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

October-December 2000
Octubre-Diciembre 2000

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The

QUARTERLY REPORT

October-December 2000

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 287 length-frequency samples and abstracted the logbook information for 267 trips of fishing vessels during the fourth quarter of 2000.

Also, during the fourth quarter members of the field office staffs placed IATTC observers on 107 fishing trips by vessels that participate in the on-board observer program. In addition, 100 IATTC observers completed trips during the quarter, and were debriefed at the corresponding field offices.

Surface fleet and surface catch and catch-per-unit-of-effort statistics

Statistical data from the Commission's field offices 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, processed, and verified. The estimates included in the weekly reports are the most preliminary, while those made six months to a year after monitoring of a 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 a vessel's return from a fishing trip. In this report, therefore, the catch-per-unit-of-effort statistics include only the January 1-September 30 period (hereafter called the report period).

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 2000 is about 190,000 cubic meters (m^3) (Table 1). The weekly average at-sea capacity for the fleet, for the weekly periods ending October 9 through December 31, was about 79,100 m^3 (range: 64,700 to 99,300 m^3). The changes of flag and additions to and deletions from the IATTC's fleet list for the period of October 3-December 31 are given in Table 2.

Catch and catch-per-unit-of-effort statistics

Weekly report data summaries

The total catches of tunas in the EPO for the January 1-December 31, 2000, period were estimated from weekly report analysis procedures to have been about 266,900 metric tons (mt) of yellowfin, 208,400 mt of skipjack, 69,800 mt of bigeye, and 3,700 mt of bluefin. The averages and ranges for the comparable periods of 1995-1999 are as follows: yellowfin, 256,600 mt (219,100 to 290,000 mt); skipjack, 157,900 mt (105,900 to 262,900 mt); bigeye, 38,900 mt (30,500 to 47,100 mt); bluefin, 2,700 (600 to 6,900 mt). Estimates of the cumulative catches from January 1, 2000, by week, the capacity of the monitored fleet, and the percent of capacity at sea, for the weekly periods ending October 9 through December 31, are listed in Table 3. During this period the average estimated weekly catches of yellowfin, skipjack, and bigeye in the EPO were about 4,200, 1,300, and 700 mt, respectively. Summaries of the estimated catches, by flag of vessel, are shown in Table 4.

Catch-per-unit-of-effort statistics based on vessel logbook abstracts

The logbook data used in the analyses have been obtained with the cooperation of vessel owners and captains. The catch and effort measures used by the IATTC staff are based on fishing trips landing predominantly yellowfin, skipjack, bigeye, and bluefin tuna. Nearly all of the purse-seine catches of yellowfin, skipjack, and bigeye are made by Class-6 vessels (vessels with carrying capacities greater than 363 mt), and only data for Class-6 purse seiners are included herein for comparisons among years. There are now far fewer baitboats than in previous years, so the baitboat data are combined without regard to size classes. There are no adjustments included for other factors, such as type of set or vessel operating costs and market prices, which might identify whether a vessel was directing its effort toward a specific species. It will be noted that the logged catch data in Tables 5, 6, and 7, referred to below, are considerably less than the cumulative catch data in Table 4. This is because the cumulative catch data are essentially complete, whereas the logbook data do not include data for current trips, trips of vessels which have recently returned to port and whose logbook data have not yet been entered into the data base, and data for trips of vessels for which logbook data have not been received or which are, for various reasons, unusable.

The catch per day of fishing (CPDF) for yellowfin in the Commission's Yellowfin Regulatory Area (CYRA) by purse seiners during the 2000 report period is estimated to have been about 9.5 mt, which is lower than the range of rates observed during the 1995-1999 report periods (10.2 to 12.6 mt) (Table 5). The CPDF of yellowfin in the CYRA by baitboats during the 2000 report period is estimated to have been about 1.5 mt, which falls within the range of rates observed during the 1995-1999 report periods (range: 1.1 to 3.5 mt) (Table 5).

During the 1995-1999 report periods the CPDF of yellowfin by purse seiners north of 5°N ranged from about 13.4 to 16.4 mt, averaging about 15.2 mt, whereas south of 5°N it ranged from about 4.7 to 6.6 mt, averaging about 5.3 mt. Preliminary estimates for 2000 show the CPDFs of yellowfin north and south of 5°N to have been about 14.2 and 7.6 mt, respectively.

The CPDF of skipjack in the EPO by purse seiners during the 2000 report period is estimated to have been about 9.1 mt, which falls within the range of rates observed during the 1995-1999 report periods (3.9 to 10.6 mt) (Table 6). The CPDF of skipjack in the EPO by baitboats during the 2000 report period is estimated to have been less than 1.0 mt, which is below the range of rates observed during the 1995-1999 report periods (range: 1.0 to 2.6 mt) (Table 6).

In general, the greatest catches of skipjack are taken in waters south of 5°N. During the 1995-1999 report periods the CPDF of skipjack by purse seiners south of 5°N averaged about 9.7 mt (range: about 6.5 to 19.4 mt), whereas north of 5°N it averaged about 2.8 mt (range: about 1.7 to 3.7 mt). Preliminary estimates for 2000 show the CPDFs of skipjack south and north of 5°N to have been about 13.1 and 3.5 mt, respectively.

The CPDF of bigeye in the EPO by purse seiners during the 2000 report period is estimated to have been about 3.2 mt, which is greater than the range of the values for the 1997-1999 report periods (0.9 to 1.6 mt) (Table 7).]

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 1), based on the staff's most recent stock assessments. Data for fish caught during the third quarter of 2000 are presented in this report.

There are ten surface fisheries for yellowfin defined for stock assessments: four floating-object, two unassociated school, three dolphin, and one baitboat (Figure 1). Of the 226 wells sampled, 162 contained yellowfin. The estimated size compositions of these fish are shown in Figure 2. Although the majority of the yellowfin catch was taken in dolphin sets, as was the case during the first two quarters of 2000, there were increased catches of yellowfin by the floating-object and baitboat fisheries during the third quarter. The increased catch by baitboats during the third quarter may be explained by the typical increase in effort by this fishery in the mid to later part of the year.

The estimated size compositions of the yellowfin caught by all fisheries combined during the third quarter of 1995-2000 are shown in Figure 3. The size ranges of yellowfin are generally consistent over time (40-160 cm), but the size distributions differ among quarters and 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 226 wells sampled, 121 contained skipjack. The estimated size compositions of these fish are shown in Figure 4. The majority of the fish was taken by the floating-object fishery and in sets on unassociated schools in Area G. The estimated catch of skipjack taken by baitboats was too small to show in the graph.

The estimated size compositions of the skipjack caught by all fisheries combined during the third quarter of 1995-2000 are shown in Figure 5. The catch of skipjack during the third quarter of 2000 was considerably less than those of the first two quarters of that year.

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 226 wells sampled, 73 contained bigeye. The estimated size compositions of these fish are shown in Figure 6. During the first half of 2000, the majority of the bigeye catch was made by floating-object sets in Area C. During the third quarter, however, the catches of bigeye associated with floating objects in Areas B and E were much greater, and those in Area B exceeded those in Area C. A small amount of bigeye was 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 third quarter of 1995-2000 are shown in Figure 7. As was the case during the first half of year, the average size of the fish caught during the third quarter of 2000 was considerably greater than those of the fish caught during the third quarter of any of the previous five years.

Pacific bluefin are caught near the surface off California and Baja California from about 23°N to 35°N by both commercial and sport-fishing vessels. Most of the catch is taken during May through October. During 2000 bluefin were caught between 27°N and 37°N, and most of the catch was taken during June, July, and August. Bluefin caught by both commercial and sport gear are sampled; previous to this year these data were combined prior to analysis, but in this report they are presented separately. Histograms showing the estimated commercial and sport catches of bluefin during each year of the 1995-2000 period appear in Figures 8 and 9, respec-

tively. Distinct modal groups are evident in most of the years for both the commercial and sport catches.

Observer program

Data collection

The design for placement of observers during 2000 called 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), was to sample half of the trips by vessels of its fleet. Venezuela's national observer program, the Programa Nacional de Observadores de Venezuela (PNOV), began placing observers on vessels of its fleet during the first quarter, and had increased its coverage during the second quarter to approximately 50 percent, where it remained for the rest of the year. Ecuador's national observer program, the Programa Nacional de Observadores Pesqueros de Ecuador (PROBECUADOR), began placing observers on vessels of its fleet during the fourth quarter, with a goal of 25-percent sampling coverage by the end of 2000, and increasing the coverage to 50 percent during 2001. The IATTC program was responsible for sampling all other trips by vessels of those fleets, plus all trips of Class-6 vessels registered in other nations that fish for tunas in the EPO. However, two vessels conducted fishing activities without an IATTC observer on board. One Vanuatu-flag vessel, which was in the process of changing its flag to Bolivia, completed an entire trip without allowing an IATTC observer on board, and a Bolivian vessel departed after a mid-trip port stop without its assigned observer on board. The trip by the Bolivian vessel is not being considered as a sampled trip for observer coverage purposes.

During the fourth quarter of 2000 IATTC, PNAAPD, PNOV, and PROBECUADOR observers departed on 107 fishing trips aboard Class-6 purse seiners. Preliminary coverage data for these vessels during the quarter are shown in Table 8.

Training

There were no IATTC observer training courses held during the fourth quarter.

RESEARCH

Early life history studies

Joint OFCF-Panama-IATTC project

Yellowfin broodstock

The yellowfin broodstock in Tank 1 (1,362,000 L) at the Achotines Laboratory spawned daily during October, November, and December. The water temperatures in the tank ranged from 27.8° to 28.7°C during the quarter. The numbers of eggs collected after each spawning event ranged from about 34,000 to 1,496,000. Spawning occurred as early as 5:20 p.m. and as late as 6:20 p.m.

There were six mortalities in Tank 1 (ranging in weight from 9 to 96 kg), and at the end of the quarter there were 1 giant (97 kg), 6 large (34-44 kg), 5 medium (18-22 kg), and 9 small (14-17 kg) yellowfin in the tank. All the mortalities appeared to be due to wall strikes.

There was a total of 21 yellowfin (6-11 kg) in the two 170,200-L capacity reserve broodstock tanks (Tanks 2 and 6). The reserve fish are being used in a diet trial to compare a pellet food with frozen fish and squid.

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 the larvae, were measured periodically.

Several groups of yellowfin larvae were reared beyond juvenile metamorphosis. The greatest time that a yellowfin was reared during the quarter was 7 weeks after hatching. In October a diet comparison trial was conducted with two groups of early juveniles, ranging in age from 24 to 29 days after hatching (DAH) (16 to 24 mm SL), each in a 2.4-m diameter, 4,800-L capacity tank. The fish of one group were fed freeze-dried thread herring, *Opisthonema* spp., and squid, *Loligo* spp., and those of the other were fed minced, previously-frozen thread herring and squid, supplemented with a small amount of freeze-dried copepods. The experiment was conducted for 12 days. Samples of 2 to 4 fish were taken from each tank at intervals of 4 or 5 days for measuring their growth. The survival after 12 days of feeding was noted, and the dry weights of the sampled fish will be analyzed to compare the growth produced by each diet.

Mr. Masahiko Koiso, a staff scientist of the Japan Sea Farming Association (JASFA), worked with the OFCF counterpart, Mr. Yukiyasu Niwa, and Achotines staff members on a rearing study of yellowfin larvae and juveniles. Over 100,000 post-hatch larvae were stocked in one 3.7-m diameter, 12,000-L capacity tank. The larvae were reared in water with dense phytoplankton blooms (green water), and they were fed a sequential diet of cultured rotifers (5 to 10 per ml) from 3 to 20 DAH, *Artemia* nauplii (500 per liter) from 14 to 22 DAH, and newly-hatched yellowfin larvae (10 per liter) from 14 to 26 DAH. At 29 DAH the survival in the tank was about 2.5 percent, and the average length of the fish (then early juveniles) was 24.9 mm (average growth rate of 0.85 mm per day). Of the survivors at 29 DAH, 1,500 were transferred to a 8.5-m diameter, 85,100-L capacity tank, and 500 were placed in each of two 3.7 m-diameter, 12,000-L capacity tanks. After transfer the fish were fed a diet of minced thread herring and minced squid. The juveniles fed well for the first week after transfer, but then the feeding rate decreased and starvation mortality increased. The last of the juveniles in the 3.7-m tanks died at 40 DAH and the final survivor in the 8.5-m tank died at 48 DAH. The length range of the juveniles at the end of the culture trial was 30 to 37 mm (~0.7 to 1.3 mm per day) except for one exceptional individual that attained a length of 83 mm (~2.1 mm per day).

Studies of snappers and corvina

The spotted rose snapper (*Lutjanus guttatus*) broodstock, which began to spawn at the end of May 2000, continued to spawn throughout the early part of the fourth quarter. A group of 70 fish, hatched in captivity in October 1998, is being held in two 12,000-L tanks. On average, these fish were about 40 cm long and weighed about 800 g 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 24 cm long and weigh about 160 g, on average. These fish will be used as broodstock.

At the end of the quarter 10 white corvina or Stoltzman's weakfish (*Cynoscion albus* or *C. stolzmani*) were being held in Tank 3 (85,000 L). Two fish died during the quarter due to infections or starvation. None of these fish has spawned yet.

Oceanography and meteorology

During the 46 years from 1955 through 2000 there have been 10 significant anti-El Niño events in the eastern tropical Pacific (ETP), each of which developed within 1 to 3 years after the termination of a moderate to strong El Niño episode. These events are characterized by stronger-than-normal easterly winds over the ETP, which cause marked increases in upwelling of cool, nutrient-rich subsurface water along the equator east of 160ºW, in the coastal areas of Ecuador and Peru, and in offshore areas off Mexico and Central America. As a result, below-normal sea-surface temperatures (SSTs) and sea levels and shallower-than-normal thermoclines prevail over much of the ETP. In addition, the Southern Oscillation Indices (SOIs) are positive during anti-El Niño episodes. (The SOI is the difference between the anomalies of sea-level atmospheric pressure at Tahiti, French Polynesia, and Darwin, Australia, and it is a measure of the strength of easterly surface winds, especially in the tropical Pacific in the Southern Hemisphere.) Anti-El Niño episodes have not received as much publicity as their opposite, El Niño episodes, which have usually been associated with unfavorable oceanic and weather conditions for fishing for surface-dwelling fish. Anti-El Niño episodes are important events, however, because they contribute to maintaining food supplies, through upwelling, for pelagic organisms, including those which are of direct commercial value. In addition, various species of fish, including yellowfin and skipjack tuna, are more vulnerable to capture when the thermocline is closer to the surface and strong (rapid decrease in temperature with depth) during anti-El Niño episodes.

Anti-El Niño conditions have prevailed in the ETP for more than two years (May 1998 to December 2000), except for a short period during the third quarter of 2000 when the SSTs appeared to be returning to normal. Such prolonged cool-water episodes have occurred only three other times in the past half-century (1954-1956, 1960-1962, and 1966-1968).]

By the end of the third quarter of 2000 oceanic and atmospheric conditions had returned to near normal in the ETP, which was a strong indication that the long-enduring anti-El Nino episode had finally come to an end.] The patterns of SST anomalies were similar for July, August, and September. These patterns showed that the oceanic area with SSTs more than 1°C below normal occupied much smaller portions of the equatorial region between 5°N and 5°S from 120° to 155°W than during the first half of the year (IATTC Quarterly Reports for January-March and April-June 2000, Figures 14 and 10, respectively). Small negative SST anomalies along the coasts of Ecuador and Peru became small positive anomalies by the end of the quarter. The SSTs over much of the Commission's Yellowfin Regulatory Area were, on average, closer to normal than during the first half of the year. The thermocline remained at depths of 40 to 60 m, which was about 10 m closer to the sea surface than normal, and the sea level was, on average, within 5 cm of its normal level over most of the ETP. The return to normal of the thermocline and sea level were also good indicators that the conditions in the ETP were nearly normal. The SOI increased from -0.4 in July, to 0.4 in August and then to 1.0 in September, however, indicating an increase in the anti-El Niño episode which was not consistent with the weaker-than-normal the easterly winds during the quarter. The increase was consistent, however, with the increase in the strength of the surface winds in the central tropical Pacific, where weak anti-El Nino conditions had set in.

During October 2000 the SSTs were nearly normal over most of the EPT, where there had been no large areas of SST anomalies greater than -1.0°C since the second quarter of 2000. During November and December, however, the strengths of the surface easterly winds were above normal again, especially in the central equatorial Pacific. This was consistent with the SOIs, which averaged 1.2 during the quarter. The strengthening of the surface winds probably contributed to the increase in upwelling and vertical wind mixing from the coasts of Ecuador and Peru to 140°W. In this region there were scattered areas with SSTs more than 1.0°C below normal. The anomaly pattern for December, which is also representative of the anomaly pattern for November, is shown in Figure 10. The thermocline in the CYRA during the fourth quarter remained at depths of 40 to 60 m, which was about 10 m closer to the sea surface than normal. In contrast, the thermocline in the central and western Pacific was at depths of 160 to 200 m, which was about 10 to 20 m deeper than normal. The sea level decreased from normal (0) to an average of –5 cm in the coastal regions from Mexico to Peru. These changes indicated that another weak anti-El Nino episode was developing in the ETP. This condition may persist until at least mid-2001.

Mr. Forrest R. Miller will be retiring in February 2001. He has served the IATTC as an employee or consultant since 1967, and his assessments of the oceanography and meteorology of the eastern Pacific Ocean, especially with regard to the El Niño phenomenon, have appeared in the IATTC Annual Reports and Quarterly Reports since that time. In addition, he is the author or co-author of numerous papers on these subjects published as IATTC Bulletins, Technical Reports, Data Reports, and contributions in outside journals.

The IATTC staff will continue to publish information on the oceanography and meteorology of the eastern Pacific Ocean in its Annual and Quarterly Reports, but the pertinent sections of these reports will be less detailed and will be accompanied by fewer analyses than previously.

GEAR PROGRAM

The IATTC staff did not participate in any dolphin safety-gear inspections or safety-panel alignment procedures aboard vessels during the fourth quarter.

MEETINGS

The minutes or chairman's reports of the various IATTC and and AIDCP meetings described below are, or soon will be, available on the IATTC's web site at www.iattc.org.

IATTC meetings

Scientific review of the methods to estimate dolphin abundance

A scientific review of the methods used to estimate dolphin abundance was held in La Jolla, California, USA, on October 19-20, 2000. Dr. Robin L. Allen, Director of the IATTC, served as chairman of the meeting, which was attended by representatives of Mexico, Spain, the United States, and Venezuela, observers from Ecuador, El Salvador, Guatemala, Mexico, the United States, the Earth Island Institute, the Humane Society of the United States, and the Whale and Dolphin Conservation Society, and the following outside experts: Dr. Stephen T. Buckland, University of St. Andrews, Scotland; Dr. Mary-Elena Carr, Jet Propulsion Laboratory, Pasadena, California, USA; Dr. Jaume Forcada, National Research Council, La Jolla, California, USA; Dr.

Salvador E. Lluch Cota, Centro de Investigaciones Biológicas del Noroeste, La Paz, Mexico; Dr. Tore Schweder, University of Oslo, Norway. The material covered during the meeting included a review of the design and results of the dolphin surveys conducted by the U.S. National Marine Fisheries Service during 1998 and 1999, a discussion of the differences between the surveys of the two years, a review of the distributions of the various stocks of dolphins, a review of the oceanography related to the distribution of dolphins in the eastern Pacific Ocean (EPO), discussion of a potential regime shift in the EPO, a discussion of inter-annual variability in the survey results and oceanography, and a discussion of other factors potentially affecting the variability of the surveys.

Scientific Working Group on Bigeye Tuna

A meeting of the Scientific Working Group On Bigeye Tuna was held in La Jolla, California, USA, on October 23-24, 2000. Dr. Robin L. Allen, Director of the IATTC, served as chairman of the meeting, which was attended by representatives of Ecuador, El Salvador, the European Union, Japan, Mexico, Peru, the Secretariat of the Pacific Community (SPC), Spain, the United States, and Venezuela, plus observers from Ecuador, Guatemala, Japan, Mexico, Nicaragua, Panama, Spain, and the United States. The principal subjects of discussion at this meeting were recent developments in the fishery, presented by Dr. Allen, an update on stock assessment of bigeye in the EPO, presented by Dr. George M. Watters, a report on Pacific-wide modeling of bigeye, presented by Dr. John Hampton of the SPC, results of a pilot tagging program conducted by the IATTC during early 2000, presented by Mr. Kurt M. Schaefer, alternative methods for reducing the catches of juvenile bigeye, and accuracy of the estimated catches of bigeye.

Fifth meeting of the Permanent Working Group on Fleet Capacity

The fifth meeting of the Permanent Working Group on Fleet Capacity was held in La Jolla, California, USA, on October 25-26, 2000. Ing. Arnulfo L. Franco Rodríguez of Panama served as chairman of the meeting, which was attended by representatives of all the member governments of the IATTC, plus Colombia, the European Union, Peru, Spain, the Humane Society of the United States, the Whale and Dolphin Conservation Society, and the World Wildlife Fund. A draft resolution on the capacity of the tuna fleet operating in the EPO was discussed, but agreement on it was not reached.

67th meeting of the IATTC

The 67th meeting of the IATTC was held in La Jolla, California, USA, on October 26, 2000. Mr. Svein Fougner of the United States served as chairman of the meeting, which was attended by representatives of all the member nations of the IATTC, plus observers from Colombia, the European Union, Peru, Spain, the Humane Society of the United States, and the Whale and Dolphin Conservation Society. Dr. Robin L. Allen, Director of the IATTC, gave informal reports on the recent meetings of the Scientific Working Group on Bigeye Tuna, the scientific review of the methods used to estimate dolphin abundance, and the catches to date of yellowfin tuna in the EPO.

AIDCP meetings

Permanent Working Group on Tuna Tracking

A meeting of the Permanent Working Group on Tuna Tracking was held in La Jolla, California, USA, on October 27, 2000. Ms. Patricia Donley of United States presided at the meeting, which was attended by representatives of Colombia, Costa Rica, Ecuador, El Salvador, the European Union, Japan, Mexico, Peru, the United States, Vanuatu, Venezuela, the environmental community, and the tuna industry. Mechanisms for tuna tracking were discussed.

25th meeting of the International Review Panel

The 25th meeting of the International Review Panel (IRP) was held in La Jolla, California, USA, on October 27, 2000. 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, Panama, Peru, the United States, Vanuatu, Venezuela, the environmental community, and the tuna industry, plus observers from Guatemala and Japan. The Panel reviewed possible infractions of the Agreement on the International Dolphin Conservation Program (AIDCP) reported by observers, approved a proposed procedure for adding fishermen to the list of qualified captains, discussed the report of the Chairwoman of the Working Group on Tuna Tracking, and reviewed the following: dolphin mortality limits (DMLs) for 2000 and 2001, the list of vessels qualified to receive DMLs for 2001, guidelines for determining possible infractions of the AIDCP, and actions by parties in response to possible infractions reported by the IRP.

Third meeting of the Working Group on Per-stock, Per-year Dolphin Mortality Caps

The third meeting of the Working Group on Per-stock, Per-year Dolphin Mortality Caps was held in La Jolla, California, USA, on October 28, 2000. Mr. William Gibbons-Fly 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, and Venezuela, plus observers from Guatemala, Spain, the Earth Island Institute, the Humane Society of the United States, the Whale and Dolphin Conservation Society, and the World Wildlife Fund. Dr. Robin L. Allen, Director of the IATTC, reviewed a Background Paper, prepared by the IATTC staff, entitled "Review of Dolphin Stocks in the Eastern Pacific and Implementation of Per-Stock, Per-Year Limits under the Agreement on the International Dolphin Conservation Program (AIDCP)," and summarized the system adopted for 2000 at the Meeting of the Parties to the AIDCP on June 16-17, 2000. A system for 2001 was discussed, and most of the participants agreed that the per-stock, per-year limits should be implemented on a global basis, as during 2000.

Fourth Meeting of the Parties to the Agreement on the International Dolphin Conservation Program

The fourth Meeting of the Parties to the Agreement on the International Dolphin Conservation Program was held in La Jolla, California, USA, on October 28-29, 2000. Mr. William Gibbons-Fly 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, Panama, Peru, the United States, Vanuatu, and Venezuela, plus observers from Guatemala, the Earth Island Institute, the Humane Society of the United States, the Whale and Dolphin Conservation Society, and the World Wildlife Fund. The topics of discussion included the report of the 25th meeting of the International Review Panel, assignments of dolphin mortality limits to individual vessels, guidelines for experimental gear or techniques, the report of the Working Group on Per-stock, Per-year Dolphin Mortality Caps, a real-time reporting system for dolphin mortalities, and the situation regarding a state that was not cooperating with the AIDCP.

Other meetings

Mr. Brian S. Hallman participated in a Technical Consultation on Illegal, Unreported, and Unregulated (IUU) Fishing, held in Rome on October 2-6, 2000. At the Consultation, which was organized by FAO, an International Plan of Action (IPOA) to deter or eliminate IUU fishing was discussed.

Dr. Martín A. Hall attended the "Innovations in Harvest and Production in the Columbia River Basin Workshop--Planning for Abundance in 2001" in Portland, Oregon, USA, on October 4-5, 2000. The workshop was sponsored by the Columbia Basin Fish and Wildlife Authority, the Columbia River Inter-Tribal Fish Commission, the U.S. National Marine Fisheries Service, and the Public Power Council.

Dr. Richard B. Deriso participated in a meeting of the Scientific and Statistical Committee of the Western Pacific Fisheries Management Council in Honolulu, Hawaii, on October 10-12, 2000.

Dr. Ashley J. Mullen participated in a meeting of the Tropical Tunas Species Group of the International Commission for the Conservation of Atlantic Tunas, held in Madrid on October 9-14, 2000, where a document, "Executive Summaries and Evaluation of Effect of FAD Moratorium on Stocks," was drafted.

Several staff members of the Achotines Laboratory attended the Fourth Latin American Aquaculture Congress and Exhibition, held in Panama, R.P., on October 25-28, 2000. Oral presentations were made by Messrs. Vernon P. Scholey (IATTC), Luis Tejada (IATTC), and Amado Cano (Autoridad Marítima de Panamá), and poster presentations were made by Messrs. Neil Bonilla (IATTC), Amado Cano, and Yuki Niwa (OFCF of Japan). These presentations covered research being carried out at the Achotines Laboratory. Two of the papers were co-authored by Drs. Daniel Margulies and Robert J. Olson and Ms. Jeanne Wexler.

Dr. Mark N. Maunder attended the "2000 William R. and Lenore Monte International Symposium, Targets, Thresholds, and the Burden of Proof in Fisheries Management," in Sarasota, Florida, on October 31-November 2, 2000.

Drs. Robert J. Olson and George M. Watters participated in a workshop at the National Center for Ecological Analysis and Synthesis (NCEAS) in Santa Barbara, California, on November 1-3, 2000. The workshop was part of a project supported by a grant obtained from NCEAS by Drs. Olson and James F. Kitchell, University of Wisconsin, to develop a simulation model for evaluating the ecological implications of alternative fishing strategies for apex predators in the EPO. NCEAS is supported by the U.S. National Science Foundation and the state of California. The purpose of the workshop was to further evaluate the EPO model, using *Ecosim* and focusing on the relative importance of ecosystem responses to fishing and to variability in climate.

Dr. Robin L. Allen participated in the III Foro Nacional sobre el Atún, sponsored by the Centro de Investigación Cientifica y de Educación Superior de Ensenada (CICESE), in Ensenada, Mexico, on November 6-7, 2000, where he presented a talk entitled "Recent Status and Future of the Tuna Fisheries in the EPO."

Mr. Brian S. Hallman was the guest speaker at the annual meeting of the Western Fishboat Owners' Association, which took place in Laughlin, Nevada, USA, on November 7-8, 2000. He spoke about the future management of albacore tuna in the Pacific Ocean.

Mr. Kurt M. Schaefer participated in a workshop of the working group on the Electronic Tagging of Pacific Pelagics (TOPP), held at the Monterey Bay Aquarium and at the Hopkins Marine Station, Stanford University, Pacific Grove, California, on November 12-14, 2000. The

workshop was sponsored by the Packard and Sloan Foundations. The TOPP program is developing a proposal for a pilot research project for the Census of Marine Life (COML). The project proposals include examination of the use of electronic tags and remote-sensing technologies to study the movements and behavior of a diverse group of large pelagic animals in relationship to their physical environment.

Dr. Mark N. Maunder participated in a Workshop on Interannual Climate Variability and Pelagic Fisheries, coordinated by the International Research Institute for Climate Prediction, which took place in Noumea, New Caledonia, on November 6-24, 2000. He did not actually go to New Caledonia, but he prepared an audio-aided Power Point presentation entitled "Incorporating Environmental Data into Stock Assessments: Standardizing CPUE and Relating Recruitment to Environmental Time Series," which was shown at the workshop.

Dr. George M. Watters participated in a bluefin workshop, sponsored by the Interim Scientific Committee for Tuna and Tuna-Like Species in the North Pacific, in Shimizu, Japan, on November 30-December 2, 2000.

Dr. Robert J. Olson participated in a conference, “Placing Fisheries in their Ecosystem Context,” at the Charles Darwin Research Station (CDRS) in the Galapagos Islands, Ecuador, on December 4-8, 2000. The conference was sponsored by the CDRS, the North Sea Centre, the Universidad San Francisco de Quito, and the Galapagos National Park. He presented a talk, co-authored with Dr. George M. Watters and seven other people, entitled “Interactive Effects of Climate Variability and Fishing: A Modeling Analysis for the Eastern Tropical Pacific Pelagic Ecosystem.”

Dr. Ashley J. Mullen spent the period of December 5-14, 2000, in Taipei, Taiwan, where he participated in the 17th North Pacific Albacore Workshop.

PUBLICATIONS

Inter-American Tropical Tuna Commission, Annual Report for 1998: 357 pp.

Allen, Robin. 2000. International management of the tuna fisheries of the eastern Pacific Ocean. Fiskeriøkonomiske Små-Skrifter [Papers on Fisheries Economics], 38: 8 pp.

Dagorn, Laurent, Filippo Menczer, Pascal Bach, and Robert J. Olson. 2000. Co-evolution of movement behaviours by tropical pelagic predatory fishes in response to prey environment: a simulation model. Ecol. Model., 134 (2-3): 325-341.

Hall, Martin A., Dayton L. Alverson, and Kaija I. Metuzals. 2000. By-catch: problems and solutions. *In* Sheppard, Charles R. C. (editor), Seas at the Millennium: an Environmental Evaluation, Vol. III, Global Issues and Processes: 135-151.

Hall, Martin A., Dayton L. Alverson, and Kaija I. Metuzals. 2000. By-catch: problems and solutions. Mar. Pollution Bull., 41 (1-6): 204-219.

Joseph, James. 2000. World tuna production: past, present and future. Pap. 6th World Tuna Trade Conference, Bangkok, Thailand: 3-20.

Lennert-Cody, Cleridy E., and Martín A. Hall. 2000. The development of the purse seine fishery on drifting fish aggregating devices in the eastern Pacific Ocean: 1992-1998. *In* Le Gall, Jean-Yves, Patrice Cayré, and Marc Taquet (editors), Pêche Thonière et Dispositifs de Concentration de Poissons, Colloque Caraïbe-Martinique, Trois-Ïlets, 15-19 Octobre 1999, Inst. Fran. Recherche Exploitation Mer (IFREMER): 78-107.

ADMINISTRATION

Jesús Mario Budria Gracia, 1953-2000

It is with deep regret that we report the death of Mr. Mario Budria, supervisor of maintenance at the Achotines Laboratory since March 1, 1989. He had been in poor health for several months, and on October 27 he checked into a hospital in Panama for testing. On November 13, while still undergoing testing, he died. Mr. Budria was a highly capable and efficient worker, and made many contributions to the success of the Laboratory. In addition, he was always in a cheerful and cooperative mood, making it a pleasure to work with him. He will be greatly missed.

Mr. Ricardo A. López Rodríquez, a graduate of the University of Panama, was hired to work at the IATTC's Panama field office on October 1, 2000. He had previously worked part-time at that office during the period when he was an observer.

Ms. Mónica B. Galván, who had been working as a temporary replacement for Ms. Teresa Musano since January 2000, was hired as permanent member of the IATTC staff on October 1, 2000.

Mr. Masahiko Koiso, a staff scientist at the Japan Sea Farming Association (JASFA) station at Amami, left Achotines on December 7, 2000, after a 5-week stay there. His visit was sponsored by the Overseas Fishery Cooperation Foundation (OFCF) of Japan. During his stay he worked with the OFCF counterpart, Mr. Yukiyasu Niwa, and Achotines staff members on a rearing study of yellowfin larvae and juveniles.

Ms. Marcela Campa, who had been an IATTC employee since June 1998, resigned on December 8, 2000, to accept employment with a large law firm in San Diego, California. She will be missed, but everyone wishes her well in her new position.

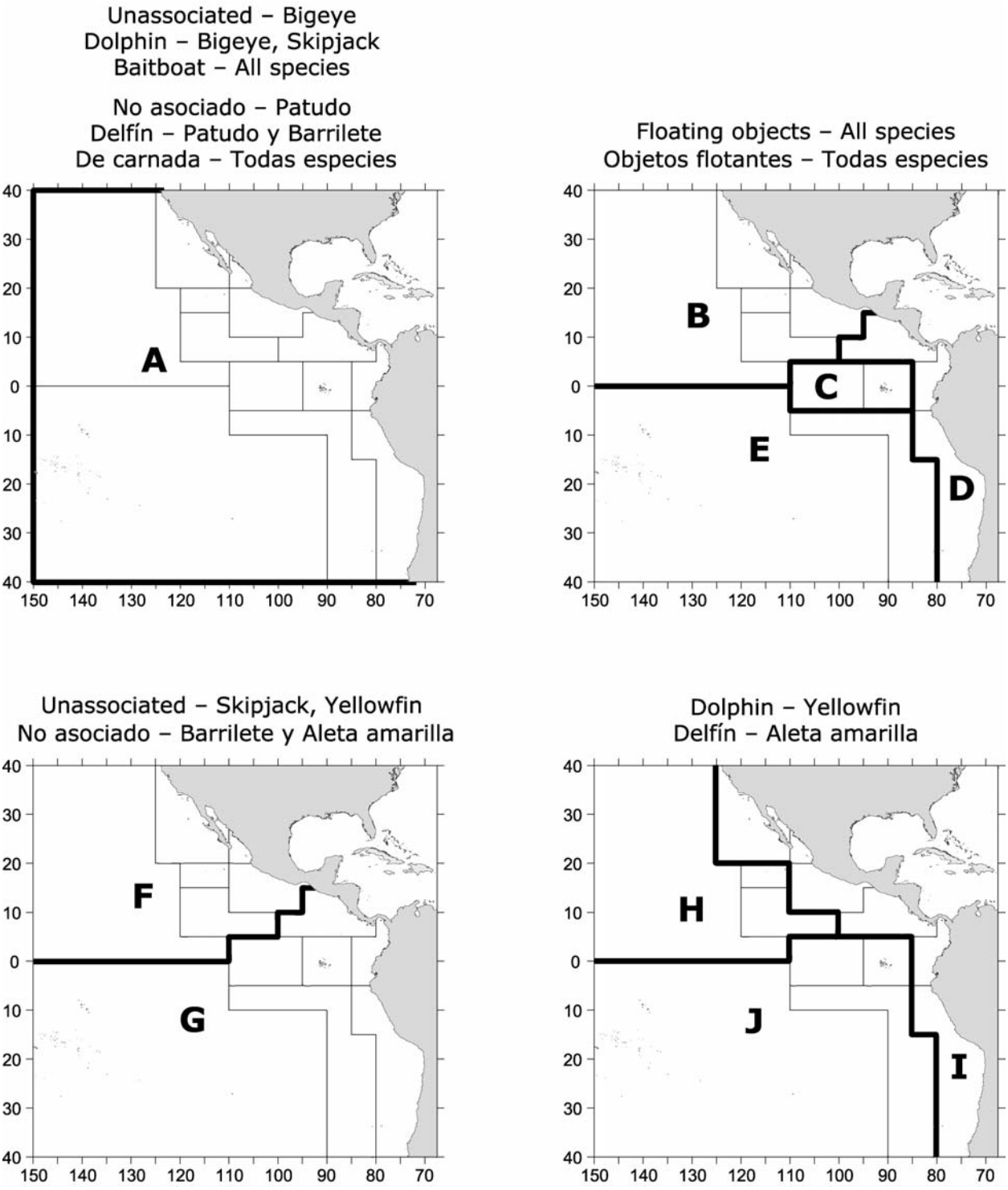

FIGURE 1. Spatial extents of the fisheries defined by the IATTC staff for stock assessment of yellowfin, skipjack, and bigeye in the EPO. The thin lines indicate the boundaries of the 13 length-frequency sampling areas, and the bold lines the boundaries of the fisheries.
FIGURA 1. Extensión especial 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.

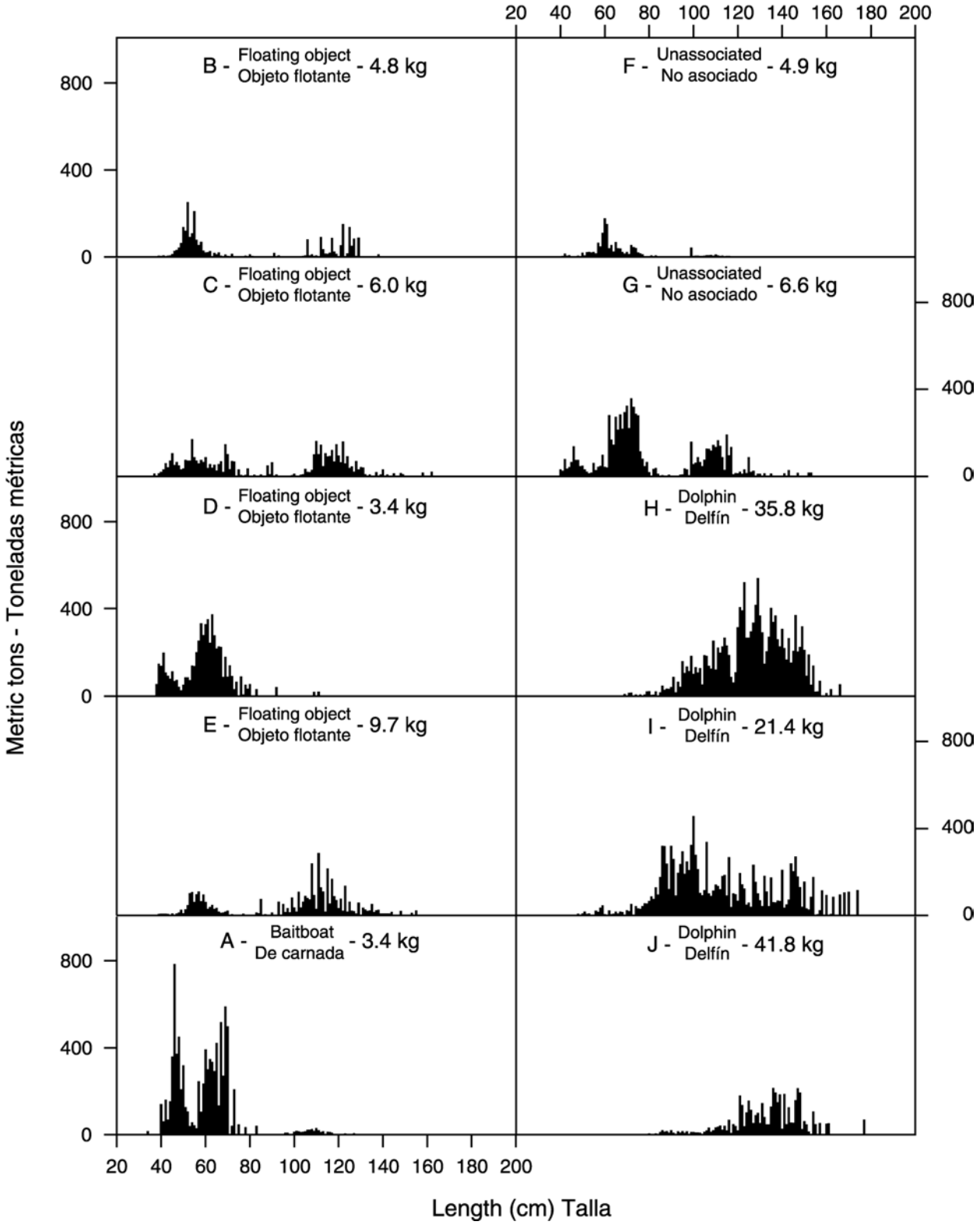

FIGURE 2. Estimated size compositions of the yellowfin caught in each fishery of the EPO during the third quarter of 2000. The average weights of the fish in the samples are given at the tops of the panels.

FIGURA 2. Composición por tallas estimada para el aleta amarilla capturado en cada pesquería del OPO durante el tercero trimestre de 2000. En cada recuadro se detalla el peso promedio de los peces en las muestras.

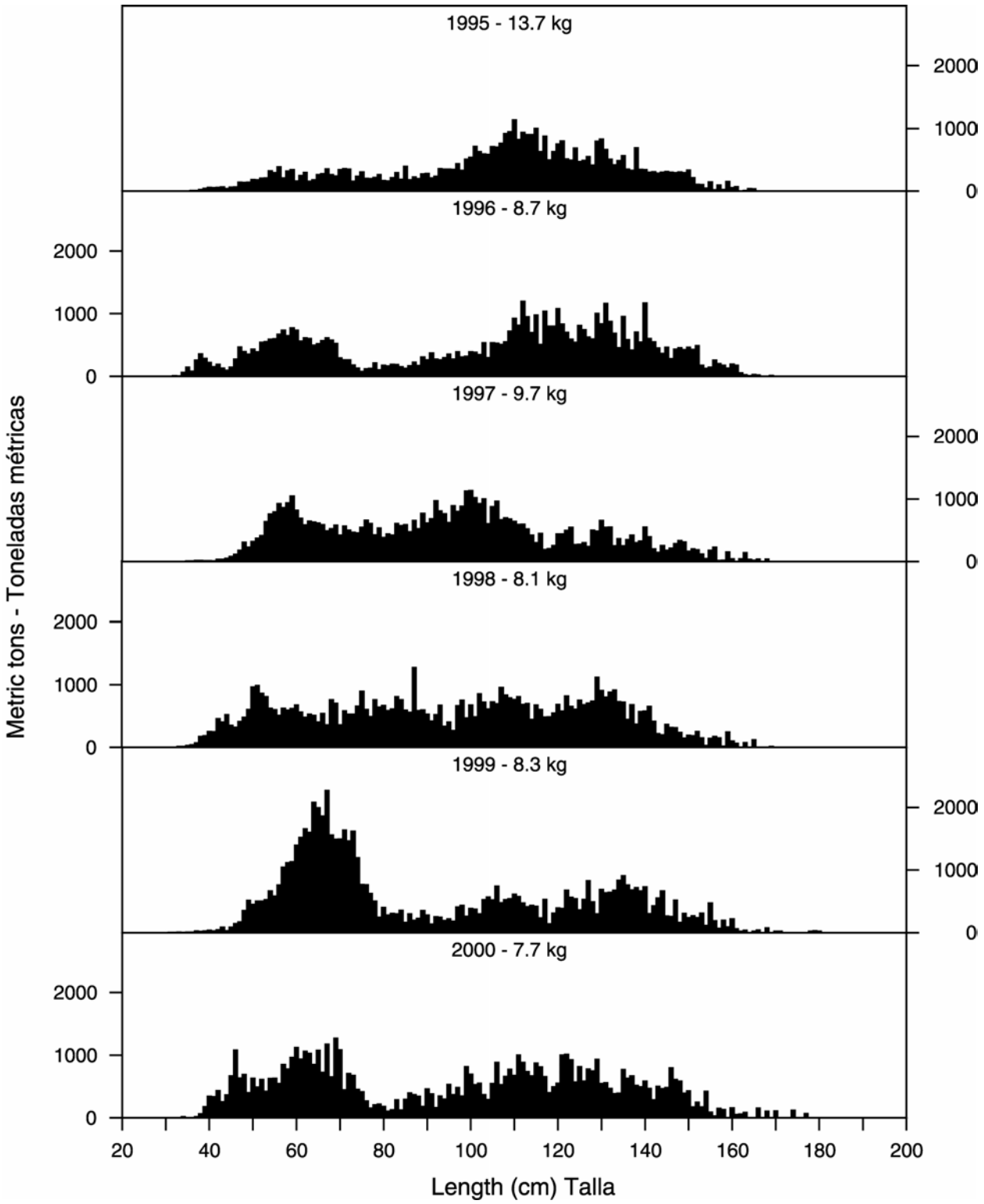

FIGURE 3. Estimated size compositions of the yellowfin caught in the EPO during the third quarter of 1995-2000. The average weights of the fish in the samples are given at the tops of the panels.

FIGURA 3. Composición por tallas estimada para el aleta amarilla capturado en el OPO en el tercero trimestre de 1995-2000. En cada recuadro se detalla el peso promedio de los peces en las muestras.

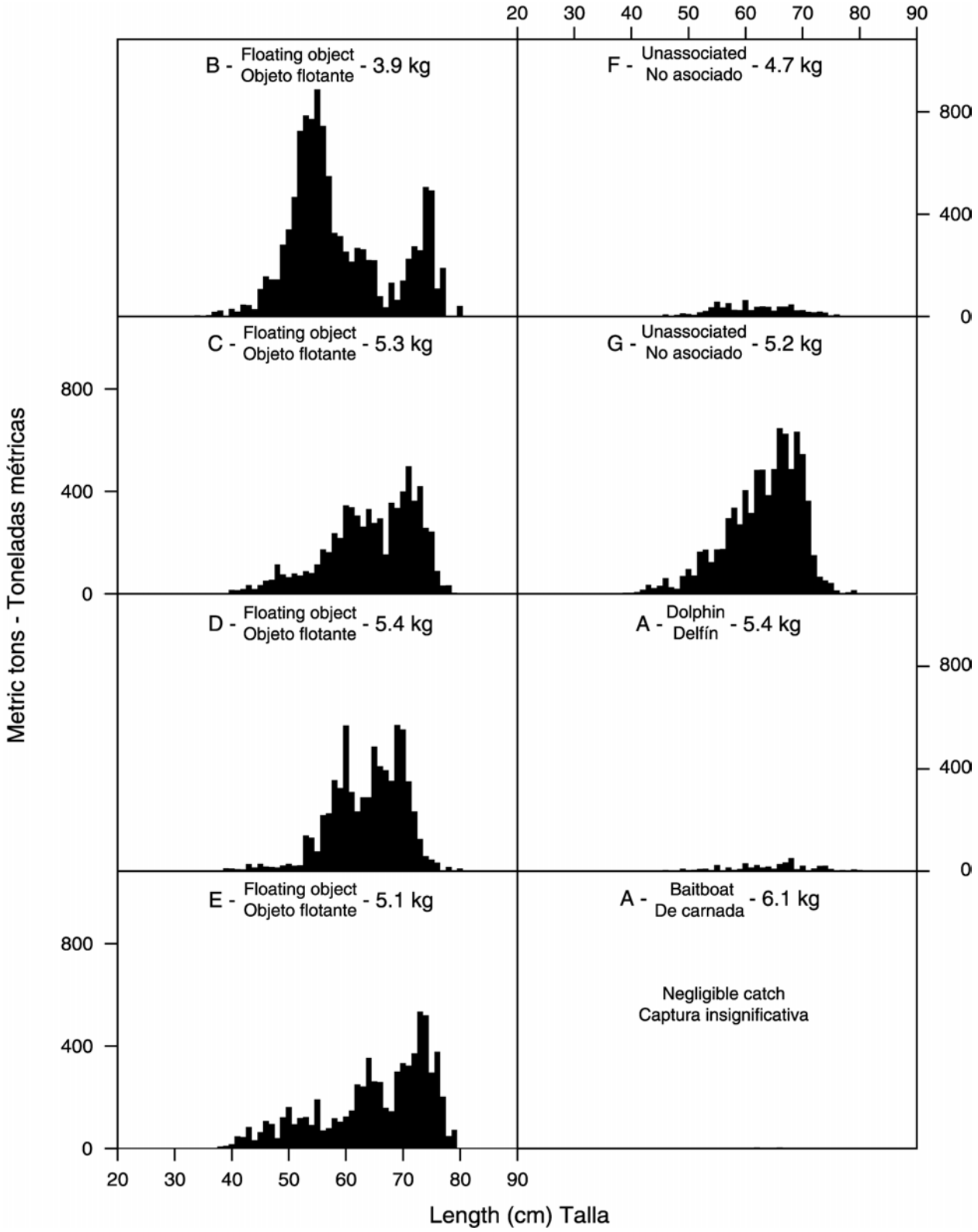

FIGURE 4. Estimated size compositions of the skipjack caught in each fishery of the EPO during the third quarter of 2000. The average weights of the fish in the samples are given at the tops of the panels.

FIGURA 4. Composición por tallas estimada para el barrilete capturado en cada pesquería del OPO durante el tercero trimestre de 2000. En cada recuadro se detalla el peso promedio de los peces en las muestras.

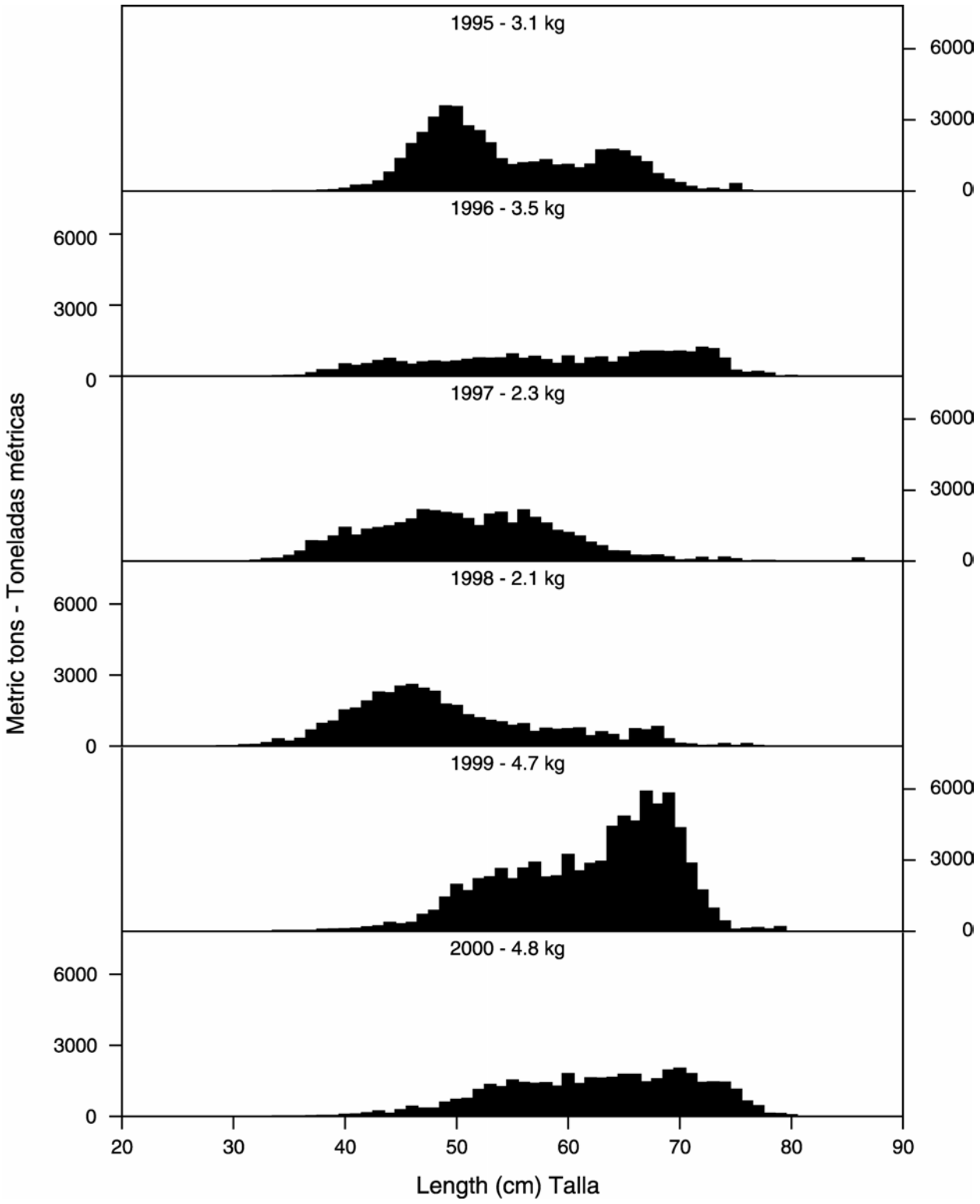

FIGURE 5. Estimated size compositions of the skipjack caught in the EPO during the third quarter of 1995-2000. The average weights of the fish in the samples are given at the tops of the panels.

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

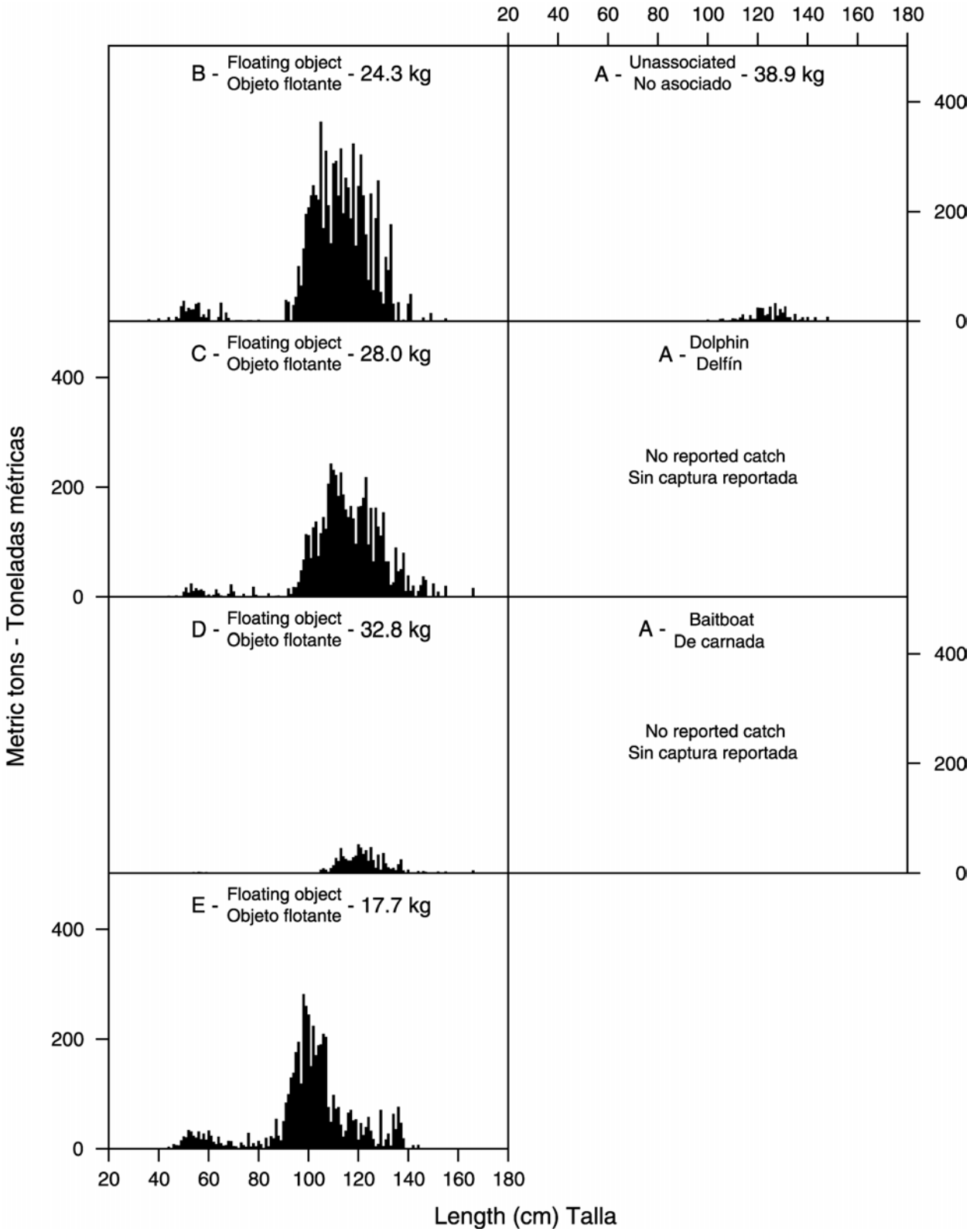

FIGURE 6. Estimated size compositions of the bigeye caught in each fishery of the EPO during the third quarter of 2000. The average weights of the fish in the samples are given at the tops of the panels.

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

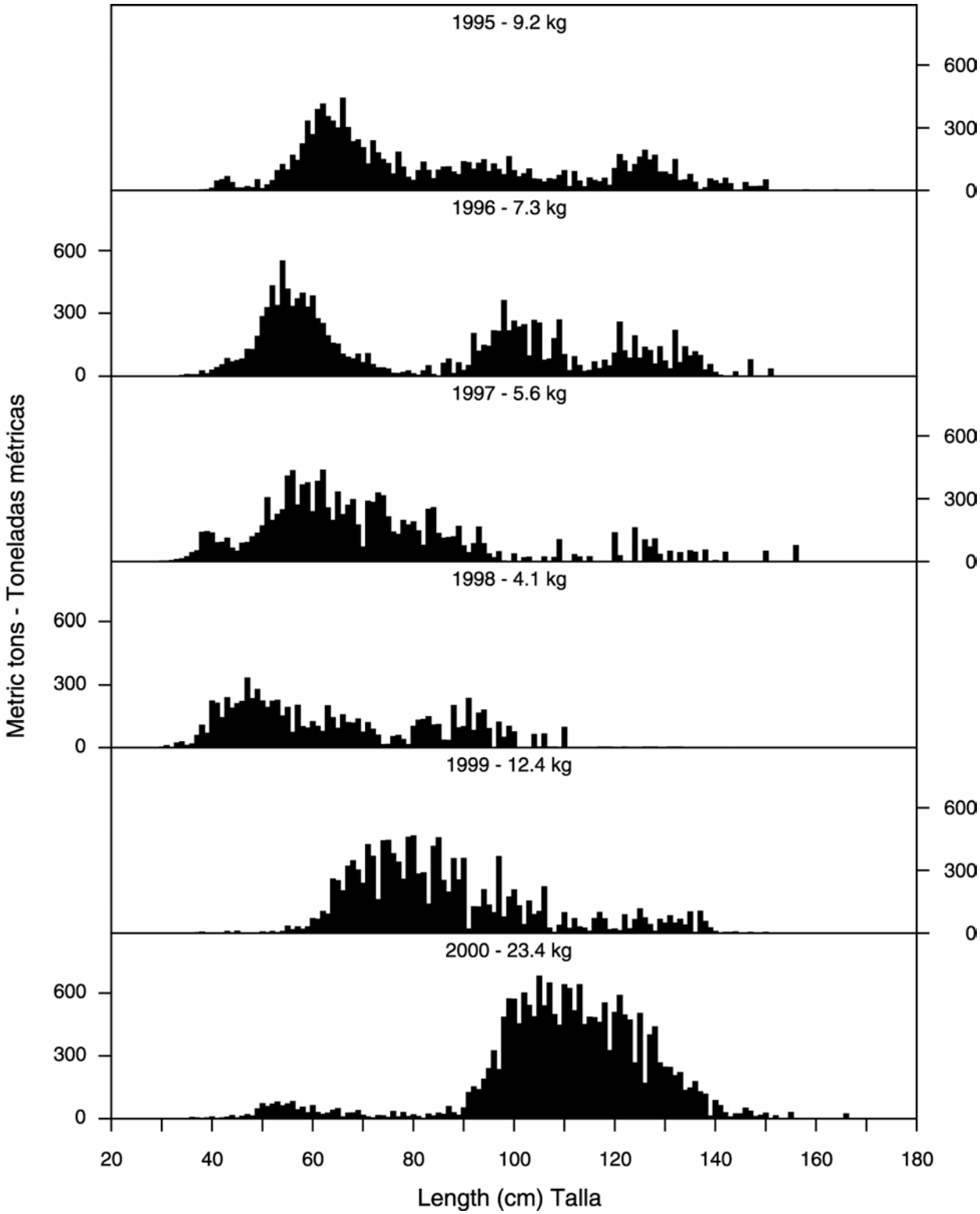

FIGURE 7. Estimated size compositions of the bigeye caught in the EPO during the third quarter of 1995-2000. The average weights of the fish in the samples are given at the tops of the panels.

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

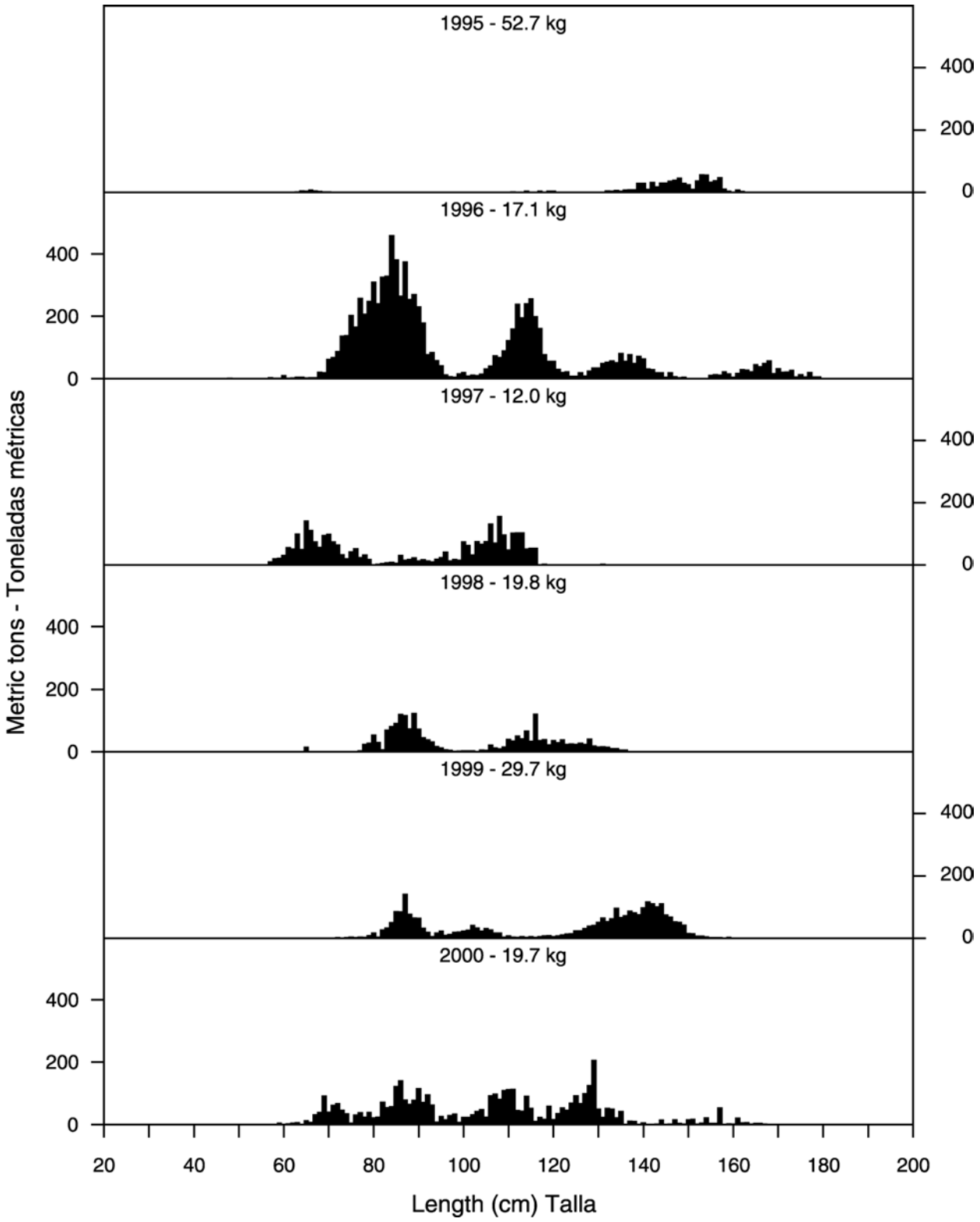

FIGURE 8. Estimated size compositions of the bluefin caught in the commercial fisheries of the EPO during 1995-2000. The average weights of the fish in the samples are given at the tops of the panels.

FIGURA 8. Composición por tallas estimada para el aleta azul capturado en las pesquerías comerciales del OPO durante 1995-2000. En cada recuadro se detalla el peso promedio de los peces en las muestras.

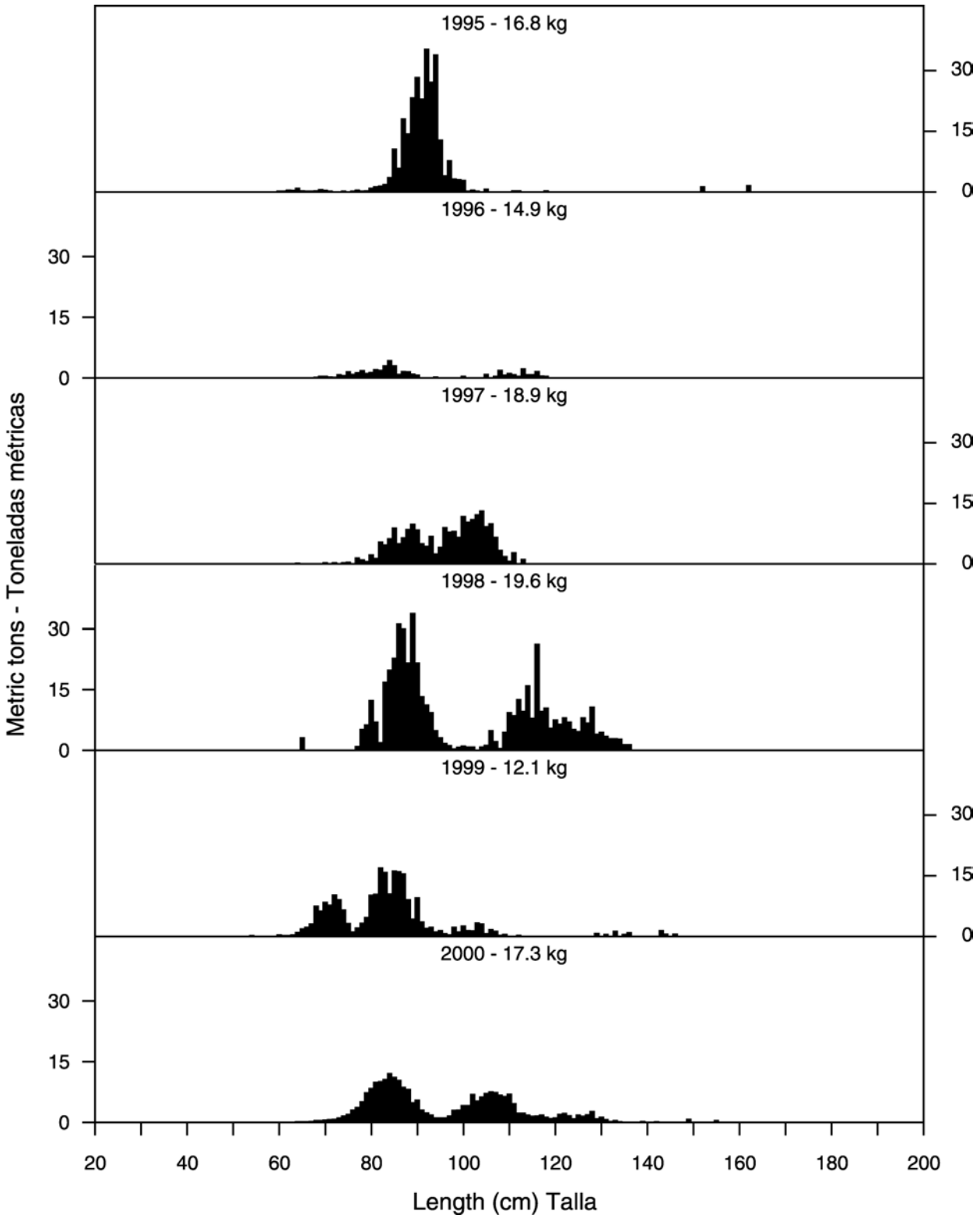

FIGURE 9. Estimated size compositions of the bluefin caught in the recreational fishery of the EPO during 1995-2000. The average weights of the fish in the samples are given at the tops of the panels.

FIGURA 9. Composición por tallas estimada para el aleta azul capturado en la pesquería deportiva en el OPO durante 1995-2000. En cada recuadro se detalla el peso promedio de los peces en las muestras.

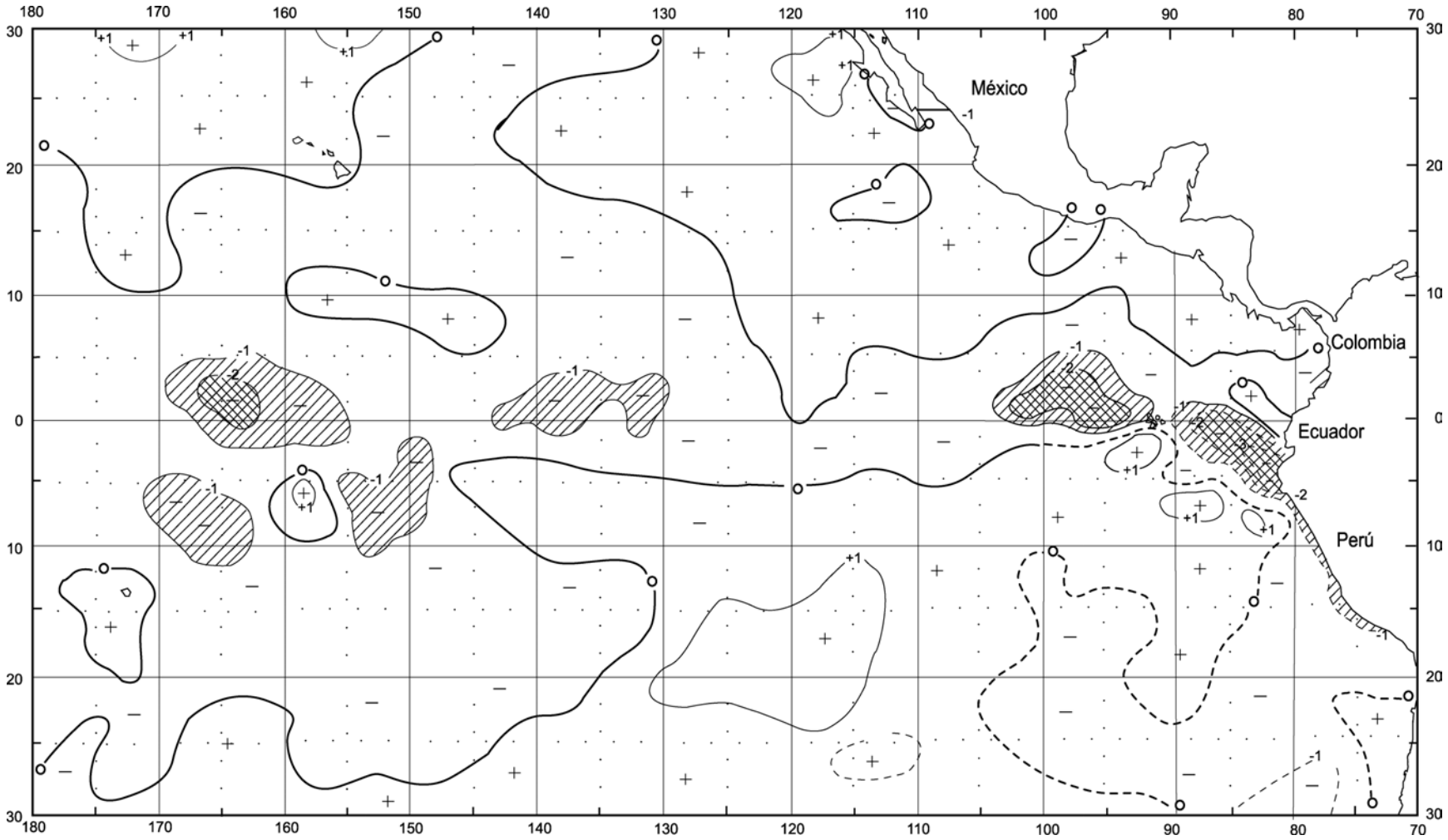

FIGURE 10. Sea-surface temperature (SST) anomalies (departures from long-term normals) for December 2000, based on data from fishing boats and other types of commercial vessels. The areas with SSTs from 1° to 2°C below normal are hatched, and those more than 2°C below normal are cross hatched. The contours are dashed in areas of sparse data.

FIGURA 10. Anomalías (variaciones de los niveles normales a largo plazo) de la temperatura superficial del mar (TSM) en diciembre de 2000, basadas en datos tomados por barcos pesqueros y otros buques comerciales. Las TSM en las zonas sombreadas fueron de 1° a 2°C inferiores a lo normal, y aquéllas en las zonas con sombreado doble más de 2°C inferiores a lo normal. Contornos de trazos significan que los datos para esa zona son escasos.

TABLE 1. Preliminary estimates of the numbers and carrying capacities, in cubic meters, of vessels (exclusive of longliners and miscellaneous small vessels) operating in the EPO in 2000, 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 barcos que pescaron en el OPO en 2000 (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 barco 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	PS	-	-	-	1	1	2	4	2,249
Bolivia	PS	-	-	-	-	-	3	3	3,956
Colombia	PS	-	-	2	-	2	5	9	7,130
Ecuador	PS	-	7	12	13	6	37	75	46,341
	BB	1	-	-	-	-	-	1	32
España--Spain	PS	-	-	-	-	-	5	5	11,466
Guatemala	PS	-	-	-	-	-	4	4	7,640
Honduras	PS	-	-	-	-	-	2	2	1,926
México	PS	-	-	8	3	4	40	55	48,493
	BB	1	4	7	-	-	-	12	1,502
Nicaragua	PS	-	-	-	-	-	1	1	1,229
Panamá	PS	-	-	2	2	-	5	9	8,413
El Salvador	PS	-	-	-	-	-	2	2	1,523
U.S.A.--EEUU	PS	-	2	1	-	2	6	11	9,081
	BB	2	5	1	-	-	-	8	657
Vanuatu	PS	-	-	-	-	-	11	11	13,578
Venezuela	PS	-	-	-	-	-	24	24	30,419
All flags	PS	-	9	25	19	15	142	210	
Todas las	BB	4	9	8	-	-	-	21	
banderas	All gear	4	18	33	19	15	142	231	
					Capacity—Capacidad				
All flags	PS	-	1,016	4,414	5,470	7,118	169,744	187,762	
Todas las	BB	169	847	1,175	-	-	-	2,191	
banderas	All gear	169	1,863	5,589	5,470	7,118	169,744	189,953	

TABLE 2. Changes in the IATTC fleet list recorded during the fourth quarter of 2000. PS = purse seine; BB = baitboat.
TABLA 2. Cambios en la flota observada por la CIAT registrados durante el cuarto trimestre de 2000. PS = cerquero; BB = barco de carnada.

Vessel name Nombre de barco	Flag Bandera	Gear Arte	Size class Clase de arqueo	Capacity (m^3) Capacidad (m^3)	Remarks Comentarios
Vessels added to the fleet—Barcos agregados a la flota					
Excalibur	MEX	PS	3	160	Re-entry--Reingreso
Rosa Isabel	ECU	BB	1	32	Re-entry--Reingreso
Vessels changing name and/or flag---Barcos de nombre y/o bandera cambiada					
Esmeralda C	ESP	PS	6	1358	Formerly--antes: *El Almirante*
Maria Del Mar	MEX	PS	6	1242	Formerly--antes: *Akalan I*
Nazca	VUT	PS	6	1414	Now flag--ahora bandera: BOL
Vessels removed from the fleet—Barcos retirados de la flota					
El Quijote	MEX	PS	6	1295	Sank--Se hundio

TABLE 3. Cumulative catches (metric tons) of yellowfin (YFT), skipjack (SKJ), bigeye (BET), and bluefin (BFT) from January 1 to December 31, 2000, by area, capacity of fleet (cubic meters), and weekly percentage capacity at sea. The data are from IATTC weekly reports.
TABLA 3. Captura acumulativa (toneladas métricas) de aleta amarilla (YFT), barrilete (SKJ), patudo (BET), y aleta azul (BFT), del 1 de enero al 31 de diciembre de 2000, por área, capacidad de la flota (metros cúbicos), y porcentaje de capacidad de la flota en el mar. Los datos provienen de los informes semanales de la CIAT.

	Cumulative catch from January 1 through weekly periods ending on indicated dates Captura acumulativa del 1 de enero hasta fin de la semana indicada					Fleet information Información de la flota	
	YFT		EPO—OPO[1]				
	CYRA ARCAA	Outside[2] Exterior[2]	SKJ	BET	BFT	Capacity Capacidad	% at sea % en el mar
Oct. 9	181,234	37,659	192,907	63,510	3,190	184,145	53.9
16	184,728	38,752	193,473	64,578	3,190	177,157	55.3
23	193,390	38,852	195,207	64,446	3,190	171,236	48.3
30	197,682	38,164	195,291	64,471	3,355	173,176	44.5
Nov. 6	200,728	38,160	196,546	64,680	3,355	175,371	46.1
13	203,750	38,176	196,735	65,024	3,355	177,251	40.5
20	206,147	38,934	197,853	67,060	3,656	178,894	43.2
27	210,980	38,936	199,804	67,072	3,656	182,825	43.5
Dec. 4	216,154	39,900	201,345	66,924	3,656	186,125	44.7
11	219,826	39,966	202,494	66,801	3,656	188,068	40.3
18	221,083	40,653	202,531	67,398	3,656	188,068	37.1
25	223,438	40,653	204,727	68,631	3,656	188,068	34.4
31	222,734	44,150	208,370	69,840	3,655	188,068	36.7

1 Includes the Pacific Ocean east of 150°W--Incluye el Océano Pacífico al este de 150°O

2 Includes the area west of the CYRA but east of 150°W--Incluye la zona al oeste del ARCAA al este de 150°O

TABLE 4. Preliminary estimates of the catches of tunas in the EPO from January 1 through December 31, 2000, by species and vessel flag, in metric tons.
TABLA 4. Estimaciones preliminares de las capturas de atunes en el OPO del 1 de enero al 31 de diciembre de 2000, por especie y bandera del barco, 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									
Colombia	13,126	3,292	6,375	1,056	-	-	-	-	2	23,851	4.3
Ecuador	32,284	3,997	107,788	27,730	-	-	-	105	48	171,952	31.2
España—Spain	3,583	2,002	16,591	17,364	-	-	-	-	-	39,540	7.2
México	82,186	20,089	16,022	81	2,985	440	79	2	40	121,924	22.2
Panamá	5,360	466	12,062	3,951	-	-	-	10	29	21,878	4.0
U.S.A.—EE.UU.	2,999	1,105	10,729	2,025	670	176	2	-	24	17,730	3.2
Vanuatu	11,689	2,642	11,094	6,231	-	-	-	-	-	31,656	5.8
Venezuela	58,583	9,254	5,342	226	-	-	-	12	-	73,417	13.4
Other—Otros[2]	12,924	1,303	22,367	11,176	-	-	-	-	-	47,770	8.7
Total	222,734	44,150	208,370	69,840	3,655	616	81	129	143	549,718	

[1] Includes mackerel, sharks, other tunas, and miscellaneous fishes
[1] Incluye caballas, tiburones, otros túnidos, y peces diversos
[2] Includes Belize, Bolivia, Guatemala, Honduras, and Nicaragua. This category is used to avoid revealing the operations of individual vessels or companies.
[2] Incluye Belice, Bolivia, Guatemala, Honduras, y Nicaragua. Se usa esta categoría para no revelar información sobre faenas de barcos o empresas individuales.

TABLE 5. Report period (January 1-September 30) logged yellowfin catch in metric tons [C(L)], and catch per day's fishing[1] [C(L)/E(L)], by year, area, and gear type, based on fishing vessel logbook information.
TABLA 5. Captura registrada de aleta amarilla [C(R)], y captura por día de pesca[1] [C(R)/E(R)], por año, área y tipo de arte, en toneladas métricas, en el período del informe (1 de enero-30 de septiembre), basado en información de los cuadernos de bitácora de barcos pesqueros.

Gear and area	Fishery statistic	Year-Año					
Arte y área	Estadística de pesca	1995	1996	1997	1998	1999	2000[2]
Purse seine	C(L)						
Red de cerco	C(R)	120,000	145,400	134,100	133,500	148,700	89,900
CYRA	C(L)/E(L)						
ARCAA	C(R)/E(R)	10.7	12.6	11.1	10.2	11.3	9.5
Outside[3]	C(L)						
Exterior[3]	C(R)	22,500	21,800	42,000	22,400	24,100	25,200
	C(L)/E(L)						
	C(R)/E(R)	13.9	8.6	12.4	6.8	13.6	15.5
EPO[4]	C(L)						
OPO[4]	C(R)	142,600	167,100	176,000	155,900	172,800	115,100
	C(L)/E(L)						
	C(R)/E(R)	11.1	11.9	11.4	9.5	11.6	10.4
Annual total	C(L)	184,100	201,200	209,900	192,400	205,900	115,100
Total anual	C(R)						
Baitboat	C(L)						
Carnada	C(R)	900	2,400	3,100	2,500	1,100	300
	C(L)/E(R)						
	C(R)/E(R)	1.1	3.5	3.4	2.7	1.5	1.5
Annual total		1,100	2,800	3,500	2,600	1,600	300
Total anual							

1 Purse-seiners, class-6 only; all baitboats. The C(L) values are rounded to the nearest 100, and the C(L)/E(L) values to the nearest 0.1.

1 Cerqueros de las clase 6; todos barcos de carnada. Se redondean los valores de C(R) al 100 más cercano, y los de C(R)/E(R) al 0.1 más cercano.

2 Preliminary: January 25 2001

2 Preliminar: 25 de enero de 2001

3 Includes the area west of the CYRA but east of 150°W

3 Incluye la zona al oeste del ARCAA al este de 150°W

4 Includes the Pacific Ocean east of 150°W

4 Incluye el Océano Pacífico al este de 150°W

TABLE 6. Report period (January 1- September 30) logged skipjack tuna catch in metric tons [C(L)] and catch per day's fishing[1] [C(L)/E(L)] in the EPO[2], by year and gear type, based on fishing vessel logbook information.

TABLA 6. Captura registrada de barrilete [C(R)], y captura por día de pesca[1] [C(R)/E(R)] en el OPO[2], por año y tipo de arte, en toneladas métricas, en el período del informe (1 de enero-30 de septiembre), basado en información de los cuadernos de bitácora de barcos pesqueros.

Gear	Fishery statistic	Year—Año					
Arte	Estadística de pesca	1995	1996	1997	1998	1999	2000[3]
Purse seine	C(L)						
Red de cerco	C(R)	64,200	55,600	69,400	63,100	158,400	100,300
	C(L)/E(L)						
	C(R)/E(R	5.0	4.0	4.5	3.9	10.6	9.1
Annual total	C(L)	91,900	74,900	98,800	97,200	177,400	100,300
Total anual	C(R)						
Baitboat	C(L)						
Carnada	C(R)	2,100	1,400	1,700	900	1,600	100
	C(L)/E(L)						
	C(R)/E(R)	2.6	2.1	1.8	1.0	2.2	<1.0
Annual total	C(L)	3,600	1,800	2,300	1,000	1,800	100
Total anual	C(R)						

1 Purse-seiners, class-6 only; all baitboats. The C(L) values are rounded to the nearest 100, and the C(L)/E(L) values to the nearest 0.1.

1 Cerquero de la clase 6; todos barcos de carnada. Se redondean los valores de C(R) al 100 más cercano, y los de C(R)/E(R) al 0.1 más cercano.

2 Includes the Pacific Ocean east of 150°W

2 Incluye el Océano Pacífico al este de 150°W

3 Preliminary: January 25, 2000

3 Preliminar: 25 de enero de 2000

TABLE 7. Report period (January 1- September 30) logged bigeye catch in the EPO[1] and catch per day of fishing (CPDF) in the EPO, in metric tons, based on logbook information from purse seiners.

TABLA 7. Captura registrada de atún patudo en el OPO[1] en el período del informe (1 de enero-30 de septiembre) captura por día de pesca (CPDP) en el OPO, en toneladas métricas, basadas en información de las bitácoras de barcos cerqueros.

Fishery statistic—Estadística de pesca	Year—Año			
	1997	1998	1999	2000[2]
Catch—Captura	24,600	14,100	20,500	35,500
CPDF—CPDP	1.6	0.9	1.4	3.2
Total annual catch--Captura total anual	34,100	20,400	22,700	35,500

1 Includes the Pacific Ocean east of 150°W

1 Incluye el Océano Pacífico al este de 150°W

2 Preliminary: January 25, 2000

2 Preliminar: 25 de enero de 2000

TABLE 8. Preliminary data on the sampling coverage of trips by Class-6 vessels (capacity >363 metric tons) by the IATTC, Mexican, and Venezuelan programs during the fourth quarter of 2000. The numbers in parentheses indicate cumulative totals for the year.

TABLA 8. Datos preliminares de la cobertura de muestreo de viajes de barcos de la Clase 6 (capacidad >363 toneladas métricas) por los programas de la CIAT, México, y Venezuela durante el cuarto trimestre de 2000. 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	1	(8)	1	(8)			1	(8)	100	(100)
Bolivia	3	(6)	3	(5)			3	(5)	100	(83.3)
Colombia	4	(21)	4	(21)			4	(21)	100	(100)
Ecuador	31	(240)	25	(234)	6	(6)	31	(240)	100	(100)
España--Spain	6	(36)	6	(36)			6	(36)	100	(100)
Guatemala	5	(35)	5	(35)			5	(35)	100	(100)
Honduras	0	(6)	0	(6)			0	(6)	100	(100)
México	30	(181)	17	(92)	13	(89)	30	(181)	100	(100)
Nicaragua	0	(5)	0	(5)			0	(5)	-	(100)
Panamá	6	(24)	6	(24)			6	(24)	100	(100)
U.S.A.-EE.UU.	0	(21)	0	(21)			0	(21)	-	(100)
Vanuatu	9	(46)	9	(45)			9	(45)	100	(97.8)
Venezuela	12	(93)	9	(60)	3	(33)	12	(93)	100	(100)
Total	107	(722)[1]	85	(592)[1]	22	(128)	107	(720)[1]	100	(99.7)

1 Includes 33 trips that began in late 1999 and ended in 2000

1 Incluye 33 viajes iniciados a fines de 1999 y completados en 2000