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

January-March 2002
Enero-Marzo 2002

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The

QUARTERLY REPORT

January-March 2002

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.

El

INFORME TRIMESTRAL

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de la

COMISION INTERAMERICANA DEL ATUN TROPICAL

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.

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 abstracted the logbook information for 259 trips of fishing vessels and collected 216 length-frequency samples during the first quarter of 2002.

Also, during the first quarter members of the field office staffs placed IATTC observers on 142 fishing trips by vessels that participate in the on-board observer program. In addition, 52 IATTC observers completed trips during the quarter, and were debriefed at the corresponding field offices.

Surface fleet and surface catch statistics

Statistical data are continuously being collected by personnel at the IATTC's field stations and processed at its headquarters in La Jolla. 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.

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 2002 is about 191,200 cubic meters (m^3) (Table 1). The weekly average at-sea capacity for the fleet, for the weekly periods ending January 1 through April 1, was about 117,100 m^3 (range: 106,800 to 128,600 m^3). The changes of flags and vessel names and additions to and deletions from the IATTC's fleet list for the period of January 1-April 1 are given in Table 2.

Catch statistics

The total retained catches of tunas in the EPO for the January 1-April 1, 2002, period were estimated to be about 113 thousand mt of yellowfin, 43 thousand mt of skipjack, and 9 thousand mt of bigeye. The averages and ranges for the comparable periods of 1997-2001 are as follows: yellowfin, 84 thousand mt (57 to 122 thousand mt); skipjack, 49 thousand mt (25 to 80 thousand mt); bigeye, 11 thousand mt (8 to 19 thousand mt). For this period the weekly averages of the estimated retained catches of yellowfin, skipjack, and bigeye in the EPO were about 9 thousand, 3 thousand, and 1 thousand mt, respectively. Summaries of the preliminary estimated retained catches, by flag of vessel, are shown in Table 3.

Catch statistics for 2001

Annual estimates of the retained and discarded catches of the various species of tunas and other fishes by vessels fishing at least part of the year in the EPO for yellowfin, skipjack, bigeye, or bluefin during 1970-2001 are shown in Table 4. This table includes only the catches by surface gear. The retained 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 had been harvested by the longline fishery.

There were no restrictions on fishing for tunas in the EPO during 1980-1997. However, there were restrictions on fishing for yellowfin in the Commission's Yellowfin Regulatory Area (CYRA) (Figure 1) from November 26 through December 31, 1998, from October 14 through December 31, 1999, from December 1 through 31, 2000, and from October 27 through December 31, 2001. In addition, fishing for tunas associated with fish-aggregating devices (FADs) was prohibited in the EPO from November 9 through December 31, 1999, and from September 15 through December 15, 2000. Furthermore, 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, the 1990s, and the early 2000s. 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 1997-1998 another major El Nino event occurred in the EPO, and the effects of this on the vulnerability of the fish to capture are currently being studied.

The average annual retained catch of yellowfin in the CYRA during 1986-2000 was 228 thousand mt (range: 196 to 268 thousand mt) (Table 4). The preliminary estimate of the retained catch of yellowfin in the CYRA during 2001 is 344 thousand mt. During 1986-2000 the annual retained catch of yellowfin from the area between the CYRA boundary and 150°W averaged 32 thousand mt (range: 19 to 51 thousand mt). The preliminary estimate of the retained catch of yellowfin from this area for 2001 is 50 thousand mt. The preliminary estimate of the retained catch of yellowfin in the EPO during 2001, 395 thousand mt, is 53 percent greater than the 1986-2000 average of 259 thousand mt and 33 percent greater than the previous record retained catch of 297 thousand mt in 1999.

The average annual distributions of the logged retained catches of yellowfin, skipjack, and bigeye by set type, by purse seiners in the EPO during the 1986-2000 period (1994-2000 for bigeye), are shown in Figures 1a, 2a, and 3a, and the preliminary estimates for 2001 are shown in Figures 1b, 2b, and 3b. The distributions of the catches of yellowfin and skipjack during 2001 were similar to those of 1986-2000, although some differences are evident.

Bigeye are not often caught by surface gear north of about 7°N. The distribution of the catch of bigeye during 2001 was similar to those of 1994-2000, although some differences are evident. With the development of the fishery for tunas associated with floating objects since 1994, 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 catches 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 retained catch of these other species in the EPO was about 3 thousand mt in 2001, which is well below the 1986-2000 average of 8 thousand mt (range: 2 to 17 thousand).

The estimated retained catch of all species in the EPO in 2001 was about 586 thousand mt, which is 20 percent greater than the average of 424 thousand mt for 1986-2000, but 4 percent less than the previous record total catch of 611 thousand mt, taken in 1999.

Preliminary estimates of the retained catches in the EPO, by flag, and the landings of EPO-caught fish, 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 2001 87 percent of the retained catch of yellowfin in the EPO was made in the CYRA. Ecuadorian-, Mexican- Venezue-

lan-, and Spanish-flag, flag vessels harvested 25, 24, 19, and 7 percent, respectively, of the retained catch of all species in the EPO.

Preliminary estimates of the landings (Table 5) indicate that, of the 591 thousand mt of tunas landed in 2001, 231 thousand mt (39 percent) was landed in Ecuador. The landings in Mexico (139 thousand mt; 24 percent) and Colombia (40 thousand mt; 7 percent) were next in terms of magnitude. Other countries with significant landings of tunas caught in the EPO included Costa Rica and Venezuela (5 percent each). 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 are described in the IATTC Annual Report for 2000. Briefly, the fish in a well of a purse seiner or pole-and-line vessel 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).

Data for fish caught during the fourth quarter of 1996-2001 are presented in this report. Two length-frequency histograms are presented for each species. For yellowfin, skipjack, and bigeye the first shows the data by fishery (area, gear type, and set type) for the fourth quarter of 2001. The second shows the fourth-quarter catches for the current year and the previous five years. The number of wells sampled during the fourth quarter, 120, was much less than during any of the first three quarters of 2001, probably due to decreased fishing activity as a result of the regulation to restrict the catch of yellowfin by purse seiners that went into effect in late October.

There are ten surface fisheries for yellowfin defined for stock assessments: four floating-object, two unassociated school, three dolphin, and one pole-and-line (Figure 4). Of the 120 wells sampled, 116 contained yellowfin. The estimated size compositions of these fish are shown in Figure 5a. As was the case during the third quarter, the majority of the yellowfin catch during the fourth quarter was taken in dolphin sets in the North and Inshore areas. Lesser amounts of fish were caught in unassociated sets during the third and fourth quarters than during the first and second quarters. Small amounts of yellowfin were taken in floating-object sets and by pole-and-line vessels, but the estimated catches do not show well in the graph.

The estimated size compositions of the yellowfin caught by all fisheries combined during the fourth quarter of 1996-2001 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 quarters and among years. There was a conspicuous mode between 90 and 120 cm during the third and fourth quarters of 2001.

There are eight fisheries for skipjack defined for stock assessments: four floating-object, two unassociated school, one dolphin, and one pole-and-line (Figure 4). The last two fisheries include all 13 sampling areas. Of the 120 wells sampled, 57 contained skipjack. The estimated size compositions of these fish are shown in Figure 6a. Two distinct modes, one between 35 and 50 cm and a second between 55 and 70 cm, are apparent in the floating-object fisheries in the North and Galapagos areas. In the floating-object fishery in the South, similar modes occurred, except that the second is shifted a little to the right, between 65 and 75 cm. The estimated catches of skipjack taken in dolphin sets and by pole-and-line vessels were too small to show well in the graphs.

The estimated size compositions of the skipjack caught by all fisheries combined during the fourth quarter of 1996-2001 are shown in Figure 6b. The two modes mentioned above are evident in the combined histogram of all fisheries for 2001.

There are seven surface fisheries for bigeye defined for stock assessments: four floating-object, one unassociated school, one dolphin, and one pole-and-line (Figure 4). The last three fisheries include all 13 sampling areas. Of the 120 wells sampled, 32 contained bigeye. The estimated size compositions of these fish are shown in Figure 7a. During the second half of 2001 the catch of bigeye in the floating-object fishery of the North was greater than during the first half of the year. The catches remained fairly high in the floating-object fisheries in the South and Galapagos areas throughout the year. A small amount of bigeye was caught in sets on unassociated schools and in the Inshore floating-object fishery. There were no recorded catches of bigeye in dolphin sets or by pole-and-line vessels.

The estimated size compositions of the bigeye caught by all fisheries combined during the fourth quarter of 1996-2001 are shown in Figure 7b. The average size of bigeye caught during the second half of 2001 was considerably less than that during the first half of 2001 and during 2000, when the average sizes were relatively high.

Observer program

Coverage

The design for placement of observers during 2002 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 approximately one-third of the trips by vessels of its fleet, and IATTC observers are to sample the remainder of those trips. The IATTC is to 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 206 fishing trips aboard Class-6 purse seiners during the first quarter of 2002. 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 2002.

RESEARCH

Tuna tagging

In January archival tags, provided by Wildlife Computers, Inc. (model Mk9) and LOTEK Wireless, Inc. (model LTD2310), were implanted into the body cavities of 12 yellowfin, ranging in weight from 4 to 10 kg, in a 170,000-L tank at the IATTC's Achotines Laboratory. This trial was being conducted to investigate whether feeding and/or spawning events of yellowfin can be detected by evaluating data on the body cavity temperatures recorded by the archival tags. In addition, the overall performance of the archival tags was to be evaluated. One of the fish became visually impaired, and was sacrificed in

mid-February. The archival tag removed from the sacrificed fish was implanted into a 6-kg yellowfin, which was placed into the tank with the others. At the end of the quarter 11 fish were feeding well, and the other was feeding intermittently.

The chartered baitboat, *Her Grace*, with two IATTC scientists aboard, left San Diego on March 1, 2002, to tag tunas in the vicinity of the Galapagos Islands. Bait was obtained in the Gulf of Panama, and at the end of March the boat was fishing north of the Galapagos Islands.

Bigeye studies

The ovaries of 469 bigeye tuna were processed for a study of the reproductive biology of this species, and the gonads and hard parts of 299 bigeye were examined for an investigation of its sex-specific age and growth.

Early life history studies

Yellowfin broodstock

The yellowfin broodstock in Tank 1 (1,362,000 L) at the Achotines Laboratory spawned nearly daily during January through March. Spawning occurred as early as 10:35 a.m. and as late as 5:05 p.m. The water temperatures in the tank ranged from 23.5° to 28.4°C during the quarter. When the temperatures were in the 23.5º to 24.0ºC range spawning became intermittent, and there was no spawning on seven days in March. The numbers of eggs collected after each spawning event ranged from about 12,000 to 1,105,000.

Two 5- to 6-kg yellowfin were added to Tank 1 during February to supplement the 15 fish that were already there. During the quarter one 28-kg fish died after striking the tank wall, two 43- to 45- kg fish died of starvation, and one 22-kg fish with vision impairment became entangled in an egg collecting net and died.

At the end of March there were four size groups of fish in Tank 1: one 66-kg fish, five 42- to 47-kg fish, nine 13- to 18-kg fish, and two 7-kg fish.

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.

Experiments with yellowfin larvae and cultured food organisms

During the fourth quarter of 2001 studies were conducted to compare the effects of antibiotics and probiotics on rotifer cultures and on the survival of yellowfin larvae. A detailed description of this work was given in the IATTC Quarterly Report for October-December 2001. The results of those experiments were inconclusive, so similar trials were conducted again during the first quarter of 2002. The results were to be analyzed during the second quarter of 2002.

Video footage of yellowfin eggs, larvae, early juveniles, and adult broodstock, taken at the Achotines Laboratory during May and June of 2000, was included as part of the Open Ocean segment of the British Broadcasting Corporation's (BBC) Blue Planet series, which was shown in the United States during the period of January 28-February 1, 2002, on the Discovery Channel.

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 two times per week during the first quarter. Another group of 40 fish, hatched in captivity in October 1998, was being held in two 12,000-L tanks. These 40 fish were being fed only three times per week in an attempt to eliminate fatty deposits in the abdominal cavity and permit natural maturation of the gonads. On average, these fish were about 47.5 cm long and weighed about 1.5 kg at the end of the quarter.

One group of 9 juvenile polla drum (*Umbrina xanti*), hatched in captivity in July 1999, was being held in a 12,000-L tank. The remaining fish were about 25 cm long and weighed about 170 g, on average, at the end of the quarter. These fish were to be used as broodstock.

Visitors at the Achotines Laboratory

Ms. Kerstin Sarter, an undergraduate student at the University of Heidelberg, arrived on February 14, 2002, to spend about 8 weeks at the Achotines Laboratory, where she was working as a volunteer student intern.

Mr. Patrick Tracy, a graduate student at the University of Miami's Rosenstiel School of Marine and Atmospheric Science (RSMAS), returned to the Achotines Laboratory on February 21, 2002, to continue his internship that began in late October of 2001. Dr. Daniel D. Benetti, Director of the Aquaculture Program at the RSMAS, spent the period of March 7-13, 2002, at the Laboratory, where he worked with Mr. Tracy on modifications of the feeding and treatment protocols for the experiments that he was conducting.

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 SOI* and the NOI*, have recently been devised. These are described in the IATTC Quarterly Report for January-March 2001. The SOI* and NOI* values are both negative during El Niño events and positive during anti-El Niño events.

The SSTs were near normal during January and February 2002, but in March a narrow band of water more than 1°C above normal extending along the coast of South America from about 2°N to 36°S appeared (Figure 8). The data in Table 7, for the most part, indicate that conditions were near normal during most of the October-February period. In March, however, the SST anomalies at 0°-10°S, 80°-90°W increased, the depth of the thermocline at 0°-80°W increased, the sea levels at La Libertad, Ecuador, and Callao, Peru, rose, and the SOI, SOI*, and NOI* all decreased. Also, the rainfall was above average in Ecuador, northern Peru, and the Galapagos Islands. According to the Climate Diagnostics Bulletin of the U.S. National Weather Service for March 2002, "it seems likely that … El Niño conditions will continue to develop in the tropical Pacific during the next three months and persist during the remainder of 2002... It is important to emphasize that these conditions represent the *early* stages of El Niño and that *mature* El Niño conditions will take at least several more months to develop."

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.

There were no dolphin mortality reduction workshops held during the quarter.

MEETINGS

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

IATTC meetings

Eighth meeting of the Working Group on the IATTC Convention

The eighth meeting of the Working Group on the IATTC Convention was held in La Jolla, California, USA, on February 4-9, 2002.

Third meeting of the Bycatch Working Group

The third meeting of the Bycatch Working Group was held in La Jolla, California, USA, on March 5-6, 2002. The participants discussed the requirement that all yellowfin, skipjack, and bigeye that were caught during 2001 be retained, the requirements regarding the release of bycatches of sea turtles and of other species, methods of obtaining data on the bycatches, and methods to reduce the bycatches.

Sixth meeting of the Permanent Working Group on Fleet Capacity

The sixth meeting of the Permanent Working Group on Fleet Capacity was held in La Jolla, California, USA, on March 7-8, 2002. The principal topic of discussion was a fair scheme for limiting the total capacity of the purse-seine vessels that participate in the fishery. A draft resolution was prepared for consideration at the 69th meeting of the IATTC, to be held in June 2002.

AIDCP meetings

Ninth meeting of the Permanent Working Group on Tuna Tracking

The ninth meeting of the Permanent Working Group on Tuna Tracking was held in La Jolla, California, USA, on January 31, 2002. The participants discussed the classification of tuna caught outside the area to which the AIDCP applies, national plans for tracking tunas, and promotion of the dolphin-safe label.

29th meeting of the International Review Panel

The 29th meeting of the International Review Panel was held in La Jolla, California, USA, on January 31-February 2, 2002. Aside from reviewing the possible infractions of the AIDCP described in the reports of the observers, the principal topics of discussion were the list of captains qualified to fish for tunas associated with dolphins, Dolphin Mortality Limits for 2001 and 2002, confidentiality of observer data, differences in the data collected by the various components of the AIDCP On-Board Observer Program, and causes of mortalities of dolphins during 1999-2001.

Other meetings

Drs. Robin Allen and Michael G. Hinton and Mr. Brian S. Hallman participated in the FAO Expert Consultation of Regional Fishery Management Bodies on the Harmonization of Catch Certification in La Jolla, California, USA, on January 9-11, 2002. The objectives of the consultation were to review the current status of catch certification and documentation in the fisheries in which they have been introduced and to evaluate possible methods to harmonize schemes for catch certification and documentation. The report of the consultation contains recommendations on catch certification and documentation for the Sub-Committee on Fish Trade of the FAO Committee on Fisheries.

Drs. Robin Allen and Michael G. Hinton participated in the third meeting of the Interim Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean in Nagasaki, Japan, on January 22-30, 2002.

Dr. Daniel Margulies and Mss. Jeanne W. Wexler and Sharon L. Hunt attended the Aquaculture America 2002 Conference of the World Aquaculture Society in San Diego, California, USA, on January 27-30, 2002. Dr. Margulies presented a paper entitled, “Captive Spawning and Rearing of Larvae and Juveniles of Yellowfin Tuna *Thunnus albacares*.” Dr. Robert J. Olson, Mr. Vernon P. Scholey, and Mss. Sharon L. Hunt, Jenny M. Suter, and Jeanne B. Wexler were coauthors of the paper.

On February 4-5, 2002, Dr. Michael D. Scott and Mr. David A. Bratten attended a meeting in La Jolla, California, USA, at which the results of the research cruise described in the IATTC Quarterly Report for October-December 2001 were discussed.

Dr. Mark N. Maunder attended the second meeting of the working group on "Developing and Testing Methods for Classifying Species Conservation Status and Estimating Risk" at the National Center for Ecological Analysis and Synthesis in Santa Barbara, California, USA, on February 11-15, 2002, where he gave a presentation entitled "Hierarchical Bayesian Integrated Modeling for Population Viability Analysis."

Mr. Brian S. Hallman participated in the second Western and Central Pacific Fisheries Convention (Tuna) Preparatory Conference at Konedobu, Papua New Guinea, on February 25-March 1, 2002.

Dr. Richard B. Deriso participated in a meeting of the Ocean Sciences Board of the U.S. National Research Council in Washington, D.C., USA, on March 4-8, 2002.

Dr. Deriso also participated in a meeting of the Scientific and Statistical Committee of the Western Pacific Fishery Management Council of the United States in Honolulu, Hawaii, USA, on March 11-15, 2002.

Dr. Robert J. Olson participated in a workshop at the National Center for Ecological Analysis and Synthesis (NCEAS) in Santa Barbara, California, on March 18-20, 2002. The workshop was the second meeting of a Working Group entitled "Models of Alternative Management Policies for Marine Ecosystems," which is funded by NCEAS. NCEAS is supported by the U.S. National Science Foundation and the state of California. The purpose of the Working Group is to use ecosystem modeling to identify robust approaches for incorporating ecological considerations into fisheries management objectives for five large marine ecosystems in the Pacific Ocean, including the tropical eastern Pacific.

Dr. Robin Allen participated in an FAO Technical Consultation on Improving Information on the Status and Trends of Capture Fisheries in Rome on March 25-28, 2002.

PUBLICATIONS

IATTC Bulletin

Maunder, Mark N. 2001. Growth of skipjack tuna (*Katsuwonus pelamis*) in the eastern Pacific Ocean, as estimated from tagging data, Vol. 22, No. 2.

Outside journals

Lennert-Cody, Cleridy E., Stephen T. Buckland, and Fernanda F. C. Marques. 2001. Trends in dolphin abundance estimated from fisheries data: a cautionary note. Jour. Cetacean Res. Manag., 3(3): 305-319.

Pabst, D. A., T. M. Harradine, W. A. Mclellan, M.M. Barbieri, E. M. Meagher, and M. D. Scott. 2001. Infrared thermograqphy as a tool to assess thermal function of the bottlenose dolphin (*Tursiops truncatus*) dorsal fin [abstract]. Amer. Zool., 41 (6): 1548.

ADMINISTRATION

Ms. Sharon L. Hunt was awarded the degree of Master of Science by Humboldt State University in December 2001. Her thesis is on the genetics of California halibut.

Ms. Jacqueline Castañeda, bilingual secretary since November 2001, resigned her position on January 15, 2002. Ms. Alejandra Ferreira, a graduate of Ithaca College, was employed to replace Ms. Castañeda on February 11, 2002.

Dr. Richard B. Deriso was appointed to the Ocean Studies Board of the U.S. National Research Council in January 2002. The Ocean Studies Board was established by the National Research Council to advise the U.S. government on issues of ocean science, engineering, and policy. It explores the science, policies, and infrastructure needed to understand and protect coastal and marine environments and resources.

Mr. Neil A. Bonilla Gaitán, who had worked at the Achotines Laboratory since July 1998, resigned on February 28, 2002, to attend graduate school at the University of Cadiz in Spain. He will be missed, but everyone wishes him well in his studies.

Aleksander Kwasniewski, president of Poland, has conferred the Commander's Cross of the Order of Merit on Mr. Witold L. Klawe, Senior Scientist Emeritus. The actual ceremony will take place later.

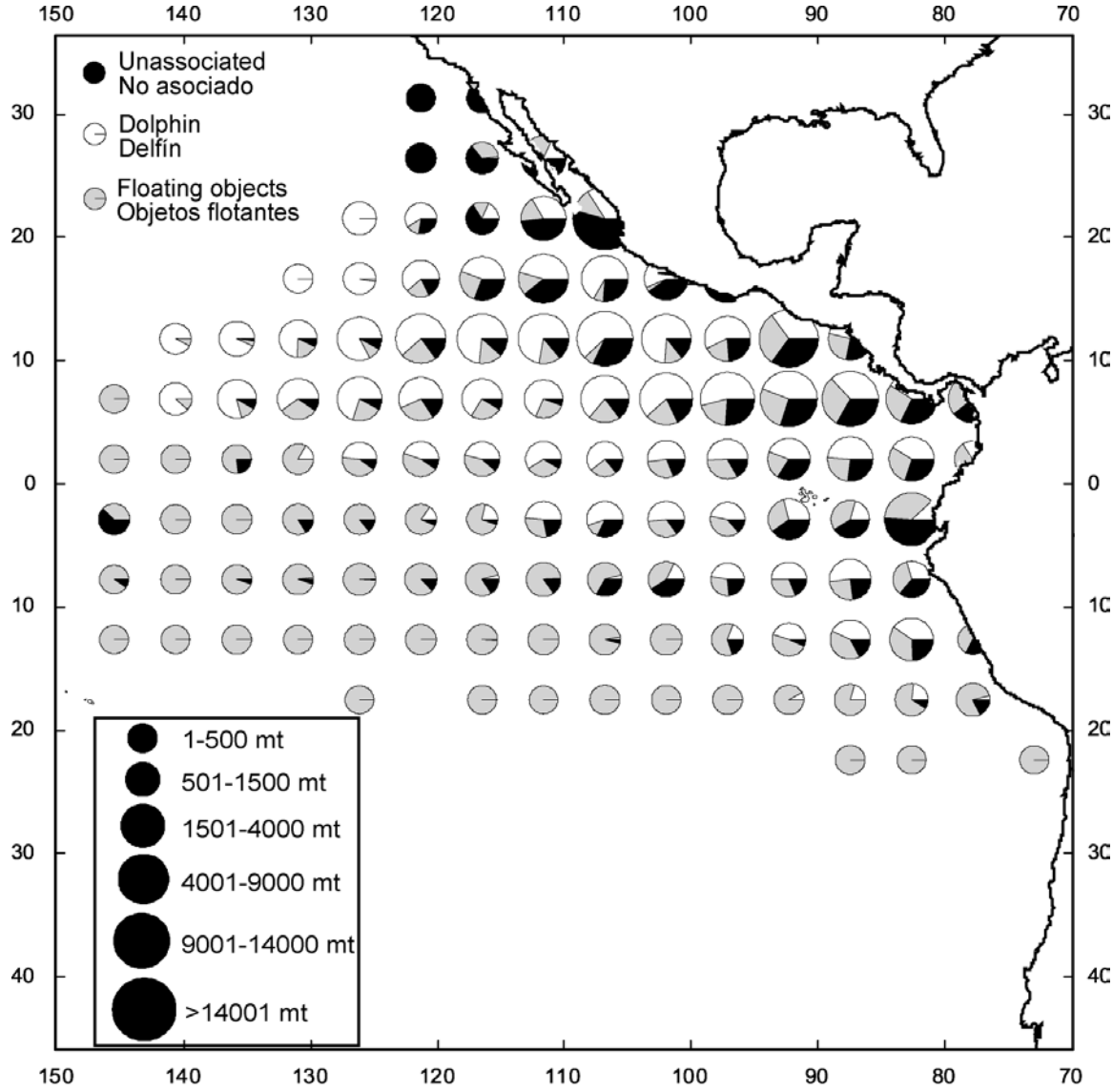

FIGURE 1a. Average annual distribution of the logged retained catches of yellowfin, in metric tons, in the eastern Pacific Ocean during 1986-2000. The average catches and effort were calculated only for the 1-degree areas for which three or more years of data were available.
FIGURA 1a. Distribución anual promedia de las capturas retenidas registradas de aleta amarilla, en toneladas métricas, en el Océano Pacífico oriental durante 1986-2000. Se calcularon promedios de captura ye esfuerzo solamente para las áreas de 1° para las cuales se disponía de tres años o más de datos.

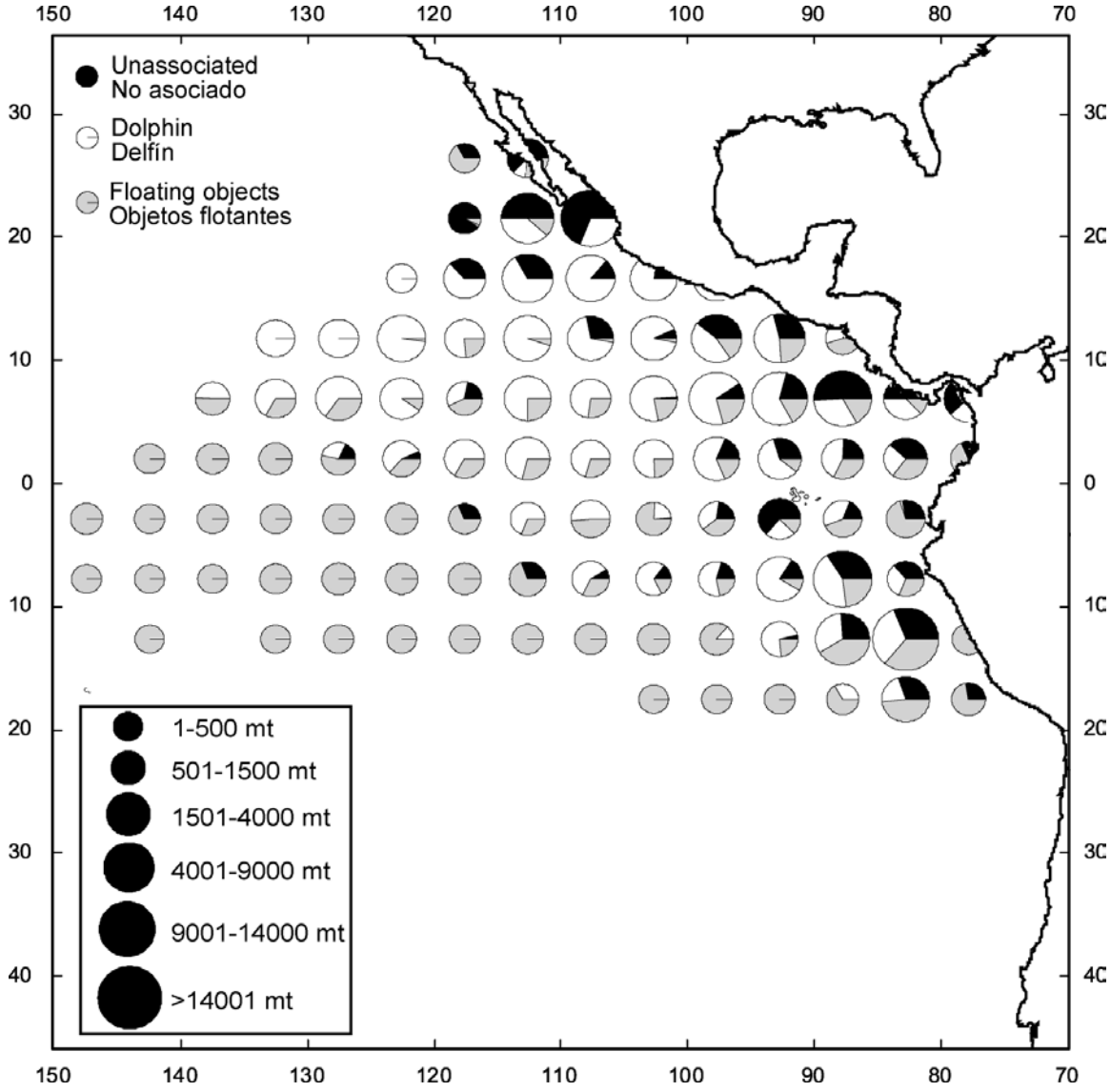

FIGURE 1b. Distribution of the logged retained catches of yellowfin, in metric tons, in the eastern Pacific Ocean during 2001.
FIGURA 1b. Distribución de las capturas retenidas registradas de aleta amarilla, en toneladas métricas, en el Océano Pacífico oriental durante 2001.

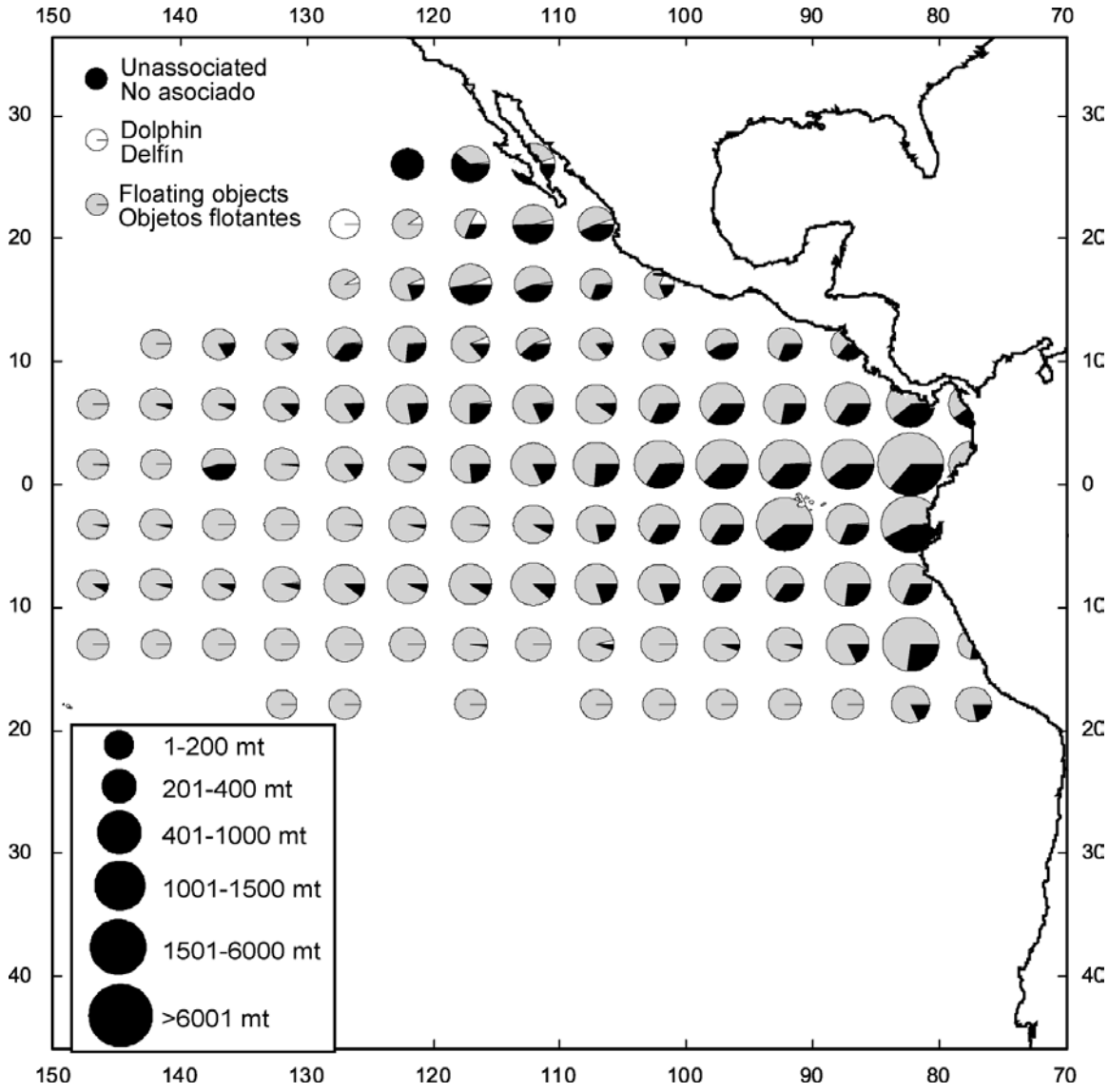

FIGURE 2a. Average annual distribution of the logged retained catches of skipjack, in metric tons, in the eastern Pacific Ocean during 1986-2000. The average catches and effort were calculated only for the 1-degree areas for which three or more years of data were available.
FIGURA 2a. Distribución anual promedia de las capturas retenidas registradas de barrilete, en toneladas métricas, en el Océano Pacífico oriental durante 1986-2000. Se calcularon promedios de captura ye esfuerzo solamente para las áreas de 1° para las cuales se disponía de tres años o más de datos.

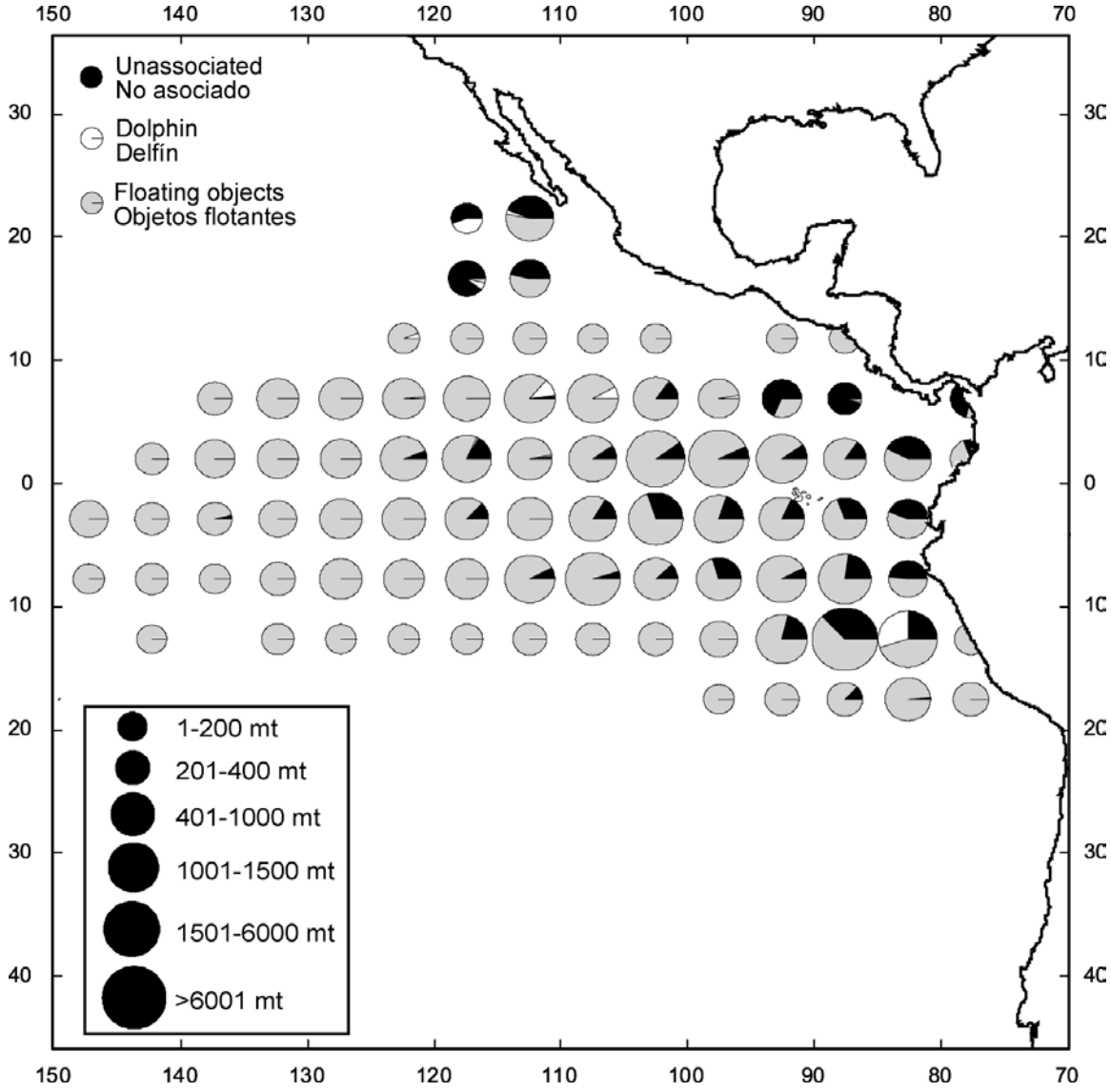

FIGURE 2b. Distribution of the logged retained catches of skipjack, in metric tons, in the eastern Pacific Ocean during 2001.
FIGURA 2b. Distribución de las capturas retenidas registradas de barrilete, en toneladas métricas, en el Océano Pacífico oriental durante 2001.

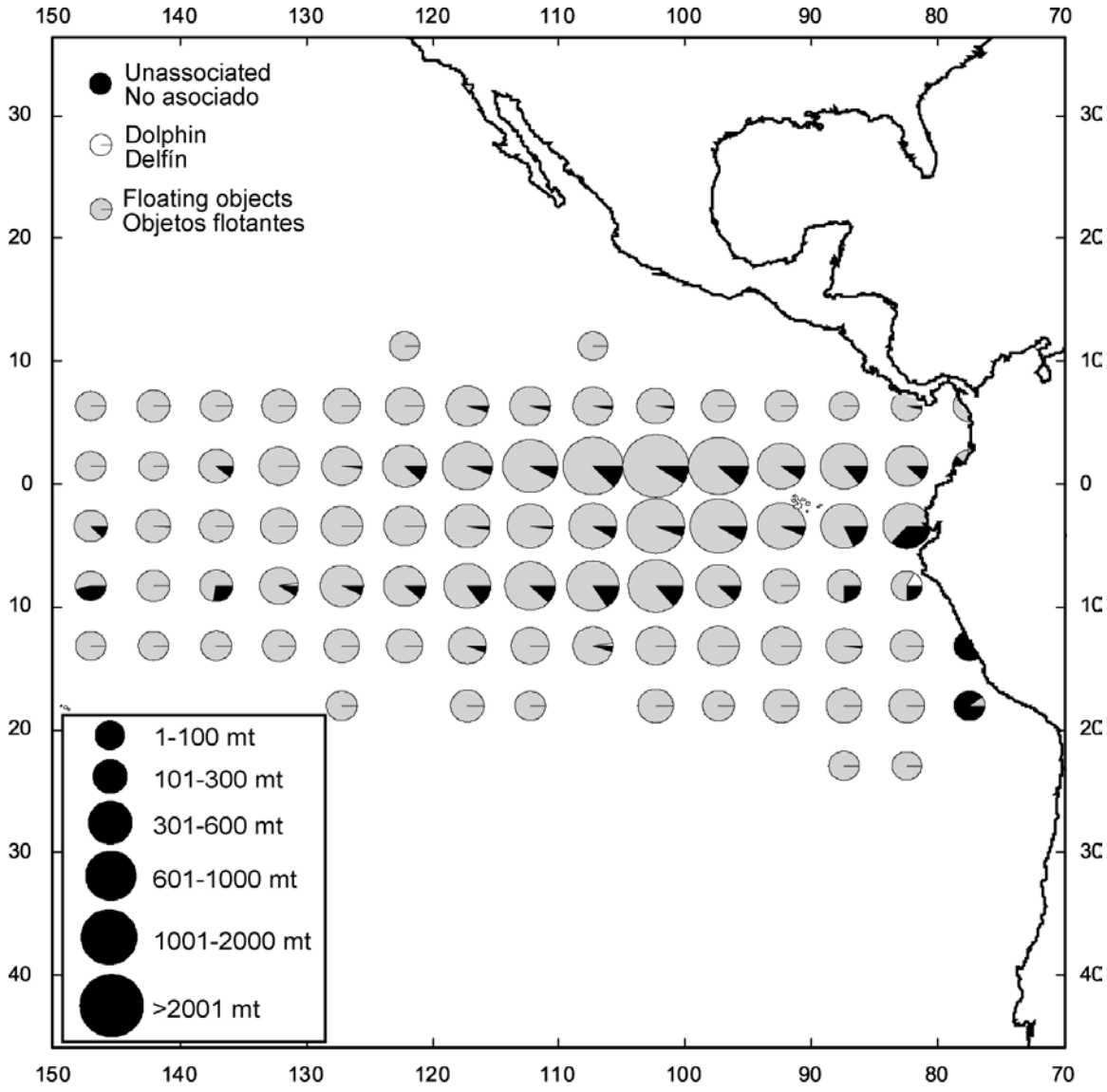

FIGURE 3a. Average annual distribution of the logged retained catches of bigeye, in metric tons, in the eastern Pacific Ocean during 1994-2000. The average catches and effort were calculated only for the 1-degree areas for which two or more years of data were available.
FIGURA 3a. Distribución anual promedia de las capturas retenidas registradas de patudo, en toneladas métricas, en el Océano Pacífico oriental durante 1994-2000. Se calcularon promedios de captura ye esfuerzo solamente para las áreas de 1° para las cuales se disponía de dos años o más de datos.

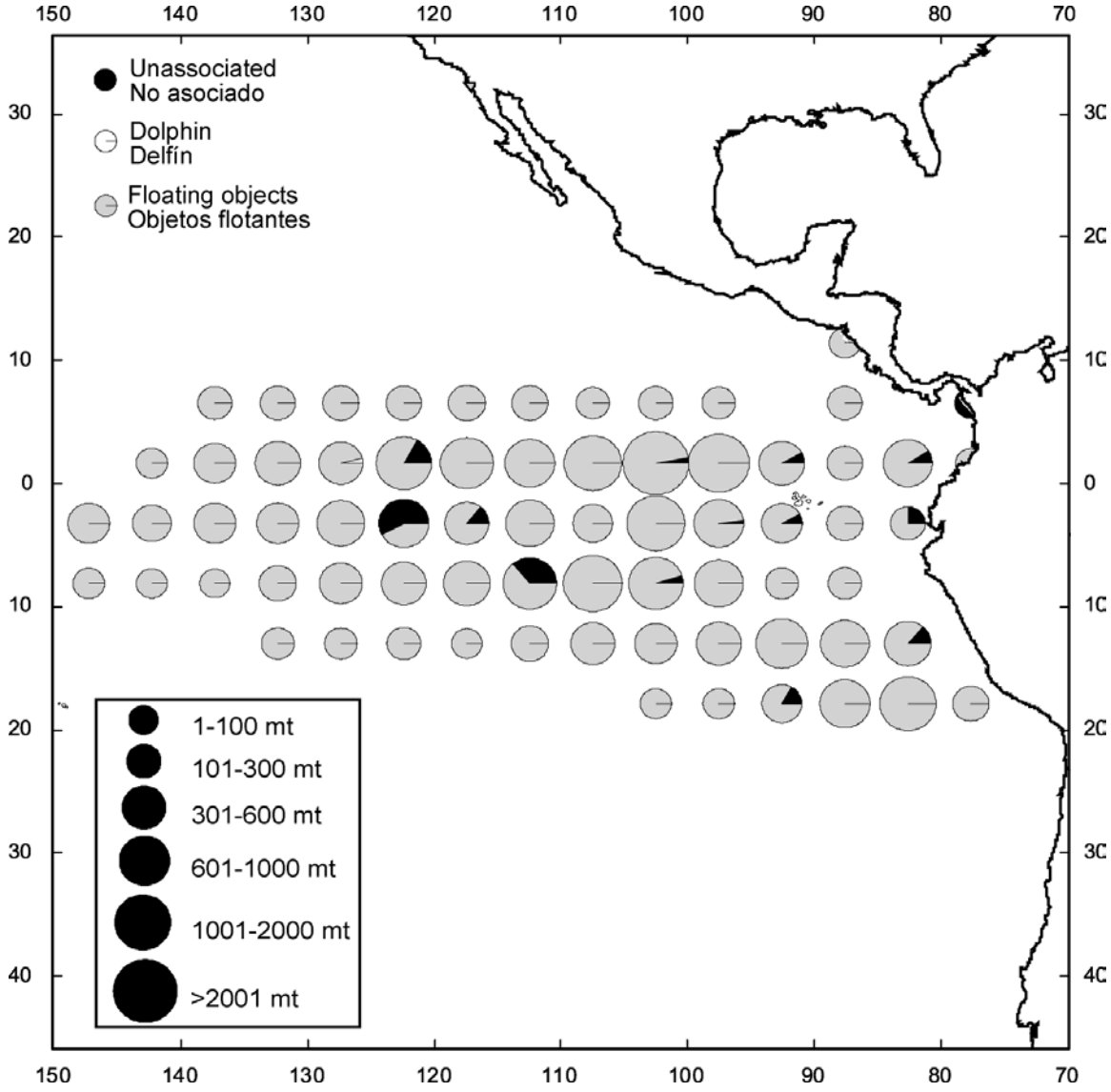

FIGURE 3b. Distribution of the logged retained catches of bigeye, in metric tons, in the eastern Pacific Ocean during 2001.
FIGURA 3b. Distribución de las capturas retenidas registradas de patudo, en toneladas métricas, en el Océano Pacífico oriental durante 2001.

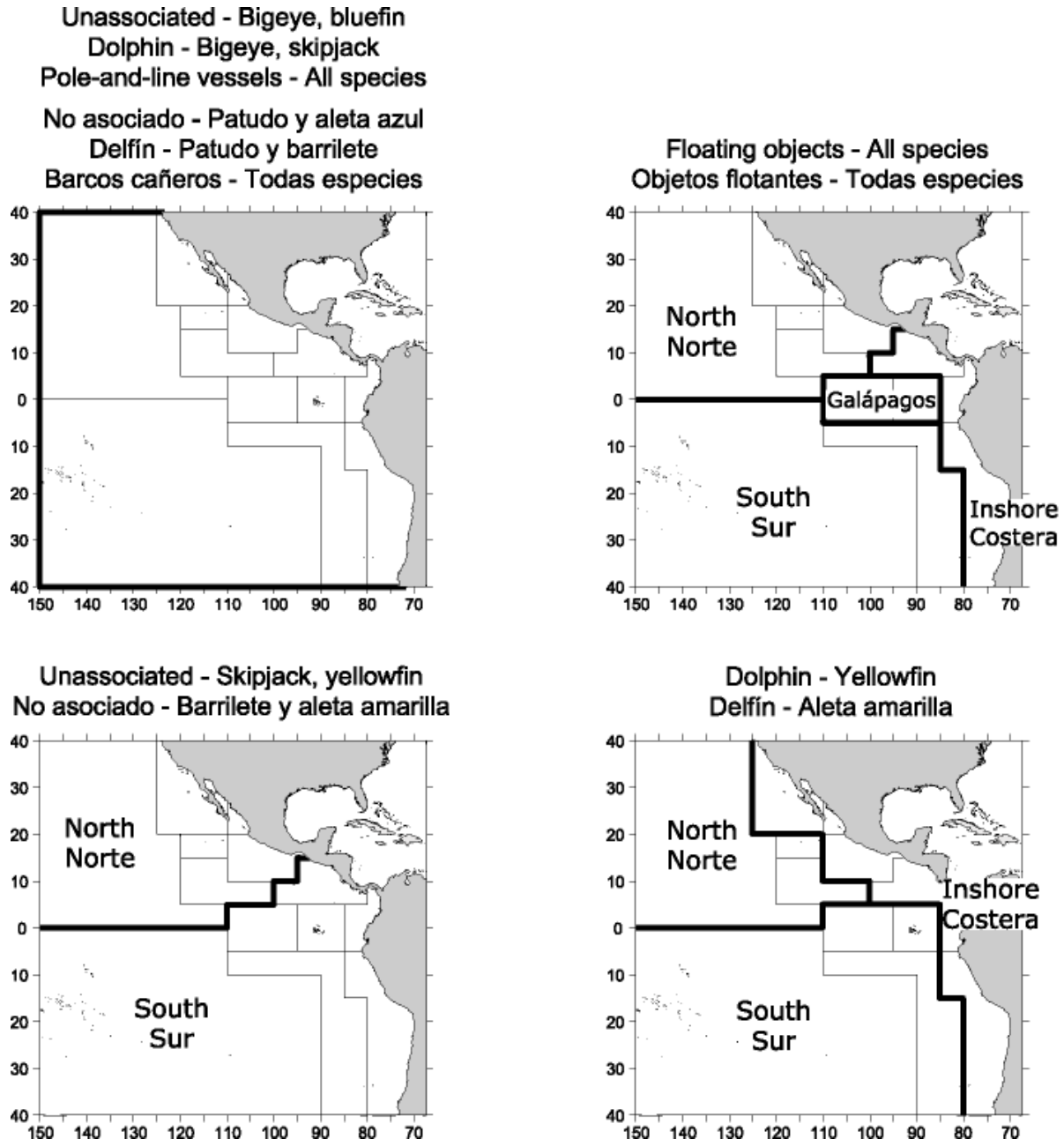

FIGURE 4. Spatial extents of the fisheries defined by the IATTC staff for stock assessment of yellowfin, skipjack, and bigeye in the EPO. The thin lines indicate the boundaries of the 13 length-frequency sampling areas, and the bold lines the boundaries of the fisheries.
FIGURA 4. Extensión especial 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.

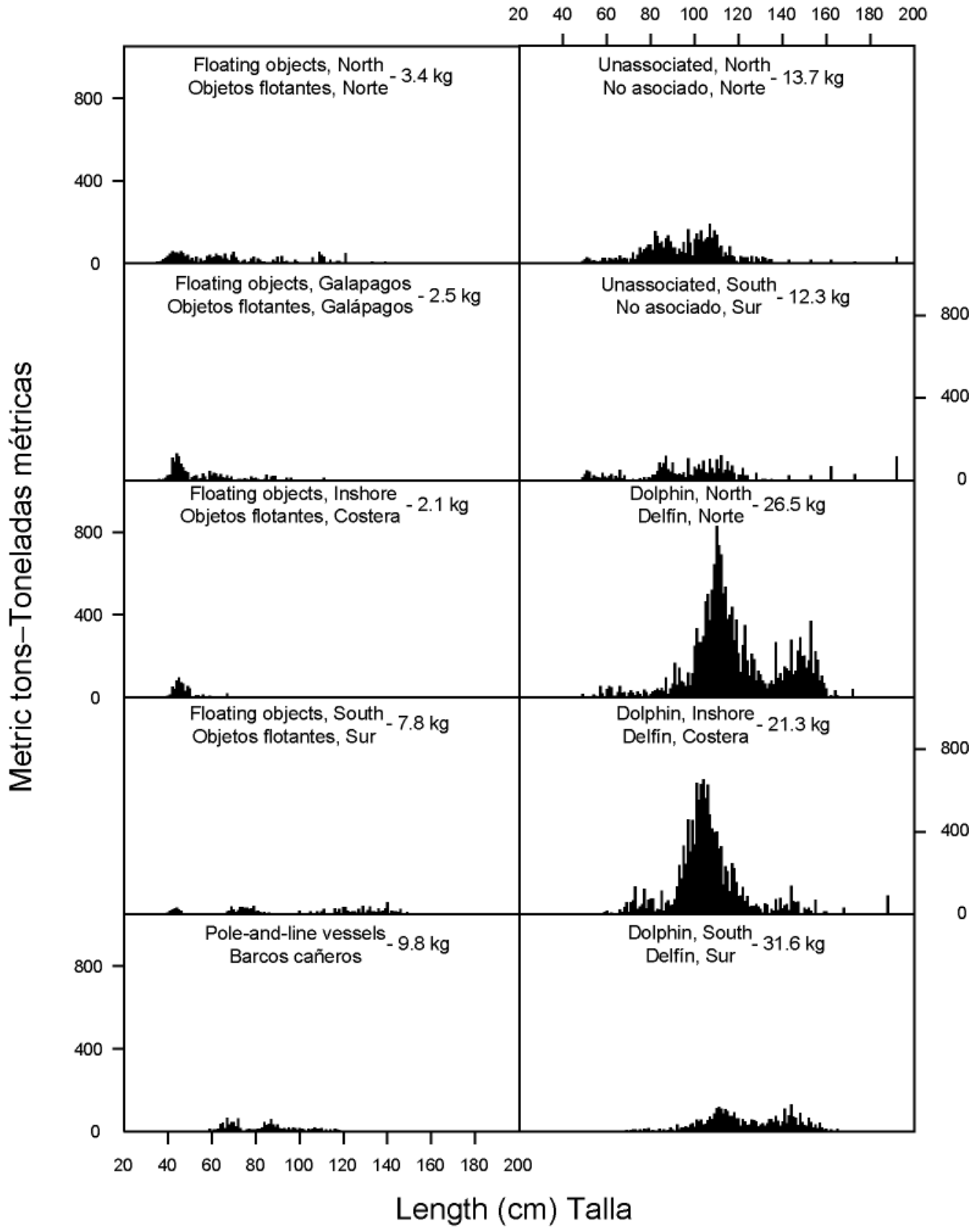

FIGURE 5a. Estimated size compositions of the yellowfin caught in each fishery of the EPO during the fourth quarter of 2001. The average weights of the fish in the samples are given at the tops of the panels.

FIGURA 5a. Composición por tallas estimada para el aleta amarilla capturado en cada pesquería del OPO durante el cuarto trimestre de 2001. En cada recuadro se detalla el peso promedio de los peces en las muestras.

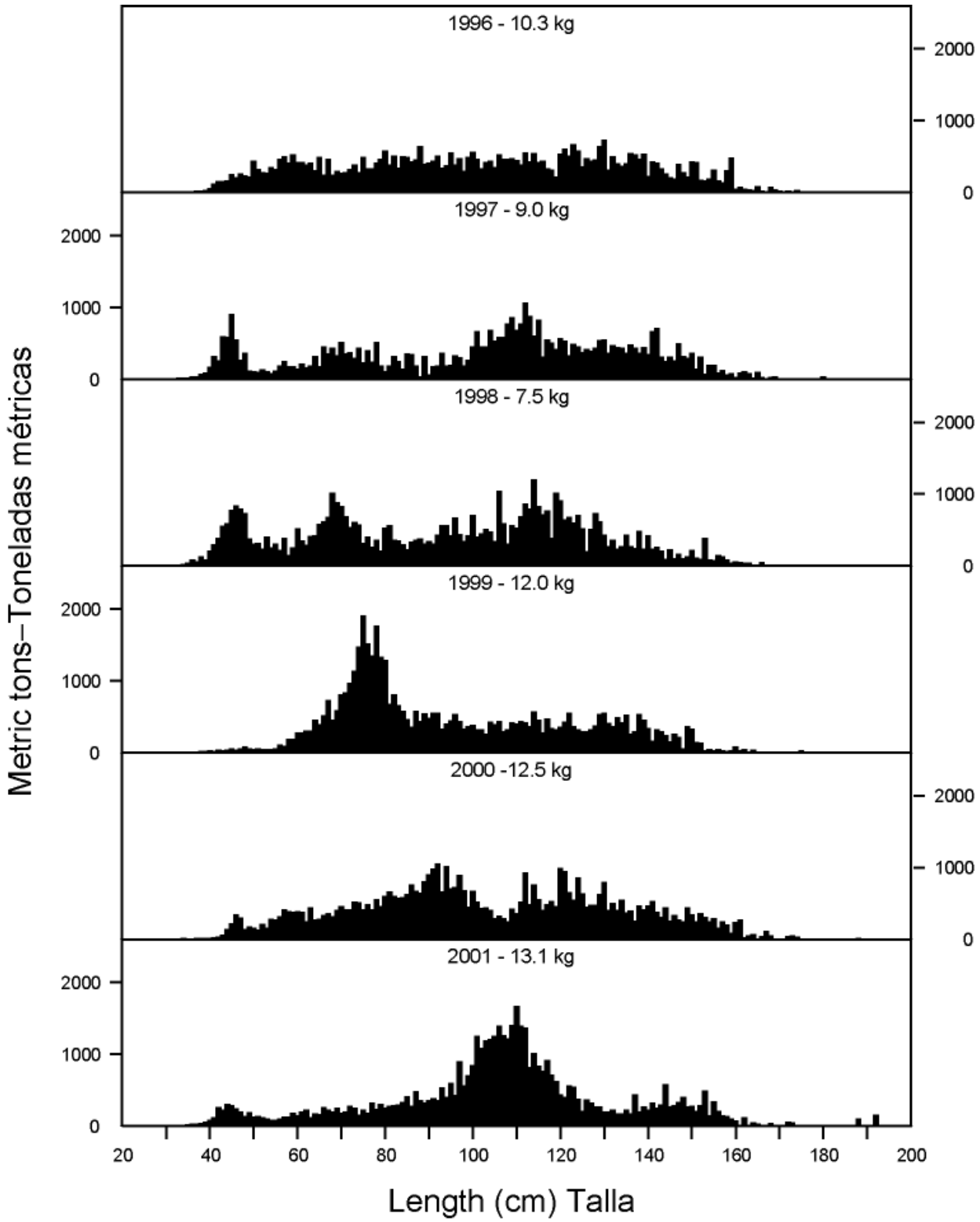

FIGURE 5b. Estimated size compositions of the yellowfin caught in the EPO during the fourth quarter of 1996-2001. The average weights of the fish in the samples are given at the tops of the panels.

FIGURA 5b. Composición por tallas estimada para el aleta amarilla capturado en el OPO en el cuarto trimestre de 1996-2001. En cada recuadro se detalla el peso promedio de los peces en las muestras.

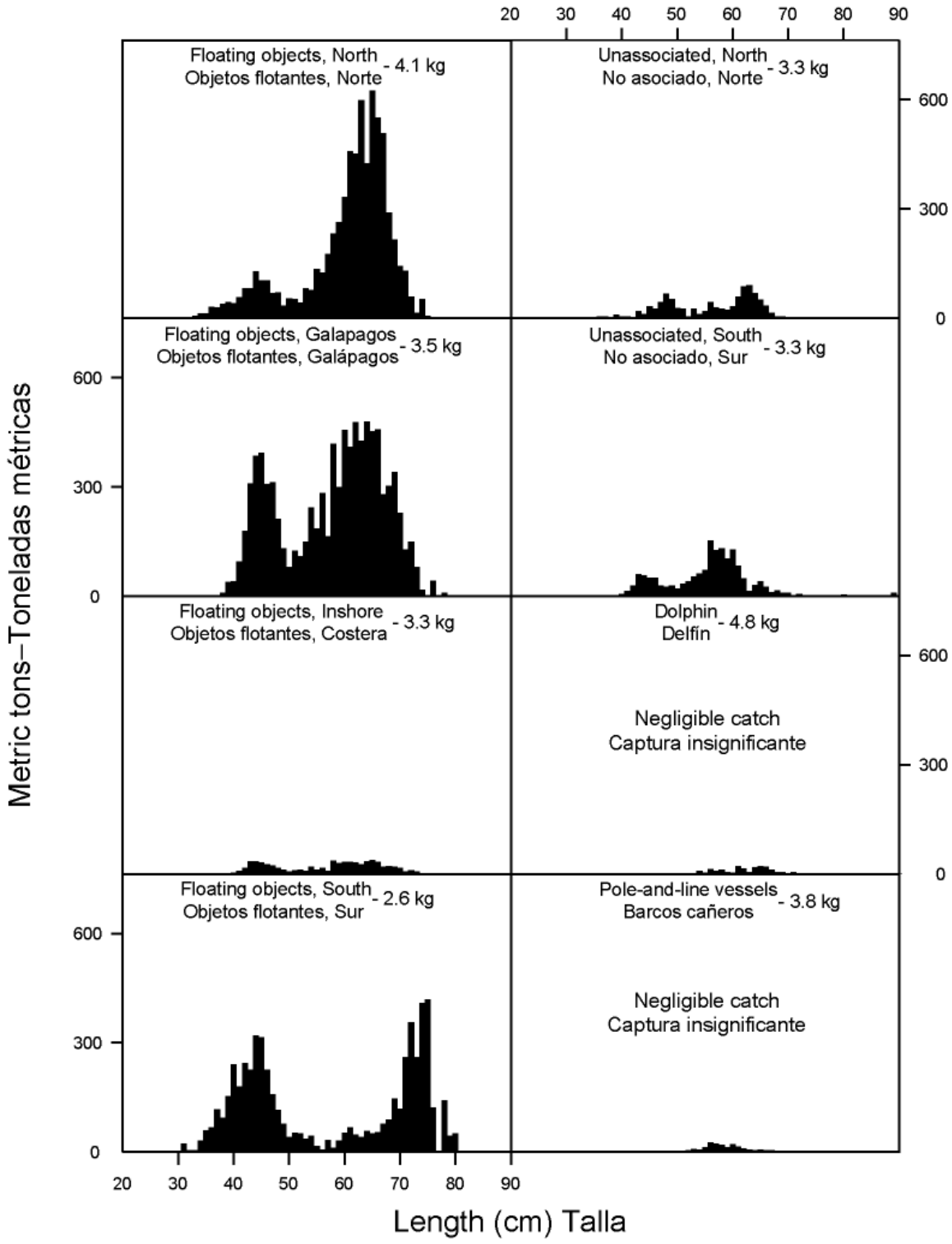

FIGURE 6a. Estimated size compositions of the skipjack caught in each fishery of the EPO during the fourth quarter of 2001. The average weights of the fish in the samples are given at the tops of the panels.

FIGURA 6a. Composición por tallas estimada para el barrilete capturado en cada pesquería del OPO durante el cuarto trimestre de 2001. En cada recuadro se detalla el peso promedio de los peces en las muestras.

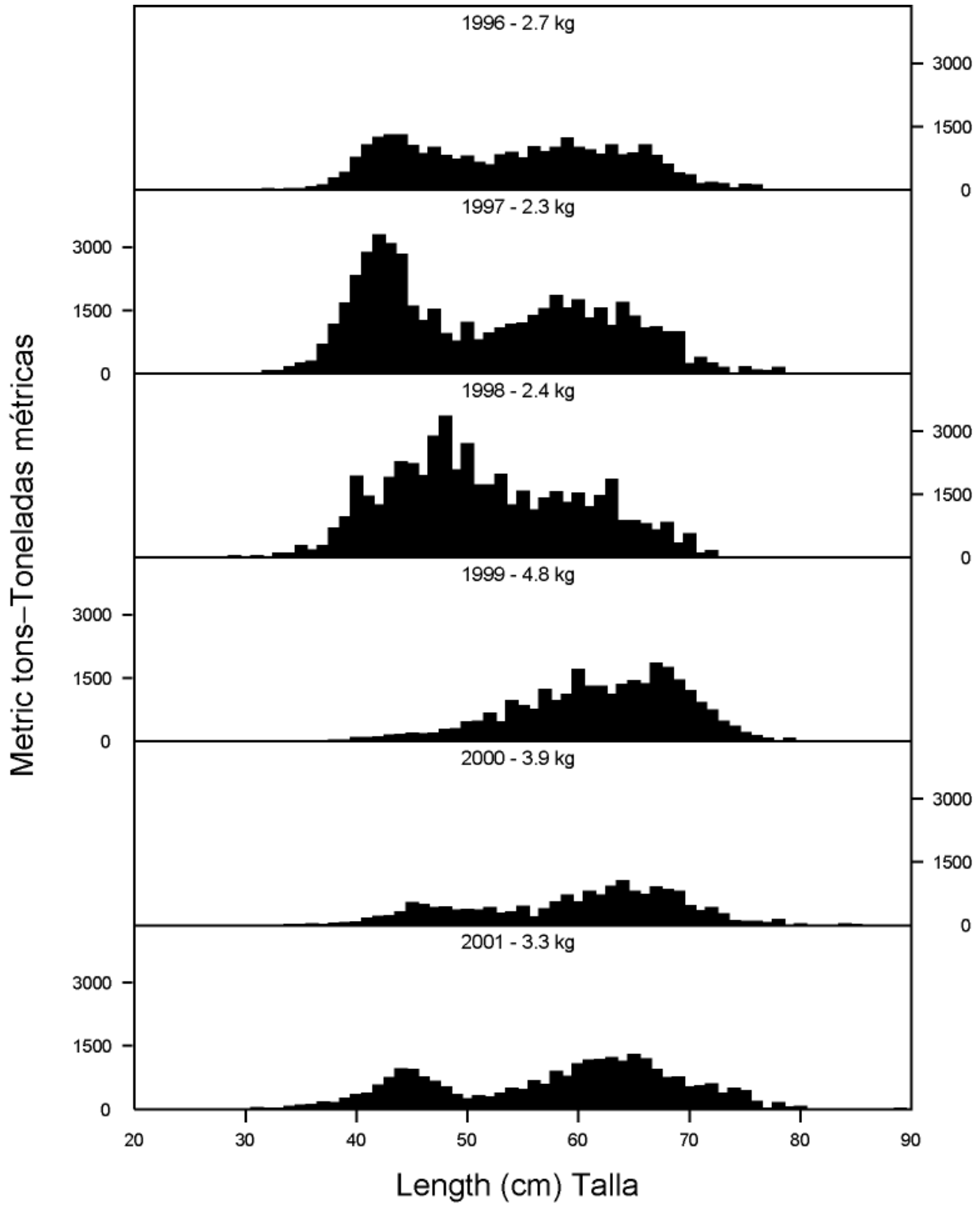

FIGURE 6b. Estimated size compositions of the skipjack caught in the EPO during the fourth quarter of 1996-2001. The average weights of the fish in the samples are given at the tops of the panels.

FIGURA 6b. Composición por tallas estimada para el barrilete capturado en el OPO en el cuarto trimestre de 1996-2001. En cada recuadro se detalla el peso promedio de los peces en las muestras.

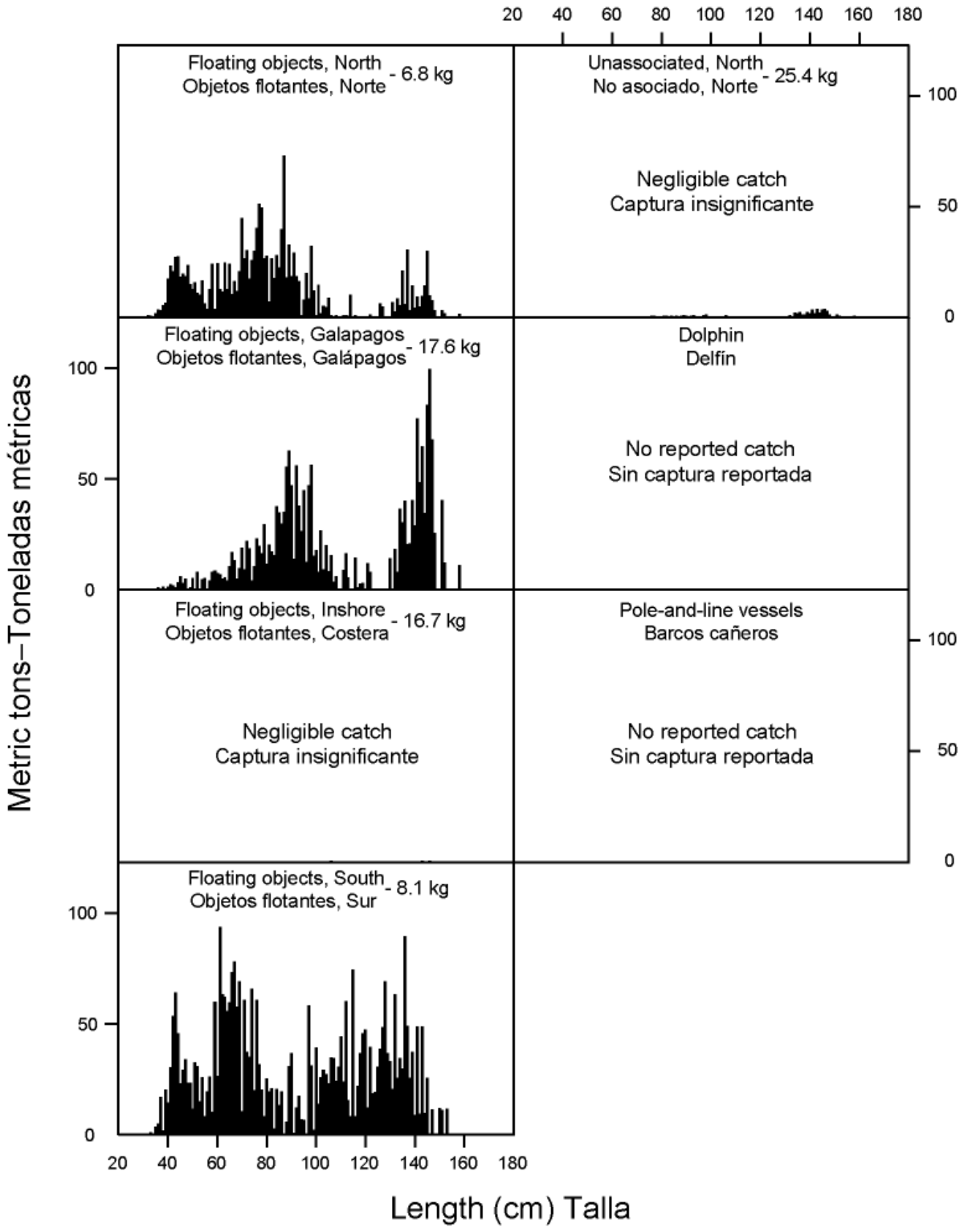

FIGURE 7a. Estimated size compositions of the bigeye caught in each fishery of the EPO during the fourth quarter of 2001. The average weights of the fish in the samples are given at the tops of the panels.

FIGURA 7a. Composición por tallas estimada para el patudo capturado en cada pesquería del OPO durante el cuarto trimestre de 2001. En cada recuadro se detalla el peso promedio de los peces en las muestras.

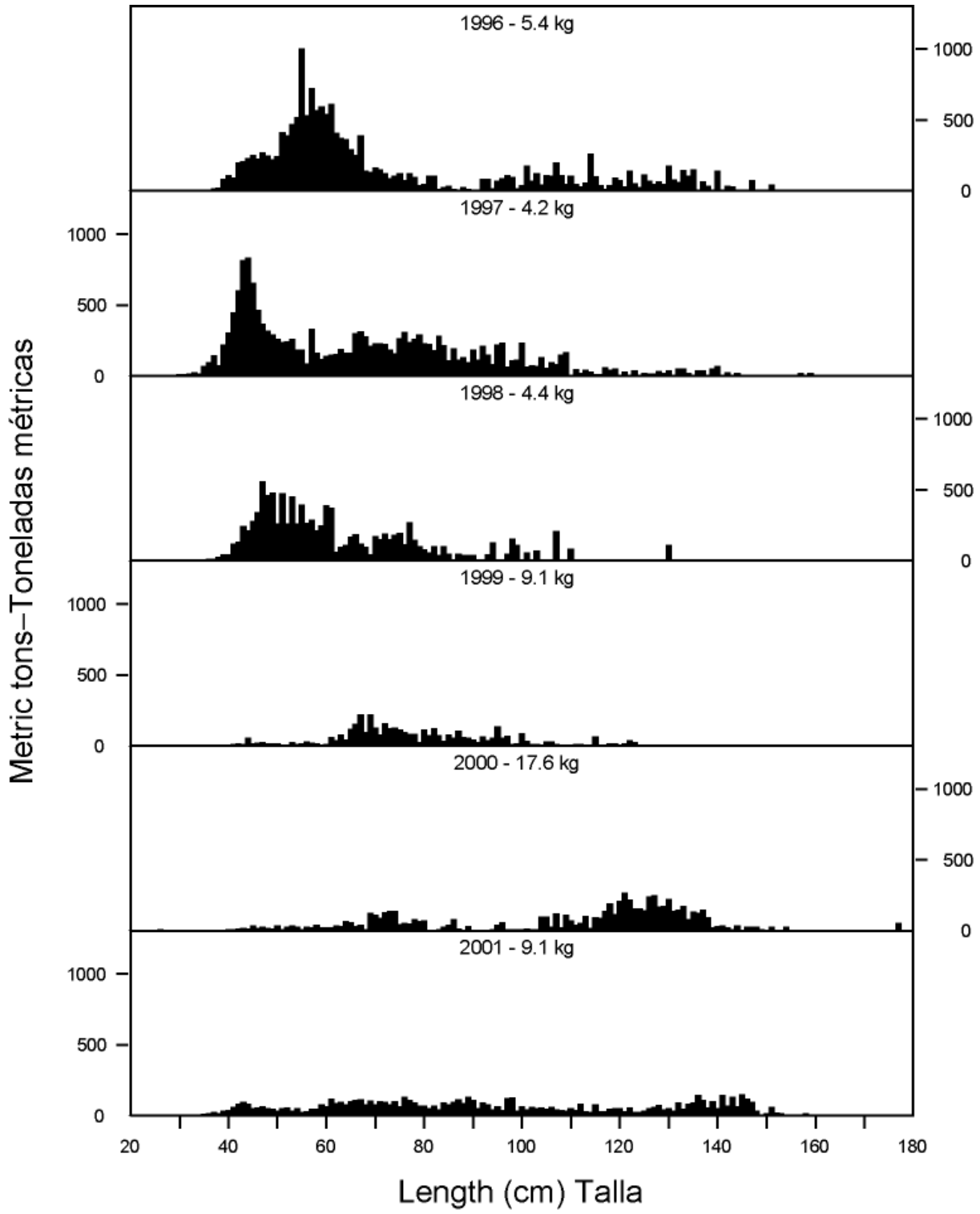

FIGURE 7b. Estimated size compositions of the bigeye caught in the EPO during the fourth quarter of 1996-2001. The average weights of the fish in the samples are given at the tops of the panels.

FIGURA 7b. Composición por tallas estimada para el patudo capturado en el OPO en el cuarto trimestre de 1996-2001. En cada recuadro se detalla el peso promedio de los peces en las muestras.

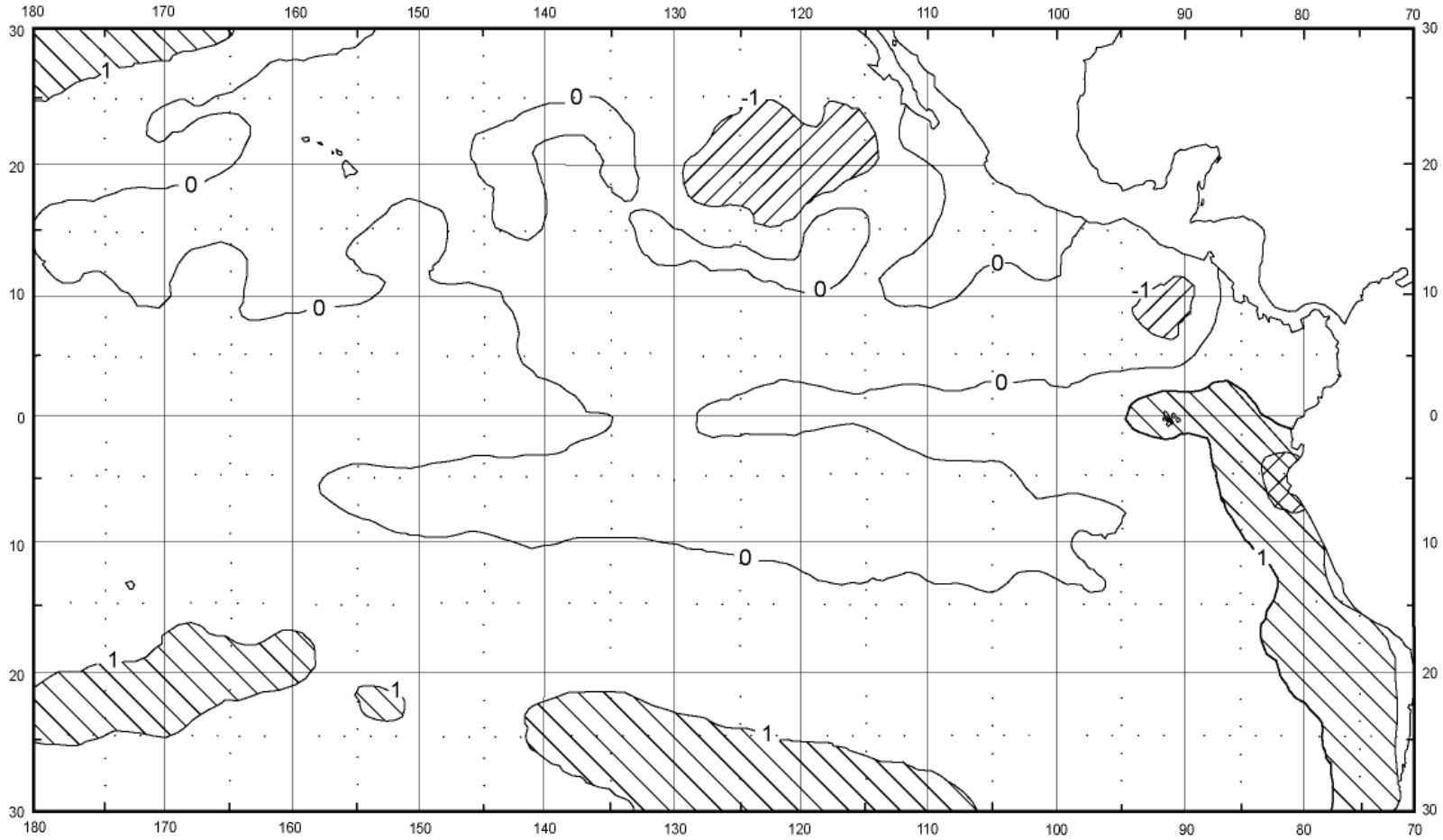

FIGURE 8. Sea-surface temperature (SST) anomalies (departures from long-term normals) for March 2002, based on data from fishing boats and other types of commercial vessels. The SSTs in the small crosshatched area off northern South America were more than 2°C above normal.

FIGURA 8. Anomalías (variaciones de los niveles normales a largo plazo) de la temperatura superficial del mar (TSM) en marzo de 2002, basadas en datos tomados por barcos pesqueros y otros buques comerciales. Las TSM en la pequeña zona con sombreado doble frente al norte de América del Sur fueron más de 2°C superiores al nivel normal.

TABLE 1. Preliminary estimates of the numbers and carrying capacities, in cubic meters, of purse seiners and baitboats operating in the EPO in 2002 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; PL = pole-and-line vessel.

TABLA 1. Estimaciones preliminares del número de buques que pescaron en el OPO en 2002 (sin incluir palangreros y buques 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; PL = barco cañero.

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	809
Bolivia	PS	-	-	-	-	-	5	5	5,830
Colombia	PS	-	-	2	1	2	5	10	7,397
Ecuador	PS	-	5	12	10	7	37	71	46,564
	PL	1	-	-	-	-	-	1	32
España—Spain	PS	-	-	-	-	-	5	5	12,137
Guatemala	PS	-	-	-	-	-	4	4	7,640
Honduras	PS	-	-	-	-	-	2	2	1,798
México	PS	-	-	4	4	10	38	56	48,865
	PL	1	3	6	-	-	-	10	1,259
Nicaragua	PS	-	-	-	-	-	1	1	1,229
Panamá	PS	-	-	2	2	-	6	10	9,517
El Salvador	PS	-	-	-	-	-	2	2	4,469
U.S.A.—EE.UU.	PS	-	-	1	-	2	5	8	7,362
Venezuela	PS	-	-	-	-	-	24	24	30,577
Vanuatu	PS	-	-	-	-	-	5	5	5,226
Unknown—Desconocida	PS	-	-	-	-	-	1	1	486
All flags—Todas banderas	PS	-	5	21	17	21	141	205	
	PL	2	3	6	-	-	-	11	
	PS + PL	2	8	27	17	21	141	216	
					Capacity—Capacidad				
All flags—Todas banderas	PS	-	453	3,801	4,931	9,576	171,145	189,906	
	PL	85	293	913	-	-	-	1,291	
	PS + PL	85	746	4,714	4,931	9,576	171,145	191,197	

TABLE 2. Changes in the list of vessels active in the surface fishery for tunas in the EPO recorded during the first quarter of 2002. PS = purse seine; PL = pole-and-line vessel; UNK = unknown.

TABLA 2. Cambios en la lista de buque actives en la pesquería atunera de superficie en el OPO registrados durante el primer trimestre de 2002. PS = cerquero; PL = buque cañero; UNK = desconocido.

Vessel name	Flag	Gear	Size class	Capacity (m^3)	Remarks	
Nombre del buque	**Bandera**	**Arte**	**Clase de arqueo**	**Capacidad (m^3)**	**Comentarios**	
Vessels added to the fleet—Buques añadidos a la flota						
New entries—Nuevos ingresos:						
Camila	México	PS	5	410		
Chiara	Vanuatu	PS	6	643		
Re-entries—Reingresos:						
Lupe Del Mar	México	PS	6	1,298		
Joiffer I	México	PS	6	810	Now—Ahora: *Tlaloc*	
Ribadesella	El Salvador	PS	6	503	Now—Ahora: *Carmen D*, Vanuatu	
Changes of name and/or flag—Cambios de nombre y/o pabellón						
					Now—Ahora	
Angel	Ecuador	PS	2	94	*Diana Maria*	-
Isabel Cinco	Ecuador	PS	6	1,265	*Elizabeth Cinco*	-
Don Italo	Honduras	PS	6	486	-	UNK
Don Tampirio	Honduras	PS	6	786	*Doña Luz*;	Ecuador
Macel II	México	PS	5	490	*Aurora*	-
Alexandros	El Salvador	PS	6	1,919	*Monterocío*	-
MariaJóse	UNK	PS	6	1,041	-	Ecuador
Vessels removed from the fleet—Buques retirados de la flota						
Sea Rover	Colombia	PS	3	138	Sank—Hundido	
Atun X	México	PS	6	778	Sank—Hundido	
Ofelia	México	PL	3	176	Sank—Hundido	
Diana Maria	Ecuador	PS	2	94		
Erasmo F	Ecuador	PS	6	701		
Gabriela A	Ecuador	PS	4	318		
Pacifico	Ecuador	PS	4	219		
Roberto A	Ecuador	PS	4	318		
Victor Andres	Ecuador	PS	2	115		
Akalan II	México	PS	6	1,311		
Atun I	México	PS	6	807		
Audaz	México	PL	2	90		
Chac Mool	México	PS	6	1,190		
Estado 29	México	PS	6	725		
Lupe Del Mar	México	PS	6	1,298		
Olivia	México	PS	3	145		
Pastora	México	PS	3	168		
Annie D	USA	PS	2	113		
Santa Maria	USA	PS	2	102		
Sea Scout	USA	PS	3	180		
St George II	USA	PS	2	107		

TABLE 3. Preliminary estimates of the retained catches of tunas in the EPO from January 1 through April 1, 2002, by species and vessel flag, in metric tons.

TABLA 3. Estimaciones preliminares de las capturas retenidas de atúnes capturadas en el OPO del 1 de enero al 1 de abril de 2002, por especie y bandera del buque, en toneladas métricas.

Flag	Yellowfin		Skipjack	Bigeye	Bluefin	Albacore	Bonito	Black skipjack	Other[1]	Total	Percentage of total
	CYRA	Outside									
Bandera	Aleta amarilla		Barrilete	Patudo	Aleta azul	Albacora	Bonito	Barrilete negro	Otras[1]	Total	Porcentaje del total
	ARCAA	Exterior									
Colombia	7,545	147	473	36	-	-	-	-	-	8,201	5.0
Ecuador	9,936	1,236	19,827	4,144	-	-	-	-	-	35,143	21.4
España—Spain	1,249	283	5,759	1,052	-	-	-	-	-	8,343	5.1
México	45,848	1	1,117	-	-	-	-	-	-	46,966	28.6
Panamá	3,794	45	2,454	386	-	-	-	-	-	6,679	4.1
Vanuatu	1,730	82	1,679	601	-	-	-	-	-	4,092	2.5
Venezuela	28,952	1,563	1,030	226	-	-	-	-	-	31,771	19.3
Other—Otros[2]	8,358	1,878	10,836	2,156	-	-	-	41	18	23,287	14.0
Total	107,412	5,235	43,175	8,601	-	-	-	41	18	164,482	

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

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

[2] Includes Belize, Bolivia, El Salvador, Guatemala, Honduras, Nicaragua, United States, and unknown: this category is used to avoid revealing the operations of individual vessels or companies.

[2] Incluye Belice, Bolivia, El Salvador, Guatemala, Honduras, Nicaragua, Estados Unidos, y desconocida; se usa esta categoría para no revelar información sobre faenas de buques o empresas individual.

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 2000 and 2001 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 2000 y 2001 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	Exterior	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	190,236	46,111	236,347		236,347	126,287		126,287	10,243		10,243	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	166,045	14,549	180,594		180,594	169,895		169,895	11,759		11,759	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	267,592	20,811	288,403		288,403	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	221,702	51,000	272,702	6,815	279,517	211,263	26,364	237,627	70,134	5,624	75,758	4,218	0	4,218
2001	344,060	50,448	394,508	7,918	402,426	144,305	13,518	157,823	43,614	1,262	44,876	1,232	3	1,235

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	394,478		394,478
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	377,195		377,195
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	388,608		388,608
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	293	1,885	2,178	388	1,496	1,884	559,754	42,184	601,938
2001	24	0	24	18	0	18	1,760	1,261	3,021	284	766	1,050	585,745	24,728	610,473

TABLE 5. Preliminary estimates of the retained catches and landings, in metric tons, of tunas caught by surface gear in the EPO in 2001, by species and vessel flag (upper panel) and location where processed (lower panel). YFT = yellowfin; SKJ = skipjack; BET = bigeye; PBF = Pacific 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 retenidas y descargas de atún capturado con artes de superficie en el OPO en 2001, 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; PBT = aleta azul del Pacífico; BEP = bonito; ALB = albacora; BKJ = barrilete negro; Misc. = otras especies, incluyendo tiburones, otros túnidos, y peces diversos

Flag	YFT		SKJ	BET	PBF	ALB	BEP	BSJ	Misc.	Total	% of total
Bandera	CYRA	Outside									% del total
Retained catches—Capturas retenidas											
Ecuador	48,851	4,062	70,678	19,980	-	-	-	1,608	269	145,448	24.8
España—Spain	6,282	3,991	20,974	7,199	-	-	-	-	-	38,446	6.6
México	112,139	22,654	8,078	91	786	22	18	-	-	143,788	24.5
Panamá	11,890	1,238	6,586	1,842	-	-	-	-	3	21,559	3.7
U.S.A.—EE.UU.	4,060	1,383	4,137	2,194	446	2	-	73	-	12,295	2.1
Venezuela	100,001	9,708	2,171	53	-	-	-	-	-	111,933	19.1
Vanuatu	9,647	1,029	8,025	3,954	-	-	-	-	-	22,655	3.9
Other—Otros[1]	51,190	6,383	23,656	8,301	-	-	-	79	12	89,621	15.3
Total	344,060	50,448	144,305	43,614	1,232	24	18	1,760	284	585,745	
Landings—Descargas											
Colombia	29,030	2,300	6,472	2,017	-	-	-	-	-	39,819	6.7
Costa Rica	25,298	541	2,037	548	-	-	-	-	-	28,424	4.8
Ecuador	89,617	10,260	98,011	31,545	-	-	-	1,687	284	231,404	39.2
España—Spain	5,628	2,133	5,351	2,378	-	-	-	-	-	15,490	2.6
México	108,183	22,267	8,109	90	785	21	17	-	-	139,472	23.6
U.S.A.—EE.UU.	397	364	1,236	464	446	2	-	72	-	2,981	0.5
Venezuela	25,064	2,223	702	-	-	-	-	-	-	27,989	4.7
Other-Otros[2]	63,497	11,157	23,349	7,188	-	-	-	-	-	105,191	17.8
Total	346,714	51,245	145,267	44,230	1,231	23	17	1,759	284	590,770	

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

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

[2] Includes Peru and unidentified. This category is used to avoid revealing the operations of individual vessels or companies.

[2] Incluye Perú y no identificados. 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 2002. 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 2002. 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	(1)	1	(1)			1	(1)	100.0	(100.0)
Bolivia	13	(13)	13	(13)			13	(13)	100.0	(100.0)
Colombia	11	(11)	11	(11)			11	(11)	100.0	(100.0)
Ecuador	83	(83)	56	(56)	27	(27)	83	(83)	100.0	(100.0)
España—Spain	12	(12)	12	(12)			12	(12)	100.0	(100.0)
Guatemala	9	(9)	9	(9)			9	(9)	100.0	(100.0)
Honduras	4	(4)	4	(4)			4	(4)	100.0	(100.0)
México	58	(58)	28	(28)	30	(30)	58	(58)	100.0	(100.0)
Nicaragua	2	(2)	2	(2)			2	(2)	100.0	(100.0)
Panamá	9	(9)	9	(9)			9	(9)	100.0	(100.0)
Perú	1	(1)	(1)	(1)			(1)	(1)	100.0	(100.0)
El Salvador	4	(4)	4	(4)			4	(4)	100.0	(100.0)
U.S.A.—EE.UU.	5	(5)	5	(5)			5	(5)	100.0	(100.0)
Venezuela	54	(54)	30	(30)	24	(24)	54	(54)	100.0	(100.0)
Vanuatu[1]	9	(9)	8	(8)			8	(8)	88.9	(88.9)
Unknown—Desconocido	2	(2)	0	(0)			0	(0)	0	(0.0)
Total	277	(277)[2]	193	(193)	81	(81)	274	(274)[2]	98.9	(98.9)

[1] The government of Vanuatu has determined that one of its vessels is not required to participate in the IDCP.
[1] El gobierno de Vanuatu determinó que uno de sus buques no necesita participar en el PICD.
[2] Includes 68 trips that began in late 2001 and ended in 2002
[2] Incluye 68 viajes iniciados a fines de 2001 y completados en 2002

TABLE 7. Oceanographic and meteorological data for the Pacific Ocean, October 2001-March 2002. The values in parentheses are anomalies.

TABLA 7. Datos oceanográficos y meteorológicos del Océano Pacífico, octubre 2001-marzo 2002. Los valores en paréntesis son anomalías.

Month—Mes	**10**	**11**	**12**	**1**	**2**	**3**
SST—TSM, 0°-10°S, 80°-90°W (°C)	19.5 (-1.4)	20.5 (-1.2)	22.0 (-0.9)	23.6 (-0.9)	26.1 (0.0)	27.5 (1.1)
SST—TSM, 5°N-5°S, 90°-150°W (°C)	24.5 (-0.5)	24.4 (-0.6)	24.6 (-0.5)	25.1 (-0.5)	26.2 (-0.2)	27.2 (0.1)
SST—TSM, 5°N-5°S, 120°-170°W (°C)	26.6 (0.0)	26.5 (-0.1)	26.2 (-0.3)	26.5 (0.0)	27.0 (0.3)	27.3 (0.2)
SST—TSM, 5°N-5°S, 150W°-160°E (°C)	29.0 (0.6)	29.0 (0.6)	28.6 (0.3)	28.8 (0.7)	28.8 (0.8)	28.7 (0.6)
Thermocline depth—Profundidad de la termoclina, 0°, 80°W (m)	40	40	40	40	30	60
Thermocline depth—Profundidad de la termoclina, 0°, 110°W (m)	60	70	70	60	110	80
Thermocline depth—Profundidad de la termoclina, 0°, 150°W (m)	140	160	160	180	170	130
Thermocline depth—Profundidad de la termoclina, 0°, 180°W (m)	180	170	180	170	170	170
Sea level—Nivel del mar, Baltra, Ecuador (cm)	174.9	174.5	178.7	173.7	--	--
	(–2.3)	(-4.4)	(-1.1)	(-7.0)	--	--
Sea level—Nivel del mar, La Libertad, Ecuador (cm)	232.1	229.8	--	222.4	237.1	233.7
	(2.6)	(0.2)	--	(-8.2)	(5.4)	(3.1)
Sea level—Nivel del mar, Callao, Perú (cm)	109.8	98.6	103.4	94.6	106.0	112.8
	(4.2)	(-8.3)	(-5.2)	(-16.9)	(-8.1)	(-1.9)
SOI—IOS	-0.4	0.7	-1.2	0.4	0.9	-0.9
SOI*—IOS*	-2.28	3.16	0.79	1.53	-0.12	-2.37
NOI*—ION*	0.73	-2.98	-0.80	2.85	2.94	1.66