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DEPARTMENT OF PARKS AND WILDLIFE

FISHERIES DEPARTMENT, WESTERN AUSTRALIA

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MONTHLY SERVICE BULLETIN

Vol. V, No. 3.

March, 1956

STAFF NOTES

The Superintendent (Mr. A.J. Fraser) will attend a field day conducted by the Serpentine-Jarrahdale Trout Acclimatisation Society on Sunday, March 18. On March 20, accompanied by the Chief Vermin Control Officer, Mr. A.R. Tomlinson, and Fauna Protection Officer H.B.S. Shugg, he will leave for an inspection of the Lakes Clifton - Preston area. During the inspection the party will meet the Mandurah, Murray, Drakesbrook and Harvey Road Boards, to discuss with them the proposed national park and fauna reserve between Mandurah and Bunbury. On March 25 the Superintendent, together with Clerk-in-Charge B.R. Saville and Technical Officer J.S. Simpson, will attend the quarterly meeting of the Trout Acclimatisation Council of W.A., at Bridgetown.

The Supervising Inspector, Mr. J.E. Bramley, and Technical Officer J.S. Simpson visited Broke Inlet and investigated a report of depletion of fish stocks. They left Perth on February 21 and returned on February 25.

The Clerk-in-Charge, Mr. B.R. Saville, left Perth on February 28, for an inspection of the crayfish processing works and grounds at Lancelin Island. He is expected to return on March 2.

Inspector S.W. Bowler recommenced duty at Mandurah on February 27, after annual leave. During his absence Inspector R.M. Crawford was in charge of the Mandurah district.

Inspector Crawford will take over the Geraldton district early this month. Inspector B.A. Carmichael will remain at Geraldton for a short time to assist Mr. Crawford, and then transfer to Perth for other duties.

Mr. R.M. Morton has been appointed Inspector, Grade 1, and commenced duty as Pearling Superintendent, Broome. Accompanied by the Relieving Inspector, Mr. A.K. Melsom, he arrived at Broome on February 9. After acquainting Mr. Morton with local conditions and introducing him to pearling personalities, Mr. Melsom returned to Perth on February 22.

Mr. D. Coppard has been selected for appointment as a temporary Assistant Inspector. He is expected to commence duty early this month.

Mr. B.K. Bowen of Head Office commenced one week's annual leave on February 27. Miss Pamela Pegrum, also of Head Office, resumed duty after annual leave on February 20. Assistant Inspector T.B. Baines will commence annual leave on March 5. Cadet Inspector L.W. Duncan, who has been on sick leave since January 3, is expected to return to duty on March 6.

Assistant Inspector G.H. Lyon and Cadet Inspector K. Kunzli brought the p.v. "Kooruldhoo" to Fremantle from Cervantes on February 19. She was slipped for an overhaul and, when repairs to her hull are completed, her crew will sail her to Geraldton for the Abrolhos season about March 7.

PERSONAL PARS

Retirement of Mr. M. Goodlad

It had been intended to present Mr. Goodlad with the combination barometer, thermometer and hydro-meter and a cigarette lighter (purchased from subscriptions received from his fellow officers) at the social evening which terminated the Inspectors' Annual Conference last January. Unfortunately, however, due to Mr. Goodlad's being at the time under medical treatment, he was unable to attend and the presentation was sent to him per favour of Inspector Gallop. The following letter was forwarded to Mr. Goodlad by the Superintendent and Mr.

Goodlad replied expressing his appreciation in a letter which is also quoted hereunder :-

" Dear Mr. Goodlad,

I would like, on the occasion of your retirement from the public service, to express to you the Department's very keen appreciation of the very valuable service you have rendered as fisheries and pearling inspector since you entered the service in 1938.

Initially, of course, you were appointed to act as whaling inspector on the factory-ship "Frango" operating in Shark Bay during the 1938 season. Your association with this venture was far from easy, because of the large number of undersize and border-line whales hauled aboard. Nevertheless you carried out a difficult task in a most conscientious, fearless and efficient manner.

Following this you were appointed to patrol the snapper fishery at Safety Bay, a duty you carried out very satisfactorily.

After your appointment to the permanent staff you served at different times as fisheries inspector at Perth, Fremantle, Geraldton, Bunbury and Mandurah, at each of which centres you did an excellent job.

Your transfer to Broome as pearling superintendent was made about seven years ago. Despite the difficulties encountered here you carried on in a most efficient manner, regardless of one or two bouts of illness and much personal inconvenience.

I must say that your retirement will leave the Department much poorer.

I am very sorry, as indeed are all members of the staff, that you were not able to visit Perth last week to receive the personal felicitations of your brother officers. They have subscribed to a testimonial, and Mr. Gallop has been asked to deliver to you a small token of their esteem and

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good wishes in your retirement.

I am,

Yours very sincerely,

(sgd) A.J. Fraser

Superintendent of Fisheries."

" Dear Mr. Fraser,

I would like to thank you for your letter and gift received on the occasion of my retirement from your Department. They have given me much pleasure.

I appreciate the kindness and thoughtfulness of you and your staff and value your good wishes for my future.

My service with the Department and association with its staff has been a happy one for me and I enter my retirement with many pleasant memories.

Will you extend my sincere appreciation to all members of your staff.

I am,

Yours sincerely,

(sgd) Matthew Goodlad "

Biologist Nears End of Visit

Mr. W. Dall, biologist of the Division of Fisheries and Oceanography, C.S.I.R.O., who has been on board "Lancelin" at Exmouth Gulf since early in the year studying the prawns in that area, will return to his headquarters at Cronulla, N.S.W., on March 4.

Visitor to Perth

Dr. G.F. Humphrey, the new Chief of the Division of Fisheries and Oceanography, C.S.I.R.O., arrived in Perth for a short visit on February 13. He inspected the regional laboratory and made contact with his staff and also called on the Superintendent (Mr. A.J. Fraser). While he was in Perth, Dr. Humphrey announced that his Division would undertake a ten-year research programme to determine the basic factors which cause fish movement. He said that fish were continually on the move in Australian waters, but that very little was known of the factors which caused it, with the result that the Australian fishing industry was severely handicapped. Dr. Humphrey said that the programme would finally answer the question as to whether Australia had the huge fishery resources often attributed to it, and, if such resources did exist, whether they could be exploited economically. Dr. Humphrey returned to Cronulla by air on February 16.

* * * * *

PRAWNS - PROPOSED ABOLITION OF MINIMUM
LEGAL LENGTH IN N.S.W.

Towards the end of 1955, Mr. D.S. Hunt, owner of the freezer-boat "Jon Jim", visited New South Wales and Queensland to enquire into methods of prawn-trawling and cooking and processing of prawns. This visit followed a few weeks with "Jon Jim" in Exmouth Gulf testing, in conjunction with our research vessel "Lancelin", the commercial possibilities of prawns in that area.

On his return to the West, Mr. Hunt mentioned to the Superintendent that he had been advised while in the East that the New South Wales Fisheries Department had decided to remove prawns from the Schedule of Minimum Length, i.e., that no legal minimum length would in future apply to prawns in that State.

In reply to a subsequent enquiry by the Superintendent, his colleague in Sydney (Mr. N.V. Harris) stated that a proposal to abolish the legal minimum lengths of prawns ($3\frac{1}{2}$ " green and $3\frac{3}{8}$ " cooked) was being considered, but that no decision had been taken pending the receipt of replies to a reference by his Department to the various

fishermen's co-operatives.

Mr. Harris pointed out that the proposal originated with his Department's marine biologist (Dr. Racek) who had been studying prawns for the past two years. The biologist had found, he said, that school and king prawns were all immature when in the estuaries. He contended there was no biological reason for these two types to enter the estuaries at all, as the bulk of the population lived out their entire lives in ocean waters. Tiger prawns, continued Mr. Harris, had been found always to remain in ocean waters, and never to enter the estuaries. The existing minimum length, he believed, failed to protect the immatures, as the three main commercial species did not reach maturity under the following approximate sizes -

School prawn	5" to 6"
King prawn	8" to 9"
Tiger prawn	8" to 9"

Mr. Harris went on to say that although there might be sound reasons from the scientific angle for abolishing the existing minimum sizes, many other factors would need to be considered. These included the economics of the fishery, the possibility of flooding the market with very small and (from the buyer's standpoint) undesirable prawns, and the ability of the marketing organisation to handle substantially increased catches.

"Fish Trades Review", the official organ of five of the fish distributors' organisations, both wholesale and retail, in New South Wales, in its issue of January, 1956, has this to say in relation to the Department's proposals -

"Spontaneous protests by fishermen and the N.S.W. Master Fish Merchants' Association against a proposal to remove restrictions on the capture and sale of prawns - irrespective of length - should act as a warning light to the authorities to consider all aspects of the industry before making a change."

It quotes United Fishermen's League secretary Facey as saying -

"Fishermen are 100 per cent against the proposal

mainly because small prawns would glut the market and spoil the price of quality prawns."

The outcome of the proposal is awaited with interest, not only by fishermen in N.S.W. but also by those working in all other States of the Commonwealth.

THE "WHITE" CRAYFISH

Most of us have heard many theories concerning the so-called "white" crayfish. The Department's view, of course, is that it belongs to the same genus and species (Panulirus longipes) as the ordinary red Westralian crayfish, and that it is merely a developmental stage. Many fishermen, on the other hand, are firmly convinced that the two kinds are quite distinct. Their opinion is based on a belief that there are marked differences in behaviour.

Mr. R.W. George, of the Division of Fisheries and Oceanography, C.S.I.R.O., who has devoted the major portion of his official career to the study of our crayfish, has been asked to set down in black and white, for the information of the staff, the sum of his knowledge of the so-called "white" crayfish. The following is a note prepared by Mr. George. We are greatly indebted to him for his kindness in making this material available for publication.

(i) "White" Crayfish Characteristics

During the late spring, for a period of approximately three weeks, there exists on the Western Australian coast an intensive fishery for a particular type of crayfish, commonly called "white" crayfish. These crayfish are pale in colour, readily distinguished in colour only at the beginning of the "run" from the red crayfish (Panulirus longipes) caught in the deeper waters later in the crayfishing season.

The "whites" are usually caught on a sand bottom and a pot set accidentally on reef bottom yields only red crayfish. These pale crayfish are restricted in their size, ranging from $2\frac{1}{2}$ to $3\frac{1}{2}$ ins. in carapace length. Fishermen have not caught "white" crayfish below $2\frac{1}{2}$ ins.

and rarely obtain "whites" above $3\frac{1}{2}$ ins. in carapace length.

During the period in which "white" crayfish are caught, the reds are in berry, i.e., they have spawned and have the bright orange eggs adhering to the pleopods of the abdomen. From visual observation, the ovaries of "white" crayfish are not mature and mating has not taken place, i.e., the females have not acquired sperm packets.

(ii) Economic Importance

During the "white" crayfish season (approximately November 20 to end of December), the catch of "white" crayfish along the coast is of the order of 2,000,000 lb. live weight. This quantity represents approximately one-fifth of the total production of all crayfish throughout the nine months' open season. The catch of "white" crayfish, therefore, in the eyes of the fishermen, is most important from the financial aspect.

(iii) Fishermen's Theories

Almost all fishermen are of one mind when the question "What are 'white' crayfish?" is put to them. They consider that these crayfish are a separate kind (species) of crayfish altogether from the reds, that they move in from deeper water towards the coast (some men say they have seen them swimming on the surface on calm nights) generally arriving on the northern part of the coast before the southern areas. The "whites" then move out towards the deeper water, the catches decrease until the "whites" are gone and never return to the shallows again.

(iv) Tagging Results

During the "white" crayfish season in November-December, 1953, a number of co-operative fishermen tagged altogether approximately 20,000 undersize "white" crayfish. There were many recaptures of these marked crayfish within a short period after release, and it was shown that in one area there was a definite movement of individual tagged fish from the shallow areas where they are first caught, to deeper waters, four miles from their release point, in only fourteen days.

Closer co-operation was made with one particular fishing boat in the Fremantle area following this initial tagging programme. Of the 1,000 undersize "white" crayfish released during December, 1953, by this boat in the vicinity of Carnac Island, seven were recaptured in December, 1954. These were still "white" and were caught in the same general area. They had grown to approximately 3 ins. in carapace length.

This fishing boat continued marking in December, 1954, a total of 1,770 crayfish being released in the same Carnac Island area. Close examination of their catches during the last "white" run in December, 1955, resulted in the recovery of 64 "white" crayfish and two red crayfish which had been released the previous year, and one "white" crayfish was recovered which had been marked in December, 1953.

The carapace lengths of all these crayfish were measured and the mean carapace length of the "whites" was 3.03 ins. From measurements of the tagged undersize crayfish released in December, 1955, the mean length of the carapace was then 2.70 ins. Assuming the size distribution of the undersize crays marked in 1954 and 1953 to be similar, these crayfish increased their carapace length by .33 ins., or 12%, in 12 months.

Relevant points accumulated as a result of tagging "whites" are as follows -

a) Recovery rate of tagged crays can be relatively high if the same areas are fished, and if every cray caught in the craypots is closely examined.

b) Undersize (below $2\frac{3}{4}$ " in carapace length) "white" crayfish can be caught in the following year and still be pale in colour.

c) Fewer fish can be caught with the true "red" colour during the "white" run.

d) Individuals move out from shallow areas into deeper waters as the season progresses.

e) A crayfish can be caught as a "white" crayfish at least two years after its release as a "white".

f) The average annual growth increment of undersize crayfish is of the order of 0.33 ins. in carapace length, or 12%.

(v) Additional Data

The majority of "white" crayfish have clean and relatively soft shells compared with the hard encrusted shells of red crayfish.

An examination of the stomach contents of "white" crays landed at the Lancelin processing factory in the early part of December, 1953, revealed the presence of hair and hock meat which had been used for bait in the pots. One stomach of the twenty examined showed remnants of old exoskeleton* - setae and parts of the antennae. Two "white" crayfish stomachs examined at Rottnest on November 26, 1953, contained a large quantity of setae and antennae. These crayfish were caught by hand. Two red crayfish caught at the same time had in their stomachs fish remnants - scales and flesh.

Eight red crayfish caught on the Rottnest reefs at night after feeding had in their stomachs crustacean fragments (not crayfish), worms, echinoderm spines, pieces of coral and ulva, Euplica (molluscs), shell fragments and flesh.

On November 26, 1953, two cast shells of crayfish were found in ten feet of water in Salmon Bay, Rottnest. Another two were found on November 24, 1954, in Fish Hook Bay, Rottnest, while diving in twelve feet of water. Since November, 1954, monthly underwater surveys in the Salmon Bay area have been made, and no cast shells have been found.

On the weekend of November 19-20, 1955, spearfishermen at Geraldton reported many very soft and very pale crayfish living in shallow water reef ledges, and they were not found in these areas at other times of the year. The spearfishermen also reported equivalent numbers of old red-brown cast shells lying on the bottom outside the reef ledges. There were only three white crayfish caught in this locality on December 11, 1955. They had much harder shells and were quite definitely pink in colour. Only one cast shell was found.

* Exoskeleton = "shell"; - setae = "hairs"; antennae = "feelers"

(vi) Proposed Interpretation of "White" Crayfish Data

From the foregoing data "white" crayfish can be said to be newly moulted animals, lacking the red pigment found in all size groups of the "red" crayfish.

The absence of small "white" crays below $2\frac{1}{2}$ ins. and above $3\frac{1}{2}$ ins. suggests that the "whites" are a phase in the "red" cycle, and first occur when the crayfish are approaching maturity. This could therefore be termed an adolescent phase. From tagging returns, the "whites" do move offshore at a fairly steady rate after the commencement of the "run". The "run" of "whites" commences when the "whites" crawl into the pots. This does not necessarily indicate their immediate "arrival" from another area. They possibly migrate onshore sometime before they are caught. In any case they do not feed, since baited pots set before the "run" of "whites" yield nothing.

The non-attractiveness of the bait at this time can be explained by the fact that just prior to and for approximately ten days after moulting food is not sought. When the "whites" do "run", however, they are caught in large numbers, the catches per pot increasing from a mere one or two to thirty or forty overnight. The actual date of the commencement of the catch of "whites" varies from area to area and from year to year. There is nevertheless only about a fortnight's variation in its onset each year. For example, around Rottnest fishermen regard November 24, 25, or 26 as the beginning of the "white" season.

A possible picture of events could include the migration of adolescent pale-coloured crayfish to relatively shallow sandy areas where moulting takes place. This is followed by heightened feeding activity and a movement offshore with a possible tendency for the crayfish to deepen in colour. The numbers of these crayfish caught decrease until, in the words of the fishermen, "they disappear and the 'white' crayfish season has ended".

The fact that individual "white" crayfish can be caught again as a "white" crayfish in the following

"white" crayfish season suggests that this "white" phase is not restricted to only one period in the life of a crayfish, but two white phases can occur at approximately the same time of the year in at least two successive years.

It has also been shown that an undersize "white" crayfish can grow to 3.0 ins. in carapace length and take on the red colouration normally found in crayfish at other times of the year.

(vii) C.S.I.R.O. Fisheries Field Work - "White" Crayfish

A. Using Holding Crates

- (i) Maintain small red crayfish caught in early November on sand and on deep reef to observe moulting and colour changes;
- (ii) Maintain "white" crayfish in late November on sand and on deep reef to observe colour changes.

B. Using Shallow Reef Enclosure, Wilson Bay, Rottnest

- (i) Observe red crays monthly for moulting, colour change, mating and spawning;
- (ii) Introduce "white" crayfish in late November and observe as in (i).

C. Continuation of Tagging Programme on "Whites"

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STERILISATION OF FISH BOXES

A report from the Division of Food Preservation and Transport, C.S.I.R.O., states that effective sterilisation of fish boxes can most simply be carried out by the use of hot water and suitable disinfectants. Firstly boxes should be either hosed down with cold water or treated with cold water applied by means of a high-pressure spray. This will remove loose debris, such as scales, and slime. Boxes which are badly soiled should also be scrubbed.

The boxes should then be treated with hot water, hosed or sprayed on, or, alternatively, by either

immersion in hot water or passing through a steam tunnel.

Disinfectants said to be the most effective are those containing chlorine and some of the new quaternary ammonium compounds. Directions for use are to be found on the containers in which the disinfectants are packed.

It is not necessary to rinse the boxes after treatment with chlorine disinfectants, as the chlorine will be dissipated fairly quickly after exposure to air, but rinsing is necessary when quaternary ammonium compounds are used.

A recent English report discusses some work undertaken to test the efficacy of certain "sanitisers". These included hypochlorite-containing substances, a formaldehyde-containing substance, quaternary ammonium compounds, non-ionic detergent and detergent/disinfectant mixtures. The results indicated that the detergents used were not of great effect, nor was formaldehyde. Hypochlorite solutions containing not less than 1,000 parts per million of free chlorine, or quaternary ammonium compounds in appropriate concentrations, could effect a reduction in bacteria counts of from 90 to 99 per cent, particularly if the boxes were scrubbed as well. On old boxes, particularly those made of softwood, which is highly porous, this could not however be regarded as really satisfactory, because the residual bacteria tended to breed again. Even a 99.9% reduction in the bacteria present would still leave a residue of around a million bacteria per square inch of box.

Inspectors who have the opportunity are asked to examine the methods used by markets and co-operatives in the treatment of fish boxes, and to report to Head Office whether steps are taken to clean boxes before returning to owners, and, if so, what methods and disinfectants are used.

AUSTRALIAN WHALING

During the 1955 whaling season Australian shore-based stations caught 1,840 humpback whales and the value of production was approximately £A1,953,000 - or £1,060 per whale. This compares with last season's catch of 2,040

whales and production worth approximately £1.7 million, or £860 per whale. Most stations completed their quotas in a much shorter period than in 1954, and with prices for whale oil and the by-products of whale meal and solubles a little higher than the previous year, another satisfactory season was experienced.

Whaling stations on the west coast of Australia had their quotas reduced from 1,320 to 1,120 hump-back whales in order to conserve whale stocks which, according to some, had shown signs of depletion. Whilst this represents a substantial reduction, it allowed greater selectivity in the size of whales taken. The shorter season undoubtedly permitted more economic operation of processing factories at Point Cloates, Babbage Island and Albany. A rise in the price of oil to £80 - £85 stg. per ton (c.i.f. continental ports) also assisted the value of production.

With the smaller number of whales caught during 1955, production of whale oil at 15,876 tons was 790 tons less than in the previous season. Production of meal was also slightly reduced, declining from 5,000 tons to 4,948 tons. The successful production of dry solubles by the Australian Whaling Commission at Carnarvon encouraged other stations to install drying plants. Notwithstanding the reduced quotas and a temporary breakdown of the Carnarvon plant, total production of solubles at 1,410 tons was only 15 tons below that of 1954.

The average yield of oil per whale of 8.6 tons compared with yields of 8.6 tons and 8.5 tons in 1952 and 1953, but was somewhat higher than the average of 8.2 tons in 1954. The small increase is perhaps in some small measure due to the greater selectivity this season in the size of the whales harpooned.

The price of whale oil had shown little variation over the previous three years, but the average price for last season's catch, at £80 - £85 stg., represents a rise of approximately £5 - £10 stg. per ton on 1954 returns. However, as the bulk of the oil production was again sold forward, exact comparisons are not available. The price of solubles rose a little to £A64 per ton as compared with £A60 per ton in 1954, but the price of meal showed little change from the previous season, varying between £A40 and £A45 per ton.

Whaling activities on the east coast are, it

is understood, to be increased during the coming season with the establishment of a further shore-based station at Norfolk Island. It is anticipated that the new venture will have an initial quota of 120 humpbacks, but whether this will cause any revision of existing quotas is at present uncertain. The Minister for Commerce and Agriculture, in discussing the 1955 quotas, said: "The separate east coast stocks are just about holding their own. However, this position is being closely watched and will be subject to annual review."

ABROLHOS CRAYFISHERY

The Minister for Fisheries (Mr. L.F. Kelly), has approved of the Fishermen's Advisory Committee's recommendation that the same restrictions apply during the 1956 Abrolhos crayfishing season as were in force in 1955. The season itself will be for the same period, that is, from March 15 to August 14, both dates inclusive.

Briefly the restrictions to be applied are as follows -

- (1) The open season at the Abrolhos shall be from March 15 to August 14, both dates inclusive;
- (2) That during the 1956 open season no fisherman will be permitted to engage in the taking of crayfish at both the Abrolhos and Geraldton, i.e., each fisherman will be required to advise the local inspector whether he will be fishing at the Abrolhos or not, and the license of any fisherman who elects to operate there will be endorsed to the effect that he shall not engage in the catching of crayfish elsewhere during the Abrolhos open season;
- (3) That freezer-boats shall not operate at the Abrolhos;
- (4) That no person or boat engaged in the taking of crayfish between latitudes 30°S and 28°S at any time during the year 1956 shall be permitted to take crayfish between latitudes 30°S and 33°S, and vice versa.

ARTICLES OF INTEREST AVAILABLE

From time to time, in the periodicals received at Head Office, appear some very interesting articles in connection with the fishing and allied industries throughout the world. Many of these articles are of general interest but are too long to reproduce in this Bulletin. Some may of course, be of particular interest to certain inspectors only. From this month we are keeping aside publications in which such articles appear, and any inspector may borrow them for a few days, provided he returns them reasonably promptly and in good condition.

A list of useful articles, and the publications from which they are taken, is reproduced below, and each month in this Bulletin further lists will be published -

- (1) Science Attacks Oyster Problems - a Report by Dr. Thurlow Nelson, Rutgers University, New Jersey, U.S.A. - "Fishing Gazette", New York, September, October and November, 1955.
- (2) Bacteria in Fish Boxes - "Fishing News", London, December 30, 1955.
- (3) Protection of Spawners - "Pacific Fisherman", Seattle, January, 1956.
- (4) Solar Activity and Causes of Fish Abundance - "Fishing News", London, November 18 & 25, December, 2, 9, 16 & 23, 1955.
- (5) Failure of the East Anglian Fishery - "World Fishing", London, January, 1956.
- (6) Lines in the Sea - Territorial Limits - "Pacific Fisherman", Seattle, January, 1956.

ROTTNEST BIOLOGICAL STATION COMMITTEE

The quarterly meeting of this committee met at the Fisheries Department, Perth, on January 24. Those present were Mr. A.J. Fraser (Chairman), Drs. E.P. Hodgkin, K. Sheard and G.M. Dunnet, and Mr. T. Sten. The Secretary (Mr. B.K. Bowen) was also in attendance.

Reports containing information of general interest were submitted by Dr. Hodgkin (University), Dr. Dunnet (C.S.I.R.O. Wildlife Survey Section) and Dr. Sheard (C.S.I.R.O. Division of Fisheries and Oceanography). The following is a summary of those reports -

(1) Dr. Hodgkin said the annual students' camp had been held at the station in November. The twenty students present had been engaged, among other things, on population studies of the Rottneest quokka and marine organisms. He said the examination of blood samples from the quokka was being continued, as were nutritional experiments on the animal.

(2) Dr. Dunnet stated that the quokka census was still being carried out on part of the Island. To capture the animals nets of about 100 yards in length were being used at Lake Bagdad and Serpentine Lake, where the quokkas came to drink, every second week. Some difficulties had arisen in estimating the population owing to the definite pattern movements of the quokkas. One thousand nine hundred quokkas had now been colour-marked. He estimated the population at being not less than 10,000, but the work had not proceeded far enough to make an accurate assessment.

(3) Dr. Sheard reported that Mr. R.W. George had successfully fenced off a rock pool in Wilson's Bay to facilitate the study of the reproduction of crayfish, their nutrition and growth rate, and the effects of intra-specific competition among crayfish.

MUCH MULLET IN THE SWAN

Senior Inspector J.E. Munro has reported that sea-mullet were noticed in great quantities in February in both the Swan and Canning Rivers. The fish ranged in

length from 2" to 11" - the size most abundant being from 8" to 9 $\frac{1}{4}$ ". Mr. Munro says that small fish have been sighted in large numbers from Guildford to the Perth Causeway, and large schools have extended inshore from the Narrows to Crawley Bay. The latter schools, he states, appeared to be unsettled; when first noticed they were moving downstream but later they have been seen travelling upstream. Mr. Munro has also reported seeing a very large school of 8" to 10" sea-mullet in Perth Water one night.

He says that he has discussed these occurrences with experienced fishermen, who declare that rarely have so many small mullet been observed in local rivers.

DUCK BANDING

After some preliminary investigation of duck populations, Technical Officer J. Traynor resumed duck banding operations during the month. As no country banding sites gave promise of any success, Mr. Traynor commenced operations at Craig's (Tomato) Swamp, at Kewdale in the metropolitan area, on February 16. On this swamp 98 black duck, 4 grey teal and 5 mountain duck were banded. Operations were then transferred to Queen's Gardens and, from February 20 to 29, 181 black duck, 2 mountain duck and 2 maned geese were banded, bringing the total number of ducks banded in the fortnight to 292. In addition, a moorhen and a black cormorant were banded with old bands. 109 banded birds re-entered the traps, making a grand total of 403 birds trapped.

Recoveries:

Only two bands were returned to Head Office during February. The first, No. 2936, was from a black duck banded at Cockleshell Gully on 25/10/54 that had been shot 170 miles from its banding site at Yandi Station, 60 miles east of the mouth of the Murchison River, on 26/1/56.

The second, No. 1356, was from a grey teal banded at Wardering Lake in the Wagin district on 12/2/53. This bird was shot on nearby Noring Lake on 14/2/56.

LOCALLY MADE GOODS - GOVERNMENT POLICY

In future all government departments are to make every endeavour to procure their requirements from local manufacturers.

A directive to this effect has been received from the Premier (Mr. Hawke), who says that this policy has been adopted by the Government in order that the trade deficit between Western Australia and the other States might be reduced.

The directive also draws attention to the need to maintain full employment in our State. The "Buy W.A. Goods" campaign will, it is believed, assist materially in this regard.

OVERCROWDING THE CRAYFISHERIES

As most officers are aware, the Department has for some time been concerned with the great influx of fishermen to our crayfisheries. With the recent announcement that a number of experienced lobster fishermen from England had reached Geraldton to engage in crayfishing at the Abrolhos, and the arrival at Esperance of two large fishing boats from Victoria en route to Geraldton, the fears entertained by established fishermen that the already crowded crayfisheries were fast becoming over-exploited have been intensified and the departmental concern deepened.

Sharing these fears, the Minister (Mr. Kelly) recently issued a warning through the press and the A.B.C. The following is the full text of the statement released by him -

The Minister for Fisheries (Mr. Kelly) yesterday struck a note of warning when discussing the crayfish industry of Western Australia. He said the crayfisheries were from many points of view the most important of all the State's fisheries. They provided a good living for upwards of 600 fishermen and their families, they found work for some 150 men and women in the freezer-boats and the

processing factories at Geraldton, Fremantle and Lancelin, and they were responsible for bringing 3½ million dollars into Australia each year.

The crayfisheries were attractive to fishermen because of the relatively congenial conditions offering. This applied particularly to the Abrolhos Islands, near Geraldton, where the weather during the greater part of winter was as pleasant as, if not more pleasant than, anywhere in the State. For this reason, said Mr. Kelly, and also for what is perhaps a more potent reason - frequent increases in the price paid to fishermen - more and more men were coming into the industry each year. The result was that the fisheries had largely become overcrowded, especially in areas like the Abrolhos, where there was really very little scope for expansion.

"The whole position in a nutshell", the Minister went on, "is that no given area is able to support more than a more or less fixed number of crays. The more men that come in the greater is the competition for the available fish, which means that each man's share is smaller. All thinking people will appreciate that there is a limit to this sort of thing, and I am not so sure that this limit has not already been reached. If the brake is not applied soon, fishing must become less and less profitable and many established fishermen will undoubtedly be forced out of the industry. This is something which we cannot regard with complacency.

"Unless the fishermen are prepared to do something about it themselves", concluded Mr. Kelly, "I am very much afraid there will be no alternative to the Fisheries Department using the power of exclusion conferred upon it by the Fisheries Act."

PEARLING OFFICER'S VISIT

Mr. E. deB. Norman, Pearling Officer of the Commonwealth Fisheries Office, Sydney, is expected to arrive in Perth early this month. He intends to leave for Broome by air on the evening of March 6 and will stay there until March 16, when he will fly to Darwin.

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THE CLEARING HOUSE

It's Worth Taking Care of

YOUR BINOCULARS

Few skippers would be without their binoculars, and many of them keep the same pair throughout their fishing careers. Properly treated, they will last a man a lifetime with unimpaired efficiency, but, like everything else they have to be looked after. The following notes on the care and maintenance of these instruments have been compiled by one who has handled many types over a number of years.

First of all it might be helpful to give a brief outline of the main characteristics of binoculars. Some have central focusing which is done by a wheel placed centrally, usually between the eyepieces. In addition to this the right eyepiece can be focused separately should there be any difference between the eyes of the observer. Others again are of the separate eye-piece focusing type which have the advantage of fewer moveable parts.

Filters

Most modern binoculars are fitted with bloomed or coated lenses which cut down the amount of light lost due to reflection. A few types have filters attached which can be swung into position; in others, the filters can be fitted on to the eyepieces separately. These filters are used according to prevailing conditions, such as haze. Rubber or metal caps are sometimes provided for the protection of the eyepiece and objective glasses.

Generally speaking fishermen seem to prefer a large binocular, quite a popular one being a 7 x 50. (The 7 denotes the magnification and the 50 the diameter of the objective glass in millimetres.) Binoculars can be had in magnification from 5x to 20x. The higher the magnification the greater the need for having the binocular steady. The aforementioned 7 x 50 is essentially for use at night, or when light conditions are poor. A more suitable binocular for day use is one which has an exit pupil of 3 to 4 mm. The exit

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pupil can be worked out by dividing the diameter of the objective glass by the magnification, e.g. 30 divided by 8 = $3\frac{3}{4}$ mm. The average size of the pupil of the human eye is 3 to 4 mm. in good lighting conditions and a binocular having the same exit pupil is to be desired under these conditions. On the other hand the pupil of the human eye dilates or is enlarged when the light is poor or at night time and this is where the binocular with a large exit pupil is really effective. For example the 7 x 50 gives an exit pupil of $7.1/7$ mm.

Now for the care and maintenance. When not in use the safest place for a binocular is in its case and put where it will not fall. What can a fall do to a binocular? It can dent the bodywork, crack the lenses, upset the prisms inside and the eyecups may be reduced to smithereens. Then there is the danger of just hanging up the binocular by the lanyard and leaving it to dangle. Does it really matter if it gets a knock with every roll of the ship? You raise your binocular to your eyes and instead of seeing one gunboat, you see two. (Bad enough seeing one of these vessels, I presume). This is what happens when the prisms in the binocular get upset. They show double and thus knocks must be avoided. Who is going to put the thing right again? This is better left to expert hands.

But there are some things you can do to a binocular yourself. There are some things you have done yourself. Was it you who cleaned the lens with the sleeve of your jersey or the bit of old newspaper that was lying on the wheelhouse floor? The first method has the same effect as rubbing with emery paper and the second is little better. You did not notice that the sand from the cod end was on your sleeve and the bit of newspaper was not really clean. What you do notice afterwards on the once beautiful coated lenses are scratches like railway lines. Better to carry a nice drf soft cloth for the purpose of cleaning the lenses. Usually the manufacturers of binoculars give advice on how to clean their instruments and it is well worth while to follow this. Lenses can be coated again but the removal of scratches is not practicable.

Then there is the effect of salt water. This is mostly seen on the externals of the binocular which include any material of a perishable nature

The best remedy is to dry off any spray and especially near the moveable parts. If any part becomes stiff it is better not to use pressure. A binocular can be cleaned, overhauled and adjusted for a very moderate charge and this valuable visual aid is well worth looking after. I know skippers who faithfully carry home their binoculars at the end of each trip. Why expend such care? There are no rolling ships in the harbour and they won't get hard knocks but they might be gently lifted - yes, even if your ship's name is on them and your's as well.

by J. Pirie

(" World Fishing" London January, 1956.)

Giant Clippers

Building in Japan to Harvest Indian Ocean's Tuna Resources

Tuna clipper construction continues apace in Japan, with thoroughly modern steel craft of large size being added steadily to a fleet which already is by far the largest in this pelagic fishery with its steadily expanding horizons.

These vessels run up to 700 gross tons, 172' long - substantially larger than any hulls ever built in the United States for tuna fishing, although the gross tonnage is only slightly larger than that of such converted vessels as the Sea Lark. These big vessels were converted fleet rescue tugs. While their gross tonnage is comparable to the largest of the new Japanese clippers, it is believed that the new long-liners building in Japan will have much larger cargo capacity than the 550 tons which the converted Americans can stow.

In November Pacific Fisherman was privileged to visit one - out of three - shipyards in Shimizu, one Japanese tuna port of many.

In that single yard - Kanazashi Shipyard - there were four steel tuna vessels under construction. One of these was a giant of 700 tons, to be powered with a 1,200-hp. diesel engine. The other three were

sister vessels of 350 gross tons, about the same as an American clipper of 127' length.

These vessels are built of exceptionally heavy steel plate, all-welded construction. Hull form is full but exceptionally easy to drive, a characteristic perhaps traceable to the fact that the Tokaiky Research Station at Tokyo has a modern model testing basin where improved hull designs are worked out to meet the special requirements of fishing duty.

Insulation is unusual, consisting of "Alflex," built-up cellular plastic blocks composed of laminations of plastic corrugated in triangular section. Instrumentation is entirely modern by any standards, consisting of radio, radar, echo sounders, gyro compasses, etc. This equipment generally is of Japanese manufacture, although a Sperry Loran was noted on one vessel visited.

Cost of the 700-ton vessel examined was reported as 150,000,000 yen by Bukichi Takano, managing director of the yard. This figures-out to \$416,000.

Most of the new tuna vessels seen were long-liners; although some skipjack vessels are being added to the Japanese fleet at the present time. These boats fish with live bait. Their catch goes almost exclusively into dried Skipjack and does not enter into the export trade.

The great long-liners are being built primarily for use in the rapidly-developing Indian Ocean fishery, which has proven astonishingly productive. They are said to be able to take their loads - around 1,000 tons of Yellowfin and Bigeye - consistently in trips of 45 days. Obviously, as they fish long-line gear exclusively, no time is lost in scouting for bait; nor is there any problem of keeping the bait alive after it is taken.

One of the leading Japanese tuna clipper operators is H. Shinomiya, whose Sumiyoshi Gyogyo Co. operates a fleet of clippers, running up to 700 tons, out of Misaki, a fishing vessel centre in the Tokyo area. He is an earnest believer in the future of the tropical tuna fishery and estimates on the basis of his vessels' actual experience, plus Japanese research

findings, that the weight of the tuna population of the seas exceeds that of the human population of the world's land masses.

Questioned by Pacific Fisherman as to the seriousness of shark losses in the long-line tuna fishery, Mr. Shinomiya admitted that shark depredations were severe when long-liners first open an area to fishing. However, he finds that the shark population dwindles rapidly under the effect of the fishery, and becomes negligible by the time an area has been long-lined for three months. Thereafter it can be fished with only nominal damage from the in-coming sharks.

Examination of the Japanese markets for tuna reveal that only a small part of the present production enters the export trade. Japan uses all of its Skipjack domestically; and the great majority of its lightmeat tuna. The Albacore and the smaller sizes of lightmeat are exported, either canned or frozen for subsequent canning.

Japanese tuna producers feel that the amount of tuna which could be produced from the Indian Ocean and the high seas around the Australian Continent is virtually unlimited, and that the consuming capacity of the markets is the only restriction upon output.

("Pacific Fisherman" Portland, Ore. January, 1956)

20 p.c. Saving in Fuel Obtained with this Supercharger

When the manufacturer of any fitting intended to go on a petrol engine guarantees it for the whole life of the engine concerned it must mean that he has every confidence in his product.

Add to that proved savings in fuel often amounting to as much as 20 per cent and the Ignition Supercharger becomes of live interest to everyone who uses a petrol engine, whether marine or on land.

Scrutton and Co., of 107 Wanstead Park Road, Ilford, Essex, have been making these superchargers for two years. They have had, too, some remarkable demonstrations at various trade shows. One of these

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was on a standard four-cylinder engine. Leads from three plugs were removed. Remaining plug was filled with oil, sealed with heavy grease, screwed in and connected. It fired instantly and carried the full load of the engine without misfiring or any apparent unevenness. This and other demonstrations were seen on Stand 92 at the National Boat Show.

Briefly the principle is this; it alters the high tension current to high frequency. Effect is to change a thin single spark to a full "oscillating" one. But this has special characteristics, due to its nature. Whereas high tension current flows easily to waste through any carbon, oil or poor insulation, high frequency current is the reverse. Consequently plugs do not deteriorate, they do not oil, the full value of the current consumed is available where it is needed - in the combustion chamber.

A master unit complete costs only 25s. and can be reckoned to repay its cost in a very short time.

("The Fishing News" London January 6, 1956)

Electrofishing for Tuna Tests Make Good Progress

Significant progress has been reported by scientists of the University of Hawaii in the development of electrofishing for tuna.

Experiments by the Physics Department of the University show that the movements of 8 to 10 pounds yellowfin tuna can be controlled in a large well ground tank. The tank used measured 35 feet long, 4 feet deep and 11 feet wide. By using 16-foot electrode spacing, it was possible to force the tuna to swim to the positive electrode when direct current interrupted at the rate of 20 cycles per second was applied. The source of power was in 6-volt storage batteries that energised a bank of condensers.

("Western Fisheries" December, 1955. Vancouver.)