INTER-AMERICAN TROPICAL TUNA COMMMISSION
COMISION INTERAMERICANA DEL ATUN TROPICAL
QUARTERLY REPORT--INFORME TRIMESTRAL

January-March 2001
Enero-Marzo 2001

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The

QUARTERLY REPORT

January-March 2001

of the

INTER-AMERICAN TROPICAL TUNA COMMISSION

is an informal account, published in English and Spanish, of the current status of the tuna fisheries in the eastern Pacific Ocean in relation to the interests of the Commission, and of the research and the associated activities of the Commission's scientific staff. The research results presented should be regarded, in most instances, as preliminary and in the nature of progress reports.

The Quarterly Reports are sent to the Commissioners, their industry advisors, and a few organizations and individuals with needs for current knowledge of the tuna fishery.

El

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es un relato informal, publicado en inglés y español, de la situación actual de la pesca atunera en el Océano Pacífico oriental con relación a los intereses de la Comisión, y de la investigación científica y demás actividades del personal científico de la Comisión. Gran parte de los resultados de investigación presentados en este informe son preliminares y deben ser considerados como informes del avance de la investigación.

Los Informes Trimestrales son enviados a los Comisionados, a los asesores de la industria, y a algunas organizaciones y personas que necesitan estar al corriente de los acontecimientos de la pesca atunera.

Editor--Redactor:
William H. Bayliff

DATA COLLECTION

The IATTC has field offices at Las Playas and Manta, Ecuador; Ensenada and Mazatlan, Mexico; Panama, Republic of Panama; Mayaguez, Puerto Rico, USA; and Cumaná, Venezuela.

Personnel at these offices and in La Jolla collected 116 length-frequency samples and abstracted the logbook information for 356 trips of fishing vessels during the first quarter of 2001.

Also, during the first quarter members of the field office staffs placed IATTC observers on 152 fishing trips by vessels that participate in the on-board observer program. In addition, 136 IATTC observers completed trips during the quarter, and were debriefed at the corresponding field offices.

Surface fleet and surface catch statistics

Statistical data from the IATTC's field stations are continuously being collected and processed. As a result, estimates of fisheries statistics with varying degrees of accuracy and precision are available, the most accurate and precise being those made after all available information has been entered into the data base, processed and verified. The estimates for the current quarter are the most preliminary, while those made six months to a year after monitoring of the fishery are much more accurate and precise. While it may require a year or more to obtain some final information, much of the catch information is processed and available within two to three months of the return of a vessel from a fishing trip. In this report, therefore, only annual statistics are compared among years.

Fleet statistics

The estimated total carrying capacity of the vessels that are fishing, or are expected to fish, in the eastern Pacific Ocean (east of 150°W; EPO) during 2001 is about 189,200 cubic meters (m^3) (Table 1). The weekly average at-sea capacity for the fleet, for the weekly periods ending January 1 through April 2, was about 105,700 m^3 (range: 92,700 to 115,400 m^3). The changes of flag and additions to and deletions from the IATTC's fleet list for the period of January 1-April 2 are given in Table 2.

Catch statistics

The total catches of tunas in the EPO for the January 1-April 2, 2001, period were estimated to be about 122 thousand mt of yellowfin, 43 thousand mt of skipjack, and 10 thousand mt of bigeye. The averages and ranges for the comparable periods of 1996-2000 are as follows: yellowfin, 73 thousand mt (57 to 86 thousand); skipjack, 45 thousand mt (22 to 80 thousand); bigeye, 10 thousand mt (6 to 19 thousand). For this period the average estimated weekly catches of yellowfin, skipjack, and bigeye in the EPO were about 9 thousand, 3 thousand and 1 thousand mt respectively. Summaries of the estimated catches, by flag of vessel, are shown in Table 3.

Catch statistics for 2000

Annual estimates of the catches of the various species of tunas and other fishes landed by vessels fishing at least part of the year in the EPO for yellowfin, skipjack, bigeye, or bluefin during the 1985-2000 period are shown in Table 4. This table includes only the catches by surface gear. The catch data for skipjack and bluefin in the EPO are essentially complete except for insignificant catches made by the longline, recreational (for skipjack), and artisanal fisheries.

The catch data for yellowfin and bigeye do not include catches by longline vessels, as the data from these fisheries are received much later than those for the surface fishery. About 5 to 10 percent of the total catch of yellowfin is taken by longlines. Until recently, the great majority of the catch of bigeye has been harvested by the longline fishery.

There were no restrictions on fishing for tunas in the EPO during the 1980-1997 period, although regulations placed on purse-seine vessels directing their effort at tunas associated with dolphins have probably affected the way these vessels operate, especially during the late 1980s and the 1990s. There was a major El Niño event, which began in mid-1982 and persisted until late 1983. The catch rates in the EPO were low before and during the El Niño episode, which caused a shift of fishing effort from the eastern to the western Pacific, and the fishing effort remained relatively low during 1984-1986. During the 1997-1998 period another major El Nino event occurred in the EPO.. Fishing for yellowfin in the Commission's Yellowfin Regulatory Area (CYRA) was restricted from December 1 through 31, 2000. Fishing for tunas associated with fish-aggregating devices was prohibited in the EPO from September 15 through December 15, 2000.

The average annual catch of yellowfin in the CYRA during the 1985-1999 period was 226 thousand mt (range: 193 to 267 thousand) (Table 4). The preliminary estimate of the 2000 yellowfin catch in the CYRA is 221 thousand mt. During the 1985-1999 period the annual yellowfin catch from the area between the CYRA boundary and 150°W averaged 30 thousand mt (range: 19 to 47 thousand). The preliminary estimate of the yellowfin catch from this area for 2000 is 51 thousand mt. The estimated 2000 yellowfin catch from the EPO, 272 thousand mt, is about 7 percent greater than the 1985-1999 average of 255 thousand mt.

The average annual distribution of logged catches of yellowfin by purse seiners in the EPO during the 1985-1999 period is shown in Figure 1a, and a preliminary estimate for 2000 is shown in Figure 1b. In 2000 the catches were relatively greater north of about 0˚ and west of about 85°W.

During the 1985-1999 period the annual catches of skipjack in the EPO averaged 104 thousand mt (range: 49 to 268 thousand) (Table 4). The preliminary estimate of the skipjack catch in the EPO in 2000, 210 thousand mt, is about 22 percent less than the record 1999 catch of 268 thousand mt.

The average annual distribution of the logged catches of skipjack by purse seiners in the EPO during the 1985-1999 period is shown in Figure 2a, and a preliminary estimate for 2000 is shown in Figure 2b. During 2000 the catches were relatively greater offshore between 5°S and 5°N and between about 80°W and 125°W and relatively less in waters off Baja California and off Central America and northern South America.

Prior to 1994 the average catch of bigeye in the EPO by surface gear was about 4 thousand mt (range: 1 to 8 thousand) (Table 4). After 1993 the catches increased to 29 thousand mt in 1994, 37 thousand mt in 1995, and 51 thousand mt in 1996 and 1997, 35 thousand mt in 1998, and 41 thousand mt in 1999. The preliminary estimate of the bigeye catch in the EPO in 2000 is 70 thousand mt. The increased catches of bigeye resulted from the discovery, made during the early 1990s, that tunas associated with floating objects, but well below the surface, can be detected with sonar and caught with purse seines. Many of these floating objects are fish-aggregating devices (FADs) placed in the water by the fishermen.

Bigeye are not often caught by surface gear north of about 7°N. The catches of bigeye by purse seiners during the 1994-1999 period were made in two principal areas, (1) between about

6°N and 16°S from about 93°W to 140°W, and (2) between about 3°N and 3˚S from about 82°W to 88°W (Figure 3a). Those of 2000 were made between about 6°N and 16°S from the coast of South America to about 140°W (Figure 3b). With the development of the fishery for tunas associated with floating objects, described above, the relative importance of the nearshore areas has decreased, while that of the offshore areas has increased.

While yellowfin, skipjack, and bigeye comprise most of the catch of fish made by tuna vessels in the EPO, bluefin, albacore, black skipjack, bonito, and other species contribute to the overall harvest in this area. The total catch of these other species in the EPO was about 5 thousand mt in 2000, which is well below the 1985-1999 average of 8 thousand mt (range: 2 to 17 thousand).

The estimated catch of all species in the EPO in 2000 was about 557 thousand mt, which is about 9 percent less than the previous record total catch of 611 thousand mt, taken in 1999.

Preliminary estimates of the 2000 catches in the EPO, by flag, and the landings, by country, are given in Table 5. The landings are fish unloaded during a calendar year, regardless of the year of catch. The country of landing is that in which the fish were unloaded from the fishing vessel or, in the case of transshipments, the country which received the transshipped fish. In 2000 81 percent of the EPO yellowfin catch of 272 thousand mt was made in the CYRA. Ecuadorian-, Mexican- Venezuelan-, Spanish-, and Vanuatu-flag, flag vessels harvested 32, 22, 14, 7, and 6 percent, respectively, of the total EPO catch.

Preliminary landings data (Table 5) indicate that, of the 547 thousand mt of tunas landed in 2000, 218 thousand mt (40 percent) was landed in Ecuador. The landings in Mexico (116 thousand mt; 21 percent) and Colombia (60 thousand mt; 11 percent) were next in terms of magnitude. Other countries with significant landings of tunas caught in the EPO included Venezuela (6 percent), Spain (5 percent), Costa Rica (4 percent), and the United States (2 percent). It is important to note that when final information is available the landings currently assigned to the various countries may change due to exports from storage facilities to processors in other nations.

Size compositions of the surface catches of tunas

The methods for sampling the catches of tunas have been changed, beginning on January 1, 2000, as described in the IATTC Quarterly Report for April-June 2000. Briefly, the fish in a well of a purse seiner or baitboat are selected for sampling only if all the fish in the well were caught during the same calendar month, in the same type of set (floating-object, unassociated school, or dolphin), and in the same sampling area. These data are then categorized by fishery (Figure 4), based on the staff's most recent stock assessments. Data for fish caught during the fourth quarter of 2000 are presented in this report. Due to regulations imposed on the fishery during the fourth quarter, the combined catches of tunas were less than those of the previous three quarters of 2000.

There are ten surface fisheries for yellowfin defined for stock assessments: four floating-object, two unassociated school, three dolphin, and one baitboat (Figure 4). The last fishery includes all 13 sampling areas. Of the 175 wells sampled, 160 contained yellowfin. The estimated size compositions of these fish are shown in Figure 5a. The majority of the catch was taken in dolphin and unassociated-school sets.

The estimated size compositions of the yellowfin caught by all fisheries combined during the fourth quarter of 1995-2000 are shown in Figure 5b. The size ranges of the fish are generally consistent over time (40-160 cm), but the size distributions differ among years.

There are eight fisheries for skipjack defined for stock assessments: four floating-object, two unassociated school, one dolphin, and one baitboat. The last two fisheries include all 13 sampling areas. Of the 175 wells sampled, 82 contained skipjack. The estimated size compositions of these fish are shown in Figure 6a. The majority of the fish was taken by the floating-object fishery in the Galapagos area and in sets on unassociated schools in the southern area. The estimated catches taken by baitboats and in dolphin sets were negligible, and do not show well in the graph.

The estimated size compositions of the skipjack caught by all fisheries combined during the fourth quarter of 1995-2000 are shown in Figure 6b. The size ranges of the fish are generally consistent over time (35-80 cm), but the size distributions differ among years.

There are seven surface fisheries for bigeye defined for stock assessments: four floating-object, one unassociated school, one dolphin, and one baitboat. The last three fisheries include all 13 sampling areas. Of the 175 wells sampled, only 15 contained bigeye. The estimated size compositions of these fish are shown in Figure 7a. During the first three quarters of 2000 the majority of the bigeye catch was taken in floating-object sets, but during the fourth quarter most of the fish were caught in sets on unassociated schools. There were no recorded catches of bigeye in dolphin sets or by baitboats.

The estimated size compositions of the bigeye caught by all fisheries combined during the fourth quarter of 1995-2000 are shown in Figure 7b. As was the case during the first three quarters, the average size of the fish caught during the fourth quarter of 2000 was considerably greater than those of the fish caught during the fourth quarter of any of the previous five years.

Observer program

Data collection

The design for placement of observers during 2001 calls for 100-percent coverage of fishing trips in the eastern Pacific Ocean (EPO) by Class-6 purse seiners (over 363 metric tons carrying capacity). Mexico's national observer program, the Programa Nacional de Aprovechamiento del Atún y de Protección de Delfines (PNAAPD), and Venezuela's national observer program, the Programa Nacional de Observadores de Venezuela (PNOV), are to sample half of the trips by vessels of their respective fleets, while IATTC observers are to sample the other half of those trips. Ecuador's national observer program, the Programa Nacional de Observadores Pesqueros de Ecuador (PROBECUADOR) began the year sampling one quarter of the trips by vessels of its fleet, and IATTC observers are to sample the remainder of those trips. The IATTC will sample all trips of Class-6 vessels registered in other nations that fish for tunas in the EPO.

IATTC, PNAAPD, PNOV, and PROBECUADOR observers departed on 215 fishing trips aboard Class-6 purse seiners during the first quarter of 2001. Preliminary coverage data for these vessels during the quarter are shown in Table 6.

Training

There were no IATTC observer training courses held during the first quarter of 2001.

RESEARCH

Age and growth of bigeye tuna

Little is known about the age and growth of bigeye in the eastern Pacific Ocean (EPO). Accurate information on the age and growth is necessary for understanding the biology and population dynamics of this species. Size-at-age data permit the formulation of growth estimates, and make it feasible to incorporate age-specific characteristics, such as mortality and fecundity, into population dynamics models.

Most recent ageing studies of marine fishes have utilized natural marks in calcified structures as time indicators. The age of the fish can be accurately estimated from these structures, provided the deposition rate of the marks is known. Both sagittal otoliths and caudal vertebrae have been utilized for age determinations for several species of the genus *Thunnus.* The results from a tagging and oxytetracycline-marking experiment initiated off Hawaii in 1995 demonstrated that bigeye in the size range of about 38 to 117 cm deposit increments daily in their sagittal otoliths (IATTC Quarterly Report for April-June 1999). Sagittal otoliths have been recovered from bigeye tagged and injected with oxytetracycline during the IATTC tagging program initiated in the EPO during 2000 (IATTC Quarterly Report for April-June 2000), and these will be examined in the near future to determine the deposition rate of the increments in those otoliths as well.

A program to sample otoliths, caudal vertebra, and gonads of bigeye, and lengths and weights of the fish, was initiated in January 2001 at the IATTC field offices in Las Playas and Manta, Ecuador. Bigeye of 15 10-cm length classes between 30 and 180 cm are being sampled. Fifteen females and fifteen males will be selected for each length class, making a total of 450 specimens. As of the end of the March 2001, 175 specimens had been sampled, and it is expected that the full complement of samples will be collected before the end of 2001. The otoliths and vertebrae will be utilized to provide direct estimates of sex-specific age and growth of bigeye from the fishery in the EPO.

Reproductive biology of bigeye tuna

Little is known about the size and age at sexual maturity, spawning distribution, and fecundity of bigeye in the eastern Pacific Ocean (EPO). A 2-year program to sample gonads of bigeye tuna, carried out by IATTC observers aboard purse-seine vessels fishing in the EPO, was initiated in January 2000. The National Research Institute of Far Seas Fisheries of Japan is concurrently sampling gonads of bigeye caught in the EPO by longline vessels. The objective of this collaborative project is to obtain a comprehensive understanding of the reproductive biology of bigeye in the EPO, which is necessary for stock assessment.

As of the end of 2000, samples had been taken on nine purse-seine trips, producing 369 females with ovarian tissues suitable for histological processing and examination. Those tissue samples were processed at the Achotines Laboratory during March 2001, and microscope slides of them will be prepared by a company in San Diego. These slides will be examined to identify the stages of oogenesis, providing an accurate assessment of the reproductive status of each fish. Ovaries are also being selected to use to estimate the fecundity of the fish.

Tuna tagging

Tagging cruise of March-May 2000

Some initial results of the pilot bigeye tagging project, conducted in the equatorial eastern Pacific Ocean (EPO) during March-May 2000, is provided in the IATTC Quarterly reports for April-June and July-September 2000. The following is a brief update on the project, as of the end of March 2001.

The recoveries of tagged tunas to the end of the quarter were as follows:

Species	Tag type	Released	Reported	Percent reported
Bigeye	conventional	101	20	19.8
Bigeye	archival	96	25	26.0
Skipjack	conventional	1,238	259	20.9
Yellowfin	conventional	71	7	9.9

The greatest times at liberty and net distances traveled recorded so far are as follows: bigeye, 297 days and 1,499 nm; skipjack, 259 days and 2,167 nm.

Twenty-four of the archival tags have been recovered, and 18 of these were on fish that had been at liberty for 30 days or more. Static and dynamic plots of the movement paths for each of those fish have been produced, and the total distances traveled, velocities, and areas probably utilized have been estimated from those movement paths.

The time and depth records for the bigeye from the archival tag data have made it possible to discriminate and classify four types of behavior, normal, FAD-associated, abnormal, and deep-diving, and to estimate the proportions of time each fish allocated to each of these behaviors during its time at liberty, including residence times at FADs. Bigeye have demonstrated a remarkable ability to dive to an estimated maximum depth of 1,750 m and to inhabit depths of 800 to 1000 m at temperatures of approximately 6ºC for up to about 4 hours.

The habitat selection of bigeye has been evaluated through analyses of depths, temperatures, and light levels recorded by the archival tags by time of day, season, and thermal structure of their habitat. As previously reported, bigeye are found primarily in the upper mixed layer at night and well below the thermocline, at depths of 200 to 300 m and temperatures of 12° to 13ºC. during the day. The light levels they encounter are similar during the night and day. Their diel shifts in depth are, most likely, an adaptation to efficiently track their prey, which consists primarily of vertically-migrating mesopelagic organisms, such as squids and fishes.

Tagging of yellowfin with archival tags at the Achotines Laboratory

An experiment was initiated in March at the Achotines Laboratory to investigate whether feeding and spawning events of captive yellowfin can be detected by evaluating data on the temperatures of the peritoneal cavities of the fish recorded by surgically-implanted electronic tags. Six yellowfin (77 to 88 cm, 9.5 to 14.8 kg) had archival tags implanted in their peritoneal cavities, and were also marked with color-coded conventional plastic dart tags in order to record the feeding and courtship behavior of individuals. These yellowfin are being held in Tank 6, which has a capacity of 170,200 L.

The experimental design requires varying the rations and keeping records of the feeding levels of individual fish. On four days per week the fish will be fed squid and anchovetas once per day, at up to 5 percent of their body weight. On one day they will only receive 2.5 percent of

their body weight, on one day they will receive no food at all, and on one day they will be fed three times, at 2 percent of their body weight per feeding. None of the fish will be sacrificed until one month after spawning has first been documented for the population. At that time one male and one female will be sacrificed in order to remove their archival tags and to obtain samples from their gonads for histological examination. Optimally, the population will be reduced to a single spawning pair, and after about one month of regular spawning activity those fish will also be sacrificed.

Early life history studies

Joint OFCF-Panama-IATTC project

The joint OFCF-Panama-IATTC project, initiated in 1993, ended on March 31, 2001. The IATTC research on the early life history of tunas is being continued at a reduced level, and the Dirección General de Recursos Marinos de Panamá is continuing its rearing work on snappers and corvina.

Yellowfin broodstock

The yellowfin broodstock in Tank 1 (1,362,000 L) at the Achotines Laboratory spawned daily during January, February, and March. The water temperatures in the tank ranged from 24.8° to 27.9°C during the quarter. The numbers of eggs collected after each spawning event ranged from about 34,000 to 1,847,000. Spawning occurred as early as 1:20 p.m. and as late as 6:20 p.m.

There were five mortalities in Tank 1 (ranging in weight from 21-41 kg), and at the end of the quarter there were 1 giant (61 kg), 4 large (40-50 kg), and 11 medium (18-26 kg) yellowfin in the tank. Four of the mortalities appeared to be due to wall strikes, and one to starvation.

There was a total of 18 yellowfin (9-17 kg) in the two 170,200-L capacity reserve broodstock tanks (Tanks 2 and 6) in early March. These fish had been used in a 4-month diet trial comparing pellet food with frozen fish and squid. On March 7 all the fish in each tank were removed, and weighed and measured. Three fish from each tank were sacrificed for later proximate analysis, and one fish was sacrificed due to poor health. Four of the remaining fish were returned to Tank 2 to continue on a diet of pellet food to see if they would become reproductively active. Archival tags were surgically implanted into six fish, and they were placed into Tank 6. The feeding and spawning behavior of these fish will be monitored over the next several months, and the observations will be compared with the internal temperatures of the fish recorded by the archival tags.

Rearing of yellowfin eggs, larvae, and juveniles

During the quarter the following parameters were recorded for each spawning event: time of spawning, egg diameter, duration of egg stage, hatching rate, lengths of hatched larvae, and duration of yolk-sac stage. The weights of the eggs, yolk-sac larvae, and first-feeding larvae, and the lengths and selected morphometrics of these, were measured periodically.

Studies of snappers and corvina

The work on snappers and corvina is carried out by the Dirección General de Recursos Marinos de Panamá.

The spotted rose snapper (*Lutjanus guttatus*) broodstock, which began to spawn at the end of May 2000, continued to spawn about three times per month during the first quarter. A group of 44 fish, hatched in captivity in October 1998, is being held in two 12,000-L tanks. On average, these fish were about 42 cm long and weighed about 1 kg at the end of the quarter.

One group of 125 juvenile polla drum (*Umbrina xanti*), hatched in captivity in July 1999, is being held in a 12,000-L tank. These fish are about 25 cm long and weigh about 170 g, on average. These fish will be used as broodstock.

At the end of the quarter 6 white corvina or Stoltzman's weakfish (*Cynoscion albus* or *C. stolzmani*) were being held in Tank 3 (85,000 L). Four fish died during the quarter due to infections or starvation. None of these fish has spawned yet.

Oceanography and meteorology

Easterly surface winds blow almost constantly over northern South America, which causes upwelling of cool, nutrient-rich subsurface water along the equator east of 160ºW, in the coastal regions off South America, and in offshore areas off Mexico and Central America. El Niño events are characterized by weaker-than-normal easterly surface winds, which cause above-normal sea-surface temperatures (SSTs) and sea levels and deeper-than-normal thermoclines over much of the eastern tropical Pacific (ETP). In addition, the Southern Oscillation Indices (SOIs) are negative during El Niño episodes. (The SOI is the difference between the anomalies of sea-level atmospheric pressure at Tahiti, French Polynesia, and Darwin, Australia. It is a measure of the strength of the easterly surface winds, especially in the tropical Pacific in the Southern Hemisphere.) Anti-El Niño events, which are the opposite of El Niño events, are characterized by stronger-than-normal easterly surface winds, below-normal SSTs and sea levels, shallower-than-normal thermoclines, and positive SOIs. Each of the four El Niño events during the 1969-1983 period was followed by better-than-average recruitment of yellowfin in the eastern Pacific Ocean two years later (Japan. Soc. Fish. Ocean., Bull., 53 (1): 77-80), and IATTC staff members are currently studying data for more recent years to see if this relationship has persisted and to see if it applies to skipjack and/or bigeye.

Two new indices, the SOIx and the NOIx, have recently been devised. These are described in a paper to be published in the journal Progress in Oceanography. The SOIx is the difference between the anomalies of sea-level atmospheric pressure at the South Pacific High (30°S-95°W) and Darwin, Australia, and the NOIx is the difference between the anomalies of sea-level atmospheric pressure at the North Pacific High (35°N-130°W) and Darwin. The SOIx and NOIx values are both negative during El Niño events and positive during anti-El Niño events.

The anti-El Niño conditions that had prevailed since mid-1998 weakened during the first quarter of 2001. During February there were few temperature anomalies anywhere in the tropical or subtropical Pacific east of 180° that were more than 1°C greater than or less than normal (Figure 8). The data in Table 7, for the most part, indicate that conditions were approaching normal. According to the Climate Diagnostics Bulletin of the U.S. National Weather Service for March 2001, the current anti-El Niño conditions "are expected to gradually weaken during the next few months, followed by near-normal or slightly warmer-than-normal conditions during the second half of 2001."

GEAR PROGRAM

During the first quarter IATTC staff members participated in dolphin safety-gear inspection and safety-panel alignment procedures aboard 10 Mexican-flag purse seiners.

One dolphin mortality reduction workshop, attended by six fishermen, was held in La Jolla, California, USA, during the quarter.

MEETINGS

The chairman's reports of the first and third meetings described below are available on the IATTC's web site, www.iattc.org.

Third meeting of the Working Group on Finance

The third meeting of the IATTC Working Group on Finance was held in La Jolla, California, USA, on January 31-February 2, 2001. Mr. Svein Fougner of the United States presided at the meeting, which was attended by representatives from Costa Rica, Ecuador, El Salvador, Guatemala, Japan, Mexico, Nicaragua, Panama, the United States, Vanuatu, and Venezuela and observers from Colombia, the European Union, Peru, Spain, the Center for Marine Conservation, and the Whale and Dolphin Conservation Society. The purpose of the meeting was to develop a system that would meet the general principles identified in the chairman's report on the second meeting of the Working Group submitted to the 66th meeting of the IATTC in June 2000. These principles included transparency, inclusion of all nations that have an interest in the IATTC's work, stability and predictability, consideration of the catches of all species of fish managed by the IATTC in determining participation in the fisheries, and flexibility, so as to accommodate the needs of nations that require time to adjust to the system and to accommodate new members as they join the IATTC. The Working Group recommended that the system be implemented for the fiscal year of October 1, 2002-September 30, 2003.

Meeting of the joint OFCF-Panama-IATTC project

The final meeting of the joint OFCF [Overseas Fishery Cooperation Foundation]-Panama-IATTC project was held at the Achotines Laboratory on January 23 and 24, 2001. Dr. Taira Matsuoka (OFCF technical advisor), Mr. Akio Nakazawa (former OFCF counterpart at the laboratory), Dr. Shukei Masuma (director of the bluefin tuna research station of JASFA (Japan Sea-Farming Association) at Amami, Japan), Mr. Yukiyasu Niwa (current OFCF counterpart at the laboratory), Mr. Epimenides Diaz (Sub-Director of the Dirección General de Recursos Marinos y Costeros, Autoridad Marítima de Panamá), Mr. Amado Cano (Panamanian counterpart at the laboratory), Drs. Robin Allen and Daniel Margulies, and Mr. Vernon P. Scholey participated in the meeting. The accomplishments of the last eight years were reviewed, and plans for continuing research on tuna and other local species were discussed. The joint project officially ended on March 31, but the IATTC and the Dirección General de Recursos Marinas de Panamá will continue their work separately.

Twenty-sixth meeting of the International Review Panel

The 26th meeting of the IRP was held in La Jolla, California, USA, on January 29-30, 2001. Mr. Jim Lecky of the United States presided at the meeting, which was attended by representatives of Colombia, Costa Rica, Ecuador, El Salvador, the European Union, Mexico, Nicaragua, Peru, the United States, Vanuatu, Venezuela, the tuna industry, and the environmental community, plus observers from Guatemala. Among the items discussed at the

meeting were participation of Bolivia in IRP meetings, the list of qualified captains, dolphin mortality limits (DMLs) for 2000 and mortalities of dolphins during that year, DMLs for 2001, measuring performance in reducing dolphin mortalities, a proposed statistical study of the patterns of violations of the Agreement on the International Dolphin Conservation Program, and the Tuna Tracking System.

Other meetings

Dr. Michael D. Scott participated in a workshop on dolphin stress studies in La Jolla, California, USA, on January 30-31, 2001. The study, to be conducted at sea by the U.S. National Marine Fisheries Service in 2001, will involve collection of blood for subsequent examination. Dr. Scott also participated in several planning meetings at which the charter of a purse seiner to conduct the studies was discussed.

Dr. George M. Watters participated in an ICCAT-sponsored workshop in Madrid, Spain, on February 6-8, 2001. The workshop consisted of informal discussions about the design and development of a statistical model that the ICCAT plans to use for future stock assessments of Atlantic bigeye tuna. The model will be similar to A-SCALA (used by the staff of the IATTC) and MULTIFAN-CL (used by the staff of the Secretariat of the Pacific Community).

Dr. Robin L. Allen spent the period of February 20-29, 2001, in Rome, Italy, where he participated in a meeting of FAO and non-FAO Fisheries Bodies, a Technical Consultation on Illegal, Unreported, and Unregulated fishing, and a meeting of the FAO Committee on Fisheries.

Dr. Martín A. Hall attended a meeting of the Southern Division of the American Fisheries Society in Jacksonville, Florida, USA, on February 22-25, 2001. He was one of the speakers at a panel entitled Fish Attracting Devices (FADs): Science and Management Issues.

Dr. Robert J. Olson participated in a workshop, "Impact of Climate Variability on Observation and Prediction of Ecosystem and Biodiversity Changes in the North Pacific," in Honolulu, Hawaii, USA, on March 7-9, 2001. The workshop was sponsored by the North Pacific Marine Science Organization (PICES), the Census of Marine Life (CoML), and the International Pacific Research Center (IPRC). He presented a summary of information from IATTC's stock assessments on time series of recruitment, biomass, and average weights of several tunas in the EPO and an overview of the Ecopath-Ecosim model for the tropical eastern Pacific.

Drs. James Joseph and Pablo R. Arenas attended the third meeting of the World Tuna Purse Seine Organization (WTPO) in Guayaquil, Ecuador, on March 2-3, 2001. Eleven countries, Colombia, Ecuador, France, Japan, Korea, Mexico, Panama, the Philippines, Spain, Taiwan, and Venezuela, have signed the new WTPO agreement. The tuna boat owners agreed to continue their measures to reduce the global catch of skipjack. In the agreement an explicit exception was made for the vessels fishing in the eastern Pacific Ocean. All vessels will be permitted to fish normally until June, since currently the purse-seine catches of skipjack in the EPO are considerably less than they were in 2000.

PUBLICATIONS

Stock Assessment Report

No. 1. 2001. Status of the tuna and billfish stocks in 1999 (in English and Spanish): 340 pp.

Special Reports

No. 12. 2001. Symposium on world tuna fisheries: commemorating the 50th anniversary of the establishment of the Inter-American Tropical Tuna Commission: 54 pp.

No. 13. Bayliff, William H. 2001. Organization, functions, and achievements of the Inter-American Tropical Tuna Commission: 122 pp.

Outside journal

Maunder, Mark N. 2001. A general framework for integrating the standardization of catch per unit of effort into stock assessment models. Canad. Jour. Fish. Aquatic Sci., 58 (4): 795-803.

ADMINISTRATION

Mr. Ricardo A. López Rodríquez started work in the Panama field office on October 1, 2000. Previously he had helped out in that office during the period when he was an observer.

Dr. Hiroaki Okamoto, an employee of the National Research Institute of Far Seas Fisheries of Japan, who had been working with IATTC staff members in La Jolla on various projects since February 1, 2000, returned to Japan on January 30, 2001.

Mr. Forrest R. Miller retired on February 28, 2001, after having served the IATTC as an employee or consultant since 1967. He has a Master of Science degree from the University of California at Los Angeles, where he studied meteorology under Dr. Jacob Bjerkness. Mr. Miller's assessments of the meteorology and oceanography of the eastern Pacific Ocean, especially with regard to the El Niño phenomenon, have appeared regularly in the IATTC Annual Reports and Quarterly Reports since 1967. (El Niño occurrences received little attention from the scientific community prior to 1982, so he was a pioneer in the study of this important phenomenon.) In addition, Mr. Miller is the author or co-author of numerous papers on meteorology and oceanography published as IATTC Bulletins, Technical Reports, Data Reports, and contributions in outside journals. He will be missed, but everyone wishes him a long and happy retirement.

Mr. Roberto Yau was hired on March 6, 2001, as the new supervisor of maintenance for the Achotines Laboratory. He replaces Mr. Mario Budria, who died in November 2000.

Mr. Joshue Gross, a graduate of American University, Washington, D.C., USA, was employed by the IATTC on March 12, 2001. He replaces Ms. Marcela Campa, who resigned in December 2000.

Mr. Yuki Niwa, the Overseas Fishery Cooperation Foundation of Japan counterpart to the early life history project, left Achotines on March 15, 2001, to return to Japan. He had been at Achotines Laboratory since February of 1999.

Mr. Robert B. Kwan, assistant computer systems manager, graduated from the University of California at San Diego on March 23, 2001, with a B.A. degree in economics.

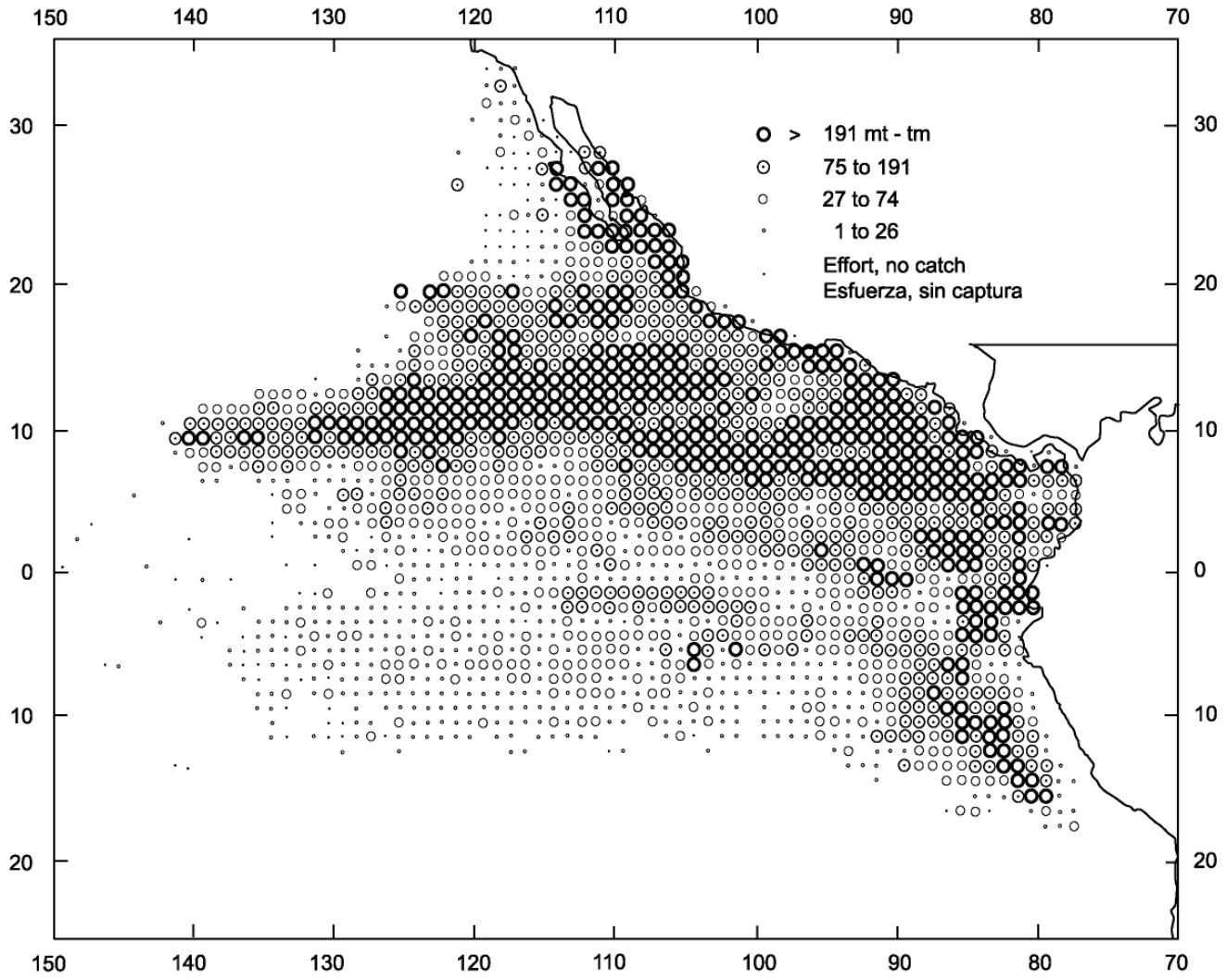

FIGURE 1a. Average annual catches of yellowfin and average annual fishing effort in the EPO during 1985-1999 for all purse-seine trips for which usable logbook data were obtained. The average catches and effort were calculated only for 1-degree areas for which three or more years of data were available.

FIGURA 1a. Capturas medias anuales de aleta amarilla y esfuerzo medio anual de pesca en el OPO durante 1985-1999, de todos los viajes de barcos cerqueros de los que se obtuvieron datos de bitácora utilizables. Se calcularon promedios de captura y esfuerzo solamente para las áreas de 1° para las cuales se disponía de tres años o más de datos.

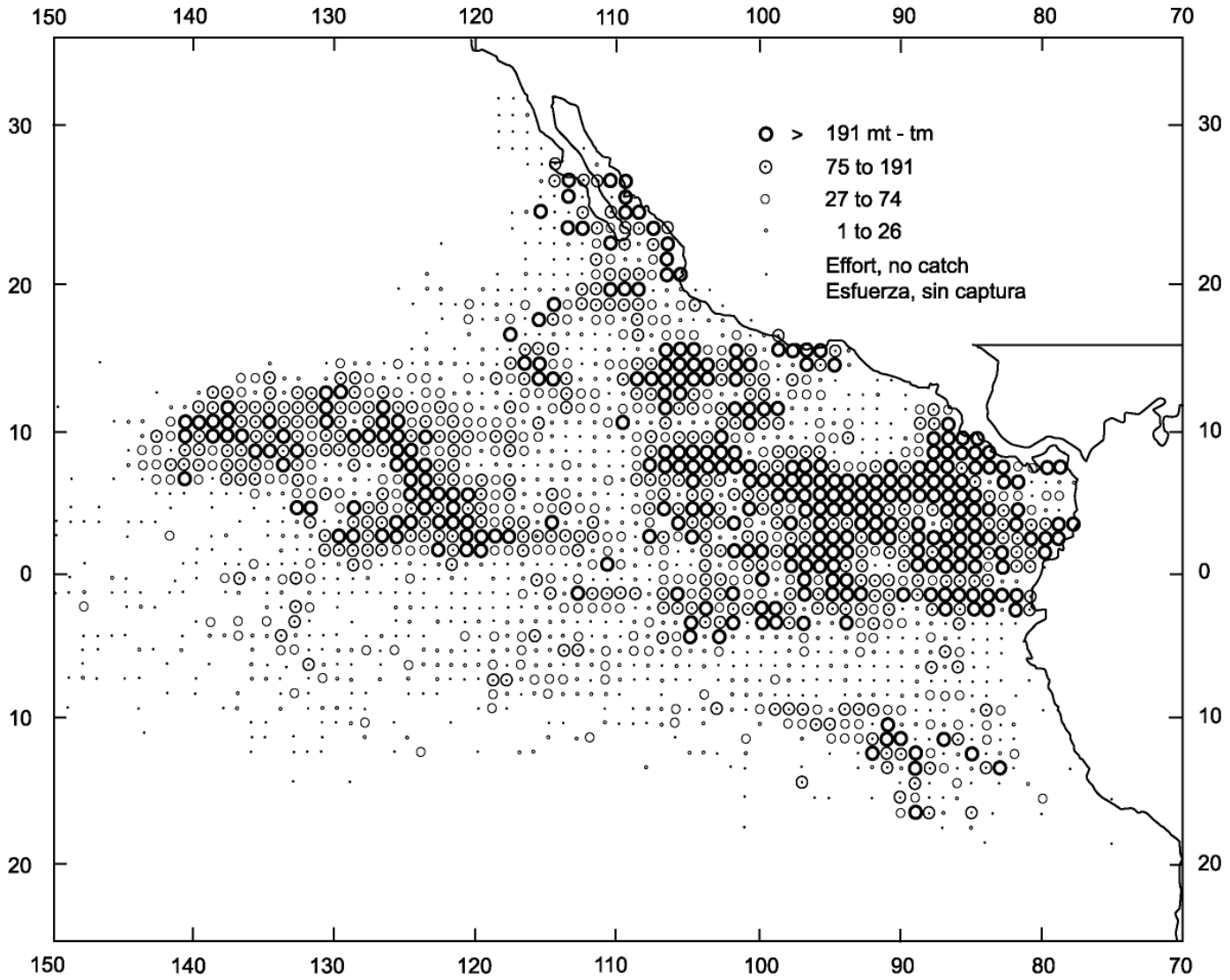

FIGURE 1b. Catches of yellowfin and fishing effort in the EPO during 2000 for all purse-seine trips for which usable logbook data were obtained.

FIGURA 1b. Capturas de aleta amarilla y esfuerzo de pesca en el OPO en 2000, de todos los viajes de barcos cerqueros de los que se obtuvieron datos de bitácora utilizables.

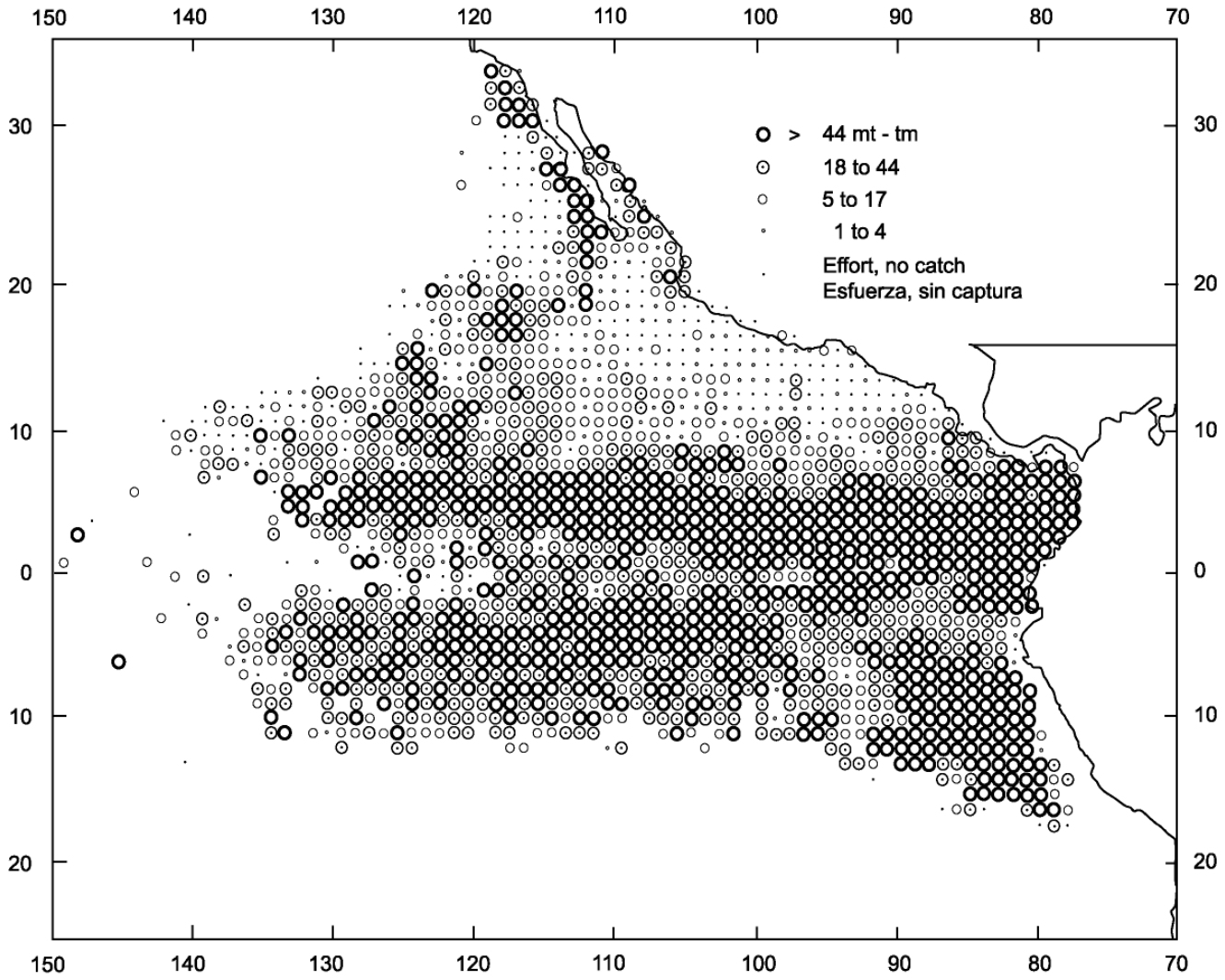

FIGURE 2a. Average annual catches of skipjack and average annual fishing effort in the EPO during 1985-1999 for all purse-seine trips for which usable logbook data were obtained. The average catches and effort were calculated only for 1-degree areas for which three or more years of data were available.

FIGURA 2a. Capturas medias anuales de barrilete y esfuerzo medio anual de pesca en el OPO durante 1985-1999, de todos los viajes de barcos cerqueros de los que se obtuvieron datos de bitácora utilizables. Se calcularon promedios de captura y esfuerzo solamente para las áreas de 1° para las cuales se disponía de tres años o más de datos.

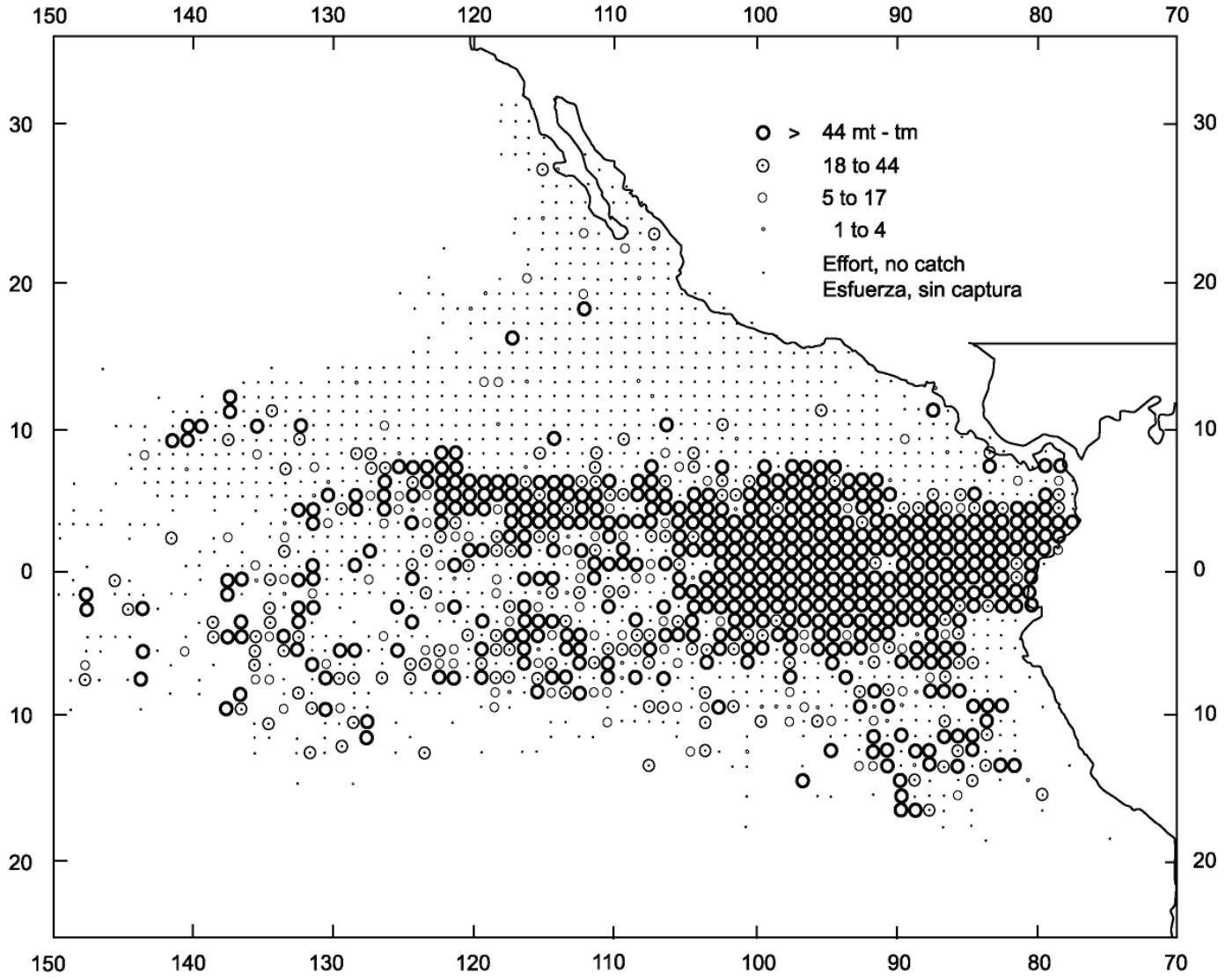

FIGURE 2b. Catches of skipjack and fishing effort in the EPO during 2000 for all purse-seine trips for which usable logbook data were obtained.
FIGURA 2b. Capturas de barrilete y esfuerzo de pesca en el OPO en 2000, de todos los viajes de barcos cerqueros de los que se obtuvieron datos de bitácora utilizables.

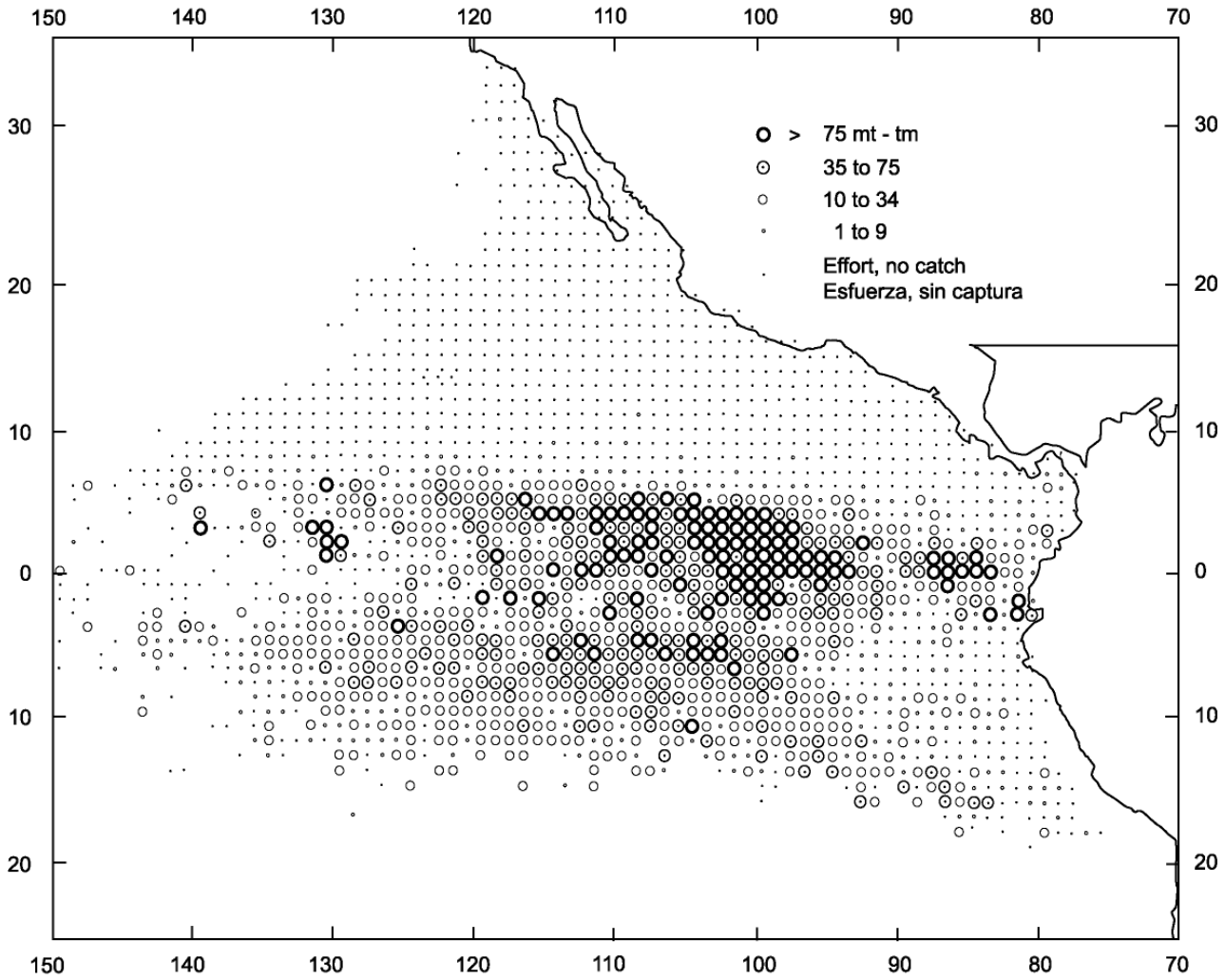

FIGURE 3a. Average annual catches of bigeye tuna and average annual fishing effort in the EPO during 1994-1999 for all purse-seine trips for which usable logbook data were obtained. The averages were calculated only for 1-degree areas for which two or more years of data were available.

FIGURA 3a. Capturas medias anuales de atún patudo y esfuerzo medio anual de pesca en el OPO durante 1994-1999, de todos los viajes de barcos cerqueros de los que se obtuvieron datos de bitácora utilizables. Se calcularon los promedios solamente para las áreas de 1° para las cuales se disponía de dos o más años de datos.

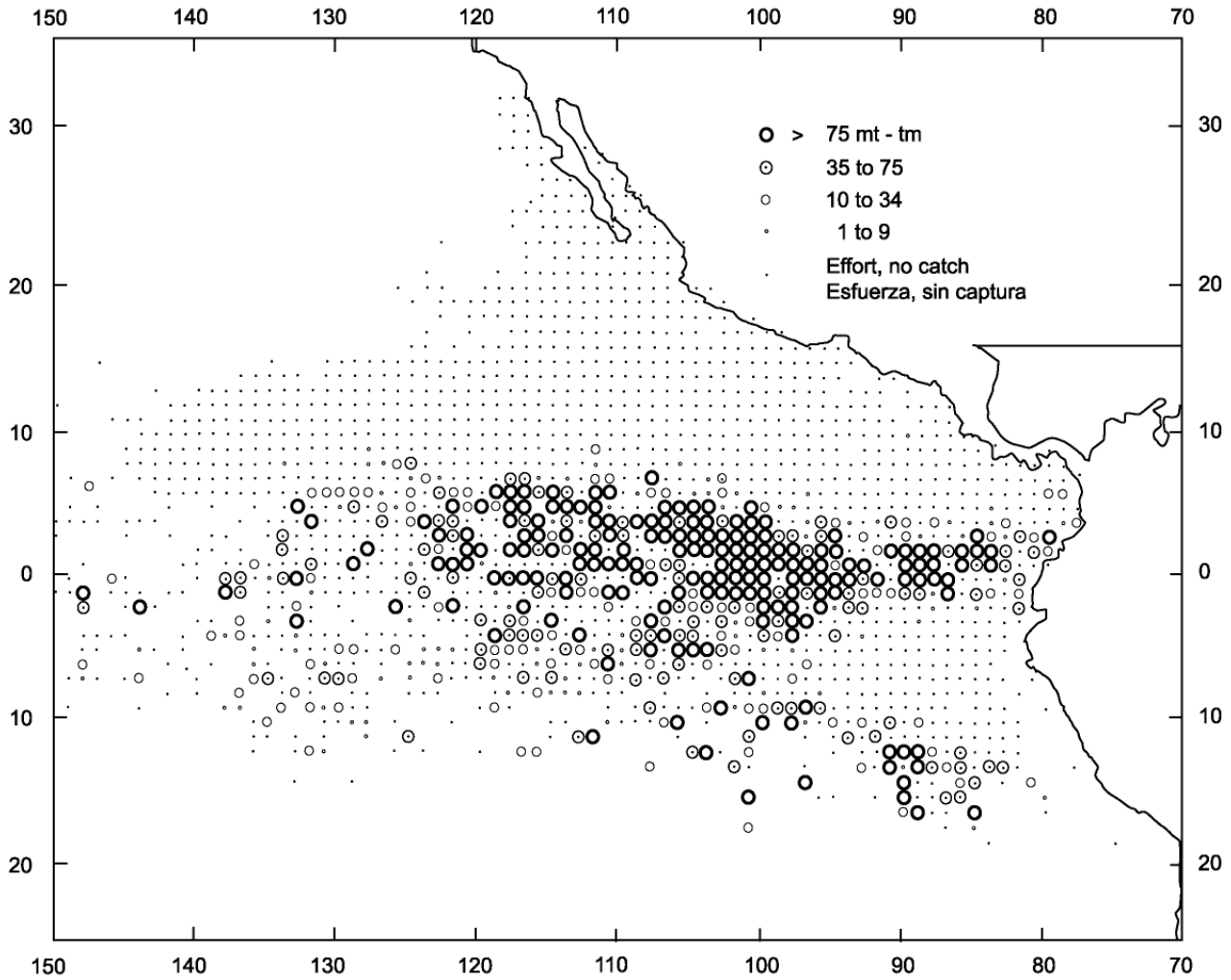

FIGURE 3b. Catches of bigeye tuna and fishing effort in the EPO during 2000 for all purse-seine trips for which usable logbook data were obtained.

FIGURA 3b. Capturas de atún patudo y esfuerzo de pesca en el OPO en 2000, de todos los viajes de barcos cerqueros de los que se obtuvieron datos de bitácora utilizables.

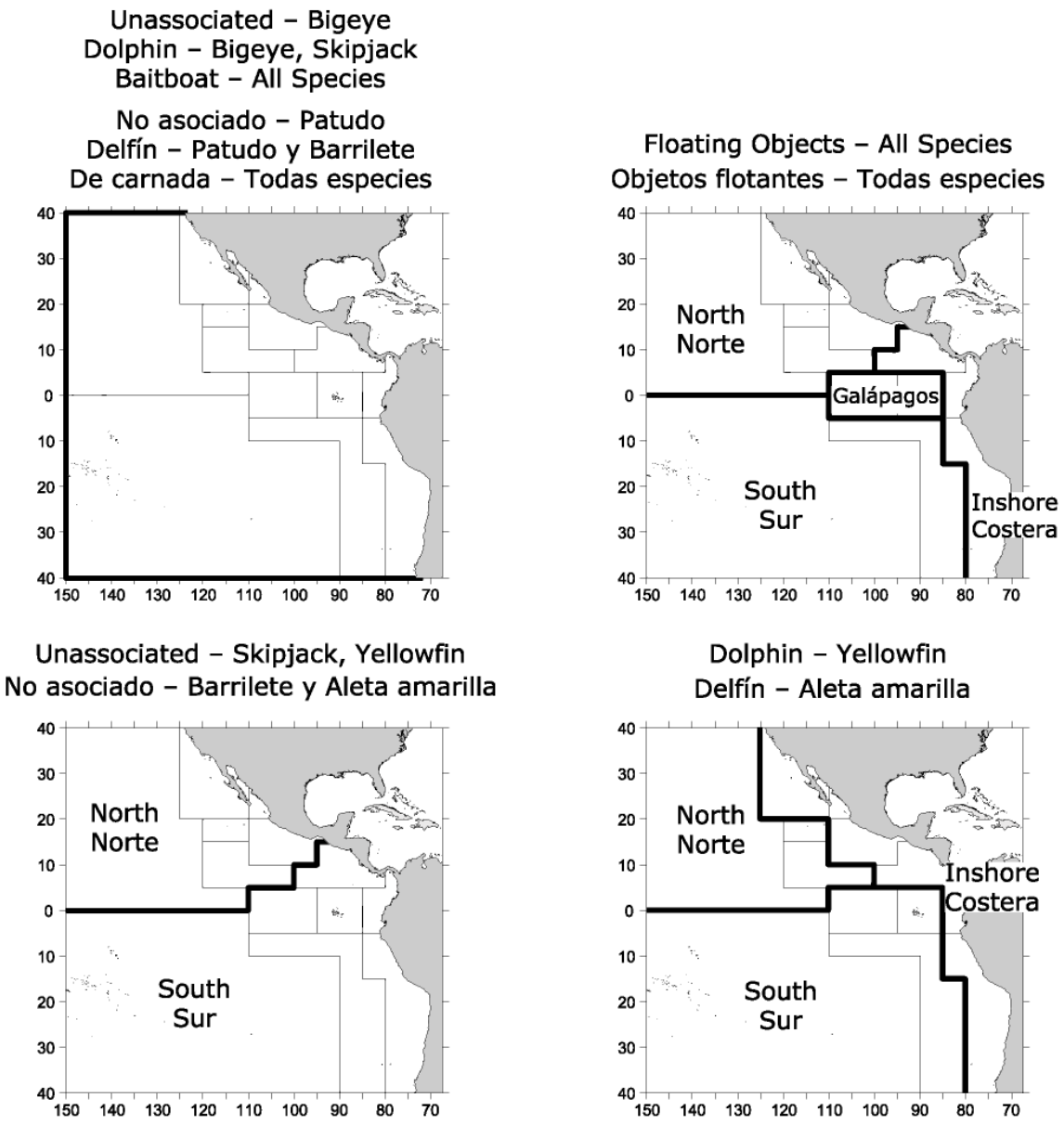

FIGURE 4. Spatial extents of the fisheries defined by the IATTC staff for stock assessment of yellowfin, skipjack, and bigeye in the EPO. The thin lines indicate the boundaries of the 13 length-frequency sampling areas, and the bold lines the boundaries of the fisheries.
FIGURA 4. Extensión especial de las pesquerías definidas por el personal de la CIAT para la evaluación de los stocks de atún aleta amarilla, barrilete, y patudo en el OPO. Las líneas delgadas indican los límites de las 13 zonasde muestreo de frecuencia de tallas, y las líneas gruesas los límites de las pesquerías.

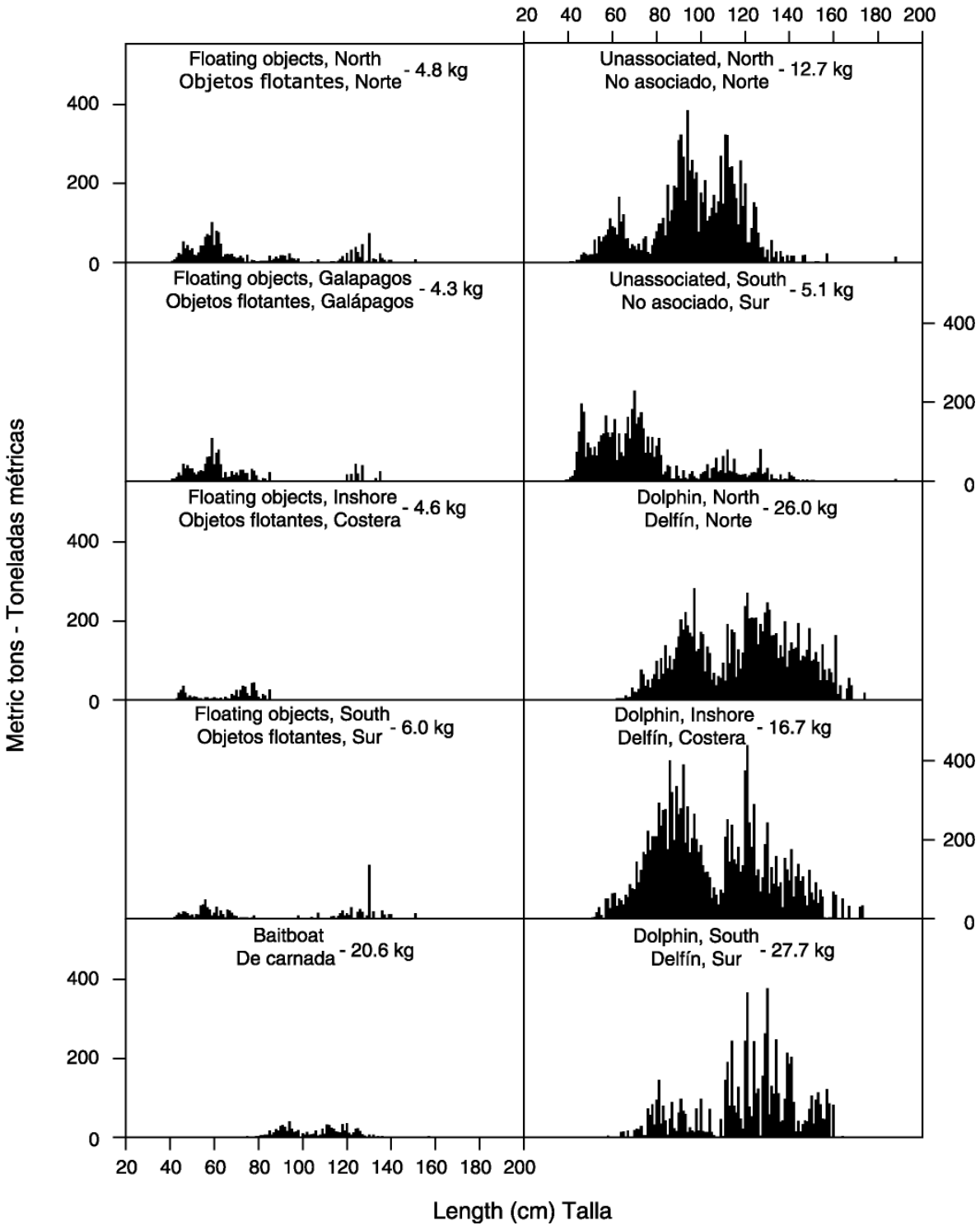

FIGURE 5a. Estimated size compositions of the yellowfin caught in each fishery of the EPO during the fourth quarter of 2000. The average weights of the fish in the samples are given at the tops of the panels.

FIGURA 5a. Composición por tallas estimada para el aleta amarilla capturado en cada pesquería del OPO durante el cuarto trimestre de 2000. En cada recuadro se detalla el peso promedio de los peces en las muestras.

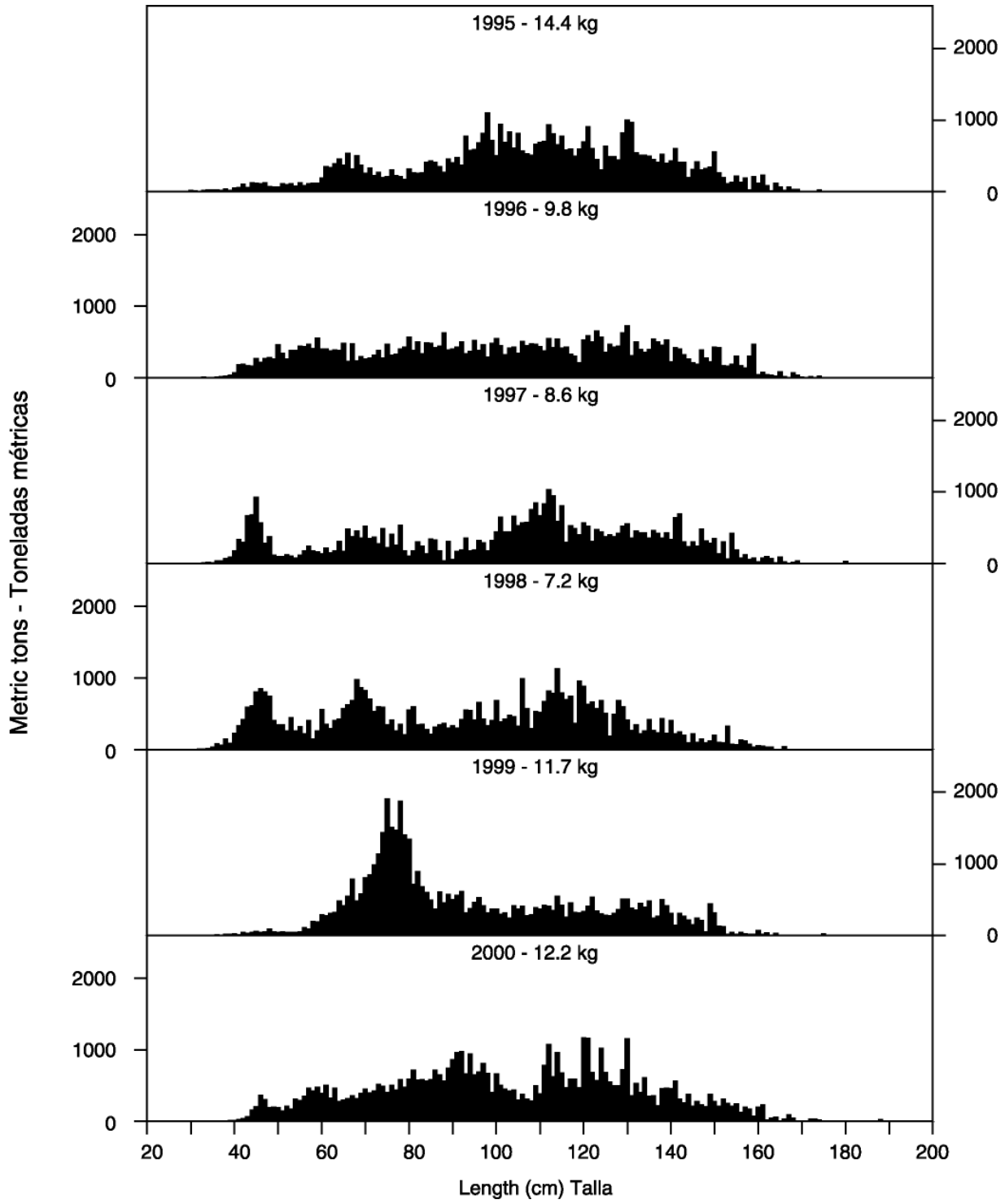

FIGURE 5b. Estimated size compositions of the yellowfin caught in the EPO during the fourth quarter of 1995-2000. The average weights of the fish in the samples are given at the tops of the panels.

FIGURA 5b. Composición por tallas estimada para el aleta amarilla capturado en el OPO en el cuarto trimestre de 1995-2000. En cada recuadro se detalla el peso promedio de los peces en las muestras.

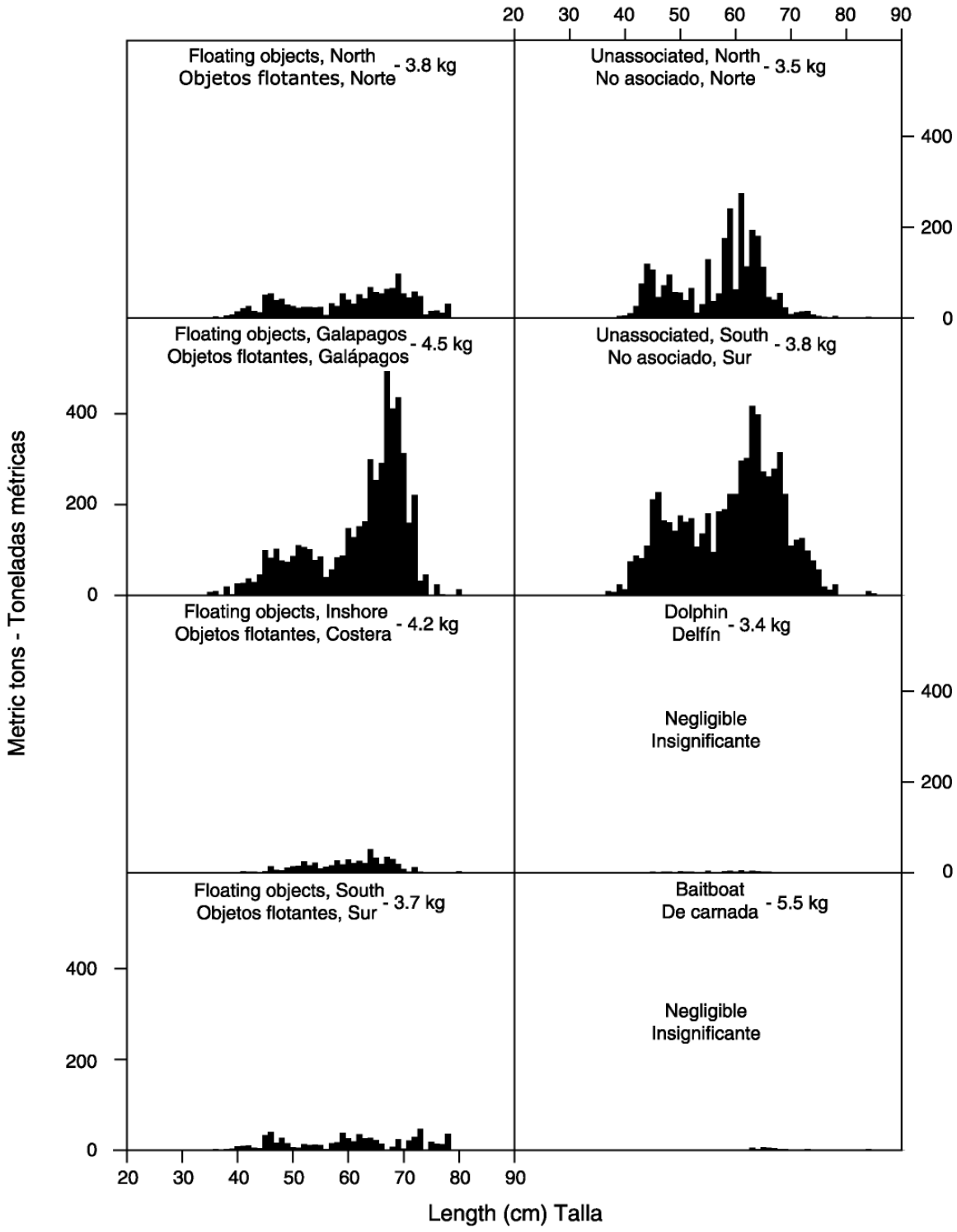

FIGURE 6a. Estimated size compositions of the skipjack caught in each fishery of the EPO during the fourth quarter of 2000. The average weights of the fish in the samples are given at the tops of the panels.

FIGURA 6a. Composición por tallas estimada para el barrilete capturado en cada pesquería del OPO durante el cuarto trimestre de 2000. En cada recuadro se detalla el peso promedio de los peces en las muestras.

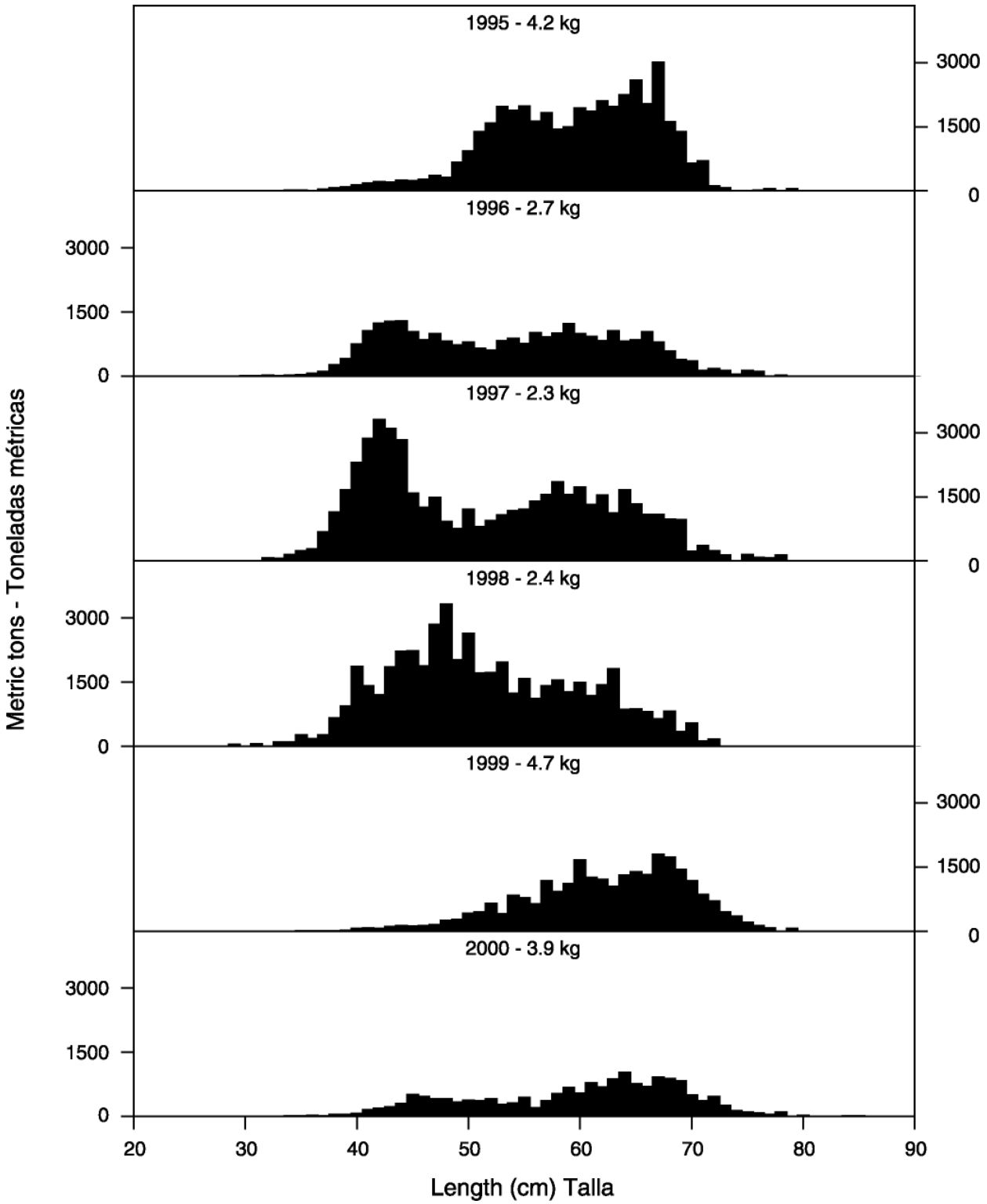

FIGURE 6b. Estimated size compositions of the skipjack caught in the EPO during the fourth quarter of 1995-2000. The average weights of the fish in the samples are given at the tops of the panels.

FIGURA 6b. Composición por tallas estimada para el barrilete capturado en el OPO en el cuarto trimestre de 1995-2000. En cada recuadro se detalla el peso promedio de los peces en las muestras.

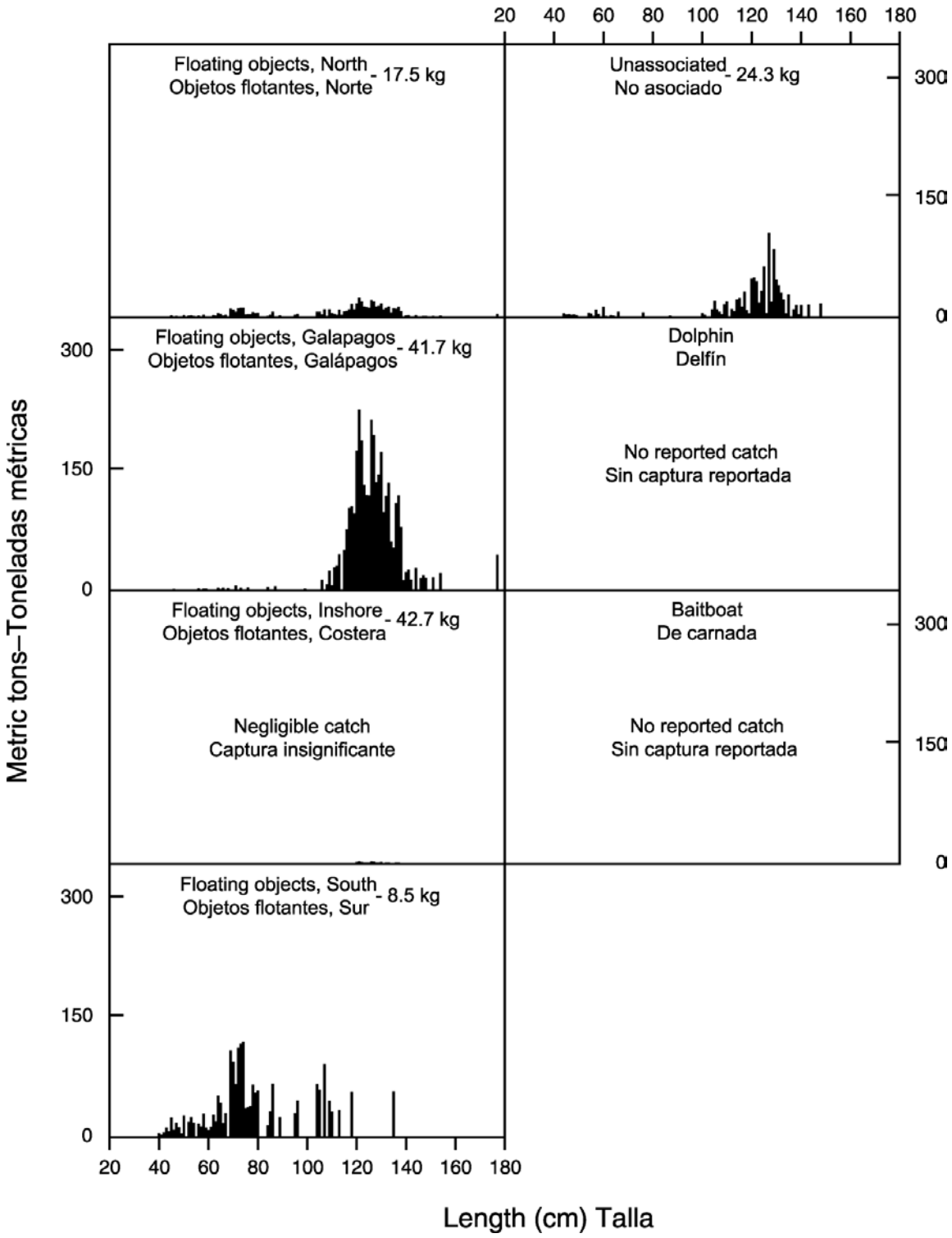

FIGURE 7a. Estimated size compositions of the bigeye caught in each fishery of the EPO during the fourth quarter of 2000. The average weights of the fish in the samples are given at the tops of the panels.

FIGURA 7a. Composición por tallas estimada para el patudo capturado en cada pesquería del OPO durante el cuarto trimestre de 2000. En cada recuadro se detalla el peso promedio de los peces en las muestras.

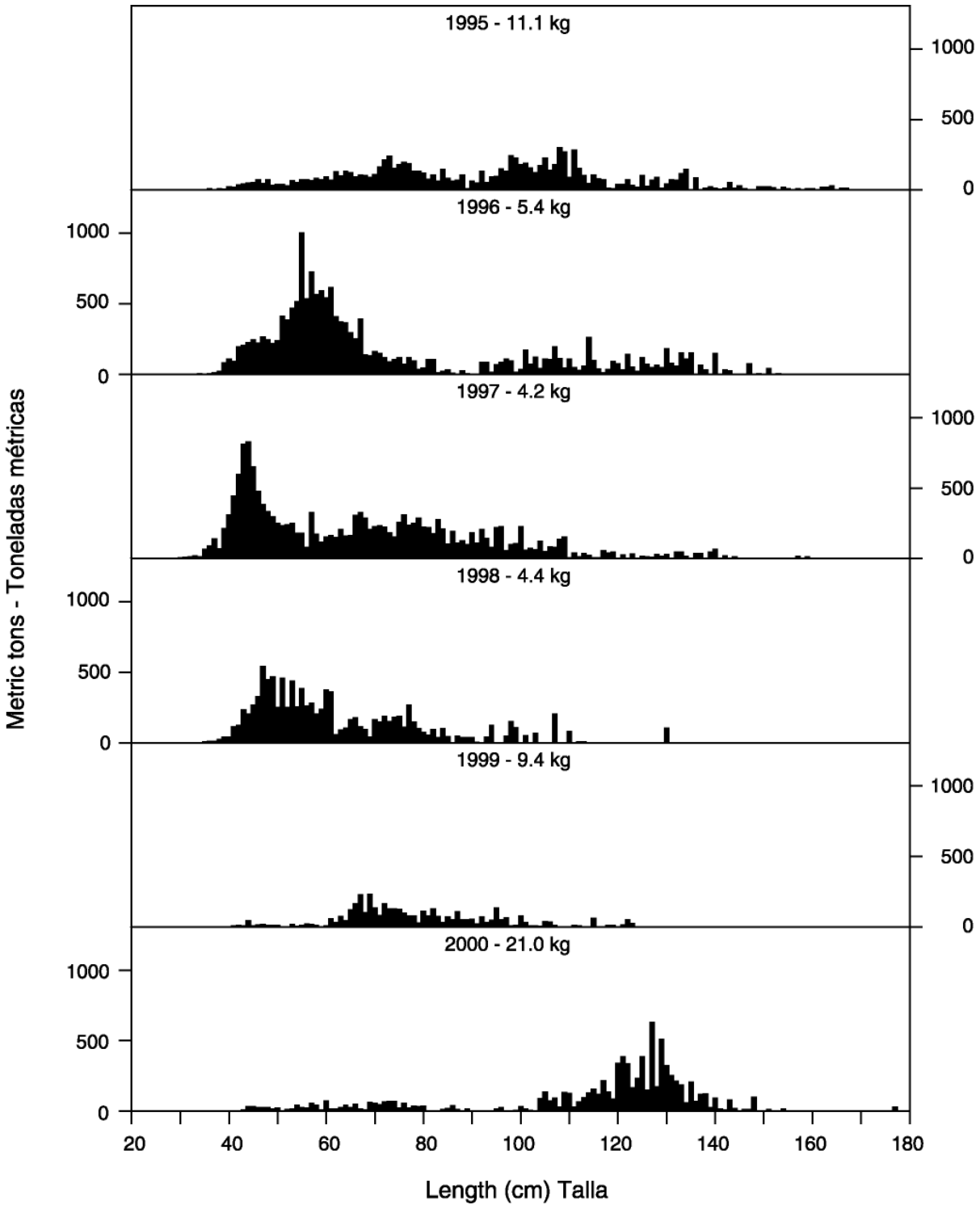

FIGURE 7b. Estimated size compositions of the bigeye caught in the EPO during the fourth quarter of 1995-2000. The average weights of the fish in the samples are given at the tops of the panels.

FIGURA 7b. Composición por tallas estimada para el patudo capturado en el OPO en el cuarto trimestre de 1995-2000. En cada recuadro se detalla el peso promedio de los peces en las muestras.

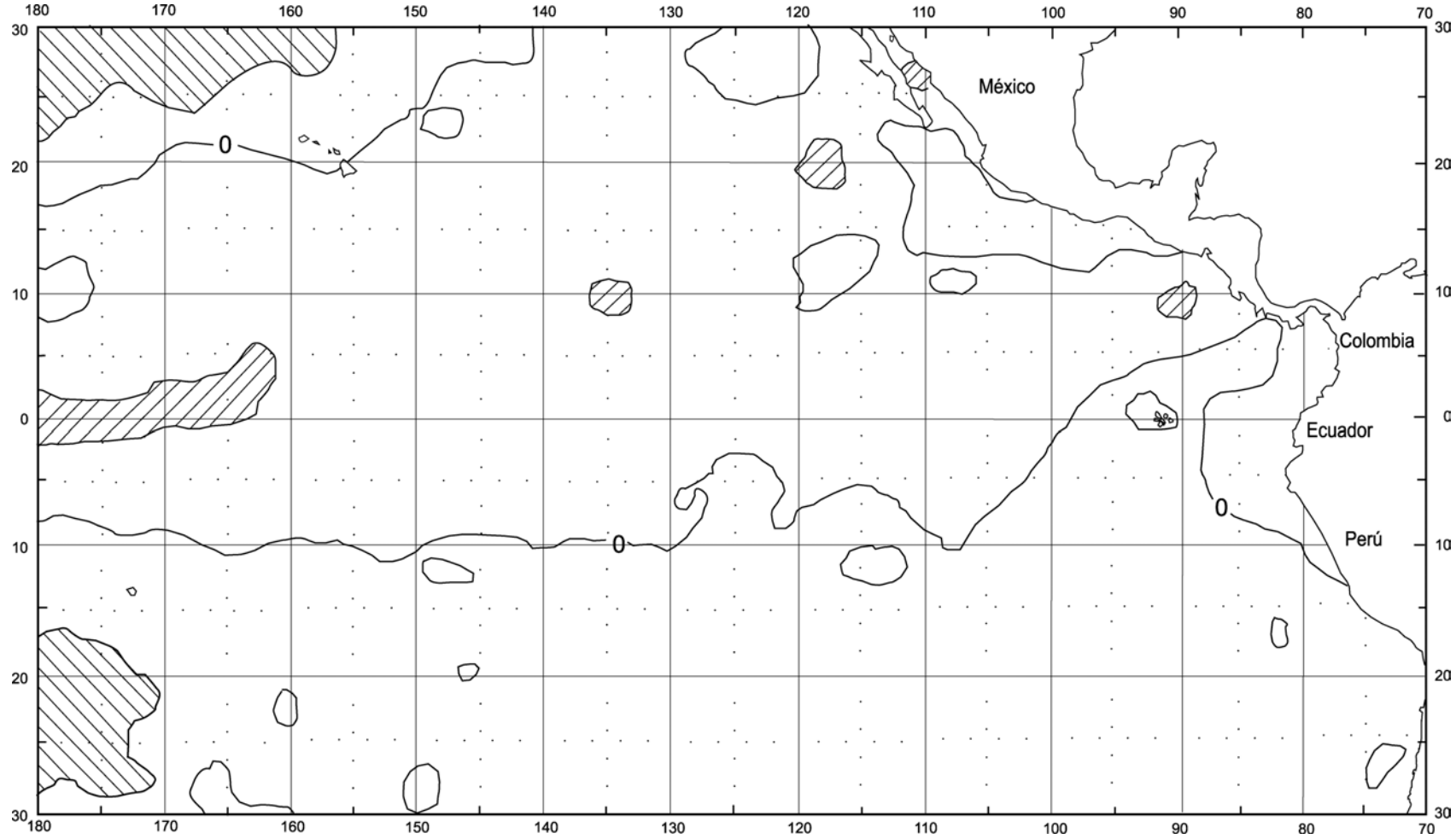

FIGURE 8. Sea-surface temperature (SST) anomalies (departures from long-term normals) for February 2001, based on data from fishing boats and other types of commercial vessels. The areas with SSTs more than 1°C below normal are hatched from lower left to upper right, and those with SSTs more than 1°C above normal are hatched from upper left to lower right.

FIGURA 8. Anomalías (variaciones de los niveles normales a largo plazo) de la temperatura superficial del mar (TSM) en febrero de 2001, basadas en datos tomados por barcos pesqueros y otros buques comerciales. Las zonas TSM más de 1°C inferiores a lo normal están sombreadas con rayas diagonales que suben hacia la derecha, y aquéllas con TSM más de 1°C superiores a lo normal con rayas diagonales que suben hacia la izquierda.

TABLE 1. Preliminary estimates of the numbers and carrying capacities, in cubic meters, of purse seiners and baitboats operating in the EPO in 2001 by flag, gear, and size class. Each vessel is included in the totals for each flag under which it fished during the year, but is included only once in the fleet total. Therefore the totals for the fleet may not equal the sums of the individual flag entries. PS = purse seine; BB = baitboat.

TABLA 1. Estimaciones preliminares del número de buques que pescaron en el OPO en 2001 (sin incluir palangreros y barcos pequeños diversos), y de la capacidad de acarreo de los mismos, en metros cúbicos, por bandera, arte de pesca, y clase de arqueo. Se incluye cada buque en los totales de cada bandera bajo la cual pescó durante el año, pero solamente una vez en el total de la flota; por consiguiente, los totales de las flotas no son siempre iguales a las sumas de las banderas individuales. PS = cerquero; BB = barco de carnada.

Flag	Gear	Size class -- Clase de arqueo							Capacity
Bandera	Arte	1	2	3	4	5	6	Total	Capacidad
					Number—Número				
Belize--Belice	PS	-	-		1	1	1	3	1,752
Bolivia	PS	-	-	-	-	-	4	4	4,636
Colombia	PS	-	-	2	-	2	5	9	7,130
Ecuador	PS	-	7	12	13	6	36	74	45,619
	BB	1	-	-	-	-	-	1	32
España--Spain	PS	-	-	-	-	-	5	5	12,188
Guatemala	PS	-	-	-	-	-	4	4	7,640
Honduras	PS	-	-	-	-	-	2	2	1,798
México	PS	-	-	6	3	4	39	52	46,898
	BB	1	4	6	-	-	-	11	1,349
Nicaragua	PS	-	-	-	-	-	1	1	1,229
Panamá	PS	-	-	2	2	-	6	10	9,517
El Salvador	PS	-	-	-	-	-	1	1	1,919
U.S.A.--EE.UU.	PS	-	3	2	-	2	6	13	9,141
Venezuela	PS	-	-	-	-	-	24	24	30,461
Vanuatu	PS	-	-	-	-	-	6	6	7,803
All flags--	PS	-	10	24	19	15	140	208	
Todas banderas	BB	2	4	6	-	-	-	12	
	PS + BB	2	14	30	19	15	140	220	
					Capacity—Capacidad				
All flags--	PS	-	984	4,294	5,470	7,030	169,953	187,731	
Todas banderas	BB	85	383	913	-	-	-	1,381	
	PS + BB	85	1,367	5,207	5,470	7,030	169,953	189,112	

TABLE 2. Changes in the IATTC fleet list recorded during the first quarter of 2001. PS = purse seine; BB = baitboat.
TABLA 2. Cambios en la flota observada por la CIAT registrados durante el primer trimestre de 2001. PS = cerquero; BB = barco de carnada.

Vessel name	Flag	Gear	Size class	Remarks
Nombre del buque	Bandera	Arte	Clase de arqueo	Comentarios
Vessels added to the fleet—Buques agregados a la flota				
Alexandros	SLV	PS	6	New entry—1er ingreso
Esthercho	HND	PS	6	New entry—1er ingreso
Lady Elizabeth	USA	PS	5	New entry—1er ingreso
Rosita C	ESP	PS	6	New entry—1er ingreso
Delfin X	MEX	BB	3	Re-entry—Reingreso
New Horizon	USA	JB	1	Re-entry—Reingreso
Annie D	USA	PS	2	Re-entry—Reingreso
Raffaello	PAN	PS	6	Re-entry—Reingreso
Santa Maria	USA	PS	2	Re-entry—Reingreso
Sea Scout	USA	PS	3	Re-entry—Reingreso
St George II	USA	PS	2	Re-entry—Reingreso
Templario	UNK	PS	6	Re-entry—Reingreso
				Flag changed to—
				Ahora bandera: VEN
Vessels changing name and/or flag—Buques de nombre y/o bandera cambiada				
Famtiza	MEX	PS	5	Name changed to—
				Ahora: *Juan Pablo I*
Karla Renata	BLZ	PS	6	Name changed to—
				Ahora: *Maria Jose*
Cabo De Hornos	VUT	PS	6	Flag changed to—
				Ahora bandera: BOL
Esmeralda C	ESP	PS	6	Flag changed to—
				Ahora bandera: VUT
Vessels removed from the fleet--Buques retirados de la flota				
Maria Valeria	MEX	PS	6	Sunk—Hundido
Delfin VI	MEX	BB	3	
Delfin X	MEX	BB	3	
Aleta Azul	HND	PS	6	
Asturias	VUT	PS	6	
Don Abel	VEN	PS	6	
Monserrat	SLV	PS	6	
Oscar I	MEX	PS	3	
Ribadesella	SLV	PS	6	
Romani Sons	USA	PS	2	
Sara	ECU	PS	6	
Sea Queen	USA	PS	2	

TABLE 3. Preliminary estimates of the catches of tunas in the EPO from January 1 through April 2, 2001, by species and vessel flag, in metric tons.

TABLA 3. Estimaciones preliminares de las capturas de atunes en el OPO del 1 de enero al 2 de abril de 2001, por especie y bandera del buque, en toneladas métricas.

Flag	Yellowfin		Skipjack	Bigeye	Bluefin	Bonito	Albacore	Black skipjack	Other[1]	Total	Percentage of total
	CYRA	Outside									
Bandera	Aleta amarilla		Barrilete	Patudo	Aleta azul	Bonito	Albacora	Barrilete negro	Otras[1]	Total	Porcentaje del total
	ARCAA	Exterior									
Ecuador	26,010	880	22,678	4,552	-	-	-	-	-	54,120	30.9
España-Spain	3,991	70	6,680	1,266	-	-	-	-	-	12,007	6.9
México	39,739	67	1,785	-	-	-	-	-	-	41,591	23.8
Panamá	2,669	15	2,196	831	-	-	-	-	-	5,711	3.3
U.S.A.-EE.UU.	3,454	459	1,648	610	-	-	-	-	-	6,171	3.5
Venezuela	24,144	155	454	2	-	-	-	-	-	24,755	14.1
Vanuatu	3,760	-	2,966	1,668	-	-	-	-	-	8,394	4.8
Other-Otros[2]	16,402	530	4,242	1,041	-	-	-	-	-	22,215	12.7
Total	120,169	2,176	42,649	9,970	-	-	-	-	-	174,964	

[1] Includes mackerel, sharks, other tunas, and miscellaneous fishes

[1] Incluye caballas, tiburones, otros túnidos, y peces diversos

[2] Includes Belize, Bolivia, Colombia, El Salvador, Guatemala, Honduras, and Nicaragua. This category is used to avoid revealing the operations of individual vessels or companies.

[2] Incluye Belice, Bolivia, Colombia, El Salvador, Guatemala, Honduras, y Nicaragua. Se usa esta categoría para no revelar información sobre faenas de buques o empresas individuales**.**

TABLE 4. Estimated retained and discarded catches by surface gear, in metric tons, of the EPO tuna fleet. "Others" includes sharks, other tunas, and miscellaneous fishes; CYRA = Commission's Yellowfin Regulatory Area; Outside = area between the CYRA and 150°W. The 1999 and 2000 data are preliminary. Additional information concerning this table is given in the text.

TABLA 4. Estimaciones de capturas retenidas y descartadas, en toneladas métricas, por artes de superficie de la flota atunera del OPO. "Otros" incluye tiburones, otros atunes, y peces diversos; ARCAA = Area de Regulación de la Comisión para el Aleta Amarilla; Exterior = zona entre el ARCAA y 150°O. Los datos de 1999 y 2000 son preliminares. En el texto se presenta información adicional sobre esta tabla.

Year	Yellowfin					Skipjack			Bigeye			Bluefin		
	Retained			Discarded	Total	Retained	Discarded	Total	Retained	Discarded	Total	Retained	Discarded	Total
	CYRA	Outside	Total											
Año	Aleta amarilla					Barrilete			Patudo			Aleta azul		
	Retenido			Descartado	Total	Retenido	Descartado	Total	Retenido	Descartado	Total	Retenido	Descartado	Total
	ARCAA	Afuera	Total											
1970	127,793	27,833	155,626		155,626	56,020		56,020	1,332		1,332	3,966		3,966
1971	102,194	20,645	122,839		122,839	104,721		104,721	2,566		2,566	8,360		8,360
1972	136,515	40,612	177,127		177,127	33,409		33,409	2,238		2,238	13,347		13,347
1973	160,341	44,912	205,253		205,253	43,954		43,954	1,979		1,979	10,744		10,744
1974	173,180	37,184	210,364		210,364	78,803		78,803	890		890	5,617		5,617
1975	158,843	43,299	202,142		202,142	123,868		123,868	3,723		3,723	9,583		9,583
1976	190,216	46,111	236,327		236,327	126,161		126,161	10,186		10,186	10,645		10,645
1977	182,676	16,140	198,816		198,816	86,337		86,337	7,055		7,055	5,473		5,473
1978	165,985	14,549	180,534		180,534	169,810		169,810	11,714		11,714	5,397		5,397
1979	175,906	13,768	189,674		189,674	132,024		132,024	7,532		7,532	6,117		6,117
1980	131,998	27,427	159,425		159,425	130,671		130,671	15,421		15,421	2,939		2,939
1981	157,733	24,080	181,813		181,813	119,606		119,606	10,091		10,091	1,089		1,089
1982	106,868	18,216	125,084		125,084	98,757		98,757	4,102		4,102	3,150		3,150
1983	82,026	12,230	94,256		94,256	58,142		58,142	3,260		3,260	853		853
1984	128,559	16,502	145,061		145,061	60,551		60,551	5,936		5,936	881		881
1985	192,543	24,449	216,992		216,992	49,460		49,460	4,532		4,532	4,055		4,055
1986	228,125	40,149	268,274		268,274	63,552		63,552	1,939		1,939	5,085		5,085
1987	248,153	24,094	272,247		272,247	62,345		62,345	776		776	1,005		1,005
1988	267,263	20,811	288,074		288,074	85,326		85,326	1,053		1,053	1,424		1,424
1989	242,342	47,033	289,375		289,375	92,374		92,374	1,470		1,470	1,170		1,170
1990	226,465	46,864	273,329		273,329	72,575		72,575	4,712		4,712	1,542		1,542
1991	219,525	19,596	239,121		239,121	63,260		63,260	3,740		3,740	461		461
1992	221,309	18,540	239,849		239,849	83,964		83,964	5,497		5,497	1,999		1,999
1993	213,258	18,813	232,071	5,040	237,111	87,357	10,589	97,946	8,069	585	8,654	879	0	879
1994	197,064	22,197	219,261	4,614	223,875	74,534	10,314	84,848	29,375	2,304	31,679	1,062	0	1,062
1995	196,220	27,556	223,776	5,344	229,120	138,239	16,614	154,853	37,328	3,260	40,588	874	0	874
1996	218,114	32,056	250,170	6,660	256,830	112,205	24,970	137,175	51,353	5,786	57,139	8,259	0	8,259
1997	214,277	43,554	257,831	5,631	263,462	161,809	31,867	193,676	51,619	5,627	57,246	2,807	3	2,810
1998	236,503	29,216	265,719	4,718	270,437	145,000	22,856	167,856	35,155	2,853	38,008	2,223	0	2,223
1999	264,739	32,176	296,915	6,628	303,543	268,021	26,813	294,834	41,163	5,166	46,329	3,091	55	3,146
2000	220,545	51,474	272,019	6,796	278,815	209,968	26,298	236,266	69,745	5,624	75,639	4,098	0	4,098

TABLE 4. (continued)
TABLA 4. (continuación)

Year	Albacore			Bonito			Black skipjack			Others			All species combined		
	Retained	Discarded	Total	Retained	Discarded	Total	Retained	Discarded	Total	Retained	Discarded	Total	Retained	Discarded	Total
Año	Albacora			Bonito			Barrilete negro			Otros			Todas las especies		
	Retenido	Descartado	Total	Retenido	Descartado	Total	Retenido	Descartado	Total	Retenido	Descartado	Total	Retenido	Descartado	Total
1970	4,476		4,476	4,738		4,738	0		0	27		27	226,185		226,185
1971	2,490		2,490	9,600		9,600	6		6	61		61	250,643		250,643
1972	4,832		4,832	8,872		8,872	601		601	367		367	240,793		240,793
1973	2,316		2,316	7,864		7,864	1,674		1,674	355		355	274,139		274,139
1974	4,783		4,783	4,436		4,436	3,742		3,742	985		985	309,620		309,620
1975	3,332		3,332	16,838		16,838	511		511	277		277	360,274		360,274
1976	3,733		3,733	4,370		4,370	1,526		1,526	1,327		1,327	394,275		394,275
1977	1,963		1,963	11,275		11,275	1,458		1,458	1,950		1,950	314,327		314,327
1978	1,745		1,745	4,837		4,837	2,162		2,162	806		806	377,005		377,005
1979	327		327	1,805		1,805	1,366		1,366	1,249		1,249	340,094		340,094
1980	601		601	6,110		6,110	3,680		3,680	953		953	319,800		319,800
1981	739		739	5,918		5,918	1,911		1,911	1,010		1,010	322,177		322,177
1982	553		553	2,121		2,121	1,338		1,338	783		783	235,888		235,888
1983	456		456	3,829		3,829	1,236		1,236	1,709		1,709	163,741		163,741
1984	5,351		5,351	3,514		3,514	666		666	987		987	222,947		222,947
1985	919		919	3,604		3,604	296		296	536		536	280,394		280,394
1986	133		133	490		490	595		595	1,140		1,140	341,208		341,208
1987	417		417	3,326		3,326	557		557	1,612		1,612	342,285		342,285
1988	288		288	9,550		9,550	1,267		1,267	1,297		1,297	388,279		388,279
1989	1		1	12,095		12,095	783		783	1,072		1,072	398,340		398,340
1990	184		184	13,856		13,856	792		792	944		944	367,934		367,934
1991	834		834	1,288		1,288	446		446	649		649	309,799		309,799
1992	255		255	978		978	104		104	762		762	333,408		333,408
1993	1	0	1	599	12	611	104	3,950	4,054	314	1,981	2,295	329,394	22,157	351,551
1994	85	0	85	8,692	145	8,837	188	805	993	419	522	941	333,616	18,704	352,320
1995	465	2	467	8,009	55	8,064	187	1,415	1,602	172	668	840	409,050	27,358	436,408
1996	83	0	83	655	1	656	704	2,417	3,121	219	1,052	1,271	423,648	40,886	464,534
1997	60	0	60	1,104	4	1,108	101	2,582	2,683	148	3,407	3,555	475,479	49,121	524,600
1998	124	0	124	1,337	4	1,341	527	1,857	2,384	168	1,233	1,401	450,253	33,521	483,774
1999	276	0	276	1,597	0	1,597	178	3,412	3,590	240	3,096	3,336	611,481	45,170	656,651
2000	151	0	151	605	0	605	244	1,870	2,144	374	1,846	1,860	557,204	42,074	599,278

TABLE 5. Preliminary estimates of the catches and landings, in metric tons, of tunas caught by surface gear in the EPO in 2000, by species and vessel flag (upper panel) and location where processed (lower panel). YFT = yellowfin; SKJ = skipjack; BET = bigeye; BFT = bluefin; BEP = bonito; ALB = albacore; BKJ = black skipjack; Misc. = other species, including sharks, other tunas, and miscellaneous fishes

TABLA 5 Estimaciones preliminares de las capturas y descargas de atún capturado con artes de superficie en el OPO en 2000, por especie y bandera del buque (panel superior) y localidad donde fue procesado (panel inferior), en toneladas métricas. YFT = aleta amarilla; SKJ = barrilete; BET = patudo; BFT = aleta azul; BEP = bonito; ALB = albacora; BKJ = barrilete negro; Misc. = otras especies, incluyendo tiburones, otros túnidos, y peces diversos

Flag Bandera	YFT		SKJ	BET	BFT	BEP	ALB	BSJ	Misc.	Total	% of total % del total
	CYRA	Outside									
Catches—Capturas											
Colombia	13,146	3,508	6,202	1,022	-	-	-	-	-	23,878	4.3
Ecuador	33,771	4,537	109,601	27,669	-	-	-	220	95	175,893	31.6
España—Spain	3,219	2,655	16,481	17,268	-	-	-	-	-	39,623	7.1
México	78,685	23,163	16,372	82	3,091	428	92	2	221	122,136	21.9
Panamá	5,604	466	12,225	3,926	-	-	-	10	29	22,260	4.0
U.S.A.—EE.UU.	3,101	1,078	10,665	2,067	1,007	177	59	-	29	18,183	3.3
Venezuela	58,483	11,272	5,139	206	-	-	-	12	-	75,112	13.5
Vanuatu	11,326	2,742	10,980	6,283	-	-	-	-	-	31,331	5.6
Other—Otros[1]	13,210	2,053	22,303	11,222	-	-	-	-	-	48,788	8.8
Total	220,545	51,474	209,968	69,745	4,098	605	151	244	374	557,204	
Landings—Descargas											
Colombia	30,303	8,673	15,865	5,356	-	-	-	10	-	60,207	11.0
Costa Rica	15,064	258	3,942	805	-	-	-	-	-	20,069	3.7
Ecuador	43,964	6,881	131,638	34,811	-	-	-	219	135	217,648	39.8
España—Spain	4,403	2,343	9,401	12,608	-	-	5	-	-	28,760	5.2
México	73,724	22,581	14,932	944	3,030	427	86	6	221	115,951	21.2
Peru	608	-	1;690	-	-	-	-	-	-	2,298	.4
U.S.A.—EE.UU	2,430	1,178	6,946	1,958	677	176	59	2	24	13,450	2.5
Venezuela	24,797	3,204	3,391	52	-	-	-	6	-	31,450	5.7
Other—Otros[2]	20,425	3,313	18,669	14,758	690	-	-	-	-	57,555	10.5
Total	215,718	48,431	206,474	71,292	4,097	603	150	243	380	547,388	

[1] Includes Belize, Bolivia, Guatemala, Honduras, Nicaragua, and unidentified. This category is used to avoid revealing the operations of individual vessels or companies.

[1] Incluye Belice, Bolivia, Guatemala, Honduras, Nicaragua, y no identificados. Se usa esta categoría para no revelar información sobre las actividades de buques o empresas individuales.

[2] Includes Ghana, Italy, Libya, and Turkey, This category is used to avoid revealing the operations of individual vessels or companies.

[2] Incluye Ghana, Libia, Italia, y Turquía. Se usa esta categoría para no revelar información sobre las actividades de buques o empresas individuales.

TABLE 6. Preliminary data on the sampling coverage of trips by Class-6 vessels (capacity >363 metric tons) by the IATTC, Ecuadorian, Mexican, and Venezuelan programs during the first quarter of 2001. The numbers in parentheses indicate cumulative totals for the year.
TABLA 6. Datos preliminares de la cobertura de muestreo de viajes de buques de la Clase 6 (capacidad >363 toneladas métricas) por los programas de la CIAT, Ecuador, México, y Venezuela durante el primer trimestre de 2001. Los números en paréntesis indican totales acumulados para el año.

Fleet	Number of trips		Trips sampled by program						Percent sampled	
			IATTC		National		Total			
Flota	Número de viajes		Viajes muestreados por programa						Porcentaje muestreado	
			CIAT		Nacional		Total			
Belize	2	(2)	2	(2)			2	(2)	100	(100)
Bolivia	5	(5)	1	(1)			1	(1)	20	(20)
Colombia	8	(8)	8	(8)			8	(8)	100	(100)
Ecuador	93	(93)	70	(70)	23	(23)	93	(93)	100	(100)
España--Spain	11	(11)	11	(11)			11	(11)	100	(100)
Guatemala	10	(10)	10	(10)			10	(10)	100	(100)
Honduras	4	(4)	4	(4)			4	(4)	100	(100)
México	62	(62)	32	(32)	30	(30)	62	(62)	100	(100)
Nicaragua	2	(2)	2	(2)			2	(2)	100	(100)
Panamá	7	(7)	7	(7)			7	(7)	100	(100)
El Salvador	1	(1)	1	(1)			1	(1)	100	(100)
U.S.A.-EE.UU.	12	(12)	12	(12)			12	(12)	100	(100)
Venezuela	41	(41)	20	(20)	21	(21)	41	(41)	100	(100)
Vanuatu	16	(16)	15	(15)			15	(15)	93.8	(93.8)
Total	274	(274)[1]	195	(195)	74	(74)	269	(269)[1]	98.2	(98.2)

[1] Includes 54 trips that began in late 2000 and ended in 2001
[1] Incluye 54 viajes iniciados a fines de 2000 y completados en 2001

TABLE 7. Oceanographic and meteorological data for the Pacific Ocean, October 2000-March 2001. The values in parentheses are anomalies.

TABLA 7. Datos oceanográficos y meteorológicos del Océano Pacífico, octubre 2000-marzo 2001. Los valores en paréntesis representan anomalías.

Year--Año	2000			2001		
Month--Mes	10	11	12	1	2	3
SST--TSM, 0°-10°S, 80°-90°W (°C)	20.4 (-0.2)	20.6 (-0.9)	22.2 (-0.4)	23.8 (-0.5)	25.8 (0.1)	27.4 (1.3)
SST--TSM, 5°N-5°S, 90°-150°W (°C)	24.4 (-0.3)	24.2 (-0.6)	24.4 (-0.6)	25.0 (-0.5)	26.1 (-0.2)	27.2 (0.3)
SST--TSM, 5°N-5°S, 120°-170°W (°C)	26.0 (-0.6)	25.8 (-0.7)	25.6 (-0.9)	25.7 (-0.7)	26.1 (-0.5)	26.8 (-0.3)
Thermocline depth--Profundidad de la termoclina, 0°, 80°W (m)	40	35	30	30	25	25
Thermocline depth--Profundidad de la termoclina, 0°, 110°W (m)	60	60	50	60	50	50
Thermocline depth--Profundidad de la termoclina, 0°, 150°W (m)	150	150	150	150	140	110
Sea level—Nivel del mar, Baltra, Ecuador (cm)	182.6 (5.4)	174.8 (-4.1)	-	174.5 (-6.4)	188.3 (6.1)	184.9 (3.1)
Sea level—Nivel del mar, La Libertad, Ecuador (cm)	-	222.4 (-7.2)	233.0 (2.6)	229.1 (-1.6)	240.8 (9.1)	-
Sea level--Nivel del mar, Callao, Peru (cm)	103.0 (-1.7)	95.7 (-11.2)	106.2 (-2.4)	102.5 (-9.5)	112.2 (-1.0)	109.8 (-4.9)
SOI--IOS	1.0	2.0	0.7	1.1	1.5	0.5
SOIx--IOSx	-0.537	0.149	3.064	0.205	2.442	1.306
NOIx--IONx	1.530	4.215	1.911	1.049	2.215	0.906