SOME THOUGHTS ON PROBLEMS OF FUTURE TUNA MANAGEMENT IN THE INDIAN AND WESTERN PACIFIC OCEANS

by

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Summary

With the total value of landings currently at some US $700 million, tuna is one of the most valuable living marine resources. In the post-World War II period consumption of tuna has been increasing steadily and this, coupled with limited supply, has brought about a steady increase in price and a growing desire to participate in the world's tuna fisheries. Thus, there is an increasing need for management and the history of the Inter-American Tropical Tuna Commission (IATTC) and the International Commission for the Conservation of Atlantic Tuna (ICCAT) in this respect is described. Since 1966 the IATTC has fixed overall catch quotas which, while biologically successful, have given rise to serious over-capitalisation. ICCAT has not yet fixed catch quotas but regulates the minimum sizes of yellowfin and skipjack. In the Indian and Western Pacific Oceans (the area of IOFC/IPFC responsibility) the most immediate need is seen as better data, especially catch and effort data, as well as provision for scientific analysis of the data. In the management of the fisheries the need for country quotas is stressed in order to mitigate the problem of excessive fleet growth experienced in the Eastern Pacific.

1. INTRODUCTION

In terms of capital, tuna represents one of the most valuable living resources in the sea. Catches of these species, which are conveniently grouped as principal (yellowfin, bi eye, albacore, bluefin and skipjack) and secondary market species (bonito, blackfin, etc.) have amounted to over 1.6 million metric tons per year in recent years. The dockside valu of this catch at current market prices exceeds 700 million US dollars. The consumption of tuna has been increasing steadily for the last three decades, and has been limited in rece years only by production. This strong demand has maintained prices high and has generated great deal of interest in tuna fishery development on the part of many nations.

Tuna, like any other living resource of the sea, can support only a limited productic A number of the principal market species have already reached this limit; others, primaril the secondary market species, can still support increased yields. The strong demand, coup with the limited supply, is resulting in major competition both within and among nations t harvest the available fish. This increased exploitation, on the one hand, requires that sound conservation programmes designed to maintain the harvest of tunas on a sustained bas be developed and implemented. On the other hand, to maintain viable industries and to prevent major political confrontations on the high seas efforts must be directed to mould: such conservation programmes into sound management which takes into account the major ecor political and social factors operating within the fisheries and among the nations partici in them.

It is the purpose of this paper to discuss the unique qualities of the tunas which s them apart from other commercially important groups of fish and to point out certain needs which must be fulfilled for their proper management. To do this experience in other tuna fisheries will be called upon in an attempt to define more precisely the problems confron the nations of the IOFC/IPFC regions which may be presently engaged in tuna fishing or pla to engage in such fisheries.

2. GENERAL CONSIDERATIONS OF TUNA AND THE FISHERIES FOR THEM

Tuna are highly mobile and undertake long migrations, many species crossing entire oceans in only a few months. They are fished by vessels of more than 40 different nation which search the seas of the world in their quest for tuna. In many cases a vessel may f in the three major oceans of the world in a single year, and often entire fleets will mov from one major ocean area to another as the fish move seasonally. The principal market species are actively traded in an international market and command an equivalent price in most of the major ports of the world.

A highly developed fishery for surface schooling tunas has existed in the Eastern Pacific Ocean since shortly after the turn of the century. Fleets of about 15 nations ar engaged in the surface and longline fisheries, capturing about 400,000 tons of the princi market species annually. Responsibility for the scientific study and management of many these species rests with an international fishery body, the Inter-American Tropical Tuna Commission (IATTC), which was established in 1949. The fishery for yellowfin tuna in the Eastern Pacific has been under management by this Commission since 1966.

In the Atlantic Ocean, as in the Pacific, the scientific study and management of the tuna stocks is the responsibility of an international body, the International Commission the Conservation of Atlantic Tunas (ICCAT), which was established by international treaty 1969. In the Atlantic the fisheries for tuna are extensive, more than 20 nations partici ing in them, and catches of the principal market species in recent years have been in exc of 300,000 tons. Though this Commission has not yet placed controls on the levels of har in the Atlantic, it has induced its members to set limits on the minimum sizes of yellowf and skipjack which can be landed.

Responsibility for coordinating the scientific study and subsequent management of tunas in the Western Pacific and Indian Oceans lie with the Indo-Pacific Fishery Council and India Ocean Fishery Commission. In the Indian Ocean the major catch of tunas is harvested by long lines. It does not appear that production there can be increased very much by using this mode of fishing. Baitboat catches of skipjack in the Indian Ocean have been increasing subsequently in recent years, and it is generally considered that the catch of skipjack can be increased further. Vessels of about six nations take most of the catch in the Indian Ocean.

More tuna is taken from the Western Pacific Ocean than in the Eastern Pacific, Atlantic or Indian Oceans. The major share of the catch which in recent years has surpassed 500,000 tons is taken by one nation and consists of a single species, skipjack. In the Northwest Pacific Ocean catches of this species have exceeded 150-250,000 tons, and in recent years southerly and easterly expansion of the fishery has increased the catch to an estimated 350,000 tons.

There is a high level of interest in further expanding the tuna fisheries in the Wester Pacific and Indian Oceans. However, there has not been a great deal of internationally coordinated research accomplished to evaluate the present impact of fishing on the stocks of tunas in those areas, nor on levels of potential harvest which might be obtained. The extent of IOFC and IPFC activities in tuna research has been the periodic convening of an ad hoc group of scientists for the assessment of the tuna stocks of the region. This group has been seriously constrainted by the lack of adequate and timely statistics on the tuna fisheries of the region, and therefore its advice has been fragmentary and highly speculative. Adequate statistics for the fisheries is a requisite if proper stock assessments for tuna are to be made. This subject will be discussed in more detail in a later section of this report.

Since many nations in and about the Indian and Western Pacific Oceans are interested ir either entering the tuna fisheries there for the first time, or expanding their present fish eries, a number of problems are certain to arise. Some of the stocks of tuna of interest ar already apparently fully exploited, and therefore any catches to be made by new participants will have to come from nations already participating in the fisheries. As competition becon more keen, the problems of exploitation and allocation will become more serious. Unless sou arrangements, including the requisite scientific study and management, are made to handle these problems irrational use of the tuna resources will result.

Since there is a long history of tuna exploitation, and a shorter but significant histo of tuna management, this experience should be examined with a view to formulating and guidir development and management in the IOFC/IPFC areas.

3. THE EASTERN PACIFIC EXPERIENCE

In the Eastern Pacific the fishery for yellowfin and skipjack has operated at a very high level of production since the end of World War II. In the late 1940's, because of concern over the resources of tuna and tuna baitfishes, Costa Rica and the United States entere into an agreement to establish the IATTC. This Commission's duties were to study the resources of fish within its area of responsibility and recommend management measures when necessary to maintain the stocks at levels which can produce maximum yields on a sustained basis. These studies led to the establishment of a conservation programme for yellowfin tuna commencing in 1966. The form of the programme was the establishment of an overall catch quota to be taken on an open-access, free enterprise basis. Thus, the resources belong to whomever can first render them to his use. At that time the international fleet (five nations) had a total carrying capacity of about 40,000 tons. Each year the capacity of the fleet has increased, so that it is now about 145,000 tons and in 1976 will probably reach nearly 200,000 tons. Though the catch has increased during this period, this increase has not been proportional to the growth of the fleet, resulting in decreased production per ton of carrying capacity. Thus, the average number of trips made per vessel has decreased from five trips per year in 1966 to about 2.5 trips per year at present. The situation is expected to worsen as more new vessels enter the fishery.

As this competition within and among nations has increased and catch per vessel decre increasingly stronger differences have arisen between developed and developing fishing nat There has been a strong desire by the developing coastal states to allocate the catch amor countries using as major criteria inter alia preferential rights of the coastal states and level of economic development. The developed states, whose coastlines are not adjacent t the resource, have opposed this concept.

It is worthwhile to examine some of the possible alternatives which might develop in the future in this area:

- First, the present system can continue, but this appears to be grossly inefficient.
- Second, coastal states can negotiate country allocations by threatening to extend substantially their jurisdiction, without licensing for foreign vessels. Non-coastal states, however, fear that coastal allocations will attract flag changes and construction of new vessels which will, in turn, necessitate larger coastal shares, to the extent that non-coastal shares will dwindle to nearly zero. It therefore appears that any allocation scheme must also include controls on fleet growth.
- Third, the participating nations can fail to agree on regulations, and the coastal states can choose to extend their jurisdiction, reasoning that such extension will conserve the resource. However, extension of territorial seas by coastal states, without regulation on the high seas, will not serve to conserve the species under exploitation, as the highly migratory nature of the tunas results in their frequently crossing and re-crossing manmade boundaries.

Based on experience in the Eastern Pacific Ocean, it appears obvious that uncontroll fleet growth operates against the best efforts of management. Some format for constrainir fleet growth must be part of any sound management programme.

4. THE ATLANTIC EXPERIENCE

The fishery for tunas in the Atlantic, with a few minor exceptions, began much later than that in the Eastern Pacific. It was dominated for many years by longline gear, but the late 1950's surface bait and purse-seine vessels quickly became major participants in the fishery. Total catch of the principal species increased rapidly, and by the mid 1960 concern over the longterm effect of exploitation on the stocks of tuna was expressed. In 1969 the ICCAT was brought into force, with responsibility for the scientific study and management of the tunas and tuna-like fishes in the Atlantic Ocean.

Unlike the IATTC, the ICCAT was not provided with sufficient funding and staff to co duct its own research. The collection of basic catch and effort data and studies of the biology of the various species of tunas is accomplished by the member governments. This lack of adequate funding for the Commission has inhibited the acquisiton of data and time formulation of management advice.

A great deal of concern over the condition of the stocks of yellowfin and northern bluefin tuna has been expressed by some of the member governments of the Commission, but concensus has not been reached by all members on the need for placing controls on the lev of harvest.

The intensity of fishing by the international fleet, principally off West Africa, is growing each year. This is due to substantial increases in construction of new vessels a due to a large seasonal influx of vessels from the Eastern Pacific Ocean after the closur of unrestricted fishing there. Increase in production has not kept pace with fleet growt and indeed much the same pattern as observed in the Eastern Pacific fishery seems to be developing in the Atlantic. Though catch quotas have not been placed to date on the Atlantic fisheries, the same confrontations between the developed and developing coastal

states as in the Eastern Pacific are building up in the Atlantic. Unless controls are placed on fleet growth in the Atlantic the same problems which have developed in the Easter Pacific will soon be evident in the Atlantic. Additionally, the surface fishery competes directly with the longline fishery for yellowfin, as the surface fishery harvests young fis which, if allowed to grow, would have been available to the longline fishery. Thus, the catch of yellowfin by the longline fishery has been reduced by nearly half.

5. PROBLEMS OF FUTURE TUNA MANAGEMENT IN THE IPFC/IOFC AREA

With the foregoing as background we can now turn to the specific aims of this paper and explore some thoughts on the problems of future tuna management in the Indian and Wester Pacific Oceans.

In both the Indian and Western Pacific Oceans the major share of tunas caught are take by three highly developed tuna fishing nations. Of the principal market species taken in these areas, all but skipjack are fully or nearly fully exploited, so increases in yield should not be expected from increased effort. Skipjack, on the other hand, can probably support a substantially increased yield in the Indian Ocean, and most likely an increase in the Western Pacific, although some scientists maintain that in the latter area the yield of skipjack may be near the maximum that can be expected. Many of the secondary market specie of small tunas can support substantially greater yields. Interest in expanding the fisheri of the two regions is high. This is particularly so in the Western Pacific, as evidenced b the UNDP/FAO South China Sea project and various joint ventures which are developing in the area, e.g. Papua New Guinea and the Philippines.

As participation in the fishery accelerates, and catches approach or exceed the maximu levels which the stocks can support on a sustained basis, numerous problems of a biological and economic nature will develop. Some of these problems may be unique to the area, but most will be similar to the problems already discussed for the Eastern Pacific and Atlantic Oceans.

5.1 Data Collection

To approach these problems rationally there must first be a basic understanding of the biology of the stocks of fish and a knowledge of the industries based upon these stocks. Fundamental to this understanding is the availability of basic data on fishing activities, particularly statistics of catch and fishing effort. For purely scientific purposes it is not necessary that these data be collected on a timely basis; however, if management programmes are in effect then such data must be collected and processed rapidly. The availability of catch and effort statistics for the Indian and Western Pacific Oceans are woefully lacking in terms of being up-to-date, which has hampered the timely assessment of the major stocks of tuna in these areas, according to the reports of the FAO Ad Hoc Group on Tuna Stock Assessment for the IOFC/IPFC. This problem has been pointed out many times previously, particularly by the FAO Expert Panel for the Facilitation of Tuna Research and the FAO Working Group on Tuna Stock Assessment which met in Miami in 1968. Presently in the IPFC/IOFC areas the collection, compilation and tabulation of catch statistical information is carried out by the various nations for their own fleets at much different levels of coverage and sophistication. As this has proven inadequate, some other system is needed to accomplish the required task. This system should include some central institution to coordinate, and perhaps supervise or execute, the collection of statistical data. This would require funds, of course. It would seem appropriate, since the nations involved in the fisheries of the area would benefit from such action, that they would want to pay for the service.

The situation concerning biological data collaction is much the same as that for catch statistical information. Data on the size composition of the fish in the catch, etc., are very sparse, and without it stock assessment work, and consequent recommendations for manage ment, cannot advance adequately. Here again arrangements for the timely acquisition, compilation and dissemination of such data are needed, and such data collection should be

initiated as soon as possible. Once the fish are caught, canned and consumed it will be i possible to determine their size composition, etc.

5.2 Data Analysis

At the same time that a system is set into action to collect statistical and biologic data on the fisheries of the IOFC/IPFC, consideration must be given to arrangements for analysis of the data. There will need to be established a cadre of scientists, either national groups or an independent international group, which is given the responsibility and necessary fiscal support to carry out such analysis. Arrangements for conducting this work fall generally into two categories. In one national groups of scientists conduct research upon which management recommendations are made, and in the other an independent group of international experts is given the responsibility of such work. It should be kep in mind that many developing nations with coastlines adjacent to tuna resources have not had a long history of technological development, and thus do not have trained scientists available. This may be particularly true in fisheries management, since the immediate con cerns of the developing nations are industrialisation, not conservation. Such nations may not want to, and perhaps should not, rely upon the expertise of the developed nations whic ay be carrying out such analysis, for often the goals of developed and developing nations are different.

5.3 Management

As the need for management becomes evident, a number of basic factors related to the general behaviour of tunas must be considered. Extremely important among these is the fac that tuna are highly migratory. The degree to which they are exploited in one area will effect the extent to which they will be available at a later state of their life in anothe area. For example, the populations bluefin and albacore exploited in the Western Pacific are the same populations which are exploited off the west coast of the Americas during different stages of their lives. Skipjack tagged in the Eastern Pacific have been re-captured in the Central Pacific, and it is hypothesized that fish from the Central and Eastern Pacific population intermingle with those belonging to a Western Pacific populatio It therefore seems obvious that any management action which might be recommended must appl over the range of the population of concern.

Likewise, the tuna fleets are highly mobile, and often move from one ocean area to another. When management is undertaken in one area it must be realized that such action will have an effect on the distribution of the fleet. For example, if restrictions are placed on longline fishing in the Western Pacific, the result will be that some of the vessels fishing there will seasonally shift to other areas where such restrictions do not exist. Since there appear to be more longline vessels than are needed to harvest the fish available in most areas of the world today, this will only serve to transfer the problem t some other area. The same holds true for purse seines as well.

In terms of the form of management which might be implemented there is only a limited experience to go on in tuna fisheries. In the Eastern Pacific global quotas were establis in which all of the catch was taken on an open-access, competitive basis. In recent years this has been modified to the extent that nearly 30 percent of the catch is allocated amon countries. In the Atlantic minimum size limits have been placed on yellowfin and skipjack, while closed areas and minimum size limits have been placed on southern bluefin tuna by the Japanese in the South Pacific and Indian Oceans. Biologically, only the overall limits on the catch of yellowfin seem to have been effective. As already pointed out, this type of regulation has had serious problems associated with it in terms of unrestricted fleet growt A strong desire by coastal developing nations to assign specific country quotas has result This desire to allocate catches, judging from recent events in negotiations concerning the

law of the sea and fishing rights, may soon become effective. However, there are a number of complex problems associated with the establishment of country quotas which are not easily handled. Foremost among these is the fact that there is no way to ensure that a system of country allocations will be stable. As conditions in countries change there will be continuing pressure to renegotiate the quotas, and if the negotiations break down the result might be no conservation programme at all.

Equally important in the implementation of a system of country quotas is the designation of a set of criteria for allocation. Opinion is developing rapidly to ascribe heavy weight to the criteria of coastal adjacency and level of economic development; however, historical participation in the fishery and present investment cannot be ignored. In any system of allocation provision must be made to allow for new entrants to the fishery. A distinct advantage of allocations is that they provide the necessary basis for limiting the number of vessels which participate in the fishery, thus avoiding the mistake of investing an excess of capital in unnecessary vessels.

In considering the systems of management discussed above, i.e. global quotas and country allocations, their shortcomings must be recognized and the systems correspondingly modified if they are to be effective. It is re-emphasized that the basic problems in management of the tuna resources of the world today are those of unrestricted growth of the fleets and distribution of the catch of a limited resource among nations.