

[MONTHLY SERVICE BULLETIN
(WESTERN AUSTRALIA FISHERIES

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DEPARTMENT OF PARKS AND WILDLIFE

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SERVICE BULLETIN

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Vol. XI, No.10

November, 1962

STAFF NOTES

The Director, Mr A.J. Fraser, returned to Perth by air in the early hours of November 1. He had attended the tenth meeting of the Inco-Pacific Fisheries Council, held in Seoul, Republic of Korea, from October 10 to 25. In Tokyo, on the return journey, Mr Fraser called at the head office of Nippo Pearl Co. and met Mr T. Kuribayashi, one of the principals of the firm of Pearls Pty. Ltd., which conducts the pearling station at Kuri Bay, North-West Australia. He also renewed acquaintance with Mr Hiroshi Iwaki, chief of operations at Kuri Bay, who was in Tokyo at the time on vacation.

Congratulations are extended to Inspector and Mrs R.M. Crawford on the birth of their third daughter, Wendy Jean, on October 19. Mr Crawford will commence annual leave on November 5.

Other officers on leave this month will include the Supervising Inspector, Mr J.E. Bramley, and Mr P. Yewers, of Head Office, both of whom will start their annual holiday on November 19.

Mr J.B. Byleveld, also of Head Office, will commence annual leave on December 3.

Research Officer R.J. Slack-Smith returned to Perth on October 5 after visiting prawning grounds in Exmouth Gulf. He spent some time aboard the prawn trawler "Dorothy W", skippered by Bill Goode, a Queenslander, who worked for the North-West Whaling Company last season.

The title and classification of the position occupied by Mr B.K. Bowen, leader of the Department's research

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section, has been amended by notice in the Government Gazette of October 26. The title has been changed from Research Officer to Senior Research Officer and the classification has been increased to P-II-8/9.

We regret to announce that Captain H.C.W. Piesse, Master of the r.v. "Peron", has, for personal reasons, submitted his resignation from the service to take effect from close of business on November 23. It is anticipated that a presentation will be made to Captain Piesse, and also to ex-Technical Officer L.G. Smith, at the forthcoming Departmental conference which is now scheduled to be held in the new year.

Applications for the filling of the vacancy consequent upon Captain Piesse's resignation, will probably be called on an Australia-wide basis.

A LETTER TO THE EDITOR

Nedlands,
26/10/62.

Dear Sir,

My attention has been directed to an article on crayfishing in your Monthly Service Bulletin, October, 1962.

On page 194 a sentence reads as follows:-

"The number of men operating these days in the Abrolhos gives a wry twist to our recollection that, less than a decade ago, one authority stated that the number of men fishing the Abrolhos should be limited to 60!"

Presumably that comment refers to a recommendation made by me (Eighth Annual Conference of Inspectors, December 13-14-15, 1950, page 27) and reading:-

"If it were desired to maintain the Abrolhos grounds proper as an effective fishing area, and to secure the optimum catch spread fairly evenly over the present fishing season (April to August), the optimum number of fishermen lay between 60 and 65"

and

"The optimum number suggested would be sufficient to permit of the proper exploitation of the Abrolhos area

itself and of some expansion easterly without forcing surplus men to fish (undesirably) in the nursery grounds westerly and north-westerly of the western reef areas."

In an official comment in the Western Australian Fisheries Department Monthly Service Bulletin, June 1954, it was stated, "It has frequently been pointed out that the maximum number of men required to work the Abrolhos efficiently and to permit of the re-introduction of 'farming' procedures common in earlier years is approximately 65, having regard to the relatively short open season of 22 weeks only in each year."

I must pointed out that the number suggested referred to the Abrolhos proper, i.e., to the fishing grounds enclosed by the encircling reefs of the various groups. It did not refer to the outer, deep water grounds. No organised fishery existed there and there was no opportunity to make an assessment of the number of men required to work those outer grounds efficiently.

The numbers referred to in your present article apply to Block 46 (and perhaps outside of this as fishermen tend to refer their catches to the statistical block containing their working anchorages). In either case the fishing grounds to which the earlier estimate applied and those to which your article applies are not the same. Part of the confusion has arisen from the expanding meaning which has been given to the term "the Abrolhos" as the area fished in Block 46 has extended.

I would appreciate it if you made the necessary correction in the November issue of your Bulletin, preferably by publishing this letter, particularly as the history of the fishery on the inner fishing grounds suggests that the estimate was not far from the mark.

Yours faithfully,

(sgd) Keith Sheard D.Sc.

WESTERN FISHERIES RESEARCH COMMITTEE

The second meeting of this Committee will be held in Perth on November 20 and 21. It might be remembered from the report of the committee's inaugural meeting published in the December 1961 issue of this bulletin, that the Director is the committee's chairman and the Chief Clerk, Mr B.R. Saville, its secretary. Other members to be present at the

second meeting will include Mr C.G. Setter, Director, Fisheries Division, Department of Primary Industry; Mr G.R. Williams, Administrative Officer, representing the Division of Fisheries and Oceanography, C.S.I.R.O.; Dr J.M. Thomson, Division of Fisheries and Oceanography, C.S.I.R.O. (Project Leader); Mr A.C. Bogg, Director of Fisheries and Game, Adelaide; Dr A.R. Main, Zoology Department, University of W.A.; and Dr W.D.L. Ride, Director, Western Australian Museum. Also to be present as consultants will be Mr J.A. Gulland, of the Fisheries Research Laboratories, Lowestoft, England, and Mr A.E. Stark, biometrician, Commonwealth Bureau of Census and Statistics, who is attached to C.S.I.R.O.

Situation reports on projects on hand will be given by the officers engaged on them. These are Dr R.W. George, Mr B.K. Bowen, and Mr P. Cawthorn, on crayfish; Mr R.J. Slack-Smith, on prawns; and Dr R.G. Chittleborough, on whales. Other situation reports will be presented on behalf of the authors by Dr Thomson.

The meeting will be officially opened by the Minister for Fisheries (Mr Ross Hutchinson) at 10 a.m. on Tuesday, November 20. On the following morning, Mr Gulland will give an address on population dynamics in fisheries.

In addition to reports on projects in hand, and the organization of the committee, matters to be discussed will include -

- * Testing of monofilament nets
- * Net selectivity
- * Crayfish and prawns
- * Legal minimum crayfish tail weight
- * Tuna research
- * Taxonomy.

ABSENCE FROM DISTRICT OVER WEEKENDS

The attention of all field staff is directed to the following instruction reprinted from the August, 1961, issue of this bulletin.

As there seems to be a doubt in some officers' minds regarding their official responsibilities over weekends and on public holidays, the following is published for information of all concerned.

The first thing that must be appreciated is that

inspectors are on call seven days a week and have no set hours of duty. This is necessary, as all officers no doubt realise, to meet the exigencies of the Department. That is the reason why no officer is entitled to leave his district or his headquarters without the sanction of his immediate superior. Inspectors in charge of districts and other officers working directly under the Supervising Inspector must accordingly obtain prior approval from the Supervising Inspector. Officers working under the direct control of a district inspector must not absent themselves from their district or headquarters without the district inspector's approval.

At the same time approval to leave a district will not be withheld without sound reason. In other words, an officer is entitled to know in advance whether he is required to work during a weekend or on a public holiday, and if he is not required to do so there is little point in tying him down to his district if he desires to leave. If, however, it appears to the officer-in-charge that an officer will be needed over the weekend - as for example in the flush of the crayfish season - he is to be notified to that effect a reasonable time beforehand.

BROADBILL SWORDFISH CAUGHT

Early last month a swordfish was caught by two men in the shallows of Shoalwater Bay. They saw the fish swimming sluggishly, waded in after it, and caught it with their bare hands. It was later identified as a broadbill swordfish, a member of the family Xiphiidae, known scientifically as Xiphias gladius. This species is comparatively rare in our waters. The last sighting of which we have any record was in May, 1952, although occurrences of sail fishes and marlin, which are grouped in the same sub-order as the sword fishes, were noted in the April issue of this volume.

FISHERIES ACT AMENDMENT

The principal features of a bill seeking to amend the Fisheries Act were explained by the Minister for Fisheries during its second reading late last month. Among other things, the bill will give authority for the seizure and confiscation of gear used for cooking undersize crayfish, and empower the limiting of the number of craypots which may be used by any one vessel. It will also increase from £50 to £100 the maximum fine which may be imposed for the breach of a regulation, and authorise the imposition of a daily penalty for continuing breaches. The bill incorporates amendments consequential to the passing last year of the Local Govern-

ment Act. Not the least important are provisions which seek to clarify powers to prescribe the persons and things required to be licensed under the Fisheries Act and the circumstances in which they will be required to be licensed.

RESTRICTION OF CRAYBOAT LICENSES

As mentioned on page 101 of last month's issue, the Minister for Fisheries approved a recommendation of the Fishermen's Advisory Committee that the number of boats engaged in the taking of crayfish be restricted. As a result of this decision, no additional licenses will as a general rule be issued after March 1, 1963, except for boats that had been crayfishing immediately prior to that date. Although special cases will be treated on their merits, it is not expected that many exceptions will be made. The new policy has been introduced to protect the existing economic standards in the fishery, and to resist further tendencies towards over-fishing.

Although we are convinced that the restriction is necessary, it will create a number of administrative problems. Together with the recently imposed limitation of the number of trawlers allowed to work the Shark Bay prawning grounds, it will bring new pressures to bear on our administrative machinery. Actually, these strictures presage a new era in fisheries management in this State, as they represent a departure from the past practice of unrestricted participation in any fishery. The legislative amendment already referred to herein foreshadows limitation of the number of pots which any one vessel may use. We anticipate that such a measure must be a concomitant of the limiting of the number of boats. Without the one the other will be of little value.

Already over-taxed by growth in past years in the inspectorial and research sections, the administrative and clerical sections of the Department will have the greatest difficulty in coping with the expected flow of additional work. All field staff are asked to keep this in mind in their dealings with Head Office.

WHALING

In their report to shareholders for the year ended March 31, 1962, the directors of Nor'-West Whaling Company Ltd. announced that the company had suffered a net loss of £8,471. In the previous twelve months, the net loss sustained had been £8,014. Notwithstanding these adverse results, the directors recommended payment of an unchanged dividend of

7½ per cent and foresaw better times for the company through the development of the prawning industry in which it expects to play a leading role.

The directors also revealed that the sperm whaling trials had been disappointing and that only 26 had been taken. Contrariwise, the Cheynes Beach Whaling Company, at Albany, has been able to develop sperm whaling on a profitable basis and last month announced the purchase of two modern whale-chasers to replace existing vessels. The new chasers were acquired from a Queensland company which recently ceased operations. They are sister ships and are reported to be more powerful and faster than the present chasers. It is understood that they operated in the Antarctic before they were acquired by the Queensland concern.

MANX KANGAROOS?

No, not a new species, but two reports have come to hand of kangaroos without tails.

The first note on such an occurrence came from the Government factotum at Onslow, Mr A.H. Clark. He wrote that the animal he had seen was a red (in colour, not political propensity) boomer of above average size. It was with several other kangaroos, all of which made off with good speed when first approached. Except that it hopped rather more erectly than the others, it did not seem to be handicapped by the loss of its tail. It was also able to sit upright - also very erectly. Mr Clark had 5 witnesses so there is no doubting his veracity, but they were unable to approach closer than 70 yards of the animal. Consequently, it was not possible to observe whether there was any scar.

When this report was sent to Dr Shelley Barker, of the Division of Wildlife Research, C.S.I.R.O., Canberra, he recounted a similar observation. A few months before receiving our letter he had visited a local farm which had a semi-tame colony of grey kangaroos. One of them, he wrote, was an old doe that had been on the farm for about 17 years. She could be easily recognised by her tail, or the lack of one. It had apparently been shot off many years ago. She could hop quite fast and jump fences without difficulty. Dr Barker commented that, just like Mr Clark's animal, she adopted a very upright stance when she hopped. She died last July, he added, of natural causes and when her skull was compared with others from similar kangaroos of known age, it was estimated that she must have been 20 years old at death.

Mr Clark, after giving us the details of his de-

tailed red, went on to say that when discussing the observation with some local men, one stated that he had recently shot a kangaroo near Meekatharra that had only a few inches of tail. Another report, from a source which Mr Clark valued as a good authority, mentioned the shooting of an hermaphrodite kangaroo that had both a pouch and male organs. A section of the skin was reported to have been brought into town but Mr Clark had not seen it.

THE MICROBE

The microbe is so very small
You cannot make him out at all,
But so many sanguine people hope
to see him through a microscope.
His jointed tongue that lies beneath
a hundred curious rows of teeth;
His seven tufted tails with lots
of lovely pink and purple spots,
On each of which a pattern stands,
Composed of 40 separate bands;
His eyebrows of a tender green;
All these have never yet been seen.
But, Scientists, who ought to know
Assure us that they must be so ...
Oh! let us never, never doubt
What nobody is sure about!

Hilaire Belloc.

WATCH WHAT YOU'RE WRITING

The Institute of Advanced Motorists in England has collected the following examples of howlers perpetrated by motorists:-

"I knocked over a man. He admitted it was his fault as he had been run over before."

"I consider that neither vehicle was to blame, but if either was to blame, it was the other one."

"The other car collided with mine without giving warning of its intention."

"The other man altered his mind, so I had to run into him."

"To avoid a collision I ran into the other car."

"The car had to turn sharply owing to an invisible lorry."

CLEARING HOUSE

International Whaling in the Post-War Period

The International Whaling Statistics edited by the Committee for Whaling Statistics and just published by the Norwegian Whaling Council is a very comprehensive report on world whaling results.

The latest edition of this report shows considerable increase in the total world catch in the Arctic as well as elsewhere, and in the last three years more than 60,000 whales were killed annually.

In 1959-60 whaling was carried out from 54 shore stations and 23 floating factories and by 399 catchers of which three shore stations, two floating factories and 241 catchers were operating in the Antarctic.

The following report is a short comparative review of the development of world whaling in the post-war period based on the results of three catching seasons, 1946-7, 1949-50 and 1959-60, thus covering the post-war period.

Table No. 1 shows the number of whales killed in the three periods in all waters arranged according to species.

Table No.1

| | 1946/47 | 1949/50 | 1959/60 |
|-----------------|---------------|---------------|---------------|
| Blue whales | 9,302 | 6,313 | 1,465 |
| Fin whales | 16,495 | 22,902 | 30,985 |
| Humpback whales | 290 | 5,063 | 3,575 |
| Sei whales | 1,131 | 2,471 | 7,035 |
| Sperm whales | 7,546 | 8,219 | 20,244 |
| Others | 56 | 125 | 312 |
| Total | <u>34,820</u> | <u>45,093</u> | <u>63,616</u> |

The Oil

With regard to the production of whale oil, Norway in 1945-46 reached 56.6 per cent of the world production but she has been beaten by Japan in the last two seasons, Japan 29.5 per cent against Norway 28.6 per cent and 28.3 per cent against 24 per cent.

Quantitatively no country has ever produced more whale oil in one year than Norway in 1950-51 and 1951-52, 1,150,728 and 1,151,404 barrels respectively, or nearly 200,000 tons.

The United Kingdom reached its highest production of oil in the pre-war period 1937-38 with 959,692 barrels or 163,147 tons.

Table No.2

Whaling results for the various countries 1959/60 arranged in order of quantity of oil production and showing also the size of the enterprises of each country:

| | Total of Whales | Oil Pro- duction | Shore Stations | Floating Factories | Catchers |
|----------------|-----------------------|------------------------|-------------------|-----------------------|------------|
| Japan | 18,854 | 816,073 | 19 | 8 | 109 |
| Norway | 11,572 | 690,944 | 4 | 8 | 86 |
| USSR | 11,434 | 519,422 | 4 | 3 | 59 |
| United Kingdom | 5,165 | 288,117 | 1 | 3 | 38 |
| Netherlands | 2,081 | 143,050 | | 1 | 13 |
| South Africa | 3,523 | 102,786 | 2 | | 17 |
| Australia | 1,809 | 89,366 | 5 | | 14 |
| Peru | 3,451 | 75,426 | 3 | | 8 |
| Chile | 2,084 | 41,443 | 3 | | 16 |
| Argentina | 932 | 40,500 | 1 | | 7 |
| Iceland | 379 | 17,536 | 1 | | 4 |
| New Zealand | 361 | 15,184 | 2 | | 6 |
| Portugal | 506 | 13,107 | | | |
| United States | 453 | 12,586 | 5 | | 14 |
| Brazil | 813 | 10,800 | 2 | | 5 |
| Spain | 197 | 5,263 | 2 | | 3 |
| Canada | 2 | 27 | | | |
| Total | <u>63,616</u> | <u>2,381,630</u> | <u>54</u> | <u>23</u> | <u>399</u> |

By Products

In addition to the whale oil the principal product in the industry, certain by-products are obtained.

These are specified as follows:

All areas 1959-60 - Whale meal 84,168 long tons; whale liver, 1,910; liver (vitamin) oil, 254; liver meal, whale meat, 143,434; whale solubles, 6,212; other by-products, 31,309, a total of 267,287 long tons (one long ton 1.016 kilo).

To the production of oil and by-products must finally be added sperm oil, the production of which in 1959-60 amounted to 648,392 barrels or 110,226,640 kilos in all areas.

The world whaling industry has thus in 1959-60

yielded the following quantities:

| | | | <u>kilos.</u> |
|-------------|----|-------|--------------------|
| Whale oil | .. | .. | 489,877,100 |
| By-products | .. | .. | 271,563,592 |
| Sperm oil | .. | .. | 110,226,640 |
| | | Total | <u>871,667,332</u> |

(The Fishing News

London

September 7, 1962)

The Strangest Fish Story?

One of the strangest "fish stories" of all time points out clearly that crime does not pay. The official records of the Government of Jamaica recounts the unhappy plight of an 18th century American pirate who found himself trapped by a British man-of-war in the Caribbean Sea. Finding escape impossible, the pirate skipper threw his ship's papers overboard. Following his capture, the American was taken to Port Royal, Jamaica, where he was placed on trial for his life. As there was no documentary evidence against him, he was about to be set free when another British ship arrived in port. The captain of the second British vessel reported that his crew had caught a shark off the coast of Haiti, and when the fish's stomach was opened, the pirate's papers were discovered. The papers were preserved intact and they served to convict the luckless pirate.

(The Fishing News

London

September 7, 1962)

Danger to Fish from Forest Spraying

Demand for control of pests

Expressing the growing alarm among conservationists over the indiscriminate use of sprays, Roderick Haig-Brown, author and conservationist, told Victoria Fish and Game Protective Association in a recent talk that forest spraying constituted the greatest immediate threat to fish.

Salmon are particularly vulnerable to forest sprays, he pointed out, demanding that other methods of controlling insect pests be used.

Emphatic warning that the cumulative effects of large scale spraying of crops, forest and other areas is poisoning the soil and destroying the natural balance has been given by soil scientists, conservationists and others

in many countries during recent years.

The New Yorker recently ran a series of articles by Rachel Carson, author of *The Sea Around Us*, pointing out that the ever more potent poisons used in the sprays were retained in the soil after years, were absorbed by plants and passed along to animals and humans.

Haig-Brown advocated that instead of spraying trees along power line right of ways in the province, growth of low shrubs should be encouraged. Low shrubs inhibited new tree growth, did not interfere with power lines and yet provided adequate cover for wildlife.

This method, he informed the Association, was now being used by authorities in some parts of the continent to eliminate unsightly and injurious annual roadside spraying.

(The Fishing News London September 21, 1962)

Cruelty to Lobsters

A controversy in the "Sydney Morning Herald" recently on cruelty to lobsters and other crustaceans in cooking them alive amused Charles Ongley, one of our veteran fish agents, now retired.

Letter writers deplored the fact that lobsters were plunged into boiling water, writhing in pain while being cooked alive.

As Charles said, anyone in the fish trade knows that the only way to cook lobsters is first to drown them in fresh water. This prevents them kicking their legs off in agony and builds up their weight.

(Fish Trades Review Sydney October, 1962)

Government Aid Promised to Fisheries

The Commonwealth Government has agreed to subsidise private fishing enterprises if their prospects are reasonably bright, a conference of State Fisheries Ministers was told in Sydney.

The Government is interested in soundly based schemes.

If such schemes, however, haven't the capital to

get under way, the Government is prepared to buy shares in the company and then sell them on the open market when the company is on its feet.

It will not assist fly-by-night projects.

One condition for Commonwealth aid is that the company must also operate outside State territorial waters.

Several schemes suggested by the various States at the Sydney conference will be considered, in priority, by the Commonwealth.

Tuna fishery

Among the schemes for which aid is sought are the development of tuna fishery in north-west Western Australia and tuna and prawns in Queensland.

Finance for such schemes will come from the Fisheries Development Trust Fund which was established several years ago when the Commonwealth sold its whaling station at Carnarvon, Western Australia.

The conference considered a series of proposals on fisheries research, development and administration and discussed the need for uniform regulations for the management of fisheries.

The Minister for Primary Industry, Mr Adermann, told the conference that Commonwealth funds would be provided to bring an international expert to Australia to advise on fishing boat design.

The States will be asked to contribute to the cost of the visit.

(Fish Trades Review

Sydney

October, 1962)

Southern Endeavour Still Trying Hard

Australia's biggest trawler, the Southern Endeavour, is still trying hard to get among the fish but hasn't had spectacular success to date.

Her new skipper is Jack Gardiner, formerly of the Hunter, recognised as one of the top fishermen of Australia.

Jack was fishing skipper when Southern Endeavour went to New Zealand last month, but has now taken full control.

Earlier this month, when rough seas forced coastal and interstate steamers to shelter at Eden, Jack and his crew were still at sea.

Poor result

It is reported that Jack's best dig in the gale was only eight baskets - not very encouraging.

Bobby Bell, a former Eden fisherman, said that Southern Endeavour had fished in seas which would have forced even the old steam trawlers to run for shelter.

The steam trawlers had more success than the former Grimsby boat, he said, because they operated in fleets of seven and eight at a time and when one boat found fish it radioed the others, who steamed to the grounds.

Lone hunter

Southern Endeavour is hunting on its own and on grounds never worked before. When it does find fish, it will catch more in one trip than three of the old trawlers put together.

Tom Lancey, one of the three owners of Southern Endeavour, said the trawler was still experimenting and still trying very hard to find new fishing grounds. He said it may take some time for the venture to succeed, but the ship had an excellent crew.

Referring to the vessel's disappointing trip to New Zealand last month, Mr Lancey said it was ill-advised and made before a proper survey of the grounds had been made.

While Southern Endeavour was in New Zealand, however, she made a survey of the North Island fishing grounds and next time she goes there the story will be entirely different, Mr Lancey said.

(Fish Trades Review

Sydney

October, 1962)

Hovercraft Lifeboats a Possibility Now

Lord Saltoun, Scottish chairman of the Royal National Lifeboat Institution, speaking at Stornoway when he presented certificates to seven local lifeboat men, said hovercraft lifeboats might be used in the future.

Praising the local organisation for the money gathered for the R.N.L.I. (nearly £3,000 in the last five

years), Lord Saltoun said new developments and rising costs meant the institution always required more.

"I think it is quite possible that in the near future there would be great changes. We may get very much larger lifeboats with the inshore work being done by hovercraft.

"This is a serious possibility once the present difficulty of using hovercraft over tumbled water is overcome", he said.

Fishing News

London

August 24, 1962)

For The Birds

An interesting experiment in multiple-use tree farming is under way in Michigan's Manistee County. There the Packaging Corporation of America, a large user of pulpwood, is supplying tree-farm owners with hawthornes, dogwoods, wild cherries, and other bird-attracting trees to be planted with the red pine that is the standard reforestation tree of the region. PCA not only furnishes the stock but planting and management plans. This is important, because conifers predominate in much of the country where the tree-farm idea is taking hold. This is a poor arrangement for wildlife; though shelter and escape cover are plentiful, food supplies are frequently nonexistent. Under the PCA plan losses in timber yield will be negligible and the gain in public relations and in benefits to hunters tremendous. Here's an undertaking worthy of the attention of wildlife officials, industry, and sportsmen.

(Field and Stream

New York

August, 1962)

Skin Divers Solve a Problem

The first "fish census" ever made off the coasts of the United States took place in the May 26 - June 3 period, by 400 skin diver volunteers of the American Littoral Society, and similar counts will be undertaken on the Fourth of July and on Labour Day, the U.S. Fish and Wildlife Survey has announced here.

The programme, co-ordinated by the Sandy Hook (N.J.) Marine Laboratory of the Fish and Wildlife Service, consisted of identifying, counting and recording salt-water fish by 70 census teams in 16 coastal states.

For years, marine biologists have been troubled

over their inability to make simultaneous observations of the distribution and abundance of fishes over their entire range, which, in some cases, may be thousands of miles along the coast. The planned fish counts are designed to help fill this gap and to answer such questions as where migratory fish come from, where they go, and where their centres of abundance may be located. Study of the collected data is expected to give some clues on why fish distribution and abundance are patterned the way they are.

Divers listed, in the census, as many of the U.S. marine fishes as they could find during the nine-day period. In a pilot study held last summer, 24 test teams counted 23,000 fish of 93 species. These ranged from one-inch long angel fish to 12-foot tiger sharks.

Fishing Gazette

New York

July, 1962)

Pacific Albacore Migration

Many unknown features concerning the life history and behaviour of the Pacific albacore (Thunnus germon) have been revealed by biologists during the last ten years with the assistance of fishing boat captains. Special tags designed by a biologist of the California Department of Fish and Game have been used to determine migrations, populations, ages and growth rates.

It has been found that albacores migrating up the Pacific coast average at least six nautical miles a day; that they undertake a trans-Pacific migration between the American mainland, the Hawaiian Islands and Japan; that their growth rate averages 7 lbs. a year; that individuals and possibly some schools return to the American coast during several seasons and that there is possibly only one population in the north Pacific.

Harold B. Clemens' paper entitled "The Migration, Age and Growth of Pacific Albacore" has been selected by the Wild Life Society as the outstanding fishery publication of 1961.

(IUCN Bulletin, Switzerland

July/September, 1962)