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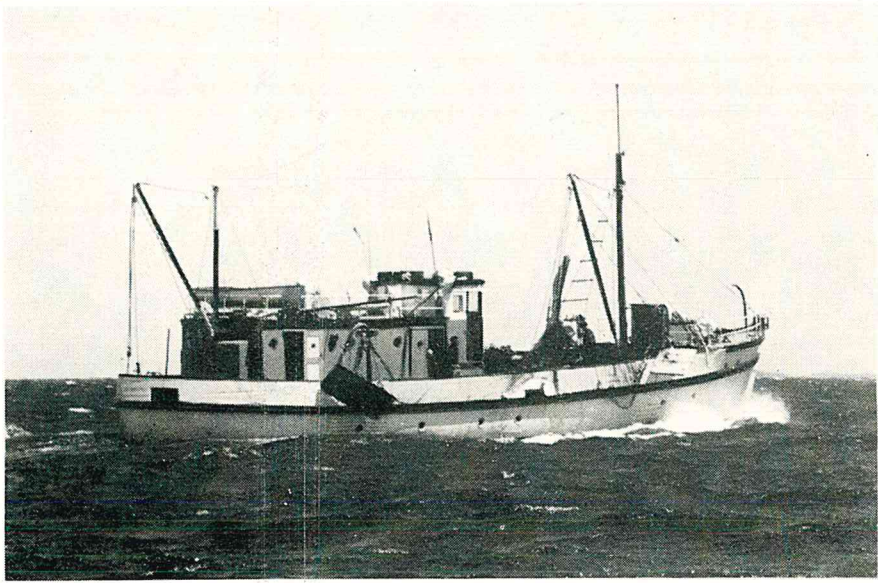
December 1964
BIO-DIVERSITY, CONSERVATION & ATTRACTIONS

DEPARTMENT OF FISHERIES AND FAUNA WESTERN AUSTRALIA

MONTHLY SERVICE BULLETIN

Vol. XIII, No. 12

DECEMBER, 1964



R. V. "PERON" WITH GEAR WORKING

Seasonal Greetings

FROM THE DIRECTOR AND STAFF, DEPARTMENT OF FISHERIES AND FAUNA, PERTH, W.A.

The r.v. "Peron", formerly the H.M.A.S. "Limicola", is a 75 ft. vessel purchased by the Department in 1958 and refitted for exploratory fishing and research. She has been used, principally, on the Shark Bay prawning grounds developed earlier from the work of the Department's other research vessel "Lancelin" which in recent years has been engaged on the crayfish research programme.

"Peron" is shown here at sea with some of her gear set in working order.

Her permanent master and crew are Captain J. White, Mate D. Wright, Engineer E. A. Mackenzie and General Survey Hand R. Bray. Technical officers and cadets serve on her as required.



A CHRISTMAS MESSAGE TO THE STAFF

I would like to take the opportunity of expressing to all members of the staff of the Department of Fisheries and Fauna my warmest thanks for the assistance and co-operation each has given me during the year just concluding.

It has not been an easy year. Progress has been made in several directions, but signs are not wanting that all is not well with our crayfisheries - the most valuable unit fishery in Australia - and that stern measures will be necessary in the not-too-distant future if we are to keep them in a healthy and productive condition. This trend has been recognised for some time, and during the past three years steps have been taken, in conjunction with C.S.I.R.O. and other research bodies, to increase research activity so that we can get a better understanding of the problems of the industry and ensure that any conservational measures we may feel are necessary will have scientific backing and not be based on opinion or guesswork.

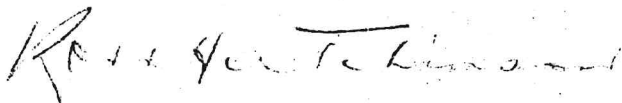
We have been subjected to much unfair criticism by the honorary Royal Commission whose report was recently released. Those of us who have many years, some even a lifetime, of experience in the industry, who have been trained to see all sides - practical, administrative, scientific, economic and technological - are perhaps justified when we complain that no opportunity was given to us to rebut any of the wrong statements made by witnesses and to present to the Commission a clearer picture than they themselves were able to draw from the inadequate material before them.

We have made mistakes - "the man who never makes mistakes never makes anything" - but whenever we have found ourselves on the wrong track we have always changed direction quickly to get ourselves back on the right road again. It is so very simple to be wise after the event, and this applies equally to Royal Commissions as to all men.

The Chairman of the Commission in a speech in Parliament referred to the feeling of the members that the evidence taken from fisheries inspectors was not truthful. Let me hasten to say that never have I, as Minister, had occasion to doubt the word of any inspector who gave evidence. On the contrary I repose complete confidence in the probity of the field staff. I also have the utmost faith in the research group now working in the crayfisheries. Had the Commission called to give evidence, and paid attention to, those currently engaged on crayfish research, it must have arrived at sounder conclusions.

Perhaps I may be forgiven if I quote from the November, 1964, issue of a Sydney periodical ("Fish Trades Review"). The extract I give is from an article which discusses the decisions the Government will eventually be called upon to take in regard to our crayfisheries. It says "This, of course, is a matter for the W.A. Fisheries Department to decide. This understaffed body of devoted men has proved its worth. Whatever it may decide will be for Western Australia's benefit". This certainly gives point to the old saying that a prophet has no honour in his own country!

In conclusion may I extend to every member of the staff, and to their families, my very best wishes for Christmas and the New Year.



(Ross Hutchinson)

MINISTER FOR FISHERIES AND FAUNA.

STAFF NOTES

Senior Research Officer B.K. Bowen and Research Officer R.J. Slack-Smith have returned to Perth after attending a stock assessment workshop at the C.S.I.R.O. Marine Laboratory, Cronulla, N.S.W. At the end of November, Mr. Bowen visited Jurien Bay to ensure that the crayfish research work being carried out on board the r.v. "Lancelin" was functioning smoothly. Mr. Bowen has since reported that some crayfish which were tagged as "reds" during the Lancelin's previous trip in September last, have now been recovered as "white" crayfish.

* * *

The r.v. "Peron" left Fremantle for Shark Bay on November 17 to carry out a sediment sampling survey in the Shark Bay area. The sampling is being carried out under the supervision of Mr. D.E. Cebulski, Geology Department, University of W.A. This study is part of the prawn research programme.

* * *

Mr. P.G. Yewers, of Head Office, and Miss L. Huntley, of Nollamara, will be married in Wesley Church, Perth, on December 12. We extend to them our congratulations and wish them every future happiness.

Cadet Inspector B.G. Price and Inspector P.V. Clarke both resigned from the service last month. They terminated their employment with us on November 13 and 23 respectively.

* * *

Cadet Research Officers N.J. Rogerson and R.C. Lenanton, after completing another academic year at the University, have rejoined the department for the duration of the vacational period. Both officers have gone to Geraldton to assist in the crayfish research programme.

* * *

We welcome to the staff Mr. J.A. Ingram and Mr. K.C. Lewis, who have been appointed Cadet Inspectors. Cadet Inspector Ingram has been posted to the r.v. "Lancelin" and Cadet Inspector Lewis to the Perth Inspectorial District. We also welcome to the staff Mr. P.A. Smith, Mr. M. Stutchbury and Mr. D. Donnelly, who were appointed during November in a temporary capacity to assist in the intensified crayfish measuring and monitoring programme.

* * *

In conjunction with the opening of the crayfish season several movements of field staff took place last month. Inspector R.M. Crawford (Relieving Inspector), after relieving Inspector D.P. Gordon at Albany while the latter was on annual leave, has gone with Assistant Inspector P. Carroll (Perth District Office) to Ledge Point. Assistant Inspector G. Hanley (Mandurah) has gone to Jurien Bay. Assistant Inspector R.J. Lindsay and Cadet Inspector P.M. Lambert (Perth District Office) have gone to Green Islets while Assistant Inspector G.D. Noble (Perth District Office) has gone to Lancelin. Assistant Inspector R.G. Emery returned to Fremantle Office from Albany after relieving Assistant Inspector I.L. Cardon while he had annual leave. Assistant Inspector P.C. Willey (Fremantle) has been temporarily assigned to the p.v. "Vlaming".

PERSONAL PARS

A visitor during the month was Dr. J. Bruce Falls, an ecologist from the University of Toronto, Canada. Dr. Falls is in Australia on academic leave and is working under a grant received from the Royal Society of London. He paid a short visit to this State recently and called at the Department on November 2 before returning to "Gungahlin", the Canberra headquarters of the Division of Wildlife Research, C.S.I.R.O., where he has been working.

Conservation Poster Issued by Fremantle Fishermen's
Co-operative Society Limited

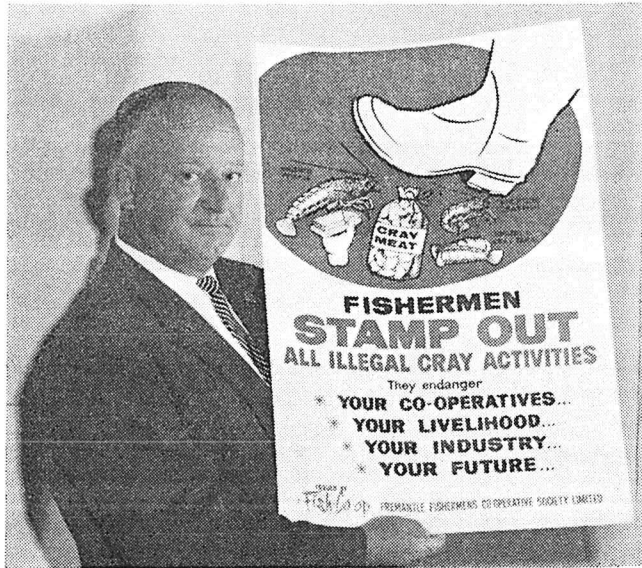


Photo courtesy "Daily News"

Mr. D.R. Fitzpatrick, private secretary to the Minister for Fisheries and Fauna (Mr. Ross Hutchinson), holding the bold poster issued by the Fremantle Fishermen's Co-operative Society Ltd. It will be displayed at fish receiving depots on the coast and at fish shops.

BASIC RATE RISE

The Public Service Commissioner has advised that as a result of the quarterly declaration of the Western Australian Industrial Commission the basic rate has been increased by £9.0.0 per annum for adult males and £7.0.0 per annum for adult females.

The new rates will apply on and from October 26, 1964.

DEPARTMENTAL CONFERENCE, 1964

Last month we dealt with some of the matters emerging from the group discussions at the departmental conference held last July.

In this issue we shall mention other matters which arose in the course of discussions during the period of the conference. Some were raised in conference periods, others during informal talks with head office personnel.

The notes which follow have been prepared after discussions between the Director and branch heads.

1. Attendance at conference.

Complaints were made by some officers that there were absentees from one or more sessions of conference. This was thought to be wrong.

In future all staff, other than those of the clerical section required to be on duty for the convenience of the public, will be directed to attend all sessions. It might be appropriate at this point to stress that all participants must be present at the time fixed for the start of each session. Several officers at the July meeting were guilty of late arrival. To say the least, it is highly discourteous to keep colleagues waiting until laggards see fit to arrive. This conference is not a holiday, but an important duty, and presence thereat is in the line of duty, as is attendance at the hour fixed.

2. Seizure of containers for fish and holding crates for crayfish.

As was pointed out at the conference, this is something which will require legislative action, i.e., an amendment of the Act. Next year it is proposed to ask Parliament to increase penalties and in other directions to amend the law. The question of enlarging the power to seize, and perhaps to destroy in certain cases, will be considered in conjunction with other matters which will be brought before the Minister.

3. Long-lines - prohibition of use by non-professional fishermen.

This matter is at present being considered departmentally.

Before a decision is taken enquiries will be made in the other States as to the situation there. At first glance, however, having regard to the rarity of this practice, it scarcely seems necessary to take action.

4. Shark Bay - limitation of snapper catch by amateurs.

This proposition is what is colloquially termed "a sticky one". It was suggested, as officers will recall, that amateur fishermen be not permitted to catch more than 50 lb. of snapper on any one day. To introduce a provision of this nature would necessitate the adoption of a completely new policy, the implications of which are at present being very carefully studied. No early decision may be expected.

5. Meeting of Fisheries Field Staff Association.

The view was expressed by a number of officers that the annual meeting of the Association should be held at the beginning of the conference. The branch heads believe, and the Director agrees, that this meeting should take place at night. If the Association so desires, facilities will be made available accordingly.

6. Closed waters - more adequate notices to be erected.

While it is not incumbent on the Department to erect notices, it has been the practice from time immemorial to have calico posters printed and exhibited at strategic places. However, even if they are allowed to remain in position by vandals, calico notices quickly deteriorate. But the question might be asked, "Will more substantial and consequently considerably more expensive notices be left unharmed by vandals?" Perhaps the field staff will give further thought to the desirability of exhibiting notices, and come to the next conference ready to discuss the matter again.

7. Crayfish season - setting of unbaited pots before opening day.

It is traditional in this State that fishermen are permitted to place unbaited craypots in the water a few days before the opening day of the season. This is done so that new stick and batten pots may be "matured" and "bubbling" eliminated, and that wire pots cease "singing".

So far as the white crayfish season is concerned, fishermen will not in future be permitted to set unbaited pots before the opening day (November 15) because it is normally several days - sometimes a fortnight - before the crays start to "crawl". With regard to the Abrolhos, an inspector is posted at each group a week before the opening day to ensure that the fishermen do not "beat the gun". Fishermen are allowed to mature their pots only in localities approved by the inspector. Although some inspectors have expressed disagreement with the policy, there appears to the Department to be no sound reason why the privilege should be withdrawn.

8. "Monthly Service Bulletin" - request that copies be posted.

Normally the "Bulletin" is sent per medium of the Correspondence Despatch Office to towns served by that instrumentality. In all other cases it is posted - to Broome and Shark Bay by air mail. If, however, any officer wishes that his copy be posted to his private address, we are quite prepared to do it if application is made to Head Office (and private address is notified).

9. Fleet Maintenance.

It is not a simple matter for the Director or branch heads to appreciate, or even understand the reasons for, the difficulties which have raised their heads in relation to fleet management and maintenance. That problems have arisen is all too evident, and they have unfortunately generated much friction which is completely unnecessary and detrimental to the efficient conduct of the Department. The administration does realise that differences of opinion as to the nature of the work to be undertaken in fleet maintenance are inevitable. The Fleet Maintenance Officer has a responsibility to the administration to ensure that all reasonable economies are effected and that no unnecessary expenditure is incurred. The boat skippers and crews, on the other hand, have to live in their vessels, sometimes for months on end, and they are entitled to small amenities and comforts to render their job more tolerable. Surely there is a mid-point which could be reached by the display of a "little sweet reasonableness" on both sides.

The Director has decided to convene a meeting between the Fleet Maintenance Officer and boat skippers at the earliest convenient moment.

He will himself preside, and ask all present to speak their minds, quite objectively and without fear or favour, in an attempt to resolve a situation which is causing, to say the least, grave concern. Also in attendance, if necessary, will be the Administrative Officer, Senior Research Officer and Supervising Inspector. The meeting will take place before Christmas and further advice as to the date and venue will be given later.

10. Extension officers

During the conference the Director expressed the hope that it would soon be possible to proceed to the appointment of an extension officer. This policy was approved in principle a year or two ago by the State Ministers for Fisheries at a meeting of Commonwealth and State Ministers.

During his visit to Japan and Korea, the Director made numerous enquiries concerning fisheries extension work in those countries. In Japan, especially, extension activities play an important role in the development and administration of the fishing industry. Indeed, it seems that without the large group of men now engaged on extension, the remarkable expansion which has taken place in the fisheries would not have been possible. In agriculture, in all the States of Australia, extension work is of considerable importance.

Briefly stated, the role of a fisheries extension officer would be to convey to the operatives in the industry by talks, practical demonstrations, leaflets, visual education techniques and other means, the application of new methods of fishing, the need of research (and its results), the reasons for and the application of fisheries legislation, the value and use made of fishermen's logs and returns, new and improved methods of handling catch, and so on, and generally to act as a liaison between administration and fishermen. He need not be an inspector, nor a scientist, nor an economist, nor a gear technologist. He could, of course, have been trained as any one of these, but he must be a man of liberal education and considerable adaptability. He must be easy of address and possess great energy and initiative. Above all he must have a deep understanding of human nature and human needs.

We have set down here what is considered to be the ideal. Whether, if an appointment is approved, we shall be able to achieve the ideal is not yet known. But the Director has indicated that he would not be prepared to appoint any person unless he were satisfied that the appointee would "deliver the goods".

NEW RESEARCH STATION OPENING

Approximately 80 people attended the official opening of the new departmental research station on the Tuttanning Fauna Reserve east of Pingelly, on November 6.

The Minister for Fisheries and Fauna (Mr. Ross Hutchinson) officially opened the station and in his opening address said that the occasion was indeed unique as well as history making. The Tuttanning reserve heralded a new era of reserve management. Much progress had been achieved since the area was first proclaimed a reserve in 1960.

The Minister also paid tribute to the local shire council and those farmers whose properties adjoined the reserve. Despite associated problems, he said, they had been generous in their views and although much had been achieved some problems remained. He had no doubt, however, these would be overcome.

The Director, Mr. A.J. Fraser, said that the purpose of the research station was to provide for the study of both fauna and flora. There had been a general upsurge of national interest in conservation. Throughout Western Australia alone, 150 reserves had been proclaimed. The people of today had an obligation to preserve the State's fauna and flora for enjoyment by future generations.

One of the persons closely associated with the research station and fauna reserve is Dr. A.R. Main, who will direct much of the future research to be carried out there. Dr. Main is Reader in Zoology at the University of W.A. and a deputy member of the Fauna Protection Advisory Committee. In the course of an address at the opening, Dr. Main spoke on research and the importance of the reserve. He said the Tuttanning reserve was a very important one. Seven or eight species of marsupials were common there and there was an incredible diversity of flora. As well as food and living space, natural cover was also very important to the existence of wild life and here existed a problem. Preventive burning against fire in the area was not as simple as some perhaps thought.

Controlled strip burning had to be carefully carried out having in mind the different ages and associations of plants required by the animals, and realizing full well that a mistake could be calamitous because another area such as the Tuttanning reserve was not available.

The President of the Pingelly Shire, Mr. I.A.C. Stewart, thanked the Minister for his attendance and for opening the research station. He also expressed pleasure over the construction of the research station and development of the reserve, and thanked those associated with the project. He said the undertaking had already provided favourable publicity for the area.

Among others present at the opening were Mr. and Mrs. J.B. Higham, Dr. and Mrs. D.L. Serventy, Mr. and Mrs. A.J. Milesi, Dr. and Mrs. W.D.L. Ride, Mr. and Mrs. A.H. Robinson (members of the Fauna Protection Advisory Committee and their wives); Mr. W.A. Manning, M.L.A., Mr. R.D. Royce (Curator, State Herbarium) and Mrs. Royce, Dr. N.H. Brittan (Acting Head, Department of Botany, University of W.A.), Mr. B. Clay (Zoology Department, University of W.A.), Mr. T.L. Riggert (Wildlife Research Officer, Department of Fisheries and Fauna), Mr. H.B. Shugg (Fauna Officer, Department of Fisheries and Fauna) and Mrs. Shugg.

OPEN SEASONS

Wild Ducks -

The 1964/65 season will open at 6 p.m. in the evening of Saturday December 19 in the south-west corner of the State from Harvey to Manjimup, and at 5 a.m. in the morning of Sunday, December 20, in the remainder of the South-West and Eucla Land Divisions.

Full details of the open season, of the restrictions which apply, and of the areas closed to shooting are set out in the duck shooter's guide, a copy of which is attached to this issue.

Quail -

A four months' open season for Stubble Quail commences each year, on December 1, in all that part of the State north of the 31st parallel - that is north of a line drawn from Lancelin Island through Coolgardie. South of that line the season is from March 1 to June 30 in each year. There is no bag limit for the species.

Marron -

The annual marron season will open on January 1, 1965, and continue until midnight on April 30, 1965. The following restrictions will apply:-

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

NEW PORT TITLE

The attention of staff members is drawn to the new title of the Fremantle Harbour Trust. The new name is the "Fremantle Port Authority" and in future all business of the port will be carried out under that name. The address and telephone numbers of the authority are unaltered.

GOLDFINCH SURVEY

We are pleased to learn that the Chief Vermin Control Officer, Department of Agriculture, is initiating a survey into the distribution and feeding habits of wild goldfinches in the metropolitan area.

It has been evident for some time that the populations of these birds have been increasing and research of the nature contemplated will certainly be welcomed by this Department.

INTERSTATE FAUNA CONFERENCE

The next biennial conference of Australian fauna authorities will be held at Kingscote, Kangaroo Island, from April 5 - 9, 1965. This has been announced by Mr. D.N. Brookman, Minister for Agriculture in South Australia, which will be the host State. Western Australia's representatives will be the Director, Mr. Fraser, and the Fauna Officer, Mr. Shugg. Their attendance at the Conference, which is expected to make some particularly important decisions on the future of fauna conservation in Australia, has been approved by the Minister for Fisheries and Fauna, Mr. Hutchinson.

NEW REGULATION ON CRAY PROCESSING

Regulation 14A relating to the processing of crayfish at sea has been rescinded. It has been replaced by a new regulation bearing the same number which does three things -

- (1) It prohibits processing or otherwise cutting up any crayfish anywhere - on land as well as at sea - except in an export establishment registered under Commonwealth law.
- (2) It prohibits registered export establishments from receiving crayfish tails or severed portions of crayfish.
- (3) It prohibits the carriage by vehicle, boat or other means, of tails or severed portions of crayfish which have not been processed in a registered export establishment.

The new regulation provides for a penalty of £100 for any breach, and empowers inspectors to seize any tails or severed portions referred to above. Any tails or portions so seized will be forfeited to the Crown.

Copies of the new regulation will be forwarded to every inspector in the next day or two. It is already enforceable with the full weight of the law.

SPEED BID ON FAUNA RESERVE

The announcement just before going to press that Donald Campbell, in his jet speed boat "Bluebird", would attempt to break the world's water speed record on Lake Dumbleyung caused more than a flutter in the departmental dovecoats. The major portion of Dumbleyung is vested in the Fauna Protection Advisory Committee as a reserve for the conservation of flora and fauna and special permission had to be granted to allow the bid to take place there. In addition, the Minister for Fisheries (Mr. Hutchinson) agreed to close to duckshooting the whole of Dumbleyung Lake and all land and water within three miles of its shores. This was done to reduce risks to Campbell and his craft and also for the safety of the many spectators expected in the environs of the lake on and after opening day.

INDIAN OCEAN INVESTIGATIONS
BY RESEARCH VESSEL "PIONEER"

The world's steepest continental slope has been discovered off the east coast of Ceylon by the U.S. Coast and Geodetic Survey research vessel Pioneer, announced the Department of Commerce on July 12, 1964. The chief scientist aboard the research vessel reported that the slope where Ceylon drops down into the Bay of Bengal is over 45 degrees steep. The average continental slopes vary between 5 degrees off the west coast of Europe, 1 to 15 degrees off the Pacific Coast of the United States, and 4 to 7 degrees off the American east coast.

The Pioneer was completing a six-months, 27,000-mile voyage to the Indian Ocean, scientifically one of the world's least known ocean areas. The vessel, described as a completely equipped "floating laboratory," left San Francisco, California, on February 11, 1964, to participate in a 20-nation scientific exploration of the Indian Ocean. Scientists from the Philippines, Malaysia, India, Indonesia, and 8 United States scientific agencies were aboard the vessel during the voyage.

The research vessel, which is manned by 104 officers and crew, was scheduled to reach Honolulu, Hawaii, about the end of July on its return trip to the United States and San Francisco-Oakland about mid-August. It will then have completed the longest and farthest trip ever made by a vessel of the Coast and Geodetic Survey in its 157-year history.

In addition to discovering the steep continental slope off Ceylon, other discoveries and activities of the expedition included (1) the finding of several previously unknown undersea mountains; (2) explored for the first time two giant submarine canyons off Ceylon both of which are larger than the Grand Canyon; (3) sent SCUBA divers down to search the top of another undersea mountain; and (4) took thousands of color photos of the bottom of the sea.

The Coast and Geodetic Survey's chief oceanographer, who headed the scientific expedition and flew back to report on its findings, termed the continental slope off Ceylon "truly spectacular". He said, "The west coast of Ceylon is connected with India by a very shallow area. It was known that deep water existed off the east coast, but no one realised how precipitous was the drop from the continental shelf (which begins at the water's edge) to the ocean bottom."

He explained that the continental slope is the connecting link between the shelf and the bottom of the sea. He continued, "From about 6 miles off the coast, where we began our soundings, the slope fell from a depth of about 180 feet to about 12,000 feet in the short distance of 18 miles. Nearly 4,000 feet of this vertical drop to the sea bottom off Ceylon was over 45 degrees." "The steep slope is located about 20 miles south of Trincomalee and is about 2 miles long", he said.

The 2 submarine canyons which were explored off the Ceylonese coast were near Batticaloa. The Larger, just north of Batticaloa, was 7,800 feet deep and was named Mundeni Canyon for the river closest to it. It was said to be deeper and narrower than the Grand Canyon. The second undersea canyon is located south of Batticaloa and is 2 miles wide at the top and 4,570 feet deep.

According to the oceanographer, one of the most unusual aspects of the trip, was their exploration of an undersea mountain in the South China Sea about 36 to 40 feet below the surface of the ocean. Millions of brightly colored tropical fish swam around them as they made their way over the white coral which covered the top of the mountain. Rock was recovered from the top and sides of the mountain and numerous color photos made of the area with the expedition's underwater cameras.

During the remainder of the expedition, the research vessel Pioneer was slated to explore some of the Pacific's most mysterious phenomena, the huge trenches, such as the Java, Philippines, Marianna, Palau, and Yap Trenches, at the ocean bottom. "They are all much larger than the Grand Canyon", explained the vessel's chief oceanographer. "They are large narrow gashes in the bottom of the sea and their origin is still in the realm of theory. We do not know what caused them. There is nothing like them anywhere on land, so we can only study them at sea. Very possibly they represent areas where the earth's crust has actually been pulled down by forces acting deep within the earth. We hope the expedition will be able to shed some light on the origin of these tremendous sea-floor trenches."

The great wealth of scientific material collected on the expedition, which included a study of the Indian Ocean's physical, chemical, meteorological, geological, biological, and geophysical aspects, will take scientists

years to assimilate completely. A preliminary report of the expedition, is to be made available in early 1965. (U.S. Coast and Geodetic Survey, July 12, 1964.)

(Commercial Fisheries Review Washington September, 1964)

PROFITABLE PRAWN FISHING WITH TRAPS

Special prawn traps are each catching an easy £1 a week for the fishing vessel Sweet Home off Skye. Mr. William Finlayson and his crew have been experimenting with various types of adapted Leakey lobster traps with the result that large prawns to the value of 4s. to 5s. a trap are taken at each lift.

They are being fished within a mile or two off shore in 30-40 fathoms, and although they can be caught at much shallower depths, there is the added nuisance of crabs entering the traps.

The prawns (Nephrops, Dublin Bay or Norwegian) all large, averaging nine tails to the pound, are caught at the rate of five to seven a trap on average and at the processing factory at Stornoway, they fetch £6 a stone, nearly 1s. a prawn. The special traps, a modification of the "East Coast" lobster creel are used. These, made by R. and B. Leakey of Settle, Yorkshire, recover their cost of around 45s. in a few days.

Fast Fishing

Experiments are continuing to increase the number the creels will take at one time, although this appears to be governed more by the distribution of prawns on the sea floor and their range of foraging rather than by the design of creels. Very nearly as many were caught when the creels were lifted after a few hours as when lifted daily, and the number nearly doubled when lifted after two days. Only a very small piece of bait is taken by each prawn.

Besides having a small mesh netting, the creels are lightweight, yet designed to sink quickly and settle right way up. Wood floored creels, when tried, proved unsuccessful, and it is assumed this was because they did not always land flat, and sank into the soft mud in which prawns live. The special traps have the two eyes of conventional creels,

with galvanised steel frames, and in the conditions being worked, their sea damage is negligible; it is anticipated they will last many years. A special feature is the end door which enables the catch to be poured out on release of a toggle, resulting in rapid handling.

Sweet Home's crew of three, who were inexperienced in this type of fishing, found no difficulty in working 220 creels in 2½ hours, and anticipate even greater speeds with improved deck gear. Spaced at eight to ten fathoms along the "trot" or back rope, the light weight of these creels (around 10lb.) is a big advantage when a number are suspended above the sea floor at one time when fishing at, say 60 fathom depths!

Nephrops prawn evidently live in colonies, and prefer mud of "sticky" consistency at any depth. They live in holes in the mud, and evidently use it as a refuge when danger threatens. Hitherto, they have been caught round our coasts in trawl nets which have a comparatively thin wire rope as foot rope which is designed to sink into the mud and lift them into the net. Fishermen using these trawls have noted that the best catches usually occur at dawn and often again at dusk, which means that at other times they are in their burrows, since it is hardly likely that they are fast enough to escape a trawl when on the surface.

Discussing this point with Mr. Leakey, who has seen the working of these trawls under water as a skin diver, our correspondent was told that it seemed highly probable that for every box of prawns landed by trawls there must be many more boxes of prawns, particularly small ones, destroyed by being squashed and suffocated in the mud beneath the trawl.

Mr. Leakey knows of no research into the damage done to uncaught prawns by trawling, and remarked that if evidence of over fishing of prawn grounds has not already become evident, it is probably because of the large size of these grounds, and in view of the disastrous future consequences of such trawling, if it does in fact destroy uncaught prawns, it is most urgent that the fact should be investigated scientifically. He hopes that this break-through of catching with traps will point the way to conservation.

Investigation

According to scientists at the Torry laboratory at Aberdeen, the reason why prawns in the South Minch are so large, compared with those caught on more exposed grounds, is because they do not get preyed on so extensively by open sea predators, particularly cod. This is good news for fishermen who have prawn mud in lochs and bays where cod are less common, and the West coast of Scotland in particular has many such places inside the three mile limit where trawling is prohibited. Such grounds deserve investigation with traps and might provide lucrative fishing as the market is large and unsatisfied.

Fishing them with these traps is easy. They take any bait - salt mackerel or herring, conger, dog fish and even prawn bodies after the tails have been removed - and they eat very little of the bait, leaving the rest intact. Traps that have been lifted after an hour or two catch nearly as many as when lifted daily, and those left two days catch almost twice as many, but some traps on a trot line catch nothing, indicating that there are areas between colonies with no prawns. It pays, therefore, to try many places when searching for them, but one curious fact is that no small prawns were caught by Sweet Home even with fine mesh traps, and sometimes predominantly females only are caught, suggesting there is segregation of sex and size in the colonies.

(Fishing News

London

November 13, 1964)

AMERICAN INITIATES MARINE TECHNOLOGY COURSES

Suffolk County Community College, Selden, Long Island, U.S.A., leads the technological way in the marine field by introducing a series of courses for High School graduates and diploma holders who wish to become "Marine technicians".

The Marine Technology programme at Suffolk County Community College is believed to be the only programme of its kind in the U.S.A. and it offers new promise to the Long Island fish, shellfish and related industries that dot the shorelines of Long Island Sound and the Great South Bay.

Through the application of practical knowledge, the Marine Technology programme promises new insight into

the problems that confront shellfish cultivation, plant sanitation, and those associated with insuring a continuous supply of marine raw materials such as fish, shellfish and seaweed.

The Goal

The fundamental goal is to provide qualified high school graduates with two years of co-ordinated technical and general education courses at the college level to enable them to function as technicians in marine and allied industries.

A graduate of this programme receives an Associate in Applied Science Degree and is prepared to assume the duties of a Marine Technician.

For decades America's natural marine resources have been grossly neglected. An increasing awareness of the danger to, and the value of them, is apparent in the concern of the federal government, local governments, and private industries. As a result, many agencies and individuals have called for intense research to overcome a rapidly deteriorating condition.

10-Year Programme

On October 23 last year, Stuart Udall, U.S. Secretary of the Interior, announced a 10-year programme to vitalise the American fishing industry. The plan known as "Trident" emphasises a three-pronged attack on the industry's problems: Research, development and services. It will involve construction of new laboratories and facilities and the replacement of obsolete equipment and vessels.

At present Suffolk Community College is the only educational institution in the country providing a supply of "comprehensive" technicians to implement Trident's ambitious aims. Locally, a survey of the various marine industries and agencies in Suffolk County was made to determine the immediate need (Autumn 1963) and future needs for graduating technicians of the Marine Technology programme and replies indicated that a considerable number of graduates could be placed immediately and increasing numbers would be placed in future years.

To the student who is seriously interested in the study of marine life, the Marine Technology programme at Suffolk offers an opportunity for challenging work and rewarding employment.

The Courses

Courses are offered on the following subjects:

Commercial Fishing Techniques: A study of the operation of all types of equipment used in the Mid-Atlantic and North Atlantic for taking fish, shellfish and crustacea.

Plant Layout: An introduction to the physical plants utilised to process fish foods. Included will be a review of laws governing zoning, building, safety and processing.

Navigation: A study of the utilisation of the sextant, octant, magnetic and gyro compasses and other related instruments. Included will be navigational laws and map reading.

Elements of Oceanography: An introduction to the chemical and physical processes that compose the marine environment.

Marine Vertebrates: A study of the fish of the north eastern area of the U.S. Emphasis will be placed on physiology and ecology.

Plant Sanitation: A study of the techniques instituted in food processing to ensure quality and sanitary conditions. A review of the laws governing handling, processing, storing and distributing marine products will be made.

Commercial Marine Products: A study of products and by-products of marine organisms such as seaweed, fish and shellfish.

Elements of Marine Ecology: An introduction to the inter-relationships of marine organisms based on the effects of the physical, chemical and biological environment.

Shellfish: A study of the physiology and anatomy of clams, oysters, scallops and other molluscs. Emphasis will be placed on techniques of culturing and growing the various shellfish.

Elements of Applied Marine Electronics: A study of various electronic instruments used in the industry such as fish finders, depth finders and navigation equipment. Emphasis will be placed on field use and maintenance.

(Fishing News

London

November 13, 1964)

GAMMA RAYS TO INCREASE FISH SHELF LIFE

A large plant for the batch pasteurisation, 1,000 lb. at a time, of fish, crustaceans and shellfish was opened at Gloucester, Mass., U.S. during an international conference on the preservation of food by nuclear radiation.

Under the control of the U.S. Bureau of Commercial Fisheries, the plant has been set up to demonstrate that it is possible to increase the shelf life of fishery products under refrigeration by subjecting them to a dose of gamma rays.

The effect is to kill off most of the bacteria, which cause the food to deteriorate, without altering appearance, taste or odour.

The plant can turn out about a ton of fish an hour and has successfully treated lobster, clams and other foods, which thereafter kept for over four weeks.

In the next few months, the U.S. Food and Drug Administration is to be asked to authorise general consumption of a range of lean fish, including cod and haddock, which has been radiation-pasteurised.

(Fishing News

London

October 9, 1964)

NEW TURBO ICE MACHINE

The new Turbo ice machine, product of Chicago Stock Yards, Turbo Refrigerating Co., Chicago, Ill., makes ice from either fresh or salt water. This ice machine provides a new kind of super-dry, cold ice, which is easy to handle. Ice size is adjustable - 9 sizes, including coarse, slow-melting "fisherman's chunks." There are only five moving parts, which makes the machine easy to operate and requiring less maintenance. There are 40 models to choose from, from one ton through to 40 tons.

(Fishing Gazette

New York

July, 1964)

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DUCK SHOOTERS' GUIDE - 1964/65

THE OPEN SEASON

OPENING:

The 1964/65 season will open -

- (a) at 6 p.m. in the evening of Saturday, December 19, in the Shires of Augusta-Margaret River, Balingup, Bridgetown, Busselton, Capel, Collie, Dardanup, Greenbushes, Harvey, Manjimup, Nannup and Preston;
- (b) at 5 a.m. in the morning of Sunday, December 20, in the remainder of the South-West and Eucla Land Divisions, not included in the Shires named.

CLOSURE:

Unless otherwise proclaimed, the season will close throughout the whole of the Eucla and South-West Land Divisions at midnight on April 30, 1965.

SPECIES INCLUDED IN THE OPEN SEASON:

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

PROTECTED SPECIES:

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

BAG LIMIT:

15 Ducks per person per day.

ILLEGAL MEANS OF CAPTURE:

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

CLOSE AREAS:

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

GENERAL AREAS:-

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

SPECIFIC AREAS:-

Albany Shire -

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

Balingup Shire -

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

Busselton Shire -

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

Capel Shire -

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

Dandaragan Shire -

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

Dumbleyung Shire -

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

Gingin Shire -

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

Gnowangerup Shire -

- (r) The whole of the land and waters contained within reserves 21646, 21647, 22353 and 22355 and all the waters of the Beaufort and Wellstead Estuaries adjoining those reserves.

Harvey Shire -

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

Mandurah Shire -

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

Mundaring Shire -

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

Murray Shire -

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

Rockingham Shire -

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

Toodyay Shire -

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

Upper Blackwood Shire -

- (aa) The whole of the area within a radius of $2\frac{1}{2}$ miles of the Post Office at Boyup Brook.

Wanneroo Shire -

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

Wickepin Shire -

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

Woodanilling Shire -

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

OTHER RESTRICTIONS:

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

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