

INTER-AMERICAN TROPICAL TUNA COMMISSION
SUMMARY MINUTES OF THE FORTY-SECOND MEETING

October 16-18, 1984
La Jolla, California

Chairman: Henry R. Beasley
Secretary: Carolina T. Mouritzen

AGENDA

42nd MEETING OF THE INTER-AMERICAN TROPICAL TUNA COMMISSION

October 16-18, 1984

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1. Opening of the Meeting
2. Consideration and Adoption of the Agenda
3. Review of Current Research
4. Tuna-Porpoise Program
5. The 1984 Fishing Year
6. Condition of the Yellowfin Stock and Recommendation for 1985
7. Recommended Research Program and Budget 1986-1987
8. Review of Recent Events concerning Tuna Management in the Eastern Pacific
9. Place and Date of next Meeting
10. Election of Officers
11. Other Business
12. Adjournment

AGENDA ITEM 1 - OPENING OF THE MEETING

The 42nd meeting of the IATTC was called to order by the Chairman, Mr. Henry R. Beasley of the United States, at 10:50 a.m., October 16, 1984, at the La Jolla Women's Club in La Jolla, California. He welcomed all the attendees to the meeting. He stated that it was appropriate that the meetings be held from time to time at the IATTC headquarters in La Jolla, as that gives the attendees an especially good opportunity to familiarize themselves with the research carried out by the staff. Then the head of each delegation introduced himself and the other members of his delegation. A list of the attendees is attached to the minutes as Appendix 1.

AGENDA ITEM 2 - CONSIDERATION AND ADOPTION OF THE AGENDA

The agenda circulated prior to the meeting was approved, and it was agreed that the meetings would begin at 9:30 a.m. each day. Commissioner Macdonald of the United States announced that the attendees and their spouses were invited to a cocktail party, sponsored by the U.S. Tuna Foundation, at the Valencia Hotel that night at 6:30.

AGENDA ITEM 3 - REVIEW OF CURRENT RESEARCH

Chairman Beasley announced that Dr. Joseph would handle the presentation of the IATTC staff's research. By way of introduction, Dr. Joseph stated that review of the staff's research gives the Commissioners an opportunity to familiarize themselves with the staff's research and make suggestions regarding its direction and how it is carried out. He stated that the IATTC Convention specifies that its goal is to keep the populations of fish covered by the Convention at levels of abundance which will permit the maximum sustainable yield. He contrasted maximum sustainable yield with optimum sustainable yield, which could mean maximum economic yield, maximum employment of fishermen, or whatever other objective was assigned to it by the government(s) managing the fishery. He then stated that in 1977 the IATTC staff was authorized to carry out investigations of the dolphins which are sometimes accidentally killed or injured during purse seining operations for tunas in the eastern Pacific Ocean. Three basic objectives were adopted: (1) to maintain tuna production at a high level; (2) to maintain stocks of dolphins at or above levels which would ensure their survival in perpetuity; (3) to make every reasonable effort to ensure that dolphins are not needlessly or carelessly killed in fishing operations. He said that the staff's dolphin studies would be reviewed in detail later under another agenda item.

He briefly discussed several types of investigations of the staff. The collection and analysis of catch and effort statistics and length-frequency data are of fundamental importance, and have continued at about the same level as in previous years. Because of the need for coverage of all the important ports where fish are landed, IATTC personnel are stationed in Peru, Ecuador, Panama, Puerto Rico, and Mexico, as well as Los Angeles and San Diego. No tunas have been tagged in the eastern Pacific Ocean since 1981, due to lack of funds, but analysis of data collected in previous years has continued. The otolith studies which have been carried out for the past few years have

produced much useful information on the growth of tunas, but it is apparent that it will not be practical in the foreseeable future to use otoliths for routine age determinations. Accordingly, some changes in this program are contemplated for the future.

Dr. Joseph then turned to the Commission's recently established laboratory at Achotines, Panama. At this laboratory studies of the early life histories of tunas will be made. Such studies are of great importance, as acquisition of knowledge of the life histories of tunas prior to recruitment into the fishery would eliminate much of the uncertainty which currently exists in the staff's assessments of the condition of the various stocks of tunas. He then introduced Mr. Robert J. Olson, who would describe the facility and the work to be conducted there.

Mr. Olson said that the IATTC's approach for studying the early life history of the fishes was to be collection of postlarvae and/or juveniles to be reared in the laboratory, rather than collection of adult tunas which would be induced to spawn in captivity. Achotines was chosen as the site for the facility because it is known that yellowfin, black skipjack, and frigate tuna spawn nearby, the sea water in the area is of good quality for laboratory use, and the site is easily accessible by highway. Achotines Bay is a small, well-protected harbor with a coralline substrate and good seawater exchange with the open ocean. Ten hectares (25 acres) of land adjacent to the bay were purchased for the facility. Much help was received from the Ministerio de Comercio, Dirección General de Recursos Marinos, of Panama and the governor of Los Santos province in acquiring the property, clearing the land, and building a 1-km (half-mile) road from the highway. A well which pumps 1,000 gallons of fresh water per hour was drilled. Four buildings have been constructed, a laboratory with outdoor and indoor tanks, a generator house with three 30-kw generators, a combination dining hall and kitchen, and an apartment building with three one-bedroom apartments. Much equipment was received free of charge as excess property from the General Services Administration of the United States.

Sampling close to shore has provided postlarval or juvenile black skipjack, frigate tuna, and Spanish mackerel, and some of these have been reared in captivity for up to 1 month. Sampling will be conducted further offshore in the near future to attempt to obtain yellowfin postlarvae and/or juveniles. In addition to the laboratory studies of captive tunas, in situ studies in the ocean off Achotines are planned, including investigation of the vertical distribution and abundance of postlarvae and juveniles in time and space, studies of behavior of tunas around anchored fish aggregating devices, acoustic telemetry of tunas and dolphins, etc. In addition, facilities of the site will be made available to personnel of the Dirección General de Recursos Marinos, the University of Panama, etc., who wish to conduct studies of corvina, snappers, sea turtles, etc.

Dr. Joseph then introduced Mr. Forrest R. Miller, who would talk about developments in regard to the 1982-1983 El Niño which have transpired since the previous meeting of the IATTC in October 1983. Mr. Miller emphasized that the El Niño was a major global event, rather than just an occurrence which was restricted to the eastern Pacific Ocean. The sea-surface temperatures in the eastern Pacific had been above normal since 1976, but the

wind patterns changed in early 1982, and additional warming first became apparent south of the Galapagos Islands in June 1982. In October 1982 the sea-surface temperatures increased rapidly in a large portion of the eastern Pacific, and this was accompanied by heavy rains in dry areas, droughts in rainy areas, rising sea levels, and sinking of the thermocline in the eastern Pacific. He then showed a series of slides indicating the principal currents and sea-surface temperatures in the Pacific Ocean during normal and El Niño conditions. During 1982-1983 the thermocline in the eastern Pacific was deeper than normal, which may have produced poorer fishing, whereas the situation was the opposite in the western Pacific. Consequently, now that the El Niño has disappeared, fishing conditions have improved in the eastern Pacific and may have worsened in the western Pacific.

Dr. Joseph added that the IATTC staff has devoted so much effort to the study of the El Niño phenomenon because it may affect the vulnerability of the fish to capture, and incorporating the effects of El Niño into its calculations reduces the "noise" in its population assessment models. Commissioner Gorby of the United States asked what happens to the heat energy which is stored in the warm water when an El Niño dissipates. Mr. Miller replied that the heat energy is picked up by low-level winds in the tropics as latent heat and carried to higher latitudes and released through rainfall as (kinetic) energy to increase the upper-level winds.

Dr. Joseph next explained that there was a meeting in La Jolla in January 1984 called "Tuna 2000," at which a number of tuna scientists from around the world discussed the requirements for tuna research over the next 20 years. He then introduced Dr. Alex Wild, a participant at the meeting, who would describe what took place at the meeting and what has subsequently occurred as a result of that meeting. Dr. Wild noted that the agenda consisted of the following items: (1) intraspecific heterogeneity; (2) growth, natural and fishing mortality, and recruitment; (3) behavior, physiology, and the environment; (4) modelling; (5) data requirements.

A number of recommendations regarding future research requirements were made, and three items were singled out for immediate action. The participants recommended that the convenor (Dr. Joseph) take responsibility for initiating action on: (1) tuna movements and distribution; (2) periodic variation in chemical constituents in relation to ageing, stock heterogeneity, and transfer rates; (3) genetic heterogeneity. A panel on Action Item 1, tuna movements and distribution, headed by Dr. John R. Hunter, U.S. National Marine Fisheries Service, has already been selected, and its first meeting was held on September 5 and 6, 1984. The subject of this meeting was the analysis of existing tag return data. Three additional meetings on movements of tunas in relation to the environment, physiology and behavior of tunas in relation to movements, and acoustic tracking and fishery-independent tag recovery systems will be held later.

Also, at the January 1984 meeting the desirability of holding a world tuna conference somewhat similar to the one sponsored by the FAO in La Jolla in 1962 was discussed. It was agreed to set up a corresponding committee to further discuss the need for such a conference, what topics should be addressed, and how it should be implemented. Dr. Joseph has also been asked to initiate action with respect to this corresponding committee.

The minutes of the January 1984 meeting will soon be available from the IATTC, the International Commission for the Conservation of Atlantic Tunas, Madrid, Spain, and the South Pacific Commission, Noumea, New Caledonia.

Dr. Joseph asked if there were any comments on questions concerning Dr. Wild's presentation. Ambassador Castro y Castro of Mexico noted that Dr. Wild had stated that different solutions should be sought for the problems which are in existence. Ambassador Castro y Castro expressed his concern respecting the limitations of regional approaches to global problems, and emphasized the importance of a world meeting to pull together the research and management which is now conducted on a regional basis.

Dr. Joseph said that he was in complete agreement with Ambassador Castro y Castro regarding the fact that tuna problems cannot be solved on regional basis. It is well known that tunas make long migrations and, in addition, vessels frequently move from one ocean to another or from one side to the other of the same ocean and frozen tunas are shipped all over the world prior to canning and consumption. The ultimate solution would be a worldwide research and management scheme, but in the meantime we must do the best we can with management on a regional basis. He pointed out that he had spoken and written on this subject many times. The Tuna 2000 meeting included experts from all over the world, so it was certainly conducted in that spirit.

Dr. Joseph next introduced Dr. John R. Calaprice, who would talk about chemical assay of hard parts of fish to determine the geographical origin of various components of the populations. Dr. Calaprice stated that the program has two objectives. The first is to determine if the hard parts of a fish contain not only a record of its age, but also record of where it had been at different stages of its life. This information, if it exists, would be deciphered by chemical techniques. Thus every fish would be equipped with a natural tag. The second, assuming that such records exist and can be deciphered, is to determine if the information can be used to solve a real problem, such as the amount of mixing between bluefin tunas of the eastern and western Atlantic Ocean. The studies which are described below were supported principally by grants awarded by the U.S. National Marine Fisheries Service and the U.S. National Science Foundation.

Vertebrae were collected from fish of various sizes at different locations. This was a major job, since bluefin are landed only sporadically at scattered ports in the eastern and western Atlantic Ocean. Pieces of the vertebrae were irradiated with protons from the linear accelerator at the California Institute of Technology in Pasadena. The x-rays of various energies emitted while the sample is irradiated are characteristic of the chemical content of the bone and its density. Multivariate statistical techniques are used to analyze the data on the emissions and classify the individuals as to their area of origin. Although there is a small amount of overlap, it has been found that young tunas from the eastern and western Atlantic are usually distinguishable from one another. The estimates of the rates of mixing obtained from these data are comparable to those obtained from tagging studies. Attempts to analyze the ratios of isotopes of oxygen in the hard parts are now being carried out to verify the above findings, as it is known that the ratios vary at different temperatures, and that the Mediterranean Sea, a nursery ground for bluefin in the eastern Atlantic, is

significantly colder in winter than is the Gulf of Mexico, a nursery ground in the western Atlantic. For other species the hard part method could become a highly useful tool, if and when the methods become established, because every fish would bear a natural tag.

Dr. Joseph next introduced Mr. Witold L. Klawe, who would talk on global tuna catch statistics. Mr. Klawe stated that large amount of money had been spent by a number of national and international organizations to obtain catch and effort statistics for tunas. These are useful for many purposes. Among fishes, tunas are sixth in weight caught (after herrings, cods, jacks, redfishes, and mackerels) and first in value in the world. The most important species of tuna in the world, and also in the Pacific Ocean, in terms of catch, is skipjack, followed by yellowfin, albacore, bigeye, northern bluefin, and southern bluefin in that order. The catch of these six species has increased from 400 thousand metric tons in 1982 to about 1,800 thousand metric tons in 1982. The largest amounts of tunas are caught by Japan, followed by the United States, Spain, the Republic of Korea, and the Philippines. The largest amounts of tunas from the Pacific Ocean are caught by Japan, the United States, the Philippines, Mexico, Indonesia, the Republic of China, the Republic of Korea, Venezuela, the Solomon Islands, and Ecuador in that order.

The Chairman announced that further presentations on other aspects of the IATTC research program should be postponed until the following day. He asked if there were any further comments or questions on any of the five talks which had been presented. Commissioner Gorby of the United States asked about the origin of the energy which heats the water in the eastern Pacific Ocean during an El Nifio event. Dr. Joseph yielded the floor to Mr. Miller, who said that the original source of all energy on the earth is the sun, of course. The heating is caused by in situ heating from the sun, advection of warm water to the east from the west, decrease in the amount of wind-driven circulation, decrease in cloud cover, and lack of equatorial and coastal upwelling. The last is the cause of dramatic increases in the sea-surface temperature. Commissioner Gorby asked if atmospheric changes control oceanic conditions or oceanic changes control atmospheric conditions. Mr. Miller replied that oceanographers and meteorologists are not in agreement on this matter, but probably it works both ways.

AGENDA ITEM 4 - TUNA-PORPOISE PROGRAM

After a brief recess, Chairman Beasley turned the floor back to Dr. Joseph. Dr. Joseph introduced Dr. Martin Hall, who would talk about dolphin research. Dr. Hall said that dolphins and tunas are often associated with one another in the eastern Pacific Ocean, and sometimes dolphins are accidentally killed during purse-seine sets for tunas. For several good reasons, dolphin mortality should be minimized, so since 1978 the IATTC has become involved in dolphin research. Governments of many nations, vessel owners, vessel captains and crews, and many others have cooperated with the IATTC in its program.

The program is divided into the following parts: (1) data collection; (2) research on the amount of dolphin mortality; (3) research on dolphin abundance; (4) extension (gear) work. Dr. Hall said he would discuss the

first, third, and fourth parts immediately, and the second part the following day.

In regard to data collection, he said that the basis for the IATTC studies was data collected from its observer program. For this program observers aboard purse-seine vessels of various nations systematically collect information on dolphin sightings and on sets made on tunas associated with dolphins. Also, the U.S. National Marine Fisheries Service has generously made the data from its observer program aboard United States vessels available to the IATTC staff. The number of trips made by vessels based in Latin America has increased recently, so additional observers have been trained in Venezuela and Ecuador.

The object of the extension work is to determine the causes of dolphin mortality during fishing operations and to try to remedy them. For example, only 8 percent of the sets made on tunas associated with dolphins are completed at night, but these sets account for 28 percent of the mortality. The IATTC has experimented with lights for illuminating the backdown channel at night, and found that these lights have reduced the mortality during night sets by nearly one third. Lights similar to those used by the IATTC staff have been purchased by the owners of several vessels, and it is likely that the use of such lights will increase in the future.

The abundance of dolphin schools is estimated by the line transect method, using data obtained by observers aboard vessels and airplanes. On the airplanes the schools of dolphins may be photographed as well. At each sighting an estimate of the school size is made, and later the average school size is calculated and multiplied by the density of the schools and the area to estimate the total population size. The IATTC staff is concerned with making these estimates as accurate as possible. One way of testing the accuracy of the school size estimates is to compare shipboard observer estimates, observer estimates made from airplanes, and estimates made from aerial photographs. Also, those estimates have been compared with counts made of animals which were caught in nets and counted as they were released from the net during backdown operations. There is little chance of error in counts made by this method, so it is possible to calibrate the other methods with those counts. In general, it appears that the data are reasonably good, but when the schools exceed about 200-500 animals the observer estimates tend to be lower than those obtained from aerial photographs.

Dr. Joseph asked if there were any questions. Mr. Valle of El Salvador asked which species of tunas and dolphins were involved. Dr. Hall replied that yellowfin is the principal species of tuna which associates with dolphins, but skipjack are sometimes caught with dolphins when they are in mixed schools with yellowfin. The principal species of dolphins are spotted, spinner, and common dolphins.

The meeting was adjourned at 5:10 p.m.

The meeting was reconvened by Chairman Beasley at 9:45 a.m., October 17, 1984. He asked Dr. Hall to continue with his presentation of the previous day. For the benefit of those who had not been in attendance the previous day, Dr. Hall quickly summarized what he had said regarding the collection of data, extension work, and abundance estimates, and said that now he would talk about mortality estimates.

Before that, however, the attendees were invited to comment and ask questions on Dr. Hall's presentation of the previous day. Mr. Broadhead of the United States noted the possibility that the quality of aerial photographs would vary greatly with the weather, and he asked if a mathematical relationship had been calculated for the data in Figure 7 of Background Paper 6. Dr. Hall confirmed that only aerial photographs taken in relatively clear weather are useful. He said that the mathematical relationship Mr. Broadhead had mentioned had not yet been calculated, but agreed that the problem deserved consideration.

Dr. Hall then proceeded with his presentation on dolphin mortality. He first showed estimates of the mortality during years previous to 1984 calculated from observer data from US and non-US vessels. He mentioned that a legal problem had prevented the observer program of the NMFS from operating normally in 1983, and also the need for observers on more trips of non-US vessels. Unfortunately, it has not yet been possible to establish a cooperative program with Mexico to sample aboard its flag vessels.

He then showed estimates of the mortality during 1984 obtained from data collected by IATTC and NMFS observers. In 1984 there were no NMFS observers aboard tuna vessels during the first quarter of the year, when the mortality is traditionally higher than average, so it is likely that those estimates are biased downward.

He then showed maps of the distribution of dolphin sets and dolphin kills, by species or stock. These slides showed that none of these is homogeneously distributed in the fishing area, so the best estimates of mortality can be achieved only by stratification of the data. Detailed examination of the effects of various factors on mortality is necessary to determine the best schemes of stratification.

As a preliminary approach, before performing more complex analyses, a few possible sources of heterogeneity were selected, and simple analyses of variance were made on all the data, using kill per set for all species and for offshore spotted, eastern spinner, and whitebelly spinner dolphins separately. For this purpose "normal" dolphin sets were selected. These are defined on pages 6 and 7 of Background Paper 6. He showed data which indicate that heterogeneity for year, month, latitude, and vessel capacity is present for offshore spotted dolphins, for year for eastern spinner dolphins, and for month and latitude for whitebelly spinner dolphins. This demonstrates the need for individual treatment for the various species or stocks. He then showed graphs of these data, which emphasized similarities and differences among the various categories.

Dr. Hall pointed out that dolphins are highly intelligent, and can apparently learn to escape from the nets. Thus the mortalities are less in

areas in which there has been relatively heavy fishing for a number of years than in newly exploited areas, which contributes to the latitudinal and seasonal heterogeneity mentioned earlier. Another factor may be differences in school sizes in different areas.

He then discussed calculation of the variances of the estimates of the mortality rates. The traditional method produces underestimates of the variances, so two new methods, the "jackknife" method and the "bootstrap" method were introduced. Estimates obtained by these methods and by the traditional method were shown.

(Note: The title of the first table on page 17 of Background Paper 6 should read, "By presence of safety panel properly covering backdown channel," and "Panel present" and "Panel absent" should be replaced by "Panel properly covering backdown channel" and "Panel not properly covering backdown channel," respectively.)

Dr. Joseph asked if there were any comments or questions. Mr. Alverson of the United States commented that most of the fishing for tunas associated with dolphins is conducted by vessels with capacities of 600 to 1,000 tons, and Mexico has the largest number of non-US vessels in that size range, so it is unfortunate that observers have not been put aboard Mexican vessels. Mr. Broadhead asked about how the staff had dealt with the non-linearity of mortality per set (i.e. the fact that a few sets are responsible for a large portion of the total mortality) and the variability among vessel captains. Dr. Hall said that non-linearity is difficult problem with traditional methods of statistics, but the non-traditional methods currently being employed are providing some solutions to these problems. He agreed that differences among skippers is also a problem. Ideally a random sample of sets from all trips would be taken, but this is not feasible, so all sets are sampled from as nearly a random sample of trips as is possible.

Ambassador Castro y Castro congratulated Dr. Hall for his excellent presentation, and asked about cooperation between the IATTC and Mexico. Dr. Hall referred the question to Dr. Joseph, who said that Mexico had cooperated with the IATTC throughout the history of the latter organization, and such cooperation is still taking place, as is evident by the fact that the IATTC has an employee currently stationed in Ensenada who is collecting catch and effort and length-frequency data which are necessary for various studies which are being made by the IATTC staff. There is no observer program on Mexican vessels, but he would welcome the opportunity to discuss such a program with Ambassador Castro y Castro or other Mexican officials. Ambassador Castro y Castro agreed that there has always been an excellent relationship between the IATTC and Mexico, and said that he wanted all the attendees to know that. He said that he would be interested in discussing a cooperative observer program. A considerable portion of the total kill takes place within the extended economic zones of the coastal states, and therefore they have a special interest in the conservation of resources within those zones. He and the other Mexican delegates had come to the meeting to find out the results of the IATTC studies, as Mexico has a long traditional of protection of natural resources. As evidence of this, he declared that Mexico had recently won an award for its protection of gray whales in the Pacific Ocean.

Chairman Beasley then noted that Dr. Joseph would discuss some aspects of the current research program which had not yet been covered.

AGENDA ITEM 3 - REVIEW OF CURRENT RESEARCH

Dr. Joseph said that he would make a few comments of skipjack, which is discussed in more detail in Background Paper 4. The catches of skipjack exceed those of any other species of tuna on a world-wide basis and in the Pacific Ocean. The Pacific Ocean catches amount to about 600 thousand metric tons per year, which is twice what they were a few years ago. The IATTC and other organizations which have studied skipjack have all concluded that considerably greater catches are possible without any danger of overfishing in the biological sense. During the 1950's and 1960's the greatest catches in the eastern Pacific were made off northern South America, but during the 1970's and early 1980's the center of abundance seemed to shift to off Central America. Currently there are indications of increased abundance off northern South America, however. Also, more skipjack are now caught far offshore than in previous years. Tag returns have shown that there is considerable mixing of skipjack among areas. Indeed, there is virtually no skipjack spawning east of 130° west longitude, so practically all of the skipjack caught in the eastern Pacific are migrants from the central and/or western Pacific. Analyses of the yields per recruit theoretically possible with different combinations of fishing effort and size at recruitment indicate that there would be no advantage to protecting small fish, and the greatest catches could be achieved by fishing all sizes as soon as they become available to the gear. This does not take into account the economics of canning fish of different sizes, however, as this is outside of the IATTC's purview. Dr. Joseph said that there is a negative relationship between the wind mixing in the area of skipjack spawning west of 130° west longitude and the catch rate of skipjack in the eastern Pacific 1 1/2 years later. Further refinement of such studies might yield information of value for predicting the catches in the eastern Pacific.

Dr. Joseph then spoke a little bit about northern bluefin, which is discussed in more detail in Background Paper 5. He summarized the life history of northern bluefin in the Pacific Ocean. Spawning occurs only in the western Pacific. Some of the young fish remain in that area, and are caught by many different kinds of Japanese gear. Others migrate to the eastern Pacific Ocean, where some are caught by purse seiners off Baja California and California. Those which are not caught eventually return to the western Pacific, where spawning takes place. He said that since the resource is shared with Japan, the IATTC and the Far Seas Fisheries Research Laboratory have been collaborating on studies of this species.

Dr. Joseph stated that the IATTC staff was also carrying out some studies of bigeye and skipjack. He said that there was not enough time for him to describe these studies, but summaries are available in Background Paper 5.

AGENDA ITEM 5 - THE 1984 FISHING YEAR

Chairman Beasley turned the floor over to Dr. Joseph for a report on the

1984 fishing year. Dr. Joseph demonstrated that the weekly vessel capacity at sea in the eastern Pacific had decreased during 1982 and 1983, due mainly to the exodus of vessels to the western Pacific, and then had begun to increase in 1984. Also, the catches of both yellowfin and skipjack decreased during 1982 and 1983, and then increased during 1984. The catch of yellowfin plus skipjack per vessel capacity ton increased considerably in 1984. The total size of the fleet during the last few years has been less than it was during the late 1970's. The total capacity of U.S.-flag vessels has decreased, while those of Mexican- and Venezuelan-flag vessels have increased. He briefly discussed the areal distribution of the catches of yellowfin and skipjack in the eastern Pacific Ocean in 1984.

AGENDA ITEM 6 - CONDITION OF THE YELLOWFIN STOCK AND RECOMMENDATION FOR 1985

Dr. Joseph continued with a discussion of the staff's work on assessment of the condition of the yellowfin stock in the eastern Pacific Ocean and its recommendation for 1985. He began with a brief review of his presentation at the previous IATTC meeting. At that time the apparent abundance of yellowfin was lower than staff's prediction of its actual abundance. The lower apparent abundance was attributed to the exodus of most of the more successful vessels to the western Pacific and lower vulnerability of the fish to capture in the eastern Pacific, apparently due to conditions associated with the 1982-1983 El Niño. It was concluded that stock had been increasing toward the level which would produce the average maximum sustainable yield (AMSY), so a higher quota was recommended.

Dr. Joseph then began with the staff's most recent assessment studies. The catch per days fishing by Class-6 purse seiners provides an index of the average annual abundance of yellowfin. Also, the average annual biomass of yellowfin of catchable size has been estimated from length-frequency and other data. Both of these showed that the abundance was high during the late 1960's and early 1970's, decreased during the mid- and late 1970's, and then began to increase in 1983 and 1984. Production models produce estimates of the AMSY of the stock in question and the amount of effort necessary to obtain that yield at equilibrium conditions. He added that the IATTC Convention specifies that its goal should be maintenance of the stock at the level which would produce the AMSY. Different mathematical treatments of the data have produced estimates of the AMSY which range from 152 to 175 thousand short tons. It is difficult to know which model best describes the fishery, but during the last year or so the data have seemed to indicate that the asymmetrical models are more nearly correct.

Turning to yield-per-recruit models, Dr. Joseph said that the productivity of the stock would be greater when the average size of the fish is at the level of the late 1960's and early 1970's than at the level of the mid- and late 1970's. The yield-per-recruit analyses show that the maximum yield per recruit can be obtained with a size at entry of about 60 pounds (27 kg) and very high effort. At the present level of effort the yields per recruit at sizes of entry between about 3 and 15 pounds (1.4 and 6.8 kg) would be about the same, however, and greater sizes at entry would result in lesser yields per recruit.

Dr. Joseph then explained the staff's recommendations for a quota for 1985. The production and biomass modelling studies indicate that the stock of yellowfin in the eastern Pacific is now larger than that necessary to produce the AMSY at equilibrium conditions. Specifically, for the asymmetrical model for which the AMSY is 173 thousand tons the biomass is 70 thousand tons greater than the optimum, while for the asymmetrical model for which the AMSY is 152 thousand tons the biomass is 52 thousand tons greater than the optimum. Accordingly, then, a catch of 173 plus 70 = 243 thousand tons in the first case or 152 plus 52 = 204 thousand tons in the second case could be taken without reducing the stock to less than the amount which would produce the AMSY. The more conservative quota would be 204 thousand tons. It is emphasized that the above values are based upon average conditions; if conditions are poor lower quotas would be appropriate. Hence, to give the management program more flexibility, a quota of 174,000 tons is recommended, with two additional increments of 15,000 tons each which the Director of Investigations would be authorized to add to the quota at his discretion. He stated that at the present fleet size the quota would almost certainly not be reached in 1985, but he reminded the attendees that if fishing becomes much worse in the western Pacific there might be a large influx of vessels to the eastern Pacific, which could result in catches comparable to those of the mid- and late 1970's if there were no quota.

Chairman Beasley asked if there were any questions. Commissioner Urroz of Nicaragua thanked Dr. Joseph for his lucid explanation of the staff's assessment of the condition of the yellowfin stock in the eastern Pacific Ocean. He called attention to the fact that the proposed quota for 1985 exceeds that for 1984 and exceeds the catches of 1980-1984. He expressed his concern that the proposed quota was too liberal, and suggested that a quota of 165,000 tons, plus two increments totalling 30,000 tons, be considered. Chairman Beasley asked if there were any comments; there were none, so he suggested that there be a short recess. After the recess he again called for comments, and Mr. Hallman of the United States said that his delegation was inclined to support Dr. Joseph's recommendation, and asked for additional information on Commissioner Urroz's proposal. Commissioner Urroz said that his proposal was based on study of the catch statistics for the last few years, and said that he thought that the circumstances warranted considerable caution to avoid the consequences of overfishing which were felt during the late 1970's and early 1980's. Chairman Beasley asked Dr. Joseph if he would be willing to further elaborate on the staff's proposal for a quota. Dr. Joseph repeated his earlier statement that the Convention of the IATTC specifies that its goal must be maintenance of the stocks of the various species of fish at levels which will support the AMSY. It was his opinion that the quota of 174,000 tons, plus two increments of 15,000 tons each, would return the stock size to the level which would produce the AMSY as quickly as possible, while minimizing the danger of overfishing. He said he realized that the proposed program might be confusing, since during the late 1970's and early 1980's the stock had been overfished and the staff had been recommending quotas less than the catches, whereas now the situation is reversed. He repeated his statement about the uncertainty regarding which model best describes the fishery, and also emphasized that selection of the most conservative model and the employment of increments which may or may not be implemented are safeguards built into the proposed management scheme.

Ambassador Castro y Castro said that Mexico did not plan to participate in the discussion of the quota, since it is not a member of the IATTC, but that he wished to make a few general remarks. First of all, he said that Dr. Joseph's discussion was, as usual, very interesting and enlightening, and he congratulated him for continually refining and improving the analyses. He said that economics, as well as biology, should be involved in considerations for management of the fishery. He remarked that the IATTC has collected large amounts of data, some of which could be used for economic analyses, and he said that he regretted that the management program does not take into account economics. He referred to a talk that Dr. Joseph had given at the IATTC meeting in Paris in 1975 in which economics was discussed. He repeated his statement about the importance of taking economics, as well as biology into account, and emphasized that his remarks were directed toward rational exploitation of the fishery, and had nothing to do with political advantages which might be realized with different systems of management. Dr. Joseph stated that he had spoken about alternate management schemes at that time, and after careful consideration, the Commissioners had instructed him to proceed with a detailed study of such schemes. This resulted in a book [Joseph, James, and Joseph W. Greenough, 1979, International Management of Tuna, Porpoise and Billfish: Biological, Legal and Political Aspects, University of Washington Press, Seattle and London: xv, 253 pp.] which has formed the basis for subsequent discussion of alternate management schemes. In that study some aspects of economics were discussed. Relative to the proposed quota, he said that he thought that if the fishing effort were increased and quotas recommended by the IATTC staff were adopted the stock would soon reach equilibrium at a level which would produce annual catches of about 155 to 175 thousand tons and that the catch rate would stabilize at a level less than the current catch rate.

Chairman Beasley asked if there were any more comments or questions. There were none, so he suggested that further consideration of Agenda Item 6 be postponed until the following day. In the interim the differences among the various delegations could perhaps be settled informally. The delegates agreed, so Chairman Beasley announced that the next order of business would be the budget.

AGENDA ITEM 7 - RECOMMENDED RESEARCH PROGRAM AND BUDGET 1986-1987

Chairman Beasley called upon Dr. Joseph again. Dr. Joseph said that the question of severance pay for IATTC employess who lost their jobs due to budget cuts had been under consideration for some time, but no decision had been made. Also, the budget should be discussed. It was decided that the question of severance pay would be discussed in an executive session that afternoon, and the budget would be discussed the following day.

The general meeting adjourned at 4:55 p.m.

The executive session convened at 5:00 p.m. Chairman Beasley said that the various alternative schemes had been supplied to the Commissioners at the last IATTC meeting, and that Dr. Joseph would take charge of the discussion. Dr. Joseph introduced Mr. Clifford L. Peterson, Assistant Director of Investigations, who had made calculations of what the costs to the IATTC in

severance pay would have been if various schemes had been in effect in 1981 and 1982, when eight staff members lost their jobs due to budget cuts. Mr. Hallman of the United States said that his delegation favored Alternative IB in Dr. Joseph's letter of January 3, 1984, to the Commissioners, which calls for benefits similar to those awarded to United States government employees in the same situation. Chairman Beasley asked if the other Commissioners would support Alternative IB. Dr. Joseph stated that selecting an alternative would not obligate any member nation to provide funds for severance pay in the event that the IATTC did not have enough money in its bank accounts for that purpose. Chairman Beasley said that the amount of money would be low unless the IATTC were disbanded, and even in that event the value of the property of the IATTC which could be sold might be enough to provide for severance pay. Dr. Joseph noted the possibility that some delegates might not have instructions from their governments regarding this matter and said that, if so, he would be willing to write to the various governments concerning severance pay. Commissioner Mouritzen of Panama said that it seemed to her that it would be just to give employees severance pay when they lost their jobs through no fault of their own, but since she had no instructions from her government regarding this matter she supported Dr. Joseph's idea of dealing with it through correspondence. Commissioner Urroz of Nicaragua, Mr. Seki of Japan, and Mr. Piney of France all agreed with Commissioner Mouritzen. Chairman Beasley said that it had been agreed that Dr. Joseph would write to the various member governments in this regard.

Chairman Beasley asked if there were any other points which should be discussed in the executive session. Dr. Joseph said that from time to time there had been complaints about the form and format of the lists of names of attendees prepared by the IATTC staff. After a brief discussion, it was agreed that the IATTC staff would submit a preliminary list of the persons in each delegation to the head of that delegation, and he would make whatever additions or corrections were necessary prior to preparation of the final list. It was also agreed that this decision would be added to the Rules of Procedure of the IATTC and incorporated into the minutes of the meeting. Chairman Beasley asked if there were any more comments. Commissioner Mouritzen suggested that the member nations be listed before the non-member nations.

The executive session was adjourned at 5:30 p.m.

The general meeting was reconvened by Chairman Beasley at 10:05 a.m., October 18, 1984. He reported to the attendees the decision reached at the executive session the previous day in regard to the lists of delegates, and requested that the head of each delegation submit such a list to the IATTC staff.

AGENDA ITEM 7 - RECOMMENDED RESEARCH PROGRAM AND BUDGET 1986-1987

Chairman Beasley turned the meeting over to Dr. Joseph, who introduced Mr. Peterson again and said that he would speak on the budget. Mr. Peterson

said that the budget in question was that for the period of October 1, 1986, through September 30, 1987. Background Paper 3, which contains the details of the budget, had been distributed to the Commissioners well in advance of the meeting so that they could study it and obtain instructions from their governments. The total amount of the 1986-1987 budget is the same as that of the 1985-1986 budget, except for an increase of 5 percent to compensate for the predicted effects of inflation. Also, the proportions of the budget allocated to various projects are practically the same for 1986-1987 as for 1985-1986. Chairman Beasley asked if there were any comments or questions. Commissioner Macdonald of the United States moved that the budget be adopted. Mr. Piney of France and Mr. Seki of Japan concurred. Chairman Beasley asked Commissioners Urroz of Nicaragua and Mouritzen of Panama if they had any objections to the budget. Neither had, so Chairman Beasley said that it would be considered as approved.

Chairman Beasley said that the matter of a quota for 1985 was still being discussed informally, so he suggested that the meeting move on to Agenda Item 8, and come back to the quota later. The attendees agreed.

AGENDA ITEM 8 - REVIEW OF RECENT EVENTS CONCERNING TUNA MANAGEMENT IN THE EASTERN PACIFIC

Chairman Beasley introduced Ambassador Manuel Freer of Costa Rica. He said that it was appropriate that Ambassador Freer report on the status of the interim treaty for tuna management in the eastern Pacific Ocean, since Costa Rica had been deeply involved in the negotiations from the start and was the depository government for the treaty. The text of Ambassador Freer's address appears as Appendix 2 of these minutes.

Mr. Hallman of the United States said that the treaty could be signed by any coastal state [bordering the eastern Pacific Ocean] or IATTC member. It is basically a licensing agreement, with the license fees to be distributed to the member nations in proportion to the catches made in the coastal waters of those nations. It is not an agreement for research, so there would be no duplication of the functions of the IATTC staff. The treaty is an interim one, and would eventually be replaced by a broader, permanent agreement.

Mr. Piney of France said that France was anxious to promote cooperation among nations in the exploitation of fishery resources, and stated that France would participate in efforts to arrive at such an agreement.

Ambassador Castro y Castro of Mexico said that he was sorry that, due to a misunderstanding, he had missed part of Ambassador Freer's presentation. He said that he had taken note of France's position. He spoke of the difficulties involved in securing just and equitable distribution of the resources of the sea, and stressed that economic and social factors, as well as biological factors, should be taken into consideration. Economic and social factors are not taken into account sufficiently in the interim treaty. The rights of the coastal states must be fully considered in any plans for management, and the non-coastal states must furnish information on their fishing operations in the waters of the coastal states. He mentioned a meeting of the South Pacific Commission held in June 1984 in Noumea, New

Caledonia, at which concern was expressed by coastal states over the lack of submission of complete and timely statistics of catches in their coastal zones by vessels of non-coastal states. Also, the coastal states are put at a disadvantage in trade. Representatives of a number of Latin American nations met in Mexico City in February 1984 and formulated a list of principles regarding these matters. Copies of this list are available from the IATTC. Mexico's catch of tunas had been only a few thousand tons in 1970 because it was operating at a disadvantage. By 1976, however, its catch had increased to about 25 thousand tons, and now it has reached 70 thousand tons. He said that he was pleased to note that Ecuador and Venezuela were also increasing their catches of tunas off their coasts, and expressed his hope that the catches of all the coastal states would increase.

Chairman Beasley asked if there were any comments or questions. Commissioner Urroz of Nicaragua congratulated Ambassador Castro y Castro on his excellent presentation. He said that Nicaragua has cooperated in the formulation of those principles and continues to support regional efforts for equitable and just agreements.

AGENDA ITEM 6 - CONDITION OF THE YELLOWFIN STOCK AND RECOMMENDATION FOR 1985

Chairman Beasley opened the floor for proposals regarding a quota for yellowfin in the eastern Pacific Ocean in 1985. Commissioner Urroz of Nicaragua said that the delegations had discussed this matter informally among themselves and had agreed to the following resolution:

Recognizing that there is a need for a conservation program to prevent the yellowfin resource of the eastern Pacific Ocean from being reduced below a level which would ensure high productivity in the future.

The Inter-American Tropical Tuna Commission therefore recommends to the high contracting parties that when a yellowfin conservation program is adopted for 1985, there should be established an annual quota on the total catch of yellowfin tuna for the 1985 calendar year of 174,000 short tons from the CYRA as defined in the resolution adopted by the Commission on May 17, 1962, and

Further recommends that the Director of Investigations should be authorized to increase this limit by no more than two successive increments if he concludes from examination of available data that such increases will offer no substantial danger to the stock, the first increment shall be for 20,000 tons and the second increase shall be for 10,000 tons, and

Finally recommends that all member states and other interested states work diligently to achieve the implementation of such a yellowfin conservation program for 1985.

Chairman Beasley called for comments. Mr. Hallman of the United States and Mr. Piney of France said that their nations supported the resolution. Chairman Beasley polled the other countries; none opposed the resolution, so it was adopted.

AGENDA ITEM 9 - PLACE AND DATE OF NEXT MEETING

Chairman Beasley stated that it was customary for the meeting to rotate among IATTC members. It would be Japan's turn in 1985, and informal discussions between the Japanese government and Dr. Joseph had resulted in a tentative agreement that the meeting would take place in October in Tokyo. Mr. Seki formally invited the delegates to attend an IATTC meeting in Tokyo on October 15-17, 1985, and the invitation was accepted. Chairman Beasley thanked Mr. Seki for the gracious invitation.

AGENDA ITEM 10 - ELECTION OF OFFICERS

Chairman Beasley said that it is traditional for the chairman of the meeting to be a representative of the host country, and opened the floor for nominations for that office, Commissioner Urroz of Nicaragua nominated Mr. Seki of Japan. Mr. Seki thanked Commissioner Urroz, but said that he was only an alternate commissioner of Japan, and suggested that the chairmanship should go to Commissioner Kyuichi Tanabe of the Ministry of Agriculture, Forestry, and Fisheries of Japan. Then Chairman Beasley called for nominations for secretary. Mr. Piney of France nominated Commissioner Urroz. Chairman Beasley suggested that the nominations be confirmed by acclamation, and this was done.

AGENDA ITEM 11 - OTHER BUSINESS

Chairman Beasley asked if there was any other business to be discussed. Mr. Valle of El Salvador said that his country had been approved for membership in the IATTC by all its members, and was currently going through the internal procedures necessary for joining. He said that it was a great honor for El Salvador to be invited to join such a distinguished international organization. Chairman Beasley said that all members of the IATTC looked forward to the day that El Salvador would become a member.

Mr. Montesinos of Venezuela said that he appreciated the invitation to attend the meeting. He said that, as a representative of the private sector, he had found the presentations of Dr. Joseph and Dr. Hall highly enlightening, and in general he had great respect for the entire scientific staff of the IATTC. Venezuela had cooperated with the IATTC staff's research program, and would continue to do so. Also, it may ask for IATTC support in its own data collection program. He hoped that Venezuela would be fully represented as a member in the future at IATTC meetings. He was fully cognizant of the statements made earlier in the day by Ambassador Castro y Castro regarding the necessity of considering economic and social factors, as well as biological factors, in management of the tuna resources of the eastern Pacific. He said that although Venezuela was not a coastal state of the eastern Pacific Ocean, it was sympathetic to the aims of the coastal states.

Mr. Hallman said that Mr. Montesinos' points were very interesting, and stated that the United States would support any efforts Venezuela might make to join the IATTC. He also expressed pleasure at the progress made in regard to the joining of El Salvador, and emphasized that the IATTC must continue to

operate, as its scientific work is of great value. Commissioner Urroz said that Nicaragua would be glad to assist El Salvador in any way necessary to join the IATTC, as the two are sister nations, bound together by a common culture and history.

AGENDA ITEM 12 - ADJOURNMENT

Chairman Beasley thanked Dr. Joseph and the IATTC staff for their presentations. He said that they had not only presented the results of the scientific studies, but also taken care of most of the arrangements for the meeting. He also thanked Mr. Carlos Diez, the interpreter, and all the delegations. He said that he thought that the meeting had been a successful and pleasant one. The meeting was adjourned at 11:55 a.m.

APPENDIX 1

LIST OF ATTENDEES

MEMBER GOVERNMENTS

FRANCE

Dominique Piney
Renaud Pianet

JAPAN

Koichivo Seki

NICARAGUA

Jamil Urroz, Commissioner

PANAMA

Carolina T. Mouritzen, Commissioner

UNITED STATES

Henry R. Beasley, Commissioner
Jack Gorby, Commissioner
Robert C. Macdonald, Commissioner
Frank Alverson
Izadore Barrett
Gordon Broadhead
David Burney
Harold Cary
August Felando
Bernard Fink
Charles Fullerton
William I. Gillis Jr.
Brian Hallman
Sam Herrick
Dennis King
James L. Malone
José E. Muñoz
Anthony V. Nizetich
Barbara Rothschild
John J. Royal
Gary Sakagawa
Lesley Scheele
Robert B. Young

OBSERVER GOVERNMENTS

COSTA RICA

Manuel Freer

ECUADOR

Jorge Ezquetini
Fernando Arcos

MEXICO

Fernando Castro y Castro
Victor Manuel Solano
Margarita Dieguez
Eduardo Medina-Mora
Walter Ocampo
Jaime Reyes
Gabriel Zamorano
Miguel Angel Martinez
Pablo Arenas

REPUBLIC OF CHINA

James Sha

EL SALVADOR

Sigfredo Valle
Pedro Garcia

VENEZUELA

Hugo Montesinos-Castillo

INTERNATIONAL ORGANIZATIONS

International Whaling Commission
William F. Perrin

APPENDIX 2

STATEMENT READ BY AMBASSADOR MANUEL FREER OF COSTA RICA ON OCTOBER 17, 1984

Mr. Chairman

It is a pleasure to express to you and the delegates and observers to this meeting of the Tropical Tuna Commission a salutation in the name of my government and myself.

As you probably already know, our nation, along with the United States and Panama, signed an Interim Convention last year which would establish a system to issue international licenses for tuna fishing and also establish from now on the bases or criteria for formation of a Permanent or Integral Convention.

The Interim Convention has since been signed by the governments of Honduras and Guatemala, and presently is in the process of ratification in accordance with the constitutional procedures of the various Contracting Parties. It will enter into force after at least five coastal states have ratified it.

Unfortunately, a large accumulation of work in the Legislative Assembly of Costa Rica has impeded the ratification of the Interim Convention, although a majority of the Commission of Economic Affairs of the Legislative Assembly has already voted affirmatively, which is the first condition for later approval by the entire assembly.

The Executive branch intends to bring the convention to the attention of what is called the Extraordinary Sessions of the Legislative branch, during which time that branch can deal only with matters submitted to its consideration by the government. We hope that in December of this year our nation will approve the text of the convention. Nevertheless we must be frank and acknowledge that some groups of public opinion have been opposed to approval of an Interim Convention, and have advocated that the coastal states would be better off joining a purely national scheme of management and exploitation of tuna resources.

We have explained to such groups that the management of the tuna resources individually by the coastal states could destroy one of the basic principles of the new Law of the Sea, which is that optimum utilization of the living resources of the sea is beneficial to all.

It is clear that we defend the concept that the coastal states have the right to exclusive benefits from their living resources, including the highly migratory species.

That does not mean that the management of those species should be carried out individually by the coastal states. Here, in contrast to the case for the non-migratory species, the management should be on an international basis, as provided in principle in Article 64 of the new Convention of the Law of the Sea, signed in December 1982 in Jamaica.

It is neither practical nor thinkable that a tuna fleet could pay for three, four, or five national licenses, in accordance with the movements of the fish. That would make the tuna fishery unprofitable and would encourage piracy.

The measures for conservation of the resource require also close cooperation among all nations, not just the coastal states, but also the states in which the vessels which have traditionally fished in the eastern Pacific Ocean are registered.

I believe that the Convention which we have signed with the United States and Panama will improve the scheme provided for in the Law of the Sea Convention. In effect, we have created the concept of "Guaranteed Allocation of Catch," based on the criterion of normal concentration of the resource in the various economic zones of the Coastal States. This concentration would be determined by confidential statistical data, according to the historical catches of the entire international fleet in X years. This concept is already mentioned in Clause 14 of the Interim Convention as the basis of the new Permanent and Integral Convention. In effect, we believe that the nature of Article 62 of the Law of the Sea Convention would condemn us always to be eternal sellers of fishing licenses. On the other hand, a convention based on Guaranteed Allocation of Catch would permit the coastal states to develop their own tuna fleets. For this reason we affirm that the scheme for the Permanent Convention which will regulate everything relative to the fishery for tunas in the eastern Pacific is better than the scheme proposed by the nations of the south Pacific, based upon purely national management of their respective 200-mile exclusive economic zones.

For that reason, also, we urge the rest of the coastal states to study and consider adherence to the Convention already signed, so that we can bring it into force for the next fishing season of 1985.

I wish success to the present meeting of the IATTC, and as soon as our Legislative Assembly has approved the Interim Convention, we have the intention to rejoin the IATTC to contribute to its commitment for conservation of the tuna resource, which concerns us all equally.

Thank you, Mr. Chairman.