

INTER-AMERICAN TROPICAL TUNA COMMISSION

SUMMARY MINUTES OF THE FORTY-FIRST MEETING

October 19 and 20, 1983
Ottawa, Canada

Chairman: Michael Hunter
Secretary: Jamil Urroz

AGENDA

41st MEETING OF THE INTER-AMERICAN TROPICAL TUNA COMMISSION

19, 20 October 1983

Centennial Room of the Canadian Government Conference Centre

2 Rideau Street, Ottawa, Canada

1. Opening of the Meeting
2. Consideration and Adoption of the Agenda
3. Review of Current Research
4. Tuna-Porpoise Program
5. The 1983 Fishing Year
6. Condition of the Yellowfin Stock and Recommendations for 1984
7. Recommended Research Program and Budget 1985-1986
8. Review of Negotiations concerning Tuna Management and Conservation
in the Eastern Pacific Ocean.
9. Place and Date of Next Meeting
10. Election of Officers
11. Other Business
12. Adjournment

SUMMARY MINUTES OF THE FORTY-FIRST MEETING

AGENDA ITEM 1 - OPENING OF THE MEETING

The 41st meeting of the IATTC was opened by the Chairman, Mr. Michael Hunter of Canada, at 10:40 a.m., October 19, 1983, at the Canadian Government Conference Center, Ottawa, Canada. Mr. Hunter introduced the keynote speaker, Mr. Gary Vernon, Assistant Deputy Minister for Pacific and Freshwater Fisheries. A copy of Mr. Vernon's remarks is attached as Appendix I. Following Mr. Vernon's remarks, Mr. Hunter welcomed all of the attendees. He then introduced Mr. Bill Sprules, a retired Canadian fishery official who had previously been associated with the Commission and who was in attendance at the meeting. Following this, the Chairman called on the leaders of the delegations to introduce themselves and their delegates. Observers representing non-member governments and representatives of international organizations also introduced themselves. All member governments were represented at the meeting. A list of attendees is attached to these minutes as Appendix II.

AGENDA ITEM 2 - CONSIDERATION AND ADOPTION OF THE AGENDA

The Chairman noted that a provisional agenda had been circulated to the various delegations in June 1983, and asked if it was acceptable to all delegations. There were no comments, so the provisional agenda was adopted. The Chairman then proposed that the morning session be continued until approximately 12:30 p.m., with the afternoon session beginning at 2:00 p.m. and ending at 5:00 p.m. On the following days morning sessions would be scheduled to begin at 9:30 a.m., and the meetings would be adjourned at 5:00 p.m. There was no objection to this schedule, so it was adopted.

AGENDA ITEM 3 - REVIEW OF CURRENT RESEARCH

The Chairman called upon the Director of Investigations, Dr. James Joseph, to review the Commission's current research program. The Director began by stating that this agenda item provided an opportunity for the Commissioners to review the research program of the Commission and to provide advice and guidance in insuring that the program was structured so as to be consistent with the objectives of the Commission as outlined in the Convention which established it. Dr. Joseph reiterated the primary objective of the Commission, which is to conduct research on the biology, ecology, and population dynamics of the tunas and tuna-like species of the eastern Pacific Ocean and, based on the results of this research, to recommend from time to time to the High Contracting Parties measures designed to maintain the populations at levels which can support maximum yields on a sustained basis. He emphasized that the Convention specifies maximum sustainable yield, rather than optimum yield, and noted that maximum sustainable yield is one element of the set of all possible optimum yields. The Director noted that in 1977 the Commission had also been given responsibility for carrying out research on the populations of dolphins taken in

association with tunas in the eastern Pacific Ocean.

After noting that 1983 was the 34th year of the Commission's research program, the Director explained that the most fundamental requirement is to collect, on a continuing basis, a variety of data describing the fishery itself. These include catch, effort, vessel characteristics, and size-frequency data, all of which are important in formulating models of tuna population dynamics. Collection of these data requires that the Commission maintain offices in ports where significant amounts of tunas from the eastern Pacific are landed. At present, the Commission maintains such offices in San Diego and San Pedro, California, Ensenada, Mexico, Panama, R.P., Mayaguez, Puerto Rico, Manta, Ecuador, and Coishco, Peru. Commission logbooks carried by most of the vessels of the eastern Pacific fleet provide detailed information on catch and effort. This information is abstracted from the logbooks by Commission personnel when the vessels complete their trips and return to port. Length-frequency samples are also taken at that time.

The Director next turned to a review of the Commission's tagging program, indicating that due to reductions in the research budget commencing in the 1981/1982 fiscal year all major tagging field work had been discontinued after the cruise conducted in October-November 1981. Work on the analysis of tag return data from previous years was carried out during the year. A graphical representation of tagged yellowfin migrations from the central Pacific to the offshore fishing area west of the CYRA and the experimental areas was presented, and Dr. Joseph noted that these returns were consistent with the present hypothesis that fish inside the CYRA can be treated for management purposes separately from those to the west of the CYRA.

The Director noted that tagging data are useful for studies of behavior, in addition to studies of migration, growth, and mortality. He reviewed work underway at the Commission in which a probabilistic approach to understanding certain characteristics of the schooling behavior of tunas was being developed. He noted that two principal hypotheses on the structure of tuna schools have been proposed. One hypothesis is that the same individuals tend to associate together in the same school throughout most of their lives. The alternate hypothesis states that there is no such tendency, but rather individuals in the same area mix among schools in a random fashion.

He noted that observers on fishing vessels and aircraft have reported that the schools frequently break up and reform. These observations might lead to the conclusion that there is considerable mixing of fish of different schools and that fish of the same species and same approximate size in the same areas would mix thoroughly with one another within a period of a few days or weeks. It is possible, however, that the fish may have characteristics other than species or size which attract them to fish with similar characteristics, so that fish which are schooled together at some time are more likely to be schooled together than with other fish at some later time. If the affinity of similar fish to one another is sufficiently strong the fish

might even remain together most of the time from hatching to spawning. If so, this could have important implications regarding management.

Some fish tagged and released at the same location and time have been recaptured weeks or months later in the same purse-seine set, and others have been recaptured weeks or months later on the same date in widely separated areas. The former results might be due merely to chance. The latter results indicate that not all the fish remain together at all times, but this information is of limited value. A much more powerful method of analysis is needed. Some exploratory studies of this nature were undertaken during 1983, and these are described below.

If a population of fish consists of 10,000,000 individuals, and 1,000 of them are tagged, 1 fish out every 10,000 will be a tagged one. If the fish mix rapidly sets made a few days after tagging consisting of 10,000 fish will almost always have 0, 1, 2, or 3 tagged individuals, with an average of 1. If they mix slowly most of the 10,000-fish sets made a few days after tagging will have 0 tagged individuals and a few of them will have perhaps 10 to 100 tagged individuals. Later there will be more sets with 1, 2, or 3 tagged individuals and less with 0 or large numbers of tagged individuals. An attempt has been made to study this quantitatively. A computer program was written for this purpose. The input consists of the average weight of the fish of the species in question in the pertinent area-time stratum (estimated from sampling the catches) and the tons of that species and the number of tagged fish in each purse-seine set or baitboat stop in that stratum. The data selected for study must be stratified so that the probabilities of tagged fish being recaptured by each set of equal size within these strata would be about equal if the tagged fish were randomly distributed in the population. The area strata can be selected by examining maps of the distributions of the areas of recapture of the tagged fish. Months or some fraction thereof are convenient for time stratification. The program estimates the number of fish in each set from the weight of fish caught and the average weight of fish in the area-time stratum. It then sums the numbers of tags and the estimates of the numbers of fish caught in each set and divides the first sum by the second to calculate the tagged to total ratio. This ratio is then used with equations for the binomial distribution to estimate the probabilities of 0, 1, 2, ... tagged fish appearing in each set if the fish are randomly mixed. The sums of the probabilities for all the sets for 0, 1, 2, ... tagged fish are then calculated so that these can be compared to the observed data.

Data for skipjack from a tagging experiment initiated off Central America in 1979 were used to illustrate the method. The probabilities of recovering 0, 1, 2, 3, 4, etc., tags, under the assumption of random mixing, were computed for each set. These probabilities were then compared to the observed numbers of tags returned per set. The Director stated that although the data are by no means conclusive, they suggest a high degree of mixing of individual fish among schools. He also noted that further research on this problem is planned for the forthcoming year.

Following the review of the tagging program, Dr. Joseph commented

on the work being conducted to age yellowfin by daily increments on the otoliths. He noted that an analysis of the work presented last year resulted in the detection of a bias in the growth rate of the older fish. A reanalysis is currently nearing completion, and the results will be validated by the analysis of several dozen otoliths which had been marked with tetracycline during tagging experiments conducted several years ago. These samples will provide data to determine whether the larger fish, like the smaller ones, lay down one increment per day on the otoliths. Dr. Joseph next noted that these analyses have provided valuable data for studying differential growth by sex. He stated that earlier research had shown that nearly all fish larger than 150 cm (about 150 pounds) are males. Until now biologists have been unable to say whether this difference was due to differential growth, i.e. female growth slowing down relative to male growth as the fish get older, or to differential mortality, i.e. all females dying as they reach a length of approximately 150 cm. The otolith data, which show length at age by sex, indicate the difference to be due to differential mortality, rather than to differential growth.

Continuing on with the review, Dr. Joseph next described the staff's work on determination of stock structure through studies of the microchemistry of tuna hard parts, such as vertebrae and spines. The basic procedure is to bombard a small area of a hard part with a proton beam from a linear accelerator, producing back-scattered x-rays which can be analyzed spectroscopically to determine the chemical composition of that area. Differences in the concentrations of different chemical elements in the bone are believed to be related to areas in which the fish have occurred. Work was originally begun on yellowfin from the eastern Pacific, but due to budget constraints the program has concentrated on Atlantic bluefin tuna, using funds provided by the U.S. NMFS. To date more than 400 fish have been examined from the western and eastern Atlantic (including the Mediterranean Sea). A cursory look at the preliminary results of these analyses was given by the Director. For juvenile fish, all of the individuals examined from the eastern Atlantic apparently originated in that area, whereas about 3 percent of those from the western Atlantic appeared to have originated in the eastern Atlantic. With respect to the large bluefin, about 20-25 percent of the fish examined from the western Atlantic were of the eastern Atlantic type, whereas only about 15 percent of the eastern Atlantic fish were of the western Atlantic type. The data showed some variability among years for the large fish. It is planned to continue this work during 1984.

The Director next discussed the Commission's efforts to establish a laboratory in Achotines, Panama, to study the early life history of tunas. An important objective in undertaking this project will be to shed light on the problem of predicting recruitment of tunas into the fishery. Prediction of recruitment can play an important role in the management of resources, but developing such predictions has always been a major problem. Traditional approaches have been unsuccessful. Egg and larval surveys are not practical because spawning takes place over wide areas throughout the year. Although recruitment to the fishery is quite variable, by a factor of about three, no relationship between

spawners and recruits is demonstrable for the yellowfin in the eastern Pacific. However, through more detailed studies of early life history, it might be possible to make significant progress on the problem of predicting recruitment. Development of the laboratory in Panama has been progressing well. The land has been purchased, and the government of Panama has put in a road to the property, in addition to clearing it and preparing it for building. Building is currently underway. Through the auspices of the U.S. State Department the Commission has been able to acquire a great deal of much-needed heavy equipment as surplus military property. A tractor, generators, furniture, and other equipment and material have been acquired and readied for shipping. A Venezuelan-flag tuna purse seiner has agreed to transport the equipment to Panama free of charge, and the Panamanian government has arranged for it to pass through customs without payment of duty. The staff is anticipating completion of the first stage of the project within 6 months.

The Director next reviewed the Commission's tuna oceanography program, noting that it had been maintained at a minimal level for several years due to budgetary constraints and because extensive oceanographic work in the eastern Pacific is carried out by other institutions. The Commission's program is coordinated with the work of other research bodies, so as to maximize the amount of useful information which can be obtained with the available resources. Dr. Joseph then went on to discuss the El Niño situation which has been prevalent in the eastern Pacific during the year. El Niño is a manifestation of many anomalous weather and ocean phenomena in which atmospheric and oceanic circulation patterns shift out of their usual patterns, generally for 6 months or more. The trade winds which drive the major ocean currents break down, resulting in overall warming in the eastern Pacific and a reduction of productivity along the equator and off South America. The phenomenon may have a major impact on the fauna of the region. For example, during the 1972 El Niño the population of anchovetas off Peru and Chile dropped from the level at which it was supporting yields of more than 13 million tons to its current level at which it is supporting yields of about 2 million tons. Catastrophic climatological effects can be associated with El Niños. During a typical El Niño drought conditions persist throughout Central America and flooding takes place as a result of heavy rainfall in southern Ecuador and northern Peru, generally an arid desert region. Data were presented which demonstrated the relative magnitude of ocean warming in the coastal regions of the eastern Pacific. Evidence of major El Niños dating back to 1925 was given. The current El Niño, which began in the fall of 1982, was shown to result in the highest temperature anomalies since 1925. It was described to be the most widespread and anomalous since extensive records of the phenomenon have been kept. It was suggested that even though atmospheric conditions are rapidly returning to normal, the ocean will probably not return to normal until at least mid-1984, due to the massive buildup of heat in the system.

Next the Director turned to research on the fisheries for species of tunas other than yellowfin. He reviewed the historical trends in the skipjack fishery of the eastern Pacific and reported on the Commission's

assessment studies for this species. He called attention to Background Paper 4, which reviewed this subject in detail. He then reported that due to a shortness of time he would not review the fisheries for bluefin, bigeye, and black skipjack, but called attention to Background Paper Number 5, which covered the fisheries for those species in some detail.

After these remarks Dr. Joseph indicated that this concluded the review of tuna and oceanographic research currently underway at the Commission. Chairman Hunter thanked the Director for his review then called for questions and comments from the floor.

Commissioner Rodriguez from Panama asked the Director if he might comment on the current level of fishing in the eastern Pacific. The Director replied that he would be covering that subject under Item 6 of the Agenda.

Commissioner Beckett of Canada noted that he had two items, one in the form of a comment the other in the form of a question. For his comment he noted that for Atlantic bluefin the difference in size by sex may be a function of differential growth rather than differential mortality, as was the case for yellowfin in the Pacific. He noted that all bluefin greater than 400 kg are males, but that when one examines the ratio of males to females by size there appears to be a grouping or clumping of females in the range between intermediate sizes and 400 kg. For his question he asked whether the tag releases used for the schooling studies were from a baitboat or a purse seiner. Dr. Joseph replied that they were from a baitboat. Mr. Beckett then made the point that if they were tag releases from a purse seiner this fact might invalidate the assumption that all of the fish were returned to the same school or further that school integrity might have been artificially upset. Dr. Joseph responded that this indeed could create a problem, and noted that similar problems could exist for baitboat-released fish. He noted that the staff is attempting to evaluate the bias this might introduce into the analyses.

Commissioner Beasley of the U.S. commented on the usefulness of the review on El Niño, and asked if Dr. Joseph would prepare a report on his presentation, including the figures which were used, and distribute the report to the Commissioners. The Chairman then asked the other delegations if they were in concurrence with this request. They all replied affirmatively, so the Chairman instructed Dr. Joseph to distribute such a report.

Commissioner Beasley then asked Dr. Joseph if he would care to elaborate or speculate on the long-term results that might be associated with the study in Panama. Dr. Joseph responded by saying that Commission scientists have been rather successful in their attempts to predict the abundance of older age groups of yellowfin based on their abundance as 1-year-olds. However, they have had no success in predicting recruitment to age 1 from environmental studies or analysis of spawner-recruit relationships. It is the opinion of himself and his staff that it will be necessary to understand some of the mechanisms

controlling growth, survival, mortality, and behavior of pre-recruit fish if progress is to be made in understanding recruitment. Little is known concerning the early life history of tunas. We are uncertain as to how old yellowfin are at recruitment to the fishery, and indeed we cannot even identify tuna eggs and are uncertain of the identity of some tuna larvae. The Panama laboratory will provide facilities for studying the early life history of tunas. In conjunction with the laboratory studies in situ studies in the waters adjacent to the laboratory site will be carried on to supplement the laboratory work. The Director emphasized that the initial research must be exploratory in nature, as studies of this type are still in their infancy. He further emphasized that such research must be long-term, and useful applicable results will most likely not be forthcoming during his term as Director. Such work is needed, however, and by starting now the Commission is moving in the proper direction.

Commissioner Urroz of Nicaragua asked if the low catches of yellowfin made during 1983 were the result of no conservation program being implemented for the last several years or if the apparent decline was due to a natural decline in the abundance of the stock. Dr. Joseph replied that he would respond to that question during discussion of Agenda Item 6.

Before closing this agenda item the Chairman, on behalf of the Commission, expressed his gratitude to the governments of Panama and the U.S. for the support they have provided in getting the construction of the facilities in Panama underway.

AGENDA ITEM 4 - TUNA-DOLPHIN PROGRAM

The Chairman called on Dr. Joseph to present this agenda item. The Director began his review by reiterating the objectives of the Commission tuna-dolphin program: (1) to maintain a high level of tuna production, (2) to maintain dolphin stocks at or above levels that assure their survival in perpetuity; and (3) to avoid needless or careless killing of dolphins. He next explained that to meet these objectives the Commission research program on the tuna-dolphin problem was structured along the following lines: an at-sea program in which scientific technicians were sent to sea aboard tuna vessels to collect biological information and data on dolphin mortality; stock assessment studies based on data gathered by the scientific technicians from tuna vessels; behavior studies directed toward understanding the bond between tunas and dolphins and other characteristics of dolphins; studies directed toward the development of techniques to reduce dolphin mortality and the disbursement of information regarding these.

Dr. Joseph next reviewed the contents of Background Paper 6. He showed slides of the distribution of the major species of dolphins taken with tunas in the eastern Pacific Ocean and reviewed some of the recent findings concerning the stock structures of these species. He noted that scientific technicians were to be placed on 63 trips during 1983, but only about half that number will be completed. Only one trip by a

non-U.S. flag vessel has been sampled so far this year. This reduction was due to the fact that more than half of the large vessels, except for those of Mexico, which normally fish for tunas associated with dolphins in the eastern Pacific had shifted their area of operations to the western Pacific. In the case of Mexico, the largest non-U.S. flag fleet in the eastern Pacific, the Commission has been unable to obtain permission from the Mexican government to sample on its vessels. Based on data from the trips on which sampling was conducted during 1983, the kill of dolphins during that year to date was approximately one-half of what it was during the same period of 1982.

Dr. Joseph next reviewed the staff's work on estimating kills during 1982. Two estimates of kill, derived from kill-per-ton and kill-per-set data, were presented. Although the estimates differ somewhat, the differences are not statistically significant. The kill-per-set and kill-per-ton estimates are both ratio estimators, and have certain limitations for use in estimating overall mortality. Work on a new method of estimating kill was explained. This new method, based on regression analysis, has several advantages over the ratio estimates, and should prove to be more efficient estimator. (Note: errors in the kill-per-ton estimate for 1982 were found after the meeting, and corrections were made in a memorandum to all Commissioners (Appendix III).)

Dr. Joseph called attention to the fact that during last year's meeting estimates of abundances for the major dolphin species were given. These estimates were based on data on sightings of dolphin schools collected by technicians aboard tuna vessels. The eastern spinner stock of dolphin was thought to have experienced the heaviest exploitation of any of the stocks. For this reason the staff has concentrated its effort on making estimates of the abundance of eastern spinners. The analyses demonstrate no apparent trend in either density of schools or numbers of animals. What appeared to be a sharp decline from 1977 to 1979 was probably an artifact due to extraneous factors. The staff believes that the analyses indicate that the eastern spinner stock is unlikely to be declining.

Next a review of research on estimating the size at age of spotted dolphins was presented. Based on the analyses of length samples obtained aboard vessels at sea, it was estimated that spotted dolphins are between 127 and 132 cm (50-52 inches) long at 1 year of age.

Finally the staff's gear research program was reviewed. This aspect of research is concerned with dolphin mortality during backing down for night sets. It has been established from observer data that the kill per set is higher during night sets than during day sets. It is hypothesized that when backing down is accomplished at night visibility is so reduced as to hinder the efficient release of dolphins over the cork line. The Commission has been experimenting with the use of different types of artificial lights to illuminate the backdown channel. The program involves lending banks of sodium vapor lights to various vessels in the fleet during trips accompanied by scientific technicians. Over the last two years the staff has been accumulating

data on trips during which Commission lights were used and trips during which no lights or the other types of lights were used. Although the analyses are incomplete, the data suggest that the Commission lights are more useful than other types of lights tried so far in reducing mortality.

Upon the completion of the presentation Chairman Hunter recognized Commissioner Beckett of Canada. Mr. Beckett inquired as to why, though the overall kills of dolphins was down during 1983 as compared to 1982, the kill of whitebelly spinner dolphins was up. Dr. Joseph commented that it was probably due to an artifact of sampling, and that in a statistical sense there was most likely no difference between the two years.

Commissioner Rodriguez of Panama noted that during a purse-seine set there must be many variables that are associated with the differential behavior among species, and he wondered whether such behavior was considered in estimating kill by species. Dr. Joseph responded by noting that such behavior was not taken into account directly, but that sampling was stratified by species, time, and area, and therefore different behavior was indirectly treated.

AGENDA ITEMS 5 AND 6 - THE 1983 FISHING YEAR AND CONDITION OF THE YELLOWFIN STOCK AND RECOMMENDATIONS FOR 1984

The Chairman explained that, because these two agenda items are closely related, he would ask the Director to discuss them jointly, as has been the custom in the past. In presenting these two items the Director made use of a number of slides and referred extensively to Background Papers 1 and 2.

Before beginning his review, Dr. Joseph stated that the 1983 fishing year was quite anomalous due to the fact that large numbers of vessels had left the eastern Pacific fishery and were now operating in the western Pacific. In addition, due to a decrease in the demand for tuna starting in late 1981, the length of time vessels were required to stay in port between trips had been increased substantially. Both of these factors have resulted in reduced fishing effort. Data which demonstrated that the fishing effort for 1983 will be approximately one-half the 1982 level and substantially below one-half the previous 5-year average were shown. This lower effort will result in much reduced catches of both yellowfin and skipjack. The staff has estimated that the 1983 catch of yellowfin from the CYRA will be about 80 thousand short tons, the lowest catch since 1963. The skipjack catch in the eastern Pacific will most likely not exceed 60 thousand tons, which would make it the lowest catch since 1973. Statistics were presented on the distribution of fleets and catches among countries participating in the eastern Pacific fishery. The two most important fishing nations, in terms of fleet size and catch, are the U.S. and Mexico. During 1983 the U.S. and Mexican fleets comprised about 58 and 32 percent of the total, respectively. In terms of catch of all species of tunas in the eastern Pacific, the shares were about 60 and 20 percent, respectively.

The Director next began his review of yellowfin stock assessment studies. He indicated the assessments of the yellowfin stock would be more difficult this year because of the anomalous oceanographic conditions resulting from El Niño and the exodus of vessels to the western Pacific. He indicated that the effects of these factors could not be evaluated with any degree of confidence until conditions in the fishery are examined over the next year or two. It was noted, however, that the general trends in the fishery, as described over the last few years, have not changed. He emphasized the fact that during recent years increasing fishing mortality has been exerted on the younger age groups of yellowfin, and this has resulted in reduced productivity of the stock and reduced yield per recruit.

Over the last several years production models which employ data on catch and fishing effort have given estimates of the productivity of the stock. These models have consistently estimated the maximum sustainable yield at about 175 thousand tons. During the last few years, while estimating sustainable production, certain parameters of the model were held within constraints which were consistent with the age-specific fishing mortality observed in the fishery up to about 1978. For the most recent analyses these estimates were not constrained, thereby reflecting a changing age-specific fishing mortality for which increasing effort was placed on small fish. The estimates based on the unconstrained parameters showed a less productive stock, the maximum sustainable production varying between 172 and 152 thousand tons per year. Although it is impossible to determine which estimates best represent the current status of the stock, the unconstrained models resulted in lower sums of squared differences between the observed and expected results, thus implying a better fit to the data. Regardless of which model was employed, they all resulted in current estimates of stock size which are larger than needed to sustain the maximum yield. In terms of the production models, this is a result of the fact that the catch for the last two years has been substantially below the equilibrium yield, thereby allowing the stock to increase in abundance. Dr. Joseph noted that the catch per days fishing, which is used as an index of stock abundance, did not show a substantial increase during 1983, which it should have done. He attributed this to the exodus of a large share of the most efficient vessels to the western Pacific and the anomalous ocean conditions which probably had an adverse effect on the catchability of the fish. Examination of data for vessels remaining in the eastern Pacific during the last five years with the same skippers showed a marked increase in catch rate during 1983, corroborating these conclusions.

Continuing with the discussion, Dr. Joseph reviewed analyses conducted on the impact of the changing size composition of the catch on the productivity of the stock. Estimates of age-specific mortality were utilized with estimates of growth and natural mortality to compute the contribution each fish recruited into the fishery made to the yield. These yield-per-recruit estimates demonstrated that as the fishery concentrated more on the younger age groups of fish the yield per recruit decreased. He then described the age-specific biomass analyses which the staff has conducted. Employing estimates of the total

recruitment to the fishery at age 1, estimates of the total yield were derived. These estimates corresponded closely to the estimates derived from production modelling. They demonstrated that as a result of decreased yield per recruit the productivity of the stock decreased by approximately 10-15 percent, similar to the decrease shown by the production models. These analyses also produce estimates of the current biomass which are slightly greater than needed to sustain the maximum yield.

At this point the Director made his recommendation for a 1984 conservation program. Pointing out that the estimates of maximum sustainable yield obtained with the unconstrained input of the model were 172 and 152 thousand short tons, and that these were corroborated by the age-structured analyses, he recommended that a catch quota for 1984 be set between the two estimates, i.e., 162,000 tons. Because the current stock size is larger than that needed for supporting the maximum yield he recommended that consideration be given to increasing the catch during 1984 on the basis of current information. He specifically suggested two increments of 15 thousand tons each.

Considering next the area to the west of the CYRA and east of 150°W, the Director noted that yellowfin in that area are usually associated with dolphins and that the fish are taken at a larger size which is near the optimum. Examination of catch and effort statistics for that area demonstrate no relationship between the two; catch per unit of effort has remained relatively constant in the outside area since fishing first started there, and the catch has fluctuated in direct proportion to the effort. Accordingly, there is no apparent need for yellowfin regulation in this area.

At the completion of Dr. Joseph's presentation Chairman Hunter asked that further discussion of these Agenda Items be postponed to the following day. He recessed the meeting at 5:30 p.m.

The meeting reconvened on the following day at 9:30 a.m. Chairman Hunter noted that there were delegates present who had arrived after the first day of the meeting, and asked them to introduce themselves. After these introductions the Chairman called for questions concerning the presentation made on the previous day dealing with the condition of the yellowfin stock.

Commissioner Beasley of the U.S., recognizing that there were various unusual conditions affecting the ability of the Commission's staff to estimate trends in the fishery, asked Dr. Joseph if he would care to hazard a guess on the possibilities for improved skipjack fishing during 1984. Dr. Joseph, referring to the measures of wind mixing in the central Pacific as a prediction of skipjack abundance in the eastern Pacific, commented that the index for estimating 1984 abundance had not yet been computed. He said that environmental conditions in the eastern Pacific should be returning to normal by the northern summer of 1984, and therefore fishing conditions are expected to improve for both the yellowfin and skipjack.

Commissioner Rodriguez of Panama indicated that he had a number of observations to make, as well as a few questions to ask. He noted that the average size of yellowfin taken inside the CYRA had decreased substantially since 1975, when it was about 30 pounds (14 kg) and when catches were at their highest. Along with this decrease in average size, the catch rate had gone from about 12 tons in the early 1970's to currently less than one-half that amount. He suggested that these trends might be a result of overfishing, and that the exodus of vessels to the western Pacific could be a reflection of this overfishing. He asked the Director if the stock was overfished and if the quota was set at some amount substantially below 162 thousand tons would the average size be expected to increase. Dr. Joseph replied that during the late 1970's the stock of yellowfin had been overfished, but due to reduced catches since 1980 the stock has increased in abundance. He also noted that vessels have gone to the western Pacific because the catch rates are significantly higher there than they have ever been in the eastern Pacific, or for that matter the eastern Atlantic. He concurred with Commissioner Rodriguez that, given no change in age-specific fishing mortality, greatly reduced catches would result in an increase in average size of fish in the catch.

Commissioner Urroz of Nicaragua was then recognized by the Chairman. He noted that there was a significant decrease in the catch rate between 1980 and 1983, and that the catches had been greater than the maximum sustainable yield during the late 1970's. He wondered if the reduced catch rates were due to the large catches, and wondered further if the low estimated catch of 80 thousand tons for 1980 was due to reduced abundance or due to environmental factors. Dr. Joseph replied that the stock had been overfished somewhat during the late 1970's, but that due to reduced catches from 1980 through 1983 it had been afforded some respite. Consequently abundance should now be substantially increased. Although anomalous environmental features have most likely resulted in reduced catches, the main reason for the catch being so low during 1983 was the reduced effort resulting from market conditions and the exodus of vessels to the western Pacific.

Commissioner Rodriguez from Panama commented once again that heavy fishing for yellowfin had reduced average size in the catch as well as potential yield. He noted that by reducing the quota to substantially below 162 thousand tons average size could perhaps be increased. He further noted that though such decisions are partially politically or economically motivated, they are still within the purview of the Commission. Dr. Joseph replied that from a biological point of view the current best estimate of maximum sustainable production was between 152 and 172 thousand tons. He said that if a lesser quota were to be set the decision should be based more on political or economic considerations, and that he would be pleased to attempt to provide the best estimate of what the consequences of any political or economic decision might be on the abundance of the stock.

Commissioner Beckett of Canada, after recognition by the Chairman, made two comments. First, he noted that since most of the larger boats which normally fish for tunas associated with dolphins have gone to the

western Pacific this should bias downward the average size of fish in the catch from the eastern Pacific. Second, he noted that if catch rate in the eastern Pacific increased as predicted the possible bias downward in average size should be reduced if and when the large vessels return from the western Pacific. He asked Dr. Joseph if a return of these vessels during 1984 was likely. Dr. Joseph replied that a return to the eastern Pacific that quickly, even though catch rates changed, was unlikely. He further commented that the catch rates could continue to be biased downward through the first half of 1984 due to the residual effects of El Niño.

There being no further discussion, the Chairman noted, that a resolution in regard to a recommendation for a catch quota for 1984 could be drafted during the coffee break and distributed to the Commissioners for their review. After the coffee break a draft resolution was distributed to all delegations. The resolution recommended a catch quota of 162,000 short tons of yellowfin for the CYRA, with two increments of 15,000 tons each. After the coffee break the resolution was circulated among all delegations. Commissioner Rodriguez of Panama noted that, considering the present state of the stock, relative to its state in 1975, there are two alternatives that the delegates might wish to consider respecting the resolution for 1984. One would be to establish a 1984 catch quota of 132 thousand tons with two increments of 15 thousand tons each, and the other would be to set an overall quota for 1984 of 162 thousand tons without increments. After reviewing the suggestions made by the delegate from Panama the Chairman asked for further comments.

Commissioner Beasley of the U.S. asked for the floor to clarify the presentation made by Dr. Joseph concerning the condition of the yellowfin stock. He noted first that the figure of 162 thousand tons was the staff's best estimate of the maximum sustainable yield from all available information. Also, provision for the two increments takes into consideration the assessment that the current stock size is greater than needed to take the maximum sustainable yield and the increments are a form of insurance in the event the estimates of condition of the stock are in error. If a problem were evident the increments would not be implemented. Based on this information, he said that the U.S. supported a quota of 162 thousand tons for 1984, with the possibility of two increments of 15 thousand tons each.

Commissioner Urroz next observed that the catches during recent years, based on data presented in Background Paper 1, had not reached the quotas which had been agreed to. He expressed concern that this might be a reflection of the stock being in much poorer condition than current estimates indicated. Based on these considerations, he believed that a catch quota of 162 thousand tons without the possibility of increments would be the most prudent course to follow.

The Chairman noted that there were basically two proposals on the floor, and suggested that perhaps further discussion should be delayed until after the noon recess, thereby giving the delegates time to exchange ideas among themselves in a more informal atmosphere. During

the remaining time before lunch the next agenda item could be considered.

Commissioner Beasley noted that the proposal to defer further discussion until after lunch was a useful one. He commented once again that the adoption of quotas with increments had been a long-standing practice of the Commission as a means of providing flexibility in terms of management at the discretion of the Director. He noted that that still seems to be a useful approach, and he could see advantages to continuation of this concept.

AGENDA ITEM 7 - RECOMMENDED RESEARCH PROGRAM AND BUDGET 1985-1986

The Chairman opened discussion on this agenda item by noting that at the 40th meeting of the Commission formal approval had been given to the Commission's Financial Regulations. He noted that the Director was instructed at the last year's meeting to have available for distribution at this year's meeting copies of the ammended and approved Financial Regulations. Copies of the regulations were distributed to all Commissioners. After the regulations were distributed the Chairman asked Dr. Joseph to present the Commission's recommended 1985/1986 budget.

Dr. Joseph noted that the 1985/1986 budget of \$2,992,567 is an increase of \$274,387 over the 1984/1985 budget. Approximately one third of the increase was due to a 4-percent increase for inflationary trends. Approximately one half of the increase was due to increased pension, social security, and medical costs. The remainder of the increase was due primarily to increased professional fees. Dr. Joseph noted that the increased pension costs were an adjustment over last year's budget due to a recalculation of projected pension costs provided by the Pension Society. It appeared that the original estimated costs provided by the Pension Society were too low.

Both the Chairman and Commissioner Beasley of the U.S. inquired as to whether this change in pension costs is indicative of a decrease in pension benefits. Dr. Joseph said that the pension benefits would remain the same.

The Chairman next asked for action on the budget. Commissioner Beasley of the U.S. moved that the budget be adopted as presented. Commissioner Rodriguez of Panama seconded the motion. The 1985/1986 budget was unanimously approved as presented.

Chairman Hunter next recalled that at the last year's annual meeting the Director was to report back at this year's meeting with alternative proposals for establishing employee termination benefits, since at present the Commission does not have a policy on such benefits.

At the Chairman's request, Dr. Joseph presented information on various options for termination benefits for cases in which employees with 12 months of service lose their jobs through no fault of their own and employees with at least 5 years of service resign their positions.

The options presented were based on termination benefits provided for Canadian and U.S. civil servants, as well as those of other international commissions.

After listening to the Director's presentation, Commissioner Beasley noted that because of the complexity of the matter it would be difficult to come quickly to a decision. He suggested that perhaps some time could be allowed over the next few weeks to study the matter. Commissioner Rodriguez of Panama noted that he supported the suggestion of the U.S. delegate that time be allowed to evaluate the various options. He wondered if data could be provided which would in some way allow economic evaluation of the alternative proposals. The Chairman instructed the Director to provide the Commissioners, as soon as possible, with estimates of the costs of implementing the various options. He specifically requested calculations of the costs to the Commission if the various plans had been in effect when the staff reductions were made in 1981/1982. Based on these numbers, the Commissioners would be in a better position to evaluate the various options. He further instructed the Director to initiate correspondence with the Commissioners concerning this matter in an attempt to develop a termination benefits policy as soon as practicable.

There being no further business under this agenda item, the Chairman adjourned the meeting for lunch.

After an extended noon recess, the Chairman reopened the discussion on Agenda Item 6.

Commissioner Rodriguez of Panama asked for permission to read a draft resolution which had been prepared during the noon recess. The resolution called for a quota of 162,000 tons, with one 13,000-ton increment which could be implemented by the Director at his own discretion and a second increment of an unspecified amount which could be implemented after approval of the Commissioners. Commissioner Beasley of the U.S. supported adoption of the resolution. Adoption was also supported by Nicaragua and unanimously approved. The full text of the resolution is as follows:

Recognizing that there continues to be a need for a yellowfin conservation program in 1984 in order that the yellowfin resource may be maintained at a level that will insure continued 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 1984, there should be established an annual quota on the total catch of yellowfin tuna for the 1984 calendar year of 162,000 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 is authorized to

increase this limit by no more than one increment of 13,000 short tons, if he concludes from examination of available data that such increases will offer no substantial danger to the stock. Because of the uncertainty of the effect of environmental factors associated with the 1982/83 El Niño as well as fisheries factors on the estimates of the abundance of the stock, the Director is authorized further to recommend to the High Contracting Parties for their approval a second increment based on the current best estimate of the condition of the stock, and

Finally recommends that all member states and other interested states work diligently to achieve the implementation of such a yellowfin conservation program for 1984.

The Chairman considered work on Agenda Item 6 completed, and moved on to the next agenda item.

AGENDA ITEM 8 - REVIEW OF NEGOTIATIONS CONCERNING TUNA MANAGEMENT AND CONSERVATION IN THE EASTERN PACIFIC OCEAN

The Chairman opened the discussion by noting that this agenda item permitted delegates an opportunity to discuss whether progress had been made during the year toward the formulation of a new tuna treaty for the eastern Pacific Ocean. He noted that during the year the Eastern Pacific Ocean Tuna Fishing Agreement was drafted and signed. Since Costa Rica was the depository government for this convention and since that nation was represented at the meeting, he invited Ambassador Lic. Manuel Freer Jimenez of Costa Rica to lead the discussion by reviewing the convention and its current status.

Ambassador Freer Jimenez commented that his government had been interested in drafting a new treaty to govern tuna fishing since the early 1970's. He noted that such a new treaty should be consistent with the new trends in law of the sea, and any future treaty should incorporate principles embodied in the new law of the sea treaty recently signed in Jamaica. Along some of these lines, his government, along with Panama and the U.S., signed a treaty in March 1983 which deals with the issuance of international tuna fishing licenses. The treaty is open to signature by all coastal states bordering the convention waters, which are defined as those waters bounded by the CYRA and by states participating in the fishery for tunas within the eastern Pacific. Although this agreement is of an interim nature, it establishes the basis for a more permanent agreement. The treaty will become effective as soon as five coastal states have signed and ratified the treaty. Recently Guatemala and Honduras have signed the treaty. The international license will permit fishing within 12 to 200 miles of all participating coastal states. License fees are to be set at a minimum of \$60.00 and a maximum of \$100.00 per net registered ton. A council will be established which will govern activities of the organization by unanimous agreement. Members of the council may be coastal states bordering the agreement area or non-coastal states which are members of the IATTC at the time the agreement enters into force. Proceeds from the sales of licenses will be distributed to member coastal states in proportion to catches made in their zones. Because

the convention can be effective only if all states participate in the agreement, the government of Costa Rica urges all members of the IATTC to participate by signing the agreement. It is also the hope of Costa Rica that this interim agreement will lead to a permanent agreement which will treat issues of allocation and conservation, as well as licensing. The complete text of Ambassador Freer Jimenez's speech is included as Appendix IV.

Chairman Hunter offered the floor to other delegations to speak on this matter, but urged the delegates to please avoid statements of national positions before this meeting. He stated that such statements should be left for future negotiations.

Commissioner Rodriguez of Panama stated that as a signatory to this agreement he would like to explain the reasons why his government decided to participate in this agreement. Historically Costa Rica and Panama are closely linked in international politics. The interests of both countries are served by the agreement, and implementation of the agreement should result in more harmony in the fishery for tunas in the eastern Pacific. It is the hope of Panama that other states present here will view these matters in the same context as Panama and Costa Rica and that such countries will be encouraged to sign the licensing agreement. It is also Panama's hope that as soon as possible the true interests of all states in the area can be defined within a framework of fairness and equity and that this agreement will lead to the establishment once again of a conservation program for yellowfin in the eastern Pacific Ocean.

The delegate from El Salvador, Mr. Mario Bicard, said that he understood the convention was in the process of being ratified by the respective signatories, and asked how the process of ratification is taking place in each country. The Chairman asked each delegation which cared to respond to please do so.

The delegate from Costa Rica, Ambassador Freer Jimenez, stated that, unfortunately, his legislative assembly was extremely busy and scheduled to devote the remaining months to the national budget. Therefore, ratification before the end of the year will be difficult. A special session of the assembly will be called at the beginning of 1984, and ratification is expected at that time.

Mr. Brian Hallman of the U.S. stated that ratification by the U.S. Senate had already taken place. The only step remaining is that the Department of State must deposit the instrument of ratification with the depository government, which is merely a procedural step. He also added that since the U.S. was one of the original signatory nations he wished to make note of U.S. support for the statements of Costa Rica and Panama in their hope to get the organization operational. He stated that his government believes that the agreement represents a fair balance between coastal and distant water states and that it will help to resolve some of the important problems associated with tuna fishing in the eastern Pacific Ocean. He further noted that the agreement will serve to bring a certain stability to the situation, and this stability

will provide an atmosphere for the development of a final and long-lasting agreement. It is the hope of the U.S. that other states of the region will give serious consideration to signing the agreement.

Commissioner Rodriguez of Panama stated that after signing of the agreement in March 1983 Panama placed the Convention before the president and his cabinet, and it was approved. At present it has been placed before the Assembly, and is to be signed next week. Thus by November Panama will be in a position to deposit its instrument of ratification.

Alternate Commissioner Iino of Japan thanked the delegate of Costa Rica for the detailed explanation of the agreement and stated that he would report it back to his government for further study. Though Mr. Iino stated that he was not in a position to speak on this agreement, he had some personal and tentative comments to make and a question to ask. At present all Japanese tuna vessels fishing in the eastern Pacific are operating on the high seas outside the 200-mile limits of any nation. Therefore it is understood that the owners and captains of these vessels are not attracted to a licensing agreement for fishing in the high seas. If Japanese vessels operating on the high seas subscribe to the licensing agreement this might be interpreted by international lawyers as coastal states exercising jurisdiction over highly-migratory species on the high seas. The question addressed to Costa Rica by Mr. Iino was whether, according to Article 3, Paragraph 10, Part b, the council could alter the convention area. Ambassador Freer Jimenez replied affirmatively, but indicated that the coastal states would not try to extend their jurisdiction beyond 200 miles. The question of altering the area of agreement, the CYRA, has been accepted by all states which have signed the agreement.

After these remarks, there being no further discussion, Chairman Hunter closed this agenda item.

AGENDA ITEM 9 - PLACE AND DATE OF NEXT MEETING

The Chairman introduced this subject by stating that it has been the practice of the Commission to rotate the meeting sites among member governments. For a number of reasons, however, it has not been possible to maintain the system of rotation. After consulting among the various delegations, it appears most appropriate to hold the next meeting at the Commission's headquarters in San Diego, California. It would not be considered a meeting to be hosted by the U.S. government, but rather to be held at the invitation of the Commission. After this discussion, all delegations agreed to holding the next meeting of the Commission in San Diego, California. All delegations likewise agreed to the dates of October 16, 17, and 18, 1984.

AGENDA ITEM 10 - ELECTION OF OFFICERS

The Chairman advised the meeting that the office of Chairman should

go to either Japan, Nicaragua, or the U.S., and called for nominations.

Mr. Iino of Japan nominated Commissioner Beasley of the U.S. as Chairman. This was seconded, and Commissioner Beasley was elected Chairman by unanimous agreement.

Mr. Beasley accepted the nomination with thanks, but noted that he was serving in a temporary capacity, and reserved the right to have someone else substituted for Chairman if the need arose. This was agreed to by all delegations. Following this, the Chairman opened the floor to nomination for Secretary. The Commissioner of France, Mr. Garache, nominated Commissioner Luis Rodriguez of Panama as Secretary. This was seconded by Japan and carried unanimously.

Having completed this item, the Chairman moved to Agenda Item 10.

AGENDA ITEM 11 - OTHER BUSINESS

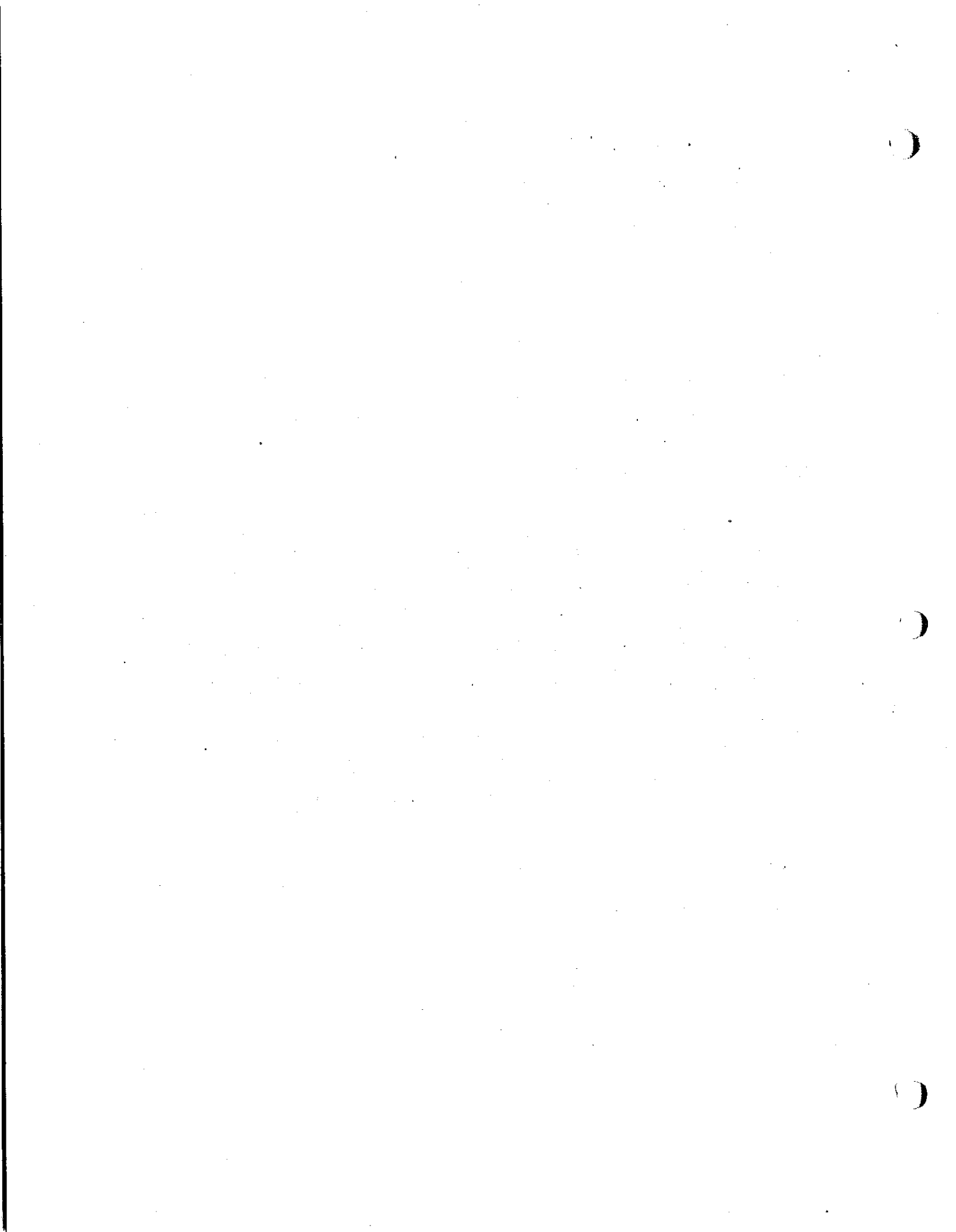
Under this item Commissioner Rodriguez of Panama expressed the hope that the statement by the observer from Costa Rica would be included in the minutes (see Appendix IV). Commissioner Beasley expressed the same opinion on this matter as Mr. Rodriguez. While he had the floor Mr. Beasley expressed his appreciation to Chairman Hunter for a job well done and to Canada for its hospitality and graciousness. He also added that he understood Canada's decision to leave the Commission, and hoped that it would continue to participate in the Commission's activities.

Commissioners Urroz of Nicaragua and Garache of France reiterated the sentiment of Mr. Beasley.

The Chairman concluded this agenda item by stating that it is with regret that he will no longer be actively participating in activities of the Commission. He noted that Canada had invested considerable time and effort in the Commission as an active member, and will continue to take interest in it in the future.

AGENDA ITEM 12 - ADJOURNMENT

The meeting was adjourned at 5:30 p.m.



APPENDIX I

NOTES FOR ADDRESS BY GARY C. VERNON TO OPENING OF
41ST MEETING OF THE INTER-AMERICAN TROPICAL TUNA COMMISSION

It is an honour for me to welcome you to Ottawa on behalf of the Government of Canada on the occasion of the opening of the 41st meeting of the Inter-American Tropical Tuna Commission.

As most of you are aware, this meeting, which we have the pleasure of hosting here in Ottawa, will be the last with Canada's participation as a party to the Convention. Earlier this year Canada gave notice of its intention to withdraw and as of May 17, 1984 Canada will no longer be a member of the IATTC. Our withdrawal is by no means an indication of a loss of interest in tuna management in the Eastern Pacific Ocean. Rather, our decision is the result of a lengthy period of consideration following the termination of a Canadian tuna fishery in the region after 1979. With the end of this fishery we can no longer justify our participation in the Commission.

As I have said, our interest in the conservation and management of Eastern Pacific tuna remains, not least because of the albacore tuna stocks found off the west coast of Canada. We will remain an active observer of events and will monitor closely the operation of the new licencing agreement. Canada would expect to have a significant input in the event of negotiation of a new comprehensive regional conservation and management regime.

As hosts to this session, my Government would like to highlight the value of the work done by the Commission over the years. In this I particularly emphasize the high regard in which the Commission's scientific work is held and would pay tribute to the experience and capability of the Commission staff.

Let me wish you success in your meeting here this week. If there is anything which we can do to make your stay here more pleasant or your work more efficient, please do not hesitate to ask.

Thank you.

APPENDIX II

LIST OF ATTENDEES

COMMISSION MEMBERS

CANADA

Michael Hunter, Commissioner
James S. Beckett, Commissioner
Elaine Feldman
Max Stanfield

FRANCE

Serge Garache, Commissioner
Renaud Pianet

JAPAN

Kenro Iino, Commissioner
Yasuo Takase

NICARAGUA

Jamil Urroz Escobar, Commissioner
Armando Segura Espinoza

PANAMA

Luis E. Rodríguez, Commissioner

UNITED STATES OF AMERICA

Henry Beasley, Commissioner
Wymberly Coerr, Commissioner
Jack Gorby, Commissioner
Robert C. Macdonald, Commissioner
Floyd Anders
Izadore Barrett
Gordon C. Broadhead
David G. Burney
August Felando
Charles E. Finan
Bernard D. Fink
Brian S. Hallman
O.E. Kerns
Harry R. Marshall, Jr.
Tim McCarthy
Barbara Keith Rothschild
Gary Sakagawa
Ed Wolfe

OFFICIAL OBSERVERS

AUSTRALIA

Robert Bain

COLOMBIA

Ana de Ospina

COSTA RICA

Manuel Freer Jimenez

CUBA

Cristobal Pupo-Tellez

EL SALVADOR

Mario Bicard
Jaime González

MEXICO

Manuel Martínez del Sobral
Hilda Bueno
Jesús Robles Villa

VENEZUELA

Carlos Gimenez

FAO

Paul J. Hooker

INTERNATIONAL WHALING COMMISSION

Gary Sakagawa

IATTC

James Joseph, Director
Regina A. Newman

APPENDIX III

COMISION INTERAMERICANA DEL ATUN TROPICAL
INTER-AMERICAN TROPICAL TUNA COMMISSION

c/o Scripps Institution of Oceanography
La Jolla, California 92093, U.S.A.

TELEX 697115
TUNACOM

Date — Fecha: November 3, 1983
Ref: 1684-154-160

Memorandum

From — De: Director of Investigations

To — Para: All Commissioners

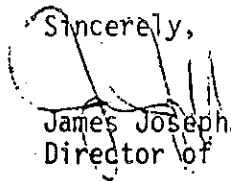
Subject — Asunto: Estimates of dolphin mortality in 1982.

It has come to my attention that the kill-per-ton estimates of dolphin mortality presented in Background Paper no. 6 at the 41st Meeting of the Commission last month are in error as a result of an over-estimate of the tons of tuna caught in association with dolphins for the U.S. fleet. Examination of the data has led the staff to conclude that this over-estimate was caused by errors in calculation rather than errors in the data. Measures have been taken to ensure that such errors are not repeated in future estimates.

The attached sheets are revised copies of page 5 and Tables 4 and 6 from Background Paper no. 6 at the 41st Meeting of the Commission. Please note that there are slight changes in the estimates other than those incorporating tons of tuna caught in association with dolphins for the U.S. fleet because the data have been updated since the previous estimates were made.

I regret the inconvenience caused by the presentation of these erroneous estimates.

Sincerely,


James Joseph
Director of Investigations

JJ/rn
enc.

registered fleet, the non-U.S. registered fleet, the U.S. and non-U.S. strata combined and the unstratified data for each dolphin species or stock grouping. The results for 1982 show that there are no significant differences in estimates of mortality between the kill-per-set and the kill-per-ton estimators for any species or stock grouping. The kill-per-ton estimator gives slightly more precise estimates for the U.S. fleet with coefficients of variation of 13% for offshore spotted dolphins, 39% for eastern spinner dolphins, 22% for whitebelly dolphins, 46% for common dolphins and 10% for total mortality, and for the unstratified estimates with coefficients of variation of 14%, 39%, 22%, 46%, and 10%, respectively. The kill-per-set estimator gives more precise estimates for the non-U.S. estimates but only for total mortality is the coefficient of variation less than 50%.

As in previous years, if the data are stratified by flag of registry there are considerable differences in the precision of the estimates between the U.S. and non-U.S. strata. Precision is acceptable for the U.S. estimates but not for the non-U.S. estimates. If the data are not stratified, the precision of the overall estimates is acceptable. The combined stratified estimates are similar in magnitude and precision to the unstratified estimates.

The U.S. estimates are higher in 1982 than for any of the three previous years. Estimates made last year showed that mortality inflicted by the U.S. registered fleet between 1979 and 1981 appears to have remained relatively constant at a level of about 16,000-19,000 dolphins each year. In 1982, total mortality is estimated to be approximately 23,000 using kill-per-set and 24,000 using kill-per-ton. The kill-per-ton estimate is probably better than the kill-per-set estimate by virtue of a higher correlation between kill and tons and a lower coefficient of variation.

The non-U.S. estimates of about 5,500 (kill-per-set) and 4,400 (kill-per-ton) are lower for 1982 than for 1980 and 1981 but about the same as for 1979. Estimates of total annual non-U.S. mortality varied between 4,000 (kill-per-ton) and 6,500 (kill-per-set) in 1979 and between 16,500 and 31,000 in 1980 and 1981 depending upon year and estimator, although coefficients of variation are high in all cases due to the small samples available for analysis.

The imprecision of the non-U.S. estimates will remain unchanged until a larger proportion of trips from the non-U.S. fleets is able to be sampled. The 8, 8, 4 and 8 trips sampled in 1979, 1980, 1981, and 1982, respectively are not enough to give precise estimates of mortality. Neither were these trips a representative sample of the different non-U.S. fleets operating in the eastern Pacific purse-seine fishery for tunas. Substantial improvements in the precision of non-U.S. mortality estimates will be able to be made only if more countries participate in the Commission's international data collection program.

Method using regression analysis

During the last twelve months the staff has been developing an alternative method of estimating incidental dolphin mortality. This method uses the technique of regression analysis which has several advantages over the ratio estimation method, described above. Ratio estimation uses a very limited amount

TABLE 4. Total and sampled numbers of trips which made dolphin sets, dolphin sets, and tons of tuna caught in dolphin sets for the U.S. and non-U.S. fleets in 1982. Totals were calculated from Commission records.

	U.S.			Non-U.S.		
	<u>Sampled</u>	<u>Total</u>	<u>Coverage</u>	<u>Sampled</u>	<u>Total</u>	<u>Coverage</u>
Trips which made dolphin sets	72	213	33.8%	8	105	7.6%
Dolphin sets	1,828	4,568	40.0%	163	1,881	8.7%
Tons of tuna caught in dolphin sets	19,828	50,891	39.0%	2,197	20,379	10.8%

TABLE 6. Estimates of mortality for 1982, with standard errors in parentheses, for (a) the kill-per-set estimator and (b) the kill-per-ton estimator.

Species grouping	US fleet	Non-US fleets	US + Non-US fleets	All fleets unstratified
(a) KILL-PER-SET-ESTIMATOR				
Offshore spotted	15,728 (2,174)	4,177 (2,619)	19,905 (3,404)	21,559 (3,183)
Eastern spinner	1,924 (747)	485 (298)	2,409 (804)	2,630 (1,070)
Whitebelly spinner	4,003 (907)	439 (246)	4,442 (940)	5,312 (1,304)
Unidentified spinner	98 (60)	0	98 (60)	126 (86)
Common	417 (189)	115 (126)	532 (227)	573 (272)
Striped	475 (424)	127 (120)	602 (441)	651 (606)
Others + unidentified	622 (243)	173 (129)	795 (275)	855 (348)
All species	23,267 (2,527)	5,516 (2,656)	28,783 (3,666)	31,707 (3,681)
(b) KILL-PER-TON ESTIMATOR				
Offshore spotted	16,154 (2,077)	3,358 (2,962)	19,512 (3,618)	21,538 (3,111)
Eastern Spinner	1,976 (769)	390 (298)	2,366 (825)	2,628 (1,101)
Whitebelly spinner	4,112 (923)	353 (296)	4,465 (969)	5,307 (1,334)
Unidentified spinner	100 (62)	0	100 (62)	126 (88)
Common	429 (198)	93 (132)	522 (238)	573 (285)
Striped	488 (429)	102 (97)	590 (440)	650 (613)
Others + unidentified	639 (244)	139 (145)	778 (284)	854 (352)
All species	23,898 (2,458)	4,434 (3,000)	28,332 (3,878)	31,676 (3,641)

APPENDIX IV

ADDRESS OF THE DELEGATED OBSERVER, LIC. MANUEL FREER JIMENEZ,
OF THE COSTA RICAN GOVERNMENT, TO THE 41ST MEETING OF THE
INTER-AMERICAN TROPICAL TUNA COMMISSION, HELD IN OTTAWA IN OCTOBER, 1983

Mr. Chairman:

I am pleased to express to you and the Delegates and Observers of this meeting of the Tropical Tuna Commission, my personal greetings and those of my government.

As many of you probably know, since 1977 Costa Rica has attempted to reach agreement on a Treaty parallel to that of the Tropical Tuna Commission, to regulate completely all aspects of conservation and management of tunas in the eastern Pacific Ocean. We believe that this treaty should derive inspiration from the new principles of the Law of the Sea which have emerged from the Third Conference of the United Nations, and which are now finally molded into the Convention text which the majority of nations signed in Jamaica last December.

While we are attempting to arrive at a new Integral Treaty which would be acceptable to all the coastal States and to the countries which own fishing fleets which have traditionally fished for tunas in the area, the governments of Costa Rica, the USA and Panama have negotiated and signed an Interim Treaty, in which there is established a system of granting international licenses for tuna fishing, as well as the basis or foundation of that which will be the Permanent or Integral Treaty.

The Interim Treaty was subsequently signed by the Governments of Honduras and Guatemala and is presently in the process of ratification according to the constitutional procedures of each of the Contracting Parties, and will be put into force by means of the ratification of at least five coastal states.

The new Treaty is open to adherence by all countries which border the eastern Pacific, as well as all of the current members of IATTC.

As we said, a mechanism is established in the Treaty to issue international fishing licenses which will give access to all of the regulated Area equivalent or similar to the CYRA of the IATTC.

These international licenses will permit the vessels of all the Contracting States to fish in any part of the eastern Pacific, including the 200-mile zone of each of the coastal States which are also members of the Treaty. The amount of the license, specified in the Annex or Protocol, has been set at \$60.00 per net registered ton of the vessel, which equals more or less 5% of the commercial value of tuna in the U.S. market. This amount will be increased by a minimum of \$10 for each additional coastal state which adheres to the Treaty, up to a maximum of \$100 per net registered ton.

It was also agreed that no Contracting Party can prohibit the

importation of tuna to its own market, as a consequence of any enforcement actions which the other Parties may adopt against vessels that fish illegally, or of the application of national laws that penalize such illegal fishing activities.

The Interim Treaty also provides for the installation of an international System or Organization for the issuing of fishing licenses, made up of a Council in which all of the Member States which are coastal states or presently members of the IATTC, are represented, the decisions of which must be made by unanimous agreement.

Also a system is established for the complete reimbursement of the monies collected from the sale of the international licenses based on the amounts of tunas caught within the respective 200-mile zones of each coastal State. The administrative costs will be deducted from the total of the license fees, but this deduction shall not exceed 10% of this amount.

We hope that the present IATTC can continue, by means of special arrangements, to give us its advice on strictly scientific aspects of tunas conservation.

Despite the interim character of the signed Treaty, there has already been incorporated in its clauses the decision of the Member States to continue negotiations in order to achieve the creation of a New Integral System for the Conservation, Management and Exploitation of the Tuna resources of the eastern Pacific (Clause XIV of the Treaty). This new integral system will be based on the recognition of guaranteed fishing quotas for the coastal States, based, among other things, on the criterion of the concentration of the tuna resource, the effective amount of which will be determined in that future treaty.

The migratory nature of tunas renders impractical or inefficient a scheme based on exclusively national boundaries of each Coastal State in its 200-mile zone. In effect, no State can develop its own tuna fleet if it must restrict itself to fish only in its own exclusive economic zone, since tunas do not recognize frontiers nor can one be assured of the existence of the resource at all times in given areas.

On the contrary, if a country acquires the right to catch the amount of fish normally found in its own Zone (determined on the basis of reliable statistical data), if it has the right, let's say, to catch this amount in all of the Regulatory Area of the Treaty, then the basis necessary for the rational development of its own fleet has been established. Also it is unrealistic to demand that a tuna fleet pay for 3, 4, 5 or more national licenses, in accord with the geographic areas to which the resource is migrating. An impractical system would do nothing more than stimulate illegal fishing, which would require that the coastal States spend enormous amounts of money to maintain an effective system of control and fines for illegal fishing. Also it could lead to a massive concentration of fishing on the high seas directly off the 200-mile zones. All this would bring nothing more than harm to everybody and would threaten the abundance of the resource.

Of course, all the contracting States of the Interim Treaty are aware and, therefore, have recognized in the Preamble that: "a conservation regime for the tuna of the eastern Pacific cannot be effective nor fair unless it be of an integral nature and have the participation of all those States which fish for tunas on a significant scale in that area, in relation to the needs of conservation.

Therefore, Costa Rica considers it of great importance that all the States that are IATTC members, and especially the coastal ones, join this Interim Treaty and participate with the States in the negotiation of the text of the Permanent Treaty. We estimate that this new Treaty could be negotiated within a two-year period coinciding with the probable entry in force of the new UN Convention on the Law of the Sea.

We sincerely believe that we are at the point of arriving at a consensus of all states in the establishment of a fair and rational regulation regarding the use of the riches of the sea. But if a distorted vision of our own interests impedes arriving at these goals, perhaps the time will come in which we will regret the loss of this opportunity, allowing the fight for our interests to take the place of cooperation, which would certainly be to the detriment of all.

Mr. Chairman, we believe that the signing of the Interim Treaty marks the first step in the right direction and will lead quickly to the establishment of a Permanent Regime established on bases that have already been delineated in the present Interim Treaty.

The only thing to add, of course, is that we do not pretend to speak for other Delegations nor to reflect their points of view. The terms of this Statement should only be interpreted to be those of the Costa Rican delegation.

I wish all success for this meeting of the IATTC.

