

[MONTHLY SERVICE BULLETIN
(WESTERN AUSTRALIA FISHERIES

4(1) Jan 1955

DEPARTMENT OF PARKS AND WILDLIFE

FISHERIES DEPARTMENT, WESTERN AUSTRALIA

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MONTHLY SERVICE BULLETIN

Vol. IV, No. 1.

January 1, 1955

STAFF NOTES

The Superintendent, Mr. A.J. Fraser, will leave Perth by air on January 9 for a short inspection of the Broome pearl fishery. Mr. Fraser will commence two weeks' annual leave on January 17.

Officers at present on annual leave include Supervising Inspector J.E. Bramley, Senior Clerk H.B. Shugg, Technical Officer J.S. Simpson, Inspector R.J. Baird and Relieving Inspector A.K. Melsom, who has completed a successful convalescence after his appendix operation.

Inspector N.E. McLaughlan, with Cadet Inspector D. Wright as crew member, brought the p.v. "Kooruldhoo" into Fremantle on December 22.

Assistant Inspector J.L. Gallop transferred to Bunbury temporarily in charge of that district on December 6, and Assistant Inspector V.J. Sinclair commenced as assistant to Inspector H.J. Murray at Mandurah on December 23, after completion of his annual leave.

Assistant Inspector B.H. Boyd and Cadet Inspector J. Milne came to Perth for a break in the metropolitan area on December 22. They will return to Lancelin Island early this month.

The Clerk-in-Charge, Mr. B.R. Saville, Assistant Inspector B.A. Carmichael and Cadet Inspector M.J. Simpson resumed duty last month after annual leave.

Mr. B.K. Bowen of Head Office, who is studying towards an arts degree at the University of W.A. received a credit pass in Zoology 1. Mr. I. Bartholomew also successfully passed in the two subjects taken last year towards a Diploma of Public Administration at the Perth Technical College.

PERSONAL PARS

The Minister for Fisheries (Mr. Kelly) is at present enjoying a holiday at Rottnest Island.

Mr. F.N. Ratcliffe, Officer-in-Charge of the Wildlife Survey Section of C.S.I.R.O., left Perth on December 10, to return to Canberra. Mr. Ratcliffe had spent some time in the North-West inspecting the research work being undertaken by his section on Woodstock Station.

Miss Patricia Kott, M.Sc., who until her recent resignation was a research officer (planktologist) with the Division of Fisheries, C.S.I.R.O., Cronulla, N.S.W., will be married on January 5 at St. Aidan's Church, Claremont, to Mr. W.B. Mather, of the University of Queensland. After her marriage Miss Kott, who is the daughter of Mr. and Mrs. Max Kott, of Claremont, will reside in Brisbane.

Mr. R.W.C. Swartz, M.P., M.B.E., E.D., Parliamentary Under Secretary, Department of Commerce and Agriculture, will visit Broome from January 22 to January 25. Mr. Swartz will, by personal interview, seek first hand information on the pearling industry. He will be accompanied by Mr. E. de B. Norman of the Commonwealth Fisheries Office.

ANNUAL LEAVE 1955

Arrangements for the payment in advance of salary due for annual leave can easily be made provided officers give sufficient notice that they desire it. Salary sheets are made up almost a fortnight ahead and

for an officer to receive his holiday pay in advance he should give not less than one month's notice to this office to allow the application to progress through its various channels.

Inspectors this year should advise the Supervising Inspector at their earliest opportunity as to what date they would like their annual leave to commence. Last year a most unsatisfactory crowding of leave towards the end of the year occurred. This will not be permitted this year. The inspectorial staff is required to be at full strength at the end of the year to cope with duties arising out of the opening of the crayfish, marron and wild duck seasons. Those officers who have not advised the Supervising Inspector by March 31 of their leave requirements will be rostered for leave according to the Department's convenience.

TUNA FISHERY, NEW SOUTH WALES

With a slump in orders for canned tuna and an accumulation of stocks, the canneries at Eden and Narooma ceased buying fish early in November. Selling difficulties were attributed to price concessions made in the American market by Japanese and Peruvian suppliers who had been making unusually large hauls. The local canneries had been paying 8d. per pound to fishermen and could not meet the market under their high costs. In addition, the price of frozen tuna, in common with most other protein foods, had dropped sharply in California, and this section of the trade had become unprofitable. With their selling outlet closed, the fishing boats were tied up for a fortnight at the peak of a flush season and individual losses were heavy. Thereafter promising orders and enquiries from the United Kingdom at prices to compete with Peruvian offers began to arrive and, at an agreed price to fishermen of 5d. per lb., the canneries resumed buying. Some particularly good catches have been reported and it is expected that the boats will operate profitably at the lower price.

AUSTRALIAN CRAYFISH PRODUCTION

Crayfisheries have developed greatly in the post-war period in response to high prices and strong demand from both local and overseas markets. Production has more than doubled in the last six years and in 1953/54 amounted to 17,094,400 lb. as compared with 15,625,540 lb. in the previous year and 5,109,000 lb. in 1938/39.

More than half of the total production for 1953/54 came from Western Australia, which has rapidly replaced Tasmania as the main source of this delicacy. There has been little scope for any marked increase in Tasmanian production because crayfisheries in this State had been fully developed in pre-war years. The increased use of echo sounders in the location of new grounds has been largely responsible for the rise in production in South Australia and Victoria. The former is now the second largest producing State, whilst Victorian production in 1953/54 topped the million lb. mark for the first time. Production in New South Wales has remained relatively steady in recent years and although the warmer Queensland waters contain crayfish, they have not been taken in commercial quantities. Details of production by States is shown in the following table. -

PRODUCTION OF CRAYFISH

(Fresh whole weight)

	1938/39	1950/51	1951/52	1952/53	1953/54
	lb.	lb.	lb.	lb.	lb.
Western Australia	1,754,000	8,414,000	7,795,000	8,099,000	9,138,000
South Australia	686,000	2,089,000	2,750,000	3,500,000	3,850,000
Tasmania	2,048,000	2,196,000	1,879,000	2,744,000	2,350,000
Victoria	201,000	426,000	623,000	756,000	1,193,000
N.S. Wales	420,000	487,000	688,000	528,000	563,000
	5,109,000	13,713,000	13,735,000	15,627,000	17,094,000

The whole catch from Victoria and New South Wales is consumed by the local market but the other three producing States have built up a small but valuable export trade. In 1953/54, 4,168,600 lb. of frozen crayfish tails and 65,738 lb. of boiled whole crayfish were exported. These were valued at £1,555,000 as compared with £1,444,450 for the previous year. The export income from crayfish is specially valuable because more than 90% of the exports go to the United States of America, Canada and Hawaii. Since 1948/49 dollar earnings from this source have increased from \$1,000,000 to \$3,500,000 in the last financial year and total dollar earnings amount to approximately \$13,500,000.

On the North American market, Australia has to compete with South Africa and New Zealand, which countries have been the principal suppliers for some time. After an uncertain start the Australian product now compares favourably with that of the other two Dominions. Government inspection has maintained the standard of the pack and in the last two years export prices have been steady at from 7/-d to 7/6d per lb. f.o.b.

ABROLHOS CRAYFISHERY

No alteration will be made this year in relation to the restrictions, conditions, etc., imposed last year for the management of the Abrolhos Crayfishery.

The Minister for Fisheries has approved the following -

1. That the open season at the Abrolhos be the same in 1955 as in 1954, i.e., from March 15 to August 15;
2. That during the 1955 open season no fisherman will be permitted to engage in the taking of crayfish at both the Abrolhos and Geraldton inshore area, i.e., each fisherman will be required to advise the local inspector whether he intends to fish at the Abrolhos 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 north of lat. 30°S at any time during the year 1955 shall be permitted to take crayfish south of that parallel, and vice versa.

CONVICTIONS RECORDED

September 1 to December 31, 1954

Date	Defendant	Court	Charge	Result
20.9.54.	Papperone, P.	Fremantle	Undersize Fish	Fined £2
27.10.54	Lancelin Products	do.	Undersize Crayfish	Cautioned
10.12.54	Bralich, M.	Geraldton	do.	Fined £2
10.12.54	do.	do.	do.	" £2
10.12.54	Kijena, M.	do.	do.	" £7
10.12.54	Cherico, A.	do.	do.	" £5
10.12.54	Davis, G.	do.	do.	" £3
14.9.54	Okomota, H.	Perth	Undersize Fish	" £2
28.9.54	Bowra, A.N.	do.	Fish in closed waters	" £5
16.9.54	Broz, Miro	do.	Undersize Fish	" £3
9.12.54	Mutsaers, P.	do.	do.	" £2
15.12.54	Heberle, R.L.	do.	do.	" £2

CONVICTIONS RECORDED

September 1 to December 31, 1954

Date	Defendant	Court	Charge	Result
8.9.54	Storer, F.J.	Pinjarra	Net in closed waters	Fined £5
8.9.54	Godfrey, A.D.	do.	do.	" £5

JAPANESE ACTIVITIES CAUSE CONCERN

According to reports given prominence in the daily press the interest of Federal officials has been aroused by the discovery of buoys, bearing Japanese markings, inside the Great Barrier Reef off the Queensland coast.

Previously conducted surveys have shown that tuna fishing is not likely to be very good inside the reef and this is said to make it more likely that Japanese are poaching trochus shell. If this is indeed a fact, there are not expected to be any difficulties in taking action under the Commonwealth Pearl Fisheries Act; however, if the Japanese are engaged in fishing for tuna officials believe that it may be difficult to proceed against them. The Commonwealth Fisheries Act, proclaimed to come into force on January 1, provides for the granting of licenses to fish waters beyond the States' territorial limits, and regulations made under this Act and recently gazetted proclaim all waters within about 200 miles of the Australian coast as subject to the Act. Any further measures to conserve fisheries would have to be gazetted, and it is believed that, at least until a decision is made to amend the Act, no attempt will be made to enforce the licensing of fishermen not living in the Commonwealth.

A Japanese Welfare Ministry official said last November that 2 tons of tuna caught off the

Australian coast was radio-active and had to be dumped - he did not give any indication of the exact locality where the catch was secured.

LARGE CRAYFISH SPEARED

At Marmion Beach north of Waterman's Bay on December 19, Barry Grover speared and landed an 8½ lb. crayfish. Although much bigger specimens have been taken by other means in this State, Grover's cray is the biggest one speared in Western Australia. The Australian record for a speared crayfish is 11½ lb.

ESTUARINE RESEARCH PROGRAMME

During December, Technical Officer L.G. Smith continued field investigations. At the metropolitan markets stomach, gonad and scale samples were secured from yellowtail consigned from Bunbury early in the month.

From December 8 to December 14 Mr. B.K. Bowen of Head Office accompanied Mr. Smith to various southern fishing centres and assisted with the sampling and recording. Gut, gonad and scale samples and length-frequencies were taken from excellent specimens of yellow-eye mullet and King George whiting at Wilson's Inlet on December 9. Male mullet measured from 251 to 289 millimetres and females from 225 to 336 millimetres. The ovaries of the latter were noted to be building up after spawning in Stages I and II. While at Wilson's Inlet records were also taken of dusky flathead which had reached the spawning stage.

At the Albany Fishermen's Co-operative samples of stomachs, scales and gonads and length measurements were taken from garfish and salmon trout. Some skipjack were also done but no scales were taken.

From December 11 to 14 at Bunbury, work was done on the following species : Perth herring, yellowtail, yellow-eye mullet from the Collie River

and from Wonnerup, black bream - also two lots from the Collie River and Wonnerup - and tailor. Mr. Smith commented that the yellow-eye mullet caught in the Collie River on December 11 were exceptionally large fish for that area and in wonderful condition.

At Mandurah, cobblers caught in the Southern Estuary were measured and dissected and their stomachs preserved; these fish had spawned. Twenty-one sand whiting were also handled and samples taken, and it was found that the gonads had reached Stage V and some were spent.

A total of 329 fish were measured and sampled during the month.

A CONDENSATION OF STEERING AND SAILING RULES
SUITABLE FOR THE USE OF FISHERMEN

(Prepared by the Harbour and Light Department, Fremantle)

A power driven vessel which is under sail and not under power is to be considered a sailing vessel, and every vessel under power, whether under sail or not, is to be considered a power driven vessel.

Navigation Lights

When travelling under sail the sidelights only should be lit, but when under power and sail the masthead and sidelights must be used.

Keep clear at night of a vessel showing two red lights in a vertical line, one over the other, or by day two black balls or shapes one over the other. This is a vessel not under command and unable to manoeuvre.

Sailing Vessels

(a) A vessel which is running free shall keep out of the way of a vessel which is close-hauled.

(b) A vessel which is close-hauled on the port tack shall keep out of the way of a vessel which is

closed-hauled on the starboard tack.

(c) When both are running free, with the wind on different sides, the vessel which has the wind on the port side shall keep out of the way of the other.

(d) When both are running free, with the wind on the same side, the vessel which is to windward shall keep out of the way of the vessel to leeward.

(e) A vessel which has the wind aft shall keep out of the way of the other vessel.

Power Vessels

When two power-driven vessels are meeting end on, or nearly end on, each shall alter her course to starboard, so that each may pass on the port side of the other.

When two power-driven vessels are crossing, the vessel which has the other on her starboard side shall keep out of the way. (Always give way to the vessel **crossing** from the right.)

A power-driven vessel must always keep out of the way of a sailing vessel.

When a vessel has to give way to another the other vessel shall keep her course and speed, unless collision appears unavoidable, in which case she shall take such action as will best aid to avert collision.

When a vessel has to give way to another she should, where possible, avoid crossing ahead of her.

A vessel overtaking another shall keep out of the way.

In a narrow channel every vessel shall, where safe and practicable, keep to that side of the channel which lies on the starboard side.

All vessels not fishing shall keep out of the way of vessels engaged in fishing, but this shall

not give to a fishing vessel the right to obstruct a fairway or channel.

Sound Signals

One short blast - I am altering my course to starboard.

Two short blasts - I am altering my course to port.

Three short blasts - My engines are going astern.

RATS - ABROLHOS SPECIES

The Director of the Australian Museum (Dr. Evans) has acknowledged with appreciation the receipt of specimens of Abrolhos rats (Rattus glauerti) recently forwarded by this Department. The specimens, which were taken by Inspector McLaughlan from West Wallabi Island on July 23, are the first received into the Australian Museum collection. In his acknowledgment Dr. Evans made the following remarks -

"Rattus glauerti was described from East Wallabi Island by Oldfield Thomas in 1926 and, until recently, has been considered as possibly an insular race of R. fuscipes of the South-West. In a recent revision, however, Dr. Tate of the American Museum of Natural History stated that the relationship is actually with a group of small Austro-Malayan rats, and that glauerti should be regarded provisionally as a full species.

"Tate advances the interesting theory that this rat may have been introduced by early voyagers, but examination of an extensive series would be required to establish such relationship."

In addition to the two specimens forwarded to Sydney, a further specimen was donated to the Perth Museum, after whose curator (Mr. L. Glauert) the species is named.

PARLIAMENTARY QUESTIONS

The following extracts from "Hansard" relate to questions asked in Parliament and answered by the Minister for Fisheries and Minister for Works -

December 2, 1954.

"FISHERIES

As to future of trawling, Southern Coast.

Hon. C.F.J. NORTH asked the Minister for Fisheries:

Can he see a future for trawling off the southern coast of the State, provided suitable craft are obtained?

The MINISTER replied:

The hon. member will be aware that from October, 1949, to March, 1952, two trawlers, the "Comilles" and the "Ben Dearg" were operating in the waters of the Great Australian Bight broadly between Doubtful Island and Eucla. For the first year or so after finding their bearings, both vessels made reasonably good catches of fish of fair quality. Subsequently, however, by reason mainly of frequent breakdowns and crew difficulties, the catches fell away, and it soon became evident that, despite increased prices allowed by the Prices Commissioner, continued operations could be carried on only at a loss.

The trawlers were both very old and small, and were not really suited to our conditions, hence it would be unfair to assess the potentialities of the south coastal region by reference to the results they achieved. At the same time, much valuable information has been made available to the Fisheries Department and to the C.S.I.R.O., one of whose officers has analysed the catch figures and related them to operations elsewhere. A copy of this paper can be made available to the hon. member if he is interested. I feel sure that there is a future in this area, given modern vessels and equipment."

December 2, 1954.

"FISHING

As to Opening of River Bar, Mandurah.

Hon. Sir ROSS McLARTY asked the Minister for Works -

(1) Could he indicate whether he is able to meet the request of approximately 90 fishermen in the Mandurah district that an opening should be made to the river bar to enable fish to enter Peel Inlet?

(2) If it is intended to carry out work on the bar, when will work commence, and what will be the nature of the work?

The MINISTER replied -

(1) It is not possible to meet the request for a dredge to be used at Mandurah as the department's equipment is not suitable for work in those exposed conditions.

(2) It is considered impracticable to attempt the work of opening up the bar under existing conditions, when there is no river flow to help to maintain and keep open a cut, as sand accretion in summer months would rapidly block up a small channel.

Consideration will be given to possible measures for opening up the sand bar when suitable conditions develop next winter."

COMMONWEALTH FISHERIES LEGISLATION

As most officers know, negotiations have been proceeding between the various State Fisheries Departments and the Commonwealth Fisheries Office in relation to the implementation of the Commonwealth Fisheries Act.

The Commonwealth Pearl Fisheries Act was put into effect on October 12, 1953, to meet an urgent

situation created by the return of Japanese pearling fleets to northern waters, and through the co-operation of the Western Australian and Queensland Governments and of the Northern Territory Administration, the Act is now said to be operating quite satisfactorily.

The Commonwealth Fisheries Act is designed to provide a complementary authority for the management of the fisheries beyond the territorial limits of the States, and the Acting Commonwealth Minister for Commerce and Agriculture (Senator McLeay) recently approached the Minister for Fisheries (Mr. Kelly) to seek the consent of the latter to officers of this Department accepting a delegation from the Secretary for Commerce and Agriculture for carrying the Act into effect.

In his reply, Mr. Kelly said he was agreeable to the services of officers of the Department being made available as desired, subject of course to the condition that their State duties must at all times take priority over duties required under the Federal law. Mr. Kelly also pointed out that it would not be possible for our inspectors to proceed far to sea to secure evidence in relation to any fisherman's activities, but he agreed that if any inspector were asked by a fisherman to issue a Commonwealth license, he would do so, provided there was no bar to the applicant holding a license. On the other hand, officers would not be required to seek out men who had not taken out a Commonwealth license.

To these conditions the Commonwealth Minister has agreed.

A communication has now been received from the Commonwealth Director of Fisheries (Mr. F.F. Anderson) enclosing 13 delegations and 11 authorisations for State officers to act. The delegations have been issued to the following officers -

Messrs A.J. Fraser, B.R. Saville, B.K. Bowen,
J.E. Bramley, M. Goodlad, J.E. Munro,
W. Davidson, H.J. Murray, S.W. Bowler, A.K.
Melson, A.V. Green, J.L. Gallop, J.C. Thair.

Authorisations have been issued to all the foregoing except Messrs Saville and Bowen.

The delegations and authorisations have been forwarded to the respective outstation officers by registered post. They should be acknowledged as soon as received, and kept in safe custody for production at Court or elsewhere, as may be required. Some stationery has also been sent out to the officers concerned, but certain other stationery has not yet been **received** from the Government Printer. It will be sent forward as soon as it reaches Perth. A special letter of instruction to all interested personnel will be forwarded as soon as it is received from Sydney.

If any doubt exists in the mind of any officer as to the procedures to be followed, or as to the extent of **his** power and authority, he should write to Head Office immediately for clarification.

PRAWN SHELL IDENTIFIED

Early last month Cadet Inspector J.D. Milne forwarded to Head Office a sample of prawn shell found on the beach at Lancelin Island. In his accompanying note Mr. Milne said that the shells and heads were to be found in very large numbers.

Dr. K. Sheard, Officer-in-Charge of the W.A. Regional Laboratory of the Division of Fisheries, C.S.I.R.O., has identified the specimen as being cast from the final plankton stage of a snapping prawn of the family Synalpheidae, probably of the genus Crangon. Dr. Sheard commented that the stage was the equivalent of the late puerilla of our marine crayfish when the larva resembles the crayfish but possesses no lime in its skeleton. He said that it was interesting to note this occurrence so late in the year, as the majority of the planktonic larvae of the bottom-living crustacea return for settlement in August and September. Planktonic larval forms of bottom-living crustacea, he continued, form a high proportion (50 - 60%) of the Western Australian neritic* plankton.

* The "neritic" zone is that zone of shallow water above the continental shelf within, approximately, the 100- fathom line.

STRANDING OF L.F.B. "THELMA"

About 10 p.m. on December 15 the L.F.B. "Thelma" (F91) ran on the northern reef of the south passage at Lancelin Anchorage. Assistant Inspector Bruce Boyd immediately went aboard L.F.B. "Trimmerwheel" (skipper F. Connell) who moved his boat, which is fitted with a powerful searchlight, close to the "Thelma" and played his light on the stricken vessel, which was hard and fast astern about 50 feet from Lancelin Island, with a fairly heavy sea running. L.F.B. "Carmen", with Cadet Inspector John Milne aboard, also went out to the anchorage in the hope of putting a rope aboard the "Thelma," but the rope was too short. Sixteen-year-old Cadet Milne in the meantime had gone over the side into "Carmen's" dinghy to see whether he could board and assist "Thelma". Eventually a longer line was secured and with the help of Cadet Milne and his dinghy, made fast to the "Thelma." "Trimmerwheel" then towed her off.

"Thelma" had thrown overboard a number of heavy objects, including 21 bags of crays, but when morning broke 18 of the latter were recovered, the contents of only 2½ bags having died overnight. Despite the pounding she took "Thelma," which is 31' in length, incurred only slight damage, although she was compelled to return to Fremantle for such repairs as were necessary.

Mr. Boyd says that high praise has been given to Cadet Milne by all at Lancelin for the fine job he did in passing the line from "Thelma" to "Trimmerwheel". He adds that he fully deserves all the praise he has received.

WILD DUCKS

(a) Duck Banding: After many disappointments at various lakes and swamps in the South-West, Technical Officer J. Traynor achieved some successful trapping at Lake Mears in the Brookton - Quairading area in November. A total of 137 birds was banded - mostly

grey teal with a few mountain duck, a black and a pink-eared duck. A further 45 ducks were banded last month in the Meckering district at swamps on private land: again grey teal predominated.

The number of ducks banded since Mr. Traynor resumed operations last spring is 294 to the end of December, bringing the total banded since the inception of the scheme to 2113 birds. The individual species totals are as follows -

Black Duck	1511	Mallards	14
Grey Teal	497	Coot	14
Mountain Duck	49	Blue bald Coot	2
Maned Geese (Wood Duck)	21	Moorhens	5
Blue Wing Shoveller	1		
Chestnut Teal	2	TOTAL ...	2113
Pink-eared Duck	3		

In addition 16 coot and 1 crow have been banded with used duck bands previously returned.

(b) Recoveries: Although the duck-shooting season opened two weeks ago there has been a singularly low number of bands returned. Only 5 were received to the end of December and these were all from grey teal - four from birds banded within 3 weeks of opening day and one from a bird banded on February 16, 1953, at Wardering Lake, near Woodanilling. The birds are believed to have been shot in the Brookton district, and as four of them were banded at Lake Mears they had not got very far. The persons who sent the bands in are being asked to supply the exact date and location and details will be published in the next issue of this Bulletin if received by then.

(c) Opening Day: Reports so far to hand indicate that many shooters this year had a light Christmas dinner so far as wild ducks were concerned. Good shooting was had at Taarblin Lake near Toolibin (east of Narrogin)

where most of the 60 shooters were able to secure the maximum bag. In the coastal areas between Mandurah and Bunbury the results were poor and at Chittering not much better. Gundaring Lake, though drier than last year, provided reasonable opportunities for shooters, as did Lake Mears north of Brookton, but generally these lakes represented isolated good spots.

Black ducks are reported to be scarce from most centres - they only comprised about 2% at Taarblin - and at least one Brookton shooter would like to see them protected for two years to give them a chance to build up again. We would be very pleased to receive notes of the occurrence of this species - especially if they are seen in great numbers or in districts where they are not normally in quantity.

LOST AND FOUND

The long arm of coincidence has reached out from a West Norway canning factory to this fair land of Australia.

A Norwegian woman worker in the factory lost a gold wedding ring a year or so ago, and although she looked high and low was unable to find it.

Now a letter has been received by the packing firm from an Australian correspondent who says he has found the ring in a tin of sardines. It is now on its way back to the owner.

Not surprising, really, for after all Norwegian sardines are only young her-ring!

THE CLEARING HOUSE

Device for Testing Flow of Currents

Where the Fish are Lying

A pamphlet by Dr. J.N. Carruthers of the British National Institute of Oceanography, has just been reprinted from the Archiv fur Meteorologie, Geophysik und Bioklimatologie, and contains some interesting details of a fishermen's current meter which has been the subject of experiment by the writer.

Dr. Carruthers, in his preamble, says it is the duty of the fisheries hydrographer to give every possible assistance to commercial fishing, and it was with that object in mind that he designed a simple but effective current meter. Dr. Carruthers carried out some of his experiments in the Humber, from Grimsby.

He describes his instrument as "a simple current-measuring device specially adapted for use when it would be an advantage to know just how the water was moving at the depth where worth-while concentrations of fish had been reported on the echometer."

Fishermen, according to the paper, say that if they could know how the current was running down below, it being quite unsafe to infer its strength and direction from the surface movements, they would be able to shoot their nets to better advantage. They would also be able to approach the fish in such a direction that they would, on taking fright, swim towards the net instead of away from it.

Broadly speaking, Dr. Carruthers' device is in the form of a cone (like a ship's megaphone but without the end cut off) which is snooded to an up-and-down cast line and shot from the fishing vessel into the sea. This line has an anchor at one end and a buoy of adequate lift at the other.

(ii)

How to Use the Device

To avoid wave disturbance the buoy has to be well beneath the surface when the line is pulled taut by its lift in conjunction with any currents. From the buoy a long, light, strayline leads either to the fishing vessel or a small finder buoy to ensure its recovery.

The cone contains a very simple device capable of recording tilt for current speed and of registering the magnetic direction of the alignment which it takes up as the result of the water movement at the depth of immersion.

Use was made of ordinary, chemical depth-indicating tubes at first, and then, as experience was gained, simple expendable depth-telling tubes, useable over and over again, were substituted.

These tubes can be constructed from a wide-mouthed laboratory bottle of heat-resisting glass, half filled with hot liquid gelatine solution and half with paraffin oil. Sealing is by a tight bung lashed into the bottle neck.

Inside the bottle, adjusted to float at the surface between jelly and oil, a small aeroplane ring compass is placed.

Simple Process

Dr. Carruthers experiments showed that it was only necessary to pin one of these compasses underneath a medicine bottle cork to get the right adjustment of density.

He said that a number of these bottles could be kept in a can of hot water in the galley and when required for use placed in the cones and dropped into the sea. After a time known from previous experiment, the gelatine would set and "freeze" in the compass. The direction of the current would thus be easily read from the compass and its speed would be noted from noting the slope of the interface between the set jelly and the clear oil.

Dr. Carruthers goes on to state that though the simple device he describes has never been used at sea for the purpose intended, an instrument less messy having been thought of, he feels that in places where the currents are not likely to change other than very slowly, the ridiculously cheap instrument could be used very profitably.

("The Fishing News", London. October 15, 1954.)

Smart Fish Stay on the Bottom

Alongside the age-old questions "Where do flies go in the wintertime?" and "Which came first, the chicken or the egg?" is the poser that fishermen have discussed for centuries: "How do fish behave when they are being caught?"

This teaser is more than a mere talking point for the curious. If the answer was readily available, the skill and knowledge of the fisherman could be used to much greater advantage.

The excellent trawl film taken by the late H.J. Hodges, working with the Ministry of Agriculture and Fisheries' research vessel Sir Lancelot in the Mediterranean, went some way towards supplying the answer. And now frogmen from the Aberdeen Marine Laboratory, photographing a seine net in action, have been able to supply factual reports on the behaviour of both fish and nets which are published in the second issue of the Scottish Fisheries Bulletin.

Fish, apparently, swam vigorously in an effort to escape capture until the net actually caught up with them. Then they normally became passive as the ground-rope of the net passed them.

No fish actually escaped capture by keeping ahead of the footrope, the photographs showed, but when fast hauling began, and the net left the bottom, a fairly large number of fish which had been gathered in the path of the net were left behind on the sea floor.

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Most of the catch kept facing forwards for some time along the line of movement of the net, but finally drifted back into the funnel.

A number of shots taken well back in the net, and even in the cod-end, showed a few fish still heading in the direction of the tow; only in a few instances were fish seen to swim out of the mouth of the net.

Overfishing Problem

The behaviour of the net itself led to the conclusion that the use of a net size which is sufficient to allow the smaller fish to escape can help solve the problem of overfishing.

The decision of the Permanent Commission of the International Fisheries Convention to reduce the minimum mesh for seine nets from 80 mm to 70 mm - less than the minimum mesh for trawl nets - was taken as a result of experiments by the Aberdeen Marine Laboratory. They showed that a seine net released a much larger proportion of the catch than a trawl net with the same mesh.

In the early stages of hauling, slack in the warps was taken up and they gradually rose off the sea bed, and later, slow winding of the winch, helped by forward thrust of the propellers, caused some movement of the net, and the funnel and cod-end unfolded themselves to stream smoothly backwards behind the head-line.

At the end of slow-hauling only the centre of the ground-rope remained in light contact with the sea-floor, and at the change-over to fast-hauling the closing of the net was quickly completed.

During fishing the meshes of all parts of the net maintained a wide diamond shape.

Summing up the findings, the Scottish Fisheries Bulletin says: "These experiments, while preliminary in character, have added convincing evidence as to how underwater photography can be usefully applied to some of the problems connected with practical fisheries.

("Fish Industry" London. October, 1954.)

Japanese Tagging Tuna to Trace Migration

Japanese fishery scientists have announced their intention of initiating a tuna tagging programme. Interest of Japanese workers in the possible success of such a programme probably resulted from the recent recoveries by Japanese fishermen of Albacore tagged by California Fish and Game workers. The Japanese hope to tag 1000 fish annually during the next several years. The tags to be used are made of vinyl plastic tubing with a nylon core. All species of tuna and spear-fish will be marked in tagging to be carried out on many of the Japanese fishing areas in the Western Pacific. American fishermen recovering these tags will be able to distinguish them from California tagged tuna as the tags will be placed around the tail of the fish. Tuna tagged by American scientists have been tagged under the dorsal fin.

("Pacific Fisherman" Portland. October, 1954)

Juvenile Herring StudiesYoung Herring Lead a Precarious Life

By A.S. Hourston,
Pacific Biological Station

In order to better predict herring abundance on the Pacific Coast, a thorough knowledge of juvenile herring is needed. Survival during the early life history stages is precarious for the herring, which during the first two or three months of their existence are unable to seek refuge from adverse oceanographic conditions, storm, or predators, and suffer much heavier mortalities than during later stages in the life history.

It is not surprising, then, that no indication of the eventual recruitment of the year-classes can be given by estimating the amount of spawn deposited, as was found in investigations carried out on the west coast of Vancouver Island. This conclusion, with some reservations, appears to apply in

general to Pacific herring populations. Similarly, larval abundance, in the early stages at least, does not appear to provide an index of the future abundance of the adults, largely because survival in these stages appears to be related to good oceanographic conditions.

After the larval stages of its existence, the young fish is less vulnerable, and is subject to the same sort of threats to its existence as the adult fish.

Three-Year Absence

Abundance at this stage should be representative, on a proportional basis, of the recruitment of the year-class as adults.

However, the juveniles tend to migrate offshore in the fall only to reappear as adult spawning fish two or three years later. Thus the only period prior to recruitment into the fishing stocks when a relatively comprehensive survey may be made of a year-class is in the juvenile stage.

It was with this objective in mind that a major study of the juvenile tags of the Pacific herring was inaugurated in 1951. This programme was concentrated in Barkley Sound and is still in progress. The immediate objective of the study has been the delineation of the relatively self-contained stocks of first-year herring and the determination of the extent of mixing between these stocks. Once the stocks are identified, the size of each may be assessed and thus the total population in any geographical region may be determined. The process of estimating the size of the various groups of juveniles found, and the extent of mixing between these groups, were studied simultaneously by scouting and marking programmes.

Population Estimation

The first step in the field programme was a thorough scouting of the area for schools of small fish. These schools made marks on echo sounder tracings and were observed flipping at the surface at dawn and dusk. Occasionally flips were seen during the day,

especially when the tide was changing. Identification of species was made by :

- (1) Visual observation from the boat;
- (2) Raking;
- (3) Seining;
- (4) Underwater observations with diving equipment.

Rough estimates of the number of fish so observed were recorded by locality. The major groups of juveniles thus located were scattered around the edge of the sound in inlets and behind islands. In most cases the water was less than 100 feet deep.

Marking experiments were then carried out on each of the major groups. From 1,000 to 10,000 fish were marked in each locality, and then the full series of markings was repeated several times. After the first marking, each subsequent marking was also a search for previously marked fish. From the percentage recovery of marked fish and the known number of marked fish at large, it was possible to calculate the number of fish in each group for every set of recoveries made. From these series of "population" estimates, an estimate for the whole sound was made.

With minor exceptions, over two-thirds of the recoveries from the various series of fish marked over the past three summers were taken in the area of marking. Relatively free mixing apparently occurs between the adjacent localities of Uchuckleset Inlet and San Mateo Bay, and between Toquart Bay and Cigarette Cove. Thus the Barkley Sound juvenile herring population is made up of a series of relatively discrete sub-populations. Studies of size (length) groups within the various localities also support this conclusion.

Other Studies

Since the juvenile herring population within Barkley Sound is made up of a series of sub-populations, it follows that a reliable estimate of this population must include all of these sub-

populations. Since more of these sub-populations were discovered and included each year of the investigation, the estimate, based on the recovery of marked fish, was 166 million fish. This value is undoubtedly low since at least one major sub-population and several minor sub-populations were not included in the marking programme. Also some of the marked fish probably died as a result of the operation, thus reducing the number of potential recoveries in each case. Thus the 1953 juvenile population in Barkley Sound was probably more of the order of 500 million fish. (Recruitment to the Barkley Sound stocks in recent years has averaged 100-200 million fish.)

Juvenile population estimates from previous years are not sufficiently complete for even this rough type of estimate, due mainly to the exploratory stage of the research. However, two large local groups were studied over the three-year period. Comparisons of the Banfield Inlet and the Uchuckleset Inlet-San Mateo Bay groups both show the 1953 year-class to be similar or slightly smaller in size than that of 1952. A less reliable estimate of the 1951 year-class shows it to be smaller than either of the subsequent two year-classes. These conclusions are supported by the population estimates made during the scouting trips.

The value of these conclusions rests on the assumptions that the relative sizes of these two sub-populations are indicative of that of the population in the entire sound, and that scouting surveys give an adequate measure of the amount of fish present. The validity of these assumptions has yet to be established. However, it seems relatively certain that the large 1953 escapment, resulting from the lack of a significant fishery in 1952-53, and the subsequent heavy spawning in Area 23 have failed to produce a significant increase in the number of juveniles produced in 1953.

Other aspects of the juvenile state of the life history are also being studied in conjunction with the major programme. Growth studies show much variation between localities within Barkley Sound, but no significant difference between the average growth rate for the sound and that found on the lower east coast of Vancouver Island. A tagging programme is

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Trout Anglers' Quiz

This season Mr. N.V. Harris, N.S.W. Superintendent of Fisheries, appeals to all trout anglers to keep a record of the time they spend fishing, the locality fished and the fish caught. Provision has been made on the back of the trout license to record these particulars and a postage-paid addressed envelope will be supplied with each license issued to facilitate the angler forwarding his creel census record to the Department at the end of the season.

The information on individual creel census forms will be treated confidentially and the results of a collation of all forms will assist the technical staff in determining :

The number of trout caught in each age-group and the streams that are being under or over-fished. This will guide the hatcheries in their restocking programmes.

The survival rate of specially-marked hatchery-liberated fish, which will indicate the efficiency of natural reproduction.

The movements of hatchery-liberated trout, the direction and distance they have travelled and the frequency of their movements.

The number of fish caught per hour. When this result is compared with the results from future census it will indicate the trends in the quality and quantity of fishing.

One possible outcome of the census may be the abolition of the restriction on catching trout less than 12 inches long.

Mr. Harris appeals to all trout anglers to conscientiously keep the record of their fishing activities throughout the season and promptly return to him early in May, 1955, their completed creel census form.

This co-operation will assist materially in management of the streams being planned for better fishing in the future.

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under way to determine whether the young fish reared in a given area are actually the ones which return to spawn there. Experiments on the mortality caused by marking and tagging indicate a mortality of 10-20% for marked fish and 75-100% for tagged fish. Tag recovery tests in reduction plants indicate approximately the same efficiency as found for adult tags (i.e. about 80%). Data on oceanographic conditions in relation to the presence of juvenile herring have been collected and are in the process of analysis. The results of all these "secondary" studies will be applied directly or indirectly to the major study of population dynamics when a more complete picture has been obtained.

("Western Fisheries" Vancouver October, 1954)

Canadians Tag True Cod

Biologists from the Pacific Biological Station at Nanaimo, B.C., have been experimenting with tagging Pacific true cod. A number of problems have confronted the taggers in finding a suitable tag and method for tagging this species. Tags placed on with the normal ridged pin and disc were not practical, because of the body shape of the true cod. A further problem was encountered by bloating of the species when it is brought to the surface. Preliminary tagging was started in 1952 when 10 opercular (cheek) tags were placed on true cod. The gas from bloated fish was released by puncturing the body cavity with a knife. Three of these tags were recovered by fillet-line workers, but none was noted by the fishermen. The biologists decided that the cheek tag was not apparent to fishermen and began using a tag which was attached with monofilament nylon. The nylon was secured through the back of the fish and disc tags were tied to the nylon. A total of 256 tags were released this year and 7.8% have been returned, many by fishermen. The fish which were tagged in Satellite Channel area of British Columbia showed very little movement. True cod has become the number one bottom fish in Northwest trawl landings and an investigation into the life history of the fish is needed.

("Pacific Fisherman" Portland. November, 1954)

mesh; they were ships of average fishing power, as shown by their catches in 1952 (see table). Observers went to sea on both the small mesh and large mesh vessels to sample catches, including the discarded and landed fish.

What was Expected

The immediate effect of the regulation was expected to be a slight decrease in landings due to a loss of some small marketable fish. This decrease was expected to be less than 10 per cent the first year and to be compensated by benefits the second year. Thereafter, there should be increasing benefits until maximum was attained at equilibrium several years later.

The lowest age of capture with the small mesh cod-ends had been $1\frac{1}{2}$ years. It was calculated that increasing the lowest age of capture from $1\frac{1}{2}$ years to $2\frac{1}{2}$ years would increase the annual landings of haddock by about 30 per cent after a new equilibrium had been attained, if fishing effort remained the same.

The results of the first few months of regulation were more gratifying than expected. The small fish were saved but the expected initial decrease in landings did not occur. Instead, a definite benefit was enjoyed by the large mesh ships beginning from the time of conversion.

The magnitude of this benefit is shown in the table. It will be noted that the average landings of haddock by the large mesh ships during the last three months of 1953 were about 13 kits per trip greater than those of the small mesh ships - an appreciable 4 per cent better. Other species of fish such as cod and pollack were also taken in greater quantity by the large mesh ships.

Georges Bank Trawling Results Compared for Period of October, November, December - 1952-3

	Landings of haddock in 10st kits per trip *			Landings of all fish in 10st kits per trip *		
	1952	1953	% change	1952	1953	% change
Small mesh	435	341	21.6	537	481	10.4
Large Mesh	391	354	9.5	539	539	-

* The number of days fished per trip is nearly standard, because the length of trip is subject to union regulation.

Practical Experience of Large Mesh Trawling
in North West Atlantic

The provisions of the International Fisheries Convention of 1946 regulating the meshes of fishing nets were brought into force in the United Kingdom on April 5, 1954. These require trawlers of the 13 participating European nations to use nets with meshes of at least 75 mm when fishing for demersal fish in the European continental shelf waters south of latitude 66° N., and at least 110 mm when fishing north of latitude 66° N. and in Icelandic waters; the mesh sizes stipulated are to be as measured by a flat internal gauge used when the net is wet.

It is still too early to see any beneficial effects of this regulation. But some effects of similar regulations in the North-West Atlantic are worthy of note. These were reported on by Herbert W. Graham, scientist of the United States Fish and Wildlife Service, and other United States and Canadian fisheries scientists, at the annual meeting of the International Commission for the North-West Atlantic Fisheries, June, 1954. Substantial extracts from the communication by Herbert Graham are included in the following paragraphs.

Damage by Intensive Work

Previous to regulation the intensive trawling in the Georges Bank area had caused considerable destruction of small haddock of a size which were not saleable; these were being caught by trawls with average mesh size of $2\frac{7}{8}$ in. internal measurement (73 mm.). The mesh regulation required the minimum mesh size used to be $4\frac{1}{2}$ in. (114 mm.) internal dimension when wet after use, and came into effect on June 1, 1953.

Conversion from small to large mesh took place gradually, a few boats converting soon after June 1 and more later until October 1, 1953, when the conversion was completed. However, special precautions were taken so that the effect of the mesh change could be observed.

These took the form of allowing, by special license, eight of the trawlers regularly fishing Georges Bank for haddock to continue to do so with the small

The total of all species landed by large mesh ships was about 58 kits greater per trip - a 12 per cent improvement on the landings of the small mesh ships.

Advantage Shown

Taken all round, it appears that, in the Georges Bank area, haddock were less plentiful in the last three months of 1953 than in the corresponding period of 1952. The haddock catches of both the large and small meshed ships were, in the period after complete conversion of mesh sizes in 1953, down on the 1952 catches, but those of the small meshed ships were noticeably more down than those of the large meshed ships. While the total catches of all fish by the small meshed ships dropped 10 per cent as between 1952 and 1953, those of the large meshed ships remained steady on conversion from small to large mesh.

These better landings of the large mesh ships must, at least for the present, be attributed to greater efficiency of the large mesh net, an effect indicated by English experiments from the Fisheries Laboratory, Lowestoft (Davis, 1934) and anticipated when regulation was proposed in 1952.

The effect of the conservation of the young fish will, of course, not be very evident for a year or two. This advantage will be added to that resulting from the more efficient net. The increased catch of the larger fish will not negate the value of conserving the small fish. Increasing the efficiency of the net constitutes an increase in the fishing power, and it is estimated that on Georges Bank increasing the fishing effort up to 25 per cent on these larger fish will result in increased total sustained yield.

Double Gains Won

Thus the large mesh net seems to be operating with a double advantage; small fish are being saved to add to the catch later, at the same time that catches of larger fish are being immediately increased.

As a result of these experiences and other mesh experiments, Canadian fishermen in another area of the North-West Atlantic region are voluntarily adopting

a 4½ in. (internal) mesh.

These results are both very striking and reassuring. Benefits from mesh regulation under the 1946 Convention are confidently expected for European waters, especially in the haddock fisheries, but the initial magnitude of the benefits brought by the small increases in mesh agreed upon cannot be expected to be so immediately obvious as were those in the North-West Atlantic where the increase in minimum mesh size was a big one.

By A.R. Margetts,
Fisheries Laboratory, Lowestoft.

("The Fishing News" London. November 19, 1954)

Oceanic Upsurge Kills Many Fish

The hurricanes which have been sweeping the American Atlantic seaboard have indirectly brought death to thousands of fish. In Chesapeake Bay many fish were found floating on the waters, says Reuter. The official explanation is that when high winds disturb the lower water levels containing little oxygen, and they surge upwards, the fish die through lack of oxygen.

("The Fishing News" London. September 17, 1954)

Too Hot

A Japanese Welfare Ministry spokesman states that 24,000 lb. of tuna caught in the South Pacific and brought to a port near Tokyo have been condemned and dumped after geiger checks had shown the fish to be radioactive and too dangerous for human consumption.

The spokesman said that two tons caught off Australia by another boat were also dumped because they were "too hot."

("The Fishing News" London. November 5, 1954)