MAY, 1967
VOL. XVI, No. 5

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

32650/1/67—160

DEPARTMENT OF FISHERIES AND FAUNA
MONTHLY SERVICE BULLETIN

EXTRACTS FROM "TRENDS IN AUSTRALIAN OVERSEAS TRADE IN MARINE PRODUCTS FOR DECEMBER 1966"

Exports of marine products from Australia for the month ended December, 1966, were valued at $1,641,000, a rise of 11.2% on the same period in 1965. However, for the six months ended December, 1966, exports were valued at $9,166,000, a decline of 0.2% on the same period in 1965. Although there was a large fall in value of frozen craytails, substantially increased values were recorded for prawns, abalone and pearls.

Crayfish

The value of exports of frozen crayfish in December, 1966, totalled $900,000, a decline of 7.9% on the same period in 1965. For the six months ended December, 1966, the value of exports of frozen crayfish totalled $3,989,000, representing a decline of 28.5% on the same period in 1965.

Country of Destination		Six months ended December				% change in value
		1965		1966		
		'000 lb.	Value $A,000	'000 lb.	Value $A,000	
U.S.A.	Tails	2,388	4,594	1,803	3,325	-27.6
	Whole	191	186	114	110	-40.9
France	Tails	163	277	31	53	-80.9
	Whole	452	418	381	360	-13.9
Other	Tails	16	32	28	55	+71.9
	Whole	83	73	91	86	+17.8
TOTAL	Tails	2,567	4,903	1,862	3,433	-30.0
	Whole	726	677	586	556	-17.9

Source: Commonwealth Statistician

The value of imports of marine products for December, 1966, and the six months ended December 1966, declined in comparison with figures for the corresponding periods in 1965. The monthly figure was down 14.3% whilst the six months figure was only down 0.7%.

During the six months ended December, 1966, imports of fish fillets in packages of 1 lb. or less totalled 6,813,000 lb. The value of these imports was $2,554,000, representing a rise of 81.3% on the figure for the same period in 1965. The U.K. was the main source of supply.

Imports of Packaged Fish - 1 lb. or less (a)

Country of Origin	Six months ended December				% change in value
	1965		1966		
	'000 lb.	Value $A,000	'000 lb.	Value $A,000	
United Kingdom	4,598	902	4,547	1,827	+102.5
Denmark	832	151	561	225	+ 49.0
Norway	518	88	207	64	- 27.3
South Africa	727	94	719	197	+109.6
Other	1,117	174	779	241	+ 38.5
TOTAL	7,792	1,409	6,813	2,554	+ 81.3

(a) Preliminary
Source: Commonwealth Statistician.

NEW YORK MARKET
GENERAL COMMENT

The official market comment, New York, for the week ended March 29 was "stocks moderate, market strong". However, quotes for Australian and New Zealand craytails were, if anything, slightly lower than those operative for the week ended March 22.

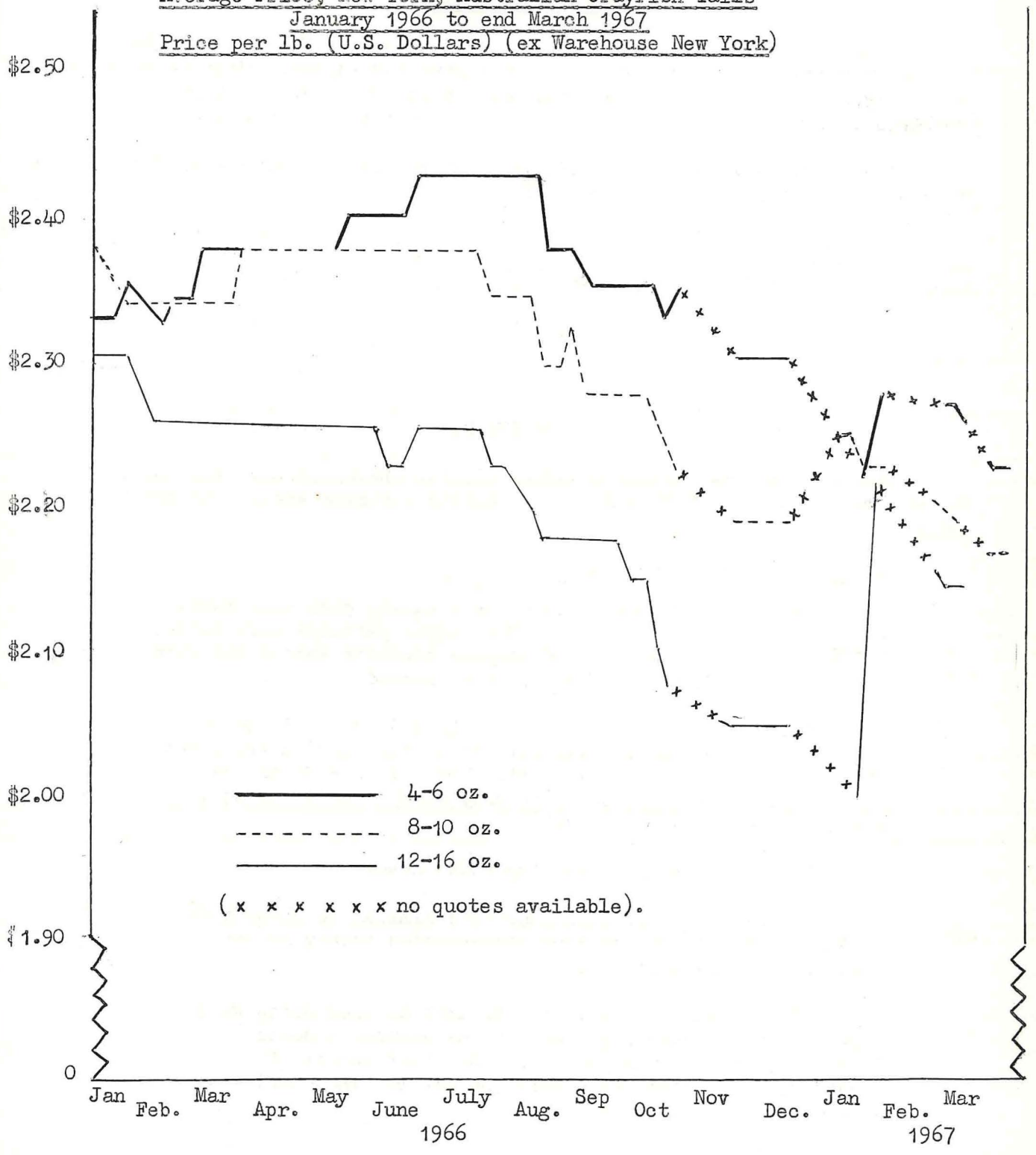
Stocks were on offer from Australia, New Zealand, Brazil, South Africa, Mozambique, Haiti, India, Pakistan, Taiwan and Thailand.

Price levels for craytails in the United States had not followed the trend in value which appeared to be indicated in January when the downward trend in values was arrested and higher prices became operative.

During February and into March, the market for Australian craytails was unsettled and prices declined (see graph opposite).

A rise in values could still occur later in the season as clearances at price levels ruling were reported as good and this is borne out by the official comment "market strong".

Average Price, New York, Australian Crayfish Tails
January 1966 to end March 1967
Price per lb. (U.S. Dollars) (ex Warehouse New York)



SALMON SEASON GOOD

Inspector Gordon has reported that to the end of March, 1967, Hunt's Canning factory had canned 1,277 tons of Australian salmon. This is an increase of 50 tons on the figures for the same period in 1966. From all indications, the remainder of the season will be as good if not better than last year.

The salmon run was late this year, but resident fish made up for any lack of travelling fish during the early part of the season.

Most beaches experienced good catches, with Cheynes Beach the biggest producer. Some beaches such as Pallinup, Boat Harbour East, Two People Bay and Peaceful Bay, had surprisingly small catches.

Inspector Gordon reports that the herring run has just begun, the cannery receiving 40 tons so far.

TUNA SURVEY

Mr. J.P. Robins, Senior Research Officer (Development), has released the following details of Tuna Survey V carried out from April 3 to April 11, 1967.

"Comments:

Water colour conditions on this survey were less muddy and 'milky' than on Survey IV. The colour patterns were better defined with current lines of varying strength associated with the positions where the water colour changed.

"Muddy water from rivers, creeks and areas of run-off had diminished with the apparent end of the 'wet' season, but these discoloured waters were still moving in a north and north-easterly direction. Extremely muddy conditions still prevailed in the area off Derby.

"The 'inversion' cloud layer was absent.

"Numbers of bird sightings were similar to those made on Survey IV. The birds were concentrated mainly in the areas where fish were sighted.

"South-easterly winds in the area between North West Cape and Broome made sightings of the smaller schools difficult, and could account for the fewer number of sightings than those made during Survey IV, when conditions were much calmer in this area.

"No sightings were made in the Fremantle-Carnarvon area where a south-west swell associated with moderate southerly winds made for poor sighting conditions.

"Tables I and II summarise school sightings by area, and sizes of fish by school size respectively."

TABLE I.

Area	Outward Flight School Sightings		
	Small	Medium	Large
Fremantle-Carnarvon	-	-	-
Carnarvon-Onslow	-	1	-
Onslow-Pt. Hedland	-	2	-
Pt. Hedland-Broome	2	8	-
Broome-Derby	15	3	-
TOTAL	17	14	0

Inward Flight School Sightings			Area
Small	Medium	Large	
6	6	2	Derby-Broome
-	1	1	Broome-Pt. Hedland
28	13	9	Pt. Hedland-Carnarvon
-	-	-	Carnarvon-Fremantle
34	20	12	TOTAL

TABLE II

Fish* Size	School Size		
	Small	Medium	Large
Small	40	26	9
Medium	8	8	2
Large	1	2	1
TOTAL	49	36	12

= 97

* Small < 15 lbs.
Medium 15-40 lbs.
Large > 40 lbs.

No. of Baitfish Schools Sighted = 42

AUSTRALIA AND NEW ZEALAND SHOULD WORK TOGETHER

The New Zealand and Australian fishing industries should work closer liaison and pool their knowledge, instead of wasting money on research into identical problems.

This was urged recently by Mr. J. Campbell, General Manager of the New Zealand Fishing Industry Board, in Sydney, reports the "Fish Trades Review."

Mr. Campbell was making a stopover in Sydney on his way back to Wellington from the Australian Fisheries Development Conference in Canberra.

Mr. Campbell said that no two countries in the world were as alike as Australia and New Zealand! "We should not regard each other as foreigners but as members of the same family", he said.

Mr. Campbell pointed out that problems of production costs, over supply at certain times of the year, merchandising, remoteness from markets, the absence of subsidies, vast untapped resources and the threat of overseas nations exploiting these resources, were common to Australia and New Zealand.

New Zealand had started a fish technologist at Massey University to carry out research work and the results could be made available to Australia on an exchange basis.

Results of a consumer survey to be conducted in Wellington soon could also be made available to Australia. There has got to be some degree of co-operation between the official bodies of both nations if their fishing industries are to progress, he said.

SALARY INCREASES

An Administrative Instruction has been received from the Public Service Commissioner setting out salary variations which will apply to officers in the Public Service with effect on and from February 3, 1967.

The salary variations are based on the increases in margins granted by the Commonwealth Conciliation and Arbitration Commission to the Metal Trades in December, 1966.

CLERICAL & GENERAL DIVISION - GROUP II

MALE OFFICERS

Classification		Gross Annual Salary Rates			Remarks
		22.7.66	Increase	3.2.67	
Group	Class	$	$	$	
II	1	3,075	77	3,152	Minimum
		3,205	80	3,285	Maximum
	2	3,335	83	3,418	Minimum
		3,465	87	3,552	Maximum
	3	3,605	90	3,695	Minimum
		3,745	94	3,839	Maximum
	4	3,885	97	3,982	Minimum
		4,025	101	4,126	Maximum
	5	4,175	104	4,279	Minimum
		4,325	108	4,433	Maximum
	6	4,475	112	4,587	Minimum
		4,625	116	4,741	Maximum

GENERAL DIVISION - GROUP VII

MALE OFFICERS

Classification		Gross Annual Salary Rates			Remarks
		22.7.66	Increase	3.2.67.	
Group	Class	$	$	$	
VII	1	1,005	10	1,015	15 years.
		1,169	12	1,181	16 years.
		1,437	14	1,451	17 years.
		1,693	22	1,715	18 years.
		1,991	30	2,021	19 years.
		2,199	44	2,243	20 years.
		2,341	59	2,400	21 or 1st year.
		2,427	61	2,488	22 or 2nd year.
		2,511	63	2,574	23 or 3rd year.
		2,617	65	2,682	24 or 4th year.
	2	2,617	65	2,682	Minimum
		2,693	67	2,760	Intermediate
		2,765	69	2,834	Maximum
	3	2,765	69	2,834	Minimum
		2,839	71	2,910	Intermediate
		2,945	74	3,019	Maximum

PROFESSIONAL DIVISION - GROUP II

MALE DIVISION

Classification		Gross Annual Salary Rates			Remarks
		22.7.66.	Increase	3.2.67	
Group	Class	$	$	$	
II	1	3,061	77	3,138	Minimum
		3,177	79	3,256	Maximum
	2	3,293	82	3,375	Minimum
		3,409	85	3,494	Maximum
	3	3,535	88	3,623	Minimum
		3,661	92	3,753	Maximum
	4	3,787	95	3,882	Minimum
		3,913	98	4,011	Maximum
	5	4,043	101	4,144	Minimum
		4,173	104	4,277	Maximum
	6	4,303	108	4,411	Minimum
		4,433	111	4,544	Maximum
	7	4,563	114	4,677	Minimum
		4,693	117	4,810	Intermediate
		4,823	121	4,944	Maximum
	8	4,953	124	5,077	Minimum
		5,083	127	5,210	Maximum
	9	5,223	131	5,354	Minimum
		5,363	134	5,497	Maximum
	10	5,503	138	5,641	Minimum
		5,643	141	5,784	Maximum
	11	5,783	145	5,928	Minimum
		5,923	148	6,071	Maximum

STAFF NOTES

Promotions

Assistant Inspectors J.S. Fletcher, L.J. Silvester and P.C. Willey have all recently been promoted to newly created positions of Inspector Grade 2 (Relieving).

Mr. C.W. Ostle has been promoted to the newly-created position of Fauna Warden, G.II.1/2. He will be stationed at Moora. Colin was previously stationed at Lancelin as Inspector, Grade 2.

Mr. John Kelly, Inspector Grade 2, has been transferred from Jurien Bay to take over from Colin Ostle, and his position will be advertised shortly.

* * * *

Mr. J.(Jim) Wilson commenced duty with the Department on April 10 as Inspector Grade 2 (Relieving). Jim was previously employed as an instructor with the Child Welfare Department, Institutional Staff.

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Another new member of the staff is Mr. R.M. (Rex) Green, who has come to us from the Department of Social Services. Rex commenced duty on April 3 as Inspector, Grade 2 (Relieving).

* * * *

Three positions of Assistant Inspector G.VII.1/2 will be advertised shortly as a result of recent promotions.

* * * *

Congratulations are extended to Technical Officer Peter Yewers and his wife on the arrival of their new baby son.

* * * *

Mr. R.E. (Bob) Baker, who is Secretary to the Fauna Protection Advisory Committee and also responsible for production of the Monthly Service Bulletin, is leaving the Department for greener (depending on the point of view) fields to take up the duties of Mining Registrar, Mt. Magnet.

Bob has worked very hard on developing a new look for the Bulletins and we are sorry to see him go. However, the move means a promotion for him and we wish him well in his new appointment. (Ed.)

* * * *

Assistant Fauna Warden K.D. (Kevin) Morrison, who was called up some time ago for national service training, has returned home on leave before embarkation for Vietnam.

Kevin visited Senior Warden S.W. Bowler and would like to be remembered to all the staff.

It is with deep regret that we report the sudden death of newly appointed Technical Assistant S.R. Hogan as a result of a traffic accident. Our sympathies are extended to his family.

SURVEY ON THE PLAINS TURKEY OR BUSTARD

The Director of Fisheries and Fauna has received a letter from the Secretary of the Fisheries and Wildlife Department, Victoria, expressing gratitude for the large number of reports received from Western Australia.

Many reports are still coming in and when the final batch is forwarded to Victoria it is expected that a very high percentage return will have been achieved.

Congratulations to all those concerned.

RESEARCH OFFICER ADDRESSES THE WESTERN AUSTRALIAN NATURALIST CLUB

At the April General Meeting of the Western Australian Naturalists Club, Fauna Research Officer Mr. T. Riggert gave senior club members a talk on "Wetlands of Western Australia".

During the course of his address Mr. Riggert dealt with swamps and reserves and fresh-water life. Mr. Riggert addressed the Club on a previous occasion, his subject then being "Antarctica", where he had served with a New Zealand party during his period as a biologist with the New Zealand Department of Internal Affairs.

SHORT-NECKED TORTOISE CAUSES RE-ROUTING OF CO-AXIAL CABLE.

Welcome news was received from the Post Master General's Department during April concerning the routing of the Perth-Carnarvon co-axial cable through the Short-Necked Tortoise Reserve at Bullsbrook.

The laying of the co-axial cable is a major undertaking which will service recent spectacular industrial development in the north west of our State. It was originally planned to route the cable through part of the habitat of the short-neck tortoise reserve. However, the P.M.G. has now decided after consultation with Fauna Officer H.B. Shugg and Dr. Main, of the University of Western Australia, to change the route to a situation close to the present boundary fence. This will mean that the habitat of the tortoise will not be disturbed in any way by the laying of the cable.

It is most gratifying to see this type of co-operation on the part of a Department responsible for such an expensive undertaking. It is another example of how industrial progress and conservation can, with mutual co-operation, develop side by side to service the needs of the whole community.

WETLANDS OF WESTERN AUSTRALIA

The Department has just published a pilot study of the Wetlands of Western Australia by Fauna Research Officer T.L. Riggert, B.Sc (Hons.).

The study is confined to the Wetlands of the Swan Coastal Plain with particular reference to their use by waterfowl.

The pilot area extends from 31°30' to 34°30'S, with a mean longitude of about 116°00'E and is bounded on the east by the Darling Fault, on the north by Yanchep Park and on the south by the Collie-Naturaliste Scarp, encompassing approximately 3,000 square miles of coastal land. The area is divided in three zones, which are approximately as shown -

Zone A - Yanchep Park to Rockingham
Zone B - Rockingham to southern extremity of Lake Preston.
Zone C - Lake Preston to Dunsborough.

Hereunder is the summary contained in Mr. Riggert's study.

"A two-year research programme has enabled the following :-

1. the location of existing and reclaimed wetlands;
2. the field evaluation of wetlands, and
3. the classification by a nation-wide system developed by the United States Fish and Wildlife Service.

Of the nineteen wetland types described by the U.S. Fish and Wildlife Service, twelve are present in the study area.

During the dry summer months 67% of all wetland habitat on the study area is lost by evaporation. This evaporation of surface water is so great that areas such as in Zone C (the most southern) are left with little or no surface water. Zone B can withstand these drought periods much better than the other zones because of its deep permanent lakes. These considerations emphasize the importance of areas of winter flooding as well as permanent wetlands for the production of waterfowl. With the tremendous loss of surface water during the summer many waterfowl utilize wetland areas that are not entirely suitable.

Since 1955 there has been a severe reduction of wetlands due to extensive drainage.

A system of wetland classification based on waterfowl usage was established with values from fair to excellent.

The use made by waterfowl of an area depends on the quality and quantity of water and vegetation present. The permanency of wetlands fall into three categories, summer, winter and year-round. Very few wetland areas in Western Australia are listed as year-round areas.

Wetland types 3 (1" - 6" throughout year), 4 (6" - 3' throughout year) and 5 (less than 10' deep) are utilized the most by waterfowl and are of the highest priority for wildlife preservation. Types 3 and 4 have been subjected to the most elaborate drainage programmes as they are desirable for agricultural development. Only 13,471 acres of wetlands are considered excellent wetland areas.

The second portion of the investigation dealt with non-drainable wetlands, such as reservoirs, rivers and flooded agricultural land. Those are considered to be of less value than the drainable types, but with proper management techniques excellent areas can be produced.

Because of the immediate contact that the Public Works Department (Irrigation and Drainage Branch) has with the people seeking draining, it would be to the advantage of the Fisheries and Fauna Department to work in close co-operation with that Department. I am sure that if our views of wildlife habitat preservation were put forth on a sound and practical basis to the Public Works Department (Irrigation and Drainage) and landowners, needless destruction of wetlands could be avoided.

The need for improving the existing wetland areas in Western Australia is quite apparent. These improvements can be accomplished by several techniques which are quite effective, but relatively low in cost.

The effectiveness that a programme of preservation will have in this State depends on the following points :-

1. A good educational programme emphasizing the value of wetlands for enjoyment and profit to landowners.

2. A better land use programme to stop excessive drainage of new wetland areas before old areas are fully developed, and

3. A definite wetland management programme to work in close co-ordination with the State and Commonwealth Departments and other interested bodies to preserve and develop our wetland areas to their fullest capacity.

It has not been the aim of this report to de-emphasize the importance of other wildlife depending on wetlands for their existence. We have utilized waterfowl as a basis for this study for two reasons. Firstly, because waterfowl are more affected by wetland losses than are populations of any other species, and secondly, use of wetlands by waterfowl is easy to assess. The lack of waterfowl on a wetland area truly reflects the deterioration of the total community (including passerine birds, mammals, amphibians, reptiles, fish, shell fish, aquatic insects and other invertebrate life), which we are trying to conserve. The key to preservation of wildlife in Western Australia is the preservation of wetland habitat."

GREY KANGAROOS DIE DURING WET WEATHER

A report has been received from Kalgoorlie that many grey kangaroos died during wet and cold weather in the Eastern Goldfields. An accurate estimate of the number per square mile was not possible, but it is believed that many hundreds of grey kangaroos perished. The animals appeared not to have struggled or lashed about and local opinion is that they died of pneumonia.

The stations where big numbers were noticed were Yindi, Hampton Hills, Mt. Monger, Cowarna and Woolibar.

Mt. Monger Station reported the death of six cattle with the same symptoms evident.

EASTERN STATES VISIT

Fauna Research Officer T.L. Riggert left Perth on April 24 for the the Eastern States, where he will have discussions on the possible integration of waterfowl research on an Australia-wide basis.

Mr. Riggert will be away for approximately one month, and his itinerary includes visits to the Victorian Department of Fisheries and Wildlife and the C.S.I.R.O., Division of Wildlife Research, Canberra. Mr. Riggert will also spend some time at the Queensland Waterfowl Research Centre at Townsville. A short stopover at Adelaide is planned and while there he will have discussions with Dr. S. Barker, of the University of Adelaide, who has been engaged in wildlife research on Kangaroo Island.

JAPANESE-NEW ZEALAND JOINT FISHING VENTURE PLANNED

The Japanese fishing firm Tokushima Suisan and a New Zealand firm, the East Coast Fisheries Products Company, are planning a joint fishing venture in New Zealand. The proposed company plans to engage in sea bream and tuna long-line fishing in the South Pacific. The president of the Japanese firm is scheduled to visit New Zealand in late April on a two-week trip to conduct preliminary talks.

(Minato Shimbun February 1967)

TRENDS IN JAPANESE PURSE-SEINE TUNA FISHERY

Distant-water purse-seine fishing in Japan (which heretofore has been overshadowed by the growing expansion of the high-seas trawl fishery) is beginning to attract wider attention as a means of improving the management of the tuna fishery. Voices are even being heard that operators engaged in this fishery should organize an overseas purse-seine fishery association to assure smooth operations.

The Japanese distant-water purse-seine fishery is presently conducted experimentally in the eastern Atlantic off West Africa and in the South Pacific. Operations in the Atlantic Ocean began when Nichiro Fishing Company in late 1964 applied for a license to conduct purse-seine fishing in the Gulf of Guinea with the 140-ton vessel "Kuroshio Maru" led by the 1,500-ton mother-ship "Chichibu Maru". That firm reportedly incurred losses during the first two years of operations but managed to pull out of the red from the summer of 1966 when it added two more efficient two-boat seiners, "Hakuryu Maru" and "Seisho Maru".

In the South Pacific, Taiyo Fishing Company in the spring of 1964 conducted the first purse-seine fishing with the power block-operated "Kenyo Maru" of 240-gross tons. Subsequently several more seiners entered the fishery and it is now reported that a total of six vessels are engaged in the South Pacific purse-seine fishery. Taiyo is presently building a 275-ton vessel to replace the "Kenyo Maru" and another firm has also ordered a large 350-ton seiner which it plans to operate in the South Pacific.

The growing interest focused on this fishery is said to be due to the fact that production per crew member on a purse seiner averages around 60 metric tons per trip, compared with 40 tons on a pole-and-line skipjack vessel and 18 tons on a tuna long-liner. However, since the seine-caught fish are predominantly skipjack, there is a need to create a greater market demand for that species. Moreover, purse-seine operators are faced with the problem of unstable fishing conditions, with catches some days running as high as 200 tons or as low as zero. Thus, unless the fishing operation is carefully co-ordinated with transportation by carriers, the owners will incur financial losses.

("Suisan Keizai Shimbun January, 1967).

FISH CATCH IN FUTURE BY SPACE VESSELS

It is expected that in the near future space vessels may be used to help in the catching of fish from the oceans. With that in view the Bureau of Commercial Fisheries (U.S.A.) is looking most intensively to new developments to increase the efficiency of the United States fishing fleet.

One interesting aspect of this is the possible use of spacecraft to obtain oceanographic and fishery data. Commercial Fisheries Review says that Charles F. Luce, Under Secretary of the Interior, has suggested that experiments and feasibility studies under way now in use of spacecraft include determination of sea surface temperature using infra-red detectors, radar detection of surface water disturbances caused by surface feeding fish schools, estimation of wave height by radar, detection of chemical fish trails at the surface of the water left by migratory schools of fish and the direct spotting of large marine mammals by high resolution photography. American astronauts have been briefed on fishery and oceanographic research and they have already supplied much useful information.

It is predicted that the local consumption of commercial fish and fishery products in the United States, both from domestic and imported sources, will jump to nearly 28 billion pounds a year by the year 2000. Present consumption is about 12 billion pounds.

(Melbourne Fish Trades Digest March 1967)

FLOATING FISH MARKETS

Reports at a recent meeting of the Soviet Academy of Sciences described two new additions to the Soviet fishing fleet, Avkarium 1 and 2. The ships are designed to act as huge aquaria, transporting fish alive from the site of catch to population and distribution centres. They are capable of carrying up to 30 tons of live fish in their metallic holds, which are oxygenated by injector devices and unloaded by a pumping process.

(Sea Secrets January 1967)

U.S. CRAYFISHERMEN HAVE PROBLEMS TOO

An article in the American publication "National Fishermen" highlights the problems of crayfishermen the world over, particularly in relation to protecting their catch.

The article describes the experiences of a crayfisherman named John Di Giacomo. Di Giacomo apparently knew that somebody was hauling his craypots and one morning decided to follow up his suspicion. Upon arriving at his line of pots he discovered a man on a cruiser hauling the first buoy. Di Giacomo gave chase but the intruder made off. So Di Giacomo began hauling his pots only to discover that the boat had circled and started to haul on the other end of the line of pots. Di Giacomo headed his boat for the cruiser but the boat turned off again, so he began to work on the other end of the craypots. Looking up he was startled to find the intruder had circled around and was working the opposite end of the line again. Di Giacomo pursued the offender for miles eventually chasing him out of sight.

On another occasion the same fisherman found a man pulling his craypots and on investigating discovered that the man was simply showing his children what a lobster looked like. Once he found a bottle in a trap with a $5 bill in it; somebody had evidently decided to pay for the meal he had taken.

I'm sure our local crayfishermen could tell some equally interesting stories.

FISH EXPERT URGES AID FOR TUNA INDUSTRY

Granting of a Federal subsidy to the tuna fishing industry was urged by the general manager of the S.A. Fishermen's Co-operarive Ltd., Mr. R.M. Fowler. He was discussing the industry's problems at an Australian fisheries development conference.

Mr. Fowler said that because of the two very short tuna fishing seasons the economics of the industry were far from satisfactory.

The only logical answer was to extend the fishing period.

The Federal Government and the C.S.I.R.O. should finance a research programme to establish where tuna fishing could be undertaken in the off-season.

However, the C.S.I.R.O. was convinced that no alternative tuna fishery was available, so some other fishery had to be developed to employ the tuna boats and canneries more fully.

He said that among other difficulties facing industry was the high cost of boat-building, road transport and cans in Australia.

The industry warranted some help from the Federal Government because of its tremendous potential and its value to the Australian economy.

Dumping

The Australian fishing industry was threatened by imports of fish at what appeared to be dump prices, Mr. R.J. McGrath, of the Victorian Fishermen's Co-operative Society Ltd., told the conference.

He said the prices paid at a wholesale level were about the same for imported fillets as the equitable wholesale price for locally caught whole fish.

These imports were subsidised directly or indirectly by the countries of origin and yet they paid only a nominal duty or, in the case of New Zealand, were landed duty-free.

"A temporary duty at least equal to the subsidy given by the countries of origin should be immediately imposed upon all imports which are offered wholesale at less than the economic average for comparative local production," he said.

Three members of the C.S.I.R.O.'s food preservation division in Ryde, N.S.W. - Mr. G.S. Sidhu, Dr. W.A. Montgomery and Mr. A.R. Johnson - said that the quality of many marine products now being produced in Australia needed to be improved. There was no common code for handling, transport and processing of fresh and frozen fish and other marine products.

To get a bigger share of the food market industry should improve the quality of its present products, diversify by developing new products and processing procedures, use modern equipment and reduce processing costs, and keep in view the convenience of the consumer and retailer to educate the consumer to use more marine products.

(Melbourne Fish Trades Digest March 1967)

LA JOLLA FIRST TO RAISE MACKEREL AND SARDINES TO ADVANCED JUVENILE STAGE.

Pacific mackerel and sardines have been raised from egg to "advanced juvenile stage" for the first time anywhere by researchers of the California Current Resources Laboratory at La Jolla.

Several hundred Pacific mackerel hatched in May 1966 reached 10 inches by year end, attained about half the adult size. Sardines hatched in August 1966 were four inches long, about one-third adult size. Using an experimental aquarium supplied with sea water, Dr. George O. Schumann has reared at least 15 species of marine fish from egg to late juvenile stages.

De. Schumann notes: "A key to the success of these experiments is to feed the proper food at the proper time." He reported that very young fish were fed small amounts of natural plankton (microscopic ocean plants and animals). As the fish grew, they were fed larger amounts of plankton, and also brine shrimp. With a lot of food and warm water some species more than doubled in length during their first two weeks of life.

Studies Needed for Conservation of Species

Dr. E.H. Ahlstrom, Laboratory Director, said Pacific mackerel and sardines are being studied to gather information needed to conserve and manage the species. "Our successful experiments will enable scientists to study the life history and habits of these fish under controlled conditions. This is one of of the most important recent developments in marine fishery biology. Information on marine fish larvae and factors influencing survival will enable scientists to better understand changes in abundance of commercial fish populations. "Rearing and studying the larvae in the laboratory will ultimately provide information leading to international co-operation in regulating the high seas fishery."

Pacific mackerel are an important West Coast fishery. But sardines, the mainstay of a prosperous fishery in the mid-1940's, have become scarce.

(Commercial Fisheries Review February 1967).

WHAT A TUNA CAN SEE

A skipjack tuna can distinguish an object the size of a pinpoint 2 feet away from its nose. Other fishes that live in the upper levels of the ocean also are remarkably sharp-sighted, scientists are finding.

For several years, Eugene L. Nakamura, biologist at BCF's Biological Laboratory, Honolulu, has been studying the vision and behaviour of the commercially important tunas. The laboratory has conducted other processing investigations in this field. Using his techniques, the Laboratory has been able to keep tunas alive for research in its shoreside tanks for months on end. It is the only place in the world where these large and active fish are regularly available for experiment.

The skipjack tuna (Katsuwonus pelamis) a relatively small and very plentiful fish, is of particular interest to the Laboratory because it forms the mainstay of Hawaii's chief commercial fishery. Also, several studies conducted by the Laboratory indicated that a very large, untouched stock exists in the central Pacific.

Nakamura has been studying the ability of tunas to see clearly the fine details of objects, especially as they become smaller and move closer together. Few such measurements of any fishes existed, and none of the much sought fishes of the high seas.

Worked in Sunless Tank House

He worked in a black-painted, sea-water tank house in a sunless building. At the end of the long, narrow tank there was an opal glass plate on which an image could be projected. The image had a pattern of black-and-white stripes of equal width.

A fish soon learned that if the stripes were vertical it would receive a morsel of food at a certain place in the tank. However, if the stripes were horizontal, and it tried to swim to the food-drop area, it would receive no food -- and, to impress the lesson upon it, a mild electric shock.

When the fish was trained and testing began, horizontal and vertical stripes were presented at random. The luminance of the stripes was decreased in steps until the fish began to make errors in half the tests. On following days, the fish would be presented with patternsn in which the stripes were narrower or broader. In this way, the visual acuity of the skipjack and a related species, kawakawa, or little tunny, was determined.

Nakamura found that when the white stripes were dim, the fish saw about equally well, but when they were brighter, the skipjack's visual acuity was greater.

There is evidence that sight is important to tunas in detecting prey and avoiding predators. Nakamura says it also is used to recognize transient and permanent body marks. Several fishes exhibit transient color markings at certain times, such as feeding or courtship. These markings may convey information about the presence of food to other fish in the school, or signal aggressive intentions. Certain permanent body marks may aid a fish distinguish its own kind from others closely resembling it.

Can See Pinpoint on Clear Day

Nakamura was able to calculate from his measurements how far the skipjack could see prey or body marks under certain conditions. On a clear day, a skipjack tuna about 100 feet down could see an object a few hundredths of an inch long 2 feet away. It could see the transient vertical bars on the flanks of another skipjack about 35 feet away. Permanent body marks on another skipjack would be resolvable at distance of about 10 feet. Nakamura points out, however, that contrast between the object and its background may be as important, or even more, than visual acuity; he was unable to measure contrast. He reports that British workers recently found that the scales of some fishes are ingeniously oriented to reduce contrast between their bodies and the background.

What Nakamura's studies may mean to the fishermen lies in the possibilities they offer of devising improved new gear and techniques for catching fish. Such gear and techniques would be based on scientific studies of the fishes' perceptual abilities and knowledge of their behaviour.

(Commercial Fisheries Review February 1967).