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MONTHLY SERVICE BULLETIN

Vol. XII, No. 12

DECEMBER, 1963



FIELD DAY SCENE - TUTTANNING WILDLIFE RESERVE, OCTOBER, 1963

Seasonal Greetings

FROM THE DIRECTOR AND STAFF, FISHERIES AND WILDLIFE, PERTH, W.A.

Dr. A. R. Main, of the Zoology Department of the University and a deputy member of the Fauna Protection Advisory Committee, addressing some of the participants at the field day held last October on the Tuttanning reserve, 14 miles east of Pingelly. About 150 people attended from Pingelly and surrounding centres and from Perth. They gathered, initially, at this spot, the selected site for the proposed £5,000 biological research station to be built in the next few months.

Of approximately 3,000 acres this reserve is, despite its relatively small size, one of the most important in the State and contains many rare species as well as amazingly diverse flora and soil components.

STAFF NOTES

The Senior Research Officer, Mr. B.K. Bowen, who returned from annual leave on November 12, left Perth for Carnarvon on November 17, where he gave a talk to the North-West Division Consultative Council. He returned to Perth on November 19. The main features of Mr. Bowen's talk appear elsewhere in this issue. On December 1, Mr. Bowen will leave for Melbourne where he will attend the Commonwealth-States Fisheries Conference, which will be followed, initially, by a one-day seminar on fisheries administration, then by a meeting of both Commonwealth and State representatives to discuss the tuna industry.

* * *

Officers to commence annual leave this month include Inspector J. Traynor, on December 2; Research Officer R.J. Slack-Smith, on December 5; Fauna Officer H.B. Shugg, on December 4; and Mr. G.E. Dixon, of Head Office, on December 11. Mr. C.R.C. Haynes, mate of the r.v. "Lancelin" will also commence leave on December 16.

Mr. Slack-Smith intends motoring overland to spend his vacation in New South Wales. While in the eastern States he will attend a fisheries school on fish population and dynamics at the C.S.I.R.O. Marine Laboratory, Cronulla. The school will commence on January 2 and finish on January 17. He will also attend the annual conference of the Australian and New Zealand Association for the Advancement of Science ("ANZAAS"), to be held in Canberra from January 20 - 24.

* * *

Fauna Warden N.E. McLaughlan returned to Perth on November 9 after attending the annual campout of the Royal Australian Ornithologist's Union which was held this year at Albany.

* * *

Mr. J.B. Byleveld, of Head Office, resumed duty on November 12 after combined annual and special military leave.

* * *

At an informal gathering at Head Office on November 14, the Director, Mr. A.J. Fraser, on behalf of the staff, made a presentation to Miss Maree Riddett on the occasion of her twenty-first birthday.

We regret to announce that we had two resignations from the Department during the month. The first was Miss R.A. Hall, of Head Office, who left to take an appointment at the Perth offices of the United States Navy. On the eve of her departure, the Director, on behalf of the staff, presented her with a token of our esteem. The second resignation was that of Assistant Inspector A.H. Ullrich, who also resigned from the service after serving some twelve months with us. Both resignations dated from close of business on November 22.

* * *

We welcome to the staff Miss J.M. Wallis and Messrs R. Smith, D.B.M. Heather, R.G. Lindsay and G.D. Noble. Miss Wallis was appointed on November 22 to replace Miss Hall. Mr. Smith, who was appointed as Inspector, Grade 2, on November 18, has taken over as skipper of the p.v. "Misty Isle". Mr. Heather, who was appointed as an assistant inspector on November 25, will assist Inspector A.T. Pearce on the p.v. "Dampier". Both Messrs Lindsay and Noble, who each commenced on November 25, have been appointed Cadet Inspectors. Mr. Lindsay will assist Inspector L.R. Frizzell at Jurien Bay, whilst Mr. Noble will be attached temporarily to the Perth District.

* * *

Cadet Research Officers R.C.J. Lenanton and J.H. Jacoby rejoined the Department on November 20, after completing another academic year at the University. Mr. Lenanton has gone to Lancelin for three to four weeks with Senior Technical Officer R.J. McKay to continue research work on the effectiveness of escape gaps in crayfish pots. Mr. Jacoby, who is with the Fauna Branch, recently accompanied a sub-committee of the Fauna Protection Advisory Committee on a 4-day field inspection in the Lake Magenta region, east of Pingrup.

DISTRICT BOUNDARIES RE-ADJUSTED

Following the recent establishment of permanent bases at Lancelin, Jurien Bay and Dongara, and the addition of a mobile patrol unit, it has been necessary to re-adjust and delineate the boundaries of the districts between Bunbury and Geraldton. They are now defined as follows:-

Bunbury - from Broke Inlet to Harvey.

- Mandurah - from Harvey to Long (Becher) Point.
- Fremantle - from Long Point north along the seafront to North Street, Cottesloe. It incorporates all that area (including the waters of the Swan River) lying south and west of a line from Point Walter Road and Honour Avenue to Point Walter Jetty, thence across the river to Point Resolution and thence downstream along the foreshore to Claremont Jetty, thence northward along Bay View Terrace to Claremont Railway Station, thence westward along the railway to Servetus Street to North Street, Cottesloe, thence westward along North Street to the ocean.
- Perth - north along the seafront from North Street, Cottesloe, to Wreck Point - approximately three miles north of Yanchep beach. This area covers all districts lying east and north of Point Walter Road, Bicton, then it follows the same boundary as described for the eastern and northern boundaries of the Fremantle district.
- Lancelin - the seafront north from Ledge Point for approximately ten miles to a prominent point opposite Lancelin Island.
- Jurien Bay - the seafront north from approximately two miles south of Island Point to North Head, Jurien Bay. This is a distance of approximately nine miles.
- Dongara - from Freshwater Point to the mouth of the Greenough River - approximately forty miles.
- Geraldton - north from the Greenough River to the Murchison River.

LATE RUN OF SWAN RIVER PRAWNS

Senior Inspector J.E. Munro says that the excessive rains during the winter and the resultant flooding has delayed the prawning season this year. Normally, prawns are taken in late October, but this year it was not until mid-November that any worthwhile catches were reported. Mr. Munro thinks that the hot weather should improve the catches and that, although late, the season will be a good one. He adds that crabs, on the other hand, have yet to appear in numbers and fishermen

are generally agreed that a wet winter invariably results in a poor crab season.

Tailer and mulloway (river kingfish) are both plentiful, while cobblers in the lower reaches are offering spear fishermen excellent sport at night.

OPEN SEASONS

Wild Ducks -

The 1963/64 season for wild ducks will open at 6 p.m. in the evening of Saturday, December 21, in the south-west corner of the State from Harvey to Manjimup, and at 5 a.m. in the morning of Sunday, December 22, in the remainder of the South-West and Eucla Land Divisions.

Full details of the open season, of the restrictions which will apply during its currency, and of the areas remaining closed to shooting, are set out in the Duck Shooters' Guide, a copy of which is attached to this issue.

A late request received from a gun club in the central wheat belt, that the opening of the season be delayed until January, had been considered but finally rejected. While the unselfish and conservation-minded thought behind the request was appreciated, the probable presence of young broods and "flappers" in many areas on opening day was an annual occurrence. Grey Teal, in particular, would nest at any time in the year when conditions were suitable. An overall view had to be taken of the situation throughout the whole of the open season area; while the season may be too early in some districts it was too late in others and just about right in the remainder. A number of opening dates would be most confusing to the public and almost impossible for our limited number of wardens to police.

Quail -

A four months' open season for Stubble Quail commences each year on December 1, throughout all that part of the State lying north of the 31st parallel - that is, north of a line drawn from Lancelin Island through Coolgardie. South of that line the season is from March 1 to June 30 in each year.

There is no bag limit for the species.

Marron -

The annual marron season will open on January 1 and continue until midnight on April 30, 1964. The following restrictions will apply -

- * Legal minimum carapace length is 3 inches from a point between the eyestalks to the end of the carapace, measured down the mid-dorsal line.
- * The use of unattended traps is prohibited at all times.
- * The taking of females in berry is prohibited.

CERVANTES PROCESSING WORKS.

Tropical Traders Limited are leasing their crayfish export establishment at Thirsty Point, Cervantes, to Mr. A. Avens, of 51 Stirk Street, Alfred Cove. It is pointed out, for the benefit of the inspection staff particularly, that Mr. Avens will be responsible for the running of this processing works.

VISIT OF "UMITAKE MARU" AND "KOYO MARU"

The Japanese fisheries training ships, "Umitake Maru" and "Koyo Maru", are to visit Fremantle this month. The "Umitake Maru" called at Broome on November 28 and will call at Geraldton on December 14 for a few days, before coming on to Fremantle where she will arrive on December 27. The "Koyo Maru" will visit Fremantle from January 14 to 18. Both these vessels form part of the large fleet of Japanese research and training vessels engaged in that country's fishing industry. They are, at present, carrying out a cadet training programme besides being engaged on specific research projects. Supervising Inspector J.E. Bramley, on behalf of the Director (who will be in the eastern States), will make official calls on both vessels and will extend an invitation to the cadets to observe local crayfishing operations. While the vessels are in port they will be open to our own staff for observational purposes. The "Umitake Maru" will sail on January 2.

CRAYFISHING - ABROLHOS PRODUCTION DOWN

The following tables show crayfish production and fishing intensity at Houtman Abrolhos for the past ten years. The figures for 1963 are not encouraging. Although the number of men engaged dropped by only 11%, the overall production dropped by 21%. The total catch is comparable with those of the 1958, 1959 and 1960 season, although in 1958 there were only 192 men engaged in crayfishing as against 231 in 1959, 259 in 1960 and 321 in 1963. The tables also reveal that the overall catch-per-man in 1963 was 10,740 lb. compared with 12,074 lb. in 1962. This represents a decrease of 11%. In the North Island area there was an increase in production as well as an increase in the catch-per-man. In the Easter Group there was a slight increase in production. However, this was achieved by an increase in effort of some 31%. Consequently the catch-per-man was well below that of 1962. Production at both the Wallabi and Pelsart Groups was below that of 1962, and the catch-per-man, likewise, dropped considerably. We should keep in mind, when considering these fluctuations, the high mortality of crayfish experienced last season in the holding crates at the Islands, and the generally poor season.

ABROLHOS CRAYFISH PRODUCTION

| Year | North Island | Wallabi Group | Easter Group | Pelsart Group | Total |
|------|--------------|----------------------|--------------|---------------|-------|
| | | <u>Number of Men</u> | | | |
| 1954 | 15 | 36 | 41 | 21 | 113 |
| 1955 | 18 | 39 | 47 | 45 | 149 |
| 1956 | 31 | 42 | 38 | 40 | 151 |
| 1957 | 26 | 45 | 60 | 46 | 177 |
| 1958 | 30 | 58 | 64 | 40 | 192 |
| 1959 | 43 | 70 | 67 | 51 | 231 |
| 1960 | 62 | 71 | 81 | 45 | 259 |
| 1961 | 74 | 68 | 80 | 55 | 277 |
| 1962 | 84 | 79 | 90 | 109 | 362 |
| 1963 | 67 | 66 | 118 | 70 | 321 |

ABROLHOS GRAYFISH PRODUCTION

| Year | North Island | Wallabi Group | Easter Group | Pelsart Group | Total |
|------|-----------------|---------------------------|-----------------|------------------|-----------|
| | | <u>Total Catch (lb)</u> | | | |
| 1954 | 208,972 | 679,781 | 814,848 | 415,797 | 2,119,400 |
| 1955 | 278,681 | 717,699 | 802,879 | 672,885 | 2,472,144 |
| 1956 | 395,831 | 713,153 | 774,172 | 561,512 | 2,444,668 |
| 1957 | 433,185 | 774,926 | 1,042,910 | 653,685 | 2,904,705 |
| 1958 | 512,126 | 1,026,150 | 1,153,189 | 580,667 | 3,276,132 |
| 1959 | 659,180 | 980,053 | 1,151,347 | 760,542 | 3,551,122 |
| 1960 | 776,798 | 937,587 | 1,165,603 | 662,773 | 3,542,761 |
| 1961 | 1,021,771 | 1,010,220 | 1,167,193 | 751,364 | 3,950,548 |
| 1962 | 783,518 | 1,039,306 | 1,041,510 | 1,514,515 | 4,378,849 |
| 1963 | 821,010 | 700,618 | 1,132,327 | 793,716 | 3,447,671 |
| | | <u>Catch per-Man (lb)</u> | | | |
| 1954 | 13,931 | 18,883 | 19,784 | 19,800 | 18,756 |
| 1955 | 15,482 | 18,402 | 17,082 | 14,952 | 16,592 |
| 1956 | 12,769 | 16,979 | 20,373 | 14,038 | 16,189 |
| 1957 | 16,661 | 17,221 | 17,382 | 14,211 | 16,411 |
| 1958 | 17,204 | 17,692 | 18,018 | 14,516 | 17,063 |
| 1959 | 15,329 | 14,001 | 17,184 | 14,912 | 15,373 |
| 1960 | 12,529 | 13,205 | 14,391 | 14,728 | 13,679 |
| 1961 | 13,807 | 14,857 | 14,590 | 13,661 | 14,229 |
| 1962 | 9,328 | 13,156 | 11,572 | 13,895 | 12,074 |
| 1963 | 12,254 | 10,615 | 9,595 | 11,339 | 10,740 |

TALK ON FISHING IN NORTHERN WATERS

As mentioned earlier in this bulletin, the Senior Research Officer, Mr. B.K. Bowen, gave a talk to the North-West Division Consultative Council at Carnarvon on November 18. Mr. Bowen spoke on the whaling industry and on the prawn, crayfish, tuna and other scale fisheries in north-west waters. He also referred to their respective potentials for development. The following is a precis of his remarks:-

Prawns -

The two species of prawns involved in trawling operations in Shark Bay were the king and the tiger prawns. They were caught from about March or April through to August. In the season just concluded there were 25 boats licensed to operate in the Shark Bay area. The combined catch of king and tiger prawns during the season was, approximately, 1.2 million lb. A few other species of prawns were caught but were of little economic importance.

Juvenile prawns about one half-inch long were found along the mangrove flats. As they matured they moved out to deeper waters. Early in the season the prawns were small but as the season progressed they increased in length and weight. In August, production decreased and it was thought that, by this time, the prawns had moved out of the Bay into an area somewhere north of Bernier Island to spawn. Samples taken from the commercial grounds showed quite clearly that the prawns were in a pre-spawning state. Soon after spawning took place the larvae hatched and it was surmised that they drifted with the currents and tides until they found their way to or were deposited in the nursery areas - the mangrove flats - where they became bottom-living animals and the cycle commenced again. The whole cycle took place in one year, and therefore the prawns which were being caught at any one time were all approximately the same age. After the prawns had spawned they did not return to the Shark Bay fishery. It was presumed that they either died or formed a deep-water population. Although prawns in a pre-spawning state were being taken commercially, it was not considered that this would have any effect on future availability. Research overseas had shown that in the North Sea plaice fishery, for example, there was no direct correlation between the stock of one year and the progeny which eventually entered the fishable stock. The reason for this was that individual marine animals, such as prawns and fish, each released a tremendous number of eggs. In the case of the prawn, the number was certainly in the hundred thousands, and for the population to persist only two

progeny of each female prawn had to survive to maturity. This meant that more than 99.9 per cent of the larvae which were released would never enter the fishery. In other words, the natural mortality rate was very high and the number which survived depended on environmental factors, such as availability of food and water temperature, and not on the size of the brood stock. Indeed, many biologists believed that, unless a fishery was reduced to very low population limits, there would always be sufficient spawners available to ensure that the fishery continued.

Various measures had been introduced to protect the Shark Bay prawn fishery, perhaps the most important being the limitation of the number of trawlers allowed to operate and the close of the nursery areas to fishing. Research, too, would play its part in conservation. The Department would be studying prawn growth and mortality rates to find out in what areas, or at what size, the greatest weight of prawns was available to the fishery. Besides the study of growth and mortality rates, the Department's research boats, early next year, would survey grounds just north of Bernier Island to plot the trawlable areas there as a preliminary to experimental trawl fishing to be carried out in the following August-September-October. The object of this work would be to attempt to find where the prawns schooled to spawn. If they schooled in the deeper water, say 30 or 40 fathoms, it was desirable to know the exact area because it might be that there was another area on which the prawn fishermen could operate. Because the prawn fishery consisted of a one-year group only, environmental factors might cause violent fluctuation in the fishery from year to year. This possibility made it difficult to say what should be done to ensure the rational exploitation of the fishery. We did not want to have too many fishing boats with no one getting a reasonable return for their capital outlay. Consequently, to ensure an organized industry rather than a disorganized one, license limitations had been instituted.

The banana prawn was another species caught in Exmouth Gulf. This fishery was trawled in the day time, whereas the king and tiger prawn grounds of Shark Bay were trawled at night. The banana prawn existed on the Queensland coast and was caught there in commercial quantities. There was a potential banana prawn fishery in Exmouth Gulf and, possibly, also in Nicol Bay. However, the banana prawn was what was termed an inconsistent species. The schools were constantly on the move, and, one day, might be caught in great numbers, then, in the days following, there might be no trace of the population. A few days later the school would be re-located in a different area, only to disappear again.

Crayfish -

There were five different species of crayfish in northern waters, but only one was dominant. This was the so-called "green" or "coral" crayfish (Panulirus versicolor). It was an unfortunate fact that nowhere in the world had anyone found a successful method of capturing it, other than by hand. Recent reports of "coral" crayfish being caught in the East Aden Protectorate, and on the west coast of Ceylon, referred to a different species - Panulirus homarus - which also occurred in our waters but was known here as the "onslow" crayfish. The reefs on which it lived were very small in extent and it was believed that the species existed only in small numbers. If one day someone did develop an economic method of catching Panulirus versicolor, a small crayfishery might be developed at Onslow.

Whales -

For the past 12 to 15 years the humpback whale, had been the basis of the whaling industry in this State. Each year, after an initial boom period, the number taken had become progressively fewer. Finally, last year, three international scientists recommended that, as the humpback whale stocks had become so small, there should be a complete ban on the taking of this species. This recommendation was placed before the International Whaling Commission and subsequently adopted. Australia accepted the prohibition and, consequently, the taking of humpback whales south of the equator had been prohibited for an indefinite period.

Sperm whales were known to travel along the west coast and the Nor'West Whaling Company, the Division of Fisheries and Oceanography, C.S.I.R.O., and the Cheynes Beach Whaling Company were co-operating in a study of the movements of this species. While it was hoped that the Nor'West Whaling Company might yet find sperm whaling was an economic possibility, it seemed that these whales moved well out to sea along the west coast, and any taken had to be hauled 150 miles to the base. At Albany, where different conditions obtained, the Cheynes Beach Whaling Company were taking and processing some hundreds of sperm whales each year.

Scale Fishing -

There was no doubt that in the northern archipelagoes considerable quantities of reef fish existed. Last year two boats from Geraldton fished in the Onslow area and caught various species of cod, north-west snapper and spanish mackerel.

It would not be surprising if those boats returned next year. Spanish mackerel became more prolific farther north and they were available at the right time of the year. It had to be remembered, nevertheless, that a reef fishery could usually support only a small number of boats. That had been the experience on the Queensland coast and the same position would probably obtain here. It also had to be remembered that while a greater variety of fish existed in warmer water, each species was represented by a smaller number of individuals. This was not conducive to the establishment of a really large fishery. Nevertheless, it would be interesting to watch developments as there was an awakening of interest in scale fishing from Carnarvon northwards.

Tuna -

There were large numbers of northern bluefin tuna in the waters between Carnarvon and the Monte Bello Islands. The Japanese, who were fishing approximately 200 miles off North West Cape, and in other areas off the Western Australian coast, were catching other species of tuna by longlining. The catch-per-unit of effort was not particularly high compared with other areas, but it was still a commercial proposition for the Japanese because they had available a much cheaper labour force than we had and this fishing method relied heavily on manpower. The Australian Government was endeavouring to find ways of reducing the manpower required so that one day Australia might operate profitably in this fishery. In June last, three experts were sent to Japan, Hawaii and Samoa to study longlining techniques and to assess the possibility of adopting them to Australian conditions. The report had not yet been delivered but it was anticipated that it would be tabled shortly.

AUSTRALIAN FISHERIES

The comparatively small quantities of fish consumed in Australia was the subject of a report published in the October edition of "Monthly Summary of Australian Conditions" published by the National Bank of Australia Ltd. The report added that with a greater migrant population and the removal of import restrictions early in 1960, consumption per head of Australian produced fish - comprising fresh, frozen and canned - had remained remarkably steady over the past seven or eight years. Consumption of imports, on the other hand, had fluctuated considerably, but around a rising trend. The article then continued -

"Prior to 1959/60, about two-fifths of fresh and frozen fish, and over two-thirds of canned fish, consumed in Australia was imported. However, more recently, almost one-half of fresh and frozen, and about three-quarters of canned fish, have been supplied through imports. Together with crayfish, prawns, oysters and scallops, which are mostly Australian in origin, total consumption per head in Australia of fisheries products for the past six years is shown in the following table:-

| <u>Year</u> | <u>Fresh & Frozen</u> | <u>Cured</u> | <u>Canned</u> | <u>Total</u> |
|-------------|----------------------------------|--------------|---------------|--------------|
| | (Edible weight in lbs. per head) | | | |
| 1956/57 | 6.0 | 0.5 | 2.5 | 9.0 |
| 1957/58 | 6.0 | 1.3 | 2.5 | 9.8 |
| 1958/59 | 6.2 | 0.8 | 2.5 | 9.5 |
| 1959/60 | 7.4 | 1.1 | 2.8 | 11.3 |
| 1960/61 | 7.3 | 1.1 | 3.3 | 11.7 |
| 1961/62 | 6.9 | 1.0 | 2.8 | 10.7 |

* includes crayfish, oysters, etc., at about 0.9 to 1.0 lbs per head per annum.

Home Production

"The Australian fish catch has expanded quite substantially over the past three years, larger catches of tuna, flathead and barracouta being most significant in this trend. Estimated live weight of fish production was 88.5m lbs. in 1961/62, compared with 74.4m lbs. in 1958/59. But the strongest and steadiest expansion has occurred within the field of crustaceans and molluscs (i.e. crayfish, prawns, oysters, etc.), most predominantly from crayfish production in which Western Australia is the major producing State. Estimated gross weight of crayfish for 1961/62 was 28.8m lbs., an increase of more than 50% when compared with the 1956/57 season. Crayfish tails comprised 93% of the value of our exports of the fishing industry during 1962/63, causing a 9.0% drop in export receipts although a similar quantity was exported. While the United States remains the major outlet for Australian crayfish tails, a growing European market, apparent during the last two or three years, may help stabilise prices in the future. An almost tenfold increase in the export of prawns during the 1962/63 year has been announced recently, and this has almost offset the decline in receipts occasioned

by the fall in crayfish prices. Although subject to a number of year to year fluctuations, oyster and scallop production (mainly from N.S.W. and Tasmania respectively) appear to have increased in recent years.

"Production of Australian canned fish has been steadily growing, but a rise of 51.7% between 1957/58 and 1961/62 was mainly the result of a 45.4% rise during the last year. The strongest element in this trend has been the consistent increase in tuna canning, which, in 1961/62, was 179% greater in weight than it was in 1957/58.

"Statistics of persons engaged in fisheries in Australia record an 18.5% increase in numbers between 1959/60 and 1961/62.

Prospects for the Industry

"The major expansionary movement in the foreseeable future will probably be centred on crustaceans and molluscs, owing to the difficulty of expanding the fish catch in Australia very much further, with the possible exception of tuna. Production of crayfish is expected to continue its rising trend, and development plans recently announced for the Northern Territory may also considerably expand future prawn hauls, and thereby give a further boost to our export market.

"Valuable hauls in a recently discovered scallop field in Port Phillip Bay may well result in Victoria making an important contribution to scallop production in the near future. Most of the recent catch is being "snap-frozen" for export. However, the recent lifting of sales tax on imported canned fish is expected to have an adverse effect on the local canning of barracouta and salmon, and may cause a reduction in the catch of these varieties."

STRAW NECKED IBIS

Mr. A.J. Bateman reported that on November 10 he saw a large flight of Straw necked Ibis flying south, parallel with Brentwood Road, Wattle Grove. There were between 80 and 100 birds in a V formation, 200 - 300 feet up. He said that he had not seen such a large aggregation of this species previously.

NOTES FROM NEWSDolphin Aground in Swan River

Last month two boys walking along the foreshore of the Swan River found an 8 ft. dolphin stranded on a sand-bank 500 yards from the shore in Lucky Bay. Their attempts to move the dolphin, which weighed approximately 350 lb., to deeper water were unsuccessful. While the boys' father contacted this Department for assistance, the boys splashed water over the dolphin to keep it from drying out in the hot sun. In the opinion of Inspector R. Hammond, who had arrived to supervise rescue operations, their action probably saved the dolphin's life. A sling was made of bags and the dolphin was eventually carried to deeper water and released. It was last seen swimming towards Fremantle.

The appearance of dolphins in the Swan River is becoming less frequent. The schools which in the past could be seen chasing fish over shallow banks, rubbing against buoys and piles, and drawing cries of delight from children on the pleasure ferries around which they would frolic, are becoming fewer. No sound explanation for the dolphins' apparent reluctance to move up river has been advanced. However, as we are told that these mammals communicate by emitting high frequency sounds, it is possible that the increased number of pleasure craft using the Swan River, particularly those propelled by high-powered motors, could have a disturbing effect on the dolphins and their method of communication. On the other hand, ecological changes wrought in the river by the advances of civilization may be a prime factor.

The Short-Necked Tortoise



Pictured above from left: The Director Mr. A. J. Fraser, the Minister for Fisheries (Mr. Ross Hutchinson), Mr. A. C. Shedley, Chairman of the Zoological Gardens Board and Dr. W. D. L. Ride, Director of the Western Australian Museum.

On November 21, at the South Perth Zoological Gardens, the Minister for Fisheries (Mr. Ross Hutchinson) officially handed over thirteen Short-necked Tortoises to the Chairman of the Zoological Gardens Board.

CLEARING HOUSE

REARING YOUNG MARSUPIALS

Accidents happen, even in the best regulated families. Sometimes it happens in the animal world too.

Our native marsupials - kangaroos, possums, wombats and others - get hit by cars or killed in other ways. Then when the body is examined, it is sometimes found that there is a baby in the pouch. The question then is, what is to be done to save the young animal.

We asked the Wildlife Research Officer, Bob Warneke, who has prepared the following notes for us.

It should be remembered that, with the exception of the wombat, all marsupials are protected, and to have them in your possession is illegal. Apart from this aspect, members of the public who come across orphan marsupials would be well advised to contact the Wildlife Laboratory at the Department if they wish the animal to have a chance of survival. - Ed.

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Feeding - Many people claim that cow's milk is completely unsuitable for rearing the young of other animals. While it may not be the best substitute, it can be used with success, as we have shown in the Wildlife Laboratory on many occasions. We use diluted milk, usually two parts of milk to one of water or a three and one mixture, at first, and then gradually change to undiluted milk. A little glucose and a drop of Pentavite is added. The mixture must be warmed to blood heat. Scouring can be controlled by the use of Kaomagma (obtainable at chemists, or by burnt flour or charcoal as alternatives) As a rule the young orphan should be fed at three or four hour intervals. *(handwritten: have to be about 8oz liquid)*

There are considerable differences in response to artificial feeding in young marsupials. For instance, young wombats are quite hardy and do not appear to develop digestive upsets as readily as do young kangaroos. The formula fed to a young wombat being reared in the Laboratory at the present time is the cream off ordinary pasteurized cow's milk, a little glucose and a drop of "Pentavite": this is a very rich mixture, but she is thriving on it. At the beginning she was started off on straight cow's milk.

Feeding Apparatus - When milk feeding an orphan marsupial, one must try to simulate the mother's nipple, which in most marsupials is long and thin. The nearest approximation to this is a length of valve rubber, but even this is too large

for the very small species, such as the Feather-tailed Glider, and the best one can do is to use a fine eye-dropper. Small kangaroos learn to suck at a calf teat very readily. Rubber teats used for human babies are an impossible shape.

Weaning - The change over to adult fare should not be too sudden. The presence of teeth does not necessarily mean that solids are required. However, when the young one starts to explore its surroundings, and becomes adventuresome, it should be given the opportunity to feed on adult fare. With kangaroos, for instance, it is quite a good idea to include grass with the bedding and the baby can then start to nibble if it feels inclined. Given the opportunity and a little help, many young animals will pass through this stage quite easily, but for some species weaning is a specialised process. With the koala for example, the female parent provides pre-digested leaves for its young during the period of transition to adult diet. Rearing an unweaned koala would be a very difficult job indeed.

Kangaroos and the common species of possum are easy to please. Many of the small or less common marsupials are often difficult to provide for. So little has been written on the diet of our native animals, that most people cannot be expected to know what a particular species eats. Our tiny bats, perhaps more than other native mammals, suffer through this lack of knowledge. Biscuit, bread and fruit are a complete waste of time, and although exclusively insect feeders just any insect will not do. Suffice to say that the food items offered a young animal approaching weaning must be the normal adult fare or as near a substitute as possible.

Warmth is absolutely essential. Because of the difficulty in maintaining a constant temperature using hot water bottles, the nuisance of refilling during the night and probability that this chore may be forgotten at times, it is better to use a screened pilot light globe of about 15 watts as a heat source. We use a strong cardboard box with the globe mounted beneath a false bottom. The young marsupial is placed in the upper compartment where the temperature should be about 90 deg.F. This can be regulated by using more or less padding in the box or by moving the globe nearer to or further from the false bottom.

Oiling - The skin of unfurred young and of those where the fur is just beginning to show, is very fine and delicate. In the mother's pouch it is kept in a moist condition but in the open air it will dry quickly, crack and flake. The young one should be oiled probably each time it is fed. Olive oil is suitable, baby oil even better.

Wrapping Cloth - The young marsupial should be kept wrapped in a soft, clean cloth but while the skin is tender, wool or harshfibred material must be avoided because these may irritate. For very small pouch young, oiled silk as the first wrapping has been used with success. Young marsupials prefer to be firmly wrapped but care should be taken to avoid smothering. Young kangaroos that are well furred are usually quite happy in a hessian bag hung up in a suitable place and slit across the front to simulate the mother's pouch. A few clean rags in the bottom of the sack make them quite at home.

"Tender, Loving Care" - Finally, the point must be made that the amount of attention given to an orphan marsupial is very important. There appears to be a need of it, possibly because there is a close physical contact between mother and young during the period of dependence. This need for contact is easily demonstrated. For example, if a young dependent Ring-tailed Possum is removed from the mother, it will utter cries of distress, but if picked up and enclosed in one's hands it will cease to "cry" and lie still.

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This rough outline is drawn from the experiences of a number of people as well as those in our own laboratory. Many people who have come into the possession of a young marsupial and have accepted the challenge, and used both care and commonsense, have often been very successful. However, if the young one has been hurt or is in shock or has been neglected for a period, it will often die despite all efforts. Again, seemingly thriving young will die without warning. There is usually no simple explanation for this.

(Fur, Feathers & Fins

Victoria

October 1963)

REPORT ON FISHING INDUSTRY IN S.W.A.

The presence of white fish and the value of catches off the shores of South West Africa are discussed in a White Paper on the activities of the different branches of the South West Africa Administration which was tabled recently in the Legislative Assembly in Windhoek by the Administrator, Mr. D.T. du P. Viljoen.

The White Paper states: "As in the past the white fish industry of South West Africa has had to cope with many problems and as always its products have had a limited sale in the Territory.

"Not only during the year did catches decrease considerably but the fishing boats also had to go further and yet further afield to look for fish. During 1962 the white fish fleet operated as far north as the Kunene River. Naturally, such conditions caused a considerable increase in the operational costs of the fishing industry.

"The catch during the year totalled about 590,641 lb, the value of which amounted to approximately R41,435. The catches were made up mainly of kabeljou and steenbras."

Dealing with snoeking operations off the coast of South West Africa, the White Paper said: "The demand for snoek is relatively uncertain but during this year two new markets for lean snoek were developed - the Congo and the Far East. Mauritius is still one of our best overseas markets for fat snoek and every effort is consequently being made to supply this market with our best.

"It is difficult to give reliable figures for the snoek catches during the year but they amounted to approximately $4\frac{1}{2}$ million lb. Other fish species - mainly maasbanker, harders, sharks, etc. - formed part of the catches to the extent of approximately two million lb. These species, as is known, are sold to the rock lobster industry for bait.

"The pilchard industry at Walvis Bay has again had a successful 1962 season," stated the report. "As the factories received an additional quota of 60,000 tons of fish for the 1962 season, catches amounted to 435,000 tons. The boats had no difficulty in hauling in this tonnage which indicates that the availability of pilchards off the coast remains high.

"Because of the increase of tonnage of processed fish meal and the decrease in canning activities, fish meal production reached a new record figure of 98,773 short tons. The demand for fish meal increased continually and satisfactory prices were obtained. The total 1962 production was sold at an estimated price of R6.9 million. The most important markets were the European continent, Britain, Israel, U.S.A., Australia and the Far East.

Fish Oil

"As regards fish oil production, the industry also had a record season. The oil content of the pilchard was slightly higher than in 1961, and, coupled with the higher fishing quota, this enabled a production of almost 24,000 long tons of fish oil. The United Kingdom remains our best buyer of fish oil and of this commodity the whole 1962 production has

been sold and shipped. The estimated value of the season's production is R1.8 million.

"As a result of the decreased demand for canned fish, production was lower during 1962. Considerable supplies of this product remain unsold, but according to estimates they will be sold by the beginning of the 1963 season. Great Britain, the Philippines, the U.S.A., and Western Europe remain the most regular buyers of the canned fish. The value of the 1962 yield is estimated at R12.1 million.

"The competition offered by the Peruvian fishing industry is having a strong influence throughout the world. Available figures indicate that Peru's catches during this year will exceed the four million ton mark. Due to an efficient marketing organisation and a progressive development policy the South and South West African fishing industry succeeded in countering its problems and in consolidating its position."

Dealing with the South West African rock lobster industry at Luderitz the White Paper said: "This industry has also had a successful season. The catches exceeded those of 1961 by more than three million pounds in weight and the prescribed quota was reached for the first time in ten years. The total catch of about 16 million lb. by weight was processed into about four million lb. of frozen tails and 320,000 lb. of canned rock lobster.

"The demand for rock lobster products overseas remains unchanged and the disposal of the product creates no problems. Good prices were again obtained in 1962 and the value of the year's yield came to approximately R3.2 million, which is a considerable increase over that of the previous year."

(The South African Shipping News
and Fishing Industry Review.

June, 1963)

CONSERVATION

Harold Titus

THE LEAST OF THESE ... Look for the U.S. Fish and Wildlife Service to establish a series of National Wildlife Monuments to protect the habitat of threatened species. Not immediately, but soon. Over 100 amphibians and reptiles, 55 species of fish, perhaps two dozen kinds of birds, and 15 or more mammals are living precariously from generation to generation because they don't have the kind of habitat they need.

Few are important to the average hunter or fisherman, but the matter goes beyond creel or bag, and the great majority of outdoorsmen want all species to survive. Those threatened range from the little garden salamander of the Los Angeles area through the humpback chub of the Colorado River to the everglade kite of Florida and the hard-pressed remnant of Tule elk in central California. All are important to the American scene.

More than 150 wildlife areas are being considered for the programme. No doubt co-operative agreements with states will be a large factor in selection of the refuges; Michigan's action in setting aside an area in the Huron National Forest for jackpine management that will keep the Kirtland's warbler happy is an example of what may be accomplished.

Not a major undertaking, this is just one more activity that will add to the enjoyment of thousands who use the outdoors and find it good to the last drop.

(Field & Stream

New York

September 1963)

FOLLOW JAPAN ON TUNA FISHING SAYS GALLAGHER

Australia needs big money syndicates to develop its tuna fishing industry to the maximum says Queensland Fish Board manager Noel Gallagher.

He said this was the Japanese method and it had made them world leaders in the field.

He did not believe that the individual boat ownership system in Australia could hope to achieve the same results.

Mr. Gallagher returned this month from a six-weeks private study tour of the Japanese fishing industry.

All Aspects

He examined every aspect of the industry including fishing, preservation, marketing, distribution, processing, and canning.

Mr. Gallagher said that some of these things were very impressive, and Australia could learn from them. But, in processing, it was Australia who could do the teaching.

Scientific Fishing

Mr. Gallagher said that the Japanese tuna boats ranged 1,000 to 6,000 miles from their ports and stayed at sea for six to nine months at a time.

They fished with great accuracy, relying on the scientific study of water temperatures and currents. Their ability was the envy of many countries.

Mr. Gallagher said he was not prepared to say Australians could not compete with the Japanese in tuna fishing.

Australians had proved that once they attained the right frame of mind they could develop an industry correctly, as had happened with prawns.

Despite past pessimism, they were now catching prawns and exporting them all over the world - even to Japan.

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Meanwhile, a Tasmanian fisherman has come back from a visit to Japan convinced that if Australia wants to make more of the fishing industry, it should start with education.

He said that Japan's fishing fleets were manned by highly skilled men who had taken courses at high schools and universities and at a special institution.

In the view of Mr. H.B. Burgess, who is vice-chairman of the Eastern Tasmanian Fishermen's Co-operative, the Commonwealth Government should establish an Australian fisheries school.

Having seen Japanese fishing trawlers call in at Hobart a few months ago, Mr. Burgess was naturally interested to visit the headquarters of the fleet at the port of Yaizu.

He saw tuna being unloaded from boats which had operated south of Hobart.

Ships from this port were working off both the east and west coasts of Tasmania.

POSER FOR THE TARIFF BOARD!

If fishermen and wholesalers are NOT getting a reasonable reward for their efforts "Who is making the profit on prawns?"

This was the poser the Wu Hop Trading Company of Sydney put to the Tariff Board in Canberra this month when the Board heard an application by fishermen for a duty on imported prawns.

Earlier, at a hearing in Brisbane, the Board listened to evidence by fishermen that prawns from cheap coloured-labour countries were threatening their industry.

A New Excuse

Understandably, a duty on imported prawns has always been part of fishermen's policy but urgency was given the matter when the August Budget abolished Sales Tax on food-stuffs.

This automatically affected prawns which were "protected" by a 12½ per cent sales tax.

The fishermen fired their biggest guns when the Tariff Board sat in Brisbane.

The main witnesses were Queensland Fish Board chairman, A.T. Fullagar, Licensed Boat Owners and Skippers' Association president, O.W. Riesenweber and Jack Parry, managing director of Peninsula Food Products Pty. Ltd., prawn processors of Woody Point.

They suggested a duty of 1/10½ to 2/- a lb, which is equal to the Sales Tax plus a bounty.

Other Side

At Canberra, the Board got the other side of the story from Mr. B.H. Evans, representing the Australian Tariff Council who said that imported prawns could be "a red herring drawn across the trail of internal competition."

He said there was something wrong with the Australian prawning industry, which after taking all the steps necessary to withhold and store prawns in good season, found itself sold out well before the season re-opened.

Mr. Evans said the plea for assistance for the Australian prawning industry by way of duty on imports did not appear to gain any backing from the development and available information on its present situation.

The statistics on the industry showed a bountiful development of the export market at prices which could do little but suggest a continuing shortage of prawn meat at reasonable prices on the Australian market.

Merchants in Sydney, who had developed prawn distribution businesses for servicing Chinese cafes, hotels and restaurants, which comprised the major points of consumption, had been treated somewhat cavalierly with regard to the local prawn supply and had been forced to resort to develop an import business to satisfy local customers, Mr. Evans said.

In opposition to the application, the Wu Hop Trading Company Pty. Ltd., of Sydney, told the board that it was chiefly concerned with supplying prawns to chinese cafes in N.S.W.

"Our company, opposing the increase of tariff, is well aware of the hardship of the local fishermen, but we disagree that imported prawns are the factor which causes the fishermen to get a lower price for their labour," it said.

"If the fishermen and the wholesalers, like us, are not getting a reasonable reward for their efforts we respectfully ask the board to look into the question of 'who is making all the profit?'"

The board reserved its decision.

(Fish Trades Review

Sydney

October, 1963)

GULF PRAWNING DISAPPOINTING

Gulf of Carpentaria prawning has been described as "a washout" and a "dead loss" by Bundaberg fisherman Bert Olsen of the trawler Jenny Ann. He said he was in the Gulf for two weeks before returning home.

"I shot the net five or six times and caught 13 prawns. I estimate those prawns cost me £1,000."

Mr. Olsen said that as far as he knew the 100ft mother ship Lakunuki, brought 3000 miles to the gulf from Western Australia, did not have a prawn in her freezing chambers.

Survey Boat

The trawler Rama, chartered by the Queensland and Federal Governments to survey the grounds is still in the Gulf but Mr. Olsen claims the Rama has found nothing worthwhile.

"I think the prawns are there, but only in the right season," he said. "The locals tell us that they have seen plenty of prawns just before and during the 'wet.'"

(Fish Trades Review Sydney October, 1963)

UNDERSIZED CRAYS SOLD IN SYDNEY

Undersized crayfish and female crayfish with the spawn berries removed are being taken from Flinders Island and sold in Sydney, a recent report in the Launceston "Examiner" claimed.

The report, quoted a Lady Barron (Flinders Island) fisherman, said to be the spokesman for the majority of fishermen on the island, as the authority for the claim.

The "Examiner" said that only a few of the 18 fishermen operating on the island are disobeying the conservation laws and bloodshed is feared unless the Tasmanian Government sends a Fisheries patrol boat to straighten out the trouble.

Fisheries inspectors have not visited the island for five years, so the "Examiner" said.

Tasmania's Fisheries Minister, Mr. Atkins, has since sent investigators to Flinders Island and is hoping that uniform laws governing the size and seasons for crayfish will be introduced all over Australia in the near future.

This will allow N.S.W. Fisheries inspectors to seize undersized or "berried" crays from other States.

(Fish Trades Review Sydney October, 1963)

DUCK SHOOTERS' GUIDE - 1963/64.

THE OPEN SEASON

OPENING:

The 1963/64 season will open -

- (a) at 6 p.m. in the evening of Saturday, December 21, in the Shires of Augusta-Margaret River, Balingup, Bridgetown, Busselton, Capel, Collie, Dardanup, Greenbushes, Harvey, Manjimup, Nannup and Preston;
- (b) at 5 a.m. in the morning of Sunday, December 22, in the remainder of the South-West and Eucla Land Divisions, not included in the Shires named.

CLOSURE:

Unless otherwise proclaimed, the season will close throughout the whole of the Eucla and South-West Land Divisions at midnight on April 30, 1964.

SPECIES INCLUDED IN THE OPEN SEASON:

Whistling Tree-Duck (Dendrocygna arcuata)
Plumed Tree-Duck (Dendrocygna eytoni)
Mountain Duck (Tadorna tadornoides)
Black Duck (Anas superciliosa)
Chestnut Teal (Anas castanea)
Grey Teal (Anas gibberifrons)
Blue-winged Shoveler (Anas rhynchos)
Pink-eared Duck (Malacorhynchus membranaceus)
Freckled Duck (Stictonetta naevosa)
White-eyed Duck (Aythya australis)
Blue-billed Duck (Oxyura australis)
Musk Duck (Biziura lobata)
White-headed Shelduck (Tadorna radjah)
Wood Duck or Maned Goose (Chenonetta jubata)
Pied or Magpie Goose (Anseranas semipalmata)
Green Pygmy Goose (Nettion pulchellus)

PROTECTED SPECIES:

The Cape Barren Goose, the Black Swan and the White Swan are the only members of the family of ducks and geese which are not included in the open season. They are fully protected at all times. In this State the Cape Barren Goose normally occurs only on the islands of the Recherche Archipelago, a sanctuary for fauna, where all shooting is prohibited.

BAG LIMIT:

15 ducks per person per day.

ILLEGAL MEANS OF CAPTURE:

This season, the only legal method of taking wild ducks will be by the use of a shotgun. All other means of capture, whatsoever, are illegal. Spotlights are an illegal aid to duck-shooting and will be seized.

CLOSE AREAS:

Duck shooting is prohibited in all the following areas which have been set aside as refuges.

GENERAL AREAS:-

- (a) All municipalities and townsites in the South-West Land Division.
- (b) All State Forests, timber reserves, town reservoirs and other areas where shooting is prohibited under the provisions of any other Act, regulation or by-law.
- (c) The whole of the area within a radius of 20 miles of the General Post Office, Perth.
- (d) The whole of the Rockingham Shire.

SPECIFIC AREAS:-

Albany Shire -

- (e) The whole of the waters of Lake Seppings and all land within 20 chains of its shores.
- (f) The whole of the waters of Nannerup (or Taylor) Inlet and all the land within 20 chains of its shores.
- (g) The whole of the waters of the King and Kalgan Rivers and all land within 20 chains of their banks.
- (h) The whole of the waters of Oyster and Princess Royal Harbours and all land within 20 chains of their shores.

Balingup Shire -

- (i) The whole of the area within a radius of one and one-half miles from the Post Office at Balingup.

Busselton Shire -

- (j) The whole of the waters of Vasse and Wonnerup Estuaries and all land within 20 chains of their shores.
- (k) The whole of the waters of the Vasse River and all land within 20 chains of its banks.
- (l) The whole of reserves 3872 and 3876 in the Broadwater.

Capel Shire -

- (m) All that portion of the Capel River between the Capel and Stirling bridges and all land within 20 chains of the river's bank.

Dandaragan Shire -

- (n) The whole of Caro Swamp and all land within 80 chains of its shores.

Dumbleyung Shire -

- (o) All that portion of the Coblinine River downstream from the eastern side of the bridge at the junction of road 3375 and road 323 (Oxley Road) to its mouth at the high-water mark of Dumbleyung Lake and all land within 20 chains of that part of the river's banks.

Gingin Shire -

- (p) The whole of the waters of Lakes Nambung, Bambun and Mungala and all land within 20 chains of their shores.
- (q) The whole of Swan Location 2340 including Wallering Swamp.

Harvey Shire -

- (r) All those waters of the Leschenault Inlet extending southwards from a line drawn south-east from Waterloo Head (Belvedere), on the west foreshore to a point on the opposite foreshore and all land within 20 chains of the included foreshores.
- (s) The whole of the Harvey Catchment area.

Mandurah Shire -

- (t) The whole of the area within a radius of 2 miles of the Post Office at Mandurah.

Mundaring Shire -

- (u) The whole of the waters of Lake Leschenaultia and all the land within 20 chains of its shores.

Murray Shire -

- (v) All that portion of the Serpentine River from road 8629 at the southern end of Goegrup (Willies) Lake to Peel Inlet near the Old Mill and all the land within 20 chains of the river banks.

Rockingham Shire -

- (w) The whole of the shire of Rockingham.

Toodyay Shire -

- (x) All that portion of the Avon River in the Toodyay District, between the northern boundary of Avon Location 3 and a point opposite road number 2069, and all land within 20 chains of the river banks.
- (y) All that portion of the Avon River from Dumbarton Bridge to the Railway Bridge, north of Toodyay and all land within 20 chains of the river banks.

Upper Blackwood Shire -

- (z) The whole of the area within a radius of 2 miles of the Post Office at Boyup Brook.

Wanneroo Shire -

- (aa) The whole of the Yanchep Caves Reserve.

Wickepin Shire -

- (ab) The whole of the waters of Lake Yealering and all land within 20 chains of its shores.

Woodanilling Shire -

- (ac) The whole of the waters of Wardering Lake and all land within 20 chains of its shores.

GENERAL:

- (a) Wild ducks are not to be kept in captivity except under special license;
- (b) The sale of wild ducks is forbidden;
- (c) A person shall not drive any bird over shooters by means of motor vehicles, aircraft, power boat or other means;
- (d) A person shall not take more than fifteen wild ducks on any one day.

NOTE:

A continuous open season applies throughout the Kimberley, North-West and Eastern Land Divisions. For further details apply to the Department of Fisheries and Wildlife, 108 Adelaide Terrace, Perth.