

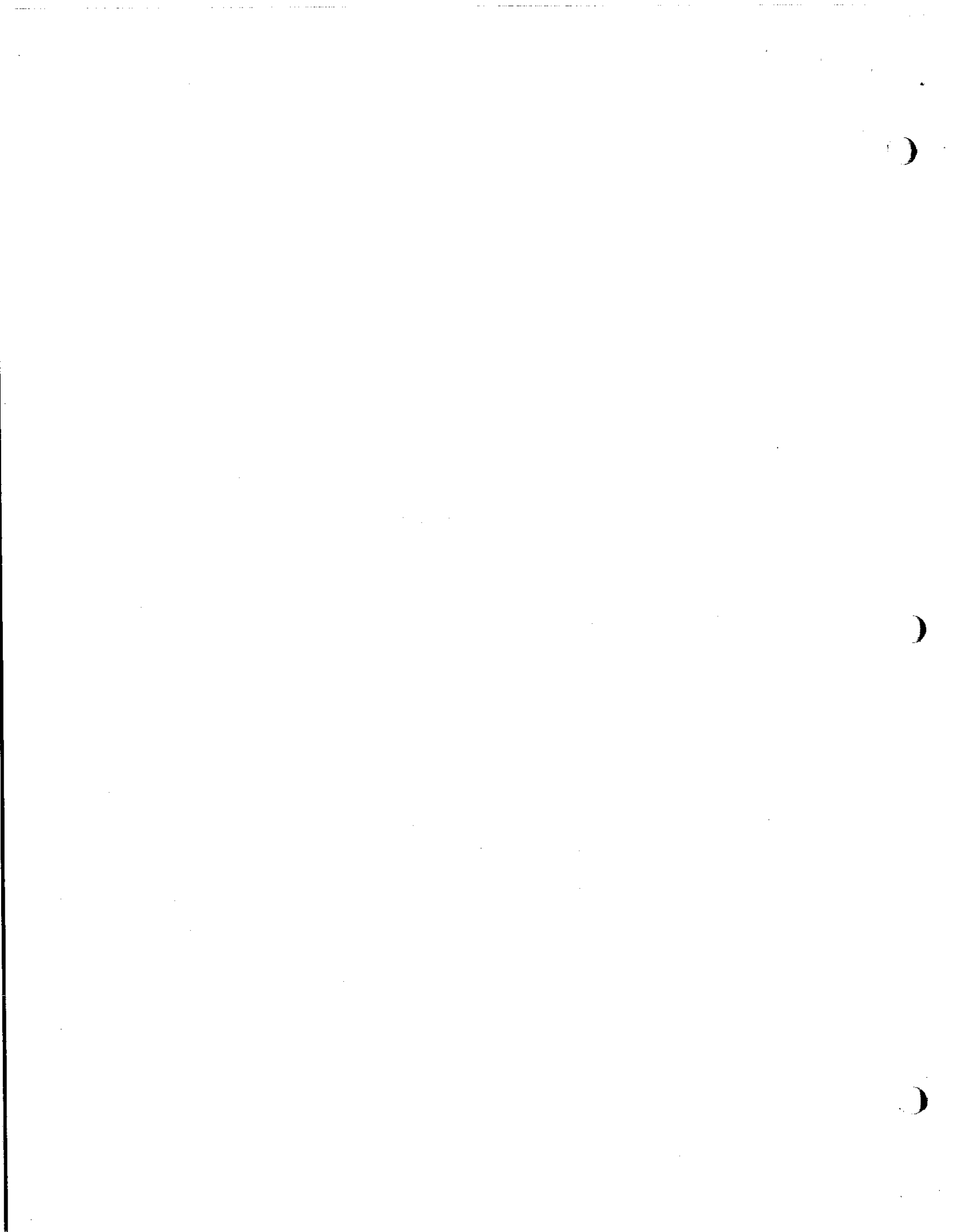
INTER-AMERICAN TROPICAL TUNA COMMISSION

SUMMARY MINUTES OF THE FORTIETH MEETING

October 19-21, 1982  
La Jolla, California

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Chairman: Michael Hunter



AGENDA

40TH MEETING OF THE INTER-AMERICAN TROPICAL TUNA COMMISSION

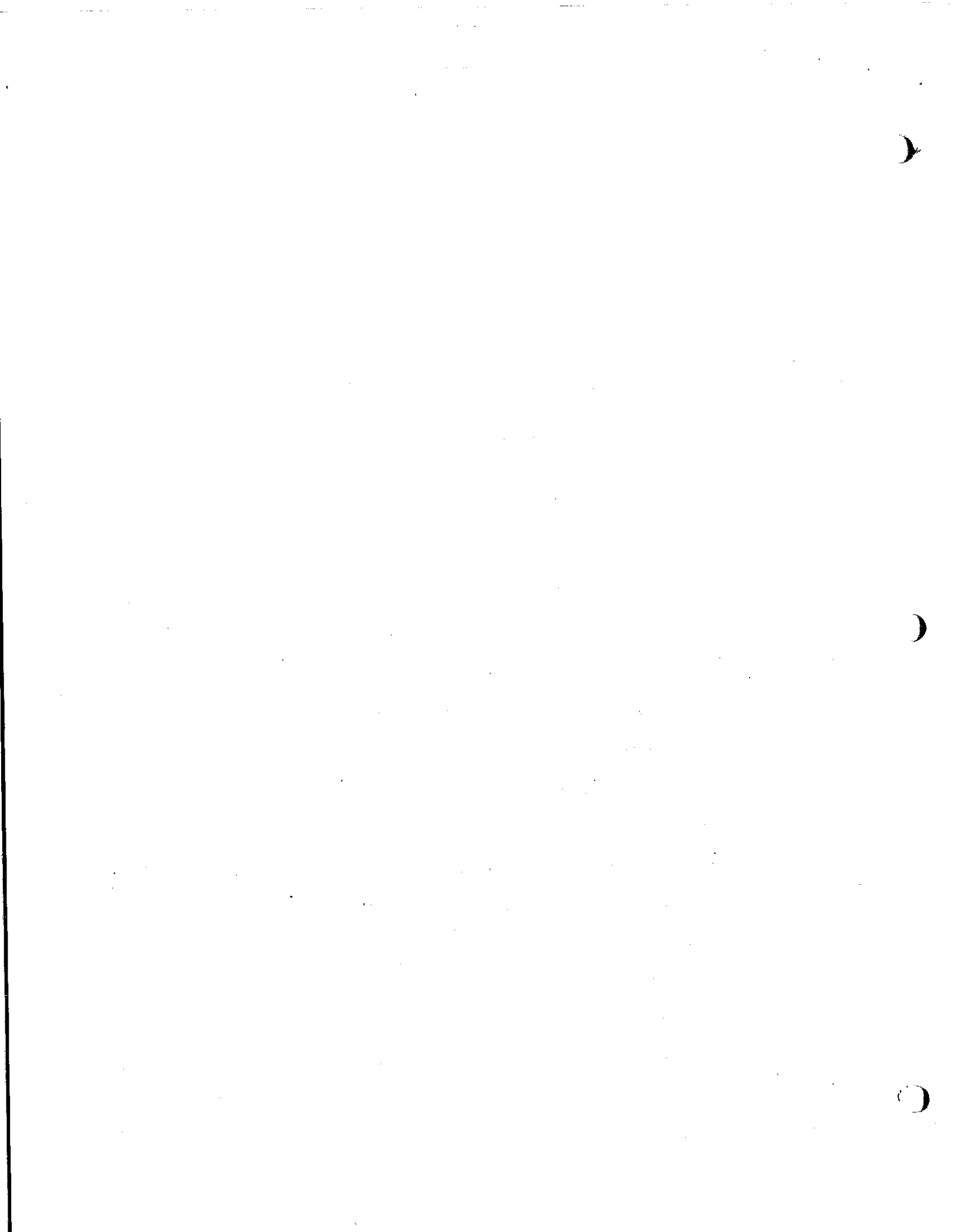
19, 20, 21 October 1982

La Jolla, California

1. Opening of the Meeting
2. Consideration and Adoption of the Agenda
3. Review of Current Research
4. Tuna-Porpoise Program
5. The 1982 Fishing Year
6. Condition of the Yellowfin Stock and Recommendation for 1983
7. Recommended Research Program and Budget 1984-1985
8. Review of Negotiation towards a New or Modified Tuna Convention
9. Place and Date of Next Meeting

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10. Election of Officers
11. Other Business
12. Adjournment



SUMMARY MINUTES OF THE FORTIETH MEETINGAGENDA ITEM 1 - OPENING OF THE MEETING

The 40th meeting of the IATTC was opened by the Chairman, Mr. Michael Hunter of Canada, at 10:35 AM, October 19, 1982, at the La Jolla Woman's Club in La Jolla, California. Mr. Hunter asked the leaders of the delegations to introduce themselves and their delegations. 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 I.

AGENDA ITEM 2 - CONSIDERATION AND ADOPTION OF THE AGENDA

The Chairman noted that a provisional agenda had been circulated in May 1982, and asked if it was acceptable to all delegations. There were no comments, and the provisional agenda was adopted. The Chairman then proposed that the morning session continue until approximately 12:30 PM with the afternoon session beginning at 2:00 PM. On following days morning sessions could tentatively be scheduled to begin at 9:30 AM. There was no objection to this schedule, and 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. Dr. Joseph began by noting that in years past the usual practice has been for the Director of Investigations to present the whole review of current research. This year, however, the Annual Meeting is being held in La Jolla where most of the Commission's research staff is based. The Director indicated that he would take advantage of this opportunity and let his staff present most of the research review.

The Director noted that 1982 was the 33rd year of the Commission's research program. The research objectives are spelled out in the Convention establishing the Commission. They are to carry out scientific investigations on tunas and other species involved in the tuna fisheries and, on the basis of these investigations, to make recommendations to member governments designed to maintain tuna populations at levels of abundance that will permit maximum sustained catches. To achieve these objectives requires that diverse types of research be pursued. The most fundamental requirement is to collect, on a continuing basis, a variety of data describing the fishery itself. These include catch and effort data, size frequency samples, and vessel characteristics, 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 tuna from the eastern Pacific are landed. At present, the Commission maintains such offices in California (San Pedro and San Diego), Mexico

(Mayaguez)

(Ensenada), Panama, Puerto Rico, Ecuador (Manta), and Peru (Trujillo). Commission logbooks carried by most of the vessels in the eastern Pacific fleet provide detailed information on catch and effort. These logbooks are abstracted by Commission personnel when vessels complete their trips and return to port. Length-frequency samples are also taken at that time.

The Director also noted that tagging studies have played an important role in the Commission's research program. Unfortunately, in 1982 no tagging was possible in the eastern Pacific due to a major cutback in funding. However, a modest northern bluefin tagging program was undertaken in Japanese waters in cooperation with the Far Seas Fisheries Research Laboratory in Japan.

The Commission has undertaken a project to study the early life history of tunas at a field station to be established in Panama. One important objective in undertaking this project will be to shed light on the problem of predicting recruitment of tunas to the fishery. This is distinct from the problem of estimating recruitment after it has taken place as the Commission has done for many years. Prediction of recruitment can play an important role in managing a resource, but developing such predictions for tuna has always been a major problem. Traditional approaches like egg and larval surveys or development of spawner-recruit relationships have limited application to a high-fecundity, wide-ranging species such as yellowfin tuna. But through a more detailed understanding of early life history, it may be possible to make significant progress on the problem of recruitment prediction. The Director emphasized the long term nature of these and other studies to be undertaken at the Panama facility, but stressed that although payoffs may be several years in the future, it is important to get started now.

The Commission has benefited greatly from the support and cooperation of the Government of Panama in initiating the early life history project. In 1981 the Pacific coast of Panama was surveyed and a suitable site was located at Bahia Achiotines near the west entrance to the Gulf of Panama. The water quality is excellent at this site, the 100-fathom isobath is not far offshore, and populations of several Scombrids occur in the area. A 10-hectare parcel of land has been purchased, and the Panamanian Government has put in an access road and surveyed the site. Also, preliminary plans for a laboratory facility, fish holding ponds, and living quarters have been prepared. It is hoped that limited research can commence by late 1983 or early 1984. In the meantime, the Commission is utilizing the Smithsonian Institution facility in Panama City to conduct preliminary studies on maintaining Scombrids in tanks.

At this point the Director turned the floor over to Dr. Alex Wild of the IATTC staff to discuss his studies on using otoliths to age tuna. Dr. Wild began by briefly reviewing several ways in which a successful method for age determination could potentially benefit the Commission's research and management program. Historically the Commission age and growth studies have relied on following modal progressions in length frequency diagrams. The shortcoming of this approach is that it is

difficult to use for larger fish so an alternative approach was needed. Unfortunately tropical tunas do not form annual marks on hard parts, but it has been speculated that microscopic daily growth increments are recorded on otoliths. To examine this hypothesis, in 1976 a number of tunas were captured, injected with tetracycline, tagged, and released. The tetracycline binds with calcium at the point of active growth on the otolith forming a distinctive mark. When the tagged fish is recovered the number of increments from the mark to the edge of the otolith can be determined. The 1976 experiment yielded 51 recoveries of tetracycline injected yellowfin. The length range at time of release for these fish was 40-110 cm. Within this range it was determined that yellowfin do deposit one increment daily.

Studies have also been conducted on the relationship between body size and total number of otolith increments. About 200 yellowfin ranging in length from 30 to 170 cm. were studied. The length vs. increment number relationship appears to be linear to about a length of 100 cm. Thereafter, growth slows as the asymptotic size is approached. ?

Two aspects of these otolith studies are of concern. One deals with the related problems of reproducibility of counts between readers and the possibility of bias being introduced when a given otolith is examined repeatedly by a single reader. The second concerns whether or not the one increment per day rule holds outside of the 40-110 cm. size range. A 1980 tetracycline experiment focused on larger fish (50-150 cm., 300 recoveries so far). Growth prior to 40 cm. will be studied in the future.

With the conclusion of Dr. Wild's presentation, Dr. Joseph called on Dr. John Calaprice of his staff to describe his 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 small areas of a hard part with a proton beam produced by a cyclotron. This produces back-scattered X-rays that can be analyzed spectroscopically to determine the chemical composition of the target area. Studies have focused primarily on northern bluefin in the Atlantic. Initially vertebrae of 2 and 3 year old bluefin from off the east coast of the US and from the eastern Atlantic (Bay of Biscay) were compared, and it was established that these two groups could be clearly distinguished from one another. The two groups of juveniles were presumed to have originated from spawning in the Gulf of Mexico and the Mediterranean Sea respectively. Evidence of seasonal patterns in the microchemistry of hard parts was also noted by sampling along transects extending outward from the center.

Attention next turned to analysis of giant bluefin to determine the degree of mixing between fish from the two spawning areas. Considerable difficulties were encountered in obtaining adequate samples of giant bluefin hard parts, but eventually suitable samples were secured and analyzed. It was concluded that out of 21 giants collected from the western Atlantic, 6 suggested an origin in the Mediterranean, while 3 out of 21 giants from the eastern Atlantic suggested an origin in the Gulf of Mexico. These bluefin studies are being carried out under a

contract with the National Marine Fisheries Service and in close cooperation with personnel of the NMFS Southeast Fisheries Center. All cyclotron work is presently carried out at the California Institute of Technology in Pasadena, and a semi-permanent facility has been established there.

In addition to the bluefin studies some preliminary work has been done on yellowfin tuna from the eastern Pacific. Dr. Calaprice noted that yellowfin from the northern and southern parts of the eastern Pacific can be separated from one another. Commissioner Beckett of Canada asked about future plans for the yellowfin studies. Dr. Calaprice and Dr. Joseph explained that the present emphasis is on sample collection. This will continue for several years in order to follow cohorts through the fishery, and spectral analysis of the samples will not be completed for some time.

Following Dr. Calaprice's presentation, Dr. Joseph called upon Mr. Robert Olson to discuss his work on the feeding ecology of yellowfin tuna in the eastern Pacific. Mr. Olson began by noting that information on feeding behavior is an important input to multispecies fisheries management which is concerned with both predator and prey populations. To determine total food intake directly, both the species composition of the diet and the amount consumed of each type of food item must be determined. Olson then presented results of analysis of stomach contents of yellowfin samples from several offshore areas. In these samples other scombrids were the dominant food item, especially frigate tuna. Squids and flying fish were also important food items. These data on stomach contents can be combined with data on gastric evacuation rates as determined in laboratory studies to try to work out a daily energy balance model for tuna. There are serious problems with this approach, however. When yellowfin are sampled in the field there is a strong tendency to underestimate food intake because of regurgitation, digestion after death, and the fact that tuna do not feed while they are in a seine net. An alternative approach to determining daily energy balance is to determine how much energy input in the form of food is required to provide for growth, locomotion, and maintenance of basic bodily functions. It appears that locomotion is the biggest energy user. In determining energy expenditure for locomotion it is necessary to estimate tuna swimming speed, and recent sonic tagging studies have been helpful in this regard. In developing models of daily energy requirements, reproduction requirements have so far not been taken into account. From work done to date, preliminary estimates have been developed of energy transfer rates for the total eastern Pacific yellowfin population. It is estimated that yellowfin consume 16 thousand tons of food items per day or about 6 million tons per year. Of this amount, it is estimated that frigate tuna make up 2.4 million tons.

At the conclusion of Mr. Olson's presentation, Chairman Hunter noted that it was time for the luncheon break, and he adjourned the meeting at 12:08 PM. The meeting was reconvened by the Chairman at 2:13 PM. Commissioner Beasley asked for the floor. On behalf of the US Tuna Foundation, he invited all members of delegations to a cocktail party at



6:00 PM, Wednesday, October 20, at the La Valencia Hotel in La Jolla.

The Director then stated that he and members of his staff would next report on research on tuna species other than yellowfin. He began with a discussion of skipjack research, noting that much of the material that he would present could be found in Background Papers 1 and 4. In the Pacific Ocean skipjack catches constitute roughly 1/2 of the total tuna catch and exceed those of any other tuna species. The Pacific skipjack fishery has expanded greatly with annual catches increasing by approximately 300 thousand metric tons over roughly the last decade. In the eastern Pacific catches generally rank second to those of yellowfin and in recent years have averaged about 130 thousand short tons annually, although they are extremely variable from year to year. Within convention waters skipjack occur in two areas lying north and south of a band of very warm water that separates them at about 15°N latitude. Tagging studies have shown very little mixing between the two areas. In typical years roughly a 1/3 of the eastern Pacific skipjack catch is taken in the northern area with 2/3 coming from the southern area. However, 1980 and 1981 were major exceptions with northern catches being unusually high. Areas of skipjack abundance have historically changed considerably. Prior to the 1970s the fishery concentrated on smaller fish off of Ecuador. The early 1970s were marked by strong "El Niño" conditions off of South America and a sharp decline in the Peruvian anchoveta population. The center of skipjack abundance shifted to off of Central America and larger fish were taken. More recently, smaller fish are being taken again, but the center of abundance has stayed north.

It is known that the skipjack taken in the eastern Pacific do not originate there. They migrate into the area, are present for a few months, and then they leave. Considerable effort has been devoted to determining skipjack migration routes by tagging in the eastern and central Pacific. It is known that some relationship exists between the northern concentration of skipjack in the eastern Pacific and the Hawaiian population because skipjack tagged off of Mexico have been recovered off of Hawaii. However, abundance does not vary in the same way in the two areas, and the implications for management are unclear. Nothing is known about what happens to the southern concentration when it leaves the eastern Pacific. The origin of eastern Pacific skipjack is also unclear. It was considered quite possible that these fish, especially those in the southern concentration, came from the central Pacific area around the Marquesas, Tuamotu, and Society Islands. Beginning in the fall of 1977 approximately 30 thousand skipjack were tagged there to test this hypothesis. A number of recoveries were made in the central and western Pacific, but none were made in the eastern Pacific. This suggests that fish in the size range tagged (mostly 45 to 55 cm. in length) do not migrate to the eastern Pacific although it is still possible that smaller juveniles (which are abundant in the central Pacific) do make such migrations.

Although the origin of eastern Pacific skipjack is unclear, it has been observed that years with warm surface waters seem to be correlated with good catches 1 1/2 years later when fish are available to the

fishery during their second year. For several years efforts have been under way to predict skipjack abundance based on this observation. One predictor is known as the Southern Oscillation Index. This is an index of the pressure difference between the South Eastern Pacific high-pressure cell and the South Western Pacific low-pressure cell. A high index is correlated with strong trade winds in the central Tropical Pacific, greater mixing and equatorial upwelling, lower surface temperatures, and poor subsequent skipjack catches in the eastern Pacific. A low index is interpreted in the opposite manner. On the whole, attempts to relate skipjack abundance to environmental conditions have not been as satisfactory as might be desired, but studies along these lines will continue and prediction may well be improved.

As far as management of skipjack is concerned, the staff recommends that no measures be taken at the present time. The relationship between catch and catch per unit of effort has been examined, and there does not seem to be any correlation between these variables. Normally, when a fishery is having a direct effect on a population, catch per unit of effort varies inversely with catch. That is catch per unit of effort decreases as catch and effort increase. Because this is not the case in the eastern Pacific and because skipjack are available for only a short period, the best strategy appears to be to exploit skipjack as heavily as possible whenever and wherever they become available in the eastern Pacific.

With his review of skipjack research completed, the Director called on Dr. William Bayliff to discuss bluefin tuna research. The surface fishery in the Pacific for northern bluefin tuna takes place off California and Baja California and off Japan. Virtually all of the eastern Pacific catch is taken by purse-seine gear. In the western Pacific various gears are involved, including purse seines, trolling, traps, gill nets, and longlines. Year-to-year catch fluctuations are great, ranging from 1 to 18 thousand short tons in the eastern Pacific and from 5 to 36 thousand short tons in the western Pacific. Bluefin spawning takes place south of Japan in the spring. Young fish from such spawning are first exploited by a July-September troll fishery off Shikoku Island when they are 3 to 6 months old and weigh less than a pound. From tagging studies it is known that some of these young fish then head for the eastern Pacific (first group of migrants) while others remain in the western Pacific. Those that remain enter a January-April troll fishery south of Kyushu when they are 9 to 12 months old and weigh between 3 and 9 pounds. Following this fishery, some fish head for the eastern Pacific (second group of migrants), and others remain in the western Pacific where they continue to be exploited by various gears, especially purse seines. The first group of migrants arrives in the eastern Pacific in June or thereabouts when they are about 14 months old and weigh between 9 and 17 pounds. The second group arrives roughly a year later when they are about 26 months old and weigh from 17 to 30 pounds. It is not known how long individual fish remain in the eastern Pacific. Tagging studies suggest that some remain as long as 2 years, but scale studies indicate that as many as six age groups occur in the eastern Pacific. Eventually, however, all survivors return to the western Pacific where they join those that did not make the

trans-Pacific migration. It is of interest that the growth rate of ocean crossers is apparently less than that of fish that stay in the western Pacific. Eventually the bluefin return to the spawning area south of Japan and the whole cycle is repeated. Northern bluefin are also taken in small quantities by various gears in more southerly parts of the western Pacific, especially around New Zealand. These fish probably also originate from spawning south of Japan. Studies of hard parts including scales, fin rays and spines, otoliths, and vertebrae are currently in progress, and it appears that some of these may be useful for aging bluefin. These and other studies should shed further light on the population dynamics of northern bluefin tuna.

Following Dr. Bayliff's presentation Dr. Joseph called on Mr. Kurt Schaefer to discuss black skipjack tuna. The genus Euthynnus consists of three species, one of which, the black skipjack, is found in the eastern Pacific. Landings of this species have been low averaging only 2400 metric tons during the 1977-80 period. The species is locally abundant, however, and catches are likely to increase in the future. For this reason the Commission is compiling and analyzing statistical data on the fishery and conducting various studies aimed at developing estimates of life history and population dynamics parameters. Tagging studies have been conducted and since August 1980 an intensive sampling program for lengths, weights, stomachs, and gonads has been in progress. Black skipjack are distributed from southern California to southern Peru and around offshore islands of the eastern Pacific, but most catches are made just north of the Equator off South and Central America. The average weight of black skipjack in the eastern Pacific catch is about 3 pounds. No significant differences are noted between sexes in the first half of the year, but in the second half larger males dominate over females at lengths over 50 cm. In 1979, 170 black skipjack were tagged off southern Mexico and in the Cocos Ridge area off Central America. There were only 6 returns, but one individual had moved 970 nautical miles from off southern Mexico to off Colombia, the longest documented migration to date. In the spring of 1981 over 800 black skipjack were tagged in the Cocos Ridge area, and about 70 fish have been recovered. These recoveries indicated a general tendency to move toward the coast from Colombia to Costa Rica. In the fall of 1981 over 400 black skipjack were tagged around Clipperton Island, well offshore from the coast of the Americas. Recoveries so far suggest that these fish have remained well offshore. Analysis of tagging data and biological samples will continue in order to shed more light on growth, reproduction, and feeding habits.

At the conclusion of Mr. Schaefer's talk, Dr. Joseph indicated that this concluded the review of current research by the Commission staff. Chairman Hunter thanked all staff members who had made contributions and noted that they had been very interesting. He then noted that Dr. Robert Kearney was representing the South Pacific Commission as an Observer, and asked Dr. Kearney if he could comment on the activities of his organization.

Dr. Kearney stated that the South Pacific Commission consisted of 26 nations scattered throughout an area extending from 130° East to 130°

West longitude and from 20° North to 30° South latitude. The Commission area encompasses almost 30 million square kilometers. Commission members are, for the most part, very small nations with very limited economies. Geographically, the 200-mile zones of these nations present a much more complex picture than that found in the eastern Pacific. Also in contrast to the nations of the eastern Pacific region, the tuna resources of these small central and western Pacific nations are very large with respect to the overall country economies. Therefore, it is not surprising that the South Pacific Commission focuses its biggest effort in the fisheries field, although it works in other areas as well. Within the Commission area the tuna catch amounts to about 300 thousand metric tons, while about 500 thousand metric tons are taken from the area within which Commission research is conducted. Longline fishing used to dominate the fishery, but since 1970 Japanese baitboat fishing has increased sharply. More recently purse seining, has increased sharply. In 1977 less than 10 thousand tons were taken by this method, while in 1982 the purse-seine catch exceeded 150 thousand tons. Presently, about 27 US and 33 Japanese seiners operate in the central and western Pacific.

Dr. Kearney indicated that research in his region was quite similar to that conducted in the eastern Pacific with collection of catch and effort statistics and tagging studies receiving major emphasis. In a recent 3-year tagging program 140 thousand skipjack and 10 thousand yellowfin were tagged. To date there have been about 6500 recoveries. The most important conclusion of this study so far is that the skipjack resource consists of a very large standing stock amounting to about 3 million tons. This stock has a very high turnover rate of about 19% per month, so that annual production amounts to about 6 million tons. Given this large and highly dynamic resource, a rapidly developing fishery, and the geographical complexity of the region, gear and country interactions are certain to become increasingly important.

With the conclusion of Dr. Kearney's presentation, the Chairman noted that this completed consideration of Agenda Item 3 reviewing current research. A coffee break from 3:30 PM to 4:05 PM followed.

#### AGENDA ITEM 4 - TUNA-PORPOISE PROGRAM

The Chairman called on Dr. Joseph who indicated that Dr. Philip Hammond of this staff would present this agenda item. Dr. Hammond began by saying that throughout his presentation (and in Background Paper No. 6) the term "dolphin" would be used rather than the term "porpoise" in conformance with the currently accepted practice.

The tuna-dolphin program began full operation in 1979 with Commission objectives being to maintain high tuna productivity, to ensure survival of dolphin stocks in perpetuity, and to avoid unnecessary or careless dolphin mortality. Despite a decrease in the amount of yellowfin caught in association with dolphins in recent years, this method of fishing is still important accounting for approximately half of the total yellowfin catch in recent years.

Data collection is a key element of the Commission program. Observers are placed on vessels of the international fleet that operates in the eastern Pacific. These observers gather a variety of data that can be used to estimate dolphin mortality levels and population sizes. Only two IATTC members, Panama and the USA, currently have flag vessels operating in the eastern Pacific that catch tuna in association with dolphin, and they both participate in the observer program. Among non-member nations, Costa Rica and Venezuela participate in the program, and the Cayman Islands (Great Britain) and El Salvador have agreed to participate in the future. The Commission had planned to place observers on a certain number of Mexican seiners in anticipation that an agreement to do so could be finalized, but thus far nothing has been finalized. This is especially unfortunate because among the non-US fleets, Mexico's is by far the largest. Altogether 80 observer trips were originally scheduled for 1982. As of October 1, 41 trips had been completed or were in progress. Differences in the number of trips planned and the number actually undertaken reflect the problem with Mexico just mentioned and a number of other factors such as flag transfers, departure of vessels from the eastern Pacific, sinkings, etc.

So far in 1982 there have been 25 trips completed with Commission observers. On these trips 768 sets were made taking 8,349 tons of yellowfin associated with dolphins. In these sets 2,685 dolphins were killed, about 2/3 of these being offshore spotted dolphin. From these data as well as from data collected by their own observers aboard US flag vessels, the US National Marine Fisheries Service estimates 1982 mortality incidental to purse seining by US vessels as of September 26 to be 16,700 animals. At the end of the year the Commission staff will estimate both the US and the non-US kill. No current estimate of the non-US kill to date has been made because only 5 non-US trips have been sampled so far.

Data on kill rates by species for the international fleet during the 1979-81 period were analyzed in 1982. Mean kill-per-set and mean kill-per-ton of tuna caught show striking differences depending on species being set upon. These measures of kill rates are lowest for pure schools of spotted dolphins and considerably higher for eastern spinner, whitebelly spinner, common, and striped dolphin. Mixed schools of spotted and spinner dolphins also showed higher kill rates than pure spotted dolphins schools.

Dr. Hammond then summarized a detailed analysis of total mortality during the 1979-81 period. This analysis was conducted in response to a request from the International Whaling Commission. The analysis was based on IATTC and NMFS observer data and the IATTC tuna data base which was used in scaling results for trips with observers up to all trips. For each species or stock, kill-per-set and kill-per-ton estimates were developed for each year and for the entire 3-year period. This was done with the fleet stratified into US and non-US components and for the fleet as a whole without stratification. A study of possible bias was also undertaken which was based on Monte Carlo simulation techniques. The detailed results of these analyses are presented in Background Paper No. 6. An important conclusion was that available data are insufficient

to establish whether or not US and non-US kill rates differ significantly from each other. In the stratified model where it is assumed that these rates can differ, kill-per-set and kill-per-ton estimates of mortality are quite similar for the US fleet. These estimates are quite different for the non-US fleet, but the differences are not significant due to the small number of non-US observer trips. In the non-stratified model the kill-per-set and kill-per-ton estimates are similar. The principle need is to obtain more data from the non-US fleet.

During the last year IATTC and NMFS observer data for the 5-year period 1977-81 were analyzed in detail in order to determine if any significant trends in dolphin population abundance can be detected and also to identify aspects of the estimation procedure that need further research. In developing population estimates, a line transect sampling technique is used. A tuna vessel proceeds along its path as it searches for dolphin schools with which tuna may be associated. When a dolphin school is sighted, its size is estimated, and its location with respect to the vessel's search path is determined. From the resulting data the size of the search area can be estimated and the density of dolphin schools within that area determined. School density is multiplied by mean school size, and the result is expanded according to the size of the area occupied by the dolphin stock in question to get the final result, an estimate of the size of the total population. This line transect estimation procedure involves several assumptions. Sampling must be random or schools must be randomly distributed. All measurements of angles and distances must be without error, and school sizes must be determined without error. It is also assumed that schools do not move in response to the vessel, that all schools on the track line are detected, and that the probability of sighting a school off of the track line is independent of school size. Some of these assumptions are probably not fully satisfied as discussed in Background Paper No. 6. Population estimates were made in several different ways. The most detailed and interesting approach involves stratification by fishing mode (dolphin fishing vs. school fishing) and by searching intensity. School density and population estimates were made for the offshore spotted, eastern spinner, and whitebelly spinner dolphin populations. When estimates over the 1977-81 period are plotted, certain trends are apparent. For both offshore spotted and eastern spinner dolphin, school density seems to be relatively constant, but the population estimates appear to trend downward due to a decrease in mean school size. For whitebelly spinners, school density, mean school size, and population size estimates all trend downward. In presenting these results, Dr. Hammond emphasized that the statistical significance of these apparent trends is quite questionable because confidence intervals about individual estimates generally overlap. Also, declines in mean school size may very well reflect changes in observer training procedures. Efforts to improve dolphin population estimation procedures, both at sea and analytically, will continue.

In November and December of 1980 the Commission, in cooperation with the NMFS and the Instituto de la Pesca in Mexico, conducted an aerial survey in the eastern Pacific. One objective of this survey was

to obtain aerial photographs of tuna schools that could be used to estimate school size and school structure and to obtain information on growth and reproduction from analysis of length frequencies. Dr. Hammond briefly reviewed some of the technical problems in processing the photos to obtain length-frequency data and noted the photos of 18 schools have been processed so far. These schools (mostly Costa Rican spinner dolphin schools) included about 14 thousand animals. Length-frequency plots of individual Costa Rican spinner schools showed a dominant mode representing adults that had completed their growth. Several modes representing sub-adult dolphins could also be discerned. Although little is known concerning the biology of Costa Rican spinners, it appears that the modes for smaller dolphins at the left of the distributions represent seasonal pulses in reproduction at intervals of six months.

Finally, Dr. Hammond reviewed the Commission's gear program. Extension activities have continued and have involved interviews with captains who have had high mortality sets, assisting in construction of nets, distribution of literature and film materials, and other related activities. Sea trials were undertaken to test the efficacy of a backdown board that had been designed by the Commission staff. This backdown board was attached to the seine and by towing it during backdown it was hoped that the backdown channel could be held open, thereby avoiding net collapse, an important source of dolphin mortality. Unfortunately the Commission design proved to be too small to achieve the desired result. It is now clear that to be effective a backdown board would have to be too big to be of any practical use and no further tests of this concept are planned. A floodlight system for lighting the backdown channel during sundown sets (i.e., evening sets) was designed. Only 11.4% of all sets are sundown sets, but they account for 33.2% of all dolphin mortality. During 1982 floodlights have been loaned to 13 vessels operating in the eastern Pacific. Ten have completed their trips, and 3 vessels had the opportunity to use the lights on sundown dolphin sets. Each of the Captains involved was pleased with the additional illumination and has expressed interest in obtaining a floodlight for his vessel.

Upon the completion of Dr. Hammond's presentation the Chairman recognized the observer from Spain, Mr. Hector Quiroga. Mr. Quiroga read a prepared statement that was distributed to the attendees. It is attached to these minutes as Appendix II. The statement notes that 4 Spanish flag vessels operated in the eastern Pacific in 1981. These vessels had a combined carrying capacity of 4765 tons and did engage in fishing on dolphin schools with spotted dolphin being the primary species encountered. Based on available information, it is estimated that dolphin mortality attributable to these 4 Spanish vessels reached 3470 individuals in 1981. The 4 vessels have operated in the eastern Atlantic during 1982.

The Chairman then recognized Dr. Joseph who thanked Spain for the information on dolphin mortality just presented. He also encouraged Spain to participate in the Commission's observer program in the event that they return to the eastern Pacific.



Noting the time, the Chairman deferred further discussion and questions concerning Agenda Item 4 until the following morning, and recessed the meeting at 5:10 PM.

The fortieth meeting reconvened on Wednesday, October 20, 1982 at 9:43 AM. The Chairman called for questions and comment on the tuna-dolphin research discussed the previous day.

US Commissioner, Mr. Jack Gorby, was recognized. He asked if it is assumed that all dolphins are at the surface when making aerial surveys and taking photos, and if so, how does one know that he is seeing all of the school members. Dr. Hammond responded. It is believed that most animals in a school can be counted, but not all of the animals that are counted can be seen clearly enough for length to be measured. Dolphins are generally close to the surface, especially when moving fast. To get good photos a preliminary pass is made with the plane to get the school running. Dr. Hammond also mentioned that in 1979, during a research cruise on the purse seiner Gina Ann, dolphin schools were photographed from a helicopter and then captured and counted out of the net.

Commissioner Beasley of the US took the floor to note that although dolphin mortality had been reduced, not all nations were participating equally in these efforts. Better participation by the non-US fleet is needed. Dr. Joseph responded to this comment. He emphasized the importance of getting Mexico's cooperation in the observer program. Mexico is the key non-US participant in the fishery because of its large and still growing fleet.

There were no further comments on the subject of tuna-dolphin studies, so Chairman Hunter moved on to Agenda Items 5 and 6.

AGENDA ITEMS 5 AND 6 - THE 1982 FISHING YEAR AND CONDITION OF THE YELLOWFIN STOCK AND RECOMMENDATION FOR 1983

In Introducing Agenda Items 5 and 6, the Chairman explained that because they are closely related, he would ask the Director to discuss them together as he has done in the past. In making his presentation the Director made use of a number of tables and figures from Background Papers 1 and 2.

The Commission began research on the tuna stocks of the eastern Pacific in 1950, over 30 years ago. By 1960 it was estimated that the maximum sustainable yield of yellowfin from inshore areas then under exploitation was 100 thousand short tons annually. In the early 1960s much of the fleet changed from baitboat fishing to purse seining, and catches increased to about 120 thousand tons, which was greater than the estimated sustainable yield for the inshore fishery. Subsequently, the catch declined to about 80 thousand tons as predicted by the Commission staff.

In 1962 the Commission first recommended a yellowfin quota, and in



1966 a conservation program for yellowfin tuna was established. The key element of the conservation program was the overall quota on the yellowfin catch from within the CYRA. Shortly after the initiation of the conservation program construction of new vessels caused the fleet to increase in size. This increase in fleet size increased competition and vessels began fishing further offshore in areas that had not previously been exploited. It was clear that the potential yield from the population relative to that during the period when the fishery was concentrated inshore on smaller fish had increased. In order to generate information with which to quantify this increased potential yield, the Commission began an experimental program of gradually increasing the quotas to empirically test the productivity of the stock. At the same time, areas of the CYRA where effort had not previously been generated were experimentally left open after closure elsewhere. The results of this unique experiment showed that the yellowfin fishery was capable of sustaining a catch of about 175 thousand tons within the CYRA. There is also a fishery west of the CYRA, but from tagging studies and catch per effort trends it appears that yellowfin harvested west of the CYRA are relatively independent from those taken in the CYRA.

The conservation program was effective through 1978 in maintaining the CYRA yellowfin resource at a high level of productivity. In 1979 the program was not implemented until so late in the year that no effective control of fishing effort was possible. In 1980 and 1981 no program was implemented at all, although agreement was reached on what the overall quota should have been in the event that a program had been implemented.

The Director then reviewed progress of the 1982 fishery through August and compared 1982 to earlier years. In 1982, as in 1981, the fleet put to sea for the first trip more slowly than usual, probably because no race against a closure date was anticipated. Also, the weekly fleet capacity at sea has consistently lagged behind the capacity at sea during 1981 with the average decrease being at least 20%. Much of this decrease can be attributed to long turnaround times in port and to vessels leaving the eastern Pacific to fish in other regions. The cumulative yellowfin catch was similar to the 1981 catch through mid-May, but it then started lagging behind and trailed both the 1980 and 1981 catches by a significant amount at the end of August. It is unlikely that the yellowfin catch will exceed 145 thousand tons by the end of 1982, and it could be considerably below that figure. Skipjack catches showed a similar pattern except that they began to lag behind 1981 in March. The total skipjack catch could reach 125 thousand tons, well below historical highs, but still a good year. Although catches are down substantially in 1982, much of the decline can be attributed to a reduction in fishing effort. This is shown by the fact that the catch of yellowfin and skipjack per 100 tons of capacity at sea for 1982 is only slightly down from 1980 and 1981 levels. All three of these years are well below the level observed in 1976, a record year for yellowfin catch.

The US takes the largest share of the catch of both yellowfin and

skipjack, followed by Mexico. This reflects the fact that these two nations have the largest fleets. The US fleet comprises 60% of the total carrying capacity and Mexico has 20%. Compared to 1981, catches for most nations are down in 1982. The sharp drop in the Mexican catch is especially noteworthy. Ecuador's skipjack catch is up this year because of good fishing off Colombia.

The Director then began his review of yellowfin stock assessment studies. It is assumed that catch per unit of effort is related to stock abundance, and several such indices based on catch and fishing effort are followed routinely by the Commission staff. All of these indices have shown a steady downward trend through the 1970s. This reflected the fact that over a period of 20 years or so fishing effort tripled while catches rose by only about 50%. The indices bottomed out in 1980. 1981 saw a slight improvement in several of the indices, but preliminary data for 1982 indicates a return to approximately the 1980 level. It can be concluded that the yellowfin population remains at a low level.

The simplest approach to yield modeling is to use only catch and effort data to develop general production models. In this type of model the average sustainable catch increases with increasing effort (the underfishing side of the production curve) until a maximum production level is reached. Thereafter the average sustainable catch declines more or less rapidly depending on what assumptions have been made (the overfishing side of the curve). Two general production models have been developed, a parabolic or symmetrical model and a model in which the production curve is asymmetrical. Both models indicate an average maximum sustainable yield of yellowfin from the CYRA of about 175 thousand short tons annually. This MSY estimate has remained unchanged for the past several years. There are two principle differences between the models. First, in the symmetrical model the AMSY is taken with 22.5 thousand days of standardized class VI effort, while in the asymmetrical model the AMSY corresponds to 27 thousand days of effort. Second, the top of the asymmetrical model is very flat compared to the symmetrical model and its right hand limb descends much more slowly.

During the 1977-81 period average effort was stabilized at about 29 thousand days which is on the overfishing side of either model. During 1977-79 catch declined steadily from an average of 200 thousand tons annually to an average of 160 thousand tons annually in 1980-81. The 1982 effort will fall to about 26 thousand days (down from 33 thousand days in 1981), and the catch will fall about 30 thousand tons. Note that the 1982 effort level is on the overfishing side of the symmetrical model and on the underfishing side of the asymmetrical model. It is unclear which of the two models best represents the situation in the eastern Pacific.

At this point the Chairman called for a coffee break which lasted from 10:40 AM to 11:13 AM. Following the break, Dr. Joseph resumed his presentation by turning to age-structured models. These models are more detailed than simple yield models in that age specific estimates of growth and mortality rates are incorporated into the models. These

parameter estimates are based on a variety of sources such as tagging studies, length-frequency analysis, etc. The average size of yellowfin taken in the CYRA showed a steady decline over a number of years until 1978. Since then average size has levelled off at a low level. The decline in average size reflected an important change in the age composition of the catch. Prior to about 1973, effort was focused on fish that were age-2 and up. Age-1 fish constituted only a minor part of the total yellowfin catch. This changed in the mid-1970's as age-1 recruits played an increasingly important role, and from 1978 on age-1 fish have dominated the catch.

The impact of the shift from older, larger fish to younger, smaller fish can be evaluated through a yield-per-recruit approach. Analysis of this type has shown that yield-per-recruit could be increased significantly if the pre-1973 type of age composition could be re-established. The problem with this, however, is that at present high levels of effort, restrictions would have to be placed on capturing young yellowfin. It is impractical to control size at capture because fishermen cannot easily determine the size of fish in a school before making a set, and small fish are often not well segregated from larger fish in specific areas or schools. Also skipjack and small yellowfin frequently intermingle so that a restriction on setting on small yellowfin would result in a substantial reduction in the skipjack catch.

Cohort analyses can be used to estimate recruitment after it has taken place, and it has been shown that recruitment can vary from year to year by a factor of as much as 3. Since 1966 recruitment estimates have varied from 29 million to 83 million fish and have averaged about 48 million fish. Preliminary estimates indicate that recruitment in 1981 and 1982 was slightly above average. No trend in recruitment over time has been noted. To date, it has not been possible to estimate recruitment in advance of its occurrence and subsequent fishing on recruited cohorts. All in all, it can be said that age-structured modeling leads to the same general conclusions as the general production approach.

At this point the Director made his recommendation for a 1982 conservation program. He noted that if fishing effort in 1983 remains at approximately the 1979-82 level, the estimated 1983 yield for the CYRA should not exceed about 165 thousand tons. However, if recruitment remains constant and the size-composition of the catch returns to the pre-1973 pattern, yield should increase to substantially more than 165 thousand tons. Using the symmetrical model the fishery is slightly on the overfishing side of the curve, and the current equilibrium yield is estimated to be about 166 thousand tons. For the asymmetrical model the fishery is slightly on the underfishing side of the curve, but the equilibrium yield in this case is similar to the symmetrical case, i.e., 168 thousand tons. For the symmetrical model, to return the population to its optimum size at which it can produce the average maximum sustained yield, less than the equilibrium yield of 166 thousand tons should be taken during 1983. For the asymmetrical model the stock size is larger than the optimum size at which it can sustain the maximum yield on the average. Therefore, more than the 168 thousand ton

equilibrium yield should be taken, i.e., about 185 thousand tons. As was noted, we cannot say which is the superior model. If the overall quota is set at 185,000 short tons and the symmetrical model is correct, overfishing will continue. But if the quota is set at 166,000 tons, and the asymmetrical model is correct, the stock will continue to increase beyond its optimum size. With this in mind, the Director recommended a 1983 overall yellowfin quota of 170,000 short tons with provision for two incremental increases of 15 thousand tons each. This is basically a conservative approach, but it also provides flexibility in case the asymmetrical model is correct or if there is a large carryover of fish due to low catches this year.

Turning to the area west of the CYRA, the Director noted that yellowfin are usually associated with dolphin schools in the outside area and that fish are taken at a larger and near-optimum size. Poor weather for about half of the year imposes a natural limitation on fishing in this area. Finally, catch and catch per unit of effort appear to be unrelated. This is reflected in the fact that catch per effort has remained essentially constant for many years in the outside area. For these reasons, there is no apparent need for yellowfin regulation west of the CYRA.

The Chairman asked if there were any questions on Dr. Joseph's presentation or conservation recommendation. Commissioner Beasley of the US asked if he was correct in his understanding that no estimate of 1983 recruitment was available and asked if such an estimate could be developed during 1983 and used in adjusting the quota. Dr. Joseph indicated that 1983 recruitment could not yet be estimated because no fishing data for 1983 was available. As 1983 progressed catches of newly recruited fish would be monitored. He also noted that early life history studies at the Panama facility presently under construction might ultimately answer many questions regarding recruitment mechanisms. Commissioner Beasley then asked if underfishing occurred, would the unutilized portion be available in later years. Dr. Joseph replied that this would be the case to some extent and briefly reviewed his conclusions from the two production models. Commissioner Beasley then asked about the consequences of possible "El Niño" conditions in 1983. Dr. Joseph briefly explained what an "El Niño" was and noted that warming surface waters and diminishing trade winds in the eastern Pacific would probably result in an "El Niño" in this coming winter. However, the staff has never been able to relate "El Niño" conditions to tuna availability.

Commissioner Beckett of Canada asked if taking a 170,000 ton quota might not require a level of effort approaching the peaks reached in 1979 and 1981. Dr. Joseph said that if there is a substantial carryover of fish from this year, the catch per effort could increase so that 170 thousand tons could be taken with less effort than was expended in 1979 and 1981. The only real answer is to wait and see. There is uncertainty about the size of the carryover and, further, we cannot predict recruitment. Our yield models assume some unspecified relationship between population and recruitment, but we have not found any relationship over the population sizes that we have encountered

historically.

Commissioner Beckett then observed that managing for maximum sustained yield did not address other goals such as increasing catch per unit of effort or average size. There is no management for economic goals, and the fishery is very dependent on incoming year classes. Several poor year classes in a row could cause severe problems and hardship. Dr. Joseph concurred in these observations.

There were no further questions. The Chairman noted the time and recessed the meeting for lunch at 12:10 PM. When the meeting reconvened at 3:05 PM, the Chairman noted that with respect to taking action on recommending an overall CYRA yellowfin quota for 1983 of 170,000 tons, a resolution could be adopted that would be an updated version of the resolution adopted on this matter in 1981 and 1982. This was agreeable to all delegations. Commissioner Beasley of the US observed that separate action by member governments would be required to actually implement a 1983 conservation regime. The Chairman suggested that the conservation resolution could be adopted on the following day.

On the next day, Thursday, October 21, the first item of business was completion of Agenda Item 6. A draft of the proposed resolution had been circulated to all delegations and it was unanimously approved. The Chairman noted that the resolution would be transmitted to each Government for appropriate action. The full text of the resolution is as follows:

"Recognizing that there continues to be a need for a yellowfin conservation program in 1983 in order that the yellowfin resources 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 1983, there should be established an annual quota on the total catch of yellowfin tuna for the 1983 calendar year of 170,000 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 of 15,000 short tons each, if he concludes from examination of available data that such increases will offer no substantial danger to 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 1983."

AGENDA ITEM 7 - RECOMMENDED RESEARCH PROGRAM AND BUDGET 1984-1985

The Chairman opened discussion on this agenda item by calling upon the Director for his comments. The Director began by noting that in addition to the 1984-85 budget itself, he would cover a number of other items relating to internal staff operation under this agenda item. These items could have been deferred to other business (Agenda Item 11), but because most of them are financial in nature, it seems more appropriate to deal with all of them under the present agenda item.

Dr. Joseph began by reviewing the Commission's efforts to replace funds lost through an embezzlement by a former administrative assistant, Mr. Leon Sion, who is currently serving an 8-year sentence in Federal Prison. The details of the embezzlement were presented at the thirty-ninth meeting last fall in Paris. Since then the staff has continued in its efforts to recover the lost funds. The total loss was approximately \$200,000. Approximately \$60,000 was returned by Sion himself. Sion was bonded for \$100,000, and this amount was received from the insurance carrier. The Commission brought suit for negligence against its bank which was settled out of court for \$57,500. Thus, to date, approximately \$217,500 has been received which covers the loss and most of the legal and other expenses incurred in pursuing this matter. Additionally, a piece of property owned by Sion in Ecuador has been offered to the Commission in partial restitution. The property is valued at approximately \$18,000, but acquisition would involve payment of substantial taxes and fees. The staff is in the process of evaluating the wisdom of acquiring this property. Efforts also continue to recover embezzled funds believed to still be held by Sion. Finally our bonding company is suing the Commission's former auditor to recover its \$100,000 loss.

As a result of the embezzlement several important changes have been made in the Commission's financial operations. A local auditing firm was retained to do our 1980-81 audit, to assist in establishing a new bookkeeping system, and to establish much tighter internal financial controls. Also, the Director invited the Governments of the United States and Canada to send a team of auditors to La Jolla to review the new bookkeeping system and controls. This team from Canada and the US spent some time at Commission headquarters and made a number of very helpful recommendations. As a result of these efforts the Commission is now operating under a partial accrual bookkeeping system rather than the cash system used in the past. Also, at the suggestion of the US-Canadian auditing team, a major auditing firm has been retained. The new auditors are Peat, Marwick, Mitchell and Co.

Regarding bonding insurance for employees, the Director announced that the bond amount had been provisionally increased from \$100,000 to \$300,000. He also pointed out that it could be increased further if the Commissioners deemed it necessary. For example, an additional \$200,000 of coverage could be obtained for 3 years with a \$2500 deductible for \$439. The Director then asked for guidance on this matter. All delegations concurred that the provisional bonding arrangements were satisfactory and should be made firm.

The Director then drew attention to the copy of the Commission Financial Regulations appended to Background Document No. 3. He stated that the Commission has operated under these regulations for approximately 25 years. However, no record could be found for our new auditors that these financial regulations had ever been formally approved. The auditors have recommended that they be approved at this fortieth meeting. The Director indicated that he had prepared a draft resolution to this effect. Some discussion ensued. Commissioner Beckett of Canada sought clarification on whether the proposed regulations were the old ones or new regulations that had been drafted. Dr. Joseph replied that they were the old regulations except that Section II dealing with the fiscal year would be changed to reflect the fact that the Commission presently operates on an October 1 through September 30 fiscal year. Commissioner Iino of Japan asked if the change in the fiscal year would affect the date of payments by member governments and also whether the old regulations had ever been approved. The Chairman indicated that payment dates would not be affected. He also explained that presumably the old regulations had been approved at the time they were drawn up. The only problem is that no formal record can be found that this was done. The purpose of the proposed resolution is simply to formalize the adoption of the regulations. There was no further discussion, and the proposed resolution was unanimously approved. The full text of the resolution is as follows:

"Whereas the business affairs of the Commission have been conducted for the past 23 years in accord with financial regulations drawn up by the Commission, and

Whereas formal approval of these financial regulations cannot be found in the minutes of the Commission meetings,

Therefore the Commission hereby formally approves said regulations in their present form with the exception that the financial year as defined in Section II shall be defined hereafter as the period from October 1 to the following September 30, both dates inclusive."

The Director then turned to the matter of cuts in the 1981-82, 1982-83, and 1983-84 budgets. The 1981-82 year was completed in September just prior to the fortieth meeting. This budget was originally for \$2.46 million when approved in 1979. Early in the year the US State Department indicated that the budget might be cut. However, it was not until this April that we got confirmation that there would be a 27% reduction from \$2.46 million to \$1.80 million, a cut of \$656 thousand. The Commission had been spending at the \$2.46 million level, so drastic measures were required. All at-sea tagging work was curtailed and 6 people were laid off. In the dolphin program gear work was cut back, the number of observer trips was reduced, and the position of tuna-dolphin coordinator was left unfilled when Dr. Robin Allen returned to New Zealand. Fortunately, with financial help from the NMFS, we were able to restore some of the canceled observer trips. As a result of all of this we entered 1982-83 with a dangerously low carryover. The cut in 1982-83 will also be 27%, from \$2.6 million approved to \$1.9 million. In 1983-84, the US proposes to reduce the 27%

out to 12%, or from \$2.6 million approved to \$2.3 million, and some curtailed activities can be restored.

At this point Dr. Joseph turned to the proposed 1984-85 budget. He began by reviewing the procedures followed by the Commission for determining member's appropriations. The level of national contributions is set in proportion to tuna utilization (i.e., tuna substantially processed or eaten in a country during the most recent year for which full data are available). Contributions are not based on catches. The US, because it consumes most of the tuna captured in the eastern Pacific, is by far the largest contributor and sets the standard for other members. If the US reduces its contribution to the Commission budget, contributions of other nations are scaled down in proportion. Commissioner Beckett inquired as to what the term "tuna" covered under this procedure. Dr. Joseph replied that generally all species of tuna were covered including black skipjack.

Dr. Joseph then noted that the proposed 1984-85 budget of \$2.72 million is an increase of \$402 thousand\* over the 1983-84 budget (after the anticipated 12% cut) of \$2.32 million. This will get the budget back up to approximately the 1980-1981 level. Nearly half of the increase is represented by a 7 1/2% inflationary factor. Restoration of 11 dolphin observer trips deleted in 1982-83 and 1983-84 (but paid for in 1981-82 by the NMFS) plus filling of the tuna-dolphin coordinator position accounts for another \$92 thousand of the increase. Finally, \$130 thousand is added for a tagging cruise in the southern hemisphere off Ecuador and the Galapagos Islands. Such tagging will shed some light on the relationship between skipjack tunas in the eastern Pacific and the central Pacific. If fish cannot be tagged in sufficient numbers on this cruise, another attempt should be made in 1985-86. Commissioner Beasley of the US asked whether a second skipjack tagging cruise in 1985-86 would cost the same as the planned 1984-85 cruise and also whether the second cruise would be needed if the first was successful. Dr. Joseph replied that the cost would be the same except for a 7 1/2% inflationary factor and that both cruises would probably be necessary since one would be an early season cruise while the other would be later in the season, and results could differ.

At this point the Chairman deferred further action on Agenda Item 7 so that the delegations could further study the figures in Background Paper No. 3 on the research program and budget for 1984-85. On the following day, Thursday, October 21, the 1984-85 budget was readdressed. The US recommended approval of the 1984-85 budget as proposed. Japan also approved the proposed budget with no reservations. Commissioner Beckett added Canada's approval, but went on to note that his government has imposed 6% and 5% limits on budget increases for each of the next two years. If such limitations are imposed beyond the next two years there could be future problems with how the 1984-85 percentage increase

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\* The increase is only \$80 thousand more than the budget approved by the Commission for 1983-84, or in other words, a 3% increase.



is calculated. If the proposed budget is compared to the originally approved 1983-84 budget, the increase is only 3% (\$2.72 million vs. \$2.63 million). But if it is compared to the 1983-84 budget after the anticipated 12% cut, the increase is 15% (\$2.72 million vs. \$2.32 million). The remaining delegations indicated their concurrence making approval of the proposed 1984-85 budget of \$2.72 million unanimous.

The Director then took up some further matters relating to budgeting and financial policy. First, he noted that the Commission's pension society, Sun Life Assurance Company of Canada has a new bookkeeping system that we had been told would have a minimal effect on Commission contributions. It now appears that the increase could be as great as \$50 thousand. This has not been taken into account in our budgeting. Second, he pointed out that the Commission does not have a policy on employee termination benefits and stated that he would review Canadian and US government policies on this matter. A Commission policy will then be recommended at next year's annual meeting. Finally, on the question of year-end carryovers, Dr. Joseph noted that the Commission has no official policy. In the past it has been normal to carryover 10-15% of the budget to get through delays in receiving member contributions. The carryover has been unusually large in the last few years due to receipt of a large amount of funding for the tuna-dolphin program very near the end of the 1977-78 fiscal year for which they were earmarked. This large carryover has now been expended. It would be desirable to adopt as Commission policy that up to 12 1/2% could be carried over annually to meet contingencies. Any carryovers in excess of that amount would either be earmarked for special projects or used to reduce national contributions. The Director added that at the suggestion of the Chairman, he would like approval of this policy. If this is granted, the financial regulations will be amended to reflect this change and a copy of the amendment distributed at the next annual meeting. Approval of the Director's proposed carryover policy was granted unanimously. The Chairman deemed work on Agenda Item 7 completed.

#### AGENDA ITEM 8 - REVIEW OF NEGOTIATION TOWARDS A NEW OR MODIFIED TUNA CONVENTION

At the request of Mr. Ramon de Miguel, an observer from Spain who had indicated that his delegation could not be present for the closing session on Thursday, Chairman Hunter took up Agenda Item 8 before adjourning the meeting on Wednesday. Mr. Hallman of the US noted that during the past year the US had met with other governments on several occasions in hopes of reaching a new agreement. Unfortunately not much progress was made, but he indicated that his Government was hopeful that progress could be made soon and that it would make every effort to reach an equitable final agreement.

Mr. Manual Freer, observer for Costa Rica, asked for the floor to read a prepared statement. The statement noted Costa Rica's withdrawal from the IATTC in 1978 and the failure of the Commission's conservation regime that followed. Costa Rica is now prepared to rejoin the

Commission on terms that are consistent with Law of the Sea principles and that do not compromise Costa Rican sovereignty. Costa Rica will charge fees for national licenses but recognizes that an international licensing system would be preferable. Therefore, Costa Rica will soon initiate negotiations among interested nations aimed at developing a new Convention for the eastern Pacific. The full text of the Costa Rican statement is appended to these minutes as Appendix III.

Commissioner Iino of Japan asked that the Costa Rican statement be translated into English and circulated to the delegations. The Chairman indicated that this would be done.

Mr. de Miguel of Spain noted that his nation had fished in the eastern Pacific for many years and would like to join the IATTC. Spain would also like to participate in any negotiations on a new management arrangement for the eastern Pacific.

Commissioner Urroz of Nicaragua also supported the concept of further negotiations and indicated his government's desire to participate in any such talks.

There being no further discussion on Agenda Item 8, the Chairman declared this item completed. He reminded the delegates of the cocktail party at the Hotel La Valencia that evening, and adjourned the meeting at 4:28 PM.

The fortieth meeting reconvened at 10:14 AM on Thursday, October 21. On behalf of all the participants, Chairman Hunter thanked the US Tuna Foundation for the previous evening's cocktail party. As previously noted in these minutes, Chairman Hunter then returned to unfinished Agenda Items 6 and 7. When these items were completed, he moved on to Agenda Item 9.

#### AGENDA ITEM 9 - PLACE AND DATE OF NEXT MEETING

Chairman Hunter in his role as Canadian Commissioner noted that it was his nation's turn to serve as host nation, and he extended an invitation to all delegations to attend the next annual meeting which will most likely be held in Ottawa, perhaps somewhat earlier in October 1983 than the present meeting.

(Subsequent to the fortieth meeting, it was confirmed that the forty-first meeting will be held October 19-21, 1983, in the Centennial Room of the Canadian Government Conference Centre, 2 Rideau Street, Ottawa, Canada.)

#### AGENDA ITEM 10 - ELECTION OF OFFICERS

Following a brief recess from 10:40 AM to 10:54 AM, the Chairman opened discussion on election of officers. Commissioner Garache of France proposed that Mr. Hunter of Canada continue as Chairman through

the next annual meeting. Japan seconded this proposal and it was unanimously approved.

Commissioner Beasley of the US nominated Mr. Jamil Urroz of Nicaragua for Secretary, and this nomination was unanimously approved.

AGENDA ITEM 11 - OTHER BUSINESS

Chairman Hunter asked if there was any further business to attend to. Commissioner Beasley of the US thanked Mr. Hunter for serving very effectively as Chairman. He also thanked Dr. Joseph and his staff for their contributions. Chairman Hunter also thanked Dr. Joseph and his staff as well as Mr. Carlos Diez for his excellent services as interpreter.

AGENDA ITEM 12 - ADJOURNMENT

In closing the meeting, Chairman Hunter noted that all delegations recognized the need for a more effective approach to management of tuna resources in the eastern Pacific Ocean, and everyone hoped for real progress during the forthcoming year in negotiations for a new or modified tuna convention. The fortieth meeting of the IATTC was adjourned at 11:02 AM, October 21, 1982.

APPENDIX ILIST OF ATTENDEESCOMMISSION MEMBERSCANADA

James S. Beckett, Commissioner  
Michael Hunter, Commissioner

FRANCE

Serge Garache, Commissioner

JAPAN

Kenro Iino, Commissioner  
S. Iwasawa

NICARAGUA

Jamil Urroz Escobar, Commissioner

PANAMA

Carolina T. Mouritzen, Commissioner

UNITED STATES OF AMERICA

Henry R. Beasley, Commissioner  
Jack Gorby, Commissioner  
Robert C. Macdonald, Commissioner  
Izadore Barrett  
Mike Bono  
Peter Buchan  
Gordon C. Broadhead  
D.G. Burney  
Chas R. Carry  
August Felando  
Charles E. Finan  
Bernie Fink  
Frank Gillis  
William J. Gillis, Jr.  
Brian S. Hallman  
Samuel R. Herrick, Jr.  
Rennie Seay Holt  
O.E. Kerns, Jr.  
James T. McCarthy  
Michael McGowan

José E. Muñoz, Jr.  
A. V. Nizetich  
William L. Perkins  
Barbara Keith Rothschild  
John J. Royal  
Gary Sakagawa  
Jack Tarantino  
Richard E. Zellers

OFFICIAL OBSERVERSCOLOMBIA

Ines Jaramillo de Santa

COSTA RICA

Manuel Freer  
Maria Eugenia de Freer  
Henry Branstetter

MEXICO

Esteban Morales

SPAIN

Ramón de Miguel  
Héctor Quiroga

TAIWAN

Po-Wei Yuan

FAO

Paul J. Hooker

INTERNATIONAL WHALING COMMISSION

William F. Perrin

SOUTH PACIFIC COMMISSION

Robert E. Kearney

OTHER ATTENDEES

Sam Blasker  
B. M. Chatwin  
Ted A. Dunn  
Ken Hudson  
E. A. Keen  
Dennis M. King  
Eric Muñoz  
Alan Pagenhart  
Wesley Parks  
Raúl Rodríguez  
Lesley Scheele  
Edward R. van Os  
R. B. Young

IATTC STAFF

James Joseph, Director  
William Bayliff  
John Calaprice  
Joseph Greenough  
Philip Hammond  
Regina Newman  
Robert Olson  
Kim Schaefer  
Kurt Schaefer  
Robert Wagner  
Alex Wild

TRANSLATOR

Carlos Diez

APPENDIX II

A note concerning dolphin mortality attributable to the Spanish tuna fleet in the Pacific during 1981.

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by  
Hector Quiroga  
Instituto Español de Oceanografía  
Centro Costero Oceanográfico  
Apartado 130. La Coruña, España

The association that exists between dolphin and tunas in the eastern Pacific is well known. This constitutes an element of great importance in these fisheries when carried out in waters beyond the continental platform.

Spain is concerned about this matter and therefore has proceeded with obtaining all the information possible in order to contribute the data to the International Whaling Commission as well as to the Inter-American Tropical Tuna Commission. Interviews have been carried out with the professional associations, owners, and captains of the vessels which operated in the eastern Pacific during 1981 and prior years. The data given in this note refer exclusively to the year 1981.

During 1981 the Spanish tuna fleet operating in the IATTC area consisted of four vessels with a total of 4,765 net tons, and 16,240 HP.

From the information collected, taking as a basis the notations made by the captains in the vessel logbooks, it has been possible to observe that they carried out tuna fishing in areas in which dolphin have been proven to occur, these animals acting as indicators of the presence of tunas.

Nevertheless there are no precise data on the number of dolphin in each set and on the number of individuals that may die as a consequence of the fishing operations. Also, there are no data on the species present nor the proportions of one or the other. Nevertheless, according to the information collected, the spotted dolphin, Stenella attenuata, is the most frequent one.

On the basis of subjective estimates using the information collected, it has been calculated that some 3,470 dolphins were killed during fishing operations of Spanish tuna vessels in the eastern Pacific during 1981.

In the current year (1982), the four Spanish tuna vessels that fished in the IATTC area during 1981 were transferred to the tropical Atlantic.

(IATTC staff translation of the Spanish original.)

APPENDIX III - STATEMENT BY COSTA RICA

Mr. Chairman:

Allow me to convey to you, and to the other Delegates, a cordial greeting on behalf of my Government and in my own name.

As you will recall, Costa Rica withdrew as an active member of the Inter-American Tropical Tuna Commission in 1978. And it was precisely that year that the conservation program we helped to establish in 1966 practically became non-existent. We understand that there has not been an effective tuna conservation program in the eastern Pacific Ocean since 1978. At present, the catch and the catch indices are at the lowest level since the inception of the conservation program. This, fellow Delegates, is truly deplorable. Over a period of 13 years we helped to maintain the first program, which became the most successful program, for the international management and conservation of a high-seas fishery resource. Therefore we are deeply concerned with the considerable reduction of the tuna resources, which has caused the total catch to decline from 250 thousand tons to an estimated amount of scarcely 165 thousand for this year.

Should this situation not be corrected, all the coastal nations of the eastern Pacific Ocean will be seriously affected; therefore the Government of Costa Rica has decided to take initial steps to rejoin this important organization as an active member. Of course, our participation in the IATTC can only take place within the context of full respect for the new principles emerging in the Law of the Sea, such as they are now reflected in the text of the new Convention on the Law of the Sea, to be signed in Jamaica in December of this year.

Furthermore, Costa Rica can participate in this Commission if it is understood that its rejoining will not interfere, compromise, or limit its jurisdiction in the 200-mile zone, starting from its continental coastline and from Cocos Island, in the Pacific Ocean. This means that Costa Rica will demand that all the boats that wish to fish in those waters pay for licenses as provided in Law No. 5775 of August 14, 1975, promulgated in conformance with Article 6 of our Constitution.

We fully realize that the system of license fees and vessel registration by each of the coastal nations is not the most appropriate system for the exploitation of a resource like tuna, given its highly migratory nature. Thus we believe that the establishment of an international regime to centralize and organize all the fishery activities in the eastern Pacific Ocean would be more desirable. For that reason, and in any case to comply with the provisions of Article 64 of what will be the Convention on the Law of the Sea, our country believes there is a pressing need to immediately initiate negotiations among all interested nations for the adoption of a new Convention to regulate all aspects of the tuna fisheries; this Convention should be in harmony with the new principles of the Law of the Sea, a goal we have tried to attain since 1977.

The new regime will have to be based upon the fair participation of all the member nations, but even more so, in the recognition of guaranteed catch quotas for the coastal nations, based on the historical concentration of the resource in the respective jurisdictional waters.

The present IATTC, with the great capability and experience accumulated during many years under the capable leadership of Dr. Joseph, which we are pleased to recognize, should be preserved as the scientific section of the new organization to be created. This new organization should prevent the excessive growth of the international tuna fishing fleet; otherwise, the exploitation of the resources of the sea will become a ruinous or non-profitable activity.

We are aware, however, that some people, fortunately very few, will yearn for that time when there was complete freedom in the fishery of what used to be called the high seas and will advocate the preservation of that system. But we wish to make clear to all that the time for the rule of the strongest has come to an end in the sea, as it also came to an end on the earth long ago. Under the difficult conditions of the present we must make a choice; it is either the chaos of irrational competition in the exploitation of the ocean's resources, or a rational and fair conservation and exploitation of those resources.

We are sure that all of us will want to contribute to the establishment of this new order in the oceans.

Very soon my country will undertake the necessary negotiations with the Governments represented at this meeting, in order to join again as one of the founding members of the IATTC, and thus be able to contribute to the attainment of the goals that, more than thirty years ago, led Costa Rica, together with the United States of America, to found this organization.

Meanwhile, we wish you the greatest success at this meeting.

Thank you, Mr. Chairman.

(IATTC staff translation of the Spanish original.)