person and all other persons assisting or

being at the time in company of such persons shall, for every such offence, be severally liable to a penalty not exceeding one hundred dollars and not less than twenty dollars; But nothing herein contained shall apply to any person duly authorised by the persons and in the manner to be prescribed by the regulations to explode torpedoes or dynamite in any such waters.

(2) If any person is found in possession of, or has in his boat, any dynamite or other explosive substance immediately after such explosion, it shall be *prima facie* evidence that such person caused such explosion.

2. FAUNA CONSERVATION ACT

Regulation 46. Except as the Chief Warden of Fauna may authorise in pursuance of a management scheme or working plan or in the administration of the Act and these regulations, a person shall not, in respect of any sanctuary—

- (a) remove or disturb any humus, leaf mould, rotting vegetation, soil, stone, sand, rock or gravel;
- (b) cut, pick, pull, break, remove, injure, poison, strip or destroy any tree, shrub, herb, grass or other plant thereof, whether living or dead;
- (e) interfere in any manner with the water level or water supply in any sanctuary, including any lake, swamp, watercourse, river, drainage flow, well, water hole, or dam, whether natural or artificial, or use any water therefrom.
- (n) introduce, place, drop, pour, spray, fog, mist or otherwise use or discharge any dangerous, poisonous or noxious substance.

Wetlands and samphire flats play an invaluable role in natural life cycles and are among the richest feeding areas for crabs, prawns, fish, birds and other forms of wildlife. Because of this their use as sanitary land fill sites is inadvisable as it must lead to further depletion of the State's fish and wildlife. Already over 500,000 acres of valuable wetlands on the coastal plain alone have been drained, filled in or otherwise destroyed and wildlife stocks have been impoverished as a result. It is considered that those that still remain must be retained unless a careful evaluation by all interested parties suggests it would be in the public interest to do otherwise.

REPRIEVE FOR WEDGE-TAILED EAGLE

The Wedge-tailed Eagle, which has for years been persecuted and crucified on fences across Australia, has become a protected bird in New South Wales. On April 13 of this year, New South Wales became the first mainland State to pass overall protective legislation, and on June 4, Victoria announced the dropping of the Wedge-tailed Eagle from their vermin list, which could open the way to the bird becoming a protected species in that State also.

Prior to this year, the eagle was protected only in Tasmania, Australian Capital Territory and part of South Australia. Until 1968, Queensland and Western Australia paid bounties on eagle scalps, averaging between them bounties on 13,056 scalps per year. Western Australia has now terminated bounty payments. The data are fragmentary, but it is possible that recently over 30,000 eagles per year have been destroyed throughout Australia.

The decision to protect the bird in New South Wales resulted from research work carried out by the C.S.I.R.O. Similar studies have been continuing in Western Australia for over three years, and have been taking place in the pastoral zone, where complaints against eagles have often been made. The main objectives are to investigate the eagle's movements, breeding, density, longevity and food, including predation on lambs. It is hoped that full details of these investigations will be published in a future issue.



Wedge-tailed Eagle (*Aquila audax*)

DRYANDRA STATE FOREST

The Forests Department is preparing a report relating to the multiple use of the Dryandra State Forest for forestry, fauna and flora conservation, controlled recreation and youth training. The Department of Fisheries and Fauna has been requested to assist in preparing management plans for the Dryandra area.

Senior Research Officer, Dr. A. A. Burbidge, considers that the Dryandra State Forest and the associated reserves provide a suitable habitat for the long-term preservation of fauna. The area consists of 50,000 acres and a survey carried out by Mr. W. H. Butler in 1964 showed that it contains a wide variety of fauna. A considerable amount of research work will be necessary and will involve trapping and tracking to provide data for the preparation of an accurate management plan.

NEW ENVIRONMENT PROTECTION AUTHORITY FOR VICTORIA

Victoria's Environment Protection Authority should be fully operational by July, 1972. The Authority will have wide powers to control noise and the discharge of waste. It will have the authority to license industries and other dischargers of waste which could cause pollution of the air, water or land. Licenses will be refused or revoked if it is felt there would be a danger to public health.

JAPAN—NEW ENVIRONMENTAL PROTECTION MINISTRY

A new Japanese Government Ministry has begun work tackling the nation's chronic pollution problems.

The new environment agency, with an initial staff of about 9,500 is headed by Mr. Sadanori Yamanaka, Director General of the Prime Minister's office.

It plans a co-ordinated crackdown on automobile exhaust gases, bad smells, factory noise and vibration, discharge of industrial wastes containing harmful substances such as mercury or cadmium, and water pollution.

For this it is seeking an initial budget of 4,500 million yen (\$A11,250,000).

GREY KANGAROO—LIMITED OPEN SEASON



The following notice appeared in the *Government Gazette*, July 23, 1971:

Fauna Conservation Act, 1950-1970.

Department of Fisheries & Fauna,

Perth, 15th July, 1971.

THE Minister for Fisheries and Fauna, pursuant to the powers conferred by section 14 of the Fauna Conservation Act, 1950-1970, does hereby declare an open season in respect of the Grey Kangaroo (*Macropus fuliginosus*), in all those parts of the State not including any National Park, or any sanctuary within the meaning of the Fauna Conservation Act, 1950-1970, which lie within the areas specified in the schedule hereto, subject to the following restrictions:—

- (a) Grey kangaroos may be taken only by the owner or occupier of the land on which they are taken or by an agent appointed in writing by the owner or occupier.
- (b) Where the land is virgin land or land held under pastoral lease, the owner or occupier or his agent shall not take any grey kangaroos unless he has first obtained a damage license in accordance with the Fauna Conservation Regulations.
- (c) **The kangaroos shall be taken only on land which is being actively farmed and on which the kangaroos are causing damage.**
- (d) The person taking the kangaroos shall notify the nearest warden of fauna as soon as practicable after he has commenced the taking of kangaroos.
- (e) The warden may, if after an inspection of the property he considers it necessary, prohibit the further taking of any grey kangaroos on that property until the owner or occupier obtains a damage

license in accordance with the Fauna Conservation Regulations and thereupon no person shall take grey kangaroos on that property except under the authority of a license.

- (f) Nothing in this notice authorises the sale of the skins or carcasses of grey kangaroos that are taken by a person who does not hold a license issued under the regulations authorising such sale.
- (g) Notwithstanding the restrictions in paragraphs (a) and (b) of this notice, grey kangaroos can be taken by a person holding a license for that purpose in accordance with the Fauna Conservation Regulations.

RON DAVIES,

Minister for Fisheries and Fauna.

Schedule.

The Shires of—

Albany	Dundas	Mullewa
Augusta-	Esperance	Nannup
Margaret River	Gnowangerup	Narembeen
Boddington	Greenough	Northampton
Boyup Brook	Irwin	Nyabing-
Bridgetown-	Kojonup	Pingrup
Greenbushes	Kondinin	Perenjori
Carnamah	Koorda	Plantagenet
Chapman Valley	Kulin	Ravensthorpe
Coorow	Lake Grace	Tambellup
Cranbrook	Manjimup	Three Springs
Dandaragan	Mingenew	Wandering
Dalwallinu	Morawa	West Arthur
Donnybrook-	Mount	Westonia
Balingup	Marshall	Williams
Denmark	Mukinbudin	Yilgarn

All that part of the Shire of Merredin east of the Vermin Fence.

DEPARTMENT OF FISHERIES AND FAUNA DISTRICT OFFICES

FAUNA

Metropolitan:
233 Adelaide Terrace.
Tel. 23 4312

Albany:
"Campion House,"
63 Serpentine Road.
Tel. 41 4111

†**Busselton:**
Queen Street.
Tel. 52 2152

†**Carnarvon:**
16 Robinson Street.
Tel. 41 1185

†**Onslow:**
Old P.W.D. Building.

Pingelly:
Park Street.
Tel. 273

Wongan Hills:
Fenton Street.
Tel. 232

†**Wyndham:**
Lot 1215,
Delamere Road.

† May also be consulted on Fisheries.

FISHERIES

Perth:
Ellam Street,
Victoria Park.
Tel. 6 3996

Albany:
"Campion House,"
63 Serpentine Road.
Tel. 41 4111

***Bunbury:**
Stirling Street.
Tel. 21 2598

***Broome:**
Hamersley Street.
Tel. 7

***Dongara:**
Carnarvon Street,
Port Denison.
Tel. 21 1187

Fremantle:
Cliff Street.
Tel. 35 6369, 35 3405

***Geraldton:**
Fisherman's Wharf.
Tel. 21 1956

***Jurien Bay:**
Padbury Street.
Tel. 48 1048

***Lancelin:**
Bootoo Street.
Tel. 78 1111

***Mandurah:**
Leslie Street.
Tel. 35 1240

***Shark Bay:**
Knight Terrace,
Denham.
Tel. 10

* May also be consulted on Fauna.

METROPOLITAN AFTER-HOURS NUMBERS

FAUNA

R. MARSHALL, Warden—8 3127
S. BOWLER, Supervising Warden—64 4137
T. EVANS, Fire Control—60 5694

FISHERIES

M. CRAWFORD, Inspector—3 6719
E. FORSTER, Inspector—6 2532
E. HAMMOND, Inspector—81 1738
B. CARMICHAEL, Supervising Inspector—64 6713
N. McLAUGHLIN, Chief Inspector—49 1072
J. ROBINS, Developmental Research Officer—
31 4701
C. J. SEABROOK, Master, R.V. Flinders—31 1224