

WESTERN AUSTRALIA



S.W.A.N.S.

State
Wildlife
Advisory
News
Service

Vol. 2 No. 4

Spring, 1971

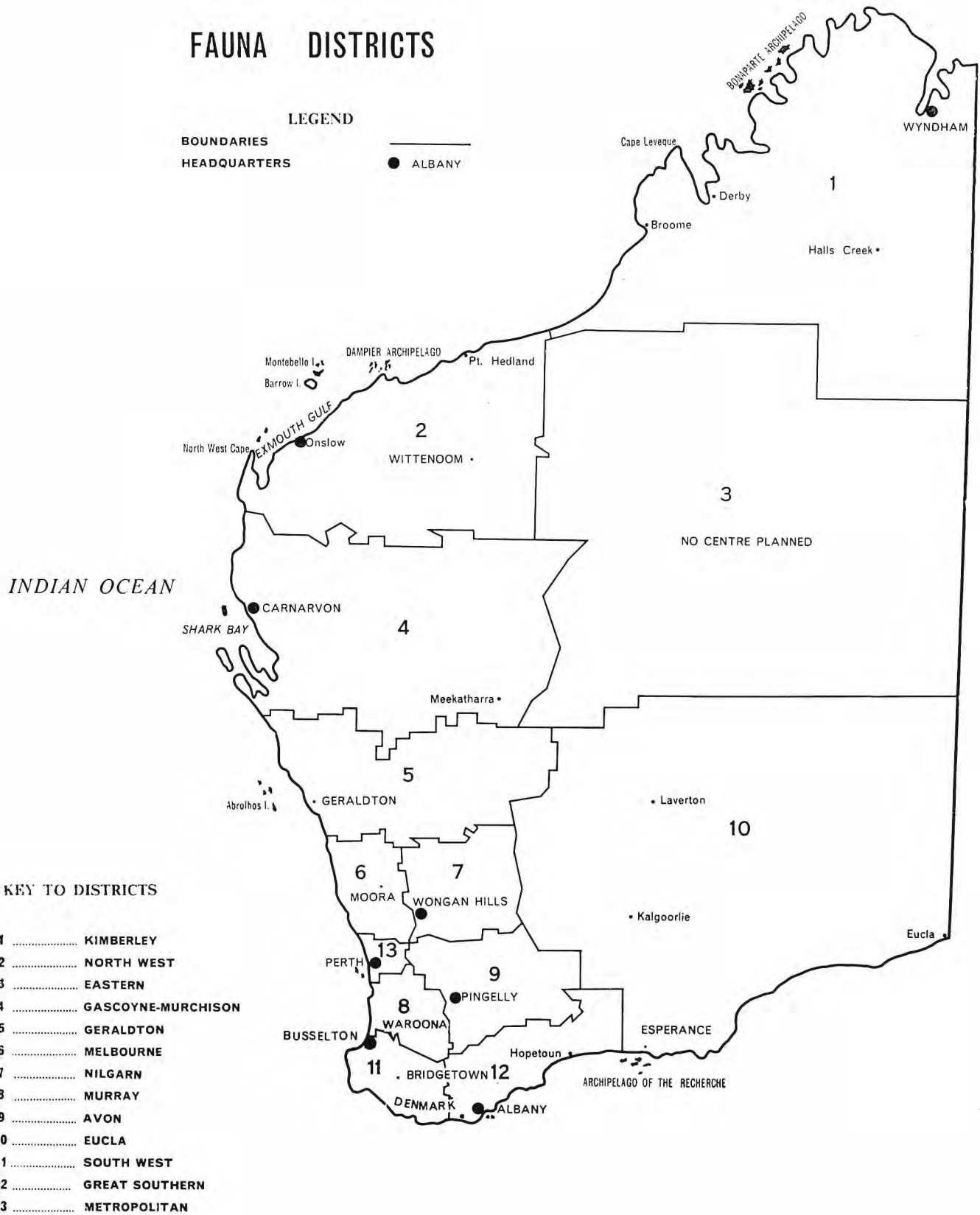


FAUNA DISTRICTS

LEGEND

BOUNDARIES
HEADQUARTERS

● ALBANY



S.W.A.N.S

Vol. 2 No. 4

SPRING, 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:

Extension and Publicity Service,
Department of Fisheries and Fauna,
108 Adelaide Terrace,
Perth, Western Australia 6000.

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

Assistant Editor: R. F. Ward

COPYRIGHT. The contents of this journal are not subject to copyright and may be freely reproduced although acknowledgement of the source would be appreciated. All correspondence to be addressed to the Editor.

Something to think about....

Several reports have been published recently in the press on the poisoning of birds by the indiscriminate use of pesticides. Naturalist Mr Brian Hutchison has been given seven dying birds in the past twelve months, all of which died within a few hours and displayed the same symptoms—fits, convulsions and uncontrollable screaming.

Is it necessary to spray gardens to control the various introduced pests?

The Editor claims that, since disposing of his stocks of dieldrin, parathion, Black Leaf 40, D.D.T., white oil, sulphur compounds, several brand-named systemic pesticides etc., etc., he has, for the past three years, had a pest and disease-free garden. However, he does now have an abundance of ladybirds, preying mantis, spiders and birds, which are the natural predators of most of the "wogs" which infest the household gardens.

Surely the arm of coincidence is not this long?

IN THIS ISSUE

	Page
Operation Noah	76
Shearwaters of Shark Bay	79
Dibblers	82
Sick and Injured Birds	83
Waterfowl Research in W.A.	84
Our Diminishing Heritage	88
Snakes are Dangerous, but	90
A.C.F. Policies Stated	92

"OPERATION NOAH"—SURVEY COMPLETED



A small section of Argyle Lagoon which will be completely inundated by the floodwaters, including the hills in the background

The team from the Western Australia Museum have completed their biological survey of the Ord River Basin and submitted their preliminary report to the W.A. Wildlife Authority. The objectives of the survey were threefold. Firstly, to survey and record the habitat and species of vertebrate animals, molluscs and spiders. Secondly, to determine what animals would require rescuing when the dam begins to flood, where they are likely to be stranded, and what should be done with them once they have been rescued. Thirdly, it was hoped that the information accrued during the survey would enable some predictions to be made on the ecological changes that may occur in the area.

Three areas within the flood region are thought to contain the representative fauna of the Ord Basin, and it was in these areas—the south-west, central-west and north-west—that the fauna survey was conducted. Surveys were also undertaken of the freshwater pools and lagoons of the area, and fish collection was concentrated mainly on the pools lying in the bed of the Ord River between Argyle Lagoon and the junction of the Ord and Bow Rivers.

The survey effort was divided into two phases. The first phase, a general fauna survey, took place from October 1st to 20th. For this survey the team split into three groups:—

- (1) Mr. Rolly McKay and Mr John Dell.
- (2) Mr Harry Butler.
- (3) Dr Darrell Kitchener and Mr Rick Grave.

From October 6th to 13th, Dr. Barry Wilson was with the party and he joined the groups that allowed him the best coverage for his collecting activities.

Although members of the team collected anything and everything of interest that they found, each member is a specialist in a particular field:

Mr McKay—Lycosid spiders and freshwater fish.

Mr Dell—Frogs and birds.

Mr Butler—Birds, mammals and reptiles.

Dr Kitchener—Mammals.

Dr Wilson—Freshwater molluscs.

Each member of the team had an opportunity to examine each of the three study areas, thus enabling a specialist coverage of all the animals in all the selected habitats.

The second phase of the survey took place between October 20th and 26th, and concentrated on the areas that may become important during the rescue operation and any habitats that were not covered in the first phase of the survey.

Each survey team set traps in habitat that showed signs of animals or appeared to be suitable for small mammals. In addition to trapping, spotlighting was conducted at night to determine the species of larger animals in the area and their distribution.

All birds sighted were recorded to provide information on the numbers of species present, their density and their habitat preferences. Observations on feeding habits, breeding and social behaviour were recorded, and those birds which could not be positively identified in the field were shot and a skin prepared of the specimen.

Reptiles were either collected by hand from beneath logs, stones, etc., or were shot with fine dust-shot in the morning or early afternoon.

For the first ten days the party camped in relative "comfort" on the verandah of the old Argyle Downs Homestead. But when the Public Works Department moved in to dismantle this historic building for relocation, the party moved out under tarpaulin in temperatures up to 113°F. Mr Colin Waldon, the Editor of S.W.A.N.S., who was present from October 6th to 16th, described the conditions as extremely arduous. Members of the team worked from 5 a.m. to 10

p.m. virtually every day; these long hours were necessary in order to locate some of the fauna which only appeared in the cooler temperatures of the early morning and late evening.

As a result of the party's observations, their studies and their collections of animals, it was discovered that the area contains only a limited number of species of mammals. However, there are some moderate-sized populations of Short-eared Rock Wallabies and Nail-tailed Wallabies. Euros and Sandy Wallabies are also present but in lesser numbers. Small mammals are extremely scarce, as are dingos, but feral cats are numerous and fairly evenly distributed. Several herds of donkeys are present on the west bank of the Ord, and, scattered throughout the area are numerous cattle which were missed at the final mustering undertaken by the stations in the area. It will be necessary to shoot any donkeys or cattle which become marooned on islands formed by the rising floodwaters. The only alternative would be to leave them to starve or drown and this would be inhumane.

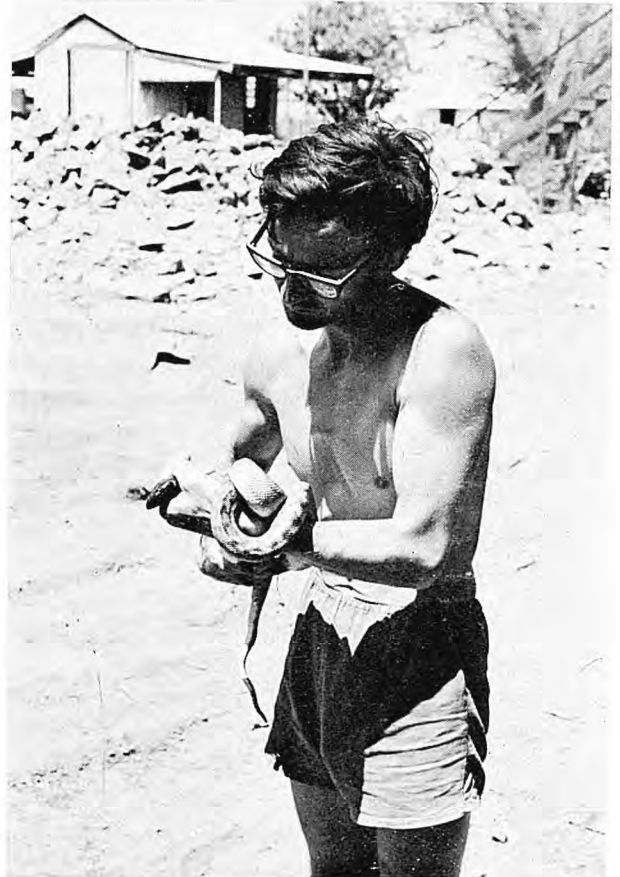
The riverine open woodland country and the low hilly country around the mouth of the Behn River and Hicks Creek will be the first land to be flooded. The Museum team consider that Sandy Wallabies and arboreal (tree-living) species will be among the first animals to be stranded, and recommend that the initial rescue attempts should be concentrated in these two areas. The second area to be flooded will be the extensive grass plains which extend out from the major watercourses, and it is considered that Nail-tailed Wallabies will be stranded on the many low islands formed by the joining of creeks and watercourses. These plains will have to be constantly watched because they will be rapidly inundated. The Museum team recommend that the last animals to be rescued should be the Short-eared Rock Wallabies and Euros, because these animals inhabit only the higher hills. It will be necessary to allow these islands to be reduced in size in order to confine the animals to a smaller area and thereby facilitate their capture.

The number and size of the islands which will be established will depend on the volume of water in the coming wet season. However, it is thought that those islands which will remain will be too small and too barren to support any animals; it will therefore be necessary to move populations to other suitable locations.

During the four-week survey, Messrs. Harry Butler and John Dell identified 149 different species of birds, and this number will increase with the subsequent identification of other species by the Museum. Birds should find no difficulty in escaping from the rising waters and establishing themselves in suitable habitat adjacent to the newly-formed lakes. The reptiles of the area will concentrate in trees and higher ground during the flooding, and it is expected that Mr. Harry Butler, who is familiar with the handling

of poisonous snakes, will undertake this aspect of the rescue operation.

A second opportunity to study the fauna of the area will arise when the filling of the dam commences, because the rising water will undoubtedly flush-out species of animals which were not observed during the October survey. Another team from the W.A. Museum will be present when the Operation Noah team commence their rescue operations. This team will ensure that by the time the lake is established a comprehensive picture will have been built up of the biota of the Ord River Basin, and this will be invaluable in monitoring future changes which might occur as a result of altering the ecology of such a large area.



Mr Rolly McKay with a water python. Part of the now-demolished historic Argyle Downs Homestead can be seen in the background

It is not possible to say when the actual rescue operations will commence, but if the pattern of the rainfall follows the overall pattern of previous years, the Operation Noah team expect to be called to the rescue area in mid-January. Messrs. Neville Beeck and Henry Hall, the project coordinators, will be the advance party and will go North as early as New Year's Day or as soon as the Ord is termed a "goer". Their immediate task at that stage will be the assemblage and double-checking of all the equipment, and it will

be their responsibility to determine when the floodwaters have risen sufficiently to enable their team to begin rescue operations.

The other seven members of the nine-man party will be prepared to move at a moment's notice. They will fly into Kununurra and set up camp at the main dam site. Accommodation and messing will be provided by facilities left at the dam site by the Public Works Department.

The rescue operations will be carried out from two 17 ft. 6 in. De Havilland run-abouts fitted with 40 h.p. outboard motors, and a third, smaller boat will be used by Mr. Butler for the rescue of reptiles. A spotter-plane, piloted by Mr Rick Grave, will be used for two or three reconnaissance flights each morning to sight animals and to report on the rate of inundation of specific areas. Two-way radios will be used to maintain contact between the plane, the boats and the base camp; this will enable Mr Grave to direct rescuers to those areas which require priority.

When the rising water reduces an island to a practical size, the teams will land and drive the animals into the water. This procedure will be adopted when animals are very agile and the terrain is such that capture on land would be virtually impossible, as well as extremely exhausting. On larger and more accessible islands trapping will be carried out. It is hoped that the shortage of food will cause the animals to more readily enter baited cage-traps. Once animals have been caught they will be placed in onion bags, which will restrict their movements and prevent them from injuring themselves. The open mesh of these bags will lessen the effect of the harsh temperatures which generally affect confined animals. The rescued animals will not be kept confined any longer than is absolutely necessary, but will be moved rapidly to suitable new habitats determined by the Museum survey.

However perfect the organization and techniques of the Operation Noah team may be, it is inevitable that some animals will be lost during the rescue operation. Experience from operations on a smaller scale and under better conditions indicates that the translocation of animals always results in some percentage of mortality due to shock etc. However, all the members of the rescue team are highly experienced in the handling and care of fauna, are themselves ardent conservationists, and, despite the fact that the rescue operations will present some personal hazard, they will ensure that every effort is made to rescue the greatest possible number of animals.

STARLINGS AT ESPERANCE



The attention of Honorary Wardens is drawn to the fact that, for the past two years Starlings (*Sturnus vulgaris*) have been observed in October near Esperance. In 1970 only one bird was seen and this was destroyed by the Agriculture Protection Board. The only previous positive identification was reported at Gingin in 1936. However, this year at Cordingup, east of Esperance, there are signs that starlings may be finding their way overland from South Australia and the eastern States where they are found in their millions.

At the time of writing fifteen starlings have been destroyed by the Agriculture Protection Board, and there are indications that the birds are now resident and breeding in Western Australia. Two nests have been found and two immature birds have been shot. The Agriculture Protection Board will pay a bounty of \$2 per bird for starlings, which is some indication how serious the recent invasion is considered to be.

Starlings are of European origin and were introduced into Australia in 1881. They are a self-reliant and gregarious bird, often found in large flocks. They present a problem to agriculture because, having wide tastes in food they frequently attack soft fruits and seedlings. Starlings also compete with native birds for food and usurp their nests. When they build their own nest it is an untidy assortment of straw and feathers placed in a hole in a tree, in a crevice in a building, or similar situation. Cases have been reported of nests being placed on the back of living sheep.

Starlings generally breed from September to January, hatching five to seven eggs which are pale blue, sometimes almost white. An adult bird is 8½ inches long and is black with a green and purple sheen and profuse pale white or buff spotting all over.

Any destroyed starlings should be forwarded to the Agriculture Protection Board, Jarrah Road South Perth (Tel. 67 0111), whereon a \$2 bounty will be paid. Any sightings should also be notified immediately.

THE SHEARWATERS OF SHARK BAY

A Report to W.A. Wild Life Authority
by Dr D. L. Serventy
1971

The Wedge-tailed Shearwater (*Puffinus pacificus*) breeds on islands along an extensive stretch of the Western Australian coast-line, from Carnac Island in the south to the Forestier Is. in the North-West. In the islands of Shark Bay the breeding shearwaters exhibit a plumage variation unknown elsewhere in Western Australia, or, indeed in any of the other nesting stations in the Indian Ocean. A proportion of the Shark Bay birds, instead of being uniformly dark-plumaged as is normal in the species, have white underparts. This type of dimorphism is wide-spread however in the Pacific Ocean colonies, but only north of the Equator, where the dimorph ratio in favour of the white birds increases with the latitude. In some of the far northern Pacific islands, such as the Pescadores and Bonins, near Japan, all the birds have white underparts.

That some of the Shark Bay birds have white underparts was first made known through the collecting of the ornithologist Tom Carter in November 1916 on Slope Island. Though he made no specific mention of a white-breasted bird in his paper (Ibis, 1917: 573) such a bird was actually collected by him and is in the Western Australian Museum, where it was examined by W. B. Alexander and its significance pointed out (Emu, 20, 1920: 19). Curiously this Australian phenomenon was overlooked by overseas reviewers of the colour variation in the species and no mention is made in the definitive study by R. C. Murphy ("The Populations of the Wedge-tailed Shearwater (*Puffinus pacificus*)," American Museum Novitates, No. 1512, 1951). Murphy, even at that late date, believed that all of the Indian Ocean populations were wholly dark-coloured.

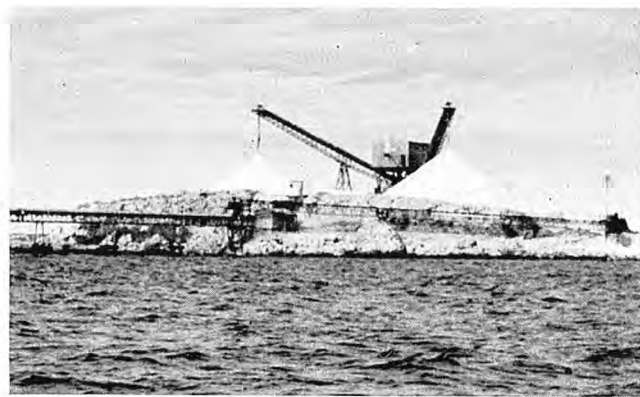
I visited Slope Island with a State Fisheries Department party in 1943, and found white-breasted individuals in burrows. In 1947 I made a survey of the guano deposits of Shark Bay in M.V. "Warreen" of the C.S.I.R.O., in the course of which I noted on which islands shearwaters nested. In 1965 Dr G. M. Storr examined several islands on behalf of the predecessor of this Authority. As a result of our joint surveys, which covered almost all of the suitable islands in the Bay, we have established that the nesting stations of the shearwaters are restricted to five islands only, all being in the Freycinet Estuary.

Owing to the rocky nature of the terrain it is difficult to make a systematic examination of the nesting burrows as the birds make extensive use of cavities in the travertine limestone of the islands. Thus until recent years the white-breasted bird was known only from the site of its original discovery—Slope Island. So when, in

April 1964, it was revealed in a letter to the "West Australian" by Mr D. C. Bathgate that Slope Island had been made over to a salt company, ornithologists throughout Australia were very much concerned. It was impossible to undo the commitments, though the island was vested in the Fauna Advisory Committee (the precursor of this Authority) as a fauna reserve.

To find out what was happening to the shearwater colony as a result of the operations of the salt company, Dr G. M. Storr with Messrs J. B. Higham, N. E. McLaughlan and G. Dixon, inspected Slope Island and other breeding stations in late August and early September 1965. They found that Slope Island had been extensively altered but nevertheless a considerable number of shearwaters were still occupying nest sites on the precipitous eastern slopes of the island. An important discovery was that white-breasted birds also occurred on Baudin Island.

In late November and early December 1966 Mr Henry Hall, before he became a member of this Authority, happened to be in the Bay and he made a brief call at Slope Island. At that time the causeway to the island had not been constructed, but a bull-dozer was at work levelling the top of the island. A quarter of the island was covered by rubble, crushed limestone and heaps of salt. Shearwaters were seen entering cavities and interstices in the rubble heaps.



Slope Island—showing the proximity of the salt workings to the breeding colonies on the cliffs slopes

Mr Hall was a member of the recent party from the Authority which visited the island on April 21-22, 1971. The other members were Messrs Angus Robinson, Neville Beeck, E. Dell, Dr Stephen Davies and myself. Mr Hall noted that the appearance of Slope Island was vastly different from what it was over 4 years previously. Not

only was a causeway now in operation, which enabled foxes to enter the island, but extensive works had been constructed—buildings, machinery, salt heaps, and a loading jetty. In 1966 an untouched cliff edge ran about three-quarters of the diameter of the island, facing the east. Now this slope was reduced to about one-tenth of the diameter of the island and was steeper. Patches of Nitre-bush which still survived on top of the island in 1966 had now disappeared.

The situation on the shearwater breeding islands in the Bay, as assessed by the visits of Dr Storr's party in 1965 and ourselves in 1971, is as follows:

Friday Island

This is a very small islet just north of Slope Island and is the furthest north breeding station of the shearwater in the Bay, so far as is known. When I landed on it in October 1947 I recorded no sea-birds nesting. However, on his visit on September 1, 1965 Dr Storr found eight shearwater burrows in the Nitre-bush jungle and considered there could have been more, say 50. We attempted a landing on April 21 by motor dinghy but a southerly suddenly blew up and we abandoned it. We accept Dr Storr's estimate of 50 burrows on the island.



A close up of the previous photograph showing breeding colony cavities on Slope Island

Slope Island

I did not attempt a population estimate on my visit in the 1940s. Dr Storr estimated there were about 150-200 breeding pairs still surviving on his visit on August 28, 1965. We agree that a population approaching this figure may still exist and accept an estimate of about 150 pairs. At the time of our visit the adult birds would probably all have left and many of the fledglings also. We located three live fledglings in the nesting crevices and a lady at the island said she saw one fly out the previous night. However, there were 10 dead fledglings around the rookery, all were very fresh with no visible signs of the cause of death. There were also two rather old adult corpses. The occurrence of these is perturbing as one does not

see such a high proportion of dead birds in similar sized rookeries of *Puffinus tenuirostris* in Bass Strait, nor did we encounter anything similar on the other Shark Bay nesting islands. The deaths may be attributed to (1) the salt workings—perhaps collisions with the strongly illuminated installations on the island (the island is brilliantly lit all night), or (2) casualties due to fox predation. We identified fox tracks on the sandy beach of the island. It is obvious that there is a reduced survival of offspring on this island, compared with others in the Bay, though a sizeable population of breeding adults continues to occupy the available remnant of the island.

Freycinet Island

This island is now the one most densely populated by breeding shearwaters, but it is difficult to make a satisfactory population assessment as the birds use natural crevices on the slopes around the periphery of the island. The top of the island, being hard ground, and littered with rock piles left by the guano operatives of the last century is virtually not used by the birds. In 1947 I estimated there might be about 50 burrows on the western side. In 1965 Dr Storr considered there were 500 burrows on the south and west slopes though he did not actually handle any birds. On our recent visit our party made a thorough search and managed to pull out four fledglings from nesting cavities and found one dead young one. After the inspection the members of our party, who were not informed at the time of the previous population estimates, were asked to note down, independently, how many breeding burrows there might be on the island. The figures submitted were: 40, 113, 180, 200, 200 and 220. I think we may reasonably accept a figure of about 250 burrows for this island.

Double Island

In my 1947 visit I noted a "few" burrows on this island. Dr Storr failed to find any. On our recent inspection we found several burrows on the western side, among the Pied Cormorant colony, and some caved in as we walked. Two live fledglings were pulled out and one unhatched egg found. We estimated that there might be about 50 breeding burrows.

Baudin Island

On my 1947 visit I found no trace of mutton-bird occupancy. I evidently overlooked them, for in 1965 Dr Storr's party saw burrows and caught an adult in one of them. They estimated that about 50 pairs nested in the Nitre-bush covered parts on the south-west face. Our recent party did not visit the island. This is the most southerly nesting station of the Shearwaters in Shark Bay.

Total Population

On present knowledge the following is the presumed population strength of the species on the breeding islands in Shark Bay.

	breeding burrows
Friday Island	50
Slope Island	150
Freycinet Island	250
Double Island	50
Baudin Island	50
Total	550

This is not a very large population and no doubt is a considerable reduction on what existed in the Bay before the salt works started in 1963.

The White-Breasted Phase

Until Dr Storr's survey of 1965 the white-breasted phase had only been met with on Slope Island. On that visit a white breasted adult was pulled out of a burrow on Baudin Island by Mr G. Dixon. On our recent visit Mr Neville Beeck pulled a white-breasted fledgling from a burrow on Freycinet Island. So now this phase has been noted on three of the five islands on which the species is known to breed in the Bay. It is reasonable to assume that it occurs on the other two as well.



Wedge-tailed Shearwaters—showing light and dark phase

The first attempt at assessing the ratio of dark to white birds in this dimorphic population was made by Dr Storr at Slope Island in 1965. By observing birds flying in at night, by torch-light, his party estimated that 30% had white underparts. On our visit we found seven dead dark fledglings and three white-breasted ones, the results thus tallying with Dr Storr's ratio. However, three live fledglings found on the island were all dark-phase birds. Thus, of the total fledglings seen by us on Slope Island, three out of 13 i.e. 23% were white-breasted. On Freycinet Island out of five fledglings noted, only one was white-breasted, i.e. 20%. On Double Island, only two dark-phase fledglings were seen.

So, on our recent visit, out of 20 fledglings (live and dead) examined on three islands (Slope, Freycinet and Double Island) 16 were dark-phase and four were white-phase (=20%).

In museum collections the only white-phase specimen which exists is the one originally collected by Tom Carter which is in the W.A. Museum. Photographs of white-breasted fledglings were taken on our recent visit.

The Future

It is clear that the salt operations on Slope Island, direct and indirect, are having a detrimental effect on the status of the Wedge-tailed Shearwater in Shark Bay. Dr Storr's party found the situation assuring on their 1965 visit, Mr Dixon reporting: "After satisfying ourselves that the species was in no danger on Slope Island, providing no further habitat is destroyed (which is unlikely) we returned to the **Vlaming**." Unfortunately, the habitat has been materially reduced since that time, and, additionally, the construction of the causeway has allowed foxes access to the rookery.

It is recommended that:

- (1) The company be asked to leave the existing undeveloped cliff slopes to remain as they are. Our party was gratified at the solicitude shown for the birds by the company's operatives on the site and we feel sure they will co-operate in any way to ensure the survival of the remnant of this important rookery.
- (2) To minimise the possibility of foxes entering the island a suitable grid (such as the provision of moving rollers) be constructed along the causeway.
- (3) The Department and the Authority continue annual surveys of the area with a view to adding to the store of information on the shearwater, so that more precise data may be accumulated on population strengths on the various islands and of the dimorph-ratio. A prudent collection of specimens, particularly of the white-breasted phase, should be permitted so that the Western Australian Museum may build up a useful reference collection of this population.

Other Nesting Sea-Birds

We found evidence that Bridled Terns (*Sterna anaetheta*) still breed on the eastern cliff face of Slope Island and did so during the 1970-71 season. On Freycinet Island a Pied Cormorant (*Phalacrocorax varius*) colony, of about 1,000 pairs, was just starting egg-laying on April 22. No other sea-birds were noted nesting.

Rock Parrots

Dr Storr's party found Rock Parrots still plentiful on Slope Island in 1965; they were absent on our visit. We questioned some of the salt company's workers but they did not know of them on the island. Rock Parrots were abundant on both Freycinet and Double Island.

ARE THERE ANY DIBBLERS LEFT?

In 1967 considerable publicity was given to the re-discovery of the Dibbler (*Antechinus apicalis*). The Fauna Wardens Bulletin Vol. 1, No. 3, June 1967, described how the Dibblers had been sent to La Trobe University in the hope that a captive breeding colony would be established. News has since been received that the Dibblers failed to reproduce and it now appears that a further attempt must be made to locate more specimens. Nearly four years have elapsed since the Dibbler hit the headlines and readers will probably welcome the following summary of events that have taken place following the rediscovery of this rare marsupial.

Until 1967 the Dibbler had been considered extinct for about 83 years. It is a small carnivorous marsupial with a body length of about $4\frac{1}{2}$ to $5\frac{1}{2}$ inches and a distinctive tail which tapers sharply in its $3\frac{1}{2}$ inch length. The forearms are distinctly reddish, but the overall appearance of the fur is grey-brown, speckled with white. This speckled appearance is evident from the eyes almost to the tip of the tail. Close examination of individual hairs reveals that, from the base, each hair changes colour from grey to reddish-grey to pure white. A very striking feature is a ring of near-white fur around each eye.

The Dibbler was rediscovered when Honorary Warden Mr Michael Morcombe was attempting to collect a live specimen of the Honey Possum to photograph for ancillary illustrations in a book he was writing on wildflowers. The Honey Possum is often seen on banksia and other large wildflowers, so Mr Morcombe constructed cylindrical traps of flywire strengthened with medium thickness fencing wire to fit over the flowers. The traps were originally set near Oyster Harbour, Albany, but after three unsuccessful days they were shifted to a site east of Albany, between Cheyne Beach and Lookout Point. On the morning of January 27, a trap set about two feet from the ground caught a small female marsupial. The Dibbler had been found again after 83 years.

Two days later a second Dibbler was trapped, this time a male. At this stage, Mr Morcombe was understandably unsure of the identity of the animals he had caught, so he kept them for several months and observed their habits. He learnt that Dibblers are agile climbers who move swiftly and surely along branches and twigs, often springing a foot or more from branch to branch. Thin branches or twigs are grasped between the thumb and the first digit, but when branches are too thick to allow this the Dibbler uses the full claw for climbing, with the tail acting as a balance. During rapid descent the tail is pressed firmly against twigs and stiff leaves to give stability. If disturbed the Dibbler will drop to the ground and burrow vigorously beneath loose leaves.

Dibblers are not entirely nocturnal, but do tend to shun harsh sunlight and glare. Consequently they are most active in early morning or early

evening, and during the day sleep beneath a mantle of leaves. Mr Morcombe noted that, in captivity, his Dibblers formed a chamber of leaves and twigs re-inforced with shredded paper. It is thought that in their wild state, a similar type of nest would be built in a hollow in the ground.

Both Dibblers were caught on banksia flowers and nocturnal examination shows that in addition to an abundance of nectar there are large numbers of small insects associated with these plants. In captivity the Dibblers licked and probed fresh banksia flowers for nectar and insects. Small insects were held in the paws to be eaten, but larger prey such as spiders were buffeted and disabled by being snatched up, bitten and dropped several times before finally being eaten.



After several months Mr Morcombe sent a photograph of his two animals and a request for further information to Mr B. Marlow, the Curator of Mammals at the Australian Museum in Sydney, who suggested that Dr David Ride of the W.A. Museum be shown the animals. Dr Ride positively identified them as Dibblers, and shortly afterwards led a small party to the original capture site. Here a further female was discovered who subsequently gave birth to seven small joeys. The adults and young were then forwarded to La Trobe University in Melbourne where it was hoped to establish a captive population. The three adults died within one year and although the young reached sexual maturity they failed to reproduce and died also. However, by comparison with events in other species of *Antechinus* it was possible to gain a reasonable idea of their pattern of reproduction.

Since 1967 further attempts have been made to locate live specimens; these have been unsuccessful, but it would be naively pessimistic to assume that the three found in 1967 were the total population. It is hoped that we have not seen the last of the Dibbler; perhaps another Honorary Warden will follow in Mr Morcombe's footsteps.

SICK AND INJURED BIRDS

Many Honorary Wardens and members of the public will undoubtedly come across sick and injured birds from time to time. The following information is a summary of some guides to treatment and recommended action which have been kindly offered by Mr. Michael Carins who recently wrote an article on this subject in "The Australian Bird Bander" (September 1971).

Disease

Disease in birds may be difficult to detect but may be evidenced by an excessive number of ecto-parasites, dull dirty plumage, very low weight for the species, excessive lethargy, sores or blebs on the feet or facial flesh, or a discharge from the eyes, nostrils or mouth. Birds so affected should be handled carefully since some infections can be transmitted to humans. The treatment of diseased birds is rarely successful and it may be more humane to destroy them in the first instance.

Shock and Exhaustion

Trapped birds which go into a state of shock may be placed in a darkened box or cage and kept quite until they recover. Most honeyeaters respond very well to sugar and water mixture and this can be used for any shocked bird which will accept it. Frequently exhausted birds will be found (see story on Giant Petrel, page 93). These should be fed and cared for until strong enough to fly and released in their natural environment. A teaspoonful of brandy or similar spirit will aid revival.

Injuries

Leg injuries are the most likely ones encountered and these do not appear to unduly incapacitate most birds. Many birds suffer little inconvenience from a single badly damaged or missing leg.

If a bird has a simple broken leg it may be splinted with matchsticks and thread and the bird cared for until the leg has healed. If the leg is badly broken and the bone protrudes through the skin it should be amputated at the next joint and treated with antiseptic before releasing the bird.

Some birds, particular waders seem prone to entanglement of the feet and legs with wool or string, etc.; gulls and terns also are very prone to such entanglement by nylon fishing line. Frequently these obstructions are so tightly worked into the leg that they are impossible to move without cutting; this should be done carefully using the tip of a scalpel.

Badly injured birds, particularly those suffering from gunshot wounds or ones struck by cars should be destroyed as soon as possible. Gunshot wounds can be treated by the application of sulpha

powder at the site of the injury, but unless the exact nature of the injury is known this may prove futile. Treatment will control infection, but if bones are broken internally the skeleton may become flooded with blood and death will inevitably occur. Injuries from telegraph wires frequently result in the loss of a section of one wing. Whilst the loss may not prevent recovery from the injury, the bird will never fly again and would have to be held in captivity for the remainder of its life.

There are various ways of destroying birds for humanitarian reasons. Small birds may be killed by pressing the thumb strongly on the left side of the breast until the heart stops. Larger birds may be killed similarly by pressing with the knee or foot. Another method is to insert a scalpel into the back of the skull, or instant decapitation which causes no distress and brings death immediately. Do not try to wring a birds neck; apart from being difficult it is frequently unsuccessful. It is highly recommended that any necessary killing should be done in seclusion in the interest of public relations and out of deference to anyone who might be upset by such a process.

Oiled Birds

If only slightly oiled a bird may be treated with a good chance of success, but the treatment must be done and the bird released quickly without destroying the waterproofing of the plumage. Slightly oiled birds should be fed, kept warm and dosed with a small quantity of castor oil to assist in the purging of any oil which may have been swallowed. After this has been done, Fullers earth (a moisture-absorbing substance) may be worked into the feathers to remove the oil. If the bird is other than slightly oiled, treatment is likely to prove unsuccessful. A possible method of rehabilitation is under investigation in Britain but the results are not sufficiently conclusive for them to be released at the present time.

Editors Note:

- (i) *The treatment of botulism and algal poisoning is not covered here, but a booklet dealing at length with this subject is available free of charge from the Department.*
- (ii) *It is recommended that any individual inexperienced in caring for injured birds should seek the advice of a more qualified person if the injuries appear severe. If the bird is to be treated and kept to recuperate a "License to care for sick, derelict or injured fauna" must be obtained from the Department. There is no fee for such a license.*

WATERFOWL RESEARCH

IN

WESTERN AUSTRALIA

by Dr T. L. Riggert

The Department of Fisheries and Fauna commenced its first waterfowl research project in 1952, when Mr Joe Traynor captured and banded ducks in Queens Garden, Perth. In the following fourteen years nearly 10,000 ducks were banded and released throughout the South-West of Western Australia. Volunteer banders such as Mr N. Beech, Mr L. Bell, Mr D. Moir, Miss C. A. Nicholls, Mr B. J. Paully, Mr T. J. Paully, Mr A. Robinson, Mr N. Stewart and many others worked individually to assist the Department with this project. Much of this basic information has been utilized to formulate the present-day waterfowl research programmes.

At the present time there are five waterfowl research programmes being carried out in Western Australia. These are:

- (1) The investigation and evaluation of wetland areas in the South-West of Western Australia.
- (2) A study of the biology of the Mountain Duck (*Tadorna tadornoides*) on Rottnest Island.
- (3) A general waterfowl banding programme. This programme operates at Moora, Katanning and on the lakes found within the Metropolitan area.
- (4) The erection of artificial nest boxes.
- (5) Aerial surveys for evaluating wetland areas and waterfowl populations.

It will only be possible to give a brief explanation of these projects in this article; however, an endeavour will be made to present each project in more detail in future editions of S.W.A.N.S.

In 1964, a research programme was initiated to investigate the disappearance of wetland areas on the Swan Coastal Plain. This area covers approximately 3,000 square miles extending from Yanchep to Busselton; bounded on the west by the coast and on the east by the Darling Escarpment. At one time this area had abundant wetlands, but

today through drainage and land reclamation the number of wetlands has been drastically reduced.

Basically the research project showed that nearly 150,000 acres of wetlands had been drained for industrialization, urbanization and agricultural projects. This area contained some of the most permanent waters in Western Australia and was important both for waterfowl breeding and drought refuges. The drastic reduction of the wetlands in this area has undoubtedly caused a serious depletion of the waterfowl population in the South-West of Western Australia.

A second research project commenced in November 1964, to study the biology of the Mountain Duck on Rottnest Island. The Island was chosen for the study area because a large population of Mountain Duck breed each year on the salt lakes, and then migrate with their young back to the mainland. Figure 2 shows some of the salt lakes on Rottnest Island, which cover an area of approximately 400 acres.

In 1969, the first phase of the research project was completed and much information was obtained which can be applied not only to Mountain Ducks on the mainland but also to several other species of duck. Two interesting features of the study were the long distances that Mountain Ducks are able to migrate and the ability of the birds to desalinate water with the aid of a salt gland which is located on the head above the eye. During aerial surveys Mountain Ducks have been observed 300 miles east of Wiluna, and banded birds from Rottnest Island have been shot at Esperance. Although Mountain Ducks have the ability to desalinate water it is still necessary for them to drink at freshwater areas to clean their system of the salt. For this reason many stock dams which are located near saline lakes are regularly utilized by large concentrations of Mountain Ducks.

The waterfowl banding programme at Moora, Katanning and on the lakes of the Metropolitan



Fig. 1. Black Duck at Shenton Park captured by cannon netting (see also Fig. 6)

Area commenced in 1967 and to the present time 20,000 ducks have been banded. From the bands which are returned by shooters, by persons finding the birds dead or by recapturing during banding operations, it will be possible to establish migration patterns, the average life of the different species of ducks and the type of habitat the different species prefer. This type of information is of major importance when trying to establish game reserves and sanctuaries for all species of waterfowl. It must be remembered that if we are to continue to enjoy the number of birds we see today we must ensure that a large portion of these birds are given refuge, so that they are able to breed during each breeding period.

The duck bands, which are wrapped around the right leg of the bird, are made of titanium and do not cause any harm to the ducks. (See figure 3.) Some ducks have had two bands attached, and this is an experiment to try various types of metal to observe what material is not corroded by saline waters. In Figure 4, a male and female Mountain Duck have been tagged with "A-Frame" bill tags. These tags are held in position by a piece of monofilament string threaded through the nares of the duck's bill. These markers make individual identification possible, which allows information to be gathered on the requirements of nesting territories, the number of young that each pair of birds is able to raise to maturity, and the length



Fig. 2. Part of the salt lakes of Rottnest Island which cover approximately 400 acres of the Island



Fig. 3. A banded Black Duck (*Anas superciliosa*) showing duck band on right leg

of time that pairs of ducks will remain together. It has been found that Mountain Ducks which have successfully reared their young have pair bonds which endure over very long periods.

If birds are found dead or shot during the annual waterfowl hunting season it is important that bands and tags are sent immediately to the Department. It is also important to give your name, address, date and the location where the bird was

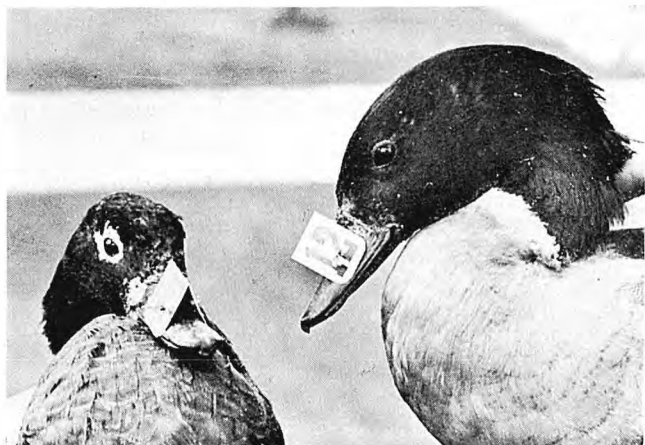


Fig. 4. Adult female (left) and adult male (right) wearing "A-Frame" bill tags

shot or found dead. In turn the Department of Fisheries and Fauna will forward to you information on the banded bird, such as the species type, age, sex and the area where it was banded.

The use of artificial nest boxes for waterfowl has been used as a game management technique for many years by northern hemisphere countries. In Western Australia nearly all ducks nest in the hollow branches of trees, and in some areas these types of nesting sites are either non-existent or have been greatly reduced by the clearing of timber for agricultural purposes. Therefore, in the past three years, 1,940 boxes of the type shown in Figure 5, have been erected in the South-West Land Division area. Because of the poor breeding seasons in 1969, 1970 and 1971 the nest boxes have not been utilized as much as anticipated; however, all indications from the nest boxes erected during 1968 show that birds will readily use the artificial nest boxes. In 1972 an additional 1,000 nest boxes will be erected in the South-West Land Division.

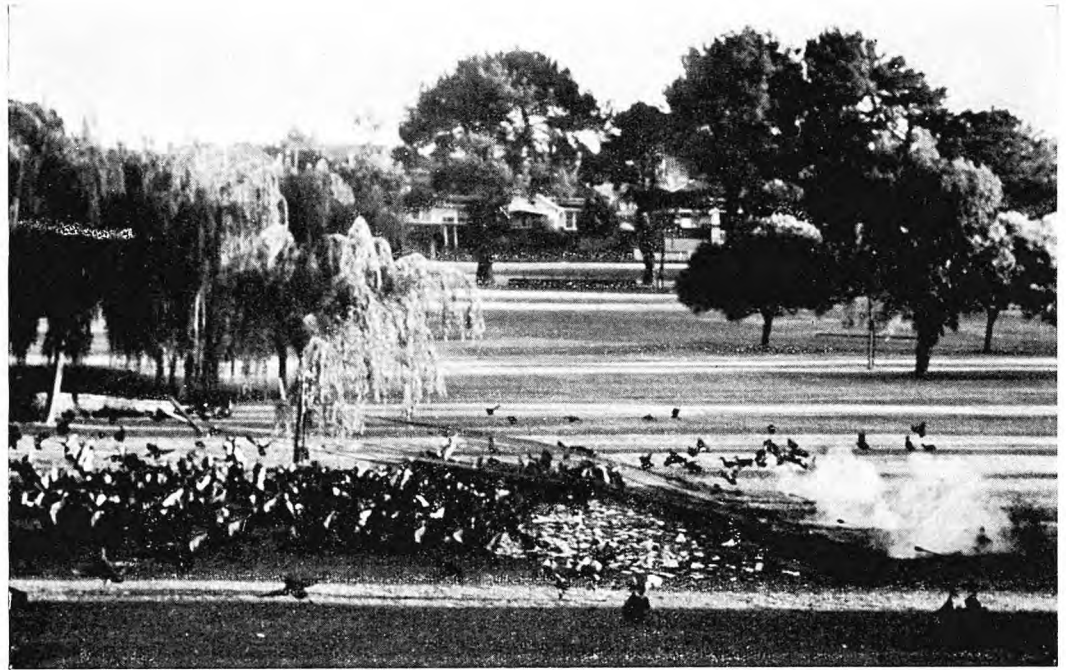


Fig. 5. Technical Officer, Mr D. Munro examines eggs of a grey teal (*Anas gibberifrons*) nesting in artificial nest box

Over the past five years the use of aircraft in survey work has proved to be most efficient since it allows observers to see many areas which are usually inaccessible on the ground. Prior to the annual waterfowl hunting season, all areas containing water in the South-West and Eucla Land Divisions are surveyed and the numbers of waterfowl using the areas are estimated. This survey takes approximately four days and allows the Department to assess the waterfowl population of the shooting area almost immediately. Figure 7 shows the aircraft refueling at Esperance during this year's waterfowl survey. In 1969, it was obvious that severe drought conditions had caused the waterfowl not to breed and the adult birds were bunched together on the few remaining waters. It was therefore necessary to close the hunting season so that large concentrations of waterfowl could be left undisturbed during the drought period. This action has proved to be very

Fig. 6.

Capturing Black Duck (*Anas superciliosa*) at Shenton Park, Perth by cannon netting. Cannon net consists of a 4,000 sq. ft. net thrown by three mortars which are electrically fired



successful and the partial droughts of 1970 and 1971 have not had the drastic effect that would have resulted if shooting had been allowed in 1969.

The future of waterfowl in Western Australia is a very complex story. The sporadic nature of winter rains and cyclonic storms make the availability of surface water irregular and non-permanent. This in turn causes ducks to miss breeding periods or to rear broods in unfavourable conditions, which accounts for low production and high mortalities, especially when young birds are stranded in wetland areas that become dry.

The loss of permanent wetland areas along the coast has caused a drastic deterioration in the Black Duck population of the South-West. These wetlands act as drought refuges for waterfowl during the summer months when inland wetland areas dry out. Once the drought refuges are lost the birds cannot survive the long summer on the limited permanent waters of the inland areas. Drought refuges are the key to maintaining a waterfowl population in Western Australia.



Fig. 7. Survey aircraft being refueled at Esperance, during the annual wetland area and waterfowl survey of 1971

The deterioration of freshwater swamps, through the inflow of brackish or saline water, has destroyed much of the valuable breeding habitat for Black Duck and Grey Teal. This is becoming more apparent with the large numbers of ducks breeding on stock dams and rivers. To maintain a waterfowl population of all species of ducks, freshwater areas must be kept and the quality of the water must be maintained. Evidence that many wetland areas are becoming salty is the growing proportion of Mountain Ducks in the waterfowl population. These birds prefer the salt-water habitat which is increasing rapidly with the clearing of land and the draining of freshwater areas.

Although we pride ourselves on the abundance of natural resources in Western Australia we fail to realize that our rarest commodity is fresh water. Fresh water needs to be saved and stored, and an excellent example of water storage for wildlife is the artificially-made lakes of Beverley. Only if this type of action is taken can I see future generations of Western Australians enjoying the pleasures that waterfowl can stimulate, both aesthetically and through the sport of duck shooting.

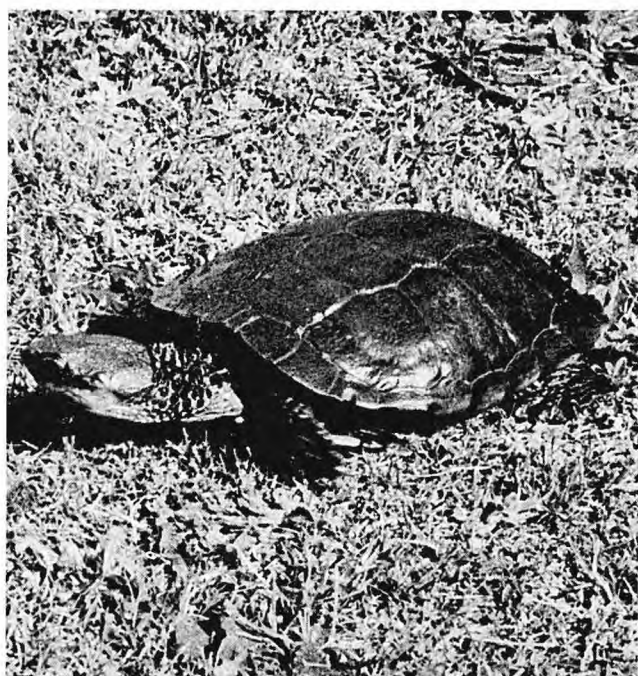
PERTH WARDENS—NEW ADDRESS

Readers are asked to note that the Metropolitan District Fauna Office of the Department is no longer at Koonwarra House, 233 Adelaide Terrace, Perth. The Supervising Warden, Mr S. Bowler, and the Metropolitan Fauna Wardens are now located within the Head Office building at 108 Adelaide Terrace.

Our Diminishing Heritage

The Western Swamp Tortoise (*Pseudemydura umbrina*), known locally as the Short-necked Tortoise, is a small carnivorous reptile which has been found *only* in a small area of the Swan Coastal Plain near Perth. Estimates of population are difficult to assess accurately but possibly less than 200 specimens exist in the whole world.

The Short-necked Tortoise was first known to science as a single specimen in the Natural History Museum, Vienna, acquired in 1839 and labelled "Phrynops Macquarrii. Nova Hollandia Jun." Then at the W.A. Naturalists' Club Wild Life Show in 1953 a young lad named Robin Boyd approached prominent naturalist Mr Vincent Serventy with a problem. He had a pet tortoise, but what kind was it? With the utmost confidence Mr Serventy told him it must be a Long-necked Swamp Tortoise, for that was the only kind found in the South-West. Young Robin wasn't convinced—his tortoise had a short neck. The 'problem' was taken to the W.A. Museum where it was at first thought to be a new species, but subsequently was found to be identical to the tortoise in the Vienna Museum.



Western Swamp Tortoise (*Pseudemydura umbrina*)

The only remaining habitat of the species was discovered to be swampland near Upper Swan and Warbrook, 20-25 miles north east of Perth, and further specimens were soon found. At this stage

strenuous efforts were made to preserve the species and these included the launching of a world-wide appeal for funds, the taking of a captive stock of 25 animals and eventually the reservation of two areas totalling together about 550 acres. These areas are known as Twin Swamps Wildlife Sanctuary (No. A27621) and Ellen Brook Wildlife Sanctuary (No. A27620). Between 1963 and 1967 studies of the species and the habitat were carried out by Dr A. A. Burbidge, and these showed that Twin Swamps held a good population of tortoises (estimated 150-200) and contained all the necessary types of habitat for their survival; Ellen Brook was only marginal habitat for the tortoises and population estimates were only 20 to 25. Both these reserves have been classified as limited access areas under the Fauna Conservation Act, and notice of this appeared in the *Government Gazette* on June 18, 1971.

Dr Burbidge's research has been continuous since 1963 and the reserves are still visited by Departmental research staff on average about once a week during the winter.

Marking of specimens to record movements, growth, age and numbers enables the Department's Research Section to assess the stability of the populations. Recent indications are that the climatic conditions over the past few years have not been conducive to growth or breeding, for the Short-necked Tortoise will not grow or breed when the swamps are dry. Most growth takes place in late spring and early summer, and nesting takes place in November or early December when the female lays three to five eggs which hatch in May or June.

The Short-necked Tortoise will only feed under water and during the summer finds refuge in leaf-litter, holes in the ground or under fallen branches, a behaviour pattern known as aestivating. When the tortoise enters a refuge it digs itself into the soil so that the soft parts of the body (limbs and head) are under or in contact with the soil; the carapace remains above the soil. With the arrival of the first heavy rains in late April or early May some tortoises emerge and move to other locations, but most remain in their refuges until enough rain has fallen for the swamps to start filling.

Twin Swamps and Ellen Brook Wildlife Sanctuaries are the only surviving protected habitat for the Short-necked Tortoise and even in these reserves the tortoise finds it difficult to survive under present conditions. Not only must this precarious habitat be preserved for all time, but a careful watch must be kept on the development of the surrounding land to ensure that there are no changes in the environment which could present a threat to the small population.

WESTERN SWAMP TORTOISE

Pseudemydura umbrina



Twin Swamps Wildlife Sanctuary. East Swamp—Summer



Twin Swamps Wildlife Sanctuary. North West Swamp—
Winter

DISTRIBUTION:

Very limited. Completely confined to a small area of the Swan Coastal Plain near Perth.

LOOKS:

Pulls head in sideways.

Pelvis is attached to plastron (under part of the shell).

Colour—varies with type of swamp.

Carapace is similar to colour of swamp water—yellow-brown in clay swamps and almost black with a maroon tinge in sandy swamps. Plastron is pale yellow-brown, and areas of recent growth along the sutures are brown-black. Males have a concave plastron and thick tail.

Females have a flat plastron and a smaller tail. Hatchlings are grey above and bright cream and black below.

LENGTH:

Male—140 mm. or 5½ in. (average carapace length).

Female—126 mm. or 5 in. (average carapace length).

WEIGHT:

Male 400 grams or 14 oz. (average).

Female 325 grams or 11 oz. (average).

NESTING:

Nesting occurs in November or early December and hatchlings emerge in May or June (180 days after laying).

Three to five eggs are laid several inches beneath the surface soil.

Eggs are hard-shelled and symmetrical—not enlarged at one end like a bird's egg.

DIET:

Aquatic earthworms and crustaceans; insects and insect larvae; small tadpoles. Feeds only under water.

SNAKES ARE DANGEROUS, BUT

In Western Australia slightly less than half of the total number of species of snakes are legally protected. This protection is afforded to the non-venomous and the relatively harmless back-fanged snakes. With the current favourable attitude of the public towards conservation is it expecting too much to hope that one day all our snakes will be protected?

Reptiles—and snakes in particular—have always been the subject of ill-informed and superstitious beliefs. The general loathing of snakes that exists among large sections of the community is the result of misguided education, and in children fear and misunderstanding of snakes are usually the result of the attitude of well-intentioned adults who were similarly influenced in their childhood. The attitude of the media does little to disperse these fears, for the occasional fatality from snake-bite is afforded a degree of hysterical publicity out of all proportion to the incidence of such occurrences. In fact, Australia's venomous snakes are responsible for an average of only about four deaths each year. Western Australian motorists might care to make the obvious comparison!

It is easy to see why snakes invoke a sense of fear in Australians, for of 110 different kinds of land snakes indigenous to the continent, there are over seventy varieties with venom glands and fangs; and taking the ratio of venomous to non-venomous land snakes, Australia has the dubious distinction of having the highest proportion of venomous land snakes in the world. It would appear that death awaits the unwary at almost every encounter. Yet in truth only a small percentage of snakes are dangerous to man; most of the technically venomous snakes are small innocuous creatures with venom of only sufficient strength to kill their prey—lizards and frogs, but mostly insects. In addition, most Australian snakes are wary and shy, and given the opportunity will flee when man approaches. If cornered or attacked they will naturally defend themselves; it is this characteristic which has given species such as the Tiger Snake and the Taipan their reputation for aggressiveness.

The venomous land-snakes are of the family *Elapidae*. Snakes of this family are found in all the continents of the world and include such species as the African Cobra and Mamba, the Asian Krait and American coral snakes. The Australian species which are known to have inflicted fatal bites are the Taipan, Death Adders, Tiger Snakes, Brown Snakes, Copperhead, Mulga, Red-bellied Black Snake, Spotted Black Snake and the Rough-scaled Snake. These species are listed

roughly in the order of the average amount of venom which each injects. Whether a bite proves fatal depends a lot on the physical condition of the victim, (some people will react violently to a "harmless" snake), and subsequent medical action, but it is worth noting that the venom of the Taipan and the Tiger Snake is more potent than that of the more infamous snakes of other continents mentioned above.

In the light of the public's attitude and the fact that some snakes are very deadly indeed, overall protection is hardly ever likely to be introduced; nor would it be really practicable except in specific areas such as reserves. Yet snakes form an integral part of the ecology of the continent; they are predators on rodent pests and have other important roles to play in preserving the balance of the environment. Since they will not attack unless unnecessarily provoked or disturbed, is it unreasonable to suggest that even dangerous snakes should not be wantonly destroyed? In the bush they can be left alone; only when some potential danger exists should they then be humanely destroyed.

Conservationists, educators and Honorary Wardens can play their part by instilling in others a sensible awareness of the importance of snakes in the overall scheme of nature. Make sure that you can recognise the snakes in your area; and be familiar with first-aid treatment of their bites.

WESTERN AUSTRALIAN WILDLIFE AUTHORITY

By notice in the *Government Gazette*, October 8, 1971, the following persons were appointed members of the Western Australian Wild Life Authority for a period of three years from 1st June, 1971:

Ex Officio Members:—

- Mr Bernard Kenneth Bowen, Director of Fisheries and Fauna, Chairman;
- Mr Harold Baxter Sandford Shugg, Chief Warden of Fauna and Deputy Chairman;
- Mr Alfred Richard Tomlinson, Chief Vermin Control Officer; and
- Mr William Roy Wallace, Conservator of Forests.

Appointed Members:—

- Mr Robert Dunlop Royce, botanist of South Perth;
- Professor Albert Russell Main, zoologist of Nedlands;
- Dr Dominic Louis Serventy, zoologist of Nedlands;
- Dr William David Lindsay Ride, of Nedlands;
- Mr Angus Hargreaves Robinson, of Coolup;
- Mr Neville Anderson Beeck, of Katanning; and
- Mr Henry George Hall, of Dangin.

DECLARATION AND AMENDMENT OF RESERVES

NEW RESERVES

Name	Res. No.	Locality	Plan	Area	Classification	Purpose	Vesting	Gazettal
Lake Joonadup	A31048	Wanneroo	1A40/A.1	About 1150a.	'A' Class	Recreation and Conservation of Flora and Fauna	Board of Control. Joint—Shire of Wanneroo and W.A.W.L.A.	22/10/71

CHANGE OF PURPOSE

Name	Res. No.	Locality	Plan	Area	Previous Purpose	New Purpose	Vesting	Gazettal
Nooragin Soak....	10262	Cadoux	56/80 C.2	475a....	Conservation of Flora	Conservation of Flora & Fauna	W.A.W.L.A.	15/10/71
	10121	Badjalang Townsite	3/80 F.3	147a. 3r. 18p.	Public Utility	Conservation of Flora & Fauna		20/7/71
	19570	North of Dangin	3/80 D.4	10a	Sanitary Site	Conservation of Flora & Fauna		20/7/71
Mooraning	11776	12 miles north of Quairading	3/80 E.2	100a.	Preservation of Flora	Water and Conservation of Flora & Fauna	Minister for Water Supplies S. & D.	18/3/71
Pingaring	23993	Pingaring	376/80 D.E.3	164a. 3r. 4p.	Public Utility	Conservation of Flora & Fauna		13/8/71
	17732	8 miles north of Bungulla Rly. Station	25/80 A.2	229a. 2r. 34p.	Hall Site and Recreation	Conservation of Flora & Fauna		24/9/71

AMENDMENT OF AREA

Name	Res. No.	Locality	Plan	Previous Area	New Area	Purpose	Vesting	Gazettal
Mokami Spring	23686	About 13 miles west-south-west of Bruce Rock	4/80 D.3	1193a. 1r. 16p.	1188a. 1r. 16p.	Conservation of Flora & Fauna		25/6/71
	17732	8 miles north of Bungulla Rly. Station	25/80 A.2	29a. 3r. 38p.	229a. 2r. 34p.	Conservation of Flora & Fauna		24/9/71

VESTING OF RESERVES

Name	Res. No.	Locality	Plan	Area	Purpose	Previous Vesting	New Vesting	Gazettal
Lacepede Islands	7279	40-50 miles west of Beagle Bay	Pender 4 Mile	Not surveyed	Conservation of Flora & Fauna		W.A.W.L.A.	7/5/71
Noorajin Soak	10262	Cadoux	56/80 C.2	475a.	Conservation of Flora & Fauna		W.A.W.L.A.	15/10/71
Needonga and Chittering Lakes	29538	15 miles east-south-east Gingin	28/80 D.1.	569a. 2r. 16p.	Conservation of Flora & Fauna	..	W.A.W.L.A.	16/7/71

AMENDMENT OF CLASSIFICATION

Name	Res. No.	Locality	Plan	Area	Purpose	Previous Classification	New Classification	Vesting	Gazettal
Noorajin Soak	10262	Cadoux	56/80 C.2	475a.	Conservation of Flora & Fauna	'C' Class	'A' Class	W.A.W.L.A.	15/10/71
Ellen Brook	27620	Bullsbrook	1B/20 N.W.	165a. 3r. 29p.	Preservation of Fauna	'C' Class	'A' Class	W.A.W.L.A.	3/9/71
Twin Swamps	27621	Bullsbrook	1B/20 N.W.	383a. 2r. 32p.	Preservation of Fauna	'C' Class	'A' Class	W.A.W.L.A.	3/9/71

AUSTRALIAN CONSERVATION FOUNDATION POLICIES STATED

For readers of S.W.A.N.S. not familiar with the Australian Conservation Foundation the following is a summary of its structure and aims:

The Australian Conservation Foundation is a national organisation, incorporated as a non-profit-making association under the laws of the Australian Capital Territory. It was established to promote the understanding and practice of conservation throughout Australia and its territories. It is financed by membership subscriptions, donations and the assistance of a grant of \$50,000 per annum for five years from the Commonwealth Government.

The primary concern of the Foundation is that in a rapidly developing world the quality of our environment will be maintained by intelligent watchfulness which takes into account the community's many and various needs. The Foundation is concerned with the conservation of the natural resources of air, water, soil, forests, minerals, wildlife, and the natural beauty of the landscape.

What the Foundation is concerned with is, in fact, the conservation of man—that Australians should learn how to live in harmony with the environment. It firmly believes that true conservation is total conservation, summed up in the words "the wisest possible use, over a long term of all our natural resources, applied for the benefit of man."

In August this year the A.C.F. issued a booklet in which 50 policies and decisions of the Foundation are stated. By nailing together in this booklet the great majority of the existing planks of its platform (whether completed or achieved or still being pursued) the A.C.F. hopes that more people, as well as its own growing membership, will gain a better appreciation of its aim and what many of the real live issues in conservation are.

The booklet goes into substantial detail on many issues, several of which are topical to Western Australian readers. Space does not permit full reproduction of these statements on policy but two are summarised below.

Kangaroos

The Australian Conservation Foundation believes that kangaroos constitute a natural resource

which should be managed to ensure its perpetuation and the provision of a continuing harvest. The Foundation strongly endorses the attitude of a great many Australians who have come to regard the conservation of kangaroos, if not as a moral issue, certainly as one involving considerations of human decency and national self-respect. But it can see no moral argument against the economic utilisation of native animals, provided it is carried out under strict control and is based on biologically sound management procedures.

Waterfowl

The Australian Conservation Foundation, recognising that habitat destruction constitutes by far the most important threat to our insecure waterfowl population, believes that effective waterfowl conservation demands:

- (i) Appreciation of the facts that the Australian waterfowl constitute a most valuable natural resource and that the security of their populations is seriously endangered.
- (ii) The creation of an official body with interstate representation which would be given the responsibility of preparing the blueprint of a national policy of waterfowl conservation and ensuring the co-ordination of State activities where this is necessary.
- (iii) Regular consultation with fauna authorities and waterfowl biologists in the planning stages of water conservation and swamp reclamation schemes.
- (iv) Recognition of the rarity, great scientific interest, and vulnerability of several of the unique endemic Australian waterfowl species, and their special requirements in conservation planning, with consequent action to establish refuges or reserves appropriate to the ecological needs of each species, and protection from shooting elsewhere.

The Australian Conservation Foundation continues to seek new members. Readers interested in joining the ACF should contact Brigadier C. M. L. Elliott, of 1 Mosman Terrace, Mosman Park—Telephone 31 3329. The annual membership fee is \$5 for ordinary members.

HONORARY FAUNA WARDEN APPOINTMENTS

McHUGH, Edward Henry; Sawyers Valley.

JUNIPER, Robert Litchfield; Hillsden Road, Darlington.

LOCKER, William; 25 Medina Avenue, Medina.

SIMPSON, Desmond Harry; 2 Gardiner Road, Karagullen.

HAMMOND, Stanley Reginald; Box 158, Kellerberrin.

REVENTLOW-MOURIER, Ove Ditlev Frederik; P.O. Laverton.

LANCE, Kenneth Alfred; 9 Duncan Street, Victoria Park.

NORRIS, Alexander Willis; 7 King George Street, Safety Bay.

SOUTHWOOD, Samuel Joseph Paul; Yalgoo.

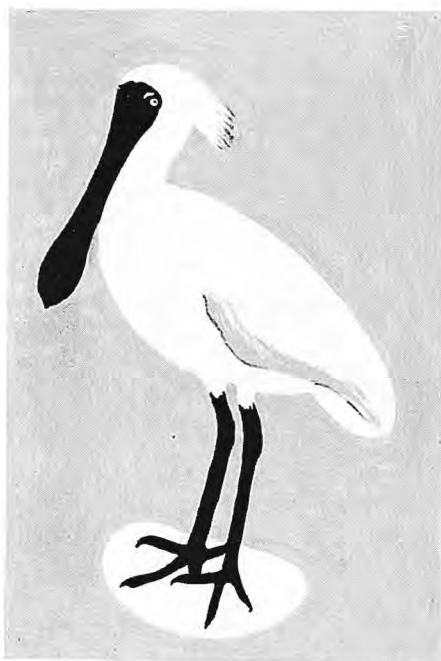
Notice of these appointments appeared in the *Government Gazette* September 10, 1971.

ROYAL SPOONBILL AT ALBANY

Warden R. Grayson, the Ranger at Two Peoples Bay Wildlife Sanctuary, reports sighting a Royal Spoonbill on the shallows of Princess Royal Harbour at Albany during July, August and September. Both Mr Grayson and many local residents say this is the first time they have ever seen a Royal Spoonbill at Albany.

Albany is, in fact, at the eastern extremity of the bird's range in W.A. and this would seem to account for the few sightings recorded in that area. Warden Grayson suggests that abnormal weather conditions experienced in Albany in the preceding three years may have affected the birds' normal pattern of movement.

Royal Spoonbills are large white birds with a black bill and black legs. They nest in trees, bushes and rushes and feed in shallow water. In sustained flight the head and neck are stretched forward and slow flapping wing beats alternate with short glides.



Royal Spoonbill (*Platalea regia*)

GIANT PETREL AT BUSSELTON

In July this year Mr John Mardon of Busselton discovered a distressed Giant Petrel while taking a run along the beach. The bird left the beach and entered the water but was unable to take off and was obviously weak. When Mr Mardon stopped to watch, the Petrel came on to the beach, waddled up to him and opened its beak. If Mr Mardon had any doubts that the bird was hungry they were dispersed when it started to nibble at his toes. Mr Mardon ran home for his car and despite the Petrel's five foot wing span managed to get the bird onto the back seat.



At home it was put in a shed and fed meat and fish, ravenously taking all that was given and demanding more. It made a rapid recovery and appeared to be quite tame. The following day it wandered around the garden and was then observed making its way towards the sea. Mr Mardon took it to the beach in his car and released it, whereon it entered the water and took off with no difficulty. The Petrel had been banded and released in the South Orkneys by the British Ornithological Trust and Mr Mardon forwarded the necessary details to London. The bird was black, which is the more common form. There are also pure white Giant Petrels which seem to comprise between five and eight per cent of the population. Any sightings of the species, in either the white or black phase are useful, as intensive banding programmes have been carried out by both American and British Museum Authorities. Bands should not be removed from the birds, simply the number taken and the date and place of sighting recorded. The Petrel should then be released to continue its fact finding mission.

HONORARY FAUNA WARDEN CANCELLATION OF APPOINTMENTS

MILROY, Ian Ross; 23 Venn Street, Collie.
BUTLER, Peter Martin; Upper Gascoyne Shire Council, Gascoyne Junction.
SINGLETON, Edward George; P.O. Box 77, Nan-nup.
BRABANTS, Robert Peter; Lot 410 Simpson Street, Quinns Rock.
MAUGHAN, Thomas Arnold; 26 Wattle Road, Bentley.

WHITWORTH, Archer Race; 20 Dorothy Street, Geraldton.
FULLER, Joseph James; 115 Roberts Street, Norse-Man.
HOLLAND, Keith Anthony John; 22 Lascelles Parade, Gooseberry Hill.
SHINE, Terrence John; MacAlinden, via Noggerup.
Notice of these cancellations appeared in the *Government Gazette* September 10, 1971.

THE ROLE OF TREES IN CONSERVATION

The following article appeared in the Tree Society's Annual Report, September/November, 1971.

"There is a growing sense of the urgency of the task facing all countries who are trying to design effective conservation measures to combat the threat of disaster to civilisation by pollution.

The problems ahead are very large and complex. Much work and research will be needed to identify and measure the multitude of factors affecting almost every walk of life if we are to see clearly and keep a sense of proportion.

One problem that is sure to be involved in many a plan is the question of how far and how much trees play a part in preserving the environment. Few will deny that they do have an important role in town and country, but how important are they, beyond their beauty and shade, and helping to stop erosion? Can trees help to stop air pollution? Certainly; trees absorb the carbon dioxide that we and animals breathe out as poison to us, and discharge pure oxygen to the atmosphere for us. They retain the carbon to rebuild their own protoplasm with the aid of sunlight. This is not a negligible function. Clean country air contains only 0.03% of CO₂, while the air exhaled by humans contains 14-16%—city air has 0.04%.

If there are enough trees together—about 20,000 acres will do—they can favourably affect the local climate. They absorb water through their roots—use some and transpire some to the air in sufficient amount to supersaturate the clouds which then send it back again as rain. It is estimated that for every hundred units a tree uses it gets an extra 150 (units = gallons or tons) which it leaves in the ground to moisten it and provide for grass to feed beast and bird.

If we want to keep our bird life we must look after the trees, then the birds will look after themselves and stay with us.

If we want to keep our farmland we must persuade men not to over-clear natural bush, which alters the water table and causes salt formation, which leads to desert conditions. They should use trees to stop this, have smaller fields, better windbreaks, and more productive land.

It has been estimated that there are over 5,000 uses for the wood we get from trees—indeed it is difficult to picture any form of human life on this planet without the constant help of wood. All these uses follow the death of the parent trees, but how much more value should be placed on live trees. We tend to take them for granted, whereas their real worth is beyond price, alive and dead. We owe it to our descendants to make sure that trees are properly used and not abused, and are given prominent place in all conservation plans in future. We neglect this at our peril."

EMUS ON THE MOVE

In Western Australia emus periodically migrate from the arid interior towards the wheat belt, causing damage to wheat crops. Since 1964 the Division of Wildlife Research C.S.I.R.O. has been studying emu populations and their movements around Sandstone and Wiluna, and at Mileura station near Meekatharra.

During a large-scale southward winter migration of emus in 1969 the Division banded more than 150 emus in the Sandstone-Wiluna-Mileura region. Banded birds were later recovered some 300 to 350 miles (480 to 560 kilometres) to the south-west at Perenjori and Ajana. Nine months after banding, birds believed to have taken part in this movement were recovered near Carnarvon after a total journey of about 700 miles (1120 kilometres). There were, however, individual banded birds which remained in the same locality on Mileura station for some time and a more intensive study has begun in part of this area using marked birds.

Whether emus migrate in winter appears to depend on the quantity of green herbs and grasses available then and during the previous autumn, but the Division has not yet discovered why. Aerial survey counts made periodically over the whole of Mileura station have provided a good picture of how the birds use the different types of country on the station. Usually they live near rivers, creeks, and watercourses, and feed away from them only when heavy rains ensure that green food is available over a considerable area.

FAUNA WARDEN APPOINTMENTS

MILLER, Kingsley Lloyd.

MAHONEY, Michael William.

McKENZIE, Alan Donald.

Notice of these appointments appeared in the *Government Gazette*, October 1, 1971.

SUGGESTED READING

BIRDS

"Kookaburras"—Veronica A. Parry. Melbourne, Lansdowne Press Pty Ltd, 1970.

REPTILES

"Reptiles of Australia"—Eric Worrell. 2nd. Ed. Sydney, Angus and Robertson, 1964.

ENVIRONMENT

"Man and Environment"—Robert Arvill, Victoria, Penguin Books Ltd, 1967.

INDEX

Vol. 1. Nos. 1 & 2.

Vol. 2. Nos. 1-4.

[illegible]

The Director,
Chief Warden of Fauna
and Staff of the
Department of Fisheries and Fauna
extend Best Wishes for Christmas
and the New Year.

Special thanks are expressed to all Honorary Fauna Wardens
and other helpers who, throughout 1971, have assisted and
contributed towards a better understanding and appreciation
of wildlife and conservation.