INTER-AMERICAN TROPICAL TUNA COMMMISSION
COMISIÓN INTERAMERICANA DEL ATÚN TROPICAL
QUARTERLY REPORT—INFORME TRIMESTRAL

July-September 2004
Julio-Septiembre 2004

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The

QUARTERLY REPORT

July-September 2004

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

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, and Spain in 2003. 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 June 17, 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 May 21, 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 February 15, 1999. In 2004 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 June 24-27, 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 are Parties to the 1949 Convention.

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 54th 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.

MEETINGS

Dr. Richard B. Deriso participated in a meeting of the Ocean Sciences Board of the U.S. National Research Council in Woods Hole, Massachusetts, on July 7-9, 2004. His travel expenses were paid by the National Research Council.

Dr. Robin Allen spent the period of July 13-16, 2004, in Japan. He participated in a workshop on compliance with the resolutions of the Multilateral High Level Conference on South Pacific Tuna Fisheries and the Commission for the Conservation and Management of Highly Migratory Fish Stocks of the Western and Central Pacific Ocean (WCPFC) in Sapporo. In addition, he visited the Overseas Fishery Cooperation Foundation in Tokyo, where he discussed a proposed Japanese project to mitigate the impact of the longline fishery on sea turtles.

Dr. Mark N. Maunder and Mr. Simon D. Hoyle participated in a joint meeting of the 22nd International Biometric Conference and the Australian Statistical Conference, in Cairns, Australia, on July 11-16, 2004. Dr. Maunder presented a paper entitled "Ecological Modeling: Information and Uncertainty," and Mr. Hoyle presented one entitled "Integrating Effective Population Size Estimates into Population Dynamics Models."

Dr. Michael G. Hinton participated in the 17th Meeting of the Standing Committee on Tuna and Billfish (SCTB) of the Oceanic Fisheries Programme of the Secretariat of the Pacific Community, which was held on Majuro Atoll, Republic of the Marshall Islands, on August 9-18,

2004. This was the last meeting of this *ad hoc* scientific group, which will be succeeded, with more formal functions, by the Scientific Committee of the WCPFC, which will be responsible for developing the scientific basis for recommendations for conservation and management of stocks within its area of responsibility. He also attended the third meeting of the Scientific Committee of the WCPFC, which was held in Majuro on August 19-21, 2004. Information developed by the SCTB working groups was presented to that meeting for consideration and development of recommendations to be made to the WCPFC at its first meeting, which will take place in late 2004.

Dr. Mark N. Maunder participated in a meeting of the International Council for the Exploration of the Sea (ICES) in Ijmuiden, Netherlands, from August 30 to September 2, 2004, where he served as an independent reviewer for the ICES assessments of the southern shelf demersal stocks. He was also involved in the reviews of the assessments for the hake, monkfish, and megrim stocks in the northeastern Atlantic Ocean. His expenses were paid by the ICES.

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 collected 76 length-frequency samples and abstracted logbook information for 260 trips of commercial fishing vessels during the third quarter of 2004. In addition, personnel in La Jolla obtained two length-frequency samples of bluefin from recreational fishing vessels.

Also during the third quarter members of the field office staffs placed IATTC observers on 120 fishing trips by vessels that participate in the AIDCP On-Board Observer Program. In addition, 119 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 for purse-seine and pole-and-line vessels 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 purse-seine and pole-and line vessels that are fishing, or are expected to fish, in the eastern Pacific Ocean (east of 150°W; EPO) during 2004 is about 210,500 cubic meters (m^3) (Table 1). The weekly average at-sea capacity for the fleet, for the weekly periods ending June 27 through October 3, was about 126,800 m^3 (range: 101,300 to 161,200 m^3). Data on the tuna fleet of the EPO are given in Table 2. The changes of flags and

vessel names and additions to and deletions from the IATTC's fleet list during the third quarter of 2004 are given in Table 3.

Catch and catch-per-unit-of-effort statistics for the purse-seine and pole-and-line fisheries

Catch statistics

The estimated total retained catches of tunas in the EPO during the period of January 1-October 3, 2004, and the corresponding periods of 1999-2003, in metric tons, were:

Species	2004	1999-2003			Weekly average, 2003
		Average	Minimum	Maximum	
Yellowfin	239,700	283,400	211,700	325,000	6,000
Skipjack	137,100	166,900	112,200	220,400	3,400
Bigeye	25,300	36,500	23,100	62,100	<1,000

Summaries of the preliminary estimated retained catches, by flag of vessel, are shown in Table 4.

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

The logbook data used in the analyses have been obtained with the cooperation of vessel owners and captains. The catch and effort measures used by the IATTC staff are based on fishing trips landing predominantly yellowfin, skipjack, bigeye, and bluefin tuna. The great majority of the purse-seine catches of yellowfin, skipjack, and bigeye are made by Class-6 vessels (vessels with well volumes greater than 425 m^3), and only data for Class-6 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 size classes. There are no adjustments included for other factors, such as type of set or vessel operating costs and market prices, which might identify whether a vessel was directing its effort toward a specific species.

Preliminary estimates of the catches per day's fishing (CPDFs), by purse seiners, of yellowfin (Table 5), skipjack (Table 6), and bigeye (Table 7) in the EPO during the first two quarters of 2004 and the corresponding periods of 1999-2003, in metric tons, were:

Species	Region	2004	1999-2003		
			Average	Minimum	Maximum
Yellowfin	N of 5° N	11.8	18.3	13.2	24.3
	S of 5° N	8.1	6.7	5.0	10.2
Skipjack	N of 5° N	2.1	2.5	1.2	3.5
	S of 5° N	6.9	11.2	7.1	18.2
Bigeye	EPO	1.6	3.4	1.8	6.1

Preliminary estimates of the catches per day's fishing (CPUEs), by pole-and-line vessels, of yellowfin and skipjack (Table 6), in the EPO during the first two quarters of 2004 and the corresponding periods of 1999-2003, in metric tons, were:

Species	2004	1999-2003		
		Average	Minimum	Maximum
Yellowfin	-	1.6	0.3	3.9
Skipjack	2.8	0.8	0.2	1.9

Catch statistics for the longline fishery

The catches of bigeye by longline gear in the EPO during the first half and the third quarter of 2004 are shown in Table 8. Equivalent data are not available for the other species of tunas, or for billfishes.

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 1).

Data for fish caught during the second quarter of 1999-2004 are presented in this report. Two length-frequency histograms are presented for each species. The first shows the data by fishery (area, gear type, and set type) for the second quarter of 2004 and the second shows the second-quarter catches for the current year and the previous five years. A total of 164 wells, 163 on purse seiners and 1 on a pole-and-line vessel, were sampled during the second quarter of 2004. As no samples of yellowfin caught by pole-and-line vessels were obtained, the estimates of the size distributions of the yellowfin catches made by pole-and-line vessels were obtained by using length-frequency data from fish caught in unassociated schools by purse seiners.

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 1). The last fishery includes all 13 sampling areas. Of the 164 wells sampled, 119 contained yellowfin. The estimated size compositions of these fish are shown in Figure 2a. The catches of yellowfin during the second quarter of 2004 were greatest in dolphin sets, and in the fishery on unassociated schools in the Southern area. The largest fish, on average, were caught in the dolphin fishery in the Southern area. The distinct mode of fish between 80 and 100 cm encountered in the Southern unassociated fishery during the first quarter was less evident during the second quarter. However, a mode of smaller fish between about 50 and 70 cm, was encountered in this area during the second quarter. Many of the yellowfin caught in the Northern and Southern dolphin fisheries were more than 120 cm in length. The catches of yellowfin in the floating-object fishery of the Equatorial area (approximately 300 metric tons (t)) and in the pole-and-line fishery (less than 100 t) were negligible.

The estimated size compositions of the yellowfin caught by all fisheries combined during the second quarter of 1999-2004 are shown in Figure 2b. The modes of small and large fish mentioned in the previous paragraph are evident in the graph for 2004. The distribution of fish between these modes was relatively uniform.

There are eight fisheries for skipjack defined for stock assessments: four floating-object, two unassociated school, one dolphin, and one pole-and-line (Figure 1). The last two fisheries include all 13 sampling areas. Of the 164 wells sampled, 96 contained skipjack. The estimated size compositions of these fish are shown in Figure 3a. The greatest catches of skipjack during the first quarter were taken in the floating-object and unassociated fisheries of the Southern area. During the second quarter, the catches of these fisheries remained high, but large proportions of the total catch were also taken in the floating-object and unassociated fisheries of the Northern area. The average weights were similar in those fisheries, except for the floating-object fishery in the Northern area, in which a large proportion of small fish were caught. The catch in the Inshore floating-object fishery was negligible (less than 300 t).

The estimated size compositions of the skipjack caught by all fisheries combined during the second quarter of 1999-2004 are shown in Figure 3b. The proportion of larger skipjack taken during the second quarter of 2004 was greater than during the first quarter of that year.

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 1). The last three fisheries include all 13 sampling areas. Of the 164 wells sampled, 30 contained bigeye. The estimated size compositions of these fish are shown in Figure 4a. The majority of the catch of bigeye was taken in floating-object sets in the Northern and Southern areas, with modes evident at around 50 and 85 cm, and a scattering of fish as large as 155 cm. Appreciable amounts were also caught in the Equatorial floating-object fishery. There were no recorded catches of bigeye in dolphin sets, in the Inshore floating-object fishery, or by pole-and-line vessels.

The estimated size compositions of the bigeye caught by all fisheries combined during the second quarter of 1999-2004 are shown in Figure 4b. The two modes of fish mentioned above are apparent in the graph for 2004, along with a few smaller modes of larger fish.

The estimated retained catch of bigeye less than 60 cm in length during the first half of 2004 was 4,193 t, or about 27 percent of the estimated total catch of bigeye. The corresponding amounts for the first halves of 1999-2003 ranged from 1,990 to 5,945 t.

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 Ecuador, the European Union, Mexico, 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 2004 the observer programs of the European Union, Mexico, 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 On-Board Observer Program is not practical.

Observers from the On-Board Observer Program departed on 175 fishing trips aboard purse seiners covered by the AIDCP during the third quarter of 2004. Preliminary coverage data for these vessels during the quarter are shown in Table 8.

Training

There were no IATTC observer training courses during the quarter.

RESEARCH

Tuna tagging

One IATTC scientist spent the period of August 10-21, 2004, aboard the long-range sport-fishing vessel *Shogun,* chartered by the Monterey Bay Aquarium, where he assisted in the implantation of archival tags in tunas off Baja California, Mexico. The tagging component of the charter was part of the Tagging of Pacific Pelagics (TOPP) program, which is one of several programs supported by the Census of Marine Life (COML). Archival tags (Lotek LTD 2310) were implanted in 102 albacore, 34 yellowfin, 8 bluefin, and 1 bigeye.

A bluefin tuna with a tag that had been placed on it in the EPO was recaptured in the Western Pacific Ocean. The data are as follows:

Release			Recapture		
Location	**Date**	**Length**	**Location**	**Date**	**Weight**
30°01'N-116°20'W	July 17, 2001	848 mm	39°03'N-56°19'E	July 10, 2004	75 kg (gilled and gutted)

Early life history studies

Yellowfin broodstock

The yellowfin broodstock in Tank 1 (1,362,000 L) at the Achotines Laboratory spawned daily from July 1 through August 16. Spawning occurred between 7:25 p.m. and 9:35 p.m. The numbers of eggs collected after each spawning event ranged from about 14,000 to 756,000.

From August 17 through September 30 there was no spawning. It is possible that a small decrease in water temperature (about 0.2° C), which occurred over a 1-week period, might have triggered the cessation of spawning. It is also possible that with the large number of immature fish in Tank 1 the larger fish may not have been getting sufficient rations. The water temperatures in the tank ranged from 27.9° to 28.7°C during the quarter.

Five fish, four 15- to 33-kg males and one 20-kg female, died during the quarter from wall strikes. Three fish (7- to 10-kg) were added during the quarter. At the end of September there were three size groups of fish in Tank 1: 2 large fish (74- and 89-kg), 11 26- to 36-kg fish, and 9 8- to 21-kg fish.

From January 2003 through April 2004 archival tags had been implanted in yellowfin tuna (IATTC Quarterly Reports for January-March 2003 and April-June 2004), and at the end of September 2004 11 fish from those groups remained in Tank 1. During the quarter one additional yellowfin (9.8 kg) was implanted with an archival tag and added to the population in Tank 1, bringing the total number of archival-tagged fish in Tank 1 to 12.

During the quarter 25 yellowfin were captured and placed into Tank 2 as reserve broodstock, bringing the total number of yellowfin in Tank 2 to 28. These fish will be used in sorting-grid trials during the fourth quarter of 2004.

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.

During the quarter 50,000 yolk-sac larvae were stocked into three 720-L tanks and reared for several weeks, at which time the surviving early juveniles were transferred to a 10,000-L tank. These fish were maintained on a diet of yellowfin larvae and several types of artificial pellet feed. After approximately 50 days after hatching only a few fish were alive, but these had been completely weaned to a diet of pellet feed only. The last fish died at 65 days after hatching, at which time they had reached a size of approximately 6 cm standard length. These fish were the first juvenile yellowfin reared partially on an artificial diet at the Achotines Laboratory. Further rearing trials of early-juvenile yellowfin, using artificial diets, are planned.

Experiments with yellowfin larvae

An experiment was conducted during the quarter to determine the maximum survivable water temperature for first-feeding yellowfin larvae. The object of the experiment was to determine the physical limitations to the distribution of yellowfin larvae in the ocean. The results from the temperature experiment indicate that first-feeding larvae are not capable of surviving at water temperatures ≥34ºC after the first 2 days of feeding; but that they are capable of feeding and surviving at 32ºC for up to 3 days after first feeding.

Studies of snappers

The work on snappers (*Lutjanus guttatus*) is carried out by the Dirección General de Recursos Marinos y Costeros de Panamá.

During the quarter 16 snappers of the broodstock established in 1996 and held in Tank 3 continued spawning several times per week. The broodstock had not spawned from January through May 2004, but had resumed spawning in June 2004.

Twenty-six snappers, which had been raised at the Achotines Laboratory from eggs hatched in 1998 to mature adults and are being held in Tank 4, spawned regularly during 2003, but did not spawn during the first two quarters of 2004. During July these fish began to spawn intermittently, and they continued to spawn throughout the quarter.

Workshop on rearing pelagics

The University of Miami and the IATTC held their second workshop on "Physiology and Aquaculture of Pelagics, with Emphasis on Reproduction and Early Developmental Stages of Yellowfin Tuna" on July 12-23, 2004. The organizers and primary instructors were Dr. Daniel Benetti, Director of the Aquaculture Program of the Rosenstiel School of Marine and Atmospheric Science, University of Miami, Dr. Daniel Margulies (IATTC), and Mr. Vernon P. Scholey (IATTC). The participants were Dr. Jose Rivera of NOAA Fisheries, Boqueron, Puerto Rico, Dr. John Lamkin of NOAA Fisheries, Miami, and Mr. Felipe Santibanez of Blue and Green International, Lima, Peru. Two University of Miami graduate students, Thomas Street and Samantha Whitcraft, took the course for credit, and fellow graduate student Patrick Rice participated as a research assistant. The workshop included lectures and daily laboratory presentations on methods for spawning and rearing tropical pelagic species, with special emphasis on rearing of yellowfin larvae. A fee for the participants covered the expenses of putting on the workshop. Mr. Amado Cano of the Dirección General de Recursos Marinos y Costeros de Panamá and several members of the staff of the Achotines Laboratory also participated in portions of the workshop.

Visitors at the Achotines Laboratory

Dr. Alexandra Amat, a post-doctoral researcher at the Smithsonian Tropical Research Institute (STRI) field laboratory in Bocas del Toro, Panama, made several visits to the Achotines Laboratory during August and September 2004. During her visits she collected corals and began an experiment to examine the effects of temperature and carbon dioxide levels on coral growth. The experiment will run until November 2004.

Mr. Franklin Guerra, Marine Aquarist at the STRI Galeta Laboratory, and Mr. Renier Vargas, Marine Aquarist at the STRI Culebra Exhibition Center, spent the period of August 24-25, 2004, at the Achotines Laboratory, where they examined its seawater system and culture methods.

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 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 new 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 in the tropical EPO had been near normal during the second quarter. The area of cool water off Peru that was present during June persisted during July and August, but disappeared in September. Also, a small area of cool water was present west of the Galapagos Islands during July. Several areas of warm water appeared during July, a narrow band along the equator between about 140°W to 175°E, a tongue extending from north temperate waters between about 130°W and 160°W, and an area in the Gulf of California that extended south to about 20°N. The narrow band along the equator persisted during August and September, and the tongue extending from north temperate waters increased its size, extending from about 120°W to 175°W in September (Figure 5). The area of warm water in the Gulf of California expanded south to about 10°N in August, but disappeared in September. The data in Table 9, for the most part, indicate that conditions were close to normal during the third quarter, although the thermocline was unusually deep at 0°-150°W in September. However, there are two large areas of warm water west of 120°W, and the Climate Diagnostics Bulletin of the U.S. National Weather Service considers that an El Niño episode was in effect, and states that these conditions are expected to continue "into early 2005."

Sea turtles

Sea turtles are caught incidentally by longline gear, which is a matter of considerable concern. A program to mitigate the impact of the Japanese longline fishery on sea turtles, which would be carried out the by Overseas Fishery Cooperation Foundation of Japan, has been proposed. There has been a considerable increase in longlining by small vessels based in nations adjacent to the eastern Pacific Ocean during recent years. In response to this, the IATTC has begun a program, supported by the World Wildlife Fund and the U.S. National Oceanic and Atmospheric Administration (NOAA), to estimate the mortalities of sea turtles due to longline fishing and to seek ways to reduce this mortality by (1) reducing the catches of sea turtles and (2) reducing the mortalities of sea turtles that are caught. The initial work has been carried out in Ecuador, with full cooperation from the Ecuadorian government and the fishing industry of Ecuador. The most promising approach is replacement of the J hooks currently used in the longline fishery with circle hooks. However, it must be determined whether the catches of tunas, billfishes, and dorado (*Coryphaena* spp.) with circle hooks are equal to or greater than those by J

hooks. Three consultants, Jimmy Martinez, Liliana Rendon, and Vanesa Velásquez, have been hired to carry out most of the work. The owners of several Ecuadorian boats volunteered to participate in the testing of the hooks by replacing some of the J hooks with circle hooks in a pattern that made it possible to compare the catch rates of different species by different sizes of the two types of hooks in the fisheries for tunas and for dorado. Observers accompanied these vessels to record the performances of the different hooks, and to make observations on the locations of the hooks that took turtles, procedures for release for the turtles that were hooked, *etc*. More than 90 boats are participating in the hook exchange program, and more than 60 observer trips have produced a substantial amount of data on the performance of the hooks.

In addition, the following work was carried out in other countries of Latin America:

- Colombia: Three workshops were organized in Tumaco on August 1-2, and a meeting with industry and government representatives took place in Cali on August 3 to launch the Colombian sea turtle program.
- Costa Rica: Dr. Martín A. Hall gave a presentation, "A Strategy to Reduce Sea Turtle Bycatch in the Artisanal Longline Fisheries of the Eastern Pacific," at a meeting of the Scientific Committee of the Inter-American Sea Turtle Convention in San Jose, Costa Rica, on August 24, 2004.
- Guatemala: Six workshops were organized by Dr. Fraterno Diaz and the staff of the Unión Nacional de Pescadores (UNIPESCA) at Puerto San José, Puerto Quetzal, Iztapa, Las Lisas, and Buena Vista, all Pacific ports. Dr. Hall, Mr. Erick Largacha, and Dr. Christofer H. Boggs (U.S. National Marine Fisheries Service, Honolulu, Hawaii) participated in the activities. NOAA contributed hooks for the experiments and support for the future observer program to monitor the experiments.
- Mexico: Planning meetings were organized to launch the regional sea turtle program, which will begin in late 2004. These involved government fisheries authorities, environmental agencies, and non-governmental organizations. Dr. Hall gave a presentation, "The Role of a Regional Fishery Organization, the Inter-American Tropical Tuna Commission, in the Conservation of Sea Turtles in the Eastern Pacific 'Commons'" at the Tenth Biennial Conference of the International Association for the Study of Common Property in Oaxaca, Mexico, on August 12, 2004.
- Panama: Workshops were held at Vacamonte and Chorrillo, both on the Pacific coast of Panama, and near Colon, on the Atlantic coast of Panama. At the request of the Dirección de Recursos Marinos y Costeros of Panama, a seminar, "El Programa Regional de Tortugas Marinas en el Pacifico Oriental," was presented by Dr. Hall at an FAO technical meeting on vessel-monitoring systems, held in Panama on August 6, 2004. In addition, he gave a presentation on the current status of the IATTC Tuna-Dolphin Program and on dolphin-safe certification at a conference, also organized by the Dirección de Recursos Marinos y Costeros, held at the Club Náutica in Panama City.
- Peru: Dr. Hall and Dr. Jeffrey A. Seminoff (U.S. National Marine Fisheries Service, La Jolla, California) participated in a round of activities that took place in Peru in September. A long-term program was developed, and the activities for the coming months were planned. In addition, they presented the following seminars:

  "Pesca de Altura y la Interferencia con las Tortugas Marinas," Universidad Peruana Cayetano Heredia, Lima, September 8, 2004;

"Las Tortugas Marinas y la Pesca de Altura," Universidad Nacional Agraria La Molina, Lima, September 8, 2004;

"El Programa Regional de Tortugas Marinas en el Pacifico Oriental," Instituto del Mar del Perú, Callao, Septiembre 9, 2004 (by Dr. Hall only).

GEAR PROGRAM

During the third quarter IATTC staff members participated in five dolphin safety-gear inspection and safety-panel alignment procedures, three aboard Mexican-flag purse seiners and one each aboard a Guatemalan-flag and a Nicaraguan-flag purse seiner.

There were no AIDCP seminars for fishermen conducted during the third quarter.

PUBLICATIONS

Fishery Status Report

No. 2: 109 pp. – LINK

Outside journals

Allen, Robin. 2004. Situación actual y perspectivas para el futuro de las pesquerías atuneras en el Océano Pacífico oriental. Industria Conservera, 48: 12-14.

Gaertner, Daniel, Jean-Pierre Hallier, and Mark N. Maunder. 2004. A tag attrition model as a means to estimate the efficiency of two types of tags used in tropical tuna fisheries. Fish. Res., 69 (2): 171-180.

IATTC staff. 2004. Informe ejecutivo sobre el funcionamiento del APICD en 2003: Acuerdo sobre el Programa Internacional para la Conservación de los Delfines. Industria Conservera, 48: 54-55.

Kimura, Shingo, Hideaki Nakata, Daniel Margulies, Jenny M. Suter, and Sharon L. Hunt. 2004. Effect of oceanic turbulence on the survival of yellowfin tuna larvae. Nippon Suisan Gakkaishi 70 (2): 175-178. [In Japanese with English abstract].

Maunder, Mark N. 2004. Population viability analysis based on combining Bayesian, integrated, and hierarchical analyses. Acta Oecologica, 26 (2): 85-94.

McCarthy, Michael A., David Keith, Justine Tietjen, Mark A Burgman, Mark Maunder, Larry Master, Barry W. Brook, Georgina Mace, High P. Possingham, Rodrigo Medellin, Sandy Andelman, Helen Regan, and Mary Ruckelshaus. 2004. Comparing predictions of extinction risk using models and subjective judgment. Acta Oecologica, 26 (2): 67-74.

ADMINISTRATION

Ms. Aidamalia Vargas, a graduate of the University of Panama, took over the position of supervisory biologist at the Achotines Laboratory on July 7, 2004. She replaces Mr. Abdiel

Juárez, who resigned on May 13, 2004, to accept employment with a commercial fishing company.

Ms. Berta Juárez, secretary to the Director since July 1987, retired on August 31, 2004. Ms. Juárez was always a cheerful person, and performed her work efficiently in the office and at the many IATTC meetings that she attended. She will be missed, but everyone wishes her many happy years of retirement.

Ms. Alejandra Ferreira has taken Ms. Juarez's place, Ms. Monica Galván has taken Ms. Ferreira's place, and Ms. Ivette Escobar, a graduate of the Instituto Tecnológico y de Estudios Superiores, Monterrey, Mexico, who was hired on August 16, 2004, has taken Ms. Galván's place.

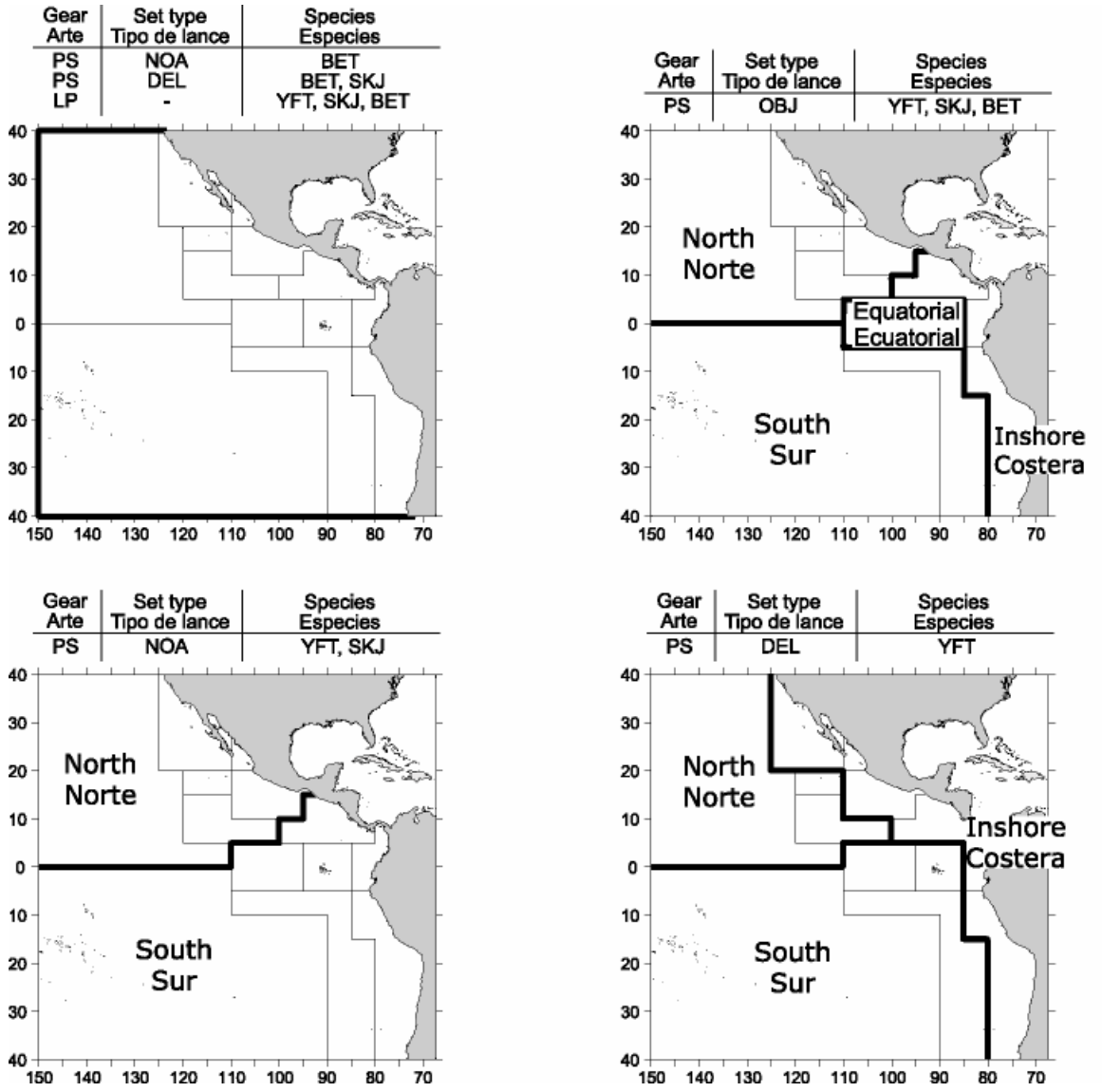

FIGURE 1. Spatial extents of the fisheries defined by the IATTC staff for stock assessment of yellowfin, skipjack, and bigeye in the EPO. The thin lines indicate the boundaries of the 13 length-frequency sampling areas, and the bold lines the boundaries of the fisheries. Gear: PS = purse seine, LP = 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, patudo, y aleta azul 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 = no asociado, DEL = delfín; OBJ = objeto flotante; Especies: YFT = aleta amarilla, SKJ = barrilete, BET = patudo.

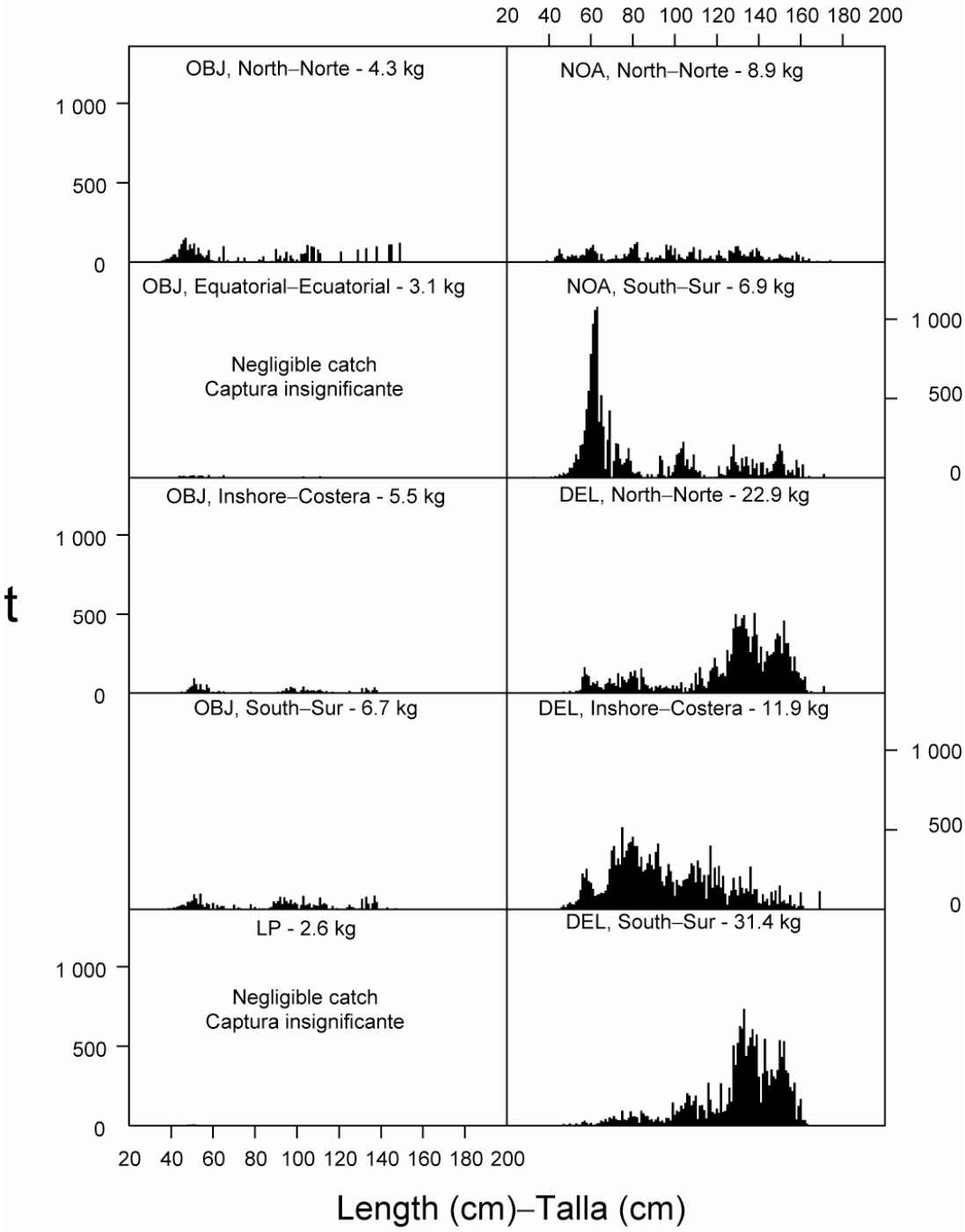

FIGURE 2a. Estimated size compositions of the yellowfin caught in each fishery of the EPO during the second quarter of 2004. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons; OBJ = floating object; LP = pole and line; NOA = unassociated; DEL = dolphin.

FIGURA 2a. Composición por tallas estimada del aleta amarilla capturado en cada pesquería del OPO durante el segundo trimestre de 2004. En cada recuadro se detalla el peso promedio de los peces en las muestras. t = toneladas métricas; OBJ = objeto flotante; LP = caña; NOA = no asociado; DEL = delfín.

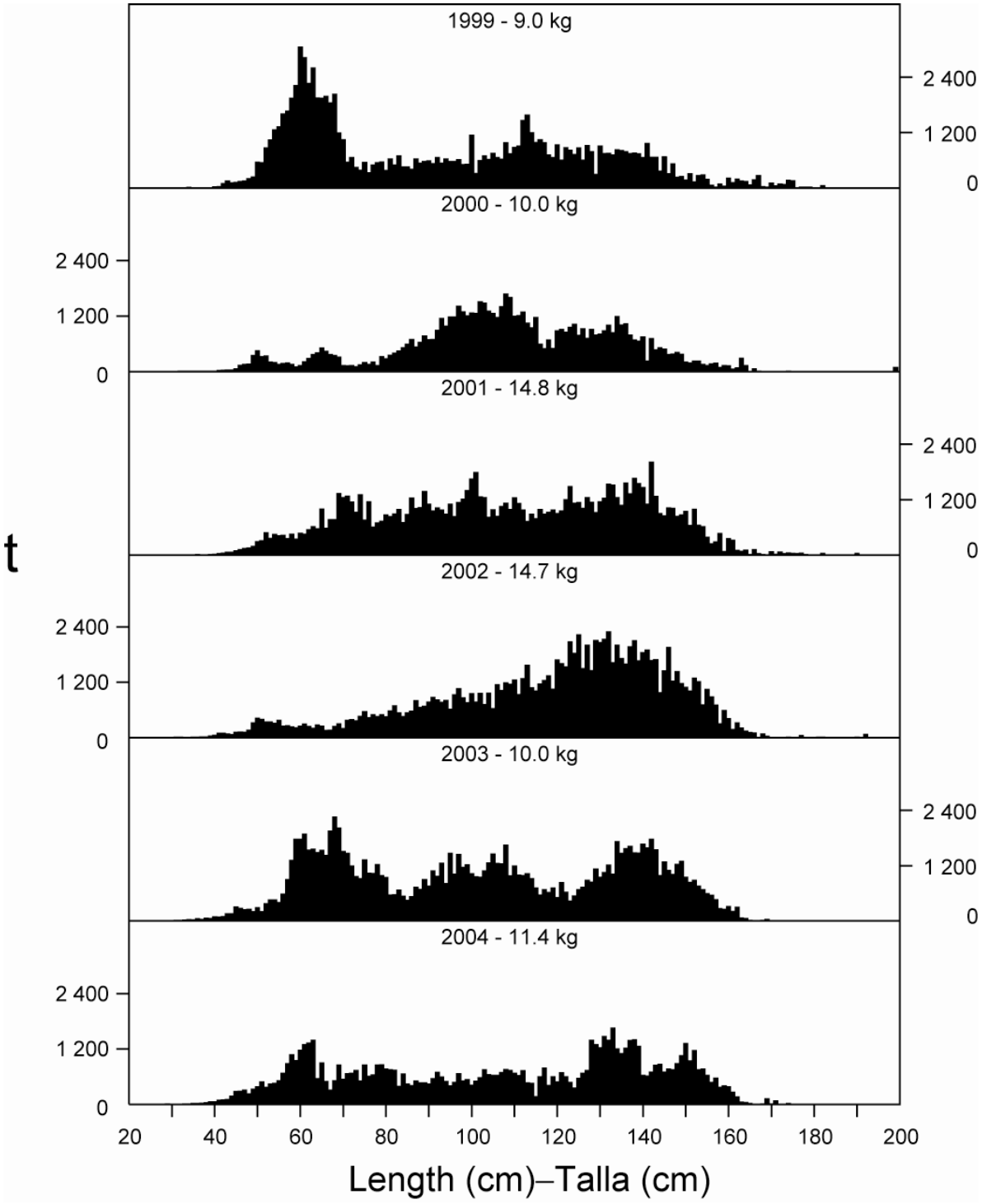

FIGURE 2b. Estimated size compositions of the yellowfin caught in the EPO during the second quarter of 1999-2004. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons.

FIGURA 2b. Composición por tallas estimada del aleta amarilla capturado en el OPO en el segundo trimestre durante 1999-2004. En cada recuadro se detalla el peso promedio de los peces en las muestras. t = toneladas métricas.

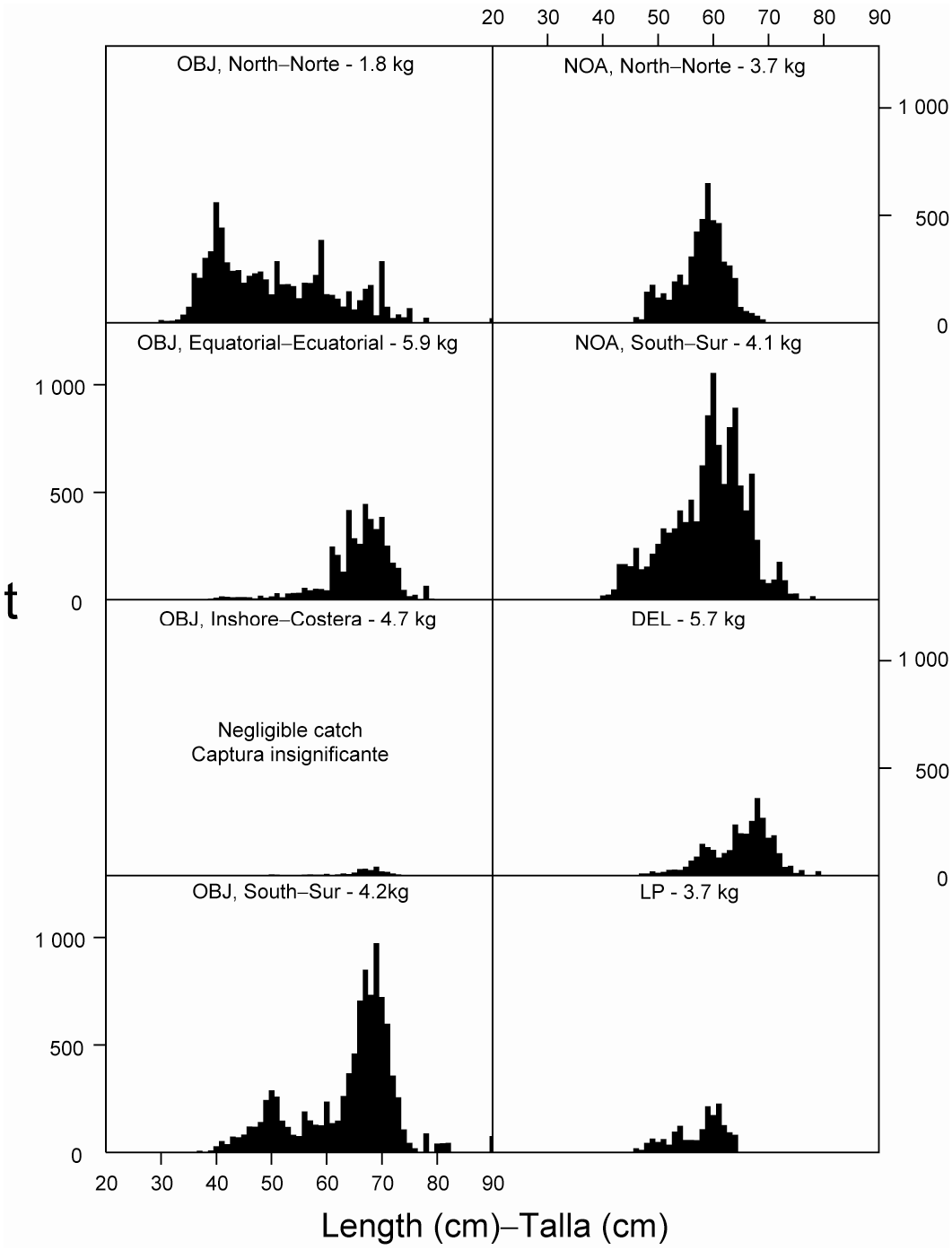

FIGURE 3a. Estimated size compositions of the skipjack caught in each fishery of the EPO during the second quarter of 2004. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons; OBJ = floating object; LP = pole and line; NOA = unassociated; DEL = dolphin.

FIGURA 3a. Composición por tallas estimada del barrilete capturado en cada pesquería del OPO durante el segundo trimestre de 2004. En cada recuadro se detalla el peso promedio de los peces en las muestras. t = toneladas métricas; OBJ = objeto flotante; LP = caña; NOA = no asociado; DEL = delfín.

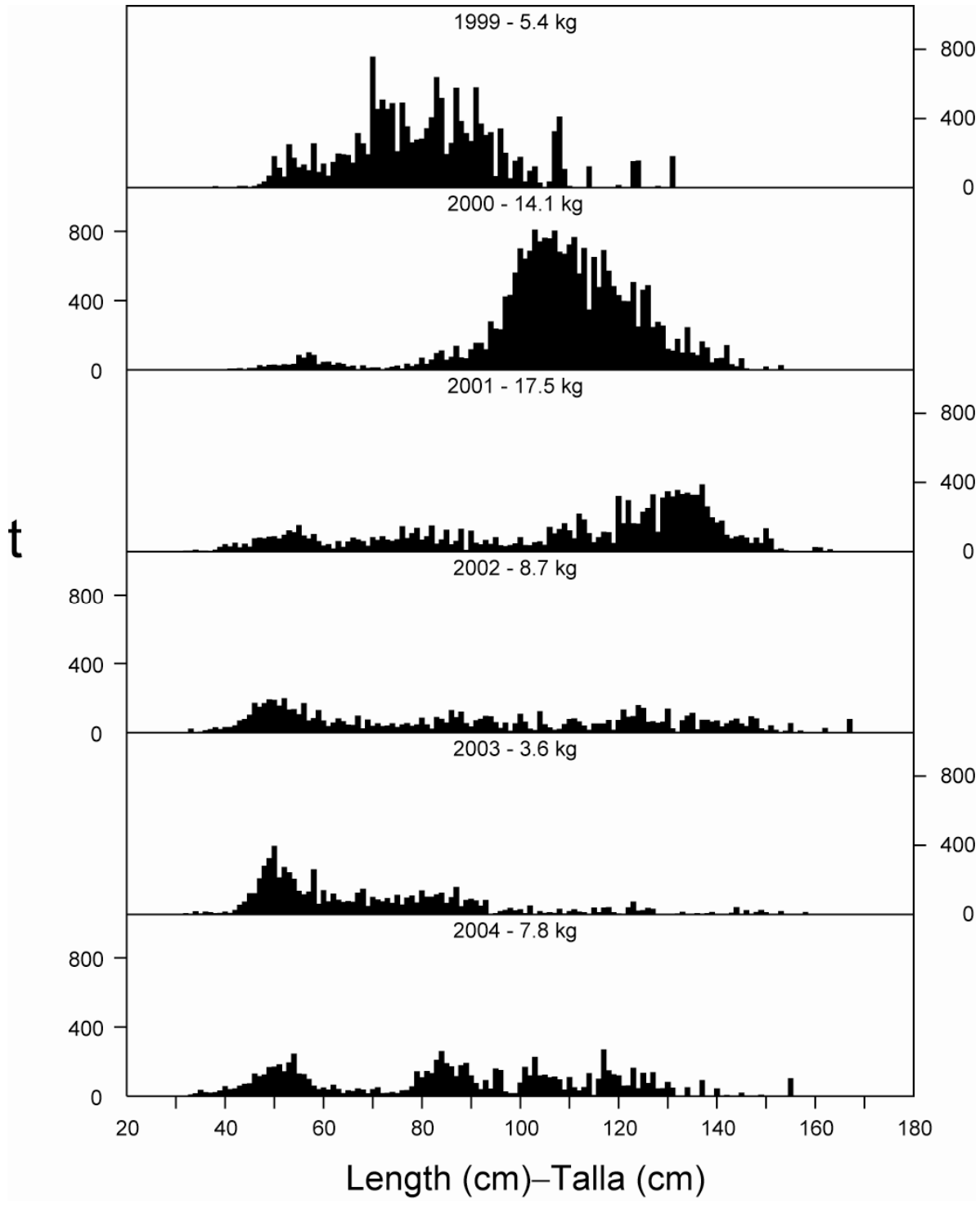

FIGURE 3b. Estimated size compositions of the skipjack caught in the EPO during the second quarter of 1999-2004. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons.
FIGURA 3b. Composición por tallas estimada del barrilete capturado en el OPO en el segundo trimestre durante 1999-2004. En cada recuadro se detalla el peso promedio de los peces en las muestras. t = toneladas métricas.

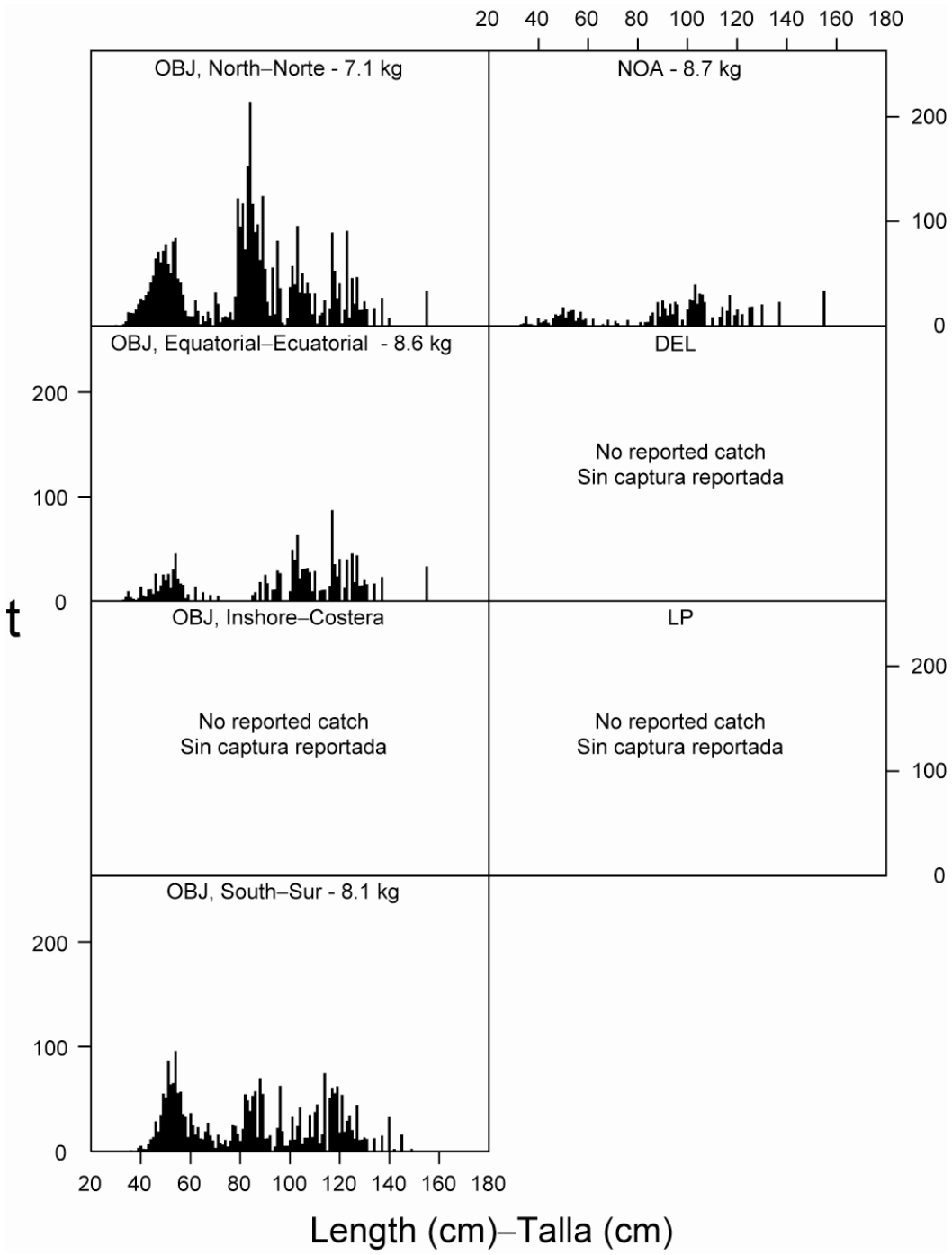

FIGURE 4a. Estimated size compositions of the bigeye caught in each fishery of the EPO during the second quarter of 2004. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons; OBJ = floating object; LP = pole and line; NOA = unassociated; DEL = dolphin.

FIGURA 4a. Composición por tallas estimada del patudo capturado en cada pesquería del OPO durante el segundo trimestre de 2004. En cada recuadro se detalla el peso promedio de los peces en las muestras. t = toneladas métricas; OBJ = objeto flotante; LP = caña; NOA = no asociado; DEL = delfín.

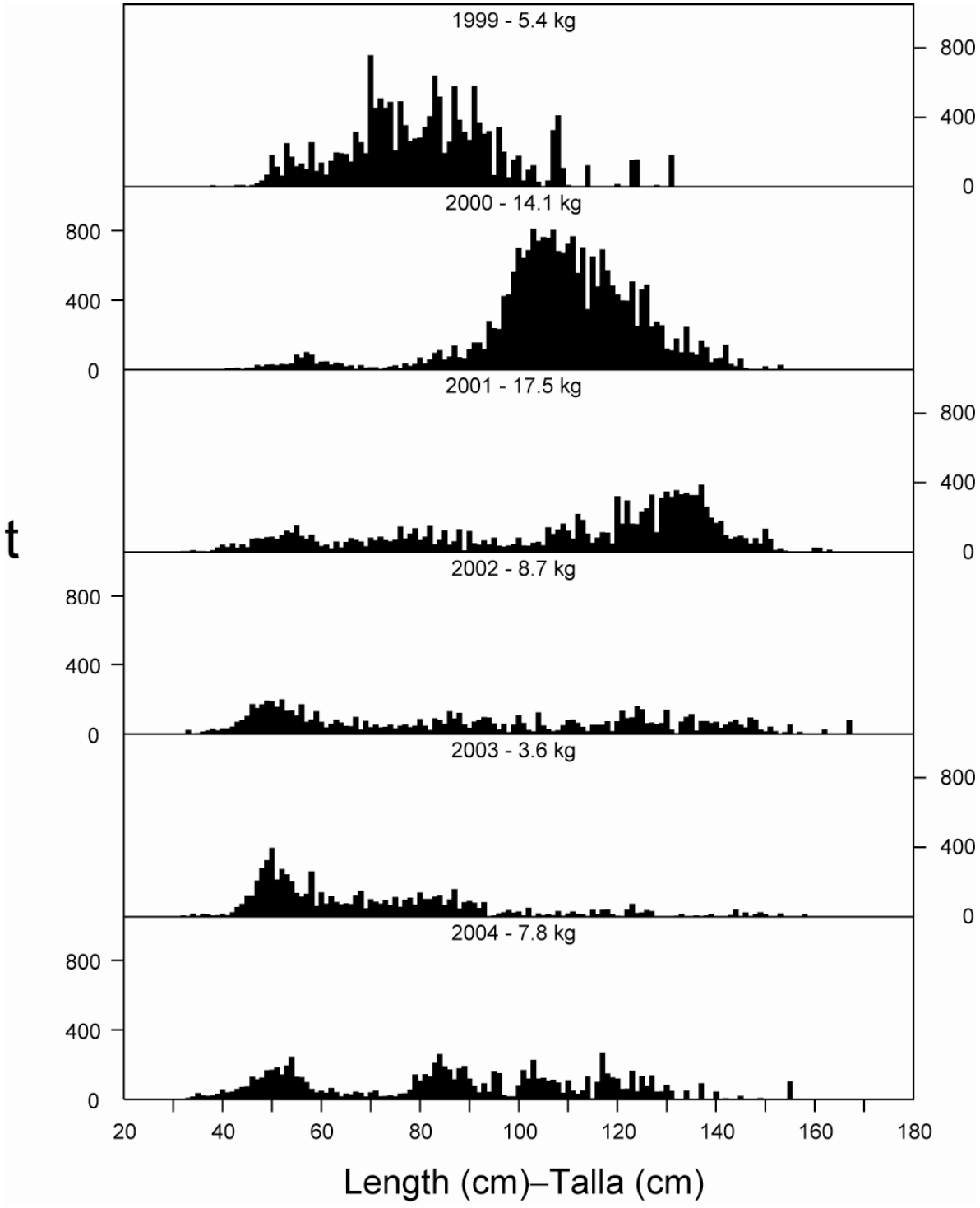

FIGURE 4b. Estimated size compositions of the bigeye caught in the EPO during the second quarter of 1999-2004. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons.

FIGURA 4b. Composición por tallas estimada del patudo capturado en el OPO en el segundo trimestre durante 1999-2004. En cada recuadro se detalla el peso promedio de los peces en las muestras. t = toneladas métricas.

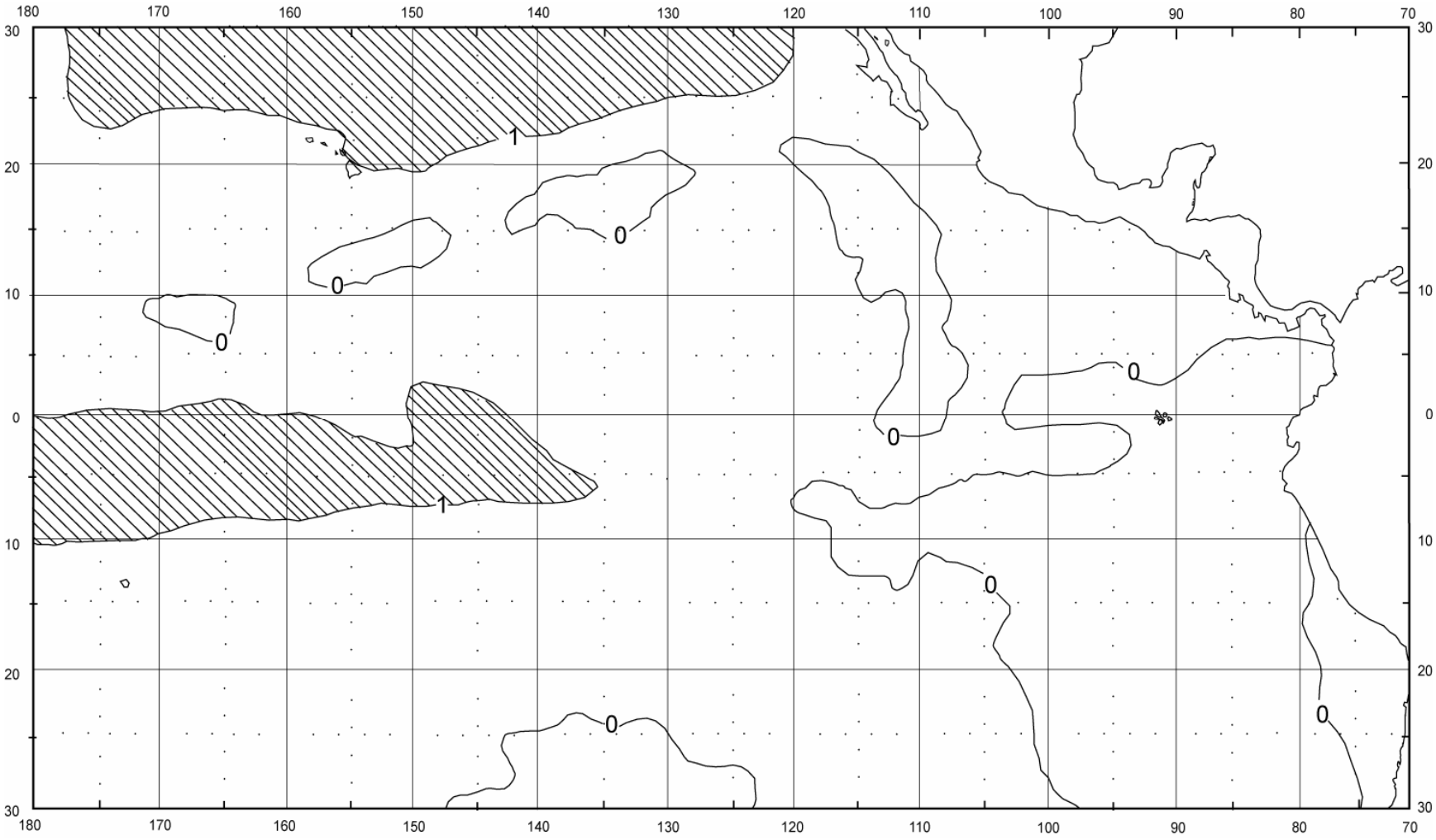

FIGURE 5. Sea-surface temperature (SST) anomalies (departures from long-term normals) for September 2004, based on data from fishing boats and other types of commercial vessels.
FIGURA 5. Anomalías (variaciones de los niveles normales a largo plazo) de la temperatura superficial del mar (TSM) en septiembre de 2004, basadas en datos tomados por barcos pesqueros y otros buques comerciales.

TABLE 1. Preliminary estimates of the numbers and carrying capacities, in cubic meters, of purse seiners and pole-and-line vessels operating in the EPO in 2004 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; LP = pole-and-line.

TABLA 1. Estimaciones preliminares del número de buques cerqueros y de cañero que pescan en el OPO en 2004, 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; LP = cañero.

Flag Bandera	Gear Arte	Size class—Clase de arqueo							Capacity Capacidad
		1	2	3	4	5	6	Total	
					Number—Número				
Bolivia	PS	-	-	2	1	-	6	9	7,424
Colombia	PS	-	-	-	1	1	6	8	8,318
Ecuador	PS	-	6	11	12	9	39	77	49,567
España—Spain	PS	-	-	-	-	-	4	4	8,859
Guatemala	PS	-	-	-	-	-	2	2	3,415
Honduras	PS	-	-	-	-	-	2	2	1,798
México	PS	-	-	3	7	11	40	61	53,503
	LP	-	1	3	-	-	-	4	526
Nicaragua	PS	-	-	-	-	-	3	3	3,926
Panamá	PS	-	-		1	1	19	21	27,156
Perú	PS	-	-	-	-	-	1	1	996
El Salvador	PS	-	-	-	-	-	3	3	5,377
Unknown—Desconocida	PS	-	-	1	-	-	-	1	209
USA—EE.UU.	PS	-	-	1	-	-	6	7	8,178
Venezuela	PS	-	-	-	-	-	24	24	31,542
Vanuatu	PS	-	-	-	-	-	5	5	5,585
All flags— Todas banderas	PS	-	6	18	22	21	155	222	
	LP	-	1	3	-	-	-	4	
	PS+LP	-	7	21	22	21	155	226	
					Capacity—Capacidad				
All flags— Todas banderas	PS	-	676	3,383	6,119	9,328	190,464	209,970	
	LP	-	101	425	-	-	-	526	
	PS+LP	-	777	3,808	6,119	9,328	190,464	210,496	

TABLE 2. Eastern Pacific Ocean surface fleet, by flag, vessel name, gear type (PS = purse seine; LP = pole-and-line), and cubic meters of fish-carrying capacity, as of October 3, 2004.
TABLA 2. La flota atunera de superficie del Océano Pacífico oriental, por bandera, nombre del barco, tipo de arte (PS = cerquero; LP = cañero), y metros cúbicos de capacidad de acarreo de pescado, hasta el 3 de octubre de 2004.

Flag and vessel name	Gear type	Capacity	Flag and vessel name	Gear type	Capacity
Bandera y nombre de buque	**Tipe de arte**	**Capacidad**	**Bandera y nombre de buque**	**Tipe de arte**	**Capacidad**
Bolivia			**Ecuador (cont.)**		
Amanda S	PS	1,268	*Indico*	PS	267
Cabo De Hornos	PS	680	*Ingalapagos*	PS	285
Gold Coast	PS	1,194	*Intrepido*	PS	85
Mar Cantabrico	PS	222	*Isabel Victoria V*	PS	307
Nazca	PS	1,414	*Jacobita*	PS	374
Sea Gem	PS	1,274	*José Antonio*	PS	142
			Joselito	PS	91
Colombia			*Julia D*		
American Eagle	PS	1,275	*Killa*		
El Dorado	PS	382	*Lizi*	PS	1,038
El Rey	PS	1,168	*Ljbuica M.*	PS	275
Enterprise	PS	1,272	*Lucia T*	PS	738
Grenadier	PS	1,176	*Lucy*	PS	245
Marta Lucia R.	PS	1,600	*Malula*	PS	849
Patricia Lynn	PS	270	*Manuel Ignacio F*	PS	644
Sandra C	PS	1,175	*Maria*	PS	168
			Maria Del Carmen	PS	320
Ecuador			*Maria Isabel*	PS	276
Alize	PS	688	*Mariajosé*	PS	1,013
Amalis	PS	217	*Mariella*	PS	1,041
Balbina	PS	217	*Medjugorje*	PS	843
Betty C	PS	1,010	*Milagros A*	PS	1,550
Betty Elizabeth	PS	290	*Miry Ann D*	PS	497
Cap. Berny B.	PS	1,285	*Monte Cristi*	PS	1,232
Carmen D	PS	503	*North Queen*	PS	257
Cesar V	PS	335	*Patricia*	PS	962
Charo	PS	2,023	*Ramoncho*	PS	96
Chasca	PS	249	*Roberto A*	PS	323
Diana Maria	PS	154	*Roberto M*	PS	1,161
Dominador	PS	162	*Rocio*	PS	1,366
Don Antonio	PS	197	*Rodolfo X*	PS	662
Don Bartolo	PS	495	*Romeo*	PS	125
Don Mario	PS	552	*Rosa F*	PS	662
Doña Luz	PS	786	*Rossana L*	PS	809
Doña Roge	PS	592	*Samsun Ranger*	PS	1,033
Doña Tula	PS	603	*San Andres*	PS	1,862
Drennec	PS	1,140	*San Mateo*	PS	1,033
Eillen Marie	PS	350	*Saturno*	PS	106
Elizabeth Cinco	PS	1,265	*Southern Queen*	PS	137
Elizabeth F	PS	738	*Tarqui*	PS	459
Fernandito	PS	147	*Ugavi*	PS	1,870
Fiorella L	PS	390	*Ugavi Dos*	PS	1,864
Gabriela A	PS	323	*Via Simoun*	PS	1,324
Gloria A	PS	543	*Victor Andres*	PS	115
Gloria C	PS	248	*Western Pacific I*	PS	274
Ile Aux Moines	PS	750	*Yelisava*	PS	855
			Yolanda L	PS	1,168

TABLE 2. (continued)
TABLE 2. (continuación)

Flag and vessel name	Gear type	Capacity	Flag and vessel name	Gear type	Capacity
Bandera y nombre de buque	**Tipe de arte**	**Capacidad**	**Bandera y nombre de buque**	**Tipe de arte**	**Capacidad**
España—Spain			**México (cont.)**		
Albacora Quince	PS	1,900	*Lupe Del Mar*	PS	1,298
Albacora Uno	PS	2,800	*Manolo*	PS	300
Aurora B.	PS	2,079	*Maranatha*	LP	125
Rosita C	PS	2,080	*Maria Antonieta*	PS	1,118
			María Beatriz	PS	829
Guatemala			*Maria Del Mar*	PS	1,242
J M Martinac	PS	1,475	*Maria Fernanda*	PS	1,232
Sant Yago Uno	PS	1,940	*Maria Gabriela*	LP	112
			María Luisa	PS	1,168
Honduras			*Maria Rosana*	PS	1,142
Blue Tuna	PS	1,012	*Maria Veronica*	PS	1,232
Eastern Pacific	PS	628	*Mazatun*	PS	1,482
Esthercho	PS	1,170	*Mazcu I*	PS	240
			Mazpesca	PS	493
México			*Molly N*	LP	101
Aguila Descalza	PS	493	*Monica*	PS	1,311
Ana Maria	LP	188	*Nair*	PS	1,346
Ariete	PS	490	*Nair II*	PS	1,275
Arkos I Chiapas	PS	1,348	*Nair III*	PS	240
Arkos II Chiapas	PS	1,348	*San José*	PS	220
Atilano Castano	PS	1,297	*San Miguel*	PS	294
Atun I	PS	807	*San Rafael*	PS	294
Atun VI	PS	809	*Tamara*	PS	493
Atun VIII	PS	751	*Theresa Janene*	PS	1,275
Azteca 1	PS	1,202	*Tizoc*	PS	180
Azteca 10	PS	1,627	*Tlaloc*	PS	810
Azteca 11	PS	493	*Tutankamon*	PS	784
Azteca 12	PS	493			
Azteca 2	PS	1,274	**Nicaragua**		
Azteca 3	PS	1,524	*Capt Vincent Gann*	PS	1,593
Azteca 4	PS	1,278	*Capt. Joe Jorge*	PS	1,229
Azteca 5	PS	1,282	*Raffaello*	PS	1,104
Azteca 6	PS	1,283			
Azteca 7	PS	1,383	**Panamá**		
Azteca 8	PS	1,157	*Albacora Catorce*	PS	1,880
Azteca 9	PS	733	*Albacora Doce*	PS	1,880
Bonnie	PS	1,278	*Cape Breton*	PS	1,556
Buenaventura I	PS	1,005	*Cape Ferrat*	PS	1,561
Buenaventura II	PS	1,005	*Cervantes*	PS	775
Cabo San Lucas	PS	1,478	*Contadora I*	PS	1,514
Camila	PS	493	*Danielle. D*	PS	1,022
Cartadedeces	PS	807	*Don Italo*	PS	486
Chac Mool	PS	1,190	*Julie L*	PS	2,056
Donna Cristina	PS	1,282	*La Parrula*	PS	889
Edgar Ivan	PS	260	*Lautaro*	PS	1,275
Ensenada	PS	381	*Lucile F*	PS	1,583
Estado 29	PS	725	*Mary Lynn*	PS	285
Excalibur	PS	160	*Milena A.*	PS	996
Guaymas	PS	359	*Napoleon*	PS	1,668
José Gerardo	PS	351	*Panama Tuna*	PS	3,300
Juan Pablo I	PS	300	*Sea King*	PS	1,487
Juan Pablo II	PS	250	*Sirenza I*	PS	490
Judith I	PS	809	*Sofia Lynn*	PS	586
			Tiuna	PS	1,202

TABLE 2. (continued)
TABLE 2. (continuación)

Flag and vessel name	Gear type	Capacity	Flag and vessel name	Gear type	Capacity
Bandera y nombre de buque	**Tipe de arte**	**Capacidad**	**Bandera y nombre de buque**	**Tipe de arte**	**Capacidad**
El Salvador			**Venezuela (cont.)**		
Montelucia	PS	2,550	*Falcon*	PS	1,137
Monteneme	PS	908	*Jane*	PS	1,250
Monterocio	PS	1,919	*Judibana*	PS	1,231
			La Foca	PS	1,287
USA—EE.UU.			*Los Roques*	PS	1,262
Atlantis	PS	1,275	*Maria Del Mar A*	PS	1,784
Cape Elizabeth	PS	1,773	*Marinero*	PS	1,244
Cape Hatteras	PS	1,805	*Orinoco II*	PS	1,581
Connie Jean	PS	605	*Sea Royal*	PS	1,488
Donna B	PS	170	*Taurus I*	PS	1,191
			Taurus Tuna	PS	1,175
Venezuela			*Templario*	PS	1,268
Amazonas	PS	1,115	*Ventuari*	PS	1,542
Calypso	PS	1,168			
Canaima	PS	1,094	**Vanuatu**		
Carirubana	PS	1,137	*Chiara*	PS	803
Carmela	PS	1,241	*Esmeralda C.*	PS	1,358
Caroni II	PS	1,438	*Mirelur*	PS	1,360
Cayude	PS	1,274			
Conquista	PS	1,168	**Unknown—Desconocida**		
Cuyuni	PS	1,573	*Caribbean Star No. 31*	PS	209
Don Abel	PS	1,226	*Don Alvaro*	PS	180
			Don Luis	PS	180

TABLE 3. Changes in the IATTC fleet list recorded during the third quarter of 2004. PS = purse seine; LP = pole-and-line; WPO = western Pacific Ocean.
TABLA 3. Cambios en la flota observada por la CIAT registrados durante el tercero trimestre de 2004. PS = cerquero; LP = cañero; WPO = Océano Pacífico occidental.

Vessel name	Flag	Gear	Capacity (m^3)	Remarks	
Nombre del buque	**Bandera**	**Arte**	**Capacidad (m^3)**	**Comentarios**	
Vessels added to the fleet—Buques añadidos a la flota					
New entry—1er ingreso					
				Now—Ahora	
J M Martinac	Guatemala	PS	1,475		
Cape Breton	Panamá	PS	1,556		
Re-entries—Reingresos					
				Now—Ahora	
Romeo	Ecuador	PS	125		
Lupe Del Mar	México	PS	1,298		
Capt Vincent Gann	USA-EE.UU.	PS	1,593	Nicaragua	
Tradition	USA-EE.UU.	PS	1,275		
Changes of name or flag—Cambios de nombre o pabellon					
				Now—Ahora	
Blue Tuna		PS	1,012	Honduras	
Don Alvaro	Bolivia	PS	180	Unknown—Desconocida	
Don Luis	Bolivia	PS	180	Unknown—Desconocida	
Aurora		PS	490	Panamá	*Sirenza I*
Capt Joe Jorge		PS	1,229	Nicaragua	
Napoleon		PS	1,668	Panamá	
Vessels removed from fleet—Buques retirados de la flota					
Legacy	USA-EE.UU.	PS	1,275	Fishing in the WPO–Pescando en el WPO	

TABLE 4. Preliminary estimates of the retained catches of tunas in the EPO from January 1 through October 3, 2004, by species and vessel flag, in metric tons.
TABLA 4. Estimaciones preliminares de las capturas retenidas de atunes en el OPO del 1 de enero al 3 de octubre 2004, 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	37,315	55,458	9,857	-	7	-	48	4	102,689	25.0
España—Spain	3,678	12,497	3,483	-	-	-	-	-	19,658	4.8
México	74,085	20,941	27	8,843	-	89	418	2	104,405	25.4
Panamá	30,955	14,505	5,397	-	-	-	-	-	50,857	12.3
USA—EE.UU.	2,617	3,762	1,969	-	-	-	38	-	8,386	2.0
Venezuela	48,837	10,758	533	-	-	-	2	-	60,130	14.6
Vanuatu	1,733	6,416	2,465	-	-	-	-	-	10,614	2.6
Other—Otros[2]	40,515	12,721	1,520	-	-	-	-	-	54,756	13.3
Total	239,735	137,058	25,251	8,843	7	89	506	6	411,495	

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

TABLE 5. Logged catches and catches per day's fishing[1] (CPDF) of yellowfin in the EPO, in metric tons, during the period of January 1-June 30, based on fishing vessel logbook information.
TABLA 5. 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 junio, basado en información de los cuadernos de bitácora de buques pesqueros.

Area	Fishery statistic Estadística de pesca	Year-Año					
		1999	2000	2001	2002	2003	2004[2]
Purse seine—Red de cerco							
North of 5°N	Catch—Captura	73,700	46,900	44,100	53,000	70,300	26,500
Al norte de 5°N	CPDF—CPDP	14.1	13.2	18.7	24.3	21.0	11.8
South of 5°N	Catch—Captura	26,300	51,700	48,500	24,600	20,600	35,800
Al sur de 5°N	CPDF—CPDP	5.3	7.5	10.2	5.5	5.0	8.1
Total	Catch—Captura	100,000	98,600	92,600	77,600	90,900	62,300
	CPDF—CPDP	11.8	10.2	14.2	18.3	17.4	9.7
Annual total Total anual	Catch—Captura	169,300	157,100	149,000	148,900	155,500	
Pole and line—Cañero							
Total	Catch—Captura	600	400	1,900	200	<100	
	CPDF—CPDP	1.5	1.5	3.9	1.0	0.3	
Annual total	Catch—Captura	1,500	2,200	3,300	800	500	

[1] Purse-seiners, Class-6 only. The catch values are rounded to the nearest 100, and the CPDF values to the nearest 0.1.
[1] Cerqueros de las Clase 6. Se redondean los valores de captura al 100 más cercano, y los de CPDP al 0.1 más cercano.
[2] preliminary—preliminar

TABLE 6. Logged catches and catches per day's fishing[1] (CPDF) of skipjack in the EPO, in metric tons, during the period of January 1-June 30, based on fishing vessel logbook information.
TABLA 6. 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 junio, basado en información de los cuadernos de bitácora de buques pesqueros.

Area	Fishery statistic Estadística de pesca	Year-Año					
		1999	2000	2001	2002	2003	2004[2]
Purse seine—Red de cerco							
North of 5°N Al norte de 5°N	Catch—Captura CPDF—CPDP	18,300 3.5	11,500 3.2	5,900 2.5	2,600 1.2	7,100 2.1	4,600 2.1
South of 5°N Al sur de 5°N	Catch—Captura CPDF—CPDP	91,100 18.2	89,500 13.0	33,600 7.1	36,200 8.0	40,200 9.9	30,300 6.9
Total	Catch—Captura CPDF—CPDP	109,400 15.8	101,000 11.9	39,500 6.4	38,800 7.6	47,300 8.7	34,900 6.3
Annual total Total anual	Catch—Captura	184,700	128,800	71,700	67,700	98,600	
Pole and line—Cañero							
Total	Catch—Captura CPDF—CPDP	100 0.3	100 0.3	100 0.2	400 1.9	<100 1.1	<100 2.8
Annual total	Catch—Captura	1,700	100	300	500	500	

[1] Purse-seiners, Class-6 only. The catch values are rounded to the nearest 100, and the CPDF values to the nearest 0.1.
[1] Cerqueros de las Clase 6. Se redondean los valores de captura al 100 más cercano, y los de CPDP al 0.1 más cercano.
[2] preliminary—preliminar

TABLE 7. Logged catches and catches per day's fishing[1] (CPDF) of bigeye in the EPO, in metric tons, during the period of January 1-June 30, based on purse-seine vessel logbook information.
TABLA 7. 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 June, basado en información de los cuadernos de bitácora de buques cerqueros.

Fishery statistic—Estadística de pesca	Year—Año					
	1999	2000	2001	2002	2003	2004[2]
Catch—Captura	25,700	44,300	16,400	9,600	7,900	7,900
CPDF—CPDP	3.6	6.1	3.3	2.0	1.8	1.6
Total annual catch—Captura total anual	43,100	64,500	31,500	21,000	20,400	

[1] Class-6 vessels only. The catch values are rounded to the nearest 100, and the CPDF values to the nearest 0.1.
[1] Buques de las Clase 6 solamente. Se redondean los valores de captura al 100 más cercano, y los de CPDF al 0.1 más cercano.
[2] preliminary—preliminar

TABLE 8. Catches of bigeye tuna in the eastern Pacific Ocean during 2004 by longline vessels.
TABLA 8. Captures de atún patudo en el Océano Pacífico oriental durante 2004 por buques palangreros.

Flag	Quarter			Month			Third quarter	Total to date
	1	2	1 + 2	7	8	9		
Bandera	Trimestre			Mes			Tercer trimestre	Total al fecha
	1	2	1 + 2	7	8	9		
China	501	63	564	175	0	-	175	739
European Union—Unión Europea	4	-	4	-	-	-	-	4
Japan—Japón	5,696	4,043	8,431	1,502	1,538	1,285	4,325	14,064
Republic of Korea—República de Corea	2,802	3,042	5,038	818	615	678	2,111	7,955
Chinese Taipei—Taipei Chino	2,910	2,025	4,562	191	163	305	659	5,594
Vanuatu	350	81	431	-	-	-	-	431
Total	12,263	9,254	19,030	2,686	2,316	2,268	7,270	28,787

TABLE 9. Preliminary data on the sampling coverage of trips by vessels with capacities greater than 363 metric tons by the observer programs of the IATTC, Ecuador, the European Union, Mexico, Venezuela, and the Forum Fisheries Agency (FFA) during the third quarter of 2004. The numbers in parentheses indicate cumulative totals for the year.

TABLA 9. 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, Ecuador, México, el Unión Europea, Venezuela, y el Forum Fisheries Agency (FFA) durante el tercero trimestre de 2004. Los números en paréntesis indican totales acumulados para el año.

Flag	Trips		Observed by program								Percent observed	
			IATTC		National		FFA		Total			
Bandera	Viajes		Observado por programa								Porcentaje observado	
			CIAT		Nacional		FFA		Total			
Bolivia	5	(25)	5	(25)					5	(25)	100.0	(100.0)
Colombia	6	(24)	6	(24)					6	(24)	100.0	(100.0)
Ecuador	40	(187)	25	(121)	15	(66)			40	(187)	100.0	(100.0)
España—Spain	5	(18)	4	(11)	1	(7)			5	(18)	100.0	(100.0)
Guatemala	1	(2)	1	(2)					1	(2)	100.0	(100.0)
Honduras	4	(12)	4	(12)					4	(12)	100.0	(100.0)
Mexico	57	(190)	28	(100)	29	(90)			57	(190)	100.0	(100.0)
Nicaragua	4	(6)	4	(6)					4	(6)	100.0	(100.0)
Panamá	19	(78)	19	(78)					19	(78)	100.0	(100.0)
El Salvador	2	(15)	2	(15)					2	(15)	100.0	(100.0)
U.S.A.—EE.UU.	2	(16)	2	(14)			0	(2)	2	(16)	100.0	(100.0)
Venezuela	26	(93)	16	(48)	10	(45)			26	(93)	100.0	(100.0)
Vanuatu	4	(18)	4	(18)					4	(18)	100.0	(100.0)
Total	175	(684)[1]	120	(474)	55	(208)	0	(2)	175	(684)[1]	100.0	(100.0)

[1] Includes 74 trips (52 by vessels with observers from the IATTC program and 22 by vessels with observers from the national programs) that began in late 2003 and ended in 2004

[1] Incluye 74 viajes (52 por observadores del programa del CIAT y 22 por observadores de los programas nacionales) iniciados a fines de 2003 y completados en 2004

TABLE 10. Oceanographic and meteorological data for the Pacific Ocean, April-September 2004. The values in parentheses are anomalies.
TABLA 10. Datos oceanográficos y meteorológicos del Océano Pacífico, Abril-Septiembre 2004. Los valores en paréntesis son anomalías.

Month—Mes	4	5	6	7	8	9
SST—TSM, 0°-10°S, 80°-90°W (°C)	25.3 (-0.2)	23.1 (-1.3)	21.6 (-1.4))	20.7 (-1.1)	19.6 (-1.2)	20.1 (-0.4)
SST—TSM, 5°N-5°S, 90°-150°W (°C)	27.4 (0.0)	26.7 (-0.3))	26.3 (-0.1)	25.4 (-0.2))	25.1 (0.1)	25.2 (0.3)
SST—TSM, 5°N-5°S, 120°-170°W (°C)	27.8 (0.2)	28.1 (0.3)	27.8 (0.3)	27.7 (0.6)	27.5 (0.8)	27.5 (0.8)
SST—TSM, 5°N-5°S, 150W°-160°E (°C)	28.8 (0.3)	29.2 (0.5))	29.2 (0.5)	29.4 (0.8)	29.3 (0.9)	29.5 (1.1)
Thermocline depth—Profundidad de la termoclina, 0°, 80°W (m)	25	40	40	50	40	40
Thermocline depth—Profundidad de la termoclina, 0°, 110°W (m)	25	40	60	40	70	80
Thermocline depth—Profundidad de la termoclina, 0°, 150°W (m)	125	130	120	130	130	160
Thermocline depth—Profundidad de la termoclina, 0°, 180°W (m)	170	170	130	170	170	160
Sea level—Nivel del mar, Callao, Perú (cm)	113.9 (-0.6)	110.0 (-3.5)	107.2 (-4.8)	108.4 (-1.7)	110.9 (3.3)	106.5 (0.6)
Sea level—Nivel del mar, Baltra, Ecuador (cm)	-	-	-	-	185.0 (7.3)	183.5 (6.2)
SOI—IOS	-1.3	0.9	-1.3	-0.7	-0.8	-0.4
SOI*—IOS*	1.67	1.99	1.57	0.51	1.75	-0.60
NOI*—ION*	0.08	1.53	0.55	-1.06	-0.77	0.67