S.W.A.N.S.

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DEPARTMENT OF FISHERIES AND WILDLIFE, PERTH

S.W.A.N.S.

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1977

Issued by direction of the Hon. Graham MacKinnon, M.L.C., Minister for Fisheries and Wildlife.

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

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

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

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

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SOMETHING TO THINK ABOUT

CREATURES OF THE WILD

"We patronise them for their incompleteness, for their tragic fate of having taken form so far below ourselves, and therein we err and greatly err.

"For the animals shall not be measured by man, in a world older and more complete than ours they move finished and completed, gifted with the extensions of the senses we have lost or never attained, living by voices we shall never hear.

"They are not brethren, they are not underlings, they are other nations caught with ourselves in the net of life and time, fellow prisoners of the splendour and travail of the earth."

Henry Beston.

IN THIS ISSUE . . . .

TRAP-DOOR SPIDER STUDY

Part of the trapdoor spider study area in wodjil bush (dominated by the wattle *Acacia stereophylla*, the sheoak *Casuarina acutivalvis* and *Hakea multilineata* with smaller wattles and *Grevillea paradoxus* and tussocks of *Ecdeiocolea monostachya*).

Nature Reserves Nos. 19950 and 17732, north of Bungulla in the Tammin Shire are being used in a current study of trap-door spiders.

Dr Barbara York Main of the W.A. University Department of Zoology has been interested for many years in the natural history and particularly in the spider fauna of the reserves.

The spider study involves observations on several species of trap-door spiders. At least eight species are known to occur in the reserves:

Anidiops villosus (family Ctenizidae)
Arbanitis hoggi (family Ctenizidae)
Idiosoma nigram (family Ctenizidae)
Aganippe cupulifex (family Ctenizidae)
Aganippe raphiduca (family Ctenizidae)
Chenistonia tepperi (family Dipluridae)
Ixamatus an undescribed species (family Dipluridae)

Undescribed genus and species (family Dipluridae)

It is probable that species of the following genera also occur in the reserves: *Missulena* and *Conothele* (family Ctenizidae) and *Aname* and *Teyl* (family Dipluridae).

Through 1967–1969 pit traps were set in the bush to collect male specimens of undescribed species. A part of the overall study is concerned with detailed observations on *Anidiops villosus*. This species attains a larger body size and digs a deeper burrow than any other Australian Ctenizid and is one of the largest ctenizids in the world. The species is endemic to southern W.A. and although formerly widespread throughout the wodjil country of the Wheatbelt and Goldfields it is now in the western part of its range restricted to small isolated pockets of **undisturbed bushland**. The genus contains only one other species—*A. manstridgei* which ranges from the eastern Goldfields into S.A.

Anidiops villosus has several characteristics which enable it to survive in semi-arid habitats and areas of erratic rainfall. These include features of the burrow and the large body size of the spider. While some work on the species has been carried out in other districts by Dr Main and Michael Gray (now arachnologist at the Australian Museum, Sydney) continuing observations are being made by Dr Main on the North Bungulla populations. To date 129 burrows have been

Site of some of the trapdoor spider nests of *Anidiops villosus*. Note termite mound in right lower corner—the spiders feed mainly on foraging termites (*Drepanotermes*) and ants. A numbered disk marking a spider's nest is visible in mid foreground behind tussock.

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'tagged" with numbered wire pegs in a small area (less than one hectare) which contains a high concentration of the spiders.

The area containing the marked burrows is immediately adjacent to and north of the sand and gravel pits in Reserve 17732. Marked burrows contain spiders of various ages. Spiders appear to take at least five years to mature. One nest still contains a reproductively active female which was mature in 1967. The estimated age of this and several other specimens is upwards of fifteen years.

Aspects of the study include: investigations on age at maturity, reproductive activity in relation to seasonal conditions, i.e. mating, egglaying, longevity, dispersal of young, prey eaten and feeding behaviour, density of spiders and effect of varying seasonal conditions on survival of spiders.

The spiders attach twigs and leaves of acacias, sheoaks and hakeas to the burrow rim and use these as feeling lines to detect insects crawling over the litter. The burrow-nest is a **permanent** life-long structure which is enlarged as the spider grows. Any disturbance of the vegetation, leaf-litter cover, or soil is detrimental to the spider population as a whole.

During the past year it has been noticed that rubbish had been deposited on the reserves. This together with haphazard walking over the natural leaf-litter had irreparably damaged some burrows. Signs have now been erected to warn of the situation. While most nature reserves are limited access areas only, shire workers and others who find it necessary to enter such reserves should do so only on worn tracks or firebreaks.

Nest of the trapdoor spider *Anidiops villosus* with door propped open. Note the fan of twig-lines of acacia phyllodes ("leaves") which the spider has attached to the rim of the nest. These function as "feeling lines" for the spider when situated in the entrance of the nest with tips of legs resting on inner ends of twigs—it feels the vibrations of insects on the outer ends of the twigs and runs out to catch them. Related species without twig-lines catch prey without emerging from nest thus nests with twig-lines provide a greater foraging range for the spider. This is an adaptation to semi-arid habitats where the prey potential is less abundant. Note also the hummock of soil behind the door—this is excavated soil from when the spider was deepening the burrow after rain.

RED KANGAROO MANAGEMENT PROGRAMME 1977 QUOTA

Having considered the recommendations of the Red Kangaroo Advisory Committee and its working group, the Minister for Fisheries and Wildlife has decided that the quota of red kangaroos to be taken in Western Australia from January 1 to December 31, 1977, shall be 150 000 animals, plus a predicted shortfall from last year of 18 000. The 150 000 quota was recommended by the Biological Working Group of the Committee.

Data available on changes in average carcase weights and take per unit of effort support the view that previous management decisions have been generally consistent with the concept of harvesting the kangaroos produced in excess of the numbers required to maintain the field populations. The most recent data (1976) have indicated an increase in the abundance of the species, which is in accord with reports being made to the Department. The increase in quota approved for 1977 is therefore reasonable.

Control of the actual kangaroo harvest within limits prescribed on an annual quota basis is achieved by limiting the issue of carcase tags which also assist in regulation of trading within the continuously operating kangaroo industry. In order to allow normal day to day trade operations to proceed without unnecessary interruptions it is necessary to supply shooter licensees with tags in advance. The holding required for effective operation within Western Australia is equivalent to a 4–8 week operating surplus on average. Variations in field conditions and other circumstances affecting the operations of shooters may thus affect the numbers of carcase tags on advance issue at the completion of a particular quota year, or in extreme circumstances lead to a large discrepancy between the projected quota available and the actual numbers of animals harvested in the year in question. The deficiency in the actial harvest (shortfall) relative to the projected quota which arises in these circumstances is clearly unrelated to the abundance of kangaroos.

The depressed market for skins which still exists due to the continued absence of the U.S.A. from the market place, is a source of economic hardship to the industry at present. The Western Australian Government is hoping that joint State-Commonwealth discussions and further negotiations with the United States Government will lead to the lifting of the prohibition on the importation of kangaroo products into the U.S.A.

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 Wildlife Conservation Act and Regulations would appear to have been breached in a number of instances. In some cases 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 are brought to the attention of the general public and 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 "fish" means and includes all or any of the varieties of marine or fresh water fishes and crustacea or marine animal life; "aquatic organism" means and includes all aquatic animals and aquatic plants and any part of those animals or plants, and the sources or reproduction of them.)

(a) *Regulation* 17 No person shall deposit any filth, refuse, or other deleterious matter in any tidal or inland waters or into any water-course, whether dry or not, leading into any tidal or inland water 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 manufactories 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 26**

(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.

(d) **Section 26A**

(1) Where in the opinion of the Minister any spraying, dusting, injection or other activity is likely, or if undertaken would be likely, to introduce into any waters, land or air any substance which might have a serious effect, whether at once or in the longer term, on any adjacent aquatic environment or the fish, aquatic plant or animal life therein, the Minister may, by an order in the prescribed form served on any person, prohibit that person or any other person under his control from undertaking, or continuing to undertake, that activity.

(e) **Section 30**

(1) The Governor may, subject to such conditions and limitations as he thinks fit, by Order in Council reserve to Her Majesty any part of Western Australian waters vested in the Crown, and the land at any time covered by those waters . . .

(2) Every Order made in pursuance of this section shall . . .

(d) specify the conditions and limitations imposed in relation to that Order.

(3) . . .

(4) A reserve created under this section may, by notice published in the *Government Gazette*, be vested by the Minister in a body corporate which shall administer that reserve subject to this Act, and every such notice shall . . .

(e) specify the conditions and limitations imposed in relation to that vesting.

(5) The Minister may, by order in writing to the body corporate in which a reserve is vested, require that body—

(a) to do, or cause to be done, anything which the Minister considers to be essential; or

(b) to cease to do, or cause the cessation of, anything which the Minister considers to be prejudicial,

to the purpose for which the reserve was created or to the environment of life therein.

2. Wildlife Conservation Act

Regulation 46 Except as the Conservator of Wildlife 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 nature reserve or wildlife 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 nature reserve or wildlife 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 in their natural state to protect the integrity of their ecosystems for the benefit of future generations.

POSSUM PUZZLE
CONCLUDED

In the last issue of SWANS, (Vol. 6, No. 3), it was reported that a Northern Brush-tail Possum *Trichosurus arnhemensis* was found dead at Carnarvon.

Normally found on Barrow Island and in the Kimberley Division, the location of the animal so far south has thrown doubt on its known distribution.

Mr A. C. Foot, a former barge engineer operating between Barrow Island and Onslow, contacted the Department and suggested the following solution.

During the transportation of machinery and equipment back to the mainland, Mr Foot occasionally observed creatures emerge from hiding in the machinery. Some of the animals were fed by hand and at times became quite tame. Eventually they were released on return trips to Barrow Island. He believed that it was quite possible for the possum in question to be undiscovered and transported south on the mainland where it alighted when the transport vehicle refueled.

Mr W. H. Butler, Conservation Consultant to WAPET, also contacted the Department with a similar suggestion. He said a building contractor from Carnarvon was working on Barrow Island during October 1976 and his vehicles were parked unattended for several days before being shipped to Onslow and driven to Carnarvon.

No new reports of Possums at Carnarvon have come to light so it seems that the Possum in question came from Barrow Island.

APOLOGY

Apologies are extended to Mr Bert Wells for our omission of the credit due to him for the photo of Ingram's Planigale in SWANS Vol. 6 No. 3, page 59. Bert's help in providing splendid photographs in times of need is truly appreciated by the Department.

THE RAINBOW LORIKEET

The Rainbow Lorikeet, *Trichoglossus haematodus*, has again been reported in the metropolitan area. Daily sightings have been made in the suburbs of Shenton Park, Daglish, Nedlands, Claremont and Floreat Park.

The striking plumage of bluish-purple, orange and green leaves no doubt as to the species, which is widespread in most timbered areas of eastern Australia.

Since their first sighting in Perth suburbs in 1968 Rainbow Lorikeets have maintained a presence in the areas mentioned with their numbers varying from a pair to a total of 9 in one group.

Increased sightings over the past few years indicate a general increase in numbers or a greater awareness of the birds' presence.

The high-altitude flight of this Lorikeet makes identification on the wing almost impossible; however, they have been observed feeding in trees, a few feet from the ground.

At Rosalie Park, Subiaco, in 1973 the species was seen to feed on flame trees and Jarrah blooms which indicates the acceptance of the indigenous Jarrah tree as a food source.

Whilst it is accepted that in times of drought within their Eastern States' habitat, a small flock could stray into W.A., the birds in question are more likely to be surplus aviary bred stocks. This reprehensible action is deplorable as indigenous stocks will eventually suffer because of the continually increasing competition for food and territory.

Rainbow Lorikeet *Trichoglossus heamatodus.*

TERRESTRIAL NATIVE MAMMALS OF WESTERN AUSTRALIA

On a number of occasions we have been asked what are the marsupials of W.A. or what is the scientific name given to a particular animal whose common name only is known.

As a guide, the following list of 62 species of marsupials and 59 species of others is published below.

MARSUPALIA

Macropodidae

Megaleia rufa—Red Kangaroo
Macropus robustus—Euro
Macropus fuliginosus—Western Grey Kangaroo
Macropus antilopinus—Antilope Kangaroo
Macropus agilis—Sandy Wallaby
Macropus irma—Brush Wallaby
Macropus eugenii—Tammar
Setonix brachyurus—Quokka
Onychogalea unguifera—Karrabul
Onychogalea lunata—Wurrung
Lagorchestes conspicillatus—Spectacled Hare-Wallaby
Lagorchestes hirsutus—Western Hare-Wallaby
Lagostrophus fasciatus—Banded Hare-Wallaby
Petrogale penicillata—Brush-tailed Rock-Wallaby
Petrogale rothschildi—Rothschild's Rock-Wallaby
Petrogale brachyotis—Short-eared Rock-Wallaby
Peradorcas concinna—Little Rock-Wallaby
Bettongia penicillata—Woilie
Bettongia lesueur—Boodie
Potorous tridactylus—Gilbert's Potoroo
Potorous platyops—Broad-faced Potoroo

Phalangeridae

Trichosurus vulpecula—Brush Possum
Trichosurus arnhemensis—Northern Brush Possum
Wyulda squamicaudata—Scaly-tailed Possum

Petauridae

Pseudocheirus peregrinus—Ring-tail Possum
Petropseudes dahli—Rock-haunting Ring-Tail
Petaurus breviceps—Sugar Glider

Burramyidae

Cercartetus concinna—Western Pigmy Possum

Tarsipedidae

Tarsipes spencerae—Honey Possum

Vombatidae

Lasiorhinus latifrons—Hairy-nosed Wombat

Peramelidae

Isoodon obesulus—Quenda
Isoodon macrourus—Brindled Bandicoot
Isoodon auratus—Golden Bandicoot
Perameles bougainville—Marl
Perameles eremiana—Desert Bandicoot
Chaeropus ecaudatus—Pig-footed Bandicoot
Macrotis lagotis—Dalgyte

Dasyuridae

D asyarus geoffroii—Western Native Cat
Dasyurus hallucatus—Northern Native Cat
Phascogale tapoatata—Wambenger
Phascogale calura—Red-tailed Wambenger
Dasycercus cristicauda—Mulgara
Antechinus flavipes—Mardo
Antechinus apicalis—Dibbler
Antechinus rosamondae—Little Red Antechinus
Antechinus macdonnellensis—Red-eared Antechinus
Antechinus ? bilarni—Harney's Antechinus
Antechinus maculatus—Pigmy Antechinus
Ningaui ridei—Ride's Ningaui
Ningaui timealyi—Ealey's Ningaui
Planigale subtilissima—Kimberley Planigale
Planigale tenuirostris—Narrow-nosed Planigale
Sminthopsis murina—Common Dunnart
Sminthopsis longicaudata—Long-tailed Dunnart
Sminthopsis crassicaudata—Fat-tailed Dunnart
Sminthopsis froggatti—Larapinta
Sminthopsis granulipes—White-tailed Dunnart
Sminthopsis hirtipes—Hairy-footed Dunnart
Sminthopsis ooldea—Troughton's Dunnart
Antechinomys laniger—Wuhl-Wuhl
Myrmecobius fasciatus—Numbat

Notoryctidae

Notoryctes typhlops—Marsupial Mole

RODENTIA

Muridae

Rattus fuscipes—Southern Bush Rat
Rattus villosissimus—Long-haired Rat
Rattus tunneyi—Tunney's Rat
Hydromys chrysogaster—Water Rat
Mesembriomys macrurus—Golden-backed Tree-Rat
Mesembriomys gouldii—Black-footed Tree-Rat
Conilurus penicillatus—Brush-tailed Tree-Rat
Leporillus conditor—Stick-nest Rat
Leporillus apicalis—White-tipped Stick-nest Rat
Notomys mitchellii—Mitchell's Hopping-Mouse
Notomys alexis—Spinifex Hopping-Mouse
Notomys fuscus—Dusky Hopping-Mouse
Notomys megalotis—Big-eared Hopping Mouse
Notomys longicaudatus—Long-tailed Hopping-Mouse
Zyzomys argurus—Common Rock-Rat
Zyzomys woodwardii—Woodward's Rock-Rat
Pseudomys forresti—Forrest's Mouse
Pseudomys delicatulus—Little Native-Mouse
Pseudomys hermannsburgensis—Sandy Mouse
Pseudomys albocinereus—Ashy-grey Mouse
Pseudomys occidentalis—Western Mouse
Pseudomys praeconis—Shark Bay Mouse
Pseudomys gouldii—Gould's Native-Mouse
Pseudomys shortridgei—Shortridge's Native-Mouse
Pseudomys desertor—Brown Desert Mouse
Pseudomys nanus—Western Chestnut Native-Mouse
Pseudomys sp.
Melomys ? cervinipes—Mosaic-tailed Rat

CHIROPTERA

Magadermatidae

Macroderma gigas—Ghost Bat

Vespertilionidae

Nyctophilus timoriensis—Greater Long-eared Bat
Nyctophilus geoffroyi—Lesser Long-eared Bat
Nyctophilus arnhemensis—Arnhem Land Long-earedA

Nyctophilus arnhemensis—Arnhem Land Long-eared Bat
Nyctophilus walkeri—
Nyctophilus bifax—North Queensland Long-eared Bat
Miniopterus schreibersii—Bent-wing Bat
Eptesicus pumilis—Little Bat
Chalinolobus gouldii—Gould's Wattled Bat
Chalinolobus morio—Chocolate Bat
Chalinolobus nigrogriseus rogersi—Hoary Bat
Pipistrellus tasmaniensis—Tasmanian Pipistrelle
Pipistrellus tenuis—Timor Pipistrelle
Myotis adversus—Large-footed Bat
Nycticeius greyii—Little Broad-nosed Bat
Rhinonicterus aurantius—Orange Horseshoe Bat

Hipposideridae

Hipposideros ater—Dusky Horseshoe Bat
Hipposideros stenotis—Lesser Warty-nosed Horseshoe Bat

Molossidae

Tadarida australis—White-striped Bat
Tadarida jobensis—Northern Mastiff Bat
Tadarida loriae—Little Northern Scurrying Bat
Tadarida planiceps—Little Flat Bat

Emballonuridae

Taphozous georgianus—Common Sheath-tailed Bat
Taphozous flaviventris—Yellow-bellied Sheath-tailed Bat

Pteropodidae

Pteropus scapulatus—Red Flying Fox
Pteropus alecto—Black Flying Fox
Macroglossus lagochilus—Northern Blossom Bat

CARNIVORA

Canidae

Canis familiaris dingo—Dingo

Otariidae

Neophoca cinerea—Australian Sea Lion
Arctocephus forsteri—New Zealand Fur Seal

MONOTREMATA

Tachyglossidae

Tachyglossus aculeatus—Echidna

PRESENTATION TO NAVY PATROL BOATS

At a brief informal function at the Department of Fisheries and Wildlife Head Office on February 14, 1977, four copies of a new bird book were handed over to the Navy. The presentation was made by the Secretary, Mr. H. B. Shugg, to the Commanding Officer of the H.M.A.S. *Attack*, Lt. Jim Stapleton, and Radio Officer Bob O'Donnell. The gifts were tokens of the Department's appreciation of the assistance that the Navy patrol vessels have given to the Department in recent months. They consisted of four copies of the Readers Digest recent publication *Complete Book of Australian Birds*. One copy of each was given to the crews of the H.M.A.S. *Attack*, H.M.A.S. *Assail*, H.M.A.S. *Adroit* and H.M.A.S. *Advance*.

In making the presentation, Mr. Shugg referred to the strong connections between the Navy and ornithologists in years past. It began in the 17th century with William Dampier and was highlighted in the voyage of the vessels *Discovery* and *Chatham* under George Vancouver. He was accompanied by Archibald Menzies, whom the Admiralty instructed, among other things, "to give attention to beasts, birds and fishes" and to keep a journal which today rests in the British Museum and shows Menzies to have been an important figure in Australian ornithology.

In receiving the presentation, Lt. Stapleton expressed his appreciation of the co-operation between the two organizations and felt sure that the crews of the vessels would make good use of the books.

Conservator of Wildlife Mr Shugg presenting Lt Stapleton with a copy of "Complete Book of Australian Birds."

Continued from page 18

(2) Colonies of bats in caves or trees. Locations of such colonies are very valuable items of information. Also numbers of bats and the presence or absence of young in the colony.

In any research programme, the savings, in both time and money, can be quite considerable when there is an accumulation and record of sightings and other reliable information available to researchers.

With the accelerated rate of growth and development of the mining industry and agriculture in today's world, time is of importance; it can be the difference between the loss or preservation of an important habitat area.

IMPROVING WATER QUALITY FOR AQUACULTURE

In February 1975 the Western Australian Fisheries Act was amended to provide for the establishment of private fish farms.

In time, certain scheduled species will be grown under licensed aquaculture conditions in various parts of the State. The first instance will apply specifically to the indigenous freshwater crayfish called Marron, *Cherax tenuimanus* (Smith).

At present, the extreme south west of the State of Western Australia is the centre of the natural distribution of marron. In the future, under artificial conditions, it will be seen that the animals will be cultured by professional and amateur growers in areas previously too hot and dry under natural conditions. This may be seen as the start of an era where, with the establishment of Marron in capitivity, there will be a relaxation in the fishing pressure on the animals in their natural habitat.

At the present time, however, drought conditions and increasing salinity of some rivers have reduced the natural habitats in quality and quantity, placing an even greater strain on wild stocks. Persons who are currently pioneering aquaculture in this State may be experiencing difficulties in maintaining the water quality of their dams, pools and streams.

Studies conducted for the Xodar Corporation by the University of Rhode Island Graduate School of Oceanography have revealed the efficiency of a new Xodar r.Aerato

The 360 *tm* aeration diffuser fabricated from PVC and porous plastic is able to withstand a full range pH attack and accounts for a tiny bubble swarm and high oxygen-to-water transfer. It is ballasted for bottom diffusion and will operate efficiently in any position.

Performance was judged on its ability to effect high oxygen transfer in a given body of water over measured time. Economy is accredited to the tests which showed air flow volume used is very low, in order to achieve sufficient discharge pressure to produce an efficient bubble swarm for the desired maximum oxygen-to-water transfer.

The mechanism of oxygen transfer in water is a rather complicated one. A variety of influences are brought to bear on this process such as temperature, salinity, pressure, depth, flow volume, intensity of turbulence, bubble size, bubble distribution, bubble ascent velocity, and of course, biological and chemical oxygen demand.

Submarine or underwater bottom diffusers, while illustrating the ability to improve dissolved oxygen content also demonstrate that desired water quality may be established without damaging the ecology of an aquatic system. In some cases such as pond or lake treatment, it may be desirable to maintain a body of water in a natural state. Oxygen input may be used to overcome ecological imbalance caused by unnatural influences and restore a body of water to its natural state in a safe, rapid manner.

For more information, write the Xodar Corporation, Powder Hill Drive, Lincoln, Rhode Island, U.S.A. 02865.

GETTING THE FACTS STRAIGHT

Readers will recall an article entitled "Animals in Sanctuary" in the last issue of SWANS.

In the article, reference was made to a child being blinded in one eye by an emu at Tidbinbilla, New South Wales.

The Director, Conservation and Agriculture Branch of the Department of the Capital Territory, questioned the fact that the child had lost an eye.

The author of the article was drawing on memory in relation to the incident which he recalled was "reported in a newspaper a year or so ago". The editor has since checked out the source and discovered it to be a short item which appeared in the *Daily News* of June 30, 1975. The story was as follows:—

> A 21-month-old boy had eight stitches inserted in an 8 cm scalp wound after being attacked by an emu at the Tidbinbilla nature reserve near Canberra yesterday. The boy, Scott Woods, was playing with a ball in the picnic area when the emu, nearly 2 m tall, attacked him. Scott's father, Mr. John Woods, ran 36 metres to his son and fought off the emu with a lump of wood. There are about 40 emus in the reserve.

We regret the publication of this wrong fact and apologise for any inconvenience that may have been occasioned by it.

The sign reads:— "Shooting, hunting, disturbing fauna or interfering with the natural environment, including dumping of rubbish, lighting fires, removing timber, flora or soil is prohibited." (See story below left.)

RUBBISH FOUND ON NATURE RESERVES

Current inspections reveal that large amounts of rubbish are being dumped on some Nature Reserves.

During the Department's programme of constructing fire breaks, each reserve is thoroughly inspected, especially in relation to existing tracks. The majority of tracks inspected so far led only to large deposits of rubbish.

There was one instance where a Senior Technical Officer of the Department found a rubbish dump so large that it was considered more expedient to push the rubbish up into a tidy heap and leave it, than to bury it with the subsequent inevitable destruction of a large area of surrounding vegetation.

Apart from the extra time and money required to clear up these rubbish deposits, the dumps were providing food and shelter for foxes, feral cats, rats and other pests.

From the reserves so far inspected it appears that the majority of the rubbish dumped has come from adjacent properties. Some deposits are possibly the accumulation of rubbish dumped over the last fifty years or so. Up until now the Department had been reluctant to prosecute any landowners because the dumping may have occurred many years previously, and the tenancy may have changed in the meantime.

The Department is now having to take a serious view of offences. Any new dumpings found will be investigated and where ownership can be established, prosecution will follow. The current penalty for dumping rubbish on a reserve is $200.00, and the costs of removing it to an authorised dump will be a further charge against the person concerned.

Nature Reserves are part of this generation's legacy to our grandchildren. We trust that some otherwise decent folk will not leave only a load of rubbish as their contribution to our wildlife heritage.

SCHEDULE OF UNPROTECTED FAUNA

A list of the unprotected fauna in the State of Western Australia appeared in the *Government Gazette* April 1, 1977.

WILDLIFE CONSERVATION ACT, 1950—1976

Department of Fisheries and Wildlife,
Perth, April 1, 1977.

1. MAMMALS

Indigenous

Wild Dog (Dingo)—*Canis familiaris dingo*

Introduced

Black Rat (Tree or Ship Rat)—*Rattus rattus* and *Rattus alexandrinus*

Brown Rat—*Rattus norvegicus*

Mouse—*Mus musculus*

Rabbit—*Oryctolagus cuniculus*

Domestic Cat—*Felis catus* (Gone wild)

Fox—*Vulpes vulpes*

Goat—all species of the genus, *Capra* (Gone wild)

Donkey and Horse—all species of the gene, *Equus* (Gone wild)

Buffalo and Cattle—all species of the genus, *Bos* and related genera (Gone wild)

Camels—all species of the genus, *Camelus* (Gone wild)

Pig—all species of the genus, *Sus*, and related genera (Gone wild)

Palm Squirrel—*Funambulus pennanit*

2. BIRDS

Indigenous

(a) Cormorants—
Black Cormorant—*Phalacrocorax carbo*

(b) Birds of Prey—
Australian Goshawk—*Accipiter fasciatus*
Collared Sparrowhawk—*Accipiter cirrocephalus*
Wedge-Tailed Eagle—*Aquila audax*
(Protected in Shire of Kojonup)

(c) Parrots and Cockatoos—
White-tailed Black Cockatoo—*Calyptorhynchus baudinii*
Galah—*Kakatoe roseicapilla*
Red-capped (King) Parrot—*Purpureicephalus spurius*
Port Lincoln Parrot or Twenty-eight—*Barnardius zonarius*
Western Rosella—*Platycercus icterotis*
Budgerygah—*Melopsittacus undulatas*

(d) Perching or Song Birds—
Western Silvereye—*Zosterops gouldi*
Australian Raven—*Corvus coronoides*
Little Crow—*Corvus bennetti*
Australian Crow—*Corvus orru*

Introduced

(a) Species of Foreign Origin which are exempted from the operations of the Vermin (Declared Birds Regulations) (other than the White Swan)
African Fire-finch—*Lagnosticta senegala*
Aurora Finch—*Pytilia phoenicoptera*
Bleeding Heart Pigeon—*Gallicolumba luzonica*
Copper Pheasant—*Syrmaticus soemmerring*
Cordon Bleu and Bluebreasted Waxbill—*Uraeginthus angolensis*
Cuban Finch—*Tiaris canora*
Domestic Ducks—
Muscovy—*Cairina moschata*
Mallard—*Anas platyrhynchos*
Domestic Fowl and all Bantams—*Gallus gallus*
Domestic Turkey—*Meleagris gallopavo*
Elliot's Pheasant—*Syrmaticus ellioto*
Fire-backed Pheasant—*Lophura diardi*
Golden Pheasant—*Chrysolophis pictus*
Golden-breasted Waxbill—*Amandava subflava*
Goldfinch—*Carduelis carduelis*
Guineafowl—*Numida meleagris*
Impeyan Pheasant—*Lophura impejanus*
Indian Turtle Dove—*Streptopelia chinensis*
Jacarini Finch—*Volatinia jacarina*
Lady Amherst's Pheasant—*Chrysolophus amherstiae*
Lavender Finch—*Estrilda caerulescens*
Melba Finch—*Phtilia melba*
Olive Finch—*Tiaris olivacea*
Peafowl—*Pavo cristatus*
Pigeons—*Columba livia*
Red-crested Cardinal—*Paroaria coronata*
Red-faced Parrot Finch—*Erythrura psittaccu*
Reeve's Pheasant—*Syrmaticus reevesii*
Senegal Turtle Dove—*Streptopelia senegalensis*
Silver Pheasant—*Lophura nycthemera*
Swinhoe Pheasant—*Lophura swinhoei*

(b) Birds of Australian origin not indigenous to Western Australia but now established in the wild.
Red-browed Waxbill—*Estulda temporalis*

3. REPTILES

Indigenous

Front-fanged Snakes (Family *Elapidae*):

(a) Large Venomous Snakes—
Dugite—*Demansia nuchalis affinis*
Gwardar—*Demansia nuchalis nuchalis*
Mulga Snake—*Pseudechis australis*
Whip Snake or Wyree—*Demansia reticulata*
Spotted-headed Snake—*Demansia olivacea*
Western Tiger Snake or Norne—*Notechis scutatus occidentalis*

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

Introduced

All species of the class Reptilia.

AVIARY BIRDS CONTAMINATE PORONGURUPS NATIONAL PARK

Silver Pheasants (*Lophura nycthemera*), an exotic species once kept in private aviaries at the tea rooms in the Porongurups National Park, are at liberty and thriving in the park. The original flock of 5 pheasants released several years ago has bred into two colonies of uncertain numbers.

Local opinion is that the birds are an interesting and most decorative addition to the Park and are already attracting the attention of tourists. It is not thought that their habits could be any more detrimental to the environment of the park than many of the native animals and birds that abound there.

Unfortunately, this is the time-worn precept of those in the past, who have introduced into Australia, rabbits, foxes, sparrows, starlings, cane toads and other noxious beasts. People have short memories.

Dr D. L. Serventy, well known Perth naturalist in his paper, "Menace of Acclimatization" states the following:—

> "If there is no likelihood of a foreign animal becoming a pest, that is, obviously harmful to man and his crops and herds, or preying directly on the more conspicuous members of our fauna, the introduction is passed as neutral or harmless and possibly even as an ornament to the landscape. Further, if the creature is insectivorous it is looked on as a definitely desirable acquisition.
>
> "To the person who has no interest whatever in the natural history of his own country this situation need occasion no concern. It is disquieting, however, when those who profess regard for the native species also share this view of detachment to so-called harmless or 'beneficial' acclimatizations. They can have little appreciation of the fact that *any* successful introduction, even if directly innocuous from the human standpoint, must, by very reason of the fact that it has obtained a foothold, disturb the balance which had existed, and therefore have repercussions which will detrimentally affect the existing fauna. The phrase 'the balance of nature' has become such a glib commonplace expression these days that few pause to consider what it really implies.
>
> "Our fauna has radiated in the long course of its evolution to occupy almost every niche in the bush or in water that will provide a living for any creature. If we introduce anything into the wild, it will in the ordinary course of events find all the places filled—food supply, nesting territory, living space in short, cannot support more until some of the original population is displaced—and that is what must happen when a foreign species is successfully acclimatized, unless it is going to cope with a food supply, etc., which is not already being exploited. The newcomer, to survive, can only do so by elbowing something else out of its place, as it were: something with habits most closely approximating to its own. It may succeed or fail, and frequently the results are very definite either way. The natural environment is far from being a vacuum into which we can indefinitely pour stranger species, expecting that it will support them in addition to those already in occupation."

The National Parks Authority, which proposes to eradicate the Chinese Silver Pheasant, has the full support of the Department of Fisheries and Wildlife. The loss of native wildlife, whether it be a species reduction or elimination, is usually subtle and insidious.

Australian wildlife is irreplacable. The Wildlife Conservation Act recognises this and makes it an offence to try to acclimatize any exotic, or to keep exotics with that in mind.

The Silver Pheasant *Lophura nycthemera* from the south of China. The male has a full and long crest, chin, throat and under parts glossy bluish black; upper parts white with black lines always narrower than in all other subspecies, three to four in numbers, wavy and often broken; rectrices very long, the central pair almost pure white with only a few thin, broken black streaks on the base of outer web.

MT. WHALEBACK OPERATIONS AND THEIR EFFECTS ON THE ENVIRONMENT

by J.M. Porter,

(Honorary Wildlife Officer)

1. AIMS

The aim of this report is to study the existing environment in the immediate area of Mt. Whaleback mine at Newman, over a period of a year. This is the first report; a second one will be made in approximately one year for the purpose of comparison.

2. SCOPE

This study is restricted mainly to the immediate areas of the mine, but comments will be made on the surrounding countryside. The areas under study are—Western Whaleback to Western Ridge, North Whaleback, Eastern Whaleback, areas immediately south of the mine support buildings, Whaleback creek, sewerage run-off, Newman Township and Gingiana Pool. A map of the area is included with these areas marked on it.

3. GENERAL

Since I first came to Newman five years ago, I have had the opportunity to observe the wildlife in reasonably close detail. During this time, I have noticed an upsurge in the population of some species, and unfortunately, the decline of others. I do not have the information to determine whether this is part of a natural cycle or not, but undoubtedly the Department will have access to knowledge of this kind.

The increase of several species is definitely not the result of nature; amongst these are the Corvid and Feline (Domestic x Feral) species. These will be covered in further detail. Domestic mice and dogs are there but are not yet a problem.

On the actual mine, while wildlife does not exactly abound, it is not uncommon to see the occasional Dingo, and usually there are a few Wallabies to be seen. Sightings are made mostly at night and occasionally during the day, despite the constant roar of machinery and regular blasting operations. Indeed, the smaller birds of prey take advantage of the blasting, and, once a shot is fired, they are usually seen to be quartering the areas immediately adjacent to the blast. Presumably this is to find small lizards and rodents, which do abound on the hill, and have been frightened out of hiding by the noise and ground vibration.

4. DIRECTION

To simplify matters, all references to direction are made relative to Mt. Whaleback itself. As the hill runs roughly East to West, the end closest to the town will be designated as the Eastern end. The Western end is towards Western Ridge, and North is classified as the area on the opposite side of the hill from the mine support buildings. Therefore, South is on the same side as the buildings.

PART I
WEST WHALEBACK TO WESTERN RIDGE

This area lies in the direct path of the dust carried by the prevailing winds for most of the time. At certain times of the year, these winds carry the dust as they swing from North and East. It is a large plain covered with scrub and small gums. Occasionally the wind comes from the west and rarely from the South.

This area has never been noted for its abundance of wildlife, although most of the Wallabies and Dingoes seen on the hill come from this area. It must be assumed therefore, that these are migrant animals, but actually live only a few miles from the mine, and within sight and earshot of it. The reason for this supposition is that Western Ridge has an almost permanent supply of water in a small gorge. This appears to leak out of the surrounding rocks and it gathers in a small rock hole at the base of the gorge, in an area of almost total shadow. Compared to the immediate area of the mine, wildlife is plentiful in this area. This is not implying that the mine is driving the wildlife away, rather that the water is attracting it.

Trees and scrub, however, are being effected with a layer of dust but this is true of the bushes which line the roads in most parts of the North West. Small birds are present in this area, but do not abound. Kangaroos and Wallabies are seen regularly in this area, but not in any great number.

PART II
NORTH WHALEBACK

This area is mostly clear of dust, although traffic using the access road around the mine stirs it up. Nevertheless, dust is building up on the plants.

The wildlife in this area appears to consist of mainly small birds and the occasional bird of prey. Corvids are rarely seen in this area or the area previously mentioned. Corvids will be covered in a separate section.

Strangely enough, there is evidence to suggest that a colony of Brush Tailed Rock Wallabies are living on the Northern face of Whaleback. Unfortunately mining operations have prevented me from confirming this. However, at the first opportunity I will be applying for permission to make a close-up study of this area. Should they actually exist it may be further evidence of the adaptability of these animals inasmuch as they would be totally ignoring the noise going on around them. It is of course realised that the animals which have been sighted in this area could have wandered from Western Ridge as I have never found water in this area. Reptiles do exist in this area, but are not often seen.

This area is semi scrub covered plains, with several small hills.

PART III

EASTERN WHALEBACK

There is at present in this area some developmental work in progress. At one location in the area there is a water filling point. Observation of this point has produced some results, as the water leaking out has brought wildlife in at night and early evening.

Kangaroos, Wallabies and Dingoes have been sighted here, as well as the Brush Tailed Rock Wallaby. Birds have included Parrots, Pigeons, Finches and the Painted Finch. Rodents or reptiles have not been sighted but from the way that birds of prey regularly quarter the area, it would seem to indicate their presence.

PART IV

SOUTH WHALEBACK INCLUDING WHALEBACK CREEK

At one stage domestic cats were a problem in this area but they have since thinned out. They were allowed to exist within the mine support buildings to control the mice as there had been a population explosion amongst them. This was probably due to a suitable artificial environment having been created when the workshops were built, and an increase in the food supply due to crumbs and scraps of food from the messrooms being available to them.

The drop in the feline population is seemingly unexplainable, as they were pampered by the workmen some of whom brought food especially for them. Nevertheless, the decrease is a welcome one as these cats were beginning to spread out into the region of Whaleback Creek and play havoc with the birds nesting there. This has now ceased.

Birds have adapted very well to the industry here and several species are nesting amongst the machinery. Two of these are the Black Faced Wood Swallow and the Willie Wagtail.

A few hundred yards to the south is Whaleback Creek. This area is of interest not only because it is a natural watercourse which is normally dry, but it is now supplied with run-off water from the mine and contains a breeding colony of rabbits. This possibly could indicate an increase in the Dingo population, however, there is no evidence that this is so. I have made only a casual search for the rabbits during the time spent in this area, but have been unable to find any burrows. Indeed, the nature of the ground precludes the possibility of such, as it is mostly stone and shale. I would venture to suggest that they are living on the surface, but in the tangle of dead vegetation and washed down scrub that surrounds the base of most of the trees. In one case, a small group was found in amongst a tangle of boulders that had been dumped.

Water samples have been taken from there at different points, and the results will be included in an appendix to this report.

Wildlife abounds here and, in my opinion, is directly attributable to the presence of the mine. Corvids have nested within the past three years but, except for an occasional visit, appear to have deserted the area now.

Reptiles are present, particularly the large lizards. Snakes, which are present but not often seen, appear to enjoy the conditions.

PART V

NEWMAN TOWNSHIP

Without doubt, the existence of this town has had a tremendous effect on the wildlife. Most of this is good, but a few parts are bad.

Water is plentiful in town and this has resulted in an increase in insect and bird population. One instance is the Crimson Chat population which literally exploded this year. Rosellas and Galahs are plentiful and regularly fly over the town. This has had the unfortunate effect of increasing the number of caged birds. Most of these cages do not conform to specification, and are overcrowded. Should the Department think fit, the other Honorary Officers and I will adopt a get tough policy towards these people, as advising them does not seem to have had much effect, although some change has been noted.

Kangaroos are plentiful around town, as are most of the birds on the lists forwarded by Mr G. Godber and myself.

Crows are a problem, as they have found suitable scavenging among the dustbins and are unfortunately thriving. The existence of a stable on the outskirts of town seems to have been a factor in attracting birds as chaff, hay, corn and oats are plentiful around the horses.

The rubbish dump on the outskirts of town is where the crow population has built up quite dramatically. At times they descend on it like a black seething mass. There is plentiful scavenging there for them. This area is also very bad for domestic cats gone wild; some have just wandered off from their homes, but mostly they have been abandoned when their owners have left town. These cats, like the rabbits previously mentioned, are nocturnal and are very rarely seen during the day. A systematic control of these cats by shooting has had good results in surrounding areas, but the tip is too close to town to do this here. I would suggest a string of box traps, as any others could possibly endanger humans.

To control the crows, we are endeavouring to locate their nesting sites, and will destroy them as they return to roost until their numbers reach a lower level. The reasons for this action will be explained in the general comments.

PART VI

SEWERAGE RUN-OFF

This is an ideal place which was created by taking the water from the sewerage farm and directing it into a natural creek bed. The area is relatively unknown to most of the townspeople, although Geologists and a few trail riders know of its existence. The stream gradually widens out into a series of small pools and eventually stops. It is believed to soak into the ground at this point. Possibly it continues underground, and maybe reaches a size where the evaporation rate equals the rate of flow. The water itself is full of algae, possibly due to it being enriched from the sewerage. As it is mostly shaded, it is not considered that the process of photosynthesis alone would produce this effect. Most birds live and nest here.

On a recent visit, I took Wildlife Officer Mr R. Smith of Karratha to view the area and we discovered a colony of Red Capped Robins. This surprised me, as I did not believe them to be a gregarious bird, but a very territorial one. The Splendid Wren is another bird that abounds here. It is of interest to note that the first sightings of the Crimson Chat were made in this location. Other bird life has included Egrets, Herons, Ibis, several varieties of duck (including the Pink Eared Duck) and on one occasion about four years ago, two Freckled Ducks. The Little Hoary Grebe and Black Swan have also been seen here. Parrots, Honeyeaters and Goshawk as well as pigeon are there. In short, the place is an oasis created by the fact that the town exists.

PART VII

GINGIANA POOL

This was the subject of a pilot experiment by the Conservation Group, the Newman Rangers. These people (who describe themselves as weekend garbos) have done valuable work around Newman by clearing up the rubbish left by man from around the water holes in the vicinity. I say that this was a pilot experiment inasmuch as this one pool was singled out from the others to be developed as an amenity that the townspeople could enjoy and perhaps they would leave the other pools alone as Gingiana is only four or five miles from town. Unfortunately, this experiment was a failure. Water was piped from an existing well across the road by courtesy of the Lions Club in an attempt to stabilise the water in the pool all year round. Unfortunately, the volume of water produced does not keep pace with evaporation. It is now realised that doing this could interfere with a natural cycle, and part of the pool was allowed to dry up naturally.

Rubbish bins were placed around the pool and emptied regularly. This did not prevent people from throwing rubbish around and from breaking glass there. In one instance, rubbish was piled around an empty bin. Barbecues were erected and achieved some success.

As a whole however, the experiment was a failure. Although birds are plentiful there the species of wading birds that inhabit the sewerage run-off avoid the place for most of the time.

Specimens of Steindachers Tortoise have been found there and the area is watched as young children have been catching and selling them. In one case, a boy of nine was the culprit. A word in his parents' ear by P. Durrant and myself stopped this practise.

Galahs, Rosellas and Honeyeaters frequent the area, as do pigeons, reptiles, rodents etc. The tracks of what appear to be small Marsupials have also been found.

There are several more areas like this around Newman which, in my opinion, would produce good results if a full time study were to be made.

ANALYSIS OF WATER SAMPLES TAKEN FROM WHALEBACK CREEK

Sample No. 1 .... Railway loop bridge 31: 1500 hrs 9/11/76.
Total dissolved solids—338 ppm.
No Coliform detected.

Sample No. 2 .... Opposite the B.P. depot: 1505 hrs 9/11/76.
Total dissolved solids—490 ppm.
Total Coliform in excess of 1 000 colonies per 100 ml of sample has been detected.

Sample No. 3 .... Opposite the Security hut: 1515 hrs 9/11/76
Total dissolved solids—628 ppm.
No Coliform detected.

Sample No. 4 .... Unable to analyse this sample as it is nearly all oil.

Sample No. 5 .... Eastern limit of the water: 1530 hrs 9/11/76.
Total dissolved solids—1 298 ppm.
Total Coliform well in excess of 1 000 colonies per 100 ml of sample has been detected.

COMMENTS

In the words of the analyst, this water is not potable, even for animals. It can be seen from this information that the amount of dissolved solids increases towards the eastern limit of the water.

The oil that pollutes this water was moving east, even as I took the samples, polluting as it went. Now, as the evaporation rate is increasing, deposits of sludge of this oil are being deposited around the creek. An increasing number of birds are being brought in, covered with oil. Most of them are found too late for treatment to be effected. The only one that has been saved so far, is an immature black swan.

It is no use trying detergent, as the volume of water is insufficient for it to be effective. The only thing to hope for, is a heavy rainfall which will flush the creek out.

As there is very little that can be done about this spill, the obvious solution now, is to try to prevent a re-occurence of the incident. To this end, an oil separation filter unit is to be installed to process any run-off into the creek.

A large growth of algae was noted in all samples.

GENERAL COMMENTS

I am going to do something now that I would never do as a rule; That is, make a prediction that is not based on fact. I believe that the next report will indicate that mining operations as such will not have a bad effect on the environment. Any bad effects will come indirectly from the mining.

Animals, birds and reptiles have adapted themselves well to the presence of the noise etc. A blast nowadays only warrants a raising of the head from nearby kangaroos. There is a direct benefit to some species by the constant water that is now present. Indeed, the Mt. Newman Mining Co. has shown its concern for the countryside by establishing an Environmental Department and implementing a program of re-planting in the mine area and on the hill itself. Experiments are constantly being carried out in this field.

On the other hand, Whaleback Creek is definitely polluted. Only last week a Black Swan was taken off there covered with oil; it subsequently died. Upon examination, it was found to be internally polluted with oil. This is the third Swan that has been caught. One had two broken wings that had healed and deformed to such an extent that they interfered with the bird's progress on water, and so it was destroyed. This bird is thought to have collided with the overhead powerlines. The other had one wing broken. This was cared for and cleaned up as it had slight oil pollution, and released on the sewerage run-off. It still is there and appears to be thriving.

My main concern however, is one that is a little difficult to put into words and is an indirect effect of the mine. I think perhaps it is best summed up in one word—MAN. People are now moving out into the bush more. Consequently, the effect is telling on the wildlife. Kangaroos have, in general, moved further out into the scrub, although they still come close to town on occasions. At one stage they used to graze in the gardens, but not now. Horse riding is gaining in popularity and will add to the pressures that man puts on the animals. There is no evidence that this has started yet, but the future will tell.

Continued on page 18

Our Diminishing Heritage

If you were lucky enough to have been in the Perenjori district in the early thirties you would have been treated to a breathtaking spectacle that was a common event those days.

In the early mornings a short distance from the homestead one would observe a large tree which appeared to be covered with cherry blossom. A loud noise resulted in the blossom lifting skywards as one enormous cloud of snowflakes reflecting bursts of white and pink as they wheeled to land en masse on a nearby tree or the ground.

The Major Mitchell (*Cacatua leadbeateri*) or Pink Cockatoo, once found in numerous large flocks throughout the west and northern wheat belt of W.A., is declining in numbers. Although sporadically distributed throughout the arid or semi-arid interior of Australia, except in the north east region, it is generally scarce.

The Major Mitchell inhabits sparsely timbered grasslands, semi-arid areas and thickly-timbered mallee scrub. The habitat is never far from water and often bordering cereal crops. The birds are a nomadic species and can be seen today in small groups or individual pairs throughout the remnant stands of York gum east of Mullewa, Morawa and Perenjori. The strongholds are thought to be in the Murchison River district where the birds seek river gum timber, and on the south coast Eucla division in the Salmon and York Gum belts.

The delicate balance of their attitude to nesting and habitat could well be the reason why they prefer the former extremeties of range of the prolific populations. Departmental field officers are convinced that the spread of agriculture and the subsequent destruction of habitat is directly responsible for the birds' decline.

The Major Mitchell is normally a rather wary bird and will not allow observers to come close, although, if disturbed fly only a short distance away. They spend most of the day feeding on the ground or among the branches of trees and shrubs, eating fruit, seeds, nuts and roots. The birds drink at local waterholes in the early morning, sometimes before sunrise, and in the later afternoon.

The breeding season is August to December, but it has been observed that the birds will make no attempt to nest if it is a poor season. Even in a good season they are the last of the cockatoos to go to nest. When courting, the male struts along a branch towards the female and with crest raised, bobs its head up and down and swishes it from side to side in a figure eight movement. The male utters soft chattering notes, then the pair preen each other.

The female lays 2–4 roundish, pure white and slightly glossy eggs in the hole or hollow of a tree or branch. The hollow nest, usually 2–3 feet deep, is lined with wood dust and bark strips. Both parents incubate the eggs, the male during the day and the female at night. The same nesting hollow is often used in successive seasons by the same pair of birds.

The Department knows at this time that the Major Mitchell Cockatoo is scarce; this opinion is quite often expressed by people on the land. It is also known through observations and patrols, that various relict populations are present. However, most known areas of habitation are also known and frequented by illegal nest robbers.

Human predations on the remaining isolated nesting sites are considered despicable acts against a country and its heritage. One such area where hundreds used to nest, accommodated only two pairs the season before last.

Land owners are refusing to allow operators to enter properties specifically to collect Major Mitchells, however, under pretence of trapping common unprotected species, the Major Mitchell nests are still being plundered at night to avoid detection. The result is that the male is left without a mate, the nest site is lost, the chicks are removed from the wild and the adult female usually frets to death.

In all known habitats, evidence has been collected to show ruthless damage and permanent destruction of trees and nests by chainsaws and axes.

The time is upon us when the present knowledge of known populations must be further investigated. The Major Mitchell must now be considered to be a "Vulnerable Species"—likely to move into an endangered category if the casual factors now at work continue operating.

Maybe those "pink clouds" were the beginning of the sunset on another beautiful wild creature.

MAJOR MITCHELL COCKATOO

Cacatua Leadbeateri

IDENTIFICATION

Length: 360 mm

Male: Crown white suffused with salmon-pink. Narrow forward-curving crest scarlet, with central band of yellow and tipped with white. Forehead, sides of head, nape, breast, upper bellyand under-wing coaverts salmon-pink. Lower belly, undertail coverts and upper parts, including tail, white. Undersides of flight and tail feathers strongly washed with deep salmon-pink. Eye dark brown; bill horn-coloured; legs grey.

Female: Similar to male but has pale red eye. Central band of yellow in crest broader than in male.

Immatures: Similar to adults. Eye pale brown.

VOICE

Usual contact call, given frequently in flight, a two-syllable quavering cry, similar to, but not as raucous as that of little corella. Alarm call three to four harsh screeches.

NESTING

Breeds August-December. Nest a hollow limb or hole in a tree. Eggs: two to four, usually three; white; oval, 39 x 30 mm. Incubation lasts 30 days. Both sexes sit, males by day and females by night. Both feed young. Chicks leave nest six weeks after hatching but stay with parents.

DISTRIBUTION

Sporadically distributed throughout arid and semi-arid interior of Australia, except in north-eastern region.
In Western Australia found in the Murchison District, through the northern and central wheat belt and in the Eucla Division.

from page 15

Trailbike riders definitely are having an effect. This has been observed in several areas and is on the increase. The largest problem exists with illegal shooters. Despite constant patrols, these people still persist, and it is common to see carcases in the bush. Man's environment has proved to the liking of some species, especially vermin such as crows, cats, dogs and rodents.

The crows have had a telling effect amongst the eggs and nestlings on the sewerage run-off. At one stage, the Red Capped Robins almost vanished from the area and I suspect the crows of having a hand in this. Without a doubt, they were assisted by domestic cats gone wild. The remains of several birds have been found there, all partially eaten. Several cats have been sighted in the area, and some of them have grown to an exceptionally large size. Here, as at Gingiana Pool, their presence is telling. Various methods of removing cats from the area have been discussed with Wildlife Officer R. Smith of Karratha, and a program will commence shortly, after discussions with Mt. Newman, should permission be forthcoming.

I must reiterate, that a full time study carried out in the Newman area would in my belief, turn up some surprising facts and information.

WILDLIFE REPORTS AND SIGHTINGS

The report on page 13 from Honorary Wildlife Officer J. M. Porter on "Mount Whaleback Operations and Their Effects on the Environment" has considerable importance in long-term analyses of environmental dangers caused by townsites, mining or whatever.

Mr Porter's report can be seen as a fine example of how the general public, naturalists and Honorary Wildlife Officers can play a larger role in supplying needed information for records of the State's natural history.

There are yet many areas of this large State that have not been documented in terms of natural history. Departmental staff are methodically researching and recording known priorities, but information and knowledge of natural cycles and local species in an area is only available through long-term study and is best collected by people living "on-the-spot". It is only through building up a knowledge of an area both **past and present,** that the adequacy or otherwise of the system of existing and proposed conservation reserves in any region can be judged.

The Department's Wildlife Research Centre at Wanneroo has suggested two further ways in which valuable data may be collected:

(1) Road kills of mammals (hare-wallabies, rock wallabies, bandicoots, rodents, native cats and dunnarts) often provide very valuable records, and specimens sent to Department of Fisheries and Wildlife Research Centre, Wanneroo, or the W.A. Museum are most appreciated. In the case of rotten animals (offensive in a family sedan) just the head (skull) in a plastic bag is sufficient. In such cases it is important to record both location and the vegetation adjacent to the pickup site as this provides habitat information. Fisheries and Wildlife will reimburse postage.

Continued on page 8

HYBRID DUCKS

Throughout the year, officers from the Department's Wildlife Research Centre at Wanneroo have been involved in a programme of controlling domestic ducks on metropolitan lakes.

Domestic ducks are cross-breeding with the wild Black Ducks on metropolitan lakes and the results are strange hybrids with strange colours and ungainly bodies. There have also been reports from shooters in the country of peculiar looking Grey Teal and Mountain Ducks in their bags.

Apparently, people are keeping domestic Mallards, Muscovies and Kahki Campbells as backyard pets to keep down snails in their gardens. After their owners have grown tired of them, the birds are disposed of at suburban lakes where they are thought to add to the lakes' attraction.

The domestic drakes are very aggressive birds and can breed at almost any time of the year. They will take wild indigenous females away from their mates, the result being a brood of hybrid offspring.

Generally, wild species do not inter-breed with each other although they may share the same habitat. Nature keeps them separate by coding each species to respond to a different set of breeding rituals, colours and plumage displays.

Domestic ducks, all of which are descended from the mallard, not only break the natural laws by freely mating with black ducks, but their offspring are fertile and can continue cross-breeding.

On the first cross some of the offspring, but not all, can fly.

More can fly in the second and third crosses, giving them the numbers and mobility to follow the wild birds back to their winter breeding grounds and further contaminate the species.

It is not just a matter of appearances that is causing concern; the domestic duck can introduce new disease strains by diluting the gene pool which has given the native birds some resistance. The introduction of these elements which damage physical characteristics and break down old immunities can easily wipe out a species.

Mallad x Black Duck hybryd.

THE DIFFERENCE BETWEEN DOLPHINS AND PORPOISES

The terms dolphin and porpoise are sometimes used synonymously for small cetaceans but there is a difference.

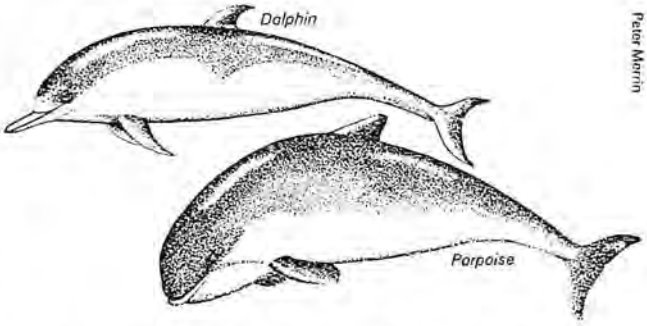
Dolphins usually have a narrow beak and a slender streamlined body form, while porpoises have a blunt snout and a stout, rather stocky form. Another difference is that the dorsal fin of dolphins curves backwards while that of porpoises is triangular. Both porpoises and dolphins are members of the family Delphinidae which embraces some of the toothed whales, sometimes large but mainly small. It is a very large family containing about 50 species and has a world-wide distribution. Only 6 of these species are porpoises.

Porpoises are fairly small animals. Most species grow only up to about 2 metres. Most dolphins grow to between 2 and 4 metres long though the biggest, the Killer Whale (*Orcinus orca*) grows up to 9 metres long.

Porpoises do not occur in Australian waters. The commonest dolphin seen off the Western Australian coast is the Bottle-nosed Dolphin (*Tursiops truncatus*). Other species which have been reported along our coast include: Risso's Dolphin (*Grampus griseus*), The Common Dolphin (*Delphinus delphis*), and the Striped Dolphin (*Stenella caeruleoalba*).

Only within the last 15 years has another species, the Irrawaddy River Dolphin (*Orcaella brevirostris*) been recognised as an Australian species, from specimens caught in fish traps off Broome. This animal belies the earlier statement that dolphins have a narrow beak since it has a blunt nose and a short shelf-like beak.

The distribution of dolphins along the Western Australian coast is poorly understood and the Western Australian Museum would welcome information, particularly when dead dolphins, or any other marine mammal remains, are found on the beach. The Museum should be informed as soon as possible after the finding; where possible the remains should be removed at least above high water mark pending further examination, and a photograph should be taken.



Basic appearance difference between Dolphin and Porpoise.

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