

some developments in the tuna fisheries in the indian ocean



UNITED NATIONS DEVELOPMENT PROGRAMME



FOOD AND AGRICULTURE ORGANIZATION
OF THE UNITED NATIONS

SOME DEVELOPMENTS IN THE TUNA FISHERIES
IN THE INDIAN OCEAN

by

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
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Rome, October 1975

The conclusions and recommendations given in the report are those considered appropriate at the time of its preparation.

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SUMMARY

1. The catch and effort data currently available for the Indian Ocean tuna fisheries are considered inadequate for stock assessment or management purposes.
2. The areas where most deficiencies occur were identified and it was concluded that a full-time data collation and evaluation service is required if the data base is to be up-graded to the desired level.
3. Recent data was obtained on the Indian Ocean longline fishery and a serious decline in total catch and catch per unit of effort was detected and discussed.
4. The current knowledge of the state of the stocks of each of the major tuna species exploited by longlining was briefly reviewed. It was concluded that the total longline catches of tuna in the Indian Ocean in 1973-74 probably reached maximum levels which may be greater than the total annual average in future years. The total 1975 catch was anticipated to be much lower than in previous years.
5. The deterioration in the economics of longlining in recent years indicates that a complete recovery of the industry is unlikely and the total tonnage of vessels employed in the industry in the Indian Ocean will probably not exceed that of 1973-74.

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1. INTRODUCTION

Following the adoption of the recommendations of the IPFC/IOFC Ad Hoc Working Party of Scientists on Stock Assessment of Tuna by the IOFC Executive Committee for the Implementation of the International Indian Ocean Fishery Survey and Development Programme (IOP) the present consultancy was undertaken with the following terms of reference:

1. Identify problem ports in the Indian Ocean, at which substantial catch and effort statistics are left unreported.
2. Collect the statistics at the problem ports identified as such, and make the local agencies acquainted with international activities for compiling the statistics.
3. Examine and compile the statistics and produce data deficit tables together with recommendations to the national offices.

In pursuing these objectives the statistics held by FAO were analysed in detail and three field trips were undertaken; the first to Madrid for discussion with the Secretariat of the International Commission for the Conservation of Atlantic Tunas on the most effective approach to longline fishing companies for obtaining the required catch and effort data; secondly to Malaysia for discussions with representatives of fishing and tuna processing companies to obtain recent data on the longline fishery, and then to Sri Lanka to obtain statistics on the surface tuna fisheries of the central Indian Ocean; thirdly to Mauritius to complete the compilation of longline statistics for presentation at the Fourth Session of the Indian Ocean Fishery Commission in Mombasa, Kenya. The results obtained are discussed according to the three categories outlined in the objectives and an additional provisional analysis of the state of the longline fishery is presented.

2. PROBLEM PORTS

The major problem in obtaining accurate total catch and effort statistics for tuna fisheries in the Indian Ocean is primarily one of expending more effort in the collection of the required information. In many cases the statistics are available but at the present time they are not being collated and examined on a regional basis.

To facilitate discussion of the statistical problems associated with the Indian Ocean tuna fisheries, the fisheries can be divided into two broad categories, namely longline and surface fisheries.

2.1 Longline fisheries

The longline fisheries account for the greater part of the total tuna catches from the Indian Ocean, but because almost all of these catches are taken by vessels registered in countries which do not border on this Ocean, there is a big discrepancy between catches and landings recorded at Indian Ocean ports. Vessels from Korea, Japan and other Asian nations account for most of the catches, and while much of this is unloaded at ports in the Indian Ocean, particularly Penang, Port Louis, Mombasa, Tamatave and Reunion, it is difficult to ascertain what quantity or percentage of the total has been unloaded at the home port or other ports in different parts of the world. This problem is discussed further under the state of the longline fishery, but while the data from the fishing ports is readily available and extremely useful for gauging the current catch rates and general state of the industry, it is of limited use in estimating total catch and geographical distribution of the effort. Such data can only be obtained from the flag countries of all the vessels operating. Indeed, it appears that all of the nations with substantial longline fleets do collect accurate catch and effort data by five degree squares from each of their vessels, but unfortunately not all of the vessels belong to countries which are members of the United Nations. Therefore, the data is not available to FAO. If all the available data could be collated by one central body, accurate descriptions of catch and effort with an estimated one year time lag would be available. This data could be updated by examination of the detailed data readily

available at the various unloading ports in the Indian Ocean. All of the fishing companies requested to supply such information have been extremely cooperative and there is no doubt very comprehensive figures for the catch landed at Indian Ocean ports could be obtained.

It is therefore concluded that insofar as longline fishery statistics are concerned, there are no real problem ports in the Indian Ocean, the problem lies in obtaining national statistics from countries outside this Ocean and in ensuring that the fish landed at all ports is not counted twice (i.e., by the country of flag and the country where it is landed) in determining total catches. The need to obtain the necessary data from all nations cannot be overemphasized.

2.2 Surface fisheries

The surface fisheries for tunas in the Indian Ocean have been expanding rapidly in recent years and they are currently the subject of considerable hope for further increases in total tuna landings. Undoubtedly, the statistics available on these fisheries are less complete than for the longline industry and proportionately more effort will be required to update them to the standard required. Of the countries which catch more than a few thousand tons of tuna with surface gear, only Sri Lanka and Madagascar supply statistics in sufficient detail to enable any attempt at stock assessment. The only way this problem can be overcome is by concerted effort by all the countries concerned to increase the quality of the statistics available. Specifically, a more accurate estimate of the total catch and a breakdown of this catch by species is urgently needed and if accurate stock assessments are to be obtained details of the distribution of effort and the size composition of the catches are required.

Most of the catches in the surface fisheries are landed at small local ports for sale and distribution among the local population. It is therefore much more difficult to assess catch or effort in these fisheries, than is the case for longline fisheries, where most of the catch is for export markets. Almost all of the countries bordering on the Indian Ocean can be regarded as problem areas for the collection of surface tuna fisheries statistics.

3. THE COMPILATION OF STATISTICS

The most recent summary of Indian Ocean total tuna catches available prior to the commencement of this present study was that given in Appendix 4 of the Report of the Second Session of the IPFC/IOFC Ad Hoc Working Party of Scientists on Stock Assessment of Tuna (1974). This summary has been updated as far as possible during the present study and the statistics for several countries previously not recorded have been included and presented in Table 1.

A great deal of additional recent data on longline landings in Indian Ocean ports was obtained and summaries of this are given in Tables 2-5 and Figures 1-9.

4. DATA DEFICIENCIES AND RECOMMENDATIONS TO IMPROVE THE STATISTICS

Most of the countries making sizeable contributions to the total Indian Ocean tuna catches are included in Table 1. However, the large number of footnotes required in this table indicates the inconsistencies in the format of the available data. The estimate of total longline catch suffers primarily from a lack of recent catch figures from Asian nations other than Korea and Japan, whereas there are numerous possible errors in the surface fishery statistics. All of the additional data presented is only of benefit in estimating total catch, and in some cases indicating gross fluctuations in effort. No additional data of particular worth for stock description or assessment could be obtained during the limited period of the present study.

In order to obtain the required data it will be necessary to increase the national efforts in data collection and in many cases initiating or expanding well planned sub-sampling programmes. Many of the countries will need external assistance to upgrade their

data base to the desired level and the most effective way of making this assistance available and coordinating a regional approach on a continuous basis would be through the formation of a full-time body specifically for the purpose.

5. ANALYSIS OF THE RECENT DATA

The Indian Ocean longline data discussed at the Second Session of the IPFC/IOFC Ad Hoc Working Party of Scientists on Stock Assessment of Tuna was derived largely from Suda (1974). In the present report additional data are presented and a preliminary analysis made in the light of recent and previous information.

Most of the longline vessels now fishing for tuna (other than T. maccoyii) in the Indian Ocean belong to either the Republic of Korea or other Asian nations; the number of Japanese vessels operating in this fishery has been decreasing continuously in recent years. Many of the longliners unload their catches at foreign ports, the most important of which are Penang (Malaysia) and Port Louis (Mauritius), and although the unloadings of these two ports by no means account for the total longline catches in the Indian Ocean, they do represent indices of change in the longline fishery in the region and are a source of the most recent statistics available. However, the inadequacies of this data for stock assessment purposes are appreciated.

The results obtained from visits to these two ports have been summarized in Tables 2 and 3 which give a subsample of the unloadings of vessels other than those of Japan and Korea, at Penang and the total unloadings of vessels other than Japanese at Port Louis respectively. Figures 1-5 show the trends in these results while Figure 6 shows the fluctuations in tuna prices from 1971 to early 1975.

The figures and tables presented show that since 1973 there has been a considerable decline in the average unloadings by longliners at both Penang and Port Louis and that this decrease has been most marked since early 1974. While these results indicate a rapid decline in the productivity of longline fishing throughout the Indian Ocean, the possibility that factors other than a decline in the stocks of the species being exploited are responsible for these decreases must be considered. Considering firstly the unloadings at Penang:

5.1 Penang

In early 1972 the price of albacore in both U.S.A. and Japan began to increase proportionately more than that for yellowfin, possibly resulting in a shift of the overall longline fishing effort, tending to concentrate this effort in areas of greatest concentration of albacore. When the Japanese prices of albacore increased markedly in late 1973 - early 1974, the total landings of albacore were likewise high. It would appear that during this period not only were the total landings of albacore high but the catch rate was also elevated, but without accurate effort data by area it is difficult to differentiate between an increase in catches due to incentive (price) and the increased relative abundance of the target species. However, whichever may be true the dollar value of the catch per trip was certainly high for this period and more than compensated for the great increases in fuel prices which occurred in 1973.

Since February 1974, the tonnage and values of the longline landings has decreased dramatically. The average unloadings per trip fell from 85.7 tons to 38.5 tons in February 1975 with a 16 percent decrease in the percentage of albacore taken. In addition the albacore price offered in Japan fell from over U.S.\$ 1 200 per ton to under U.S.\$ 1 000 in February 1975 and then to under U.S.\$ 800 in May. During this period overall operating costs rose sharply even though there was a slight decrease in fuel costs. In addition the average trip length tended to increase due to the depressed catch rate and by May 1975 the trip length for most vessels was almost four months whereas it had been approximately three months in previous years.

As the fishing conditions deteriorated, many austerity measures were introduced or their use expanded. Vessels returning to Taiwan tended to carry billfish and some tunas caught by other boats back to the home ports where the price for many species was much higher. This can be seen as the decrease in the percentage landings of species other than tuna since 1971 (Table 2). Also as the average price and catch per trip continued to decrease it became more economical for longline vessels to carry their own catch to Taiwan or Japan rather than accept the ex-vessel price of approximately U.S.\$ 150 less per ton on offer in Penang. For catches of species other than albacore the proportion of the value of the catch lost due to freight charges is much higher and hence it is comparatively more economical for the catcher vessels to transport their fish to a market port rather than suffer transshipment costs of the order of 30 percent of the value of the catch. Once the trip length had been increased to almost four months this 30 percent transshipping loss could be overcome by a 30 day return trip to a market port resulting in a smaller net loss of capital and having the social advantage of spending the turn-around time in the home port. Fuel consumption due to the extra steaming would not be greatly above that normally used for longline fishing and the additional costs could be covered to some extent by cheaper rates on fuel and stores in the home port.

It therefore appears that the decrease in the total landings per vessel as indicated in Figure 1 and the decrease in the number of vessels unloading in Figure 3 may exaggerate the decline in landings in this area. However the verbal reports of the fishermen and company representatives on the greatly reduced average catches per day indicate that production from longlining in the eastern Indian Ocean has been greatly reduced and when coupled with the depressed tuna prices and general economic climate, the industry is at present in a period of extremely serious decline. The number of vessels which have ceased fishing (Appendix 1) emphasizes the present plight of the fishery.

5.2 Port Louis

Unlike Penang almost all of the longline vessels calling at Port Louis unload their total catch, probably because of the huge distances involved in steaming to and from the home port. The total unloading figures (Table 3), therefore, probably more accurately represent catch fluctuations than do those for Penang (Table 2), at least for the central and western Indian Ocean. As a result of the depressed fishing conditions in this area in 1975, all of the Korean vessels formerly based in Port Louis moved to the Atlantic Ocean, resulting in a complete cessation of unloadings in Mauritius. Such movements would be expected as a result of abnormally good catches in the Atlantic or low catches in the Indian Ocean; the latter appears to be the case and average daily catches per vessel dropped to 0.5-0.8 tons by June although the catch rate was tending to increase in late July (Kim Hai Chun^{1/}, personal communication).

From Table 3 a general decline in both total landings and average catch per vessel is evident. The average catch per trip by Korean vessels fell to 66 percent of the 1973 figure by February 1975 at which time operations ceased. Average landings per trip by other vessels were down to 55 percent of their 1973 levels by mid-1975 and the number of vessels operating was reduced by at least half. The total 1975 landings to June 30 represented only 32 percent of the landings in the corresponding period of 1973 and the catch per trip and number of trips were still declining rapidly. It is interesting that the landings per trip by vessels other than Korean are consistently only approximately 75 percent of those from Korea.

Unfortunately no breakdown of the catch by species was available.

^{1/} Fisheries Attaché, Embassy of the Republic of Korea, Baidjan, Ivory Coast.

6. INDICATIONS FROM THE OFFICIAL KOREAN STATISTICS

The only official national statistics currently available for 1974 for the longline fleets operating in the Indian Ocean are those from Korea. Summaries of these figures are given in Tables 4 and 5 and from these summaries it can be seen that the total catch and the provisional estimate of the catch per vessel are both considerably higher than the corresponding figures for 1973. The catch of each species listed in Table 5 was higher in 1974 than 1973 but much of the overall increase of 47 percent was due to the increase of 7 746 tons (138 percent) of bigeye tuna, and catches of this species exceeded those of yellowfin tuna for the first time. This increase in bigeye catches was probably due to a geographical redistribution of the Korean longline fishing effort in 1974 coupled with an increase in the percentage of total effort directed primarily at bigeye. An increasing number of Korean vessels are being equipped with refrigeration colder than -40°C with the primary goal of catching bigeye for sale on the lucrative Japanese "sashimi" market. This has not only contributed greatly to the increase in bigeye catches but could be anticipated to substantially increase the value per ton of the catches which were taken and would tend to counteract the general drop in prices for the other species exploited by the longline fishery.

Although the total landings by Korean vessels were high in 1974, the available statistics give several indications that the industry was undergoing a period of abnormal fluctuations. From Table 4 it can be seen that the number of vessels unloading in the first half of the year was approximately half (139:270) of that for the second half and yet the catch varied by only approximately one third (16 844:25 114). From Figure 8 the number of vessels unloading per month can be seen to continuously increase, with more than 50 percent of the estimated total Indian Ocean fleet of approximately 130 vessels unloading in December, while the average catch per trip fell to less than half of that for January and February. This combined with the verbal reports of industry and Government representatives indicates that while the total 1974 catch was high, the catch rate in the latter part of the year and early 1975 was alarmingly low.

7. POSSIBLE ALTERATIONS IN THE STATUS OF THE STOCKS

7.1 Yellowfin

Although there is a discrepancy of more than 10 percent between the figures given for the total Indian Ocean catch of yellowfin in Appendix 4 of the Nantes Report and those given in Figures 9 and 10 from Suda 1974, these two sources of information are the most recent available and enable preliminary estimates of fluctuations in the numbers of yellowfin being taken in the Indian Ocean. Suda (1974) estimated that approximately 1.0 and 1.1 million yellowfin were taken by longlining in 1970 and 1971 respectively and the Nantes Report (1974) endorsed his estimate of annual recruitment to the longline fishery being on the average of the order of 1.9 million fish. Although detailed size composition data on the surface fisheries in the Indian Ocean are not available, preliminary reports indicate that the average size of fish captures in these fisheries is approximately 5 kg. From Table 1 the 1973 catches of such fish exceeded 15 000 tons and was probably comprised of some 3 000 000 individuals, or 1.5 times Suda's estimate of recruitment to the longline fishery or 1.2 times his estimate of the virgin population of individuals of a size greater than that at first capture in the longline fishery.

As the surface fisheries for yellowfin in the Indian Ocean are still expanding and are generally considered to be currently underexploited, the virgin population of these smaller fish could be expected to be much higher than the 3 000 000 fish taken in 1973. It is, therefore, concluded that either:

- (a) the previous estimates of recruitment of yellowfin to the longline fishery which were based purely on longline catch data were inaccurate, or

- (b) there is a high natural mortality for yellowfin between the ages of exposure to the surface fishery and recruitment to the longline fishery, or
- (c) the stocks exploited by the longline and surface fisheries are different, or
- (d) the longline fishery exploits only part of the same stocks available to the surface fishery, or
- (e) the large number of individuals taken in the surface fishery in 1972 and 1973 has greatly decreased recruitment to the longline fishery and the figures for recruitment to the longline fishery prior to 1973 are no longer applicable.

Considering the experiences of the expansion of the surface fisheries in the eastern Pacific and Atlantic Oceans far beyond the levels indicated by longline data, alternative (d) or a compromise between (c) and (d) is possibly the most likely.

The average size of yellowfin taken by longline in the Indian Ocean between 1965 and 1971 was approximately 120 cm (from figures of Suda 1974) and while verbal reports suggest it may have decreased in more recent years, it appears to be still well above the estimated minimum size at first spawning (less than 100 cm) for yellowfin in the eastern Pacific Ocean (Orange 1961, Shingu *et al.* 1974). Although extreme caution is necessary when comparing growth parameters from one ocean to another, the lack of relevant data on Indian Ocean yellowfin means an alternative must be used at this time. Therefore, assuming the sexual development to length relationship is similar between the Indian and Pacific Oceans, the available length data support the generally held belief that longline fisheries are unlikely to result in over-exploitation of the yellowfin stocks to the point where total yield could be anticipated to be appreciably decreased. If this theory is correct then the current poor catch rate of yellowfin (assuming that the catch data adjusted for the geographic location of the effort confirms the presently available indications) is probably due to the occurrence of one or more poor-year classes, or else interactions from the recently expanded surface catches of juveniles. In either case the possible influence that development of surface fisheries may be having on the longline industry and the total stocks of yellowfin must be further investigated. It would be most interesting to compare the catch rates in recent years per standard number of hooks for albacore and bigeye with those for yellowfin, as the first two species have not been subjected to the same fishing pressure as juveniles.

The Second Session of the IPFC/IOFC Ad Hoc Working Party of Scientists on the Stock Assessment of Tuna (1974) concluded that an increase in the longline fishing effort for yellowfin and albacore in the Indian Ocean would not result in any increase in total catch but would lead to a further reduction in the catch per unit of effort and possibly even a drop in total catch. These conclusions were based on an analysis of the status of the stocks using data on the fishery to 1972. While the additional data included in this report contains insufficient detail to ascertain if the apparent changes in relative abundance are real, it does confirm that there have been further decreases in the catch per unit of effort since 1973 and the total catch for 1975 is predicted to be substantially lower than for preceding years. The average unloadings at Penang for the first three months of 1975 are down to 51.8 percent (Table 2) of what they were for the same period in 1973 while those at Port Louis fell to 50.1 percent in the same period (Table 3). At the same time as these average catches per vessel were decreasing, the costs of running longline vessels had probably doubled because of increasing costs due to escalating fuel, bait and gear prices, wage increases and worldwide inflation. In addition the tuna price has fallen substantially in 1975 while freight costs have further increased, making conditions even more unfavourable for those vessels unloading at foreign ports. Due to the combination of rising costs, poor catch rates and depressed tuna prices, approximately half of the Indian Ocean longline fleet has ceased operating and if this low productivity continues the landings of longline caught fish at foreign ports is anticipated to be of the order of one quarter of that in previous years.

7.2 Albacore

The additional information gained is of little benefit in up-dating the knowledge on the stocks of this species in the Indian Ocean. A superficial examination of the current information indicates that the longline catch rate for albacore has decreased dramatically since mid-1974. More detailed information on the geographical and temporal distribution of the effort concentrated on albacore is required as a matter of urgency as the limited data available indicate that this fishery is overcapitalized, even if the stocks have not declined as a result of excessive fishing pressure.

7.3 Bigeye Tuna

The proportional increase in the bigeye catches can be attributed to some extent to the increase in the use of this species for "sashimi" by the Japanese. Care must be taken not to confuse the cash returns from longline fishing for "sashimi" fish, i.e. bigeye or southern bluefin with those for fish for the conventional cannery trade. Because of the extremely cold refrigeration used on "sashimi" vessels a very high quality product results which may bring a price of 10 times that obtained for fish for canning. The economics of this fishery are therefore completely different to conventional longlining and comparatively much lower catch rates can be tolerated.

It is probable that some of the increase in bigeye catches was due to more active searching for this species as the catches of yellowfin and later albacore declined. This could be verified by an analysis of the movements of the fishing effort when more detailed data is available.

7.4 Southern bluefin tuna

Almost all of the southern bluefin taken in the Indian Ocean are taken by Japanese vessels and no attempt was made to update the information on this fishery. At the Third Session of the Special Committee on Management of Indo-Pacific Tuna at Mombasa, Kenya, 18-19 July 1975, a Report of the Special Southern Bluefin Tuna Working Party (TM/75/Info.10) was discussed. This report does give the most recent information on both the Japanese longline and Australian coastal fisheries and should be consulted.

8. POSSIBLE FUTURE DEVELOPMENTS

It is possible that the poor catch rates experienced in late 1974 and early 1975 are due to short-term fluctuations in the stocks and catches may well return to previous levels in the near future. However, all the available evidence indicates that the known Indian Ocean tuna stocks are unlikely to support any substantial increase in longline catch over the levels of 1970-73. Due to the continuous deterioration in the balance between the cost of catching tuna by longline and the unit value of such fish, it appears that a recovery in the catch rate to the levels of 1970-73 will still not make it economical for the continued operation of the total number of longline vessels fishing in early 1974. It would appear that an increase in the catch per unit of effort, in addition to a recovery of the tuna price is required before longlining will once again generally become a profitable industry. The current knowledge of the stocks indicates that the only way an increase in the catch per unit of effort can be affected is through a substantial decrease in the total effort. The present economic state of the fishery has led to about half of the fleet lying idle and it is unlikely that a recovery will occur which will make it economical for all of these to recommence operations. It is, therefore, probable that there will be a reduction in the longline fishing effort in the Indian Ocean, with hopefully an increase in the catch per unit of effort, provided the possible influence of increased surface fisheries does not significantly alter the productivity of the stocks exploited by longlining.

TABLE 1

Summary of Statistics of Landings (Catches) of Tuna from the Indian Ocean
(modified from Appendix 4 of the Report of IPFC/IOFC Working Party of
Scientists on Stock Assessment of Tuna, Nantes, France,
16-18 September 1974, FAO Fisheries
Reports No. 152)

Species	Gear	Country	1971	1972	1973	1974
Albacore (<u>T. alalunga</u>)	longline	Japan ^a	2.9	1.1	1.8	
		Korea ^a	2.1	3.6	9.0	9.2
		Reunion ^b	0.5	1.1	2.7	4.9
		U.S.S.R. ^c	0.6	0.6	0.9	
		Other	5.0			
	surface	Reunion	0.1			
Bigeye Tuna (<u>T. obesus</u>)	longline	Japan ^a	10.8	8.9	5.1	
		Korea ^a	4.1	4.3	5.6	13.6
		Reunion ^b	0.5	0.3	0.3	0.5
		Sri Lanka	0.1	0.1	0.1	
		U.S.S.R. ^c	1.1	0.8	0.6	
		Other	6.5			
Yellowfin Tuna (<u>T. albacares</u>)	longline	Japan ^a	12.9	7.8	3.4	
		Korea ^a	6.5	9.6	9.2	11.6
		Reunion ^b	0.2	0.9	0.4	0.4
		Somalia ^d				1.0
		Sri Lanka	0.2	0.1	0.1	
		U.S.S.R. ^c	1.7	1.7	0.9	
		Other	13.1			
	surface	Australia	0.1	0.1		
		India	0.2	0.2	0.2	0.2
		Madagascar		0.2	0.5	2.5 ^f
		Maldives ^e	1.3	5.0	5.2	
		Pakistan	0.2	0.3	0.2	
		Reunion ^g		0.2	0.3	0.4
Sri Lanka	3.8	5.1	5.0			
Southern Bluefin (<u>T. maccoyii</u>)	longline	Japan ^a	22.6	20.1	19.5	
		Korea ^a	0.5	0.1	0.1	0.2
surface	Australia	7.8	10.4	8.6	6.9	
Skipjack (<u>K. pelamis</u>)	longline	Japan ^a	0.1	0.2	0.0	
		Korea ^a	0.1	0.1		
		Somalia ^d				0.1
	surface	Australia	0.0	0.1	0.1	
		Bangladesh	0.7	0.9		
		India	5.1	4.8	4.8	
		Madagascar		3.3	4.5	10.0 ^f
		Maldives ^e	28.9	16.0	20.0	
		Pakistan	6.0	8.1	5.8	
		Sri Lanka	9.8	12.4	10.5	
Indonesia	(13)	(15)				

TABLE 1 (cont'd)

Species	Gear	Country	1971	1972	1973	1974
Little Tuna (<u>E. affinis</u>)	surface	India	0.3	0.3	0.3	
		Maldives	0.4	0.6	1.0	
		Pakistan	0.1	0.1	0.1	
		Sri Lanka	2.4	2.3	2.0	
Frigate Mackerel (<u>A. thazard</u>)	surface	Bangladesh	0.7	0.5		
		India	0.2	0.2	0.2	
		Maldives	26.9 ^h	3.1	6.2	
		Pakistan	5.6	4.9	5.5	
		Sri Lanka	3.2	4.1	3.8	
Tuna (not specified or included elsewhere)		India	5.4 ⁱ	4.9 ⁱ	22.5 ^j	
		Maldives ^k	1.4	7.5	1.3	
		Reunion	0.1	0.4	0.3	0.7
		Tanzania	0.8	1.6	0.8	
		Yemen (Dem. Rep.) ^l	7.5	9.4	8.9	
		Yemen (Arab Rep.) ^m			0.3	

- a - Based on more recent official figures (from FAO).
- b - Includes in addition to local vessels catches by French and other Asian nations landed at Reunion. Care must be taken to avoid double reporting.
- c - Figures from FAO Yearbook divided by species on the basis of Korean catch figures for the whole Indian Ocean (Area 51).
- d - Caught by handline and short longlines and is therefore not strictly either longline or surface catch.
- e - Recent figures from Maldivian Government but not identical to those given to FAO.
- f - Estimated figure.
- g - Yellowfin and skipjack mixed.
- h - Considered to probably be a reporting error and should probably be 2.69.
- i - Redistributed in previous tables as given in Nantes Meeting 1974.
- j - Official figure but not in keeping with previous years data and grossly different from that given in Nantes Meeting 1974.
- k - Includes Gymnosarda nuda and Thunnus tonggol but percentage composition unknown.
- l - Yemen figures may include some figures from U.S.S.R. vessels.
- m - Species given as the unlikely mixture of skipjack and bigeye.

TABLE 2 - A Sample of Unloadings by Longliners, Other than Japanese or Korean, at Penang.

1971	No. of Vessels	Total Catch		Yellowfin		Albacore		Bigeye		Marlin		Swordfish		Others								
		Total	Per Boat	Total	%	Total	%	Total	%	Total	%	Total	%	Total	%							
Jan.- March	46	2 712	58.96	649	14.12	23.94	1 111	24.15	40.95	463	10.07	17.08	211	4.59	7.78	18	0.39	0.66	260	5.65	9.59	
April- June	38	2 017	53.08	983	25.88	48.75	239	6.30	11.86	296	7.79	14.68	233	6.13	11.55	24	0.62	1.17	242	6.36	11.98	
July- Sept.	12	807	67.26	395	32.90	48.92	55	4.55	6.76	201	16.75	24.90	63	5.25	7.81	6	0.48	0.71	88	7.35	10.93	
Oct.- Dec.	8	391	48.85	242	30.24	61.90	9	1.17	2.39	90	11.30	23.13	26	3.25	6.65	5	0.05	0.11	23	2.83	5.80	
1972																						
Jan.- March	27	1 593	59.01	897	33.22	56.30	157	5.83	9.87	301	11.16	18.92	76	2.81	4.77	24	0.89	1.51	137	5.09	8.62	
April- June	19	1 082	56.93	441	23.23	40.81	120	6.31	11.08	318	16.76	29.44	87	4.58	8.04	13	0.67	1.18	103	5.40	9.48	
July- Sept.	22	1 305	59.31	567	25.76	43.44	249	11.33	19.11	348	15.81	26.66	60	2.73	4.60	12	0.54	0.90	69	3.12	5.26	
Oct.- Dec.	13	695	53.44	229	17.64	33.00	268	20.62	38.58	131	10.07	18.85	14	1.08	2.02	5	0.40	0.75	47	3.63	6.80	
1973																						
Jan.- March	30	2 232	74.39	832	27.74	37.29	835	27.85	37.44	362	12.07	16.23	71	2.37	3.18	20	0.66	0.89	111	3.71	4.99	
Apr.- June	26	1 839	70.74	796	30.62	43.28	669	25.74	36.38	257	9.90	14.00	36	1.38	1.96	10	0.40	0.57	70	2.69	3.81	
July- Sept.	18	1 136	63.13	318	17.64	27.94	469	26.06	41.27	241	13.38	21.19	22	1.22	1.94	18	0.99	1.56	69	3.84	6.08	
Oct.- Dec.	13	1 190	91.56	388	29.83	32.58	487	37.43	40.88	287	22.05	24.08	8	0.62	0.67	3	0.22	0.24	18	1.40	1.53	
1974																						
Jan.- March	21	1 801	85.74	343	16.32	19.03	1 231	58.62	68.37	189	9.02	10.51	12	0.57	0.67	5	0.23	0.27	21	0.99	1.15	
April- June	23	1 154	50.16	196	6.79	13.55	736	31.99	63.77	182	7.93	15.81	35	1.52	3.03	11	0.48	0.95	34	1.47	2.93	
July- Sept.	33	1 983	60.09	205	6.22	10.35	1 351	40.95	68.14	312	9.44	15.71	40	1.21	2.02	28	0.83	1.39	48	1.45	2.41	
Oct.- Dec.	50	2 115	42.30	317	6.33	14.97	1 088	21.76	51.44	470	9.40	22.23	113	2.25	5.34	37	0.74	1.73	91	1.82	4.29	
1975																						
Jan.- March	40	1 541	38.53	356	8.91	23.12	805	20.17	52.21	280	7.01	18.20	44	1.10	2.85	18	0.46	1.19	38	0.94	2.45	

All total figures have been rounded to the nearest metric ton

TABLE 3

Total Unloadings by Longliners at Port Louis (Japanese vessels excluded)

	1973						1974						1975					
	Other Asian Nations			Korea			Other Asian Nations			Korea			Other Asian Nations			Korea		
	No. of vessels unloading	Total tons	Average per vessel	No. of vessels unloading	Total tons	Average per vessel	No. of vessels unloading	Total tons	Average per vessel	No. of vessels unloading	Total tons	Average per vessel	No. of vessels unloading	Total tons	Average per vessel	No. of vessels unloading	Total tons	Average per vessel
Jan.	14	1 120	80.0	6	752	125.3	8	433	54.1	3	242	80.7	14	589	42.1	2	99	49.5
Feb.	5	471	94.2	6	597	99.5	6	268	44.7	2	264	132.0	6	164	27.3	1	107	107.0
Mar.	10	674	67.4	5	574	114.8	6	356	59.3	2	50	25.0	10	546	54.6	0	-	-
Apr.	2	127	63.5	5	416	83.2	4	95	23.8	7	454	64.9	6	265	44.2	0	-	-
May	9	483	53.7	3	183	61.0	4	266	66.5	1	30	30.0	4	174	43.5	0	-	-
June	9	696	77.3	2	256	128.0	9	754	83.8	4	305	76.3	4	174	43.5	0	-	-
July	5	489	97.8	7	1 086	155.1	13	1 072	82.5	10	900	90.0	2	63	31.5	0	-	-
Aug.	14	1 173	83.8	2	314	157.0	3	178	59.3	4	299	74.8						
Sep.	7	728	104.0	6	578	96.3	7	439	62.7	3	298	99.3						
Oct.	15	1 079	71.9	7	362	51.7	17	835	49.1	5	338	67.6						
Nov.	9	591	65.7	3	242	80.7	6	360	60.0	4	271	67.8						
Dec.	8	593	74.1	5	594	118.8	12	636	53.0	3	283	94.3						
	107	8 224	76.9	57	5 954	104.5	95	5 692	59.9	48	3 734	77.8	42	1 801	42.9	3	206	68.7

TABLE 4

Korean Longline Catches for 1974 in the Indian Ocean*
(in metric tons)

	No. of Boats	Total including Billfish and Sharks		Albacore		Yellowfin		Bigeye	
		Total	Av/Boat	Total	Av/Boat	Total	Av/Boat	Total	Av/Boat
Jan.	18	2 932	162.9	726	40.3	1 151	63.9	615	34.2
Feb.	5	1 152	230.4	401	80.2	294	58.8	264	52.8
March	18	1 982	110.1	315	17.5	786	43.7	555	30.8
April	24	2 427	101.1	192	8.0	926	38.6	782	32.6
May	31	3 728	120.3	245	7.9	1 256	40.5	1 409	45.5
June	43	4 623	107.5	668	15.5	1 494	34.7	1 266	29.4
July	27	3 089	114.4	1 186	43.9	469	17.4	880	32.6
August	45	4 769	106.0	1 931	42.9	984	21.9	1 101	24.5
Sept.	43	4 097	95.3	1 272	29.6	949	22.1	1 195	27.8
Oct.	38	3 006	79.1	608	16.0	601	15.8	1 140	30.0
Nov.	50	4 050	81.0	664	13.3	1 087	21.7	1 629	32.6
Dec.	67	6 103	91.1	998	14.9	1 566	23.4	2 522	37.6
TOTAL	409	41 958	102.6	9 206	22.5	11 563	28.3	13 358	32.7

* Figures from the Office of Fisheries, Republic of Korea

TABLE 5

Catches in metric tons by Korean longliners in the
Indian Ocean*

<u>Species</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>
Albacore (<u>T. alalunga</u>)	2 408	3 601	8 988	9 206
Yellowfin (<u>T. albacares</u>)	6 474	9 580	9 233	11 563
Bluefin (<u>T. spp.</u>)	537	72	55	182
Bigeye (<u>T. obesus</u>)	4 057	4 337	5 612	13 358
Marlin	719	1 151	1 250	2 747
TOTAL	13 895	18 741	25 138	37 056

* Figures from the Office of Fisheries, Republic of Korea

Figure 1
AVERAGE CATCH (ALL SPECIES) PER BOAT PER TRIP FOR LONGLINERS
UNLOADING AT PENANG. FIGURES DERIVED FROM A SUB-SAMPLE OF
THE TOTAL FLEET

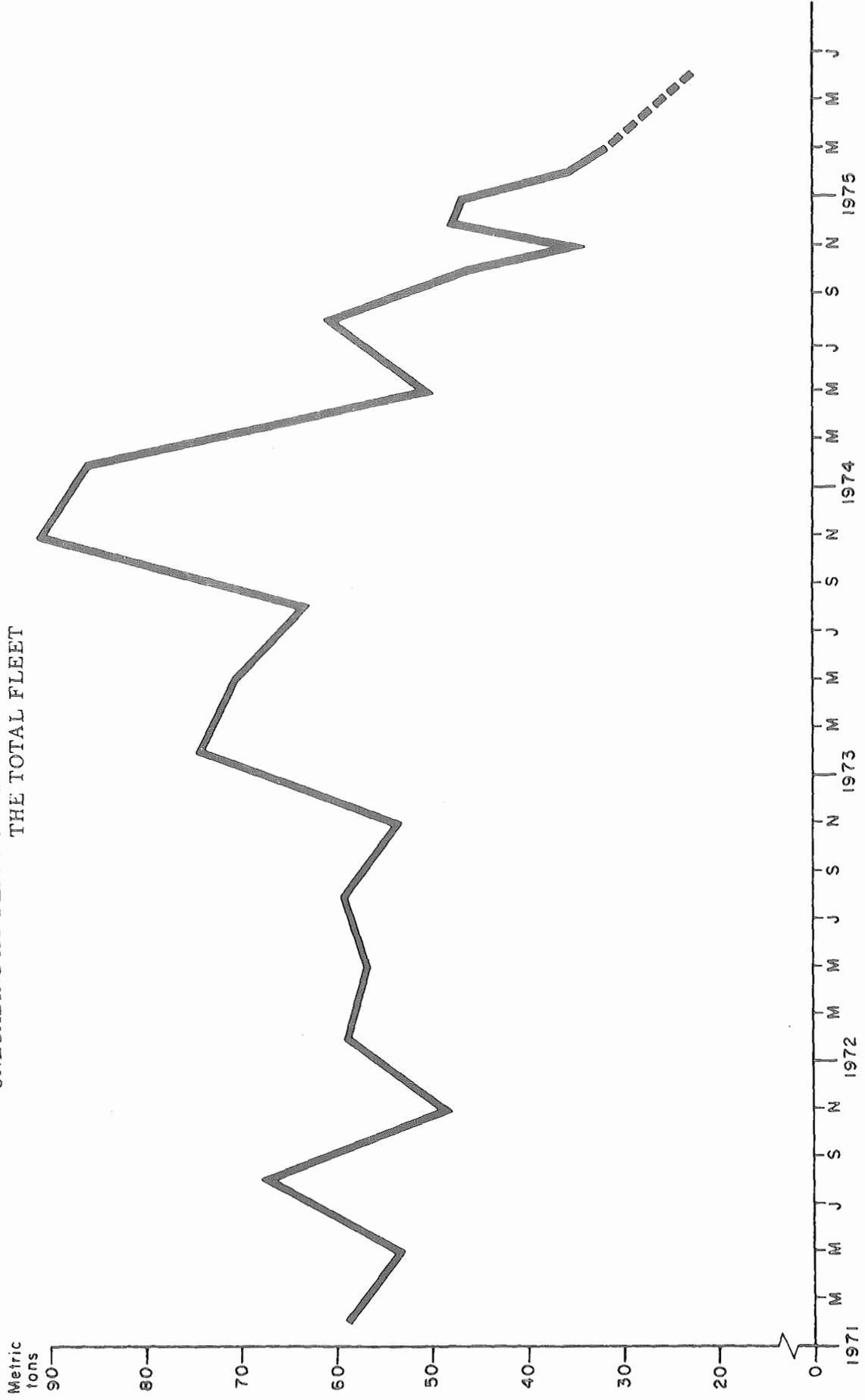


Figure 2
AVERAGE CATCH PER TRIP BY SPECIES FOR LONGLINERS UNLOADING
AT PENANG

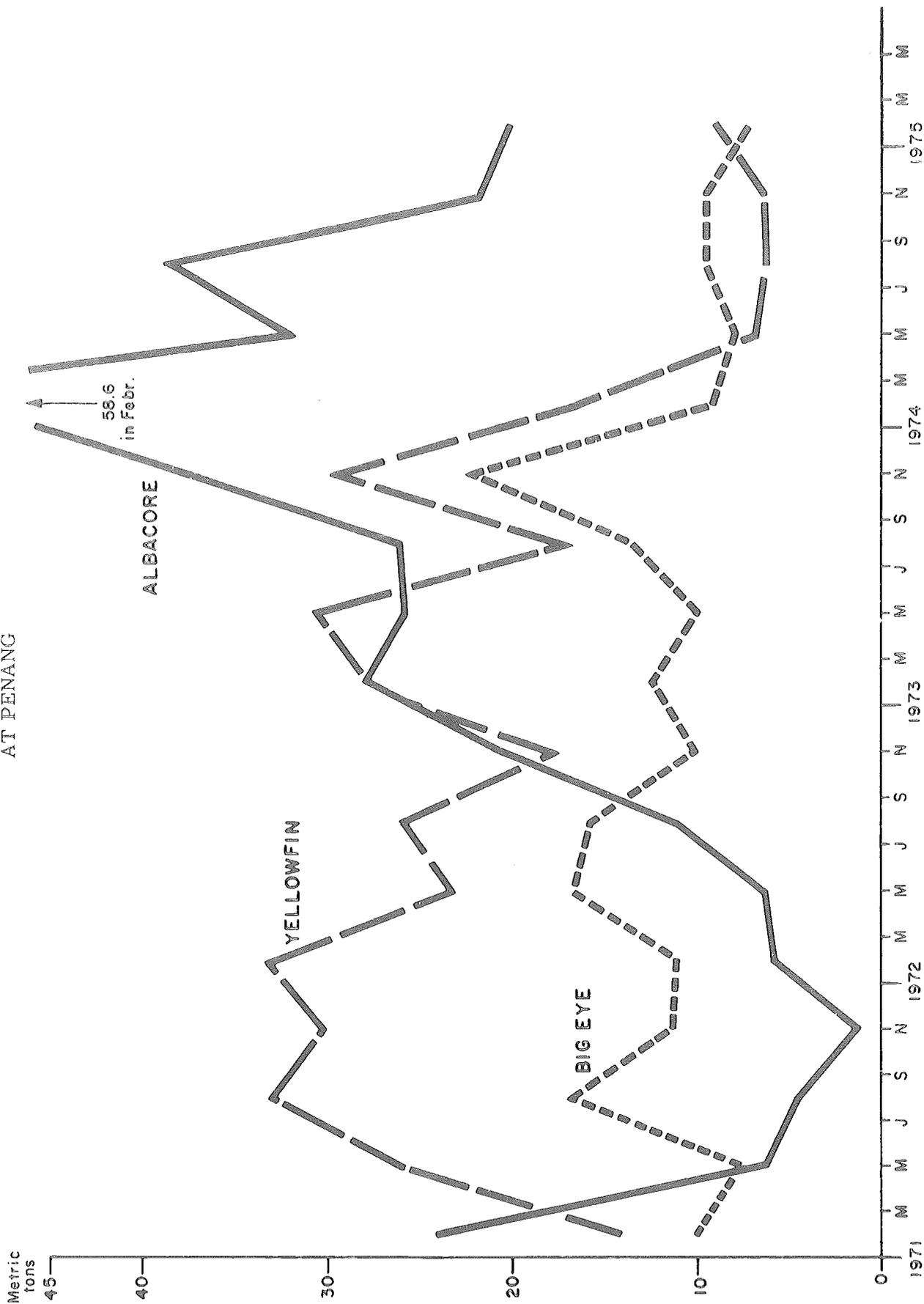


Figure 2

Figure 4
AVERAGE UNLOADINGS (ALL SPECIES) BY LONGLINERS OTHER THAN JAPANESE
AND KOREAN AT PORT LOUIS

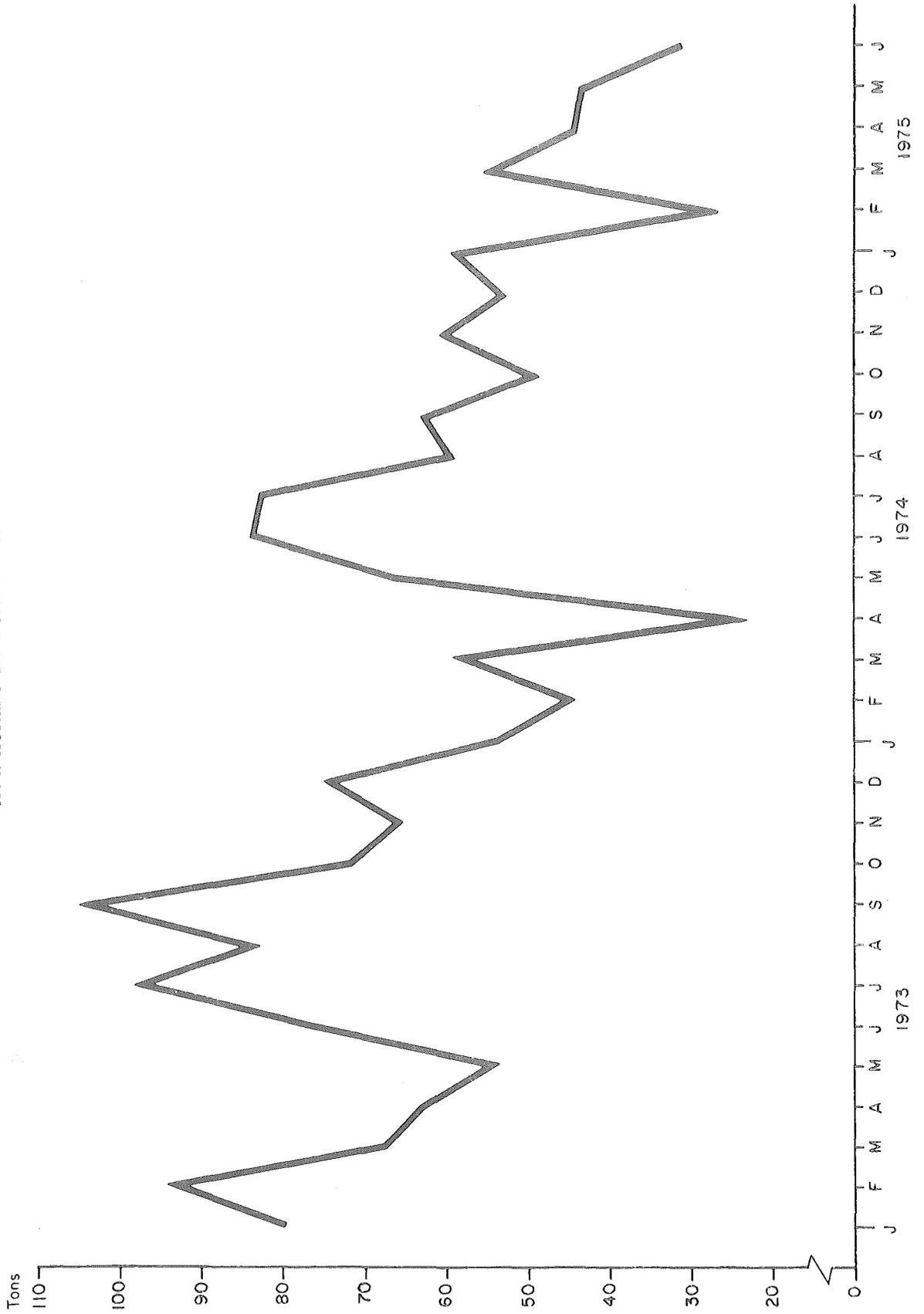


Figure 5
NUMBER OF LONGLINERS VESSELS UNLOADING AT PORT LOUIS

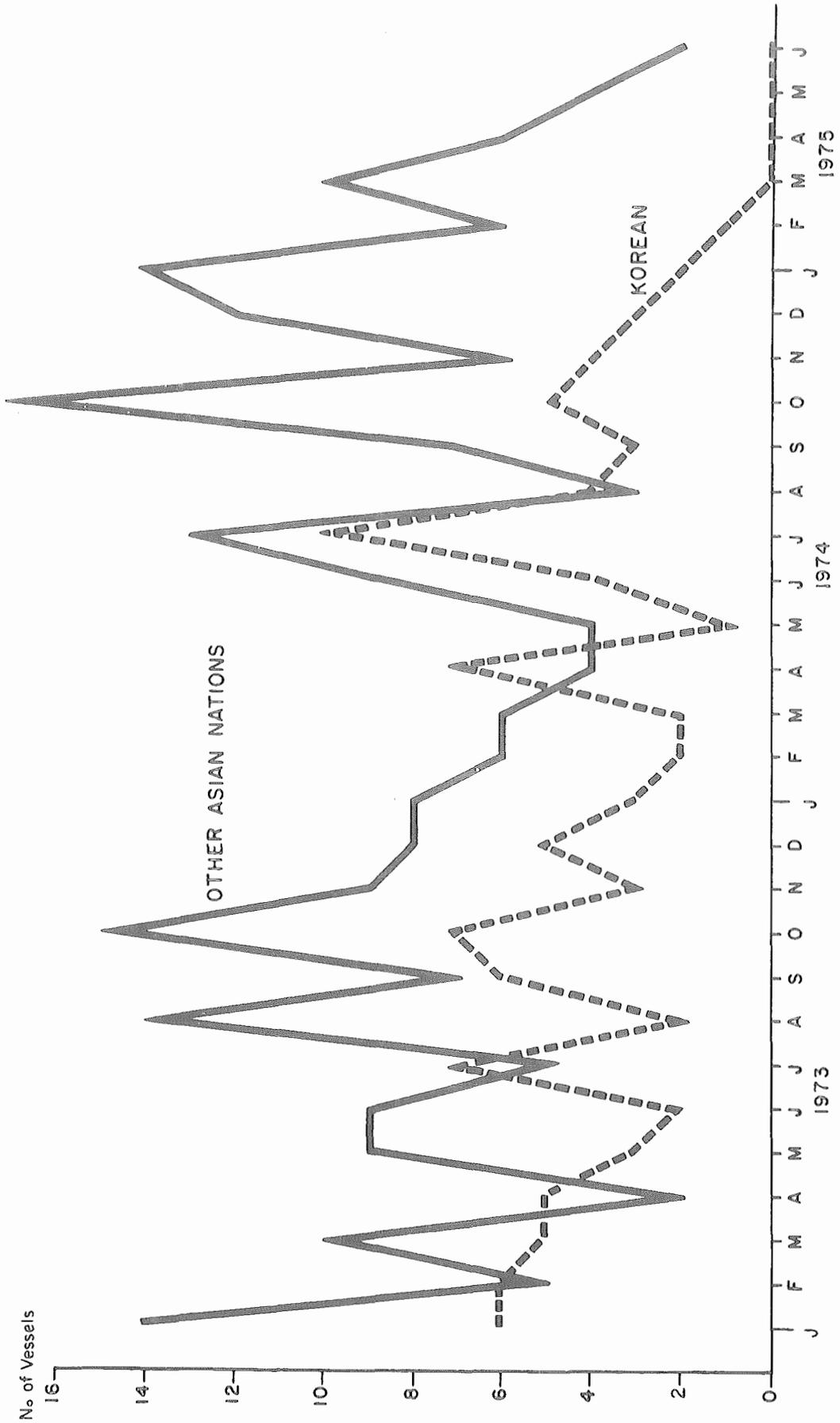


Figure 6

AVERAGE EX-VESSEL PRICES OF SELECTED TUNA SPECIES IN U.S. \$/METRIC TON
AS GIVEN IN THE US MARKET NEWS REPORTS

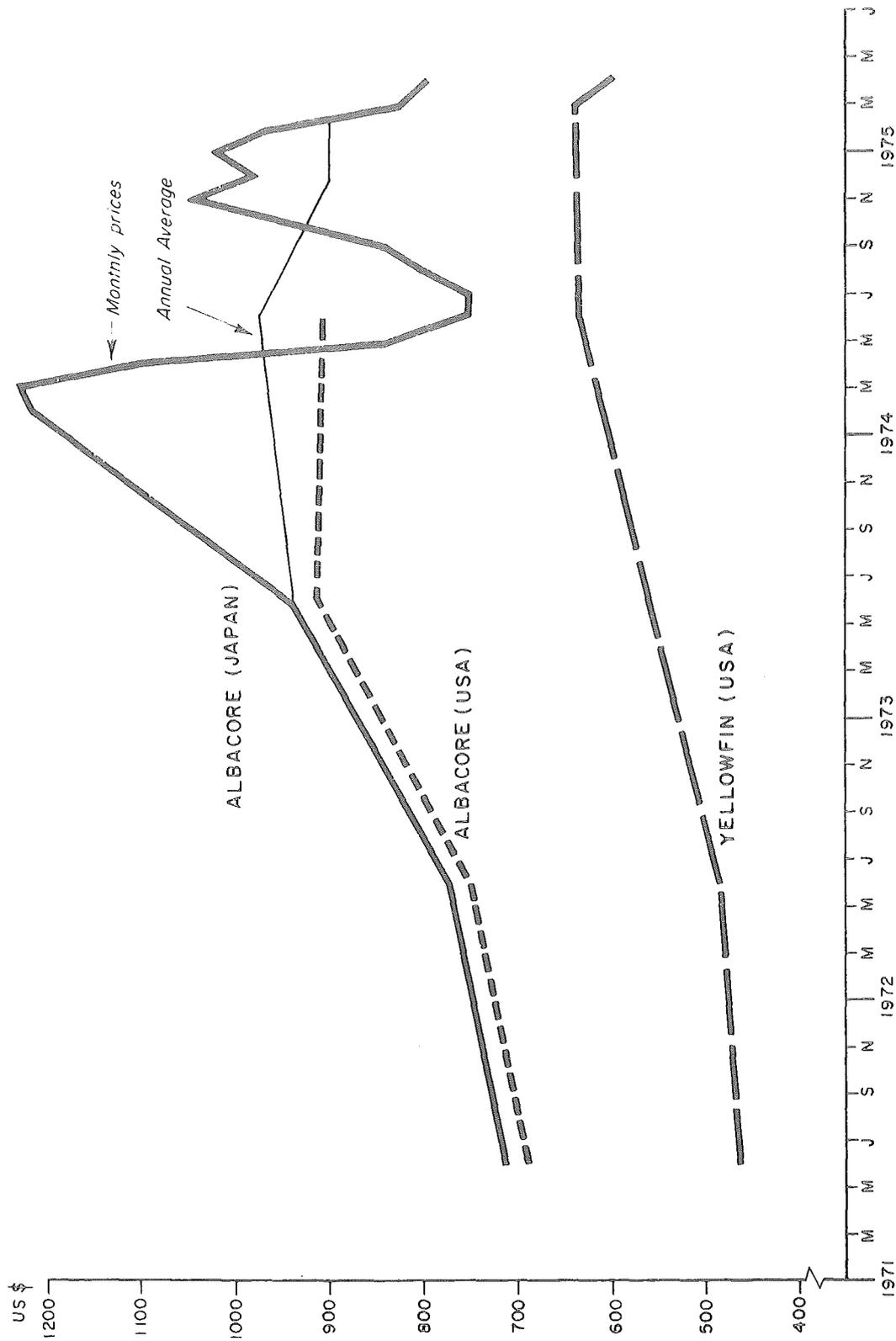


Figure 7
TOTAL CATCH BY MONTH FOR KOREAN LONGLINERS VESSELS IN THE
INDIAN OCEAN (1974)

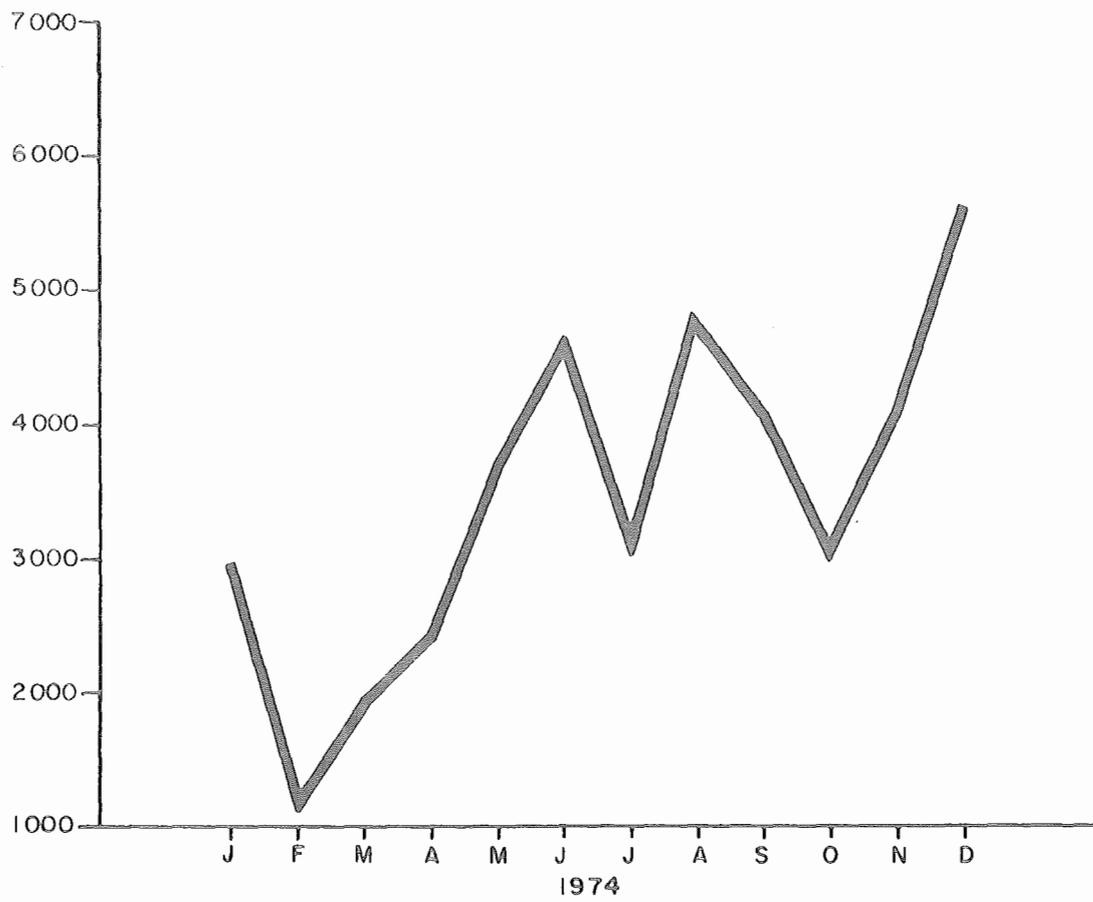


Figure 8

1974 CATCHES BY KOREAN LONGLINERS IN THE INDIAN OCEAN

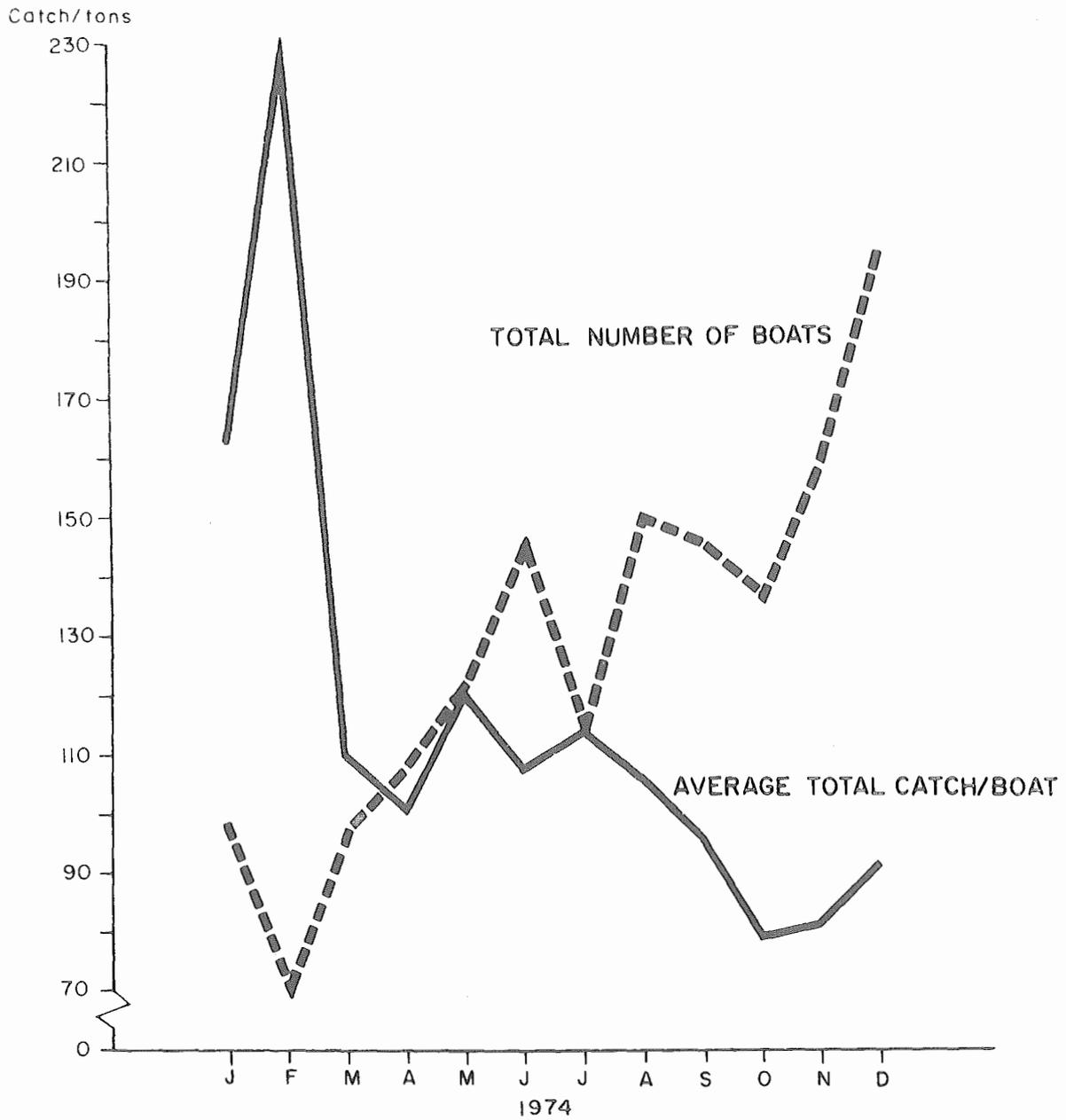
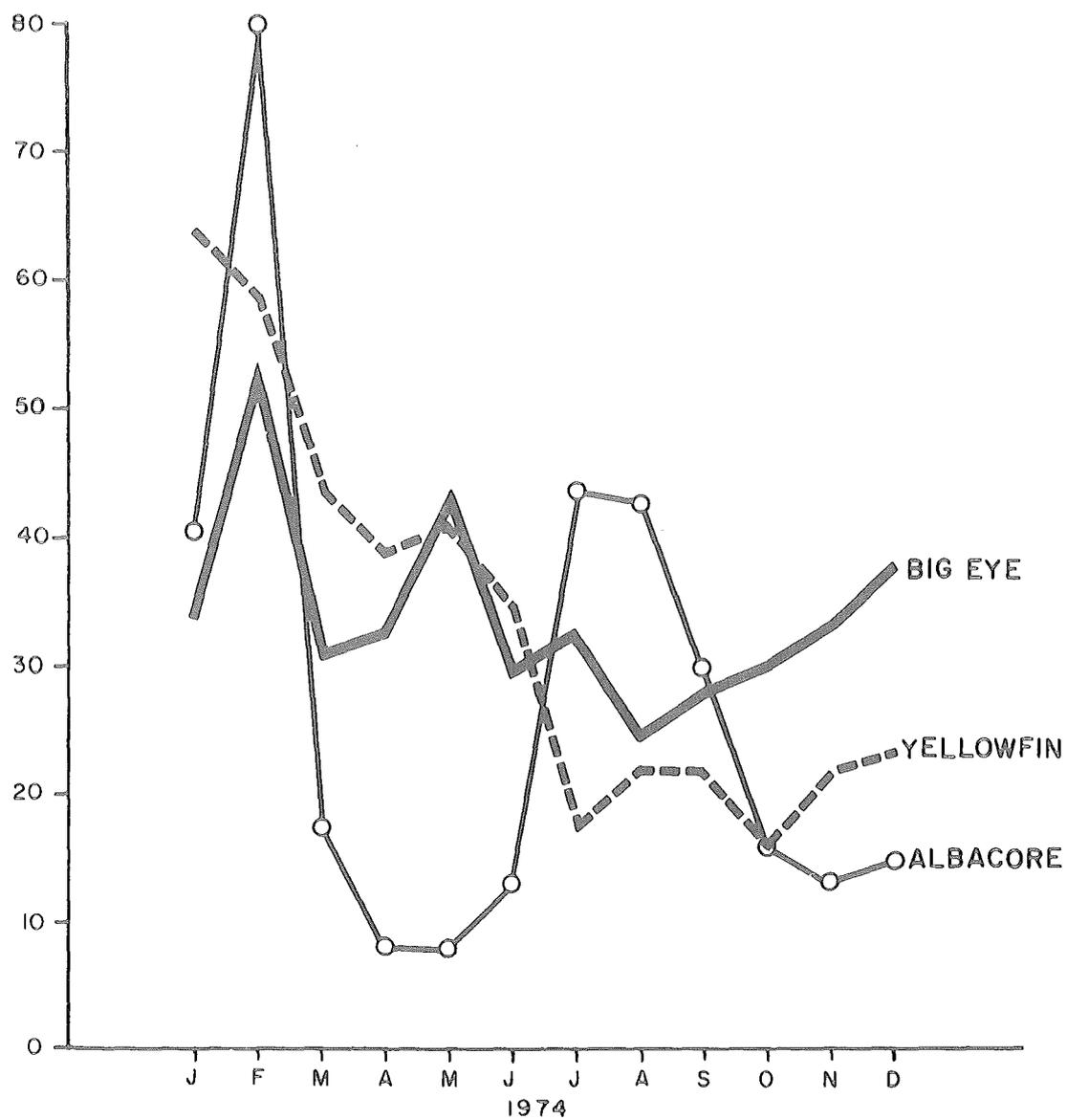


Figure 9

AVERAGE CATCH (PER VESSEL) BY SPECIES FOR KOREAN LONGLINERS
(1974) IN THE INDIAN OCEAN



APPENDIX I

Tuna Vessel Tie-Up in Taiwan and Republic of Korea
Increasing Due to Depressed Tuna Market

Increasing number of Taiwanese and Republic of Korea (ROK) tuna longline vessels are halting fishing operations owing to sharply reduced tuna prices at overseas bases. In Taiwan, close to 200 longliners are reported to be idle at Kaohsiung alone. This and the number of vessels tied up at overseas bases may bring the total of inactive vessels to well over one-half of the Taiwanese tuna fleet.

ROK tuna longline fishery operators are also experiencing management difficulties owing to depressed tuna prices. In mid-March, idle ROK longliners numbered 70 at Pusan (southern port in South Korea), 50 at American Samoa, 20 in the Indian Ocean, and 30 in the Atlantic. Subsequently, additional vessels were reported to have been either retired or transferred to other fisheries.

At American Samoa, the largest overseas fishing base for ROK and Taiwan, the number of longliners recently based in that Island was 152 from those two countries, compared with 298 a year ago. At present, about 70-80 percent of the longliners at Samoa are reported to be fishing. ("Katsuo-maguro Tsushin", April 24, 1975).

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