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(WESTERN AUSTRALIA, DEPT. OF

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SEPTEMBER, 1967

VOL. XVI, No. 9

DEPARTMENT OF FISHERIES AND FAUNA  
108 Adelaide Terrace, Perth, Western Australia

MONTHLY SERVICE BULLETIN

DEPARTMENT OF  
FISHERIES AND FAUNA  
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WESTERN AUSTRALIA.

MUSEUM BOARD HONOURS DIRECTOR

We extend our heartiest congratulations to the Director (Mr. A.J. Fraser) who has accepted an invitation from Sir Thomas Meagher, Chairman of the Western Australian Museum Board, to become an Honorary Museum Associate for the current year. The invitation read as follows :-

Western Australian Museum,  
Perth. August 16, 1967.

Mr. A.J. Fraser, J.P.,  
Director,  
Department of Fisheries and Fauna,  
108 Adelaide Terrace,  
PERTH W.A. 6000.

Dear Mr. Fraser,

In recognition of your interest in the work of the Museum and the assistance you have so readily given to us in the past years, I have pleasure in inviting you, on behalf of my fellow Board Members and of the Museum staff, to accept appointment as Honorary Museum Associate for the current year.

Many of the aims and objects of the Museum have been implemented or initiated by your Department in the past and your enthusiasm and co-operation in the problems of conservation of fisheries and fauna in our State is appreciated by the Board.

We hope, therefore, that you will accept appointment as Honorary Museum Associate to the 30th June, 1968.

Yours sincerely,

Thomas Meagher,  
Chairman  
Western Australian Museum Board

Mr. Fraser replied in the following terms :-

Sir Thomas Meagher, Kt.,  
Chairman,  
Western Australian Museum Board,  
Beaufort Street,  
PERTH W.A. 6000.

Dear Sir Thomas,

It is with great pleasure that I accept your Board's invitation to become an Honorary Museum Associate for this year.



2.

Whatever I may have achieved in promoting the interests of fisheries and fauna conservation is, of course, but what I have been required to do by reason of my official appointment. At the same time conservation in its broadest sense has always been close to my heart and I have perhaps derived much greater personal pleasure and enjoyment from my efforts than if it were merely a job I was doing. Furthermore, it has afforded me the privilege of knowing so many like minded people - people who are really 'nice to know' and whose friendship I value.

Will you please accept for yourself, and convey to your colleagues, my best expressions of appreciation of the signal honour you have done me.

Yours sincerely,

A.J. Fraser,  
DIRECTOR

COMMONWEALTH-STATES FISHERIES CONFERENCE

From September 4 to 6 Perth will be the host city to one of the largest and most representative gatherings of Australia's Fisheries Administrators ever to visit Western Australia.

Following this meeting on September 8 the Commonwealth and State Ministers responsible for fisheries will meet, also in Perth, to consider the recommendations coming from the officers' meeting.

There will be a very lengthy agenda, and discussions on an exceptionally wide range of topics concerning the development and management of Australia's fishery resources will take place.

The following Ministers have expressed their intention of being present -

The Rt. Hon. C.F. Adermann, P.C., M.P., Minister for Primary Industry;  
The Hon. C.E. Barnes, M.P., Minister for Territories;  
The Hon. A.E. Willis, M.L.A., Chief Secretary, N.S.W.;  
The Hon. A.G. Rylah, E.D., M.L.A., Chief Secretary, Victoria;  
The Hon. J.D. Herbert, M.L.A., Minister for Labour and Tourism, Queensland;  
The Hon. G.A. Bywaters, M.P., Minister for Agriculture, South Australia;  
The Hon. A.C. Atkins, M.H.A., Minister for Agriculture, Tasmania, and  
The Hon. G.C. MacKinnon, M.L.C., Minister for Fisheries and Fauna, Western Australia.

The participants and observers at the officers' conference will be Dr. D.D. Francois (N.S.W.), Messrs. A.D. Butcher and J.C.F. Wharton (Victoria), G.G.T. Harrison and N.M. Haysom (Queensland), H.S. Rush and A. Caton (South Australia), A.W. Mead and R.H. Scott (Tasmania), C.G. Setter, T.W. Burton and D. Macdonald (Department of Primary Industry), D. Mentz and J. McConnel (Department of Territories), Drs. G.F. Humphrey, R.G. Chittleborough, Messrs. B.F. McKeon, C.A. Mobbs (C.S.I.R.O.), A.J. Fraser, J.P. Robins, B.R. Saville, R.J. Slack-Smith and J.E. Bramley (Western Australia).

Mr. Walter Ives, a member of the C.S.I.R.O. Executive, and Mr. A.C.B. Maiden, Secretary of the Department of Primary Industry, Canberra, will sit in at the Ministers' meeting. The conference secretary will be Mr. W.D. Hardy, of the Department of Primary Industry, Canberra.

### PLASTICS IN THE FISHING INDUSTRY

Plastics are used extensively in this modern world particularly in the everyday articles we see around us at work, at home and elsewhere.

Industry finds various types of plastics useful for component parts in washing machines, refrigerators, polishers, television sets, automobiles and a host of other items.

Materials-handling containers have been a great boost to industry generally. Moulded plastic containers are now making a big impression on all sections of Australian industry and commerce.

Plastic crates for fish handling have been in use in overseas countries for many years. They have also become increasingly popular in the eastern States and to a lesser extent in Western Australia.

Plastic crates have many advantages over the traditional wooden boxes. Some of these advantages are :-

- \* They nest snugly when empty, thus saving storage space and cutting transport costs.
- \* They have a long life with no maintenance.
- \* They are light to handle.
- \* They resist corrosion.

According to the New South Wales Fish Authority, which is in the process of changing over from wooden to plastic containers, the big advantage is that they do not harbour bacteria which turn fish sour when packed in wooden boxes.

### SILVER WHITING TAKEN AT COMO PRELUDE TO GOOD WHITING SEASON.

As mentioned in a previous bulletin, an exceptional autumn whiting season was reported in estuarine waters at Bunbury, Mandurah and Augusta.

An unusual haul of silver whiting in the Swan River near Como in March seems, in retrospect, to have foreshadowed the good catches elsewhere on the coast. About 100 whiting were taken in the one haul at Como. These included a few King George Whiting. It is believed that catches of silver whiting in this quantity have not been recorded in the Swan for many years.

NEW REGULATIONS TO GOVERN  
LAUNCHES OFF W.A. COAST.

Launches up to 50 gross tons operating commercially on the Western Australian coast are to be brought under new legislation.

This was announced recently by the Minister for Works, Mr. Hutchinson, who said that a new set of regulations under the W.A. Marine Act had been prepared to govern the operations of this class of vessel. Boats of this type, he said, had become more numerous as a result of increased exploration and development along the coast, particularly in the north.

Until it was amended last year the Marine Act recognised as a single class all coast trade vessels up to 300 tons gross, but regulations applicable to bigger ships in the class were not appropriate to the relatively small 30 - 60 ft. launches engaged on oil exploration work, hydrographic surveys, tourist charters and similar coastal operations, Mr. Hutchinson said.

These vessels had now been classified as Limited Coast-Trade Vessels and new regulations governing them would come into force within a few weeks.

The survey and equipment specifications of the new regulations were similar to those applying to commercial fishing boats, but masters and other personnel were required to possess a higher standard of qualification.

Before being eligible to sit for an examination for a Master's Certificate for a limited coast-trade vessel a seaman will have to satisfy the Harbour and Light Department that

- \* he is over 21 years of age and not an alien;
- \* he has had at least 3 years satisfactory sea service;
- \* he has satisfactorily completed an approved course in coastal navigation.

The examination for a Master's Certificate covers an extensive syllabus in navigation, seamanship and signalling.

Similar conditions as to age and nationality apply to a candidate for a Marine Motor Engine Driver's Certificate. Other necessary qualifications include at least 12 months approved practical experience and a satisfactory knowledge of marine motor engines and related matters.

The Harbour and Light Department will arrange for examinations and surveys to be conducted as necessary, and a reasonable time will be allowed for compliance with the regulations before any enforcement action would be taken.

The new regulations would enable a number of companies to proceed with plans for the development of charter services, for big game fishing tourism and for other purposes, Mr. Hutchinson concluded.

#### WILDLIFE SHOW 1967.

The annual Wildlife Show conducted by the Western Australian Naturalists' Club and the W.A. Gould League will take place at the Perth Town Hall from September 18 to 23 inclusive.

Once again the Department will participate with a display. The theme will be the "Wetlands of Western Australia" and will feature the Department's activities in waterfowl research and habitat preservation.

Two films will be screened in the theatrette at the Town Hall featuring waterfowl research work. One film is of the Department's research work at Rottneest Island and the other concerns the preserving of a particular waterfowl refuge in New Zealand.

Immediately following the Wildlife Show the display will be taken to Kalgoorlie where the Department will participate in the Australian Inland Mission's Wildflower and General Exhibition.

#### PALLINUP RIVER PATROL

Inspector D.P. Gordon reports from Albany that on a recent patrol to the Pallinup River he sighted approximately 1,000 Black Duck. There were also several hundred Grey Teal and approximately 20 pairs of Chestnut Teal with the Black Duck.

Other birds sighted included gulls, Crested Terns, Large Black Cormorants, Small Black Cormorants, Large Pied Cormorants, several large hawks and one Wedge-tailed Eagle.

Black Swans, Musk Ducks, Dab Chicks and large White Egrets were also observed. Inspector Gordon said there were many hundreds of coots and also two pairs of maned geese (or wood duck) and one pair of mountain duck.

#### OPEN SEASON FOR WILD DUCK

The Minister for Fisheries and Fauna announced recently that he had accepted in principle a recommendation from the Fauna Protection Advisory Committee that the next open season for wild duck should commence from a date much later in the season than previously.



Consequently, it was proposed that the season should open at 2.00 p.m. on Saturday, January 20, 1968, throughout the whole of the South-West and Eucla Land Divisions. The evening opening previously granted as a concession to dairy farmers in the south-west corner of the State, from Bunbury to Manjimup, would be abolished and the season would open in those areas at the same time as in the rest of the area concerned.

The Committee's reasons for recommending a delay in the opening were -

1. Duck populations are at an all time low.
2. The heavy rains this year suggest that breeding will probably be continued longer than usual.
3. In normal years the old opening time of the week-end before Christmas was -
  - (a) often far too early;
  - (b) sometimes a week or two early;
  - (c) infrequently just about right.
4. A later opening would increase the possibility of other water birds successfully raising their young before the season opened. According to information received in other years the young of some rarer birds, such as Spoonbills and Egrets, had been lost through disturbance suffered on opening day.

It was realised that the later opening time would not suit all parts of the State. The work of the Department's wetland research unit suggested, however, that duck populations were so reduced that strong measures were necessary to safeguard them.

The season would close at the usual time of 7.0'clock in the afternoon of April 30.

#### SENIOR RESEARCH OFFICER IN AMERICA

Senior Research Officer B.K. Bowen reports from the U.S.A. that his fact finding visit is proving very valuable.

Before travelling to the United States Mr. Bowen spent about a week in Japan, where he inspected some of the major fishing centres. The Japanese Fisheries Agency arranged for a visit to the Tokyo regional laboratory as well as the Tokyo fish markets. A visit was also made to the major tuna port of Yaizu.

It is at the market at this place that a large proportion of the Japanese tuna catch is landed.

After several days at Honolulu, Mr. Bowen went onto mainland United States.

Under the sponsorship of the Fisheries Department of the State of Washington, he visited many fisheries institutions. The itinerary included visits to the Bureau of Commercial Fisheries, University of Washington, the Halibut Commission and many other points of fishing interest.

Mr. Bowen said that one impression stood out clearly in his mind whilst in Washington. This was the number of sport fishermen in the State and the voice they commanded in Congress. He instanced the case of the razor clam fishery where the professionals have been all but driven from the industry by amateur fishermen.

An example of the influence of the amateur, by sheer weight of numbers it seems, was given by Mr. Bowen when describing a Sunday morning visit to four razor clam beaches. "The beaches were packed", he said, "by 7,000 people all seeking their 18 clam bag limit". The maximum density of people fishing on these beaches", he added, "had been counted at 1,000 per mile of beach".

On the same day Mr. Bowen visited Westport Bay where 200 salmon charter boats were out, each with between 10 and 30 people on board. The bag limit in this fishery is 3 salmon per person.

Mr. Bowen has since visited Vancouver and Nanaimo, in Canada. At present he is in California where he will visit the Department of Fish and Game at Sacramento and the oceanographical research laboratories at La Jolla, near San Diego. From thence he will go to Florida.

#### STAFF MOVEMENTS

There has been a fair amount of traffic between Albany and Perth this month as far as the inspection staff is concerned.

Inspector D.P. Gordon is off duty following an operation for appendicitis and Inspector R.M. Crawford is relieving in his position. Inspector Gordon is being transferred to Perth to take over from Inspector Pearce, who has taken up the position of Fauna Warden at Albany.

Assistant Inspector I.W. Burns, hitherto at Albany, has been promoted to Inspector, Grade 2 (Relieving).

\* \* \* \* \*



8.

Captain C.J. Seabrook, master of r.v. "Lancelin", was attached to the charter vessel "Estelle Star" during her recent tuna fishing operations conducted in conjunction with the tuna aerial survey.

\* \* \* \* \*

Fauna Wardens V.T. Nelson (Wyndham) and R.F. Dear (Wittenoom) have been very active sending in a number of preliminary reports concerning the status of fauna in their respective districts, which have recently been created.

\* \* \* \* \*

Extension and Publicity Officer A.C. Waldon is at present on long service leave after spending an introductory period at the Department. He will return to duty in December when the extension and publicity programme is expected to get into full swing.

\* \* \* \* \*

Senior Inspector A.V. Green, has resigned from the public service, his last day of service being August 31. All members of the staff wish him well in his new sphere of activity at Beacon.

#### RIDDLE FOR TODAY

When is a Marine Dealer not a Marine Dealer?

When he's a bottle-oh.

The answer to this riddle was established recently by the counter staff at Head Office when a person called to obtain a Marine Dealer's License.

After a second or two's reflection and a few quick deductions the counter clerk was able to establish that the customer was seeking a license to collect species of marine life found largely in suburban back yards rather than the open seas.

#### WATERMAN RESEARCH LABORATORY TO PROCEED

Increases in costs associated with construction of the research laboratories at Waterman will not delay work, as was previously feared.

Because of the need for special laboratory facilities, particularly for crayfish research, the Government has decided to press on with the project despite the increased costs.

The cost increases were mainly associated with the sea water circuits for the aquaria. This type of work has not previously been undertaken in Western Australia, and earlier estimates were made on rather inadequate information. Shire Council requirements that additional parking areas be provided, and the need to include a caretaker's quarters also contributed substantially to the increase in costs.

Now that the project has received the green light it is expected that preparatory work will commence within the next few weeks.

The laboratory is expected to be ready for occupation sometime in May, 1968.

#### FISHERIES ACT REGULATIONS

Reprinted copies of the Fisheries Act Regulations have recently been sent to each Inspector.

Inspectors receiving enquiries for copies of the regulations should not redirect such enquiries to Head Office, but should advise fishermen and others that the regulations are available, at the price of 30c each, from -

The Government Printer,  
Station Street,  
WEMBLEY W.A. 6014

Fishermen especially should be encouraged to obtain a copy so that they may develop a working knowledge of the regulations governing their industry.

#### GENERAL FISHERIES ADVISORY COMMITTEE

##### VISITS NORTHERN AREAS

The General Fisheries Advisory Committee, making its second visit to fishing centres since its appointment in December, 1966, visited Carnarvon and Shark Bay during August. The previous expedition by the committee was to the Albany region in January this year.

At Carnarvon the committee inspected fishing facilities and processing works. Discussions were also held with the Shire President and local fishermen.

This meeting was extremely well attended by the fishermen, due in no small way to the excellent arrangements made by Inspector R. Smith.

Discussions were also had with representatives from local businessmen and the Shire Clerk.

Matters arising out of the visit will be discussed at a further committee meeting in Perth following which a submission will be made to the Minister for Fisheries and Fauna (Mr. MacKinnon).

#### PELICANS NEST AT CREERY ISLE

Senior Inspector A.V. Green has reported that pelicans are nesting at Creery Isle (Peel Inlet). The nests are located at the south-east corner of Channel Isle, the same area used in earlier years.

About 160 pelicans were observed by Inspector Green during a recent patrol. There appeared to be a large number of nests on the Isle.

"There had been previous reports of ravens robbing the nests," said Inspector Green, but at the time of his patrol none were seen.

Observations of nesting will continue and an effort will also be made to prevent sightseers disturbing the birds during the nesting period.

#### FISH TRAP RESTRICTION STILL APPLIES TO SHARK BAY

In last month's issue of the Bulletin it was announced that the prohibition on the use of traps to take snapper had been lifted in the whole of Western Australian waters of the Indian Ocean.

Staff should note that the lifting of this restriction does NOT mean that the use of fish traps in the waters of Shark Bay is now legal. The proclamation prohibiting the taking of any fish whatsoever by means of fish traps in the waters of Shark Bay still applies.

#### TUNA SURVEY

The eighth in a series of fish spotting surveys was flown between July 18 and July 28.



Comments:

Water colour conditions were changed only slightly from those sighted in June. The "milky"-green coloured water appears to have contracted closer to the coast and muddy water was confined to small areas off river mouths. However, in the area between Broome and the Lacepede Islands strong currents associated with spring tides caused "muddy" conditions which extended well offshore (to 60 miles) from the coast and islands.

Current lines were more pronounced and lines and patches of *Trichodesmium* were associated with the edges of the currents.

Weather conditions were less favourable than those experienced in June. Easterly and south-easterly winds prevailed during the forenoon in inshore regions and strong south-easterly winds (15-20 knots) were encountered near the edge of the continental shelf during the afternoon. Very low cloud cover and rain adversely affected spotting between Onslow and Fremantle on the return flight.

Except in the Broome area fish school sightings were fewer than usual and few schools of large size fish were spotted.

The accompanying charts show the tracks flown and the tracks flown and the number of fish schools sighted.

Table I summarises the sightings of schools by size and area; Table II gives an analysis of the size composition of the schools sighted; Table III summarises the number and size of bait schools sighted.

Table I.

Outward Flight (School Sightings)				
Area	Small	Medium	Large	Total
Fremantle-Geraldton	-	-	-	-
Geraldton-Carnarvon	1	1	-	2
Carnarvon-Onslow	3	-	-	3
Onslow-Pt. Hedland	11	5	-	16
Pt. Hedland-Broome	36	16	3	55
Broome-Broome(outer)	179	57	3	239
Total	230	79	6	315

Inward Flight (School Sightings)				
Small	Medium	Large	Total	Area
-	-	-	-	Broome-Pt. Hedland.
7	-	-	7	Pt. Hedland-Onslow.
(Flight overland-bad weather)				Onslow-Carnarvon.
-	-	-	-	Carnarvon-Geraldton
-	-	-	-	Geraldton-Fremantle
7	-	-	7	Total

Table II

Fish Size*	School Size			
	Small	Medium	Large	Total
Small	63	174	-	237
Medium	14	59	6	79
Large	3	3	-	6
Total	80	236	6	322

- \* Small - 15 lbs.
- \* Medium - 15-40 lbs.
- \* Large - 40 lbs.

Table III

Bait Schools Sighted	
Small	61
Medium	31
Large	7
Total	99

ENFORCEMENT ACTIVITIESPROSECUTIONS JULY - AUGUST, 1967.

Name	Offence	Place of Hearing	Date of Hearing	Fine
BALINGHALL, M.	U/S marron	Harvey	28.7.67.	\$\$ 10
BUCKLEY, G.J.	No professional fisherman's license	Geraldton	21.7.67.	\$\$ 10
BURTON, K.	U/S crayfish	Perth	25.7.67.	\$\$ 40
CAMPBELL, L.	No professional fisherman's license	Geraldton	21.7.67.	\$\$ 10
CHAMBERS, E.	U/S marron	Harvey	28.7.67.	\$\$ 10
DAVENPORT, J.S.	No professional fisherman's license.	Geraldton	4.7.67.	\$\$ 10
EVANS, R.N.	No professional fisherman's license.	Geraldton	21.7.67.	\$\$ 10
GANNAWAY, A.E.	U/S crayfish	Perth	25.7.67.	\$\$100
HAYBY, R.E.	No professional fisherman's license.	Geraldton	21.7.67.	\$\$ 10
HONEYBELL, A.	U/S marron	Harvey	28.7.67.	\$\$ 10
HUBBARD, J.	U/S crayfish	Perth	25.7.67.	\$\$100
JONES, C.	U/S marron	Harvey	28.7.67.	\$\$ 10
MCGORMICK, H.W.	Fishing in closed waters.	Perth	15.8.67.	\$\$250
MCKENZIE, F.K.	Unlawful taking of crayfish.	Midland	2.8.67.	\$\$200
MIHOVLOVICH, T.	Using poison to take fish.	Mandurah	20.7.67.	\$\$ 50
MOYLE, J.R.	No professional fisherman's license	Geraldton	21.7.67.	\$\$ 10
O'BYRNE, V.	U/S marron	Harvey	28.7.67.	\$\$ 10
O'BYRNE, W.J.	U/S marron	Harvey	28.7.67.	\$\$ 10
SCHEVJENS, A.	U/S marron	Harvey	28.7.67.	\$\$ 10
SCHIRRIPA, M.	U/S marron	Harvey	28.7.67.	\$\$ 10
SCHRAM, G.	U/S crayfish	Geraldton	21.7.67.	\$\$100
TAYLOR, L.	U/S crayfish	Perth	25.7.67.	\$\$100
WILLIAMS, R.	U/S crayfish	Perth	25.7.67.	\$\$500

U/S = undersize



### ANNUAL STAFF CONFERENCE

The annual staff conference will be held from October 16 to October 20 inclusive. The venue will be the Conference Room, 13th floor, Public Works Building, corner King's Park Road and Havelock Street, West Perth.

All officers are required to be present at 9.00 a.m. on Monday, October 16.

Officers attending from the country may use public transport, the cost of which will be paid by the Department. Any officer wishing to bring his private vehicle to Perth may claim the cost of petrol and oil for the return journey.

Problems to be submitted for discussion by syndicates must reach Head Office by September 30. Any items for the agenda should also be forwarded at the same time. A good response from all officers will contribute greatly to the success of the conference.

Inspectors and wardens in charge of districts and officers in charge of departmental vessels are requested to submit their annual reports to Head Office by September 30. Selected officers will be required to present their reports to Conference.

After the hard work is over the Social Club will hold the annual staff social on Friday, October 20, and everyone is asked to give the occasion their full support.

The venue will be the Swan Rowing Club, Canning Bridge, with music provided by Ron Jenkins and his band; so if you are not yet a member of the Social Club now is the time to join.

### UNUSUAL DUCK SIGHTED

Inspector E.R. Hammond, of No. 2 Mobile Patrol, reports sighting an unusual duck at Lancelin. The bird appeared to be a cross between a muscovy and a khaki campbell. Mainly white with brown markings on wing and back, the bird was with a flock of seagulls when observed.

### ASIAN TUNA CONFERENCE HAILED AS SUCCESS

The two-day Asian tuna conference, held in Tokyo May 30-31, at the initiative of Japan Federation of Tuna Fishermen's Co-operative Associations (NIKKATSUREN), was hailed as a success. Over 40 representatives from South Korea, Formosa, Okinawa,

and Japan, participated in discussions dealing with tuna production, price, marketing, consumption, management, labor, regulations, and administrative policies. Problems facing the tuna industry were explored and the positions of the respective countries on various issues were clarified. An atmosphere of friendship and co-operation prevailed throughout the meeting. Before closing the session, the participants agreed to meet annually hereafter and decided that next year's conference will be held in Formosa.

Discussions on the tuna price problem drew considerable attention. NIKKATSUREN proposed that this problem be considered from the standpoint of co-operating on all tuna exports, but South Korea and Formosa insisted on limiting discussions to tuna prices at American Samoa, Espiritu Santo, and the Fiji Islands. Consequently agreement was reached to appoint an 8-man study group (two members from each country) to look into the price situations in the Pacific, Atlantic and Indian Ocean area. The study group was to hold its first meeting on June 3, 1967. The South Koreans, and Okinawans voiced strong dissatisfaction over the present price setting method at American Samoa, where only Japanese trading firms negotiate prices with U.S. packers, and urged that the will of the producers be reflected more strongly in those negotiations.

Discussions on production and marketing revealed that South Korea, Formosa and Okinawa whose tuna production is increasing annually, have no sales organization or overseas outlets of their own, and export their products through Japanese trading firms or agents of other countries. Thus, they expressed interest in forming among the participating countries, an organization which would give them greater independence in the sales of their production. Tuna production and exports in 1966 by South Korea, Formosa and Okinawa, as well as the size of tuna fleets of those countries, are shown below.

1966

Country	Size of Tuna Fleet		Production/Exports	
	(No. vessels)	(Gross Tonnage)	(Metric Tons)	
South Korea	132	11,532	16,000	16,000
Formosa	701	38,000	43,330	21,848
Okinawa	45	9,206	10,340	7,019

("Suisan Keizai Simbum"

June 1 & 2, 1967,

and other sources).

### JAPANESE PROGRESS IN THE FARMING OF MARINE FISH

Since 1962, the Japanese Government has set up five marine fish farming centres in the Inland Sea: at Yashima, Kamiura, Tamano City, Shibu City, and on Hakata Island.

Because good fish like red sea bream and prawns are becoming more rare, while cheap low-quality fish such as sand eels are more numerous, these centres specialize in the artificial incubation and hatching of fish eggs and the raising of fry.

This is then released into the Inland Sea. So far red sea bream, sea eels and prawns have been hatched in this way.

As for salmon and trout, which swim up the rivers of Hokkaido and the Tohoku region to spawn their young, the Japanese have been engaged in their artificial hatching and conservation since 1876.

#### Few Mature

A single red sea bream lays hundreds of thousands of eggs, but in its natural environment only a few of these grow to maturity. New artificial hatching techniques now make it possible to raise several hundred or even several thousand eggs without loss.

In addition to this technique of releasing young fish, progress is also being made in the raising of fry to maturity.

Japan has a long history of artificially rearing marine products. People started raising larvae artificially in Tokyo at the end of the 17th century; the artificial breeding of oysters started at about the same time at Hiroshima and in the Bay of Matsushima in north-east Japan.

The artificial cultivation of these two delicacies is today vastly improved and provides a livelihood for people in the coastal areas. The cultivation of pearls, pioneered by Kokichi Mikimoto, began in the 1890's. Since then, cultured pearls have become an important export product.

Despite these three precedents, it is only recently that the idea of fish farming has developed. The movement started with goldfish, carp, rainbow trout and other freshwater fish, but has now spread to include sea fish and prawns.

Total production from fish farms in shallow coastal waters reached 426,000 tons in 1964, a 42 per cent increase over the preceding five years. While off-shore and pelagic fishing have been commercially static since their last peak in 1962, the cultivation of larvae and coastal fish is flourishing.



The main marine products are hamachi (the yellow-tail fish), octopus and prawns; the main centres of cultivation are in the Mie and Kochi Prefectures facing the Pacific, together with the Kagawa and Ehime Prefectures facing the Inland Sea.

Hamachi was first cultivated 40 years ago in Kagawa Prefecture on the island of Shikoku, but large scale production started only around 1958. The cultivated fish are put on the market during the winter, when the natural catch is low.

There are two problems in the cultivation of hamachi: one concerns the fry, the other the feed. Cultivation used to be interrupted when there was a great shortage of natural fry, as in 1963.

### Artificial Incubation

A steadier basis for cultivation would depend on the artificial incubation of fry. But it is difficult to get hamachi eggs and hatch them on a commercially large enough scale. It is, therefore, necessary to collect fry in their natural environment, and this has given rise to anxiety lest the stock become depleted.

In fact, these fears seem to be unnecessary, because the fry normally start devouring each other at the rate of about ten per cent a day when they have reached a certain size. The collection of fry at an earlier stage does not seem to harm the overall supply of the stock.

As for feed, hamachi are being fed with sardines, sand eels and mackerel-pike, but because of the rising prices of these feed-fish, alternative feed must be found.

The only marine animal whose whole life cycle, including the breeding of fry, can be controlled artificially on a profitable basis is probably the prawn. Prawns began to be artificially cultivated in Japan at the start of this century, but it was not until 1932 that Motosaku Fujimaga began to study the prawn's life cycle. It took over 30 years of experimenting before the artificial cultivation of prawns through the entire cycle (prawn-egg-fry-prawn) was achieved. Crustacea, such as the prawn, go through many different stages before maturing, and cultivation is therefore difficult. It took six years to discover the Bacillariophyta bred by pure culture formed the most suitable feed.

### Costly to change

It is costly to change the water in large prawn-ponds by electrical pumps, and so the ebb and flow of the tide is harnessed for the purpose. Seven years ago it was decided to abolish two-thirds of the salt farms in the districts facing the Inland Sea and turn some of them into prawn-ponds. Some of these are as large as ten hectares (25 acres), and motor boats are used to spray the feed.

Another successful development has been the cultivation of sea-eel fry, which are shaped like the leaves of the willow tree and can be seen in the Inland Sea during April and May.

Today the fish farming centre on Hakata Island is cultivating sea-eel fry in ponds for about 40 days, (by which time they grow about six to ten grammes in weight) and then releasing them into the sea.

#### Only five per cent

Despite these successes, production from fish farms still accounts for only five per cent of the nation's total catch.

Two problems face the future large scale development of the industry: one is to cultivate artificially those marine animals that have a ready and voluminous supply of fry, such as prawns; the other, even more difficult, problem is to develop new types of cheap artificial feed. But the pioneering stage has been passed, and the future will bring much greater progress in this new form of fish production.

#### SEINING WITHOUT BRAILING

A bold experiment by Spanish owners could be a major step in cutting time and manpower in purse seining operations for tuna.

A revolutionary method of taking aboard tuna from a purse seine is to be used by a Spanish vessel, the Sarasua, at present fitting out at the Balenciaga shipyard at Zumaya, Spain. It is expected to be completed shortly.

The new vessel will purse the net aft and, after hardening up, a stern hatch will open and powerful water turbines will draw in water and fish, the latter being separated by an angled grille and the water being returned to the sea just forward of the propeller. The turbine "exhaust" is expected to serve the additional purpose of keeping the net clear of the propeller by virtue of the strong water current created.

The Sarasua has an overall length of 62.8 m. (206 ft.) and is 51 m. (167 ft. 4 in.) b.p. moulded depth is 7.10 m. (23 ft. 3 in.), moulded breadth, 13.60 m. (44 ft. 8 in.), and tonnage is 1,200 gross, 2,200 displacement.

The vessel will carry five British engines, the main propulsion being by twin 1,000 h.p. Paxman engines with three Paxman 380 h.p. engines driving the alternators, the 300 h.p. water turbines and the refrigerating compressors. The main engines are opposite handed and drive through Lohman and Stolterfoht 6:1 ratio co-axial reverse/reduction gears.

After being brought aboard by the pumps, the fish pass over a conveyor lift into six tanks amidships, where they are chilled by immersion in refrigerated brine at minus 18 deg. C. They are then transported to the refrigerated hold, where they are held at minus 25 deg. C. The refrigerating system employs four compressors and uses direct expansion Freon 22. The freezing capacity is 100 tons per day and the capacity of the fish hold is 1,000 cu. m. (35,300 cu. ft.). The system was supplied and installed by Ramon Vizcaino S.A., Madrid, using Worthington-Vizcaino compressors.

The man behind the Sarasua is a young designer of the same name, Ignacio Sarasua, who had the idea when fishing for tuna off the coast of Africa. He believes that it will revolutionise tuna purse seining, and reduce labour by as much as 50 per cent. World patents have been taken out. Also involved in the design was Don Francisco Lasa Echarri, marine engineer. The owners are, Alberdi, Sarasate and Sarasua, so that the inventor has a share in the enterprise and will be on board for the maiden voyage to the African coast. The catch will be transported home in reefer vessels.

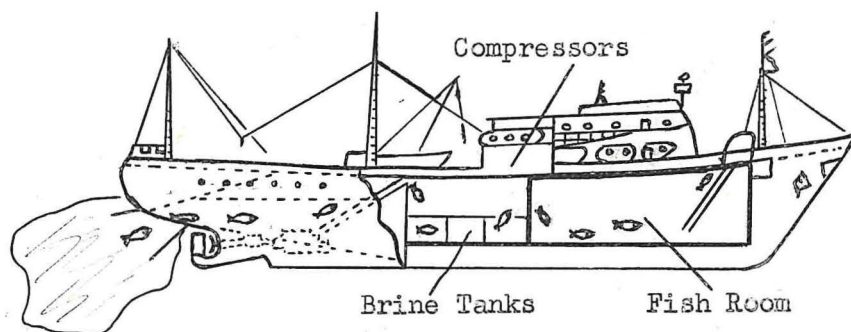
### Scouting Boats

Other features of the ship are, air conditioning, remote control of operations, and fresh water generator and four auxiliary launches. The latter will be used to search for tuna, the owners believing that search from the surface with echo sounders is better than spotting by planes. Each launch has a 180 h.p. engine and is capable of 20 knots.

The cost of the Sarasua is expected to be nearly £ $\frac{1}{2}$  million stg.

(World Fishing

May 19, 1967).





CEYLON TO FISH FOR INDIAN OCEAN TUNA

Two Ceylon vessels will go out for the first time on a tuna fishing expedition on the Indian Ocean.

It was a red letter day for the Fisheries Corporation of Ceylon, when the Fisheries Minister, Mr. Philip Gunawardene, took over the two vessels from the Japanese firm of manufacturers, Taito Seiko Co. Ltd. of Minatu-ko, Tokyo.

Mr. Gunawardene said at the handing over of the two boats, "Mirissa" and "Kalmunia", that Ceylon though considered far behind other countries in the field of technology, could now compete with any other country in the world in the sphere of deepsea fishing.

The two 320-ton boats have a fish hold capacity of 150 tons. Built at a cost of Rs. 1,500,000 each, the vessels are fully equipped with the latest navigational, refrigeration and fishing equipment and can carry a crew of 32.

The two vessels are the first of their kind in Ceylon. Each vessel is managed by key Japanese personnel who will train local hands in tuna fishing. One boat can cover 1,500 miles on a single trip.

With the establishment of shore facilities at Galle the vessels will make Galle port their base for tuna fishing operations and for the handling and storage of fish for export. A spokesman for the Fisheries Corporation said that the entire catch of fish by these vessels will be sent to the United States.

(Fishing News International

May 19, 1967.)

RESEARCH OFFICER ADDRESSES KELLERBERRIN GUN CLUB

Research Officer T.L. Riggert spoke to the Kellerberrin Gun Club during August about the Department's waterfowl research programme also explaining the proposal for the introduction of a shooter's license.

As a result of assurance that fees from the licenses would be paid into a special fund to be used only for research and conservation of waterfowl the Club withdrew its opposition to the proposal.