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

April-June 2005
Abril-Junio 2005

COMMISSIONERS—COMISIONADOS

DIRECTOR

Robin Allen

HEADQUARTERS AND MAIN LABORATORY—OFICINA Y LABORATORIO PRINCIPAL
8604 La Jolla Shores Drive
La Jolla, California 92037-1508, USA
www.iattc.org

The

QUARTERLY REPORT

April-June 2005

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

Abril-Junio 2005

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. It was ratified by Mexico on January 14, 2005, and by El Salvador on March 10, 2005.

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 55th 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

IATTC and AIDCP meetings

The reports of the IATTC and AIDCP meetings are available on the Meetings page of the IATTC web site.

The sixth meeting of the IATTC Working Group on Stock Assessment was held at Scripps Institution of Oceanography, La Jolla, California, on May 2-6. 2005. Many members of the staff participated in that meeting.

The following meetings of the IATTC and the AIDCP and their working groups were held in Lanzarote, Spain, in June 2005:

Inter-American Tropical Tuna Commission		
Meeting		**Dates**
6	Permanent Working Group on Compliance	June 17, 2005
8	Permanent Working Group on Fleet Capacity	June 22, 2005
73	Inter-American Tropical Tuna Commission	June 20-24, 2005

The following resolutions were adopted at the 73rd meeting of the IATTC:.

- C-05-01 Resolution on Incidental Mortality of Seabirds
- C-05-02 Resolution on Northern Albacore Tuna
- C-05-03 Resolution on the Conservation of Sharks Caught in Association with Fisheries in the Eastern Pacific Ocean
- C-05-04 Resolution Concerning the Adoption of Trade Measures to Promote Compliance
- C-05-05 Resolution on Full Retention
- C-05-06 Resolution on Financing
- C-05-07 Resolution to Establish a List of Vessels Presumed to Have Carried Out Illegal, Unreported and Unregulated Fishing Activities in the Eastern Pacific Ocean

Agreement on the International Dolphin Conservation Program		
Meeting		**Dates**
19	Permanent Working Group on Tuna Tracking	June 13, 2005
5	Working Group to Promote and Publicize the AIDCP Dolphin Safe Tuna Certification System	June 13, 2005
39	International Review Panel	June 14, 2005
13	Parties [to the AIDCP]	June 15 and 24, 2005
2	Scientific Advisory Board	June 19, 2005

The following resolution was adopted at the 13th meeting of the Parties to the AIDCP:

- A-05-01 Resolution on Vessel Assessments and Financing

IATTC and AIDCP		
Meeting		**Date**
4	Joint Working Group on Fishing by non-Parties	June 16, 2005

Other meetings

Dr. Robin Allen and Ms. Nora Roa-Wade participated in the annual meeting of the International Fisheries Commissions Pension Society in Victoria, B.C., Canada, on April 13-15, 2005.

Mr. Brian S. Hallman participated in a meeting of an ICCAT [International Commission for the Conservation of Atlantic Tunas] Working Group to Review Statistical Monitoring Programs, held in Fukuoka, Japan, on April 25-27, 2005. According to the ICCAT newsletter, the purpose of the meeting was to "evaluate the performance of the current system used by ICCAT to monitor international trade of bluefin, swordfish and bigeye products, and suggest improvements." The other tuna commissions, which have similar programs, were also represented at the meeting.

Dr. Richard B. Deriso participated in the second meeting of the U.S. National Academies committee, "Ecosystem Effects of Fishing: Phase II—Assessments of the Extent of Change and the Implications for Policy," in Washington, D.C., USA, on May 9-11, 2005, and in the third meeting of that committee, also in Washington, D.C., USA, on June 30-July 1, 2005. His expenses were paid by the U.S. Academies.

Many members of the IATTC staff attended all or parts of the 56th Tuna Conference in Lake Arrowhead, California, on May 23-26, 2005. Mr. Simon D. Hoyle and Dr. Michael G. Hinton were co-chairmen of the conference, and Dr. Robert J. Olson and Ms. Jenny M. Suter were moderators of sessions on Biological Studies and on Ecology, respectively. Talks were given by Dr. Robert J. Olson, Mr. Kurt M. Schaefer, and Ms. Jeanne B. Wexler. In addition, research in which Drs. Daniel Margulies, Mark N. Maunder, and Robert J. Olson, Messrs. Daniel W. Fuller, Simon D. Hoyle, and Vernon P. Scholey, and Mss. Sharon L. Hunt and Jenny M. Suter had participated was presented by other speakers. Also, a poster based on the work of Drs. Robert J. Olson, and Cleridy E. Lennert-Cody and Messrs. Marlon H. Román and Nickolas W. Vogel, was displayed. Finally, Mr. Edward H. Everett and Mss. JoyDeLee C. Marrow and Mildred D. De los Reyes performed much of the behind-the-scenes effort that was necessary to make the conference a success.

Drs. Martín A. Hall, Cleridy E. Lennert-Cody, Robert J. Olson, and Michael D. Scott and Messrs. David A. Bratten and Kurt M. Schaefer participated in the "ETP Purse-Seine Bycatch Reduction Workshop," convened by the U.S. National Marine Fisheries Service (NMFS), in La Jolla on May 31-June 1, 2005. Four people from the NMFS, one from the University of California at Davis, one from the Ocean Conservancy, and one from the Tagging of Pacific Pelagics program of the Census of Marine Life also participated in the workshop.

Dr. Robin Allen participated in the 4th informal meeting of states party to the United Nations Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, which took place in New York City from May 31 to June 2, 2005.

Dr. Mark N. Maunder participated in the Fifth International Workshop on Objective Bayes Methodology in Branson, Missouri, USA, on June 4-8, 2005. He and Dr. P. Takis Besbeas of the University of Kent presented a poster, "Data-based priors for objective Bayes methods," at the workshop.

Mr. Kurt M. Schaefer participated in the 2nd International Bio-logging Science Symposium, held at the University of St. Andrews, Scotland, on June 13-16, 2005. He presented a poster, coauthored with Mr. Daniel W. Fuller, entitled "Comparative performance of current generation geolocating archival tags."

Dr. Mark N. Maunder participated in the 2005 meeting of the Subgroup on Assessment Methods of the Working Group on Fish Stock Assessment (WG-FSA-SAM) of the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) in Yokohama, Japan, on June 27-July 1, 2005. His expenses were paid by the CCAMLR.

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 length-frequency samples from 201 wells and abstracted logbook information for 273 trips of commercial fishing vessels during the second quarter of 2005.

Also during the second quarter members of the field office staffs placed IATTC observers on 153 fishing trips by vessels that participate in the AIDCP On-Board Observer Program. In addition, 129 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 2005 is about 210,500 cubic meters (m^3) (Table 1). The weekly average at-sea capacity for the fleet, for the weekly periods ending April 4 through July 3, was about 152,900 m^3 (range: 130,700 to 168,700 m^3). The changes of flags and vessel names and additions to and deletions from the IATTC's fleet list during that period are given in Table 2.

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 January 1-July 3, 2005, period, in metric tons, were:

Species	**2005**	**2000-2004**			**Weekly average, 2005**
		Average	**Minimum**	**Maximum**	
Yellowfin	177,700	200,100	150,400	229,200	6,800
Skipjack	150,600	105,700	78,400	152,000	5,800
Bigeye	22,800	26,000	13,000	51,900	<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 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 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 quarter of 2005 and the corresponding periods of 2000-2004, in metric tons, were:

Species	Region	2005	2000-2004		
			Average	Minimum	Maximum
Yellowfin	N of 5°N	11.1	18.9	11.9	29.3
	S of 5°N	6.4	8.4	5.6	14.3
Skipjack	N of 5°N	3.6	2.2	0.5	4.7
	S of 5°N	12.2	10.0	7.7	15.5
Bigeye	EPO	1.5	2.6	1.4	5.4

Catch statistics for the longline fishery

The catches of bigeye by longline gear in the EPO during the first and second quarters of 2005 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, its Annual Reports for 1954-2002, its Fishery Status Reports 1 and 2, and its Stock Assessment Reports 1-5.

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 first quarter of 2000-2005 are presented in this report. Two sets of length-frequency histograms are presented for each species; the first shows the data by stratum (gear type, set type, and area) for the first quarter of 2005, and the second shows the combined data for the first quarter of each year of the 2000-2005 period. Samples from 201 wells were taken during the first quarter of 2005. There were no reported catches made by pole-and-line vessels during the first quarter of 2005.

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 201 wells sampled during the first quarter of 2005, 151 contained yellowfin. The estimated size compositions of these fish are shown in Figure 2a. The majority of the yellowfin catch was taken by sets on unassociated schools and on schools associated with dolphins. There were small amounts of yellowfin taken in floating-object sets. A mode of fish around 60 cm in length was evident in all of the floating-object and unassociated fisheries.

The estimated size compositions of the yellowfin caught by all fisheries combined during the first quarter of 2000-2005 are shown in Figure 2b. As was the case during the previous quarter, the average weights of the yellowfin caught during the first quarter of 2005 were less than during any of the previous five years, probably as a result of the large mode of small fish around 60 cm in length, mentioned above.

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 4). The last two fisheries include all 13 sampling areas. Of the 201 wells sampled during the first quarter of 2005, 152 contained skipjack. The estimated size compositions of these fish are shown in Figure 3a. Most of skipjack were caught in the Southern unassociated fishery. Negligible amounts of skipjack were taken in the Equatorial floating-object fishery, the Northern unassociated fishery, and in schools associated with dolphins.

The estimated size compositions of the skipjack caught by all fisheries combined during the first quarter of 2000-2005 are shown in Figure 3b. Most of the skipjack caught were between 40 and 55 cm, slightly larger than in the previous quarter.

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 201 wells sampled during the first quarter of 2005, 30 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 all but the Inshore area, where only a negligible amount was taken. A negligible amount of bigeye was caught in the unassociated fishery. There were no recorded catches of bigeye in dolphin sets or in the pole-and-line fishery.

The estimated size compositions of the bigeye caught by all fisheries combined during the first quarter of 2000-2005 are shown in Figure 4b. The average weight of bigeye during the first quarter of 2005 was greater than during that quarter of the previous two years, due to the presence of more fish larger than 100 cm.

The estimated retained catch of bigeye less than 60 cm in length during the first quarter of 2005 was 2,365 metric tons (t), or about 25 percent of the estimated total catch of bigeye by purse seiners. The corresponding amounts for 2000-2004 ranged from 501 to 3,194 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 Colombia, 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 2005 the observer programs of 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. The national program of Colombia, the Programa Nacional de Observadores, commenced operations during the first quarter of 2005, and it is expected that it will be sampling half of the trips of Colombian vessels by the end of 2005. (The remainder of the trips by Colombian vessels be will sampled by IATTC observers.) The national program of the European Union has sampled one trip of a Spanish-flag vessel in 2005, but has advised the IATTC that it will be inactive until further notice. In the meantime the IATTC program will sample the trips of Spanish vessels. 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 153 fishing trips aboard purse seiners covered by that program during the second quarter of 2005. Preliminary coverage data for these vessels during the quarter are shown in Table 8. In addition to those trips, the On-Board Observer Program is also placing observers aboard one vessel of less than 363 metric tons capacity during 2005, as required by AIDCP Resolution A-02-01. Four fishing trips by that vessel were sampled during the quarter.

Training

There was one IATTC observer training course during the quarter, held at the Department of Marine Biology of the Oceanographic Institute in Cumana, Venezuela, from April 11-27, 2005, for eight trainees.

RESEARCH

Tuna tagging

The chartered pole-and-line fishing vessel, *Her Grace*, with two IATTC employees aboard, returned to San Diego on May 8, 2005, following a 68-day chartered cruise on which tuna tagging operations were conducted in the equatorial eastern Pacific Ocean. The total numbers of tunas tagged and released during this cruise were as follows: bigeye, 1,982; skipjack, 381; yellowfin, 265. Archival tags, with light sensors for geolocation estimation, were implanted into the peritoneal cavities of 53 bigeye, ranging in length from 59 to 113 cm. Small archival tags, without light sensors, but with depth and temperature sensors, were also implanted into the peritoneal cavities of 48 skipjack, ranging in length from 44 to 65 cm.

Early life history studies

Yellowfin broodstock

The yellowfin broodstock in Tank 1 (1,362,000 L) at the Achotines Laboratory spawned daily throughout the quarter. Spawning occurred between 4:40 p.m. and 9:40 p.m. The numbers of eggs collected after each spawning event ranged from about 35,000 to 3,703,000. The water temperatures in the tank ranged from 26.2° to 29.2°C during the quarter.

Two archival-tagged males, 33 and 39 kg, died during the quarter from striking the wall of the tank. At the end of June there were three size groups of fish in Tank 1: one large fish (118 kg), 13 33- to 57-kg fish, and 13 12- to 23-kg fish.

From January 2003 through December 2004 archival tags had been implanted in yellowfin tuna (IATTC Quarterly Reports for January-March 2003, April-June 2004, October-December 2004, and January-March 2005), and at the end of June, nine fish from those groups remained in Tank 1 (8 33- to 57-kg fish and one 19-kg fish).

At the end of the quarter there were 11 yellowfin in Tank 2.

Experiments with yellowfin eggs and larvae

Several experiments were conducted during the quarter to determine the upper lethal water temperature and oxygen requirements during egg development, hatching, and post-hatching of yellowfin. These experiments, along with those conducted during 2004 (IATTC Quarterly Report for April-June 2004), were designed to examine the physical limitations for the distribution of eggs and yolk-sac and first-feeding larvae in the ocean. Several trials were conducted during the quarter at temperatures of 32° to 36°C and at oxygen levels of 25- to 40-percent saturation. The eggs appear to develop and hatch normally at water temperatures between 32° and 35°C, but the yolk-sac larvae that survived appeared malformed, with little movement during the first 18 hours after hatching, at water temperatures ≥34°C. Hatching was delayed in eggs incubated at 36°C, and all of the larvae died either prior to hatching or shortly thereafter. Eggs appeared to develop and hatch normally when incubated at mean dissolved oxygen levels of 2.7 mg/L (41 percent of oxygen saturation), 2.0 mg/L (31 percent of oxygen saturation), and 1.7 mg/L (25 percent of oxygen saturation); however, the yolk-sac larvae did not survive beyond 12 to 15 hours after hatching at mean dissolved oxygen levels ≤2.0 mg/L.

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.

Studies of snappers

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

Two separate broodstocks of snappers are being kept in two 85-m^3 tanks. The first consists of 16 individuals from the original broodstock caught in 1996. Their reproductive activity began again during the second week of June 2004, and they continued to spawn during the first half of the fourth quarter with high frequency and intensity (number of eggs). Intermittent spawning continued thereafter and during the second quarter 2005, but less frequently.

The second group consists of 26 individuals from a group bred at the Laboratory from eggs obtained from spawning in 1998. These fish, which in 2003 spawned until November, continued to spawn frequently during the second half of the fourth quarter of 2004, but less frequently thereafter.

Visitors at the Achotines Laboratory

The work of Dr. Alexandra Amat, a Smithsonian Tropical Research Institute (STRI) postdoctoral fellow, was described in the IATTC Quarterly Report for July-September 2004. Dr. Amat spent the period of April 8-15, 2005, at the Achotines Laboratory, where she completed her experiments.

Dr. Stephen W. Paccala, Frederick D. Petrie Professor in the Department of Ecology and Evolutionary Biology at Princeton University, taught a portion of his Coral Reef Ecology field course at the Achotines Laboratory. The 28-person group spent the period of April 23-27, 2005, at the Achotines Laboratory.

Dr. Sarah Gray, Associate Professor of Marine and Environmental Studies at the University of San Diego and Dr. Chris Metzler, Professor of Geology and Oceanography at Mira Costa College (Oceanside, California), spent the period of June 17-19, 2005, at the Achotines Laboratory, where they surveying coral reef systems in Panama to identify new study sites for their studies on tropical carbonates and coral reefs.

Dr. Wayne P. Sousa of the Department of Integrative Biology at the University of California at Berkeley spent the period of June 23-24, 2005, at Achotines Laboratory, where he surveyed nearby mangrove areas for potential long-term study sites.

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 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.

During the first quarter of 2005 the SSTs were nearly normal, although there were small areas of cool water near the equator east of 95°W during February and March and small areas of warm water off Central America and off northern Chile during March (IATTC Quarterly Report for January-March 2005: Figure 8). Near-normal conditions persisted during the second quarter of 2005. During April there was a small area of cool water off Ecuador and small areas of warm water off Colombia and Central America. During May there was a small area of cool water south of 25°S at about 140°W and scattered areas of warm water north of 20°N from the coast to 180°. During June there was an area of cool water off Peru and another one south of 25°S at about 135°W (Figure 5). The scattered areas of warm water that existed in May merged into a single warm-water area west of 130°W. Also, there was a small area of warm water at about 30°S-115°W. The data in Table 9 are mixed. The SSTs were below normal during April and June between 0° and 10°S and 80°W and 90°W, but above normal west of there during all three months. The SOIs were negative during April and May, and the SOI* was negative during June and, to a much lesser extent, during April. According to the Climate Diagnostics Bulletin of the U.S. National Weather Service for June 2005, "It is most likely that … neutral conditions will continue during the remainder of the [northern hemisphere] summer and fall."

Estimates of the mortality of dolphins due to fishing

The preliminary estimate of the incidental mortality of dolphins in the fishery in 2004 is 1,469 animals (Table 10), a slight decrease relative to the 1,502 mortalities recorded in 2003. The mortalities for 1979-2004, by species and stock, are shown in Table 11a, and the standard errors of these estimates are shown in Table 11b. The estimates for 1979-1992 are based on a mortality-per-set ratio. The estimates for 1993-1994 are based on the sums of the IATTC species and stock tallies and the total dolphin mortalities recorded by the Mexican program, prorated to species and stock. The mortalities for 1995-2004 represent the sums of the observed species and stock tallies recorded by the programs of the IATTC, Ecuador, Mexico, and Venezuela. The mortalities for 2001-2003 have been adjusted for unobserved trips of Class-6 vessels. The mortalities of the principal dolphin species affected by the fishery show declines in the last decade (Figure 6) similar to that for the mortalities of all dolphins combined (Figure 7). Estimates of the abundances of the various stocks of dolphins for 1986-1990 and the relative mortalities (mortality/abundance) are also shown in Table 10. The stocks with the highest levels of relative mortality were northeastern spotted dolphins, eastern spinner dolphins, and northern common dolphins (each 0.03 percent).

The number of sets on dolphin-associated schools of tuna made by Class-6 vessels decreased by 15 percent, from 13,839 in 2003 to 11,783 in 2004, and this type of set accounted for 52 percent of the total number of sets made in 2004, compared to 57 percent in 2003. The average mortality per set increased from 0.11 dolphins in 2003 to 0.12 dolphins in 2004. The estimated spatial distribution of the average mortalities per set during 2004 is shown in Figure 8. Typically, patches of relatively high mortalities per set were found throughout the fishing area, but in 2004 the higher-mortality areas were west of the Galapagos Islands, off the tip of Baja California, and at the far western edge of the fishery along the 10ºN parallel. The trends in the numbers of sets on dolphin-associated fish, mortality per set, and total mortality in recent years are shown in Figure 7.

The catches of dolphin-associated yellowfin decreased by 35 percent in 2004 relative to 2003. The percentage of the catch of yellowfin taken in sets on dolphins decreased from 76 percent of the total catch in 2003 to 69 percent of the catch in 2004, and the average catch of yellowfin per set on dolphins decreased from 20 to 15 metric tons. The mortality of dolphins per metric ton of yellowfin caught increased from 0.0053 in 2003 to 0.0080 in 2004.

Causes of the mortality of dolphins

The above figures are based on data from trips covered by observers from all components of the On-Board Observer Program. The comparisons in the next paragraph are based on the IATTC data bases for 1986-2004 only.

The decrease in the mortality per set is the result of actions by the fishermen to better manage the factors that bring about incidental mortalities of dolphins. Indicative of this effort is the number of sets in which no mortalities occurred, which has risen from 38 percent in 1986 to 94 percent in 2004, and the average number of animals left in the net after backdown, which has decreased from 6.0 in 1986 to less than 0.1 in 2004 (Table 12). The factors under the control of the fishermen that are likely to affect the mortality of dolphins per set include the occurrence of malfunctions, especially those that lead to net canopies and net collapses, and the time it takes to complete the backdown maneuver (Table 12). The percentage of sets with major mechanical malfunctions has decreased from an average of approximately 11 percent during the late 1980s to less than 6 percent during 1998-2004; in the same period the percentage of sets with net collapses decreased from about 30 percent to less than 5 percent, on average, and that of net canopies from about 20 percent to less than 5 percent, on average. Although the chance of dolphin mortality increases with the duration of the backdown maneuver, the average backdown time has changed little since 1986. Also, the mortality of dolphins per set increases with the number of animals in the encircled herd, in part because the backdown maneuver takes longer to complete when larger herds are encircled. The fishermen could reduce the mortalities per set by encircling schools of fish associated with fewer dolphins.

GEAR PROGRAM

During the second quarter IATTC staff participated in four dolphin safety-gear inspection and safety-panel alignment procedures, all aboard Mexican-flag purse seiners.

VISITING SCIENTIST

Dr. Xiaojie Dai of the College of Marine Sciences and Technology, Shanghai Fisheries University, Shanghai, Peoples Republic of China, commenced a 4-month stay in La Jolla on April 27, 2005. He is working with IATTC staff members on the Chinese longline fishery for tunas and billfishes in the eastern Pacific Ocean.

MARGARITA LIZÁRRAGA MEDAL

The Food and Agriculture Organization of the United Nations (FAO) has announced that it will award the Margarita Lizárraga Medal to the Agreement for the International Dolphin Conservation Program during the 33rd session of the FAO Conference in November 2005. The Margarita Lizárraga Medal is awarded to a person or organization that has served with distinction in the application of the Code of Conduct for Responsible Fisheries.

The FAO has recognized that "the AIDCP has been an unqualified success and has diligently applied the relevant principles set forth in the Code, in particular those aspects relating to the precautionary approach and to the utilization of fishing gear and techniques which minimize the catch of non-target species."

ADMINISTRATION

Ms. Maria Santiago, a graduate of the University of North Dakota at Grand Forks, was hired as a temporary employee on June 10, 2005, to help Dr. Robert J. Olson in taking and preserving tissue samples for stable isotope analyses.

Ms. Ivette Escobar, bilingual secretary for the tuna-dolphin group since August 2004, resigned on June 17, 2005, to accept employment with Univision, a Spanish-language media company in Los Angeles, California. She performed well during the short time that she worked at the IATTC, and she will be missed, but everyone wishes her the best in her new position.

Ms. Amy French, who had been employed as a temporary worker at the IATTC headquarters since January 24, 2005, completed her work in June.

PUBLICATIONS

Bayliff, William H., and Robert J. Olson. 2005. Tuna. PICES Spec. Publ., 1: 211-219.

Hampton, John, John R. Sibert, Pierre Kleiber, Mark N. Maunder, and Shelton J. Harley. 2005. Decline of Pacific tuna populations exaggerated? Nature, 434 (7037): E1-E2. (http://www.nature.com/nature/journal/v434/n7037/pdf/nature03581.pdf)

Harley, Shelton J., Mark N. Maunder, and Richard B. Deriso. 2005. Assessment of bigeye tuna (*Thunnus obesus*) in the eastern Pacific Ocean. Inter. Comm. Cons. Atlantic Tunas, Coll. Vol. Sci. Pap., 57 (2): 218-241.

Margulies, Daniel, Vernon Scholey, Sharon Hunt, and Jeanne Wexler. 2005. Achotines Lab studies diets for larval, juvenile yellowfin tuna. Global Aqua. Advocate, 8 (2): 87.

Olson, Robert, and others. 2005 *In* Maury, O., and P. Lehodey (editors). 2005. Climate impacts on oceanic top predators (CLIOTOP). Science plan and implementation strategy. GLOBEC Report 18: 42 pp. (http://www.pml.ac.uk/globec/structure/regional/cliotop/cliotop_science_plan.pdf).

Olson, Robert, Jock Young, Valérie Allain, and Felipe Galván-Magaña. 2005. OFCCP workshop on the application of stable isotopes in pelagic ecosystems, La Paz, B.C.S., Mexico, 31 May-1 June 2004. GLOBEC International Newsletter 11 (1): 42-44.

Schaefer, Kurt M., and Daniel W. Fuller. 2005. Conventional and archival tagging of bigeye tuna (*Thunnus obesus*) in the eastern equatorial Pacific Ocean. Inter. Comm. Cons. Atlantic Tunas, Coll. Vol. Sci. Pap., 57 (2): 67-84.

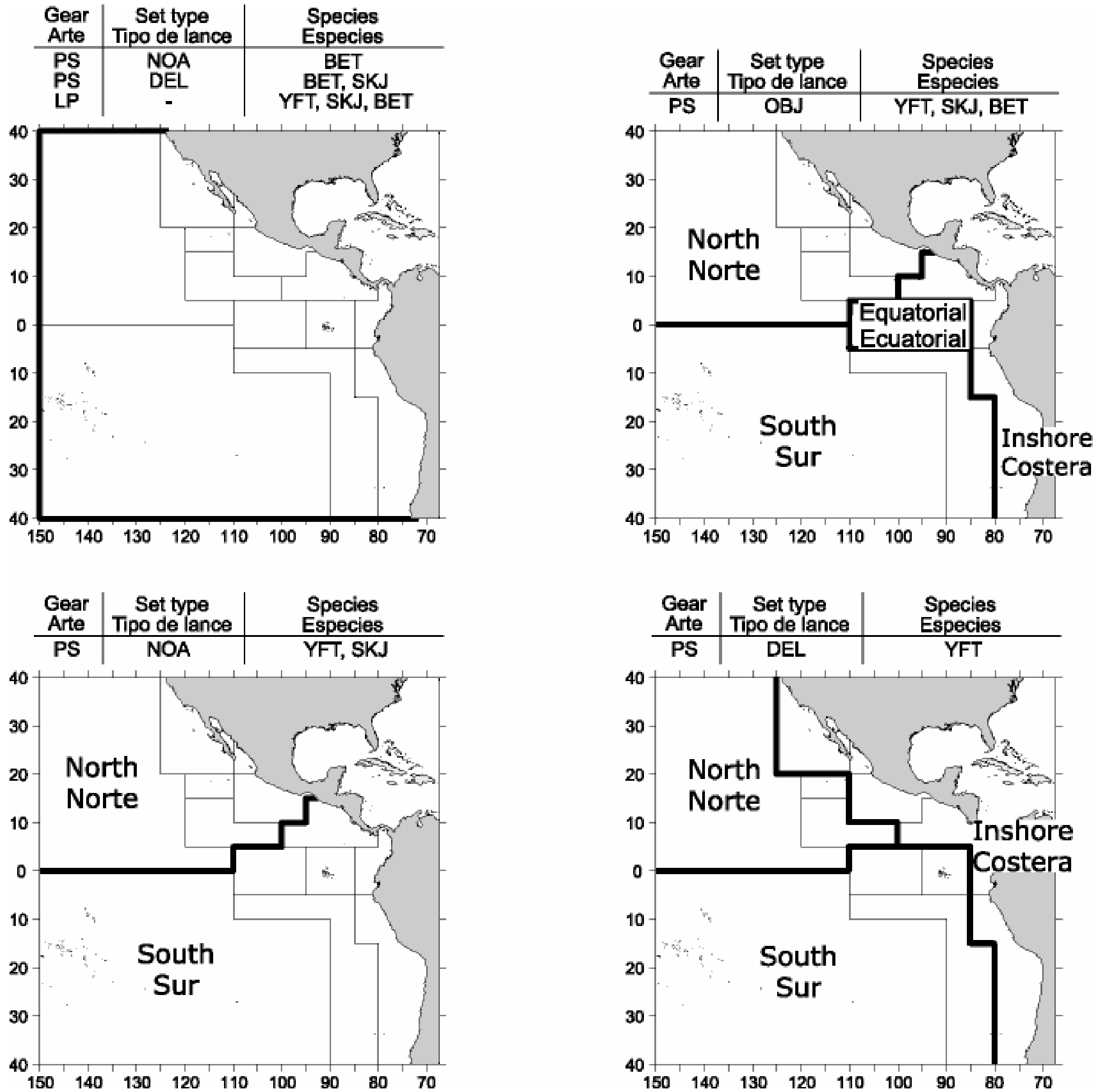

FIGURE 1. Spatial extents of the fisheries defined by the IATTC staff for stock assessment of yellowfin, skipjack, and bigeye in the EPO. The thin lines indicate the boundaries of the 13 length-frequency sampling areas, and the bold lines the boundaries of the fisheries. Gear – PS = purse seine, LP =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

FIGURA 1. Extensión especial de las pesquerías definidas por el personal de la CIAT para la evaluación de los stocks 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 = cerquero, LP = caño; Tipo de arte – NOA = no asociada, DEL = delfín; OBJ = objeto flotante; Especies – YFT = aleta amarilla, SKJ = barrilete, BET = patudo.

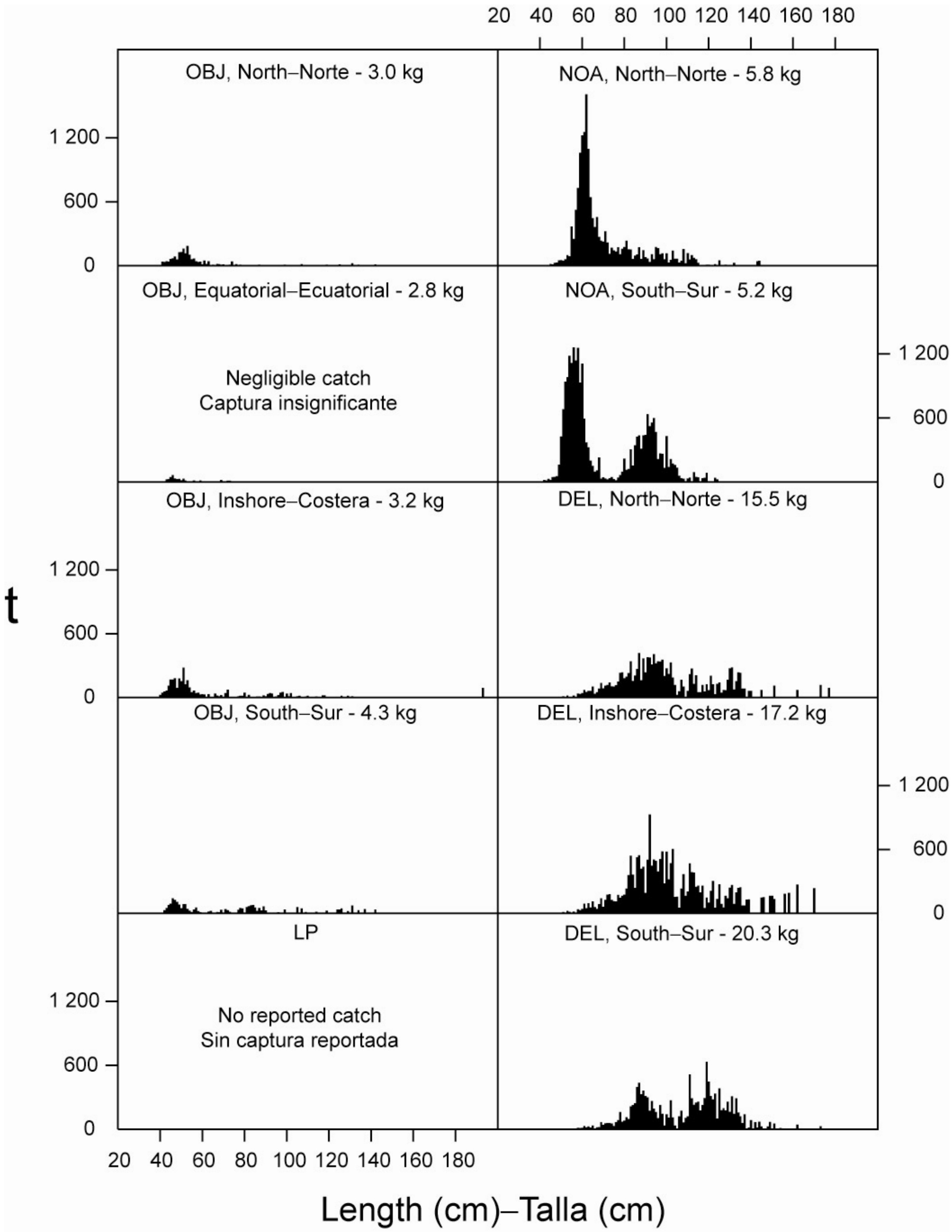

FIGURE 2a. Estimated size compositions of the yellowfin caught in each fishery of the EPO during the first quarter of 2005. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons; OBJ = floating object; LP = pole and line; NOA = unassociated; DEL = dolphin.

FIGURA 2a. Composición por tallas estimada para el aleta amarilla capturado en cada pesquería del OPO durante el primer trimestre de 2005. En cada recuadro se detalla el peso promedio de los peces en las muestras. t = toneladas métricas; OBJ = objeto flotante; LP = caño; NOA = no asociada; DEL = delfín.

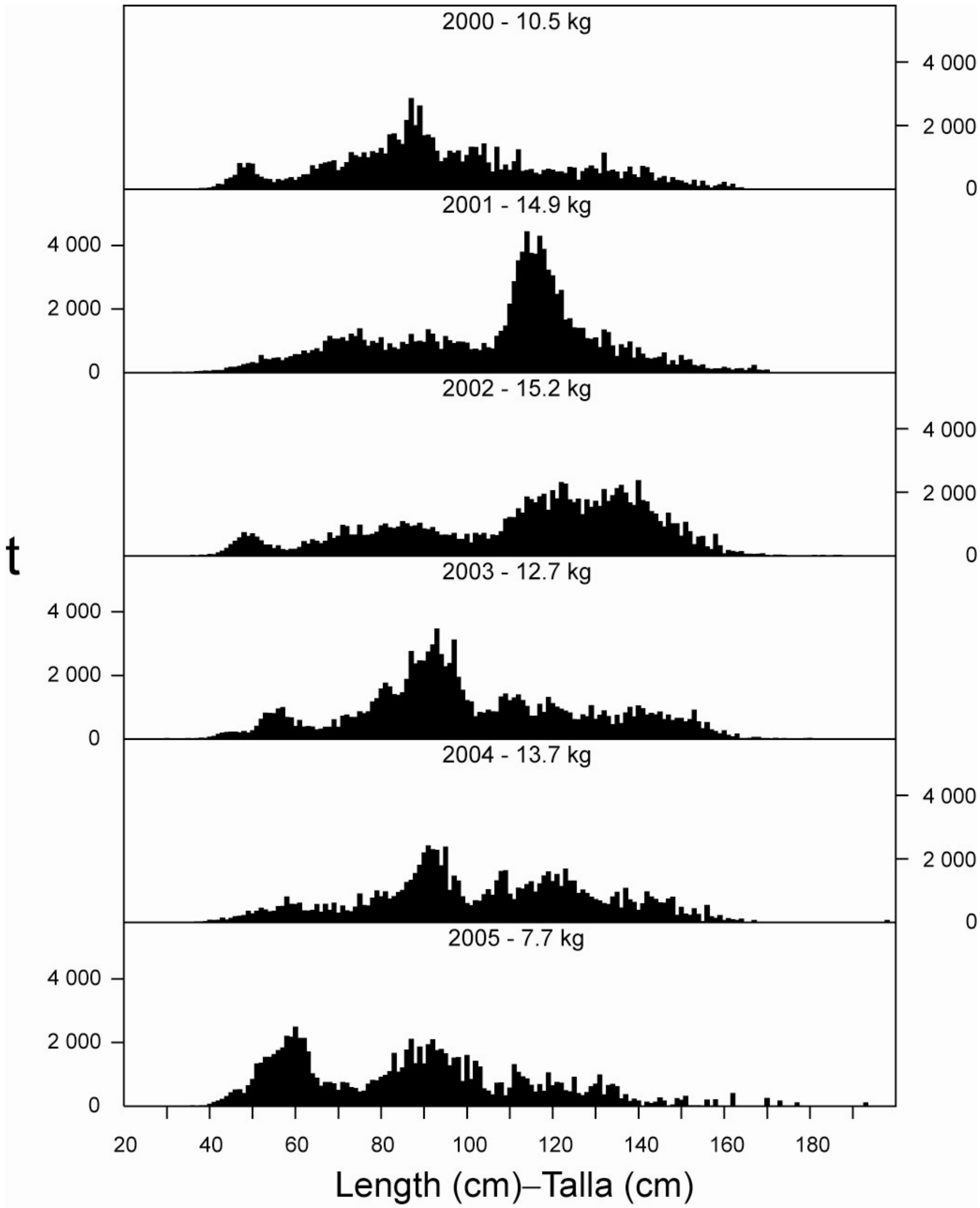

FIGURE 2b. Estimated size compositions of the yellowfin caught in the EPO during the first quarter of 2000-2005. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons.

FIGURA 2b. Composición por tallas estimada para el aleta amarilla capturado en el OPO en el primer trimestre de 2000-2005. En cada recuadro se detalla el peso promedio de los peces en las muestras. t = toneladas métricas.

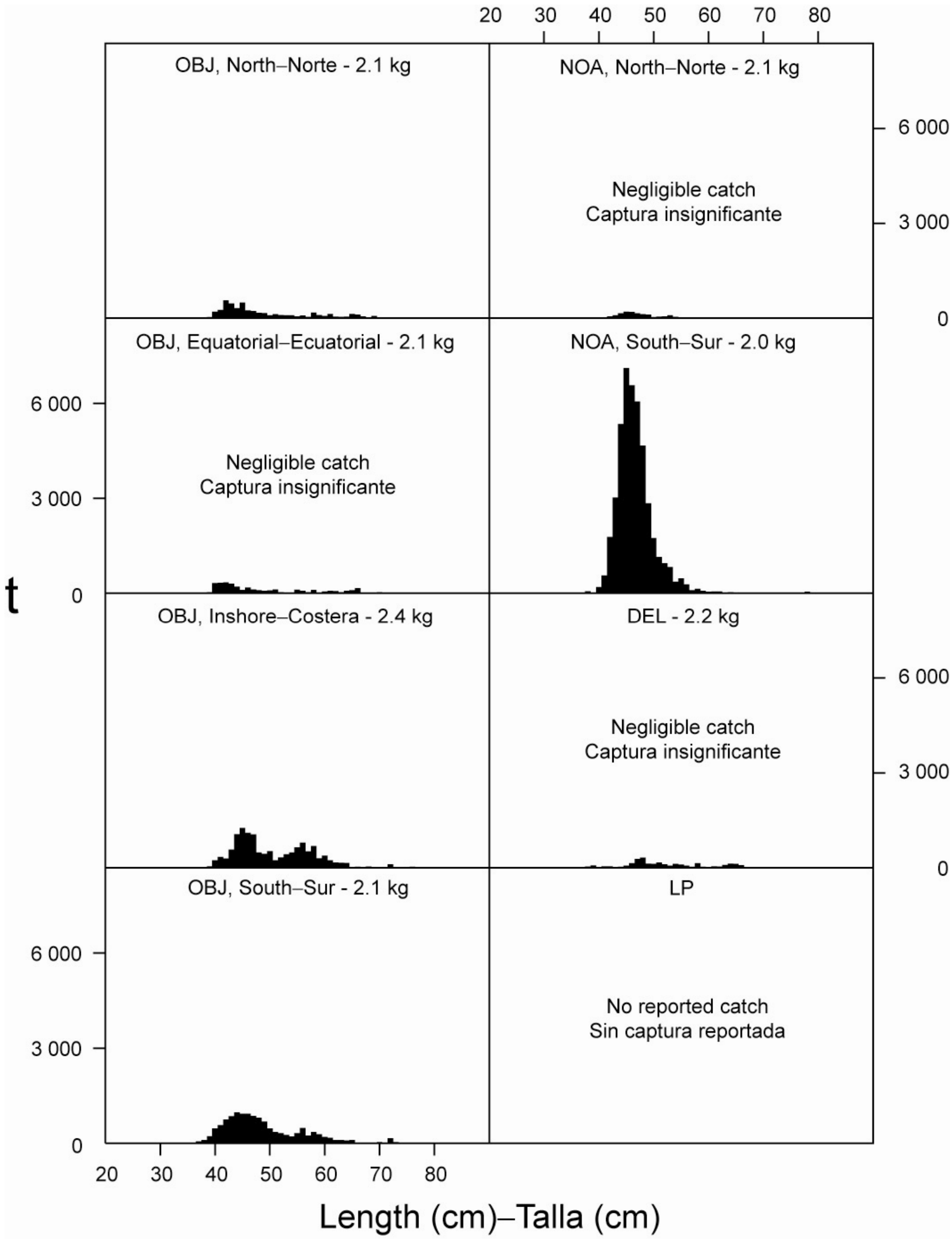

FIGURE 3a. Estimated size compositions of the skipjack caught in each fishery of the EPO during the first quarter of 2005. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons; OBJ = floating object; LP = pole and line; NOA = unassociated; DEL = dolphin.

FIGURA 3a. Composición por tallas estimada para el barrilete capturado en cada pesquería del OPO durante el primer trimestre de 2005. En cada recuadro se detalla el peso promedio de los peces en las muestras. t = toneladas métricas; OBJ = objeto flotante; LP = caño; NOA = no asociado; DEL = delfín.

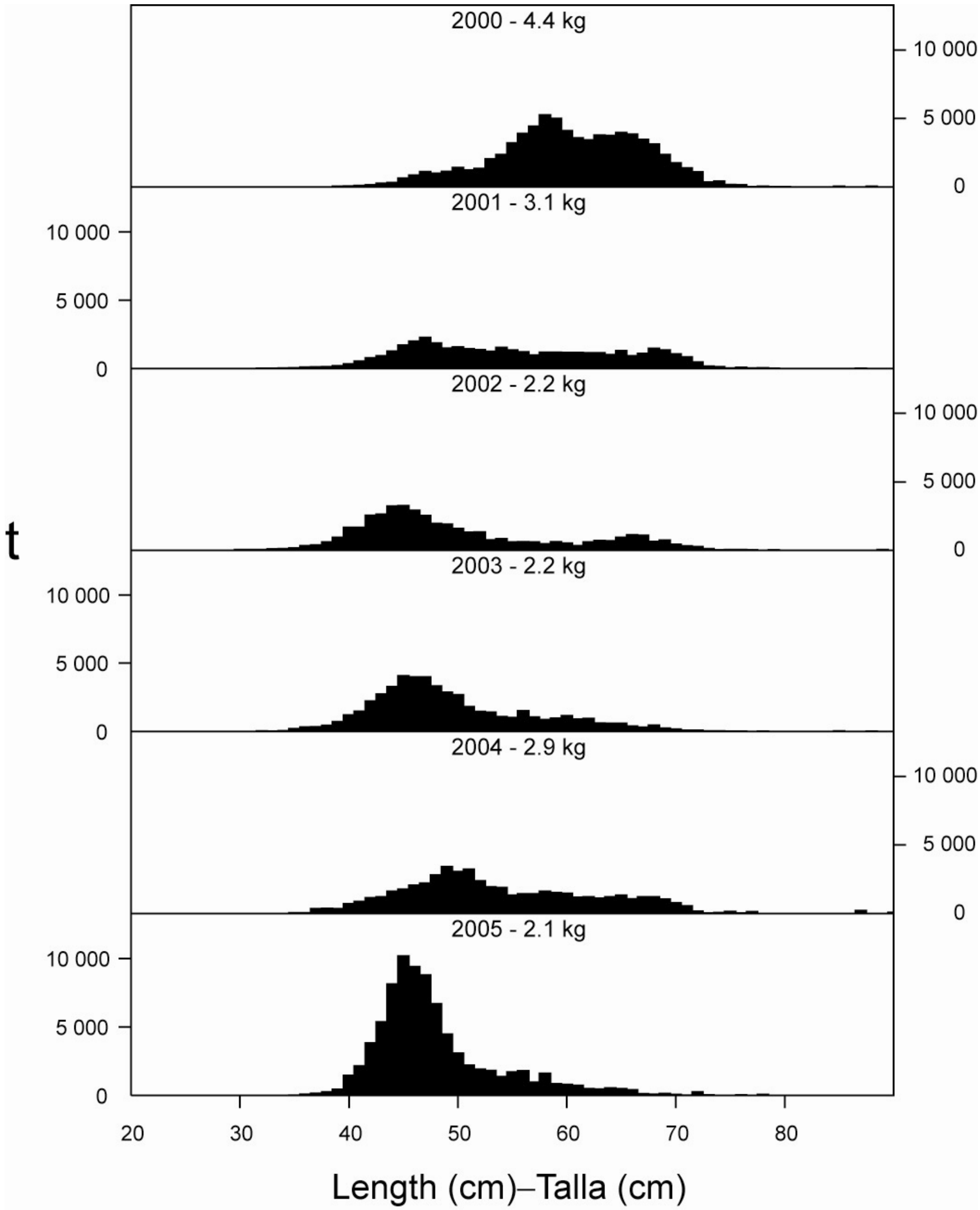

FIGURE 3b. Estimated size compositions of the skipjack caught in the EPO during the first quarter of 2000-2005. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons.

FIGURA 3b. Composición por tallas estimada para el barrilete capturado en el OPO en el primer trimestre de 2000-2005. En cada recuadro se detalla el peso promedio de los peces en las muestras. t = toneladas métricas.

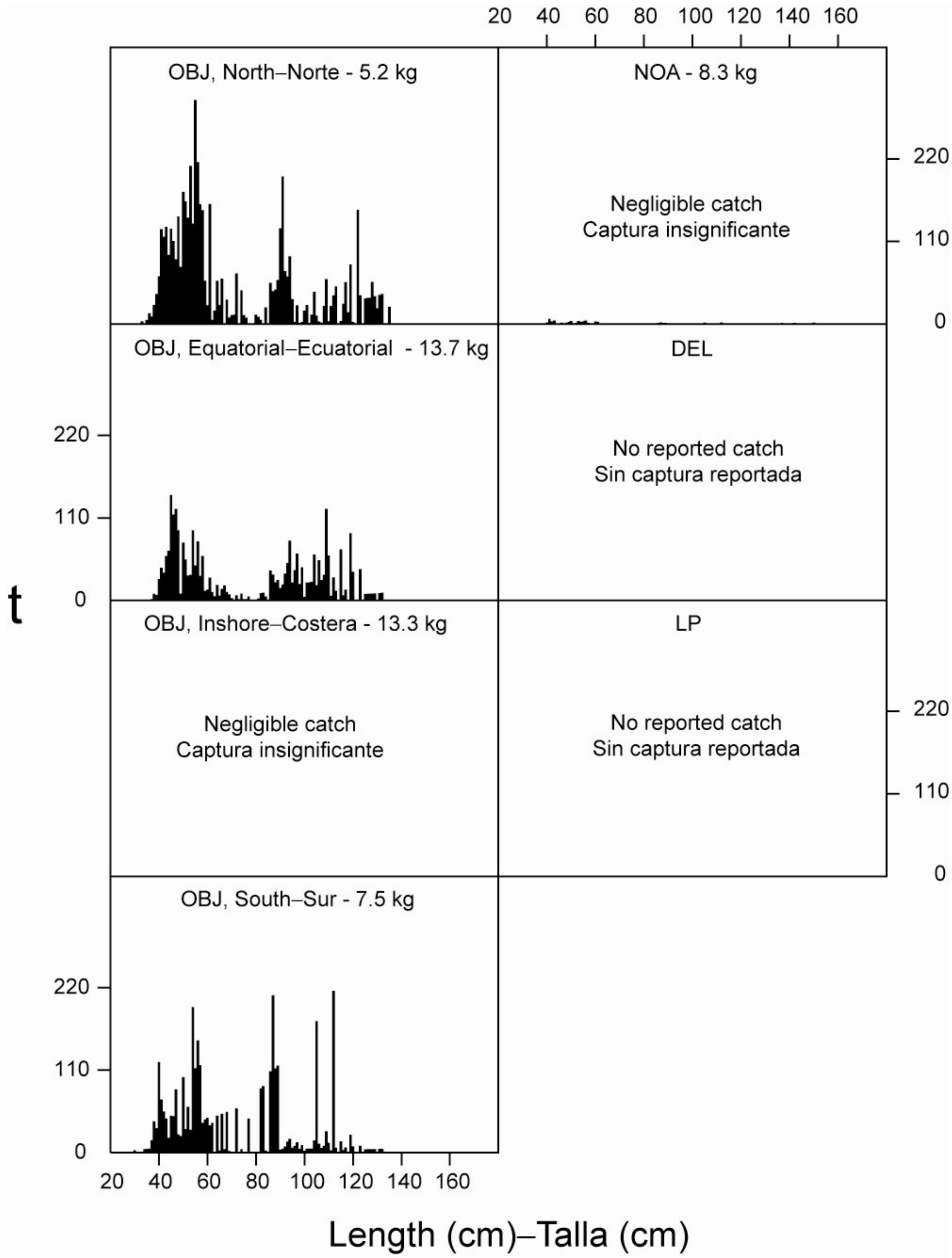

FIGURE 4a. Estimated size compositions of the bigeye caught in each fishery of the EPO during the first quarter of 2005. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons; OBJ = floating object; LP = pole and line; NOA = unassociated; DEL = dolphin.

FIGURA 4a. Composición por tallas estimada para el patudo capturado en cada pesquería del OPO durante el primer trimestre de 2005. En cada recuadro se detalla el peso promedio de los peces en las muestras. t = toneladas métricas; OBJ = objeto flotante; LP = caño; NOA = no asociada; DEL = delfín.

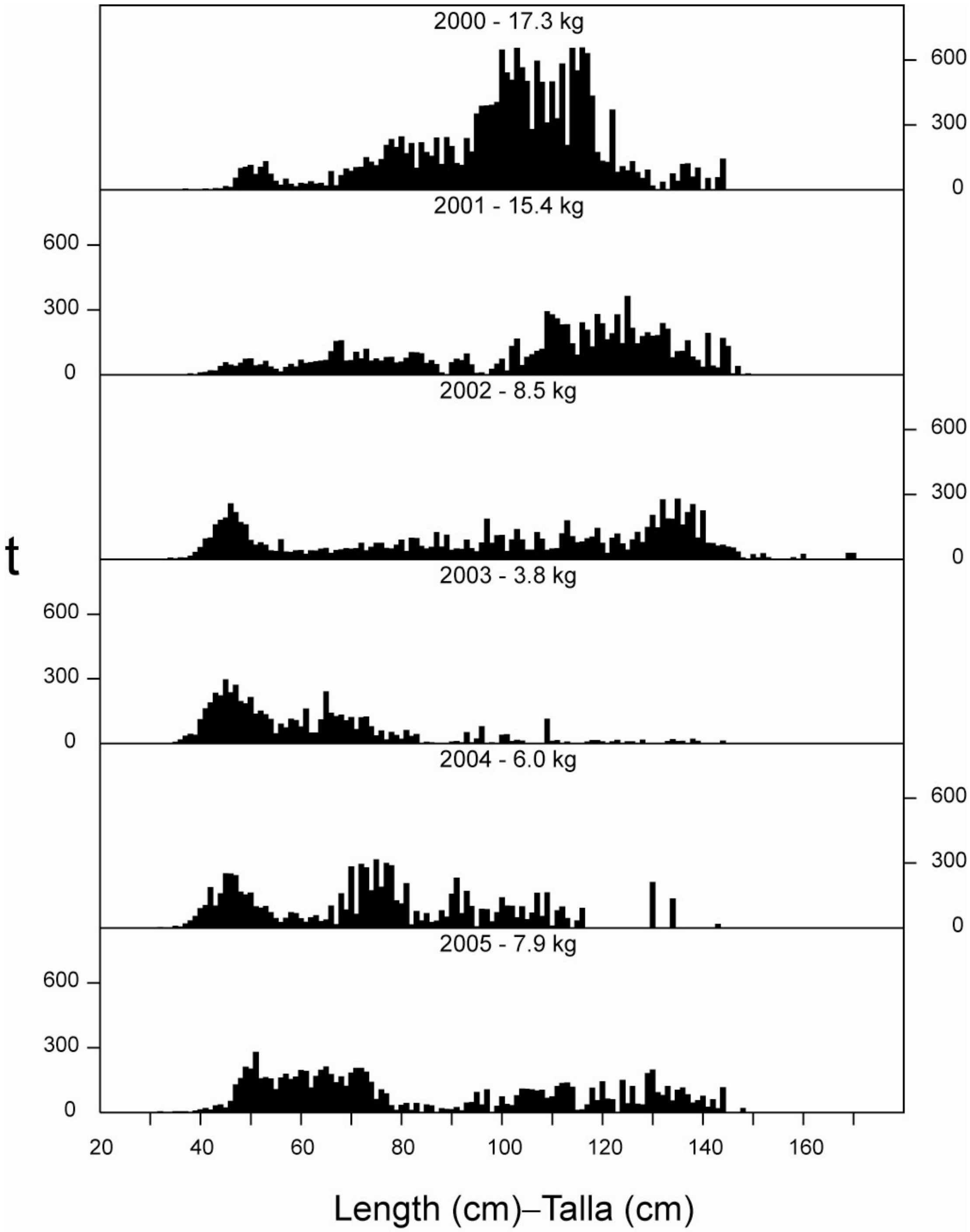

FIGURE 4b. Size composition of the bigeye caught in the EPO during the first quarter of 2000-2005. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons.

FIGURA 4b. Composición por tallas estimada para el patudo capturado en el OPO en el primer trimestre de 2000-2005. En cada recuadro se detalla el peso promedio de los peces en las muestras. t = toneladas métricas.

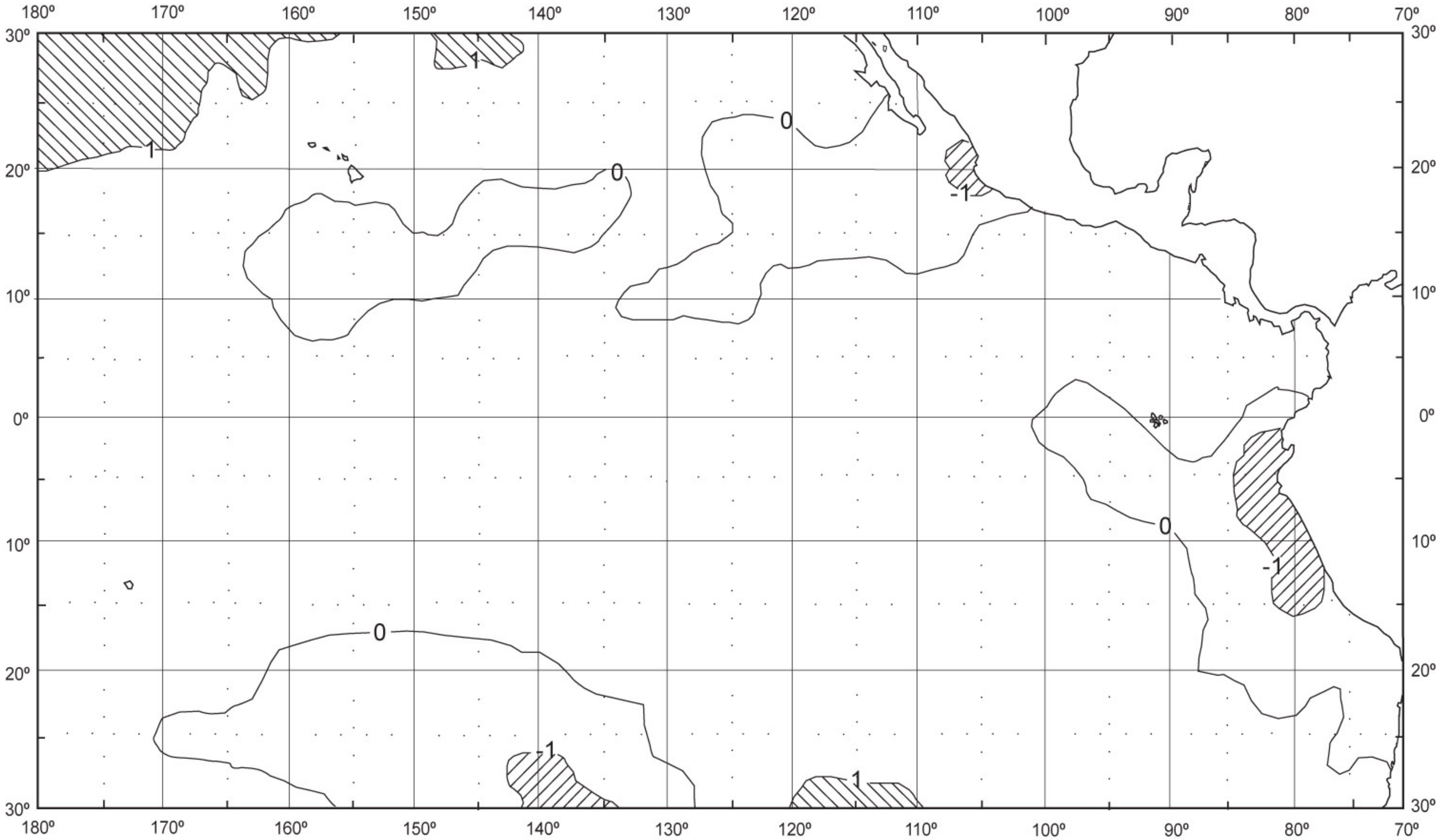

FIGURE 5. Sea-surface temperature (SST) anomalies (departures from long-term normals) for June 2005, based on data from fishing boats and other types of commercial vessels.
FIGURA 5. Anomalías (variaciones de los niveles normales a largo plazo) de la temperatura superficial del mar (TSM) en junioo de 2005, basadas en datos tomados por barcos pesqueros y otros buques comerciales.

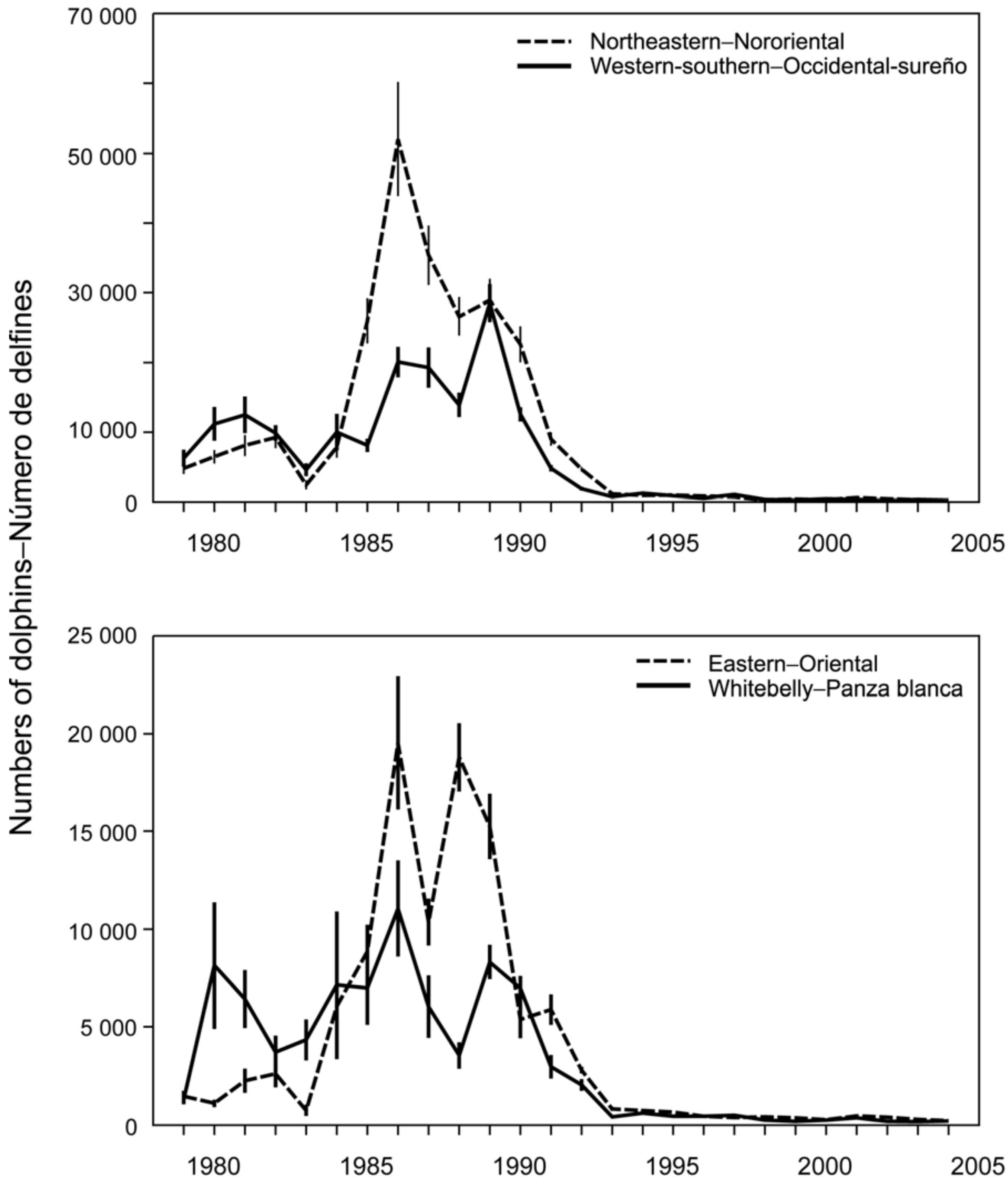

FIGURE 6. Estimated numbers of mortalities for the stocks of spotted (upper panel) and spinner (lower panel) dolphins in the EPO. Each vertical line represents one positive and one negative standard error.
FIGURA 6. Número estimado de mortalidades para los stocks de delfines manchado (panel superior) y tornillo (panel inferior) en el OPO. Cada línea vertical representa un error estándar positivo y un error estándar negativo.

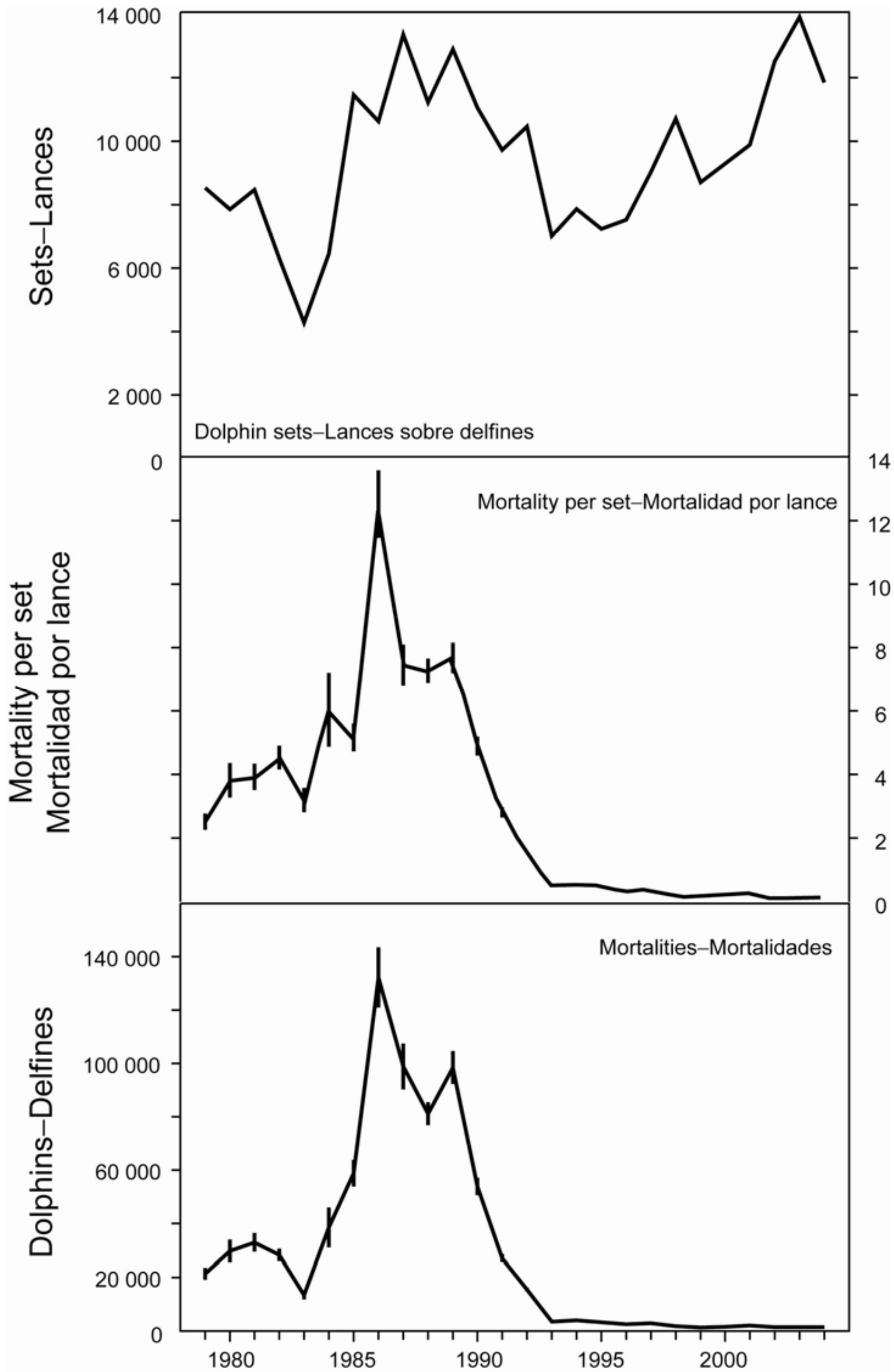

FIGURE 7. Estimated numbers of sets on tunas associated with dolphins, dolphin mortalities per set, and total mortalities of dolphins due to fishing in the EPO. Each vertical line represents one positive and one negative standard error.

FIGURA 7. Número estimado de lances sobre atunes asociados con delfines, mortalidades de delfines por lance, y mortalidad total de delfines causada por la pesca en el OPO. Cada línea vertical representa un error estándar positivo y un error estándar negativo.

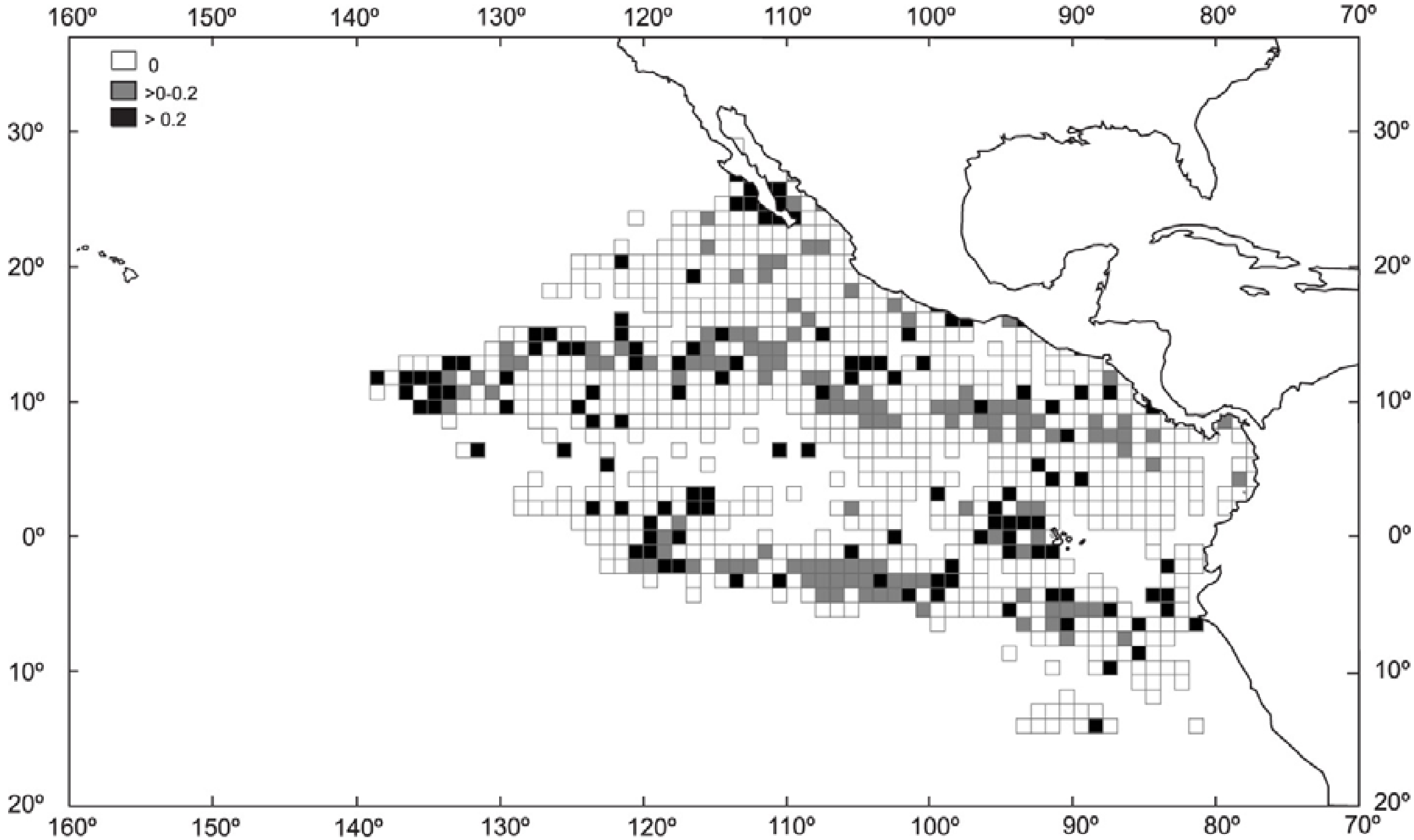

FIGURE 8. Spatial distribution of the average mortality of dolphins per set for all stocks combined, 2004.
FIGURA 8. Distribución de la mortalidad media de delfines por lance para todas las poblaciones combinadas, 2004.

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 2005 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 2005, 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	Gear	Size class—Clase de arqueo							Capacity
Bandera	Arte	1	2	3	4	5	6	Total	Capacidad
					Number—Número				
Colombia	PS	-	-	-	1	1	11	13	14,148
Ecuador	PS	-	4	7	13	10	42	76	54,037
España—Spain	PS	-	-	-	-	-	3	3	6,959
Guatemala	PS	-	-	-	-	-	2	2	3,415
Honduras	PS	-	-	-	-	-	3	3	2,810
México	PS	-	-	3	7	11	41	62	55,274
	LP	-	1	2	-	-	-	3	338
Nicaragua	PS	-	-	-	-	-	5	5	6,785
Panamá	PS	-	-	-	2	1	17	20	24,386
El Salvador	PS	-	-	-	-	-	3	3	5,238
USA—EE.UU.	PS	-	-	1	-	-	1	2	1,445
Venezuela	PS	-	-	-	-	-	26	26	33,839
Vanuatu	PS	-	-	-	-	-	2	2	2,163
Unknown—Desconocida	PS	-	-	2	1	-	1	4	2,387
All flags—	PS	-	4	13	24	23	155	219	
Todas banderas	LP	-	1	2	-	-	-	3	
	PS + LP	-	5	15	24	23	155	222	
					Capacity—Capacidad				
All flags—	PS	-	383	2,353	6,712	10,191	190,515	210,154	
Todas banderas	LP	-	101	237	-	-	-	338	
	PS + LP	-	484	2,590	6,712	10,191	190,515	210,492	

TABLE 2. Changes in the IATTC fleet list recorded during the second quarter of 2005. PS = purse seine; LP = pole-and-line.
TABLA 2. Cambios en la flota observada por la CIAT registrados durante el segundo trimestre de 2005. PS = cerquero; LP = cañero.

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	
Don Francesco	Venezuela	PS	1,275		
Re-entries—Reingresos					
				Now—Ahora	
Ciudad de Portoviejo	Ecuador	PS	591		
Juan Pablo II	México	PS	250		
Maria Guadalupe	México	PS	808		
Changes of name or flag—Cambios de nombre o pabellon					
				Now—Ahora	
Albacora Catorce	Ecuador	PS	1,880	*Guayatuna Dos*	
Albacora Doce	Ecuador	PS	1,880	*Guayatuna Uno*	
Danielle. D	Venezue-	PS	1,022	*La Rosa Mística*	
Marinero	Venezuela	PS	1,244		Panamá
Sea Royal	Venezuela	PS	1,488		Panamá

TABLE 3. Preliminary estimates of the retained catches of tunas in the EPO from January 1 through July 3, 2005, 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 3 de julio 2005, 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	29,615	80,125	9,963	-	10	-	-	54	119,767	33.9
México	73,206	12,278	-	2,114	6	-	112	110	87,826	24.8
Panamá	15,628	17,307	4,449	-	-	-	-	10	37,394	10.6
Venezuela	27,194	12,387	34	-	-	-	16	2	39,633	11.2
Other—Otros[2]	32,094	28,523	8,322	-	-	-	-	-	68,939	19.5
Total	177,737	150,620	22,768	2,114	16	-	128	176	353,559	

[1] Includes other tunas, mackerel, sharks, and miscellaneous fishes
[1] Incluye otros túnidos, caballas, tiburones, y peces diversos
[2] Includes Colombia, El Salvador, Guatemala, Honduras, Nicaragua, Spain, United States, Vanuatu, and Unknown; this category is used to avoid revealing the operations of individual vessels or companies.
[2] Incluye Colombia, El Salvador, España, Estados Unidos, Guatemala, Honduras, Nicaragua, 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 January 1-March 31, 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-31 de marzo, basado en información de los cuadernos de bitácora de buques pesqueros.

Area	Fishery statistic Estadística de pesca	Year-Año					
		2000	**2001**	**2002**	**2003**	**2004**	**2005**[2]
	Purse seine—Red de cerco						
North of 5°N	Catch—Captura	26,600	22,800	30,300	37,700	18,300	19,200
Al norte de 5°N	CPDF—CPDP	13.8	18.1	29.3	21.7	11.9	11.1
South of 5°N	Catch—Captura	25,200	34,800	15,900	14,900	26,100	14,900
Al sur de 5°N	CPDF—CPDP	7.0	14.3	6.4	5.6	8.9	6.4
Total	Catch—Captura	51,800	57,600	46,200	52,600	44,400	34,100
	CPDF—CPDP	10.5	15.8	21.4	17.1	10.1	9.1
Annual total Total anual	Catch—Captura	157,400	148,900	149,400	162,600	115,500	
	Pole and line—Cañero						
Total	Catch—Captura	100	900	100			-
	CPDF—CPDP	0.9	4.6	1.2			-
Annual total Total anual		2,100	3,100				

[1] Purse-seiners, Class-6 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 de las Clase 6; 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 January 1-March 31, 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-31 de marzo, basado en información de los cuadernos de bitácora de buques pesqueros.

Area	**Fishery statistic Estadística de pesca**	**Year-Año**					
		2000	**2001**	**2002**	**2003**	**2004**	**2005[2]**
Purse seine—Red de cerco							
North of 5°N	Catch—Captura	9,000	3,200	500	3,000	2,500	6,200
Al norte de 5°N	CPDF—CPDP	4.7	2.5	0.5	1.7	1.7	3.6
South of 5°N	Catch—Captura	55,700	19,100	22,400	27,000	22,700	28,300
Al sur de 5°N	CPDF—CPDP	15.5	7.8	8.9	10.1	7.7	12.2
Total	Catch—Captura	64,700	22,300	22,900	30,000	25,200	34,500
	CPDF—CPDP	14.0	7.1	8.7	9.3	7.1	10.7
Annual total Total anual	Catch—Captura	129,000	71,300	67,900	115,500	81,600	
Pole and line-Cañero							
Total	Catch—Captura	100	<100	200			
	CPDF—CPDP	0.8	0.1	1.7			
Annual total Total anual	Catch—Captura	100	200				

[1] Purse-seiners, Class-6 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 de las Clase 6; 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 January 1-March 31, based on logbook information for Class-6 purse-seine vessels.
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-31 de marzo, basado en información de los cuadernos de bitácora de buques cerqueros de las Clase 6.

Fishery statistic—Estadística de pesca	Year—Año					
	2000	2001	2002	2003	2004	2005[2]
Catch—Captura	21,400	6,900	4,600	5,100	4,400	4,400
CPDF—CPDP	5.4	2.7	1.8	1.8	1.4	1.5
Total annual catch—Captura total anual	64,800	31,500	21,000	25,900	27,200	

1 The catch values are rounded to the nearest 100, and the CPDF values to the nearest 0.1.
1 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 2005 by longline vessels.
TABLA 7. Captures de atún patudo en el Océano Pacífico oriental durante 2005 por buques palangreros.

Flag	Month			First quarter	Month			Second quarter	Total to date
	1	2	3		4	5	6		
Bandera	Mes			Primer trimestre	Mes			Segundo trimestre	Total al fecha
	1	2	3		4	5	6		
China	129	150	122	401					401
European Union—Unión Europea									
Japan—Japón	1,418	1,336	1,340	4,094	1,141	1,011	1,296	3,448	7,542
Republic of Korea—República de Corea	975	950	1,110	3,035	1,187	1,127	939	3,253	6,288
Chinese Taipei—Taipei Chino	272	336	616	1,224	530	499	515	1,544	2,768
Vanuatu									
Total	2,794	2,772	3,188	8,754	2,858	2,637	2,750	8,245	16,999

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, Ecuador, the European Union, Mexico, Venezuela, and the Forum Fisheries Agency (FFA) during the second quarter of 2005. 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, Ecuador, México, el Unión Europea, Venezuela, y el Forum Fisheries Agency (FFA) durante el segundo trimestre de 2005. 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			
Colombia	12	(30)	4	(21)	8	(9)		12	(30)	100.0	(100.0)
Ecuador	75	(190)	51	(127)	24	(63)		75	(190)	100.0	(100.0)
España—Spain	5	(11)	5	(10)	0	(1)		5	(11)	100.0	(100.0)
Guatemala	1	(3)	1	(3)				1	(3)	100.0	(100.0)
Honduras	5	(14)	5	(14)				5	(14)	100.0	(100.0)
México	60	(134)	37	(74)	23	(60)		60	(134)	100.0	(100.0)
Nicaragua	4	(9)	4	(9)				4	(9)	100.0	(100.0)
Panamá	22	(49)	21	(48)	1[2]	(1)		22	(49)	100.0	(100.0)
El Salvador	7	(11)	7	(11)				7	(11)	100.0	(100.0)
U.S.A.—EE.UU.	1	(3)	1	(3)				1	(3)	100.0	(100.0)
Venezuela	27	(56)	15	(29)	12	(27)		27	(56)	100.0	(100.0)
Vanuatu	2	(7)	2	(7)				2	(7)	100.0	(100.0)
Total	221	(517)[1]	153	(356)	68	(161)		221	(517)[2]	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 2004 and ended in 2005

[1] Incluye 74 viajes (52 por observadores del programa del CIAT y 22 por observadores de los programas nacionales) iniciados a fines de 2004 y completados en 2005

[2] Sampled by the Venezuelan national program. It was not known at the time that the vessel had changed flag from Venezuela to Panama just prior to the trip departure.

[2] Muestreado por el programa nacional venezolano. No se supo en ese momento que el buque había cambiado de pabellón de Venezuela a Panamá justo antes de comenzar el viaje.

TABLE 9. Oceanographic and meteorological data for the Pacific Ocean, January-June 2005. The values in parentheses are anomalies. SST = sea-surface temperature; SOI = Southern Oscillation Index; NOI = Northern Oscillation Index.
TABLA 9. Datos oceanográficos y meteorológicos del Océano Pacífico, Enero-Junio 2005. Los valores en paréntesis son anomalías. TSM = temperatura superficie del mar; IOS = Índice de Oscilación del Sur; ION = Índice de Oscilación del Norte.

Month—Mes	**1**	**2**	**3**	**4**	**5**	**6**
SST—TSM, 0°-10°S, 80°-90°W (°C)	24.4 (-0.1)	25.4 (-0.6)	25.6 (-0.9)	24.9 (-0.6)	24.4 (0.1)	22.5 (-0.5)
SST—TSM, 5°N-5°S, 90°-150°W (°C)	25.9 (0.3)	26.2 (-0.2)	27.0 (-0.1)	27.7 (0.3)	27.5 (0.4)	26.8 (0.4)
SST—TSM, 5°N-5°S, 120°-170°W (°C)	27.1 (0.6)	27.0 (0.3)	27.5 (0.4)	28.0 (0.4)	28.2 (0.4)	28.1 (0.6)
SST—TSM, 5°N-5°S, 150W°-160°E (°C)	29.2 (1.1)	28.8 (0.8)	28.9 (0.8)	28.9 (0.5)	29.2 (0.5)	29.2 (0.6)
Thermocline depth—Profundidad de la termoclina, 0°, 80°W (m)	20	15	15	20	25	30
Thermocline depth—Profundidad de la termoclina, 0°, 110°W (m)	80	60	60	70	50	40
Thermocline depth—Profundidad de la termoclina, 0°, 150°W (m)	170	160	160	140	120	130
Thermocline depth—Profundidad de la termoclina, 0°, 180°W (m)	140	170	160	150	160	160
Sea level—Nivel del mar, Baltra, Ecuador (cm)	189.3 (8.6)	183.4) (1.1)	195.5 (13.7)	195.7 (13.0)	185.7 (4.3)	184.7 (3.8)
Sea level—Nivel del mar, Callao, Perú (cm)	110.9 (-0.6)	108.7 (-5.4)	116.4 (1.7)	113.9 (-0.6)	111.5 (-2.0)	108.7 (-3.3)
SOI—IOS	0.3	-4.1	0.2	-1.0	-1.2	0.1
SOI*—IOS*	3.35	-3.55	1.27	-1.00	2.29	-4.68
NOI*—ION*	-2.24	-5.40	0.00	0.29	-2.47	1.03

TABLE 10. Preliminary estimates of mortalities of dolphins in 2004, population abundance pooled for 1986-1990 (from Report of the International Whaling Commission, 43: 477-493), and relative mortality (with approximate 95-percent confidence intervals), by stock.

TABLA 10. Estimaciones preliminares de la mortalidad incidental de delfines en 2004, la abundancia de poblaciones agrupadas para 1986-1990 (del Informe de la Comisión Ballenera Internacional, 43: 477-493), y la mortalidad relativa (con intervalos de confianza de 95% aproximados), por población.

Species and stock	Incidental mortality	Population abundance	Relative mortality (percent)
Especie y población	**Mortalidad incidental**	**Abundancia de la población**	**Mortalidad relativa (porcentaje)**
Offshore spotted dolphin—Delfín manchado de altamar			
Northeastern—Nororiental	250	730,900	0.03 (0.026, 0.043)
Western-southern—Occidental y sureño	248	1,298,400	0.02 (0.015, 0.027)
Spinner dolphin—Delfín tornillo			
Eastern—Oriental	220	631,800	0.03 (0.022, 0.053)
Whitebelly—Panza blanca	214	1,019,300	0.02 (0.013, 0.028)
Common dolphin—Delfín común			
Northern—Norteño	159	476,300	0.03 (0.019, 0.072)
Central	100	406,100	0.02 (0.013, 0.048)
Southern—Sureño	222	2,210,900	<0.01 (0.007, 0.016)
Other dolphins—Otros delfines[1]	56	2,802,300	<0.01 (0.001, 0.002)
Total	1,469	9,576,000	0.015 (0.013, 0.017)

[1] "Other dolphins" includes the following species and stocks, whose observed mortalities were as follows: striped dolphins (*Stenella coeruleoalba*), 5; coastal spotted dolphin (*Stenella attenuata*), 9; central American spinner dolphin (*Stenella longirostris centroamericana*) 7; rough-toothed dolphin (*Steno bredanensis*) 1; and unidentified dolphins, 34.

[1] "Otros delfines" incluye las siguientes especies y poblaciones, con las mortalidades observadas correspondientes: delfín listado (*Stenella coeruleoalba*), 5; delfín manchado costero (*Stenella attenuata*), 9; delfín tornillo centroamericano (*Stenella longirostris centroamericana*) 7; delfín de dientes rugosos (*Steno bredanensis*) 1; y delfines no identificados, 34.

TABLE 11a. Annual estimates of dolphin mortality, by species and stock, 1979-2004. The data for 2004 are preliminary. The estimates for 1979-1992 are based on a mortality-per-set ratio. The sums of the estimated mortalities for the northeastern and western-southern stocks of offshore spotted dolphins do not necessarily equal those for the previous stocks of northern and southern offshore spotted dolphins because the estimates for the two stock groups are based on different areal strata, and the mortalities per set and the total numbers of sets vary spatially.
TABLA 11a. Estimaciones anuales de la mortalidad de delfines, por especie y población, 1979-2004. Los datos de 2004 son preliminares. Las sumas de las mortalidades estimadas para las poblaciones nororiental y occidental y sureño del delfín manchado de altamar no equivalen necesariamente a las sumas de aquéllas para las antiguas poblaciones de delfín manchado de altamar norteño y sureño porque las estimaciones para los dos grupos de poblaciones se basan en estratos espaciales diferentes, y las mortalidades por lance y el número total de lances varían espacialmente.

Year	Offshore spotted[1]		Spinner		Common			Others	Total
	North-eastern	Western-southern	Eastern	White belly	Northern	Central	Southern		
Año	Manchado de altamar[1]		Tornillo		Común			Otros	Total
	Nor-oriental	Occidental y sureño	Oriental	Panza blanca	Norteño	Central	Sureño		
1979	4,828	6,254	1,460	1,312	4,161	2,342	94	880	21,331
1980	6,468	11,200	1,108	8,132	1,060	963	188	633	29,752
1981	8,096	12,512	2,261	6,412	2,629	372	348	367	32,997
1982	9,254	9,869	2,606	3,716	989	487	28	1,347	28,296
1983	2,430	4,587	745	4,337	845	191	0	353	13,488
1984	7,836	10,018	6,033	7,132	0	7,403	6	156	38,584
1985	25,975	8,089	8,853	6,979	0	6,839	304	1,777	58,816
1986	52,035	20,074	19,526	11,042	13,289	10,884	134	5,185	132,169
1987	35,366	19,298	10,358	6,026	8,216	9,659	6,759	3,200	98,882
1988	26,625	13,916	18,793	3,545	4,829	7,128	4,219	2,074	81,129
1989	28,898	28,530	15,245	8,302	1,066	12,711	576	3,123	98,451
1990	22,616	12,578	5,378	6,952	704	4,053	272	1,321	53,874
1991	9,005	4,821	5,879	2,974	161	3,182	115	990	27,127
1992	4,657	1,874	2,794	2,044	1,773	1,815	64	518	15,539
1993	1,139	757	821	412	81	230	0	161	3,601
1994	935	1,226	743	619	101	151	0	321	4,096
1995	952	859	654	445	9	192	0	163	3,274
1996	818	545	450	447	77	51	30	129	2,547
1997	721	1,044	391	498	9	114	58	170	3,005
1998	298	341	422	249	261	172	33	101	1,877
1999	358	253	363	192	85	34	1	62	1,348
2000	295	435	275	262	54	223	10	82	1,636
2001	592	311	469	372	94	203	46	44	2,131
2002	442	204	405	186	69	155	4	50	1,515
2003	290	341	289	171	133	140	99	39	1,502
2004	252	255	220	214	159	100	222	47	1,469

[1] The estimates for offshore spotted dolphins include mortalities of coastal spotted dolphins.
[1] Las estimaciones de delfines manchados de altamar incluyen mortalidades de delfines manchados costeros.

TABLE 11b. Standard errors of annual estimates of dolphin species and stock mortality for 1979-1994, and 2001-2003. There are no standard errors for 1995-2000 and 2004, because the coverage was at or nearly at 100 percent during those years.

TABLA 11b. Errores estándar de las estimaciones anuales de la mortalidad de delfines por especie y población para 1979-1994, y 2001-2003. No hay errores estándar para 1995-2000 y 2004, porque la cobertura fue de 100%, o casi, en esos años.

Year	Offshore spotted		Spinner		Common			Other
	North-eastern	Western-southern	Eastern	Whitebelly	Northern	Central	Southern	
Año	Manchado de altamar		Tornillo		Común			Otros
	Nor-oriental	Occidental y sureño	Oriental	Panza blanca	Norteño	Central	Sureño	
1979	817	1,229	276	255	1,432	560	115	204
1980	962	2,430	187	3,239	438	567	140	217
1981	1,508	2,629	616	1,477	645	167	230	76
1982	1,529	1,146	692	831	495	168	16	512
1983	659	928	284	1,043	349	87	-	171
1984	1,493	2,614	2,421	3,773	-	5,093	3	72
1985	3,210	951	1,362	1,882	-	2,776	247	570
1986	8,134	2,187	3,404	2,454	5,107	3,062	111	1,722
1987	4,272	2,899	1,199	1,589	4,954	2,507	3,323	1,140
1988	2,744	1,741	1,749	668	1,020	1,224	1,354	399
1989	3,108	2,675	1,674	883	325	4,168	295	430
1990	2,575	1,015	949	640	192	1,223	95	405
1991	956	454	771	598	57	442	30	182
1992	321	288	168	297	329	157	8	95
1993	89	52	98	33	27	-	-	29
1994	69	55	84	41	35	8	-	20
2001	3	28	1	6	7	7	-	1
2002	1	2	1	1	1	1	1	1
2003	1	1	1	1	-	1	1	-

TABLE 12. Percentages of sets with no dolphin mortalities, with major gear malfunctions, with net collapses, with net canopies, average times of backdown (in minutes), and average number of live dolphins left in the net at the end of backdown.

TABLA 12. Porcentajes de lances sin mortalidad de delfines, con averías mayores, con colapso de la red, con abultamiento de la red, duración media del retroceso (en minutos), y número medio de delfines en la red después del retroceso.

Year	Sets with zero mortality (percent)	Sets with major malfunctions (percent)	Sets with net collapse (percent)	Sets with net canopy (percent)	Average duration of backdown (minutes)	Average number of live dolphins left in net after backdown
Año	**Lances sin mortalidad (%)**	**Lances con averías mayores (%)**	**Lances con colapso de la red (%)**	**Lances con abultamiento de la red (%)**	**Duración media del retroceso (minutos)**	**Número medio de delfines en la red después del retroceso**
1986	38.1	9.5	29.0	22.2	15.3	6.0
1987	46.1	10.9	32.9	18.9	14.6	4.4
1988	45.1	11.6	31.6	22.7	14.3	5.5
1989	44.9	10.3	29.7	18.3	15.1	5.0
1990	54.2	9.8	30.1	16.7	14.3	2.4
1991	61.9	10.6	25.2	13.2	14.2	1.6
1992	73.4	8.9	22.0	7.3	13.0	1.3
1993	84.3	9.4	12.9	5.7	13.2	0.7
1994	83.4	8.2	10.9	6.5	15.1	0.3
1995	85.0	7.7	10.3	6.0	14.0	0.4
1996	87.6	7.1	7.3	4.9	13.6	0.2
1997	87.7	6.6	6.1	4.6	14.3	0.2
1998	90.3	6.3	4.9	3.7	13.2	0.2
1999	91.0	6.6	5.9	4.6	14.0	0.1
2000	90.8	5.6	4.3	5.0	14.9	0.2
2001	91.6	6.5	3.9	4.6	15.6	0.1
2002	93.6	6.0	3.1	3.3	15.0	0.1
2003	93.9	5.2	3.5	3.7	14.5	<0.1
2004	93.8	5.4	3.4	3.4	15.2	<0.1