INTER-AMERICAN TROPICAL TUNA COMMMISSION
COMISIÓN INTERAMERICANA DEL ATÚN TROPICAL

QUARTERLY REPORT—INFORME TRIMESTRAL

October-December 2007—Octubre-Diciembre 2007

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The

QUARTERLY REPORT

October-December 2007

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

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de la

COMISIÓN INTERAMERICANA DEL ATÚN 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

INTRODUCTION

The Inter-American Tropical Tuna Commission (IATTC) operates under the authority and direction of a convention originally entered into by Costa Rica and the United States. The convention, which came into force in 1950, is open to adherence by other governments whose nationals fish for tropical tunas and tuna-like species in the eastern Pacific Ocean (EPO). Under this provision Panama adhered in 1953, Ecuador in 1961, Mexico in 1964, Canada in 1968, Japan in 1970, France and Nicaragua in 1973, Vanuatu in 1990, Venezuela in 1992, El Salvador in 1997, Guatemala in 2000, Peru in 2002, Spain in 2003, the Republic of Korea in 2005, and Colombia in 2007. Canada withdrew from the IATTC in 1984.

The IATTC's responsibilities are met with two programs, the Tuna-Billfish Program and the Tuna-Dolphin Program.

The principal responsibilities of the Tuna-Billfish Program specified in the IATTC's convention were (1) to study the biology of the tunas and related species of the eastern Pacific Ocean to estimate the effects that fishing and natural factors have on their abundance and (2) to recommend appropriate conservation measures so that the stocks of fish could be maintained at levels that would afford maximum sustainable catches. It was subsequently given the responsibility for collecting information on compliance with Commission resolutions.

The IATTC's responsibilities were broadened in 1976 to address the problems arising from the incidental mortality in purse seines of dolphins that associate with yellowfin tuna in the EPO. The Commission agreed that it "should strive to maintain a high level of tuna production and also to maintain [dolphin] stocks at or above levels that assure their survival in perpetuity, with every reasonable effort being made to avoid needless or careless killing of [dolphins]" (IATTC, 33rd meeting, minutes: page 9). The principal responsibilities of the IATTC's Tuna-Dolphin Program are (1) to monitor the abundance of dolphins and their mortality incidental to purse-seine fishing in the EPO, (2) to study the causes of mortality of dolphins during fishing operations and promote the use of fishing techniques and equipment that minimize these mortalities, (3) to study the effects of different modes of fishing on the various fish and other animals of the pelagic ecosystem, and (4) to provide a secretariat for the International Dolphin Conservation Program, described below.

On 17 June 1992, the Agreement for the Conservation of Dolphins ("the 1992 La Jolla Agreement"), which created the International Dolphin Conservation Program (IDCP), was adopted. The main objective of the Agreement was to reduce the mortality of dolphins in the purse-seine fishery without harming the tuna resources of the region and the fisheries that depend on them. This agreement introduced such novel and effective measures as Dolphin Mortality Limits (DMLs) for individual vessels and the International Review Panel to monitor the performance and compliance of the fishing fleet. On 21 May 1998, the Agreement on the International Dolphin Conservation Program (AIDCP), which built on and formalized the provisions of the 1992 La Jolla Agreement, was signed, and it entered into force on 15 February 1999. In 2007 the Parties to this agreement consisted of Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Peru, the United States, Vanuatu, and Venezuela, and Bolivia, Colombia, and the European Union were applying it provisionally. These were "committed to ensure the sustainability of tuna stocks in the eastern Pacific Ocean

and to progressively reduce the incidental mortalities of dolphins in the tuna fishery of the eastern Pacific Ocean to levels approaching zero; to avoid, reduce and minimize the incidental catch and the discard of juvenile tuna and the incidental catch of non-target species, taking into consideration the interrelationship among species in the ecosystem." This agreement established Stock Mortality Limits, which are similar to DMLs except that (1) they apply to all vessels combined, rather than to individual vessels, and (2) they apply to individual stocks of dolphins, rather than to all stocks of dolphins combined. The IATTC provides the Secretariat for the International Dolphin Conservation Program (IDCP) and its various working groups and panels and coordinates the On-Board Observer Program and the Tuna Tracking and Verification System (both described later in this report).

At its 70th meeting, on 24-27 June 2003, the Commission adopted the Resolution on the Adoption of the Convention for the Strengthening of the Inter-American Tropical Tuna Commission Established by the 1949 Convention between the United States of America and the Republic of Costa Rica ("the Antigua Convention"). This convention will replace the original one 15 months after it has been ratified by seven signatories that were Parties to the 1949 Convention on the date that the Antigua Convention was open for signature. It has been ratified or acceded to by Mexico on 14 January 2005, El Salvador on 10 March 2005, the Republic of Korea on 13 December 2005, the European Union on 7 June 2006, Nicaragua on 13 December 2006, Belize on 12 June 2007, Panama on 10 July 2007, and France on 20 July 2007.

To carry out its responsibilities, the IATTC conducts a wide variety of investigations at sea, in ports where tunas are landed, and in its laboratories. The research is carried out by a permanent, internationally-recruited research and support staff appointed by the Director, who is directly responsible to the Commission.

The scientific program is now in its 57th year. The results of the IATTC staff's research are published in the IATTC's Bulletin and Stock Assessment Report series in English and Spanish, its two official languages, in its Special Report and Data Report series, and in books, outside scientific journals, and trade journals. Summaries of each year's activities are reported upon in the IATTC's Annual Reports and Fishery Status Reports, also in the two languages.

SPECIAL ANNOUNCEMENT

We are pleased to announce that Colombia deposited its instrument of accession to the 1949 Convention of the IATTC on 10 October 2007, bringing the number of member countries to 16.

MEETINGS

IATTC and IDCP meetings

The following IATTC meetings were held in La Jolla, California, USA, during October 2007:

Meeting	Number	Date
Permanent Working Group on Fleet Capacity	9	20 October
IATTC	76	22-24 October

The following IDCP meetings were held in La Jolla, California, USA, during October 2007:

Meeting	Number	Date
Permanent Working Group on Tuna Tracking	24	25 October
Working Group to Promote and Publicize the Dolphin Safe Tuna Certification System	10	25 October
International Review Panel	44	26 October
Parties [to the AIDCP]	18	26 October
IATTC and National Observer Programs	2	27 October

Other meetings

A tutorial on the application to tunas of the general stock assessment program, *Stock Synthesis II,* convened by Dr. Mark N. Maunder, was held in La Jolla on 15 October 2007. Scientists from the Alaska Department of Fish and Game, the Commonwealth Scientific and Industrial Organisation of Australia, the Instituto Nacional de Pesca of Mexico, the National Research Institute of Far Seas Fisheries of Japan, the Secretariat of the Pacific Community, the National Institute of Water and Atmospheric Research of New Zealand, the U.S. National Marine Fisheries Service (Hawaii, La Jolla, Pacific Grove, and Seattle), the University of British Columbia, and the Western and Central Pacific Fisheries Commission participated in the meeting.. In addition to Dr. Maunder, Drs. Richard B. Deriso and Michael G. Hinton and Mr. Alexandre Aires-da-Silva participated in all or parts of the meeting. Two talks were given by Dr. Maunder, one of which was based on work done jointly by himself and Mr. Aires-da-Silva.

A Workshop on Using Tagging Data for Fisheries Stock Assessment and Management, also convened by Dr. Maunder, was held in La Jolla on 16-19 October 2007. Scientists from the Alaska Department of Fish and Game, the Billfish Foundation, the Commonwealth Scientific and Industrial Organisation of Australia, the Indian Ocean Tuna Commission, the Institut de Recherche pour le Développement of France, the Instituto Español de Oceanografía, the Instituto Nacional de Pesca of Mexico, the National Research Institute of Far Seas Fisheries of Japan, the Secretariat of the Pacific Community, the National Institute of Water and Atmospheric Research of New Zealand, the U.S. National Marine Fisheries Service (Hawaii, La Jolla, Pacific Grove, and Seattle), the University of British Columbia, the University of Hawaii at Manoa, the University of Rhode Island, the University of Washington, and the Western and Central Pacific Fisheries Commission participated in the meeting. In addition to Dr. Maunder, Drs. Guillermo A. Compeán, Richard B. Deriso, Martín A. Hall, William H. Bayliff, and Michael G. Hinton and Messrs. Alexandre Aires-da-Silva, Daniel W. Fuller, and Kurt M. Schaefer of the IATTC staff also participated in all or parts of the meeting. Talks were given by Dr. Maunder and Messrs. Aires-da-Silva and Schaefer, and work in which Dr. Hinton and Mr. Fuller had participated was presented by other scientists.

Mr. Vernon P. Scholey participated in the "Seminario sobre Armonización de Metodologías de Investigación del Recurso Pesquero," held in Antigua, Guatemala, on 8-10 October 2007, where he gave a presentation on research activities at the Achotines Laboratory co-authored with Dr. Daniel Margulies and Mss. Jeanne B. Wexler, and Maria C. Santiago. Mr. Scholey's travel expenses were paid by the organizers of the seminar.

Mr. Kurt M. Schaefer participated at the "Second International Symposium on Tagging and Tracking Marine Fish with Electronic Devices," held in Donostia-San Sebastián, Spain, on 8-11 October 2007. He presented a paper, coauthored with Mr. Daniel W. Fuller (IATTC) and Dr. Barbara A. Block (Hopkins Marine Station, Stanford University), entitled "Vertical movements and habitat utilization of bigeye, yellowfin, and skipjack tunas in the equatorial eastern Pacific Ocean, ascertained through archival tag data." His travel expenses were shared by the IATTC and the Tagging of Pacific Pelagics Project, Census of Marine Life.

Dr. Richard B. Deriso spent the period of 29 October-2 November 2007 in Victoria, British Columbia, Canada, where he participated in part of the 16th Annual Meeting of the North Pacific Marine Science Organization

Dr. Mark N. Maunder participated in the Albatross Modeling Workshop at the University of Hawaii in Honolulu on 7-9 November 2007, where he gave or was involved in the following presentations:

Data, methods, and preliminary results from an integrated population dynamics model for black-footed albatross, by Simon D. Hoyle and Mark N. Maunder;

A general covariate based model for modeling the population dynamics of protected species: application to black footed albatross, by Mark N. Maunder, Carlos Alvarez-Flores, and Simon D. Hoyle;

Planning the next generation general population assessment model, by Mark N. Maunder and Simon D. Hoyle.

His travel expenses were paid by Montana State University.

Dr. Cleridy E. Lennert-Cody organized a "Statistical Workshop on Experimental Design and Analysis in Turtle Mitigation Studies," which took place in Alajuela, San Ramón, Costa Rica, on 7-8 November 2007. The participants were Drs. Martín A. Hall and Cleridy E. Lennert-Cody from the IATTC, plus Drs. Mary Christman, Daniel Hall, Paul Kinas, Bryan Manly, Marti McCracken, Mihoko Minami, Michelle Sims, and Steven Thompson. The costs of the workshop were paid by the IATTC and the Overseas Fishery Cooperation Foundation (OFCF) of Japan. This workshop was devoted to analysis of the experiments that are being carried out to test the feasibility of replacing J hooks with circle hooks to reduce the mortality of sea turtles in longline fisheries. However, the conclusions would be applicable to many other bycatch mitigation experiments.

Mr. Nickolas W. Vogel led a meeting of data base managers held in Puntarenas, Costa Rica, on 8 November 2007. The 15 participants included representatives from Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Japan, Mexico, Nicaragua, Panama, and Peru.

Drs. Martín A. Hall and Cleridy E. Lennert-Cody and Mr. Nickolas W. Vogel participated in the Second Technical Meeting of the Regional Sea Turtle Program of the Eastern Pacific in Puntarenas, Costa Rica, on 9-11 November 2007. The meeting was sponsored by the OFCF, the Western Pacific Regional Fishery Management Council (National Oceanic and Atmospheric Administration, USA), and the World Wildlife Fund. The 34 participants included

representatives from Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Japan, Mexico, Nicaragua, Panama, Peru, Spain, Switzerland, and the United States.

Drs. Guillermo A. Compeán, Martín A. Hall, and Cleridy E. Lennert-Cody and Mr. Nickolas W. Vogel participated in the fourth International Fishers Forum in Puntarenas, Costa Rica, on 12-15 November 2007. This meeting was organized by the Instituto Costarricense de Pesca y Acuicultura (INCOPESCA), the Western Pacific Regional Fishery Management Council, and the World Wildlife Fund. Several hundred people from many countries attended the meeting. Dr. Compeán gave a presentation entitled "The Role of the IATTC with Regard to Coastal Fisheries Resources," and Dr. Hall gave one entitled "The Development of the Regional Sea Turtle Program of the Eastern Pacific: Results of Mitigation Activities, Achievements, and Hurdles."

Dr. Michael D. Scott participated in the 17th Biennial Conference on the Biology of Marine Mammals, held in Cape Town, South Africa, on 29 November-3 December 2007. He presented two talks at the Conference: "Deciphering the Tuna-Dolphin Bond" (co-authored with Drs. Susan Chivers, Robert Olson, and Kim Holland) and "Long-Term Studies of Bottlenose Dolphins in Sarasota, Florida" (co-authored with Drs. Blair Irvine and Randy Wells).

Dr. Guillermo A. Compeán and Mr. Brian S. Hallman participated in the fourth meeting of the Western and Central Pacific Fisheries Commission (WCPFC), held in Guam on 3-7 December 2007.

The WCPFC did not agree to any additional conservation and management measures for yellowfin or bigeye tuna.

The WCPFC did not agree to grant Ecuador or El Salvador status as cooperating non-members, which was being sought by those governments. However, it did agree to grant cooperating non-member status to Belize.

The second Consultative Meeting between the IATTC and the WCPFC took place on 6 December 2007. The meeting explored areas of potential collaboration between the two commissions, and reviewed a draft Program of Work on collaboration between the two organizations that might subsequently be considered by the two commissions.

Drs. Daniel Margulies and Robert J. Olson and Ms. Leanne Duffy participated in First International CLIOTOP Symposium held in La Paz, Baja California Sur, Mexico, on 3-7 December 2007. CLIOTOP, Climate Impacts on Oceanic Top Predators, is a 10-year program implemented under the international research program GLOBEC (Global Ocean Ecosystem Dynamics, http://www.globec.org), a component of the International Geosphere-Biosphere Programme (IGBP).

Dr. Margulies presented a paper entitled "Studies of the early life history of tunas: experimental and field investigations," co-authored with Ms. Jeanne B. Wexler, Mr. Vernon P. Scholey, and Ms. Maria C. Santiago. Dr. Margulies also participated in the steering committee meeting of Working Group 1: Early Life History of Top Predators.

Dr. Olson was the convener of a session on Trophic Pathways in Open-Ocean Ecosystems, and presented a paper, co-authored with Dr. Cleridy E. Lennert-Cody, Ms. Leanne Duffy, and others, entitled "Stable isotope ecology of the pelagic food web in the eastern Pacific Ocean." Dr. Olson co-authored another paper presented by Ms. Brittany Graham, University of Hawaii, entitled "Applying stable isotope techniques to determine residency and net movements of tropical tunas in the equatorial Pacific Ocean," and he was a co-author of two poster presentations, "Feeding habits of yellowfin and skipjack tunas caught in the same sets in the tropical eastern Pacific Ocean," by Ms. Vanessa Alatorre-Ramírez (Centro Interdisciplinario de Ciencias Marinas; CICIMAR, La Paz) and "Trophic relationships among the predators associated with the tuna fishery in the eastern Pacific Ocean," by Ms. Noemi Bocanegra-Castillo (CICIMAR, La Paz). Dr. Olson and Dr. Jock Young of the Commonwealth Scientific and Industrial Research Organisation, Australia, are the co-chairs of CLIOTOP Working Group 3, and they led a planning meeting of participants and interested parties during an evening recess. Dr. Olson's travel expenses were shared by the IATTC and GLOBEC-CLIOTOP, and Ms. Duffy's travel expenses were paid by the Pelagic Fisheries Research Program, University of Hawaii.

Also, a poster, "Historical linkages between oceanographic satellite imagery and recruitment of tuna in the eastern tropical Pacific," by Dale A. Kiefer, Edward Armstrong, Michael Hinton, and Augustus Vogel, was presented at the meeting.

Mr. Alexandre Aries-Da-Silva participated in the Seventh Meeting of the Pacific Bluefin Tuna Working Group of the International Scientific Committee for Tuna and Tuna-Like Species in the North Pacific Ocean (ISC), in Shimizu, Japan, on 11-18 December 2007.

DATA COLLECTION

The IATTC had field offices at Las Playas and Manta, Ecuador; Manzanillo and Mazatlan, Mexico; Panama, Republic of Panama; Mayaguez, Puerto Rico, USA; and Cumaná, Venezuela, during the fourth quarter of 2007.

Personnel at these offices abstracted logbook information from 186 trips of commercial fishing vessels and collected 349 length-frequency samples from 183 wells during the fourth quarter of 2007.

Also during the fourth quarter members of the field office staffs placed IATTC observers on 79 fishing trips by vessels that participate in the AIDCP On-Board Observer Program. In addition, 115 IATTC observers completed trips during the quarter, and were debriefed by field office personnel.

Surface fleet and surface catch and catch-per-unit-of-effort 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 fished in the eastern Pacific Ocean (east of 150°W; EPO) during 2007 is about 226,900 cubic meters (m^3) (Table 1). The changes to the IATTC's fleet list during the fourth quarter of 2007 are given in Table 2. The weekly average at-sea capacity for the fleet, for the weekly periods ending 7 October through 31 December, was about 118,500 m^3 (range: 46,300 to 178,500 m^3). The EPO was closed to purse-seine fishing for tunas for two periods during 2007, which explains the low capacity-at-sea averages.

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

Catch statistics

The estimated total retained catches of tunas in the EPO during 1 January-31 December 2007, and the corresponding periods of 2002-2006, in metric tons (t), were:

Species	2007	2002-2006			Weekly average, 2007
		Average	Minimum	Maximum	
Yellowfin	181,600	307,600	178,400	413,900	3,500
Skipjack	194,600	230,000	154,300	284,800	3,700
Bigeye	50,200	46,900	34,400	59,900	1,000

Summaries of the preliminary estimated retained catches, by flag of vessel, are shown in Table 3.

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. The great majority of the purse-seine catches of yellowfin, skipjack, and bigeye are made by vessels with carrying capacities greater than 363 t, and only data for such purse seiners are included herein for comparisons among years. There are now far fewer pole-and-line vessels than in previous years, so the data for these vessels are combined without regard to carrying capacity. 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.

Preliminary estimates of the catches per unit of effort (CPUEs), expressed as catches per day's fishing by purse seiners, of yellowfin (Table 4), skipjack (Table 5), and bigeye (Table 6) in the EPO during the first three quarters of 2007 and the corresponding periods of 2002-2006, in metric tons, were:

Species	Region	2007	2002-2006		
			Average	Minimum	Maximum
Yellowfin	N of 5°N	8.5	15.1	8.4	24.3
	S of 5°N	2.6	4.5	2.0	6.2
Skipjack	N of 5°N	3.1	2.9	1.3	4.4
	S of 5°N	4.8	8.5	6.9	10.2
Bigeye	EPO	1.7	2.0	1.7	2.2

Preliminary estimates of the CPUEs, by pole-and-line vessels, of yellowfin (Table 4) and skipjack (Table 5) in the EPO during the first three quarters of 2007 and the corresponding periods of 2002-2006, in metric tons, were:

Species	Region	2007	2002-2006		
			Average	Minimum	Maximum
Yellowfin	EPO	2.4	2.1	0.8	3.6
Skipjack	EPO	0.6	1.6	0.6	2.6

Catch statistics for the longline fishery

Preliminary estimates of the catches of bigeye by longline gear in the EPO during 2007 are shown in Table 7. Equivalent data are not available for the other species of tunas, or for billfishes.

Size compositions of the surface catches of tunas

Length-frequency samples are the basic source of data used for estimating the size and age compositions of the various species of fish in the landings. This information is necessary to obtain age-structured estimates of the population for various purposes, including the integrated modeling that the staff has employed during the last several years. The results of such studies have been described in several IATTC Bulletins, in its Annual Reports for 1954-2002, in its Fishery Status Reports 1-4 (covering the years 2002-2005), and in its Stock Assessment Reports.

Length-frequency samples of yellowfin, skipjack, bigeye, Pacific bluefin, and, occasionally, black skipjack from the catches of purse-seine, pole-and-line, and recreational vessels in the EPO are collected by IATTC personnel at ports of landing in Ecuador, Mexico, Panama, the USA, and Venezuela. The catches of yellowfin and skipjack were first sampled in 1954, bluefin in 1973, and bigeye in 1975. Sampling has continued to the present.

The methods for sampling the catches of tunas are described in the IATTC Annual Report for 2000 and in IATTC Stock Assessment Report 4. Briefly, the fish in a well of a purse-seine 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 1).

Data for fish caught during the third quarter of each year of the 2002-2007 period are presented in this report. Two sets of length-frequency histograms are presented for each species; the first shows the data by strata (gear type, set type, and area) for the third quarter of 2007, and

the second shows data for the combined strata for the third quarter of each year of the 2002-2007 period. Samples from 154 wells were taken during the third quarter of 2007.

There are ten surface fisheries for yellowfin defined for stock assessments: four associated with floating objects, two unassociated school, three associated with dolphins, and one pole-and-line (Figure 1). The last fishery includes all 13 sampling areas. Of the 154 wells sampled that contained fish caught during the third quarter of 2007, 105 contained yellowfin. The estimated size compositions of these fish are shown in Figure 2a. The majority of the yellowfin catch during the third quarter was taken by sets on unassociated schools in the Northern area and on schools associated with dolphins in the Northern and Inshore areas. Small amounts of yellowfin were taken in floating-object sets in four areas and in dolphin sets in the Southern area.

The estimated size compositions of the yellowfin caught by all fisheries combined during the third quarter of 2002-2007 are shown in Figure 2b. The average weight of the yellowfin caught during the third quarter of 2007 was less than any of those of the previous five years.

There are eight fisheries for skipjack defined for stock assessments: four associated with floating objects, two unassociated school, one associated with dolphins, and one pole-and-line (Figure 1). The last two fisheries include all 13 sampling areas. Of the 154 wells sampled that contained fish caught during the third quarter of 2007, 104 contained skipjack. The estimated size compositions of these fish are shown in Figure 3a. Significant amounts of skipjack were caught in the Northern, Equatorial, and Southern floating-object fisheries. Also, a large amount of skipjack was caught in the Northern unassociated fishery and a significant amount in the Southern unassociated fishery. Small amounts of skipjack were taken in the Inshore floating-object fishery and in schools associated with dolphins.

The estimated size compositions of the skipjack caught by all fisheries combined during the third quarter of 2002-2007 are shown in Figure 3b. The average weight of the skipjack caught during the third quarter of 2007 was less than those of any of the previous five years.

There are seven surface fisheries for bigeye defined for stock assessments: four associated with floating objects, one unassociated school, one associated with dolphins, and one pole-and-line (Figure 1). The last three fisheries include all 13 sampling areas. Of the 154 wells sampled that contained fish caught during the third quarter of 2007, 48 contained bigeye. The estimated size compositions of these fish are shown in Figure 4a. The majority of the catch was taken in floating-object sets in the Northern and Southern areas, small amounts of bigeye were taken in the Inshore and Equatorial floating-object fisheries and in the unassociated fishery

The estimated size compositions of the bigeye caught by all fisheries combined during the third quarter of 2002-2007 are shown in Figure 4b. The average weight of bigeye caught during the third quarter of 2007 was equal to that of 2006, but less than those of the 2002-2005 period.

The estimated retained catch of bigeye less than 60 cm in length during the first three quarters of 2007 was 18,034 metric tons (t), or about 40 percent of the estimated total catch of

bigeye by purse seiners during those three quarters. The corresponding amounts for the first three quarters of 2002-2006 ranged from 12,332 to 29,595 t, or 28 to 49 percent.

Pacific bluefin are caught by purse-seine and recreational gear off California and Baja California from about 23°N to 35°N, with most of the catch being taken during May through October. During 2007 bluefin were caught between 26°N and 32°N from May through August. The majority of the catches of bluefin by both commercial and recreational vessels was taken during June and July. In the past commercial and recreational catches have been reported separately. The inability to collect sufficient numbers of samples during 2004, 2005, 2006, and 2007, however, has made it infeasible to estimate the catches and size compositions separately. Therefore, the commercial and recreational catches of bluefin were combined for each year of the 2002-2007 period. The estimated size compositions are shown in Figure 5.

Observer program

Coverage

The Agreement on the International Dolphin Conservation Program (AIDCP) requires 100-percent coverage by observers on trips by purse seiners with carrying capacities greater than 363 metric tons that fish for tunas in the eastern Pacific Ocean (EPO). This mandate is carried out by the AIDCP On-Board Observer Program, made up of the IATTC's international observer program and the observer programs of Colombia, Ecuador, the European Union, Mexico, Nicaragua, Panama, and Venezuela. The observers are biologists trained to collect a variety of data on the mortalities of dolphins associated with the fishery, sightings of dolphin herds, catches of tunas and bycatches of fish and other animals, oceanographic and meteorological data, and other information used by the IATTC staff to assess the conditions of the various stocks of dolphins, study the causes of dolphin mortality, and assess the effect of the fishery on tunas and other components of the ecosystem. The observers also collect data relevant to compliance with the provisions of the AIDCP, and data required for the tuna-tracking system established under the AIDCP, which tracks the "dolphin-safe" status of tuna caught in each set from the time it is captured until it is unloaded (and, after that, until it is canned and labeled).

In 2007 the observer programs of Colombia, the European Union, Mexico, Nicaragua, Panama, and Venezuela are to sample half, and that of Ecuador approximately one-third, of the trips by vessels of their respective fleets, while IATTC observers are to sample the remainder of those trips. Except as described in the next paragraph, the IATTC is to cover all trips by vessels registered in other nations that are required to carry observers.

At the fifth meeting of the Parties to the AIDCP in June 2001, observers from the international observer program of the South Pacific Forum Fisheries Agency (FFA) were approved to collect pertinent information for the On-Board Observer Program, pursuant to Annex II (9) of the AIDCP in cases for which the Director determines that the use of an observer from the AIDCP On-Board Observer Program is not practical.

Observers from the On-Board Observer Program departed on 108 fishing trips aboard purse seiners covered by that program during the fourth quarter of 2007. Preliminary coverage data for these vessels during the quarter are shown in Table 8. In addition to those trips, the

Program has also been placing observers aboard two vessels of less than 364 metric tons capacity during 2007, as required by AIDCP Resolution A-02-01 which was adopted at the eighth meeting of the Parties to the AIDCP on10 October 2002. Two fishing trips by each of those vessels that departed during the quarter were sampled. However, an investigation by the flag Party of one of those vessels has concluded that there was no infraction, so that vessel is no longer required to carry AIDCP observers

Training

There were no IATTC observer training courses during the quarter.

RESEARCH

Tuna tagging

Messrs. Kurt M. Schaefer and Daniel W. Fuller spent the period of 23 November-3 December 2007 aboard the San Diego-based long-range sport-fishing vessel *Royal Star* on a regularly-scheduled fishing trip to Baja California, Mexico. The purpose of the trip was to tag yellowfin tuna, as part of the Tagging of Pacific Pelagics (TOPP) program, which is one of several programs supported by the Census of Marine Life (COML). The cruise was successful, as 35 archival tags (Lotek LTD 2310s) were implanted in the peritoneal cavities of yellowfin tuna ranging in length from 62 to 129 cm (mean = 92.2 cm). The fish were captured and released near Lusitania Bank (23°36'N-111°42'W).

Early life history studies

Yellowfin broodstock

The yellowfin broodstock in Tank 1 (1,362,000 L) at the Achotines Laboratory spawned daily during the quarter. Spawning occurred between 8:05 p.m. and 10:35 p.m. The numbers of eggs collected after each spawning event ranged from about 25,000 to 2,345,000. The water temperatures in the tank ranged from 26.4° to 28.4°C during the quarter.

At the end of December, there were 6 56- to 60-kg and 6 23- to 32-kg yellowfin tuna in Tank 1.

From January 2003 through July 2005 archival tags had been implanted in yellowfin tuna (IATTC Quarterly Reports for January-March 2003, April-June 2004, October-December 2004, and July-September 2005), and at the end of December 2006 five fish from those groups remained in Tank 1. In late January 2007, 10 yellowfin (4 to 10 kg) held in the 170,000-L reserve broodstock tank (Tank 2) were implanted with prototype archival tags and transferred to Tank 1. At the end of December 2007, five of the six smaller fish and two of the six larger fish in Tank 1 had archival tags.

Rearing of yellowfin eggs, larvae, and juveniles

During the quarter the following parameters were recorded for most spawning events: times 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 tuna larvae

During the quarter an experiment was conducted to examine the density effect on growth in early-stage juveniles between 14 and 22 days after hatching. A similar experiment was conducted during the second quarter with fish between 15 and 24 days after hatching. Previous experiments had been conducted to estimate the density-dependent growth of larvae during the first two weeks of feeding (3-18 days after hatching), and the results indicated that the larvae grow more rapidly when they are maintained at lower densities. The food levels were not limiting in any of the density experiments. The results of the experiments with early-stage juveniles indicated that density effects on growth, which are quite pronounced during the larval stage, begin to diminish during the early-juvenile stage.

Several series of larval and juvenile yellowfin tuna were sampled for analysis by scientists from other organizations. Fish ranging from 5 to 35 mm in standard length were preserved and readied for shipment to Dr. Kathryn Dickson, Department of Biological Science, California State University at Fullerton. These samples will be used to augment research initiated by Dr. Dickson in 2006 (IATTC Quarterly Report for April-June 2006) to determine when and how the internalized slow-oxidative, red locomotor muscle first develops in tunas. Also, several hundred yellowfin larvae and juveniles 20 to 30 mm in standard length reared from eggs at the Achotines Laboratory were frozen for shipment to Texas A&M University (TAMU). IATTC scientists are conducting collaborative nutritional research on yellowfin with Drs. Delbert Gatlin and Alejandro Buentello at TAMU, and these samples will be used for some preliminary analyses of lipid and amino acid profiles in early-juvenile yellowfin.

Studies of snappers

The work on spotted rose snappers (*Lutjanus guttatus*) is carried out by the Autoridad de los Recursos Acuáticos de Panamá (ARAP).

Two separate broodstocks of snappers are being kept in two 85,000-L tanks. The first consists of 15 individuals from the original broodstock caught in 1996. They spawned 1-2 times per week early in the quarter and about once every two weeks late in the quarter.

The second group consists of 25 individuals from a group bred at the Laboratory from eggs obtained from spawning in 1998. They also spawned 1-2 times per week early in the quarter and about once every two weeks late in the quarter.

Studies of mollusks

The Secretaría Nacional de Ciencia y Tecnología de Panamá (SENACYT) of Panama approved a project proposal submitted by Mr. Amado Cano of ARAP entitled "Unidad de validación tecnológica y escalamiento piloto, para la producción de moluscos conchuela (*Argopecten ventricosus*) en Achotines, Peninsula de Azuero, Panamá." The research will be carried out jointly with the Centro de Investigaciones Biológicas del Noroeste S.C. (CIBNOR,

La Paz, Mexico) and with participation of the Achotines Laboratory staff. The project will be funded by SENACYT over three years.

Visitors at the Achotines Laboratory

Dr. Cecilia Guerra visited the Achotines Laboratory on 5-6 October 2007, with a group of students from her Aquatic Eco-Physiology class at the Universidad Tecnológica de Panamá. The students are pursuing graduate degrees in environmental engineering.

Oceanography and meteorology

Easterly surface winds blow almost constantly over northern South America, which cause 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 tropical eastern Pacific Ocean (EPO). 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. Two additional indices, the NOI* (Progress Ocean., 53 (2-4): 115-139) and the SOI*, have recently been devised. The NOI* is the difference between the anomalies of sea-level atmospheric pressure at the North Pacific High (35°N-130°W) and Darwin, Australia, and the SOI* is the difference between the anomalies of sea-level atmospheric pressure at the South Pacific High (30°S-95°W) and Darwin. Ordinarily, the NOI* and SOI* values are both negative during El Niño events and positive during anti-El Niño events.

The SSTs were more than 1°C above normal along the equator from near the coast to about 170°E throughout the fourth quarter of 2006. In addition, there were areas of warm water off northern and central Mexico and in a few other scattered areas during that quarter (IATTC Quarterly Report for October-December 2006: Figure 14). During January 2007 there was a narrow strip of warm water extending along the equator from the Galapagos Islands to about 130°W and an area of cool water off Mexico at about 25°N. In February the former was replaced by a narrow strip of cool water extending from about 120°W to about 135°W. The latter persisted in February. An area of warm water appeared off northern Chile during that month. In March a narrow band of cool water extended along the equator from the coast to about 110°W (IATTC Quarterly Report for January-March 2007: Figure 8). This band of cool water persisted during April, May, and June, and it extended southward along the coast of South America, reaching 40°S in June. Scattered areas of warm and cool water appeared offshore, particularly in May and June (IATTC Quarterly Report for April-June 2007: Figure 8). In July there was a narrow strip of cool water extending westward along the equator from the coast to about 135°W and southward along the coast of South America to about 50°S and a small area of cool water centered at about 20°N-135°W. In August the strip of cool water became wider, and the small area of cool water moved northwestward to about 40°N-140°W. In September the strip

of cool water was not quite as wide as it had been in August, but it extended westward to about 160°W (IATTC Quarterly Report for July-September 2007: Figure 5). The area of cool water along the equator and off the coast of northern South American persisted throughout the fourth quarter (Figure 6). Also, a small area of cool water appeared off Baja California in October, and persisted through December. There were some areas of warm water west of 170°W and south of 15°S during October and November, but these had disappeared by December. The data in Table 9 indicate that anti-El Niño conditions were in effect during the fourth quarter. The NOI* value for December, 7.03, is the fifth-greatest value on record, being exceeded only by the values for February 1953, February 1955, January 1989, and January 2007. (The series of data for NOI* extends from January 1948 through December 2007.) According to the Climate Diagnostics Bulletin of the U.S. National Weather Service for December 2007, "Current atmospheric and oceanic conditions and recent trends are consistent with a likely continuation of [anti-El Niño conditions] into the Northern Hemisphere spring [of] 2008."

GEAR PROGRAM

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

COLLECTION OF AT-SEA AND SUPPLEMENTAL RETAINED CATCH DATA FOR SMALL PURSE SEINERS

The U.S. National Oceanic and Atmospheric Administration has awarded the IATTC a contract to place observers, on a voluntary basis, on sufficient numbers of trips of "Class-5" purse seiners (vessels with carrying capacities of 273-363 metric tons) based in ports on the Pacific Coast of Latin America to obtain data on "catch, bycatch, interaction with protected species, and gear" for 1,000 days at sea per year and to "sample 100 percent of the in-port unloadings of Class 4-5 purse seine vessels [vessels with well capacities of 182-363 metric tons]." If that is not possible, observers can be placed on sufficient numbers of trips of Class-3 and/or -4 vessels (vessels with well capacities of 92-272 metric tons) to bring the total numbers of days at sea observed to 1,000.

No observers were placed on vessels during the fourth quarter. The numbers of trips completed, numbers of samples taken, and numbers of fish sampled were as follows:

Month	Trips completed	Samples taken	Fish sampled		
			Yellowfin	Skipjack	Bigeye
October	18	16	6,083	200	65
November	18	13	8,464	500	67
December	32	28	19,249	1,350	50
Total	64	57	33,796	2,050	182

INTER-AGENCY COOPERATION

Mr. Luis Tejada spent the period of 3-31 October 2007, at the Instituto de Ciencias Marinas de Andalucía (ICMAN) in Puerto Real, Cádiz Province, Spain. The marine algae collection at ICMAN and algal research activity there is recognized at national and international

levels. During his stay he worked primarily with Dr. Luís Maria Lubian, receiving training in maintenance of algal culture collections and general aspects of algal culture, including taxonomy, chlorophyll analysis, and measurement of photosynthetic rates. Mr. Tejada's travel expenses were covered by a grant from the Spanish government and from the algal culture project funded by the Secretaría Nacional de Ciencia, Tecnología e Innovación (SENACYT) that Mr. Tejada is supervising at the Achotines Laboratory.

Dr. Robert J. Olson participated in the final examination of a Master of Science candidate, Ms. Vanessa Alatorre-Ramírez, of the Centro Interdisciplinario de Ciencias Marinas, La Paz, Mexico, on 10 December 2007. Her thesis was entitled, "Hábitos alimenticios del atún aleta amarilla *Thunnus albacares* y barrilete *Katsuwonus pelamis* en cardúmenes mixtos del Océano Pacifico oriental tropical."

PUBLICATIONS

IATTC. 2007. Annual Report of the Inter-American Tropical Tuna Commission 2005: 100 pp.

IATTC. 2007. Status of the tuna and billfish stocks in 2006. Inter-Amer. Trop. Tuna Comm., Stock Assess. Rep., 8: 266 pp.

Arenas, Pablo. 2007. Estimated target fleet capacity for the tuna fleet in the eastern Pacific Ocean, based on the stock assessments of target species. FAO Fisheries Proceedings, 8: 39-50.

Bayliff, W. H., and J. Majkowski (editors). 2007. Methodological workshop on the management of tuna fishing capacity: stock status, data envelopment analysis, industry surveys and management options. FAO Fisheries Proceedings, 8: x, 218 pp.

Bigelow, Keith A., and Mark N. Maunder. 2007. Does habitat or depth influence catch rates of pelagic species? Canad. Jour. Fish. Aquat. Sci., 64 (11): 1581-1594.

García, A., A. Bakun, and D. Margulies. 2007. Report of CLIOTOP Workshop of Working Group 1 on Early Life History of Top Predators. Inter. Comm. Cons. Atlan. Tunas, Coll. Vol. Sci. Pap., 60 (4): 1312-1327.

Joseph, James, Dale Squires, William Bayliff, and Theodore Groves. 2007. Requirements and alternatives for the limitation of fishing capacity in tuna purse-seine fleets. FAO Fisheries Proceedings, 8: 153-191.

ADMINISTRATION

Dr. Liming Song of Shanghai Fisheries University, Peoples Republic of China, began a 5-month stay at the IATTC headquarters in La Jolla on 19 November 2007. He is working with Drs. Michael G. Hinton and Mark N. Maunder on standardization models for longline catch rates, utilizing some of the detailed observations of gear and environment made in the Indian Ocean by Dr. Song's research group.

Mr. Harold Valverde, who had worked at the Manta office since 1 November 1 2005, resigned on 30 November 2007. He was replaced by Mr. Francisco Robayo, a graduate of the

University of Guayaquil, on 1 December 2007.

Mr. Robert Kwan, who had worked as a data base manager for the IATTC since June 2000, resigned his position on 14 December 2007, to accept employment at Qualcomm, a large technology company in San Diego. He will be missed, but everyone wishes him the best in his new job.

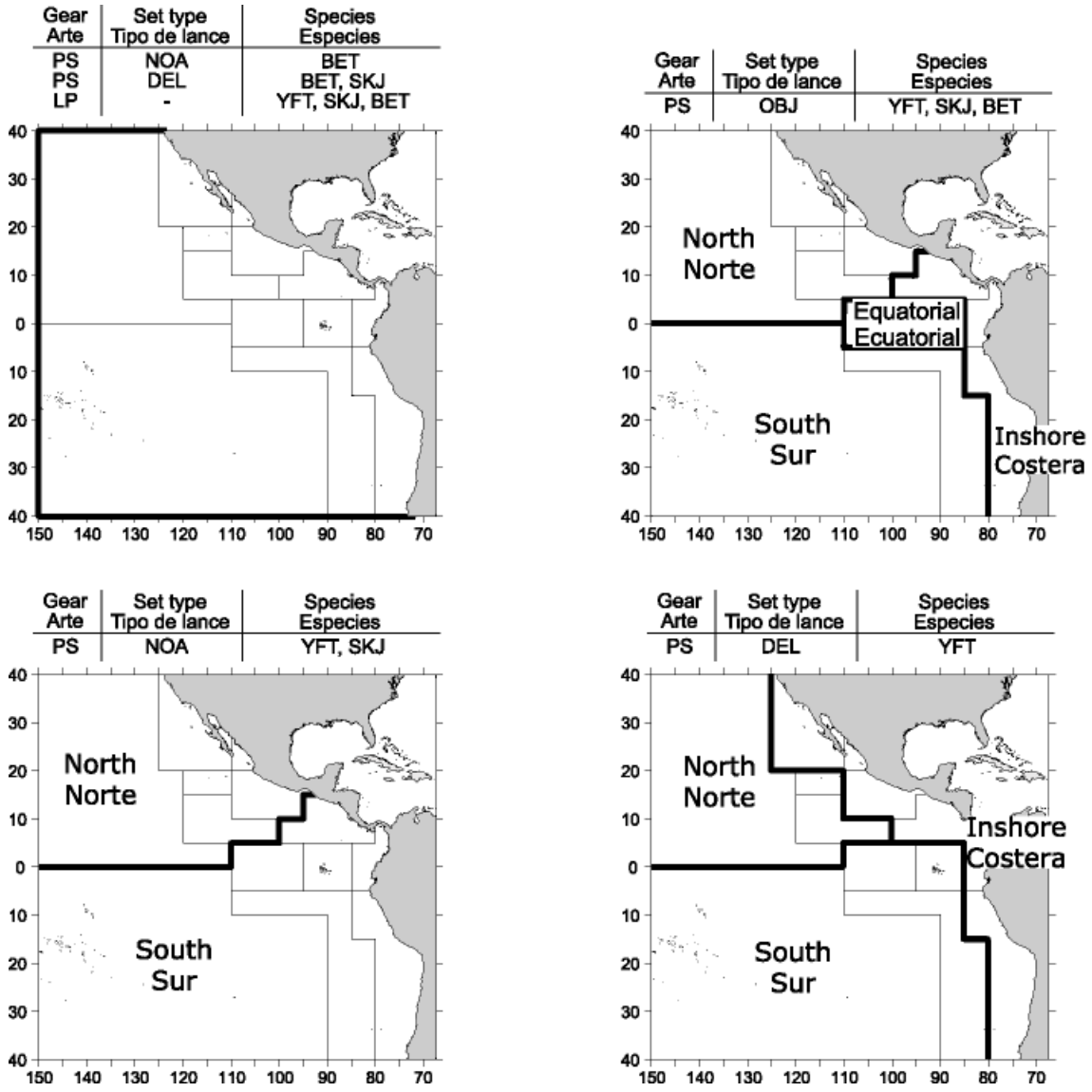

FIGURE 1. Spatial extents of the fisheries defined by the IATTC staff for stock assessment of yellowfin, skipjack, and bigeye in the EPO. The thin lines indicate the boundaries of the 13 length-frequency sampling areas, and the bold lines the boundaries of the fisheries. Gear: PS = purse seine, LP = pole and line; Set type: NOA = unassociated, DEL = dolphin, OBJ = floating object; Species: YFT = yellowfin, SKJ = skipjack, BET = bigeye.

FIGURA 1. Extensión espacial de las pesquerías definidas por el personal de la CIAT para la evaluación de las poblaciones de atún aleta amarilla, barrilete, y patudo en el OPO. Las líneas delgadas indican los límites de las 13 zonas de muestreo de frecuencia de tallas, y las líneas gruesas los límites de las pesquerías. Artes: PS = red de cerco, LP = caña; Tipo de lance: NOA = peces no asociados, DEL = delfín; OBJ = objeto flotante; Especies: YFT = aleta amarilla, SKJ = barrilete, BET = patudo.

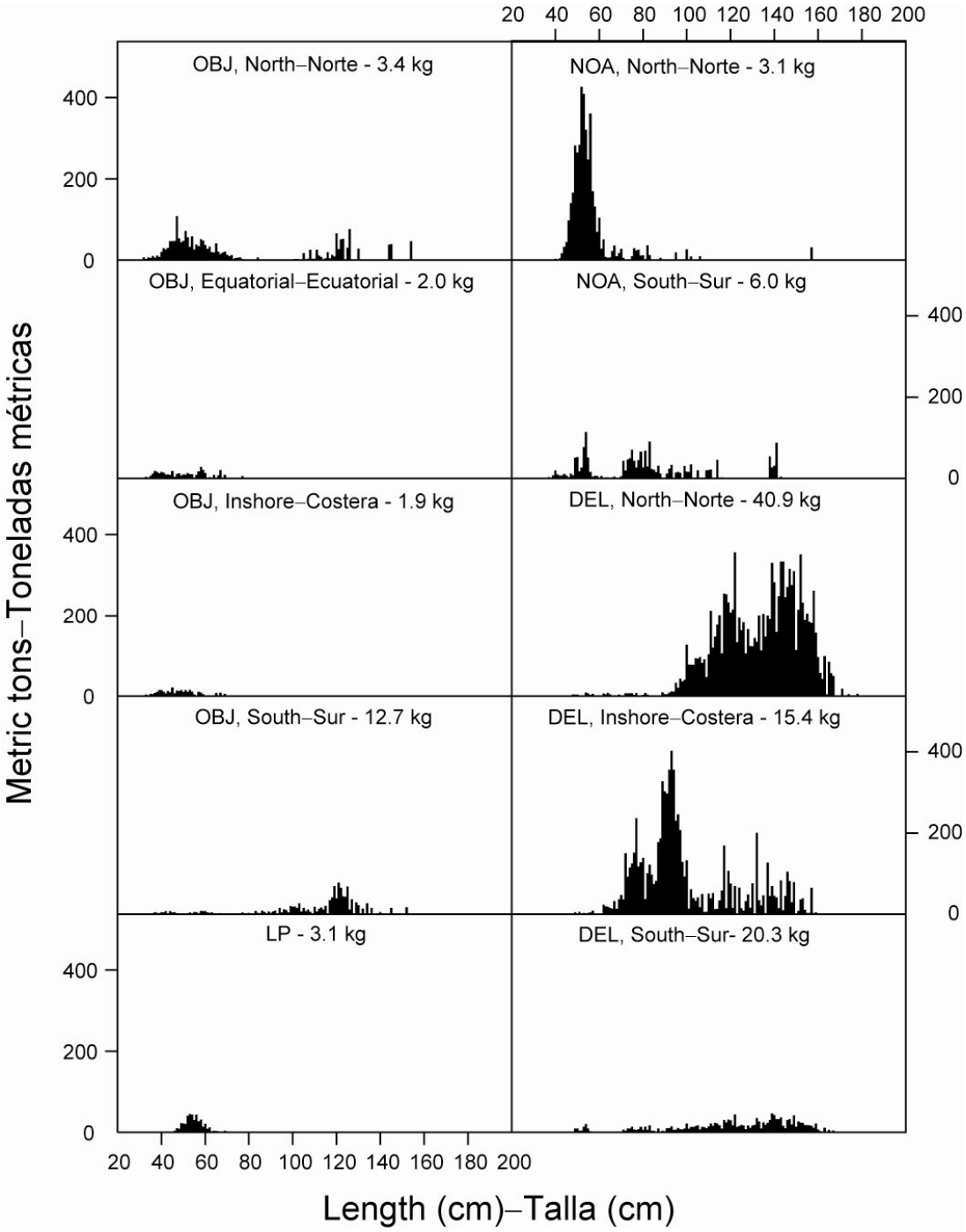

FIGURE 2a. Estimated size compositions of the yellowfin caught in each fishery of the EPO during the third quarter of 2007. The average weights of the fish in the samples are given at the tops of the panels. OBJ = floating object; LP = pole and line; NOA = unassociated; DEL = dolphin.

FIGURA 2a. Composición por tallas estimada para el aleta amarilla capturado en cada pesquería del OPO durante el tercer trimestre de 2007. En cada recuadro se detalla el peso promedio de los peces en las muestras. OBJ = objeto flotante; LP = caña; NOA = peces no asociados; DEL = delfín.

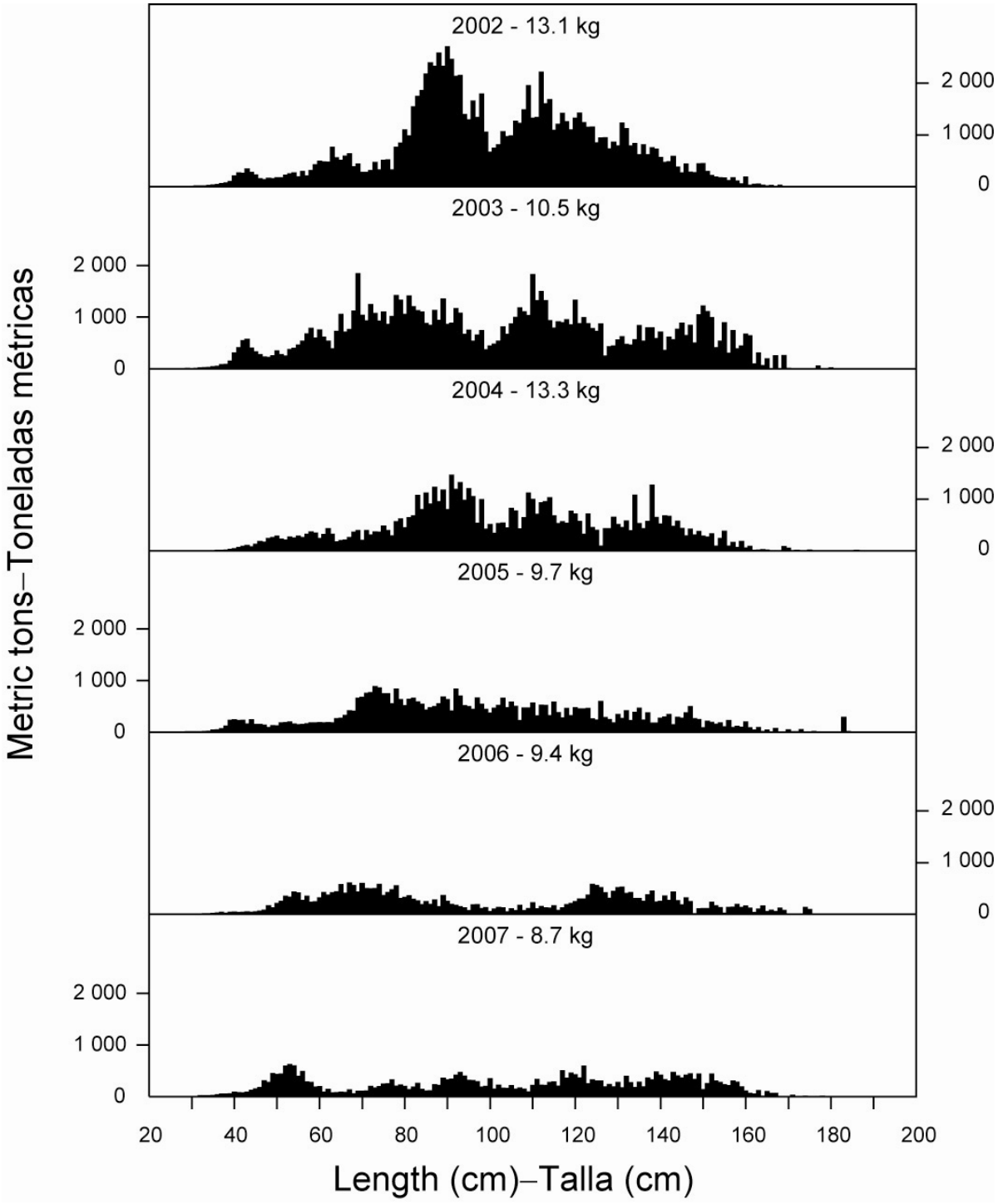

FIGURE 2b. Estimated size compositions of the yellowfin caught in the EPO during the third quarter of 2002-2007. The average weights of the fish in the samples are given at the tops of the panels.

FIGURA 2b. Composición por tallas estimada para el aleta amarilla capturado en el OPO en el tercer trimestre de 2002-2007. En cada recuadro se detalla el peso promedio de los peces en las muestras.

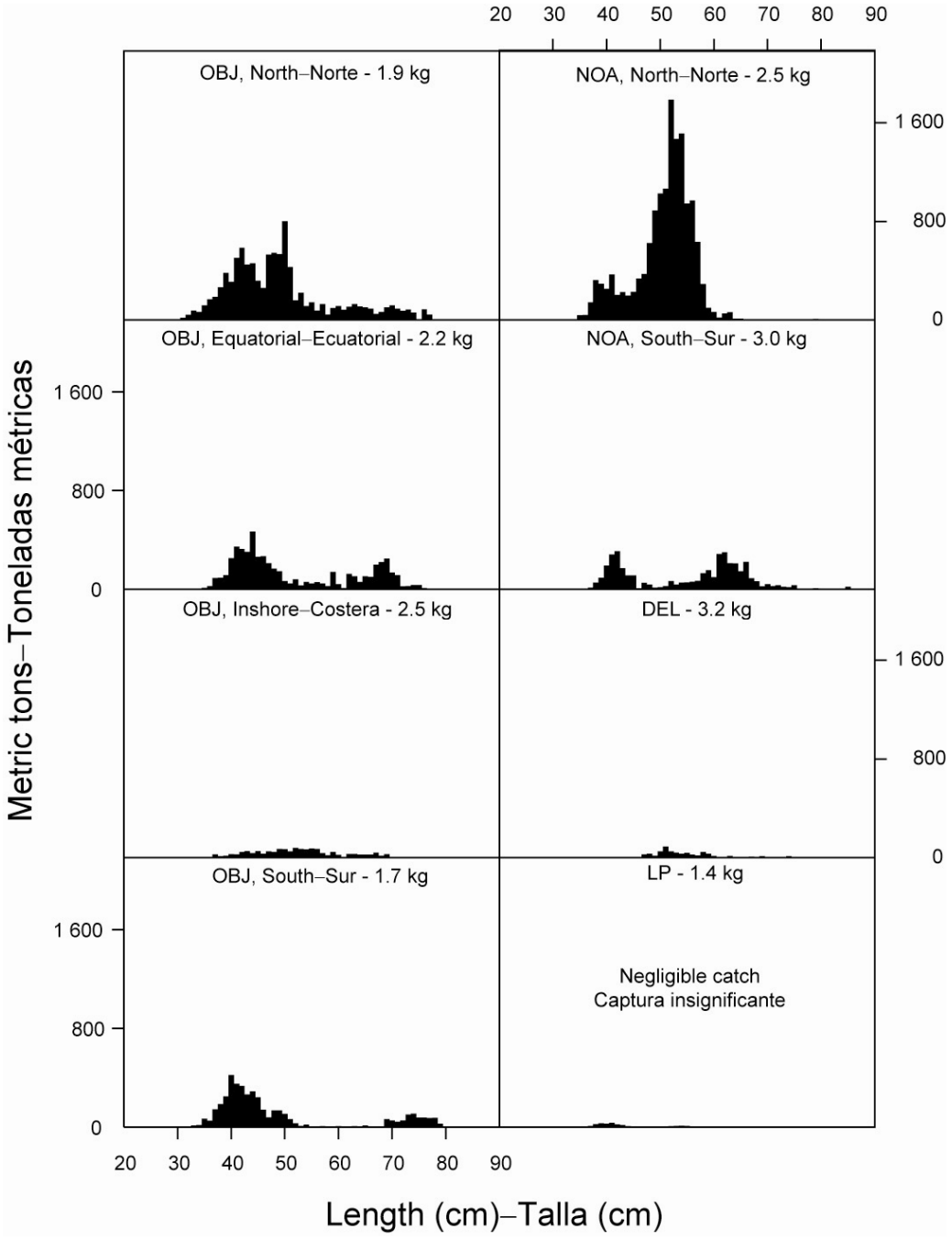

FIGURE 3a. Estimated size compositions of the skipjack caught in each fishery of the EPO during the third quarter of 2007. The average weights of the fish in the samples are given at the tops of the panels. OBJ = floating object; LP = pole and line; NOA = unassociated; DEL = dolphin.

FIGURA 3a. Composición por tallas estimada para el barrilete capturado en cada pesquería del OPO durante el tercer trimestre de 2007. En cada recuadro se detalla el peso promedio de los peces en las muestras. OBJ = objeto flotante; LP = caña; NOA = peces no asociados; DEL = delfín.

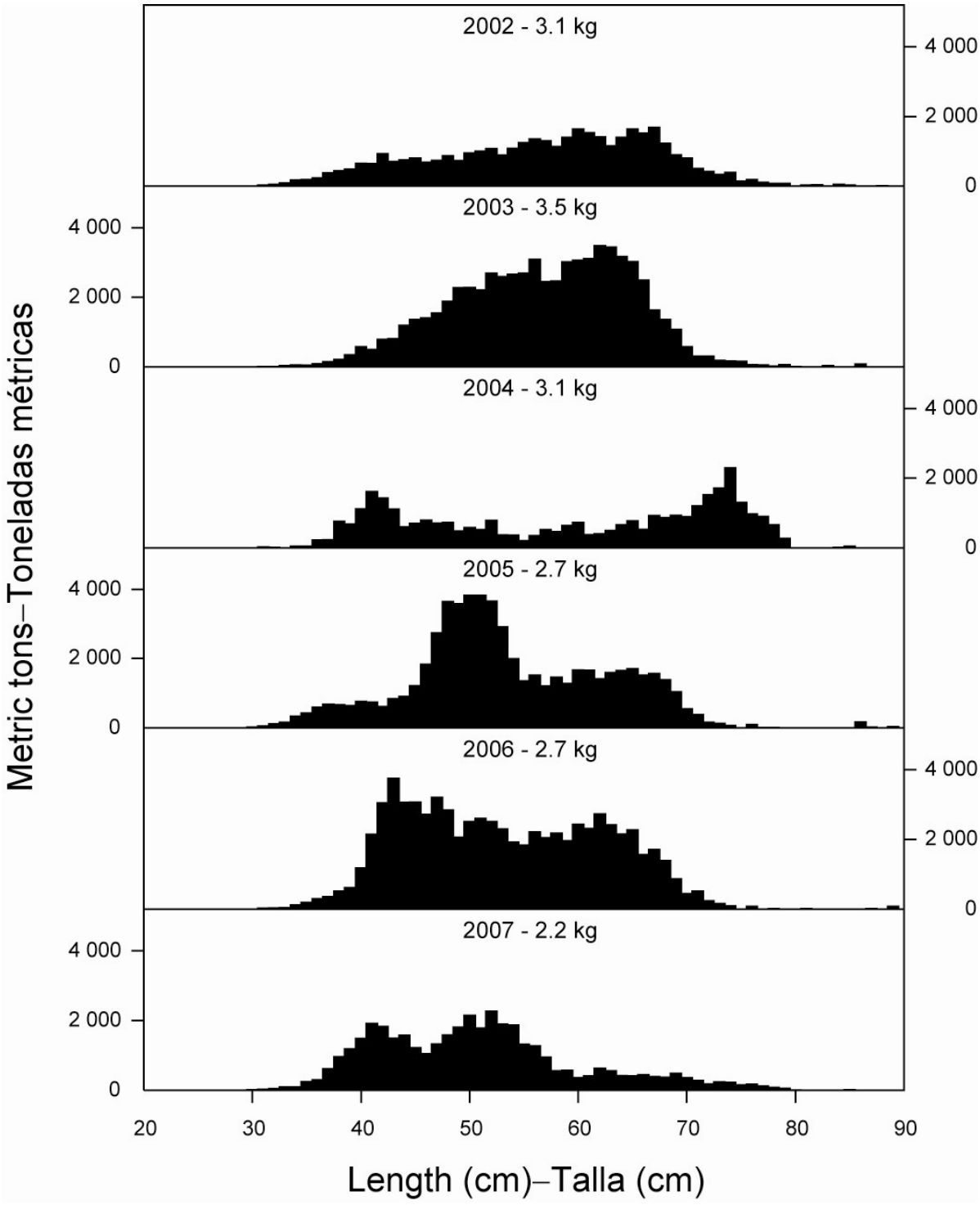

FIGURE 3b. Estimated size compositions of the skipjack caught in the EPO during the third quarter of 2002-2007. The average weights of the fish in the samples are given at the tops of the panels.
FIGURA 3b. Composición por tallas estimada para el barrilete capturado en el OPO en el tercer trimestre de 2002-2007. En cada recuadro se detalla el peso promedio de los peces en las muestras.

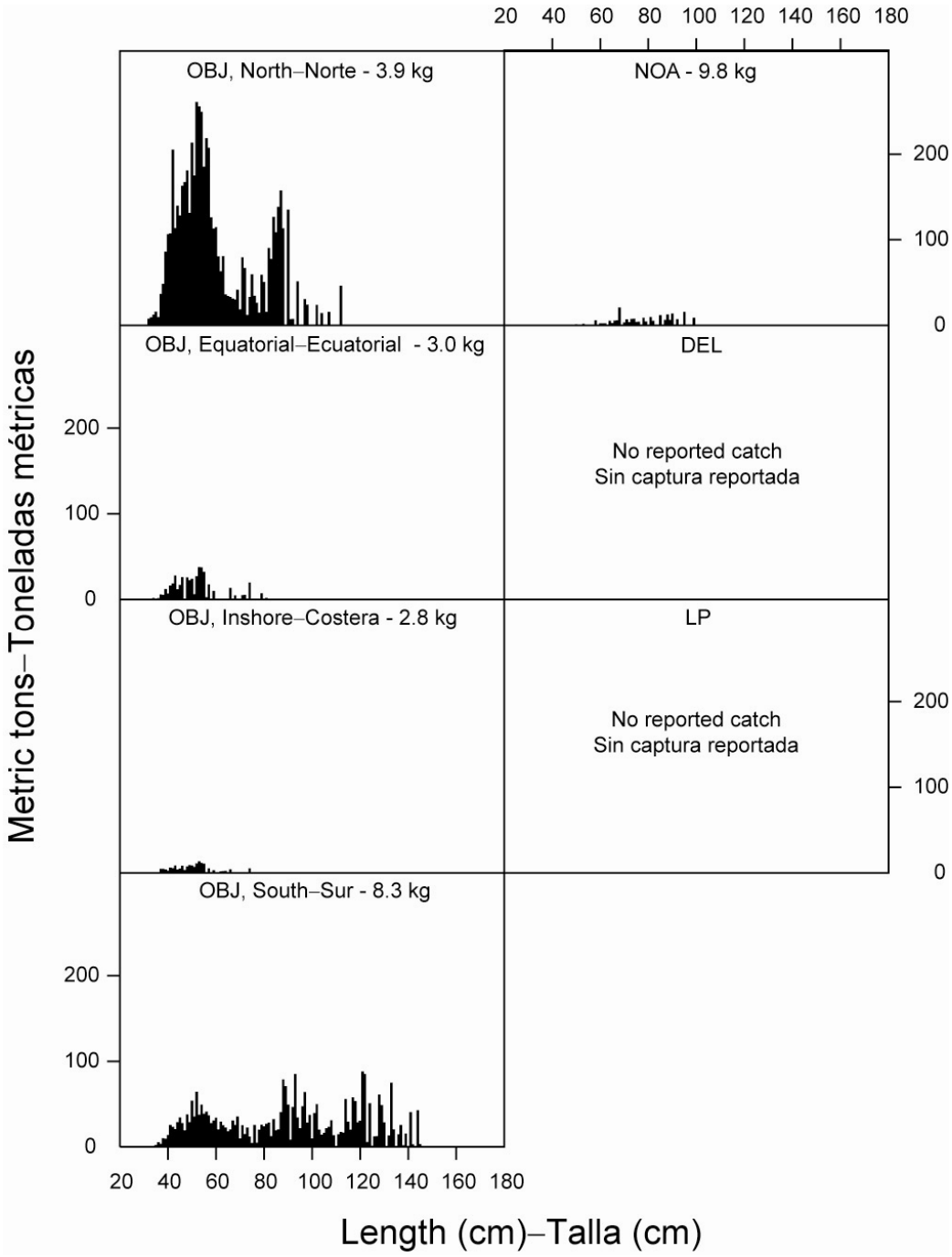

FIGURE 4a. Estimated size compositions of the bigeye caught in each fishery of the EPO during the third quarter of 2007. The average weights of the fish in the samples are given at the tops of the panels. OBJ = floating object; LP = pole and line; NOA = unassociated; DEL = dolphin.

FIGURA 4a. Composición por tallas estimada para el patudo capturado en cada pesquería del OPO durante el tercer trimestre de 2007. En cada recuadro se detalla el peso promedio de los peces en las muestras. OBJ = objeto flotante; LP = caña; NOA = peces no asociados; DEL = delfín.

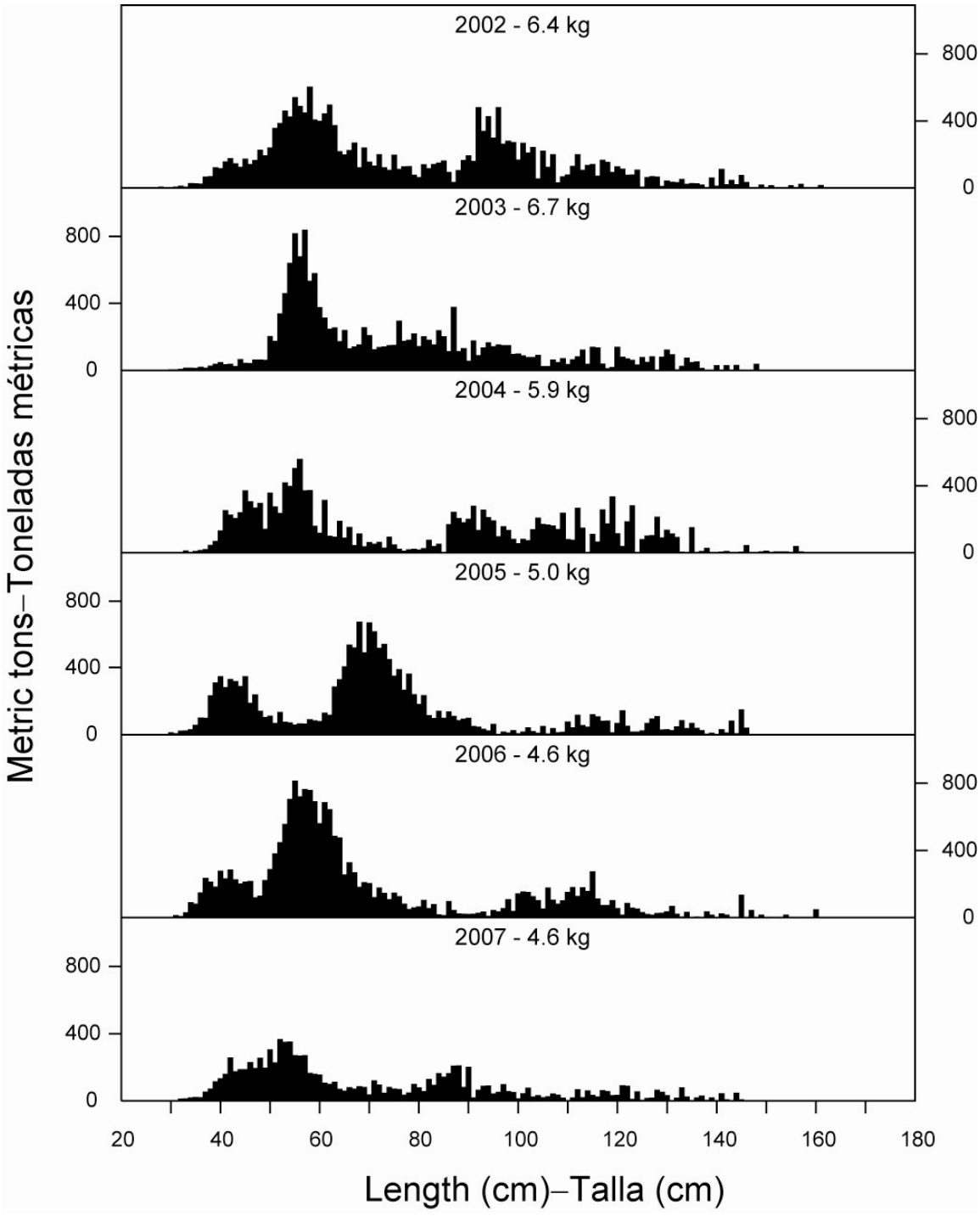

FIGURE 4b. Estimated size compositions of the bigeye caught in the EPO during the third quarter of 2002-2007. The average weights of the fish in the samples are given at the tops of the panels.

FIGURA 4b. Composición por tallas estimada para el patudo capturado en el OPO en el tercer trimestre de 2002-2007. En cada recuadro se detalla el peso promedio de los peces en las muestras.

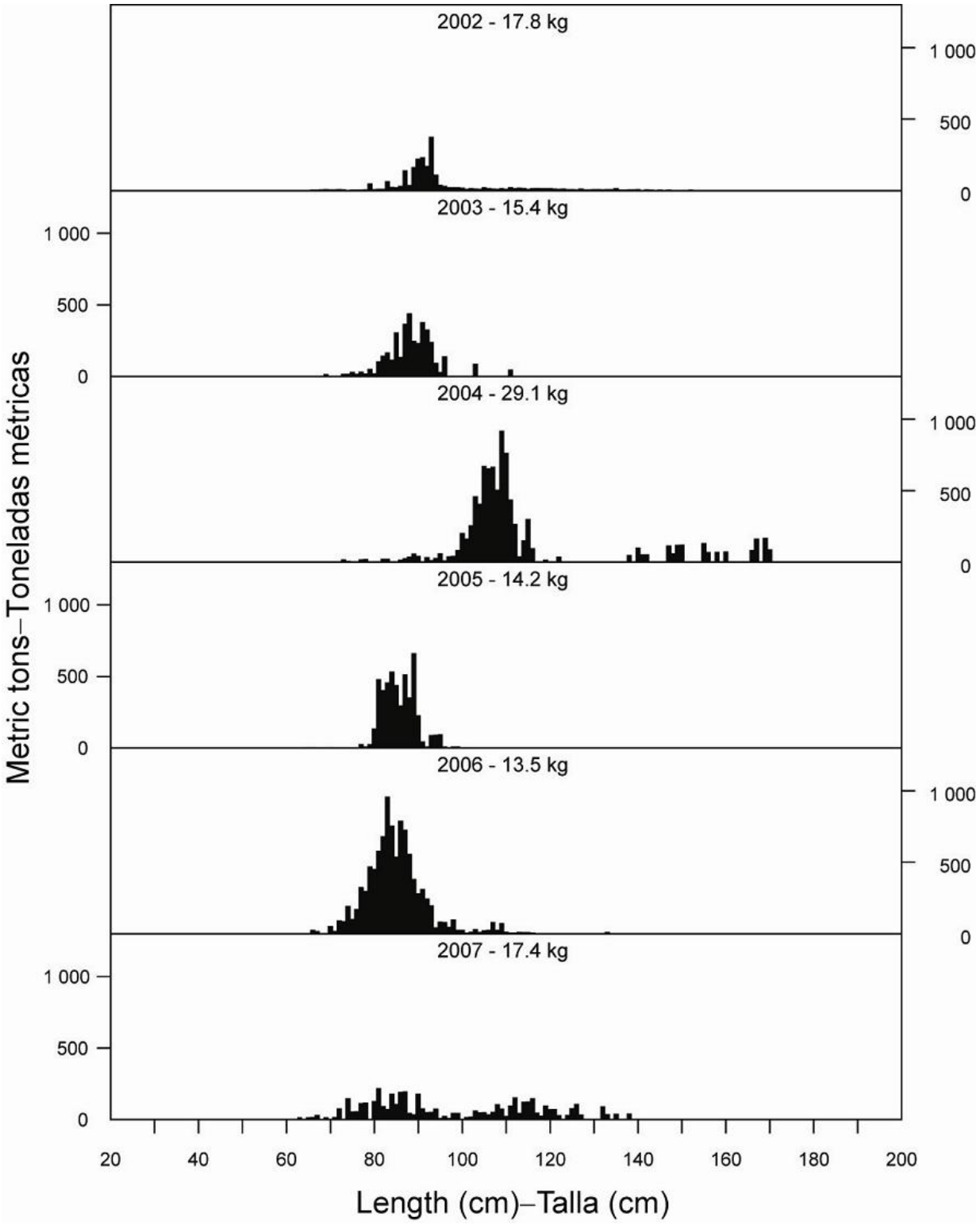

FIGURE 5. Estimated catches of Pacific bluefin by purse-seine and recreational gear in the EPO during 2002-2007. The values at the tops of the panels are the average weights.
FIGURE 5. Captura estimada de aleta azul del Pacífico con arte de cerco y deportiva en el OPO durante 2002-2007. El valor en cada recuadro representa el peso promedio.

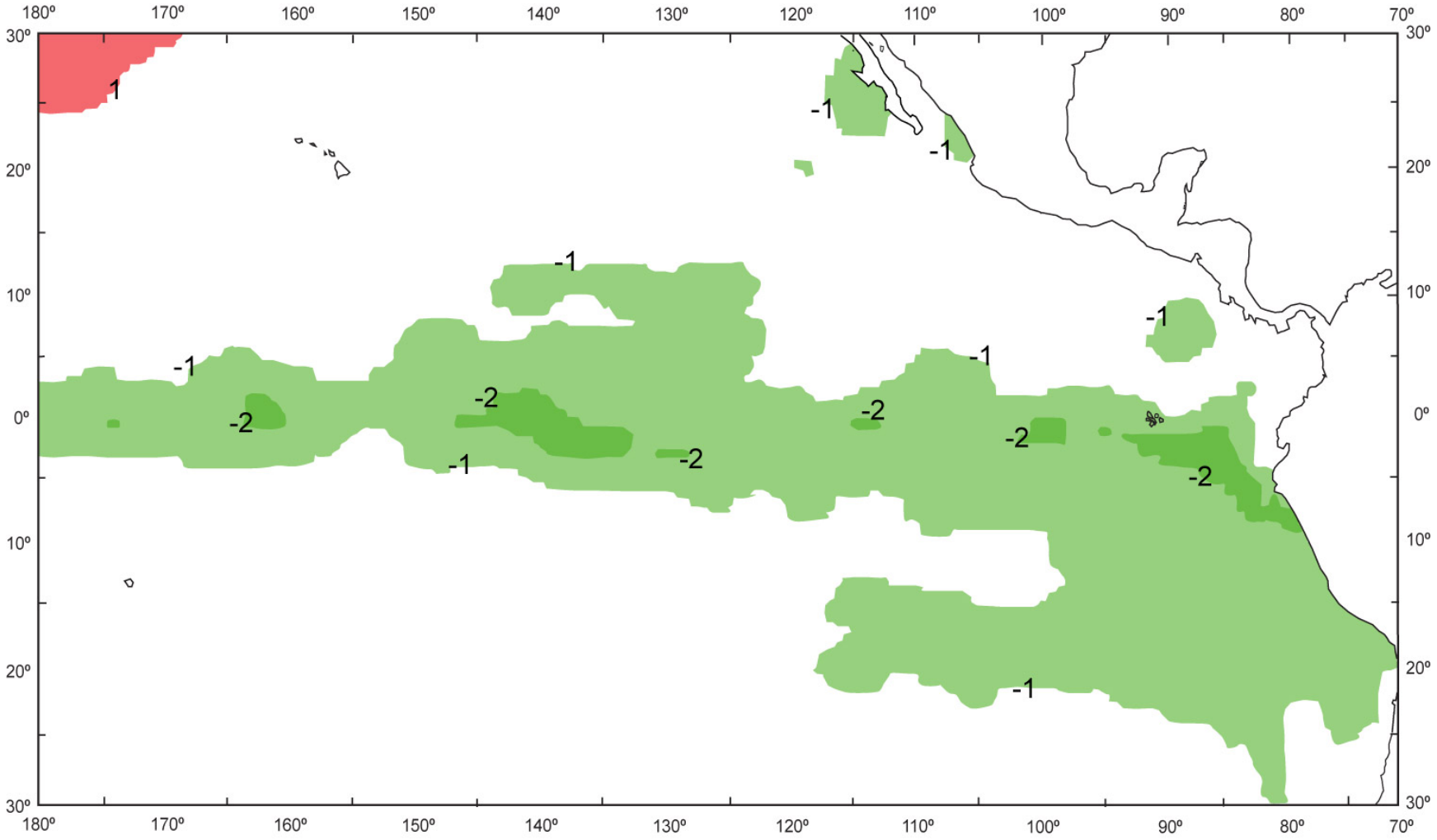

FIGURE 6. Sea-surface temperature (SST) anomalies (departures from long-term normals) for December 2007, based on data from fishing boats and other types of commercial vessels.
FIGURA 6. Anomalías (variaciones de los niveles normales a largo plazo) de la temperatura superficial del mar (TSM) en diciembre de 2007, basadas en datos tomados por barcos pesqueros y otros buques comerciales.

TABLE 1. Preliminary estimates of the numbers and capacities, in cubic meters, of purse seiners and pole-and-line vessels operating in the EPO in 2007 by flag, gear, and well volume. 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; LP = pole-and-line.

TABLA 1. Estimaciones preliminares del número de buques cerqueros y cañeros que pescan en el OPO en 2007, y de la capacidad de acarreo de los mismos, en metros cúbicos, por bandera, arte de pesca, y volumen de bodega. 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; LP = cañero.

Flag Bandera	Gear Arte	Well volume–Volumen de bodega				Capacity Capacidad
		1-900	901-1700	>1700	Total	
			Number—Número			
Bolivia	PS	1	-	-	1	222
Colombia	PS	4	10	-	14	14,577
Ecuador	PS	58	15	9	82	59,147
España—Spain	PS	-	-	3	3	6,955
Guatemala	PS	-	1	-	1	1,475
Honduras	PS	2	1	-	3	1,700
México	PS	23	34	1	58	57,700
	LP	4	-	-	4	380
Nicaragua	PS	-	5	-	5	6,023
Panamá	PS	5	18	5	28	36,914
Perú	PS	1	-	-	1	542
El Salvador	PS	-	1	3	4	7,415
USA—EE.UU.	PS	1	3	-	4	4,372
Venezuela	PS	-	20	2	22	29,684
Vanuatu	PS	1	2	-	3	3,609
Unknown— Desconocida	PS	1	-	-	1	209
All flags— Todas banderas	PS	97	107	23	227	
	LP	4	-	-	4	
	PS + LP	101	107	23	231	
			Capacity—Capacidad			
All flags— Todas banderas	PS	41,683	137,310	47,535	226,528	
	LP	380	-	-	380	
	PS + LP	42,063	137,310	47,535	226,908	

TABLE 2. Changes in the IATTC fleet list recorded during the fourth quarter of 2007. PS = purse Seine; LP = pole-and-line.
TABLA 2. Cambios en la flota observada por la CIAT registrados durante el cuarto trimestre de 2007. PS = cerquero; LP = cañero.

Vessel name Nombre del buque	Flag Bandera	Gear Arte	Capacity (m^3) Capacidad (m^3)	Remarks Comentarios	
Vessels added to the fleet—Buques añadidos a la flota					
New entries—1er ingresos					
Westerly	México	LP	42		
Alina	Perú	PS	542		
Re-entries—Reingresos					
Tizoc	México	PS	240		
Caribbean Star No. 31	Unknown	PS	209		
Changes of name or flag—Cambios de nombre o pabellon					
				Now—Ahora	
Ramoncho	Ecuador	PS	96	*Gema Del Mar*	
Cabo Marzo	México	PS	1,083		Nicaragua
Sea King F	Panamá	PS	1,487	*Acarigua F*	Venezuela
Vessels removed from fleet—Buques retirados de la flota					
Emperador	Ecuador	PS	82		
Isabel Victoria V	Ecuador	PS	389		
Mandy	Ecuador	PS	786		
Manuel Ignacio F	Ecuador	PS	644		
Delfin IX	México	LP	160		
Juan Pablo I	México	PS	300		
Taurus I	Venezuela	PS	1,380		

TABLE 3. Preliminary estimates of the retained catches of tunas in the EPO from 1 January through 31 December 2007, by species and vessel flag, in metric tons.
TABLA 3. Estimaciones preliminares de las capturas retenidas de atunes en el OPO del 1 de enero al 31 de diciembre 2007, por especie y bandera del buque, en toneladas métricas**.**

Flag	Yellowfin	Skipjack	Bigeye	Pacific bluefin	Bonitos (*Sarda* spp.)	Albacore	Black skipjack	Other[1]	Total	Percentage of total
Bandera	**Aleta amarilla**	**Barrilete**	**Patudo**	**Aleta azul del Pacífico**	**Bonitos (*Sarda* spp.)**	**Albacora**	**Barrilete negro**	**Otras[1]**	**Total**	**Porcentaje del total**
Ecuador	22,155	92,462	28,783	-	1,230	-	324	600	145,554	32.4
México	65,591	22,297	91	4,009	14,481	39	1,424	571	108,503	24.1
Nicaragua	5,443	2,227	775	-	-	-	-	-	8,445	1.9
Panamá	31,814	20,853	8,314	-	23	48	12	6	61,070	13.6
Venezuela	26,731	18,510	992	-	4	-	48	26	46,311	10.3
Other—Otros[2]	29,890	38,266	11,296	-	-	-	74	268	79,794	17.7
Total	181,624	194,615	50,251	4,009	15,738	87	1,882	1,471	449,677	

[1] Includes other tunas, sharks, and miscellaneous fishes
[1] Incluye otros túnidos, tiburones, y peces diversos
[2] Includes Bolivia, Colombia, El Salvador, Guatemala, Honduras, Spain, United States, Vanuatu, and Unknown; this category is used to avoid revealing information about the operations of individual vessels or companies.
[2] Incluye Bolivia, Colombia, El Salvador, España, Estados Unidos, Guatemala, Honduras Vanuatu, y Desconocida; se usa esta categoría para no revelar información sobre faenas de buques o empresas individuales

TABLE 4. Logged catches and catches per day's fishing[1] (CPDF) of yellowfin in the EPO, in metric tons, during the period of 1 January-30 September, based on fishing vessel logbook information.

TABLA 4. Captura registrada y captura por día de pesca[1] CPDP) de aleta amarilla en el OPO, en toneladas métricas, durante el período de 1 de enero-30 de septiembre, basado en información de los cuadernos de bitácora de buques pesqueros.

Area	Fishery statistic Estadística de pesca	Year-Año					
		2002	2003	2004	2005	2006	2007[2]
Purse seine—Red de cerco							
North of 5°N Al norte de 5°N	Catch—Captura CPDF—CPDP	169,300 24.3	186,600 20.6	102,800 11.0	91,800 11.3	68,500 8.4	57,600 8.5
South of 5°N Al sur de 5°N	Catch—Captura CPDF—CPDP	45,800 5.1	40,200 4.6	65,100 6.2	39,700 4.6	20,400 2.0	14,800 2.6
Total	Catch—Captura CPDF—CPDP	215,100 20.2	226,800 17.8	167,900 9.2	131,500 9.3	88,900 7.0	72,400 7.3
Annual total Total anual	Catch—Captura	261,800	275,100	193,200	162,600	104,600	
Pole and line—Cañero							
Total	Catch—Captura CPDF—CPDP	400 1.2	100 0.8	900 3.6	800 2.5	200 2.4	400 2.4
Annual total Total anual	Catch—Captura	800	500	1,800	800	400	

[1] Purse-seiners with carrying capacities greater than 363 metric tons only; all pole-and-line vessels. The catch values are rounded to the nearest 100, and the CPDF values to the nearest 0.1.

[1] Cerqueros con capacidad de acarreo más de 363 toneladas métricas únicamente; todos buques cañeros. Se redondean los valores de captura al 100 más cercano, y los de CPDP al 0.1 más cercano.

[2] Preliminary

[2] Preliminar

TABLE 5. Logged catches and catches per day's fishing[1] (CPDF) of skipjack in the EPO, in metric tons, during the period of 1 January-30 September, based on fishing vessel logbook information.

TABLA 5. Captura registrada y captura por día de pesca[1] (CPDP) de barrilete en el OPO, en toneladas métricas, durante el período de 1 de enero-30 de septiembre, basado en información de los cuadernos de bitácora de buques pesqueros.

Area	Fishery statistic Estadística de pesca	Year-Año					
		2002	2003	2004	2005	2006	2007[2]
Purse seine—Red de cerco							
North of 5°N Al norte de 5°N	Catch—Captura CPDF—CPDP	9,200 1.3	29,000 3.2	22,100 2.4	36,000 4.4	27,700 3.4	20,700 3.1
South of 5°N Al sur de 5°N	Catch—Captura CPDF—CPDP	62,200 6.9	84,400 9.7	73,200 7.0	87,400 10.2	88,100 8.8	34,100 5.9
Total	Catch—Captura CPDF—CPDP	71,400 6.2	113,400 8.1	95,300 5.9	123,400 8.5	115,800 7.5	54,800 4.8
Annual total Total anual	Catch—Captura	84,300	155,000	132,500	148,900	145,400	
Pole and line—Cañero							
Total	Catch—Captura CPDF—CPDP	500 1.5	200 2.6	500 1.9	300 1.5	100 0.6	100 0.6
Annual total Total anual	Catch—Captura	500	500	500	400	300	

[1] Purse-seiners with carrying capacities greater than 363 metric tons only; all pole-and-line vessels. The catch values are rounded to the nearest 100, and the CPDF values to the nearest 0.1.

[1] Cerqueros con capacidad de acarreo más de 363 toneladas métricas únicamente; todos buques cañeros. Se redondean los valores de captura al 100 más cercano, y los de CPDP al 0.1 más cercano.

[2] Preliminary

[2] Preliminar

TABLE 6. Logged catches and catches per day's fishing[1] (CPDF) of bigeye in the EPO, in metric tons, during the period of 1 January-30 September, based on purse-seine vessel logbook information.

TABLA 6. Captura registrada y captura por día de pesca[1] (CPDP) de patudo en el OPO, en toneladas métricas, durante el período de 1 de enero-30 de septiembre, basado en información de los cuadernos de bitácora de buques cerqueros.

Fishery statistic—Estadística de pesca	Year—Año					
	2002	2003	2004	2005	2006	2007[2]
Catch—Captura	22,000	21,100	28,000	18,000	26,700	11,700
CPDF—CPDP	2.2	2.0	2.2	1.7	2.1	1.7
Total annual catch—Captura total anual	26,700	33,100	43,100	28,500	33,400	

[1] Vessels with carrying capacities greater than 363 metric tons only. The catch values are rounded to the nearest 100, and the CPDF values to the nearest 0.1.

[1] Buques con capacidad de acarreo más de 363 toneladas métricas únicamente. Se redondean los valores de captura al 100 más cercano, y los de CPDF al 0.1 más cercano.

[2] Preliminary

[2] Preliminar

TABLE 7. Catches of bigeye tuna in the eastern Pacific Ocean during 2007 by longline vessels.
TABLA 7. Captures de atún patudo en el Océano Pacífico oriental durante 2007 por buques palangreros.

Flag	Quarter				Month			Fourth quarter	Total
	1	2	3	1-3	10	11	12		
Bandera	**Trimestre**				**Mes**			**Cuarto trimestre**	**Total**
	1	2	3	1-3	10	11	12		
China	-	-	-	-	-	-	-	-	-
Japan—Japón	3,282	2,902	3,105	9,289	1,090	1,377	1,506	3,973	13,262
Republic of Korea—República de Corea	1,826	1,963	941	4,730	229	280	372	881	5,611
Chinese Taipei—Taipei Chino	1,096	905	901	2,902	542	1,168	1,247	2,957	5,859
United States—EE.UU.	106	10	203	319	6	5	-	11	330
Vanuatu	273	221	0	494	-	-	-	-	494
Total	6,583	6,001	5,150	17,734	1,867	2,830	3,125	7,822	25,556

TABLE 8. Preliminary data on the sampling coverage of trips by vessels with capacities greater than 363 metric tons by the observer programs of the IATTC, Colombia, Ecuador, the European Union, Mexico, Nicaragua, Panama, and Venezuela during the fourth quarter of 2007. The numbers in parentheses indicate cumulative totals for the year.

TABLA 8. Datos preliminares de la cobertura de muestreo de viajes de buques con capacidad más que 363 toneladas métricas por los programas de observadores de la CIAT, Colombia, Ecuador, México, Nicaragua, Panamá, la Unión Europea, y Venezuela durante el cuarto trimestre de 2007. Los números en paréntesis indican totales acumulados para el año.

Flag	Trips		Observed by program						Percent observed	
			IATTC		National		Total			
Bandera	Viajes		Observado por programa						Porcentaje observado	
			CIAT		Nacional		Total			
Colombia	10	(47)	6	(23)	4	(24)	10	(47)	100.0	(100.0)
Ecuador	52	(248)	39	(169)	13	(79)	52	(248)	100.0	(100.0)
España—Spain	5	(20)	3	(11)	2	(9)	5	(20)	100.0	(100.0)
Guatemala	0	(4)	0	(4)			0	(4)	-	(100.0)
Honduras	3	(15)	3	(15)			3	(15)	100.0	(100.0)
México	11	(202)	6	(102)	5	(100)	11	(202)	100.0	(100.0)
Nicaragua	4	(21)	2	(11)	2	(10)	4	(21)	100.0	(100.0)
Panamá	10	(105)	8	(55)	2	(50)	10	(105)	100.0	(100.0)
Peru	1	(1)	1	(1)			1	(1)	100.0	(100.0)
El Salvador	6	(28)	6	(28)			6	(28)	100.0	(100.0)
U.S.A.—EE.UU.	0	(5)	0	(5)			0	(5)	-	(100.0)
Venezuela	5	(78)	2	(40)	3	(38)	5	(78)	100.0	(100.0)
Vanuatu	1	(11)	1	(11)			1	(11)	100.0	(100.0)
Total	108	(785)[1]	77	(475)	31	(310)	108	(785)	100.0	(100.0)

[1] Includes 49 trips (26 by vessels with observers from the IATTC program and 23 by vessels with observers from the national programs) that began in late 2006 and ended in 2007

[1] Incluye 49 viajes (26 por observadores del programa del CIAT y 23 por observadores de los programas nacionales) iniciados a fines de 2006 y completados en 2007

TABLE 9. Oceanographic and meteorological data for the Pacific Ocean, 2007. The values in parentheses are anomalies. SST = sea-surface temperature; SOI = Southern Oscillation Index; SOI* and NOI* are defined in the text.
TABLA 9. Datos oceanográficos y meteorológicos del Océano Pacífico, 2007. Los valores en paréntesis son anomalías. TSM = temperatura superficie del mar; IOS = Índice de Oscilación del Sur; IOS* y ION* están definidas en el texto.

Month—Mes	**1**	**2**	**3**	**4**	**5**	**6**
SST—TSM (°C)						
Area 1 (0°-10°S, 80°-90°W)	25.0 (0.5)	26.3 (0.2)	25.8 (-0.7)	24.4 (-1.1)	22.8 (-1.6)	21.7 (-1.4)
Area 2 (5°N-5°S, 90°-150°W	26.5 (0.9)	26.5 (0.1)	26.8 (-0.3)	27.1 (-0.3)	26.4 (-0.7)	25.9 (-0.5)
Area 3 (5°N-5°S, 120°-170°W)	27.3 (0.7)	26.8 (0.1)	27.1 (0.0)	27.8 (0.1)	27.6 (-0.2)	27.6 (0.1)
Area 4 (5°N-5°S, 150W°-160°E)	28.9 (0.8)	28.6 (0.6)	28.6 (0.5)	28.7 (0.3)	28.9 (0.2)	29.0 (0.4)
Thermocline depth—Profundidad de la termoclina, 0°, 80°W (m)	25	20	20	15	25	25
Thermocline depth—Profundidad de la termoclina, 0°, 110°W (m)	50	35	30	10	15	25
Thermocline depth—Profundidad de la termoclina, 0°, 150°W (m)	120	120	125	100	90	105
Thermocline depth—Profundidad de la termoclina, 0°, 180°W (m)	160	170	170	170	170	170
Sea level—Nivel del mar, Baltra, Ecuador (cm)	197.7 (17.0)	186.1 (3.9)	184.7 (2.9)	186.1 (3.4)	190.6 9.2	190.3 (9.4)
Sea level—Nivel del mar, Callao, Perú (cm)	117.0 (5.5)	109.1 (-4.8)	109.3 (-5.4)	102.8 (-11.7)	105.7 (-7.8)	99.7 (-12.3)
SOI—IOS	-1.1	-0.5	-0.4	-0.4	-0.4	0.2
SOI*—IOS*	0.36	0.92	2.85	1.24	5.50	2.69
NOI*—ION*	8.06	2.21	5.11	1.96	2.03	3.35

Month—Mes	**7**	**8**	**9**	**10**	**11**	**12**
SST—TSM (°C)						
Area 1 (0°-10°S, 80°-90°W)	20.4 (-1.5)	19.2 (-1.6)	18.6 (-1.9)	18.8 (-2.1)	19.5 (-2.2)	20.8 (-2.0)
Area 2 (5°N-5°S, 90°-150°W	24.9 (-0.7)	23.9 (-1.1)	23.6 (-1.3)	23.4 (-1.5)	23.2 (-1.8)	23.6 (-1.5)
Area 3 (5°N-5°S, 120°-170°W)	26.9 (-0.2)	26.2 (-0.5)	25.8 (-0.8)	25.2 (-1.4)	25.1 (-1.3)	25.0 (-1.5)
Area 4 (5°N-5°S, 150W°-160°E)	28.8 (0.2)	28.6 (0.1)	28.1 (-0.4)	27.9 (-0.6)	27.4 (-0.9)	27.4 (-0.9)
Thermocline depth—Profundidad de la termoclina, 0°, 80°W (m)	30	45	40	50	40	50
Thermocline depth—Profundidad de la termoclina, 0°, 110°W (m)	40	35	30	25	25	30
Thermocline depth—Profundidad de la termoclina, 0°, 150°W (m)	125	130	130	140	125	150
Thermocline depth—Profundidad de la termoclina, 0°, 180°W (m)	180	170	165	170	180	180
Sea level—Nivel del mar, Callao, Perú (cm)	-	109.1 (1.5)	-	-	-	96.3 (-12.3)
SOI—IOS	-0.5	0.1	0.2	0.6	0.9	1.8
SOI*—IOS*	4.36	7.92	4.12	0.77	4.14	5.38
NOI*—ION*	-1.61	-1.56	1.38	2.13	3.97	7.03