INTER-AMERICAN TROPICAL TUNA COMMMISSION
COMISIÓN INTERAMERICANA DEL ATÚN TROPICAL

QUARTERLY REPORT—INFORME TRIMESTRAL

April-June 2010—Abril-Junio 2010

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 2010

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

Abrio-Junio 2010

de la

COMISIÓN INTERAMERICANA DEL ATÚN TROPICAL

es un relato informal, publicado en inglés y español, de la situación actual de la pesca atunera en el Océano Pacífico oriental con relación a los intereses de la Comisión, y de la investigación científica y demás actividades del personal científico de la Comisión. Gran parte de los resultados de investigación presentados en este informe son preliminares y deben ser considerados como informes del avance de la investigación.

Editor—Redactor:
William H. Bayliff

INTRODUCTION

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

The convention states that the Commission is to "make investigations concerning the abundance, biology, biometry, and ecology of yellowfin … and skipjack … tuna in the waters of the eastern Pacific Ocean fished by the nationals of the High Contracting Parties, and the kinds of fishes commonly used as bait in the tuna fisheries … and of other kinds of fish taken by tuna fishing vessels; and the effects of natural factors and human activities on the abundance of the populations of fishes supporting all of these fisheries." Further it is to "recommend from time to time, on the basis of scientific investigations, proposals for joint action by the High Contracting Parties designed to keep the populations of fishes covered by this Convention at those levels of abundance which will permit the maximum sustained catch." (In practice, the Commissioners appoint the Director, the Director appoints the members of the staff, and the Director and staff perform the research and make recommendations for conservation and management, when appropriate, to the Commissioners.)

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

On 17 June 1992, the Agreement for the Conservation of Dolphins ("the 1992 La Jolla Agreement"), which created the International Dolphin Conservation Program (IDCP), was adopted. The main objective of the Agreement was to reduce the mortality of dolphins in the purse-seine fishery without harming the tuna resources of the region and the fisheries that depend on them. This agreement introduced such novel and effective measures as Dolphin Mortality Limits (DMLs) for individual vessels and the International Review Panel to monitor the performance and compliance of the fishing fleet. On 21 May 1998, the Agreement on the International Dolphin Conservation Program (AIDCP), which built on and formalized the provisions of the 1992 La Jolla Agreement, was signed, and it entered into force on 15 February 1999. In 2010, Costa Rica, Ecuador, El Salvador, the European Union, Guatemala, Honduras, Mexico, Nicaragua, Panama, Peru, the United States, Vanuatu, and Venezuela were Parties to this agreement, and Bolivia and Colombia were applying it provisionally. The objectives of the AIDCP are to ensure the sustainability of the tuna stocks in the eastern Pacific Ocean, to progressively reduce the incidental mortalities of dolphins in the tuna fishery of the eastern Pacific Ocean to levels approaching zero, and to minimize the incidental catches and discards of juvenile tunas and non-target species, taking into consideration the interrelationships among the 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. (The former is described later in this report and the latter in recent Annual Reports of the IATTC.)

In addition, the IATTC staff has become involved with conservation of seabirds (Resolution C-05-01, adopted at its 73rd meeting in June 2005), sharks (Resolution C-05-03, adopted at the same meeting), and sea turtles (Resolution C-07-01, adopted at its 75th meeting in June 2007).

At its 70th meeting, on 24-27 June 2003, the Commission adopted the Resolution on the Adoption of the Convention for the Strengthening of the Inter-American Tropical Tuna Commission Established by the 1949 Convention between the United States of America and the Republic of Costa Rica ("the Antigua Convention"). This convention will replace the original one 15 months after it has been ratified or acceded to by seven Parties that were Parties to the 1949 Convention on the date that the Antigua Convention was open for signature. It has been ratified or acceded to by Mexico on 14 January 2005, El Salvador on 10 March 2005, the Republic of Korea on 13 December 2005, the European Union on 7 June 2006, Nicaragua on 13 December 2006, Belize on 12 June 2007, Panama on 10 July 2007, France on 20 July 2007, Japan on 11 July 2008, and Costa Rica on 27 May 2009. Of these, Costa Rica, El Salvador, France, Japan, Mexico, Nicaragua, and Panama were Parties to the 1949 Convention on the date that the Antigua Convention was open for signature, so it will enter into force on 27 August 2010.

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 60th 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 meeting

An External Review of the IATTC staff's Bigeye Tuna Assessment was held in La Jolla, California, USA, on 3-7 May 2010. The members of the review panel were Drs. Shelton Harley, Secretariat of the Pacific Community, Noumea, New Caledonia, James Ianelli, U.S. National Marine Fisheries Service, Seattle, Washington, USA, Andre Punt, University of Washington, Seattle, Washington, USA, and John Sibert, University of Hawaii, Honolulu, Hawaii, USA. Also, scientists and observers from the Caribbean Conservation Corporation, Gainesville, Florida, USA, the Institut de Recherche pour le Developpement of France, the Instituto Español de Oceanografía, the Instituto Nacional de Pesca of Mexico, the National Research Institute of Far Seas Fisheries of Japan, National Taiwan Ocean University, the Organización de Productores Asociados de Grandes Atuneros Congeladores, Madrid, Spain, Pontificia Universidad Católica de Valparaiso (Chile), the Subsecretaría de Recursos Pesqueros of Ecuador, the University of California at San Diego (USA), the U.S. National Marine Fisheries Service (Honolulu, Hawaii, USA, and La Jolla, California, USA), and the World Wildlife Fund participated in the meeting. In addition, Drs. Guillermo A. Compeán, Richard B. Deriso, Martín A. Hall, Mark N. Maunder, Alexandre Aires-da-Silva, Cleridy E. Lennert-Cody, and Michael G. Hinton and Messrs. Kurt M. Schaefer and Patrick K. Tomlinson participated in all or parts of the meeting. Dr. Compeán made the welcoming address, and the following papers were presented:

Summary of Issues in the Eastern Pacific Ocean Bigeye Tuna Assessment, by Mark N. Maunder, Alexandre Aires-da-Silva, and Cleridy E. Lennert-Cody;

Preliminary Analysis of Spatial-Temporal Pattern in Bigeye Tuna Length-Frequency Distributions and Catch-Per-Unit Effort Trends, by Cleridy E. Lennert-Cody, Mark N. Maunder, and Alexandre Aires-da-Silva;

An Evaluation of Spatial Structure in the Stock Assessment of Bigeye Tuna in the Eastern Pacific Ocean, by Alexandre Aires-da-Silva and Mark Maunder;

Sensitivity Analysis of Bigeye Stock Assessment to Alternative Growth Assumptions, by Alexandre Aires-da-Silva and Mark N. Maunder;

Investigation of Catch-Per-Unit-of-Effort Data Used in the Eastern Pacific Ocean Bigeye Assessment Model, by Mark N. Maunder and Alexandre Aires-da-Silva;

An Investigation of the Longline Fishery Length-Frequency Residual Pattern in the Stock Assessment of Bigeye Tuna in the Eastern Pacific Ocean, by Alexandre Aires-da-Silva, Mark N. Maunder, and Cleridy E. Lennert-Cody;

An Investigation of the Trend in the Estimated Recruitment for Bigeye Tuna in the Eastern Pacific Ocean, by Alexandre Aires-Da-Silva, Mark N. Maunder, and Patrick K. Tomlinson;

Summary of Data Available for Bigeye Tuna in the Eastern Pacific Ocean and its Use in Stock Assessment, by Mark N. Maunder, Cleridy E. Lennert-Cody, Alexandre Aires-da-Silva, William H. Bayliff, Patrick K. Tomlinson, and Kurt M. Schaefer.

Other meetings

Ms. Nora Roa-Wade participated in a meeting of the International Fisheries Commissions Pension Society in Boston, Massachusetts, USA, on 5-9 April 2010.

Dr. Richard B. Deriso participated in a meeting of Scientific Advisory Committee of the International Seafood Sustainability Foundation (ISSF), in La Jolla, California, USA, on 12-16 April 2010. Dr. Deriso is one of seven members of that committee.

Mr. Vernon P. Scholey participated in the first International Mariculture Conference, held in Manta, Ecuador, on 15-16 April 2010. He gave a talk entitled "Manejo de Laboratorio de Investigaciones de Atunes Aleta Amarilla: las Experiencias Exitosas de la Comisión Inter-Americana del Atún Tropical en el Laboratorio Achotines, Panama" that was co-authored by Dr. Daniel Margulies and Mss. Jeanne B. Wexler and Maria C. Santiago. His expenses were paid by the organizers of the conference.

Dr. Michael G. Hinton participated in a meeting of the Billfish Working Group of the International Scientific Committee (ISC) for Tuna and Tuna-like Species in the North Pacific Ocean, held in Hakodate, Japan, on 15-22 April 2010. The group set up geographical regions to be used in the next (2011) ISC assessment of striped marlin in the North Pacific Ocean. There was also discussion on the ISC's Northern Committee's request for information on biological reference points.

Mss. Nora Roa-Wade and María Teresa Musano participated in a training course, on 10-14 May 2010 on how to better utilize the current accounting system, Sage MIP Fund Accounting, which was implemented on 1 January 2007.

Several members of the IATTC staff attended all or parts of "A Workshop on Global Tuna Demand, Fisheries Dynamics and Fisheries Management in the Eastern Pacific Ocean," which was coordinated by Dr. Chin-Hwa Sun, a visiting economist at the IATTC headquarters in La Jolla, California, USA, Dr. Mark N. Maunder, and two others. It was held in La Jolla on 13-14 May 2010. Dr. Guillermo A. Compeán gave the keynote address, "Tuna Fleet Dynamics and Capacity Overview in EPO" and Dr. Mark N. Maunder served as Chairman of the session entitled "Stock Assessment and Management in EPO" and as one of 13 members of a "Feedback Discussion on Analysis of Global Demand of Tuna Fisheries." The following talks, authored or co-authored by IATTC staff members were given:

The Fishery for Tunas and Billfishes in the Eastern Pacific Ocean, by Guillermo A. Compeán;

Status of Yellowfin and Skipjack Tuna in the Eastern Pacific Ocean in 2008 and Outlook for the Future, by Mark N. Maunder and Alexandre Aires-da-Silva;

Status of Bigeye Tuna in the Eastern Pacific Ocean in 2008 and Outlook for the Future, by Alexandre Aires-da-Silva and Mark N. Maunder;

Increasing the Economic Values of the Eastern Pacific Ocean Tropical Tuna Fishery: Tradeoffs between Longline and Purse-Seine Fishing, by Chin-Hwa Sun, Mark N. Maunder, Alexandre Aires-da-Silva, and William H. Bayliff.

Many members of the IATTC staff attended all or parts of the 61st Tuna Conference at Lake Arrowhead, California, USA, on 17-20 May 2010. Dr. Martín A. Hall was one of four participants in a panel discussion, "Improving Assessment and Mitigation of Bycatch in Tuna RFMOs [Regional Fishery Management Organizations]" and one of three participants in an informal evening session entitled "Summary and Discussion of the Sukarrieta [Spain] Meeting on Bycatch in Tuna Purse Seine FAD Fisheries, November 2009," and Dr. William H. Bayliff was moderator of a session on "Recreational Fisheries." Talks were given by Drs. Alexandre Aires-da-Silva, Martín A. Hall (two), and Robert J. Olson, and Messrs Ernesto Altamirano Nieto, Marlon Román Verdesota, Kurt M. Schaefer, and Vernon P. Scholey, and Ms. Jeanne B. Wexler. In addition, research in which Drs. Alexandre Aires-da-Silva, Martin A. Hall, Cleridy E. Lennert-Cody, Daniel Margulies, Mark N. Maunder, and Messrs. Daniel W. Fuller, Erick Largacha, Marlon Román Verdesota, Kurt M. Schaefer, Vernon P. Scholey, Nickolas W. Vogel, and Mss. Maria C. Santiago and Jeanne B. Wexler had participated was presented by other speakers. Also, a poster prepared by Dr. Alexandre Aires-da-Silva and five others was presented.

Mr. Brian S. Hallman participated in a conference to review the United Nations Agreement on Straddling Fish Stocks and Highly Migratory Fish Stocks (the "UN Fish Stocks Agreement"), held at United Nations headquarters in New York City, USA, on 24-28 May 2010. The purpose of the conference was to review the success of this agreement, which entered into force in 2005, and whose purpose is to improve the conservation and management of straddling stocks and highly-migratory stocks by regional fisheries management organizations.

Dr. Guillermo A. Compeán participated in the 12th meeting of the Secretariats of the Tuna Agencies and Programs in Barcelona, Spain, on 30 May 2010. The representatives of the other organizations were: Commission for the Conservation of Southern Bluefin Tuna, Mr. Robert Kennedy; Indian Ocean Tuna Commission, Mr. Alejandro Anganuzzi; International Commission for the Conservation of Atlantic Tunas, Mr. Driss Meski; Western and Central Pacific Fisheries Commission, Dr. Sung Kwon Soh. The subject of the meeting was "Coordination of the Secretariats in Relation to the Kobe II Workshop." ("The Kobe II Workshop" is the workshop, described below, that was to take place in Brisbane, Australia, on 23-25 June 2010.)

Dr. Guillermo A. Compeán participated in two Joint Tuna RFMO [Regional Fishery Management Organization] Workshops, in Barcelona, Spain. The first, entitled "Meeting of Experts to Share Best Practices on Provision of Scientific Advice," which was also attended by Dr. Richard B. Deriso, took place on 31 May-2 June 2010. The second, entitled "Workshop on Improvement, Harmonization, and Compatibility of Monitoring, Control and Surveillance Measures, Including Monitoring Catches from Catching Vessels to Markets," which was also attended by Mr. Brian S. Hallman, took place on 3-5 June 2010. Mr. Hallman gave a presentation on the methods used by the IATTC staff to monitor transshipments of longline-caught tunas at that workshop.

Dr. Robert J. Olson participated in the meeting of the Subcommittee on Ecosystems of the Standing Committee on Research and Statistics of the International Commission for the Conservation of Atlantic Tunas in Madrid, Spain, from 31 May to 4 June 2010. He gave two presentations. The first, "'Ecosystem Considerations,' IATTC Fishery Status Report," was an overview of the Ecosystem Considerations section of IATTC Fishery Status Report 7 and a summary of recent and current ecological research in the eastern Pacific Ocean (EPO). The second presentation, "Metrics of Ecosystem Impact in the Purse-Seine Fishery of the Eastern Pacific Ocean," summarized a case study to evaluate three possible metrics of ecosystem impact of the purse-seine fishery in the EPO.

Dr. Robert J. Olson participated in the Summer Conference of the American Society of Limnology and Oceanography (ASLO) in Santa Fe, New Mexico, USA on 6-11 June 2010. Dr. Olson was an invited participant in a special session, "Fish and Fisheries in an Ecosystem Context: a Celebration of the Career of J.F. Kitchell." (Dr. James F. Kitchell was Dr. Olson's major professor at the University of Wisconsin.) His presentation was entitled "Apex Predation in the Eastern Tropical Pacific: Lessons from Fish and Fisheries."

Dr. Michael D. Scott gave a workshop on dolphin radio-tracking at the Harbor Branch Oceanographic Institute (HBOI) of Florida Atlantic University, at Vero Beach, Florida, USA, on 9-10 June 2010. The purpose of the workshop, which was funded by the HBOI, was to teach the latest techniques to researchers who are currently tracking bottlenose dolphins along the east coast of Florida.

Dr. Martin A. Hall participated in the first Coral Triangle Fishers Forum, held at Bali, Indonesia, on 15-17 June 2010. Its objectives were to allow "participants to gain perspective from fishers around the region, learn more about the issues that affect them, and gain a common ground in achieving sustainable and equitable fisheries." Dr. Hall was one of five participants in a panel discussion entitled, "Review of Key Issues for Fisheries Best Management Practices (BMP) and Bycatch Reduction in the Coral Triangle."

Mr. Ricardo Belmontes participated in the 11th meeting of the United Nations Open Informal Consultative Process on Oceans and the Law of the Sea in New York City, USA, on 21-25 June 2010. Among the various issues discussed at the meeting, at which there were representatives of 87 nations, 27 intergovernmental organizations, and 11 non-governmental organizations, was building the capabilities of developing states to comply with their obligations as members of international fisheries organizations. It is appropriate that the IATTC was represented at this meeting, as Article XXIII, Paragraph 1, of the new IATTC Convention states that "The Commission shall seek to adopt measures relating to technical assistance, technology transfer, training and other forms of cooperation, to assist developing countries that are members of the Commission to fulfill their obligations under this Convention, as well as to enhance their ability to develop fisheries under their respective national jurisdictions and to participate in high seas fisheries on a sustainable basis."

Dr. Richard B. Deriso participated in a meeting of the Scientific and Statistical Committee of the Western Pacific Fishery Management Council (WPFMC) of the United States in Honolulu, Hawaii, USA, on 22-24 June 2010. His travel expenses were paid by the WPFMC.

Drs. Guillermo A. Compeán and Martín A. Hall and Messrs. Brian S. Hallman and Kurt M. Schaefer participated in a "Joint Tuna RFMOs [Regional Fishery Management Organizations], International Workshop on Tuna RFMO Management Issues Relating to By-Catch and to Call on RFMOs to Avoid Duplication of Work on This Issue" in Brisbane, Australia, on 23-25 June 2010. Dr. Compeán participated in a panel discussion entitled "Addressing Bycatch in the Tuna RFMOs: Current Measures, Gaps and Challenges," at which he gave a talk on actions being taken to reduce bycatches in the tuna fisheries of the eastern Pacific Ocean. Dr. Hall participated in a panel discussion entitled "Bycatches in Global Tuna Fisheries," at which he gave a talk entitled "Examples of Successful Development and Implementation of Bycatch Measures."

Dr. Martín A. Hall and Mr. Kurt M. Schaefer participated in an International Seafood Sustainability Foundation (ISSF) workshop on bycatch research in tuna purse-seine fisheries entitled "Taking Stock 2010—Brisbane" on 26 June 2010. Dr. Hall gave a presentation on the occurrence of sea turtles in the vicinity of floating objects and attempts to minimize the bycatches of sea turtles by purse seiners fishing for tunas associated with floating objects, and Mr. Schaefer gave a presentation entitled "Minimizing the Catch of Bigeye and Maximizing the Catch of Skipjack in Purse-Seine Fishing around Floating Objects in the Eastern Pacific."

Dr. Guillermo A. Compeán and Mr. Brian S. Hallman participated in a "Joint Tuna RFMOs [Regional Fishery Management Organizations], International Workshop on RFMO Management of Tuna Fisheries, with Emphasis on Reducing Overcapacity" in Brisbane, Australia, on 28 June-1 July 2010, at which Dr. Compeán gave a presentation on the implementation of IATTC Resolution C-02-03 (Resolution on the Capacity of the Tuna Fleet Operating in the Eastern Pacific Ocean).

RESEARCH

DATA COLLECTION AND DATABASE PROGRAM

The IATTC had field offices at Las Playas and Manta, Ecuador; Manzanillo and Mazatlan, Mexico; Panama, Republic of Panama; and Cumaná, Venezuela, during the second quarter of 2010. Personnel at these offices collected 261 length-frequency samples from 185 wells and abstracted logbook information for 132 trips of commercial fishing vessels during the second quarter of 2010.

Reported fisheries statistics

Information reported herein are for the eastern Pacific Ocean (EPO: the region east of 150ºW, south of 50ºN, and north of 50°S, unless noted otherwise. Catch is reported in metric tons (t), vessel capacity in cubic meters (m^3), and effort in days fishing. Estimates of fisheries statistics with varying degrees of accuracy and precision are available. The most accurate and precise are those made after all available information has been entered into the data base, processed, and verified. 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. Thus the estimates for the current week are the most preliminary, while those made a year later are much more accurate and precise. Statistics are developed using data from many sources, including reports of landings, fishing vessel logbooks, scientific observers, and governmental agencies.

Fleet statistics for the purse seine and pole-and-line fisheries

The lists of vessels authorized to fish for tunas in the EPO are given in the IATTC Regional Vessel Register (http://www.iattc.org/VesselListsENG.htm). The estimated total carrying capacity of the purse-seine and pole-and-line vessels that have or are expected to fish in the EPO during 2010 is about 212,700 m^3 (Table 1). The average weekly at-sea capacity for the fleet, for the weeks ending 29 March through 27 June, was about 155,000 m^3 (range: 141,200 to 168,000 m^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, in metric tons, of tropical tunas in the EPO during the period of January-June in 2010, and comparative statistics for 2005-2009, were:

Species	2010	2005-2009			Weekly average, 2010
		Average	Minimum	Maximum	
Yellowfin	130,200	126,100	106,000	171,700	5,200
Skipjack	86,300	140,400	112,400	179,200	3,400
Bigeye	22,600	27,600	19,500	37,700	900

Summaries of the estimated retained catches, by species and by flag of vessel, are shown in Table 2.

Catch statistics for 2009

Estimates of the annual retained and discarded catches of the various species of tunas and other fishes by purse seiners and pole-and line vessels fishing at least part of the year in the EPO for yellowfin, skipjack, bigeye, or bluefin during 1980-2009 are shown in Table 3. The retained catch data for skipjack and bluefin are essentially complete except for insignificant catches made by the longline, recreational (for skipjack), and artisanal fisheries. The catch data for yellowfin and bigeye do not include catches by longline vessels, as the data for these fisheries are received much later than those for the surface fisheries. About 5 to 10 percent of the total catch of yellowfin is taken by longlines. Until recently, the great majority of the catch of bigeye had been harvested by the longline fishery.

There were no restrictions on fishing for tunas in the EPO during 1980-1997. However, there were restrictions on fishing for yellowfin in the Commission's Yellowfin Regulatory Area (CYRA) (IATTC Annual Report for 2001: Figure 1) from 26 November through 31 December 1998, from 14 October through 31 December 1999, from 1 through 31 December 2000, and from 27 October through 31 December 2001. Purse-seine fishing for tunas was prohibited in the EPO from 1 through 31 December 2002, and in a portion of the EPO from 1 through 31 December 2003. In 2004-2007, there were restrictions on purse-seine fishing for tunas for vessels of some countries from 1 August through 11 September, and from 20 November through 31 December for vessels of other countries. The members of the IATTC could not agree on regulations for 2008, but most of the countries adopted regulations similar to those that they had had during 2007. In 2009, Class-4, -5, and -6 purse-seine vessels (vessels with fish-carrying capacities greater than 181 t were subject to seasonal closures and an areal closure, and longline vessels of the four major participants in the longline fishery in the EPO with overall lengths greater than 24 m were subject to catch quotas for bigeye tuna. In addition, fishing for tunas associated with fish-aggregating devices (FADs) was prohibited in the EPO from 9 November through 31 December 1999 and from 15 September through 15 December 2000. Furthermore, regulations placed on purse-seine vessels directing their effort at tunas associated with dolphins have probably affected the way that these vessels operate, especially since the late 1980s.

There was a major El Niño event, which began in mid-1982 and persisted until late 1983. The catch rates in the EPO were low before and during that El Niño episode, which caused a shift of fishing effort from the eastern to the western Pacific, and the fishing effort remained relatively low during 1984-1986. During 1997-1998 another major El Niño event occurred in the EPO, but the effects of that on the vulnerability of the fish to capture were apparently less severe.

The retained catches, in metric tons, of yellowfin, skipjack, and bigeye in the EPO during 2009, based on the current species composition project, described in the IATTC Annual Report for 2000 and in IATTC Stock Assessment Report 4, and the 1994-2008 annual averages for those species, are as follows:

Species	**2009**	**Average**	**Minimum**	**Maximum**
			1994-2008	
Yellowfin	236,599	264,496	167,016	413,457
Skipjack	229,819	194,553	73,366	297,843
Bigeye	76,513	61,867	34,899	94,640

The 2009 catch of yellowfin was about 28 thousand t (10 percent) less than the average for 1994-2008. The 2009 skipjack catch was about 35 thousand t (18 percent) greater than the average for 1994-2008. The 2009 bigeye catch was about 15 thousand t (24 percent) greater than the average for 1994-2008.

The average annual distributions of the purse-seine catches of yellowfin, skipjack, and bigeye tuna, by set type, in the EPO during 2004-2008, are shown in Figures 1a, 2a, and 3a, and preliminary estimates for 2009 are shown in Figures 1b, 2b, and 3b. The catches of yellowfin in 2009 showed an increase in effort on dolphins in the northern area compared to the average annual distributions for 2004-2008. The catches of yellowfin on dolphins were greater in the inshore area between 5°N and 15°N, and somewhat greater in the offshore areas from about 5°S to 10°N in sets on dolphins and floating objects. The catches of yellowfin were smaller in the inshore areas off southern Ecuador and Peru. The catches of skipjack were somewhat smaller in the areas north of 10°N and in the inshore areas off Ecuador, compared to the average annual distributions for 2004-2008. Greater catches of skipjack were observed in the areas between 5°S and 5°N and from 85°W to 100°W, and also in the far offshore equatorial area from about 125°W to 150°W. The catches were slightly greater in the south from about 15°S to 20°S. The catches of bigeye in 2009 were very similar to the average annual distribution of catches during 2004-2008, with slightly greater catches observed in the inshore areas off Peru from about 15°S to 25°S.

Bigeye are not often caught north of about 7°N, and the catches of bigeye have decreased in the inshore areas off South America for several years. With the development of the fishery for tunas associated with FADs, the relative importance of the inshore areas has decreased, while that of the offshore areas has increased. Most of the bigeye catches are taken in sets on FADs between 5°N and 5°S.

While yellowfin, skipjack, and bigeye comprise most of the catches of fish made by tuna vessels in the EPO, bluefin, albacore, bonito, black skipjack, and other species contribute to the overall harvest in this area. The total retained catch of these other species in the EPO was about 14 thousand t in 2009 (Table 3), which is greater than the 1994-2008 annual average retained catch of about 8 thousand t (range: 3 t to 22 thousand t). The increase was due mainly to increased catches of bonito by Mexican vessels (Table 3).

Preliminary estimates of the retained catches in the EPO in 2009, by flag, and the landings of EPO-caught fish, by country, are given in Table 4. The landings are fish unloaded during a calendar year, regardless of the year of catch. The country of landing is that in which the fish were unloaded from the fishing vessel or, in the case of transshipments, the country that received the transshipped fish.

Preliminary estimates of the most significant (equal to or greater than about 5 percent of the total) retained catches of all species combined, during 2009 were as follows:

Flag	**Retained catch**	
	Metric tons	**Percentage**
Ecuador	203,400	35
Mexico	122,500	21
Panama	81,600	14
Venezuela	51,000	9

Catch-per-unit-of-effort statistics for purse seine vessels

No adjustments in the catch-per-unit-of-effort data are included for 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.

The measures of catch rate used in analyses 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 fish-carrying capacities greater than about 425 m^3), and only data for these vessels are included in these measures of catch rate. There are now far fewer pole-and-line vessels than in previous years, so the data for these vessels are combined without regard to carrying capacity.

The estimated nominal catches per day of fishing for yellowfin, skipjack, and bigeye in the EPO during the first quarter of 2010 and comparative statistics for 2005-2009 were:

Region	**Species**	**Gear**	**2010**	**2005-2009**		
				Average	**Minimum**	**Maximum**
N of 5° N	Yellowfin	PS	16.6	11.5	9.0	15.5
S of 5° N	Yellowfin	PS	2.9	3.7	2.4	6.9
N of 5° N	Skipjack	PS	1.0	1.8	0.6	3.5
S of 5° N	Skipjack	PS	8.0	10.3	7.1	13.6
EPO	Bigeye	PS	1.8	1.8	1.3	2.9
EPO	Yellowfin	LP	0.0	1.0	0.0	3.8
EPO	Skipjack	LP	0.0	0.7	0.0	2.3

Catch statistics for the longline fishery

The catches of bigeye by longline gear in the EPO are reported by flag states whose annual catches have exceeded 500 t (http://www.iattc.org/PDFFiles2/Resolutions/C-09-01-Tuna-conservation-2009-2011.pdf). Preliminary estimates of the catches reported for the first two quarters of 2010 are shown in Table 5.

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. 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.

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 2005-2010 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 2010, and the second shows data for the combined strata for the first quarter of each year of the 2005-2010 period. Samples from 167 wells were taken during the first quarter of 2010.

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 4). The last fishery includes all 13 sampling areas. Of the 167 wells sampled that contained fish caught during the first quarter of 2010, 140 contained yellowfin. The estimated size compositions of these fish are shown in Figure 5a. The majority of the yellowfin catch during the first quarter was taken by sets on dolphins in the Northern, Southern, and Inshore areas, and in the Northern and Southern unassociated fisheries. Lesser amounts of yellowfin were captured in the floating-object fisheries.

The estimated size compositions of the yellowfin caught by all fisheries combined during the first quarters of 2005-2010 are shown in Figure 5b. The average weight of yellowfin caught during the first quarter of 2010 (10.3 kg) was considerably less than that of 2009 (22.5 kg), but greater than those of 2005-2008.

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 167 wells sampled that contained fish caught during the first quarter of 2010, 95 contained skipjack. The estimated size compositions of these fish are shown in Figure 6a. Large amounts of skipjack in the 40- to 50-

cm range were caught in the Northern, Equatorial, Inshore, and Southern floating-object fisheries. Larger skipjack in the 45- to 60-cm range were taken in the Southern unassociated fishery.

The estimated size compositions of the skipjack caught by all fisheries combined during the first quarter of 2005-2010 are shown in Figure 6b. The average weight of skipjack caught during the first quarter of 2010 (2.5 kg) was less than those of 2007 and 2009, but greater than those of 2005, 2006, and 2008.

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 4). The last three fisheries include all 13 sampling areas. Of the 167 wells sampled that contained fish caught during the first quarter of 2010, 37 contained bigeye. The estimated size compositions of these fish are shown in Figure 7a. The majority of the catch was taken in floating-object sets in the Northern, and Southern areas, with a large portion of this catch in the 40- to 90-cm size range. Lesser amounts of bigeye were taken in the Equatorial and Inshore floating-object fisheries.

The estimated size compositions of the bigeye caught by all fisheries combined during the first quarter of 2005-2010 are shown in Figure 7b. The average weight of bigeye caught during the first quarter of 2010 (7.1 kg) was less than those of 2008 and 2009, but greater than those of 2005-2007.

The estimated retained purse-seine catch of bigeye less than 60 cm in length during the first quarter of 2010 was 2,216 t, or about 25 percent of the estimated total retained purse-seine catch of bigeye during that period. The corresponding amounts for 2003-2009 ranged from 2,835 to 4,016 t, or 17 to 53 percent. These values may differ slightly from those given in previous Quarterly Reports due to changes in the estimation procedure.

BIOLOGY AND ECOSYSTEM PROGRAM

Ecosystem studies

Notification was received in April 2010 that a proposal for a research project, "CAMEO 2009: a Novel Tool for Validating Trophic Position Estimates in Ecosystem-Based Fisheries Models," co-authored by Dr. Robert J. Olson of the IATTC staff, Drs. Brian Popp and Jeffrey Drazen, University of Hawaii, Dr. Michael Landry, Scripps Institution of Oceanography, and Dr. Carolyn Holl, Oceanic Institute, Hawaii, will be funded. The proposal was submitted in October 2009 to the Comparative Analysis of Marine Ecosystem Organization (CAMEO) program, which is implemented as a partnership between the U.S. National Marine Fisheries Service and the U.S. National Science Foundation, Division of Ocean Sciences. According to the CAMEO prospectus, "The purpose of CAMEO is to strengthen the scientific basis for an ecosystem approach to the stewardship of our ocean and coastal living marine resources. The program supports fundamental research to understand complex dynamics controlling ecosystem structure, productivity, behavior, resilience, and population connectivity, as well as effects of climate variability and anthropogenic pressures on living marine resources and critical habitats. CAMEO encourages the development of multiple approaches, such as ecosystem models and comparative analyses of managed and unmanaged areas (*e.g.*, marine protected areas) that can ultimately form a basis for forecasting and decision support."

The project has three principal goals: (1) to validate the application of amino acid compound-specific isotopic analyses (AA-CSIA) across multiple marine phyla under differing physiological conditions; (2) to compare the application of AA-CSIA across systems with contrasting biogeochemical cycling regimes; and (3) to develop the use of AA-CSIA trophic position estimates for validating trophic models of exploited ecosystems—past and present. The total funding available for the successful proposals in the 2009 CAMEO funding opportunity amounted to only about 10 percent of the proposals submitted, in terms of budgeted dollars.

Early life history studies

Yellowfin broodstock

The yellowfin broodstock in Tank 1 (1,362,000 L) at the Achotines Laboratory spawned daily during the second quarter of 2010. Spawning occurred between 10:15 p.m. and 11:50 p.m. The numbers of eggs collected after each spawning event ranged from about 100,000 to 1,063,000. The water temperatures in the tank during the quarter ranged from 27.8° to 28.9°C.

There were five 45- to 59-kg yellowfin (two with archival tags), and six 11- to 28-kg yellowfin in Tank 1 at the end of June.

In January 2007, 10 yellowfin (4 to 10 kg) held in the 170,000-L reserve broodstock tank (Tank 2) were implanted with prototype archival tags and transferred to Tank 1. Another 15 reserve-broodstock yellowfin held in Tank 2 were transferred to Tank 1 during the fourth quarter of 2008; archival tags were implanted into 6 of these at that time. At the end of June 2010, one of the January 2007 group and one of the fourth-quarter 2008 group, bearing archival tags, remained in Tank 1.

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

Workshop on physiology and aquaculture of pelagic fishes

The IATTC and the University of Miami (Miami, Florida, USA) held their eighth workshop, "Physiology and Aquaculture of Pelagics, with Emphasis on Reproduction and Early Developmental Stages of Yellowfin Tuna," on 7-19 June 2010. The organizers were Daniel Margulies and Vernon P. Scholey of the IATTC staff and Dr. Daniel Benetti, Director of the Aquaculture Program of the Rosenstiel School of Marine and Atmospheric Science, University of Miami. Mr. Scholey and Dr. Benetti served as instructors. The participants were Messrs. Luke Cheviot and Luke Vanderberg of New South Wales Industry and Investment in Australia, Ms. Polly Hilder of the University of Tasmania (Australia), Mr. Bent Urup of the Danish Akva Group, Messrs. Zack Daugherty, Patrick Dunaway, and John Stieglitz, all graduate students of Dr. Benetti at the University of Miami, and Dr. Gavin Partridge, a University of Miami post-doctoral student. A fee for the participants covered the expenses of putting on the workshop. As part of the workshop, yellowfin larvae and juveniles were cultured from the egg stage through the second week of feeding. (Some larval cultures had been initiated prior to the beginning of the workshop.)

Rearing of yellowfin eggs, larvae, and juveniles

During the quarter, the following parameters were recorded for most spawning events: times of spawning, egg diameter, duration of egg stage, hatching rate, lengths of hatched larvae, and duration of yolk-sac stage. The weights of the eggs, yolk-sac larvae, and first-feeding larvae, and the lengths and selected morphometrics of these, were measured periodically.

Experiments with yellowfin tuna larvae

IATTC ELH Group–Hubbs Sea World Research Institute trials

In August 2009, the early life history group and Hubbs Sea World Research Institute of San Diego, California, USA, were awarded a grant through the Saltonstall-Kennedy Program of the U.S. National Oceanic and Atmospheric Administration to conduct feasibility studies of the air shipment and subsequent rearing of yellowfin tuna eggs and larvae. The studies continued during the quarter with additional simulated shipping trials in order to ascertain the best shipping protocols to be used in future shipments.

Global Royal Fish trials

During the second quarter, Dr. Gidon Minkoff and Mr. Isacio Siguero Sánchez of Global Royal Fish continued trials with Achotines Laboratory staff members designed to increase the growth and survival of larval and juvenile yellowfin tuna.

Studies of snappers

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

During 1996-2009, ARAP staff members had conducted full life cycle research on spotted rose snapper (*Lutjanus guttatus*) in captivity. During the second and third quarters of 2009, the broodstock fish died due to low water temperatures and feeding problems. The mortality coincided with the ARAP's plans to commence spawning and rearing studies with a new, more commercially-important species of snapper. Yellow snapper (*Lutjanus argentiventris*) was chosen as the new species of snapper for study. In addition, the ARAP decided to rebuild its spotted rose snapper broodstock. During the second quarter, collection of broodstock yellow snapper and spotted rose snapper continued in local waters. At the end of June there were 45 spotted rose snappers and 19 yellow snappers being held in reserve holding tanks at the Achotines Laboratory. The ARAP plans to move the yellow snappers to a separate mariculture facility outside Panama City.

Visitors at the Achotines Laboratory

Mr. Donald Bacoat, a Ph.D. candidate at the University of Rhode Island, USA, spent the period of 6-30 April 2010, at the Achotines Laboratory. During his stay he fulfilled part of the requirements for a course entitled "Internship in Coastal Management."

A group of 15 professors and graduate and undergraduate students from the Coastal Marine Resource Program of the Universidad Marítima Internacional de Panamá visited the Achotines Laboratory on 24 April 2010.

Drs. William Hawkins and Jeffrey Lotz and Mr. James Franks of the Gulf Coast Research Laboratory in Ocean Springs, Mississippi, USA, visited the Achotines Laboratory on 27-29 April 2010.

In November 2009, the early life history group of the IATTC, the ARAP, and Kinki University of Osaka, Japan, had submitted research project applications to funding agencies in Japan. The applications covered a single research project entitled "Comparative Studies of the Early Life History of Pacific Bluefin Tuna (*Thunnus orientalis*) and Yellowfin Tuna (*Thunnus albacares*) for Purposes of Resource Management and Aquaculture Development," but the application was submitted in two parts. The part of the application for research to be conducted in Panama was submitted by the IATTC and ARAP to the Japan International Cooperation Agency (JICA) and the part of the research to be carried out in Japan was submitted by Kinki University to the Japan Science and Technology Agency (JST). During April, the JICA and JST announced that the applications were provisionally accepted for funding for the 2010 review year. The applications would than go through a "record of discussion" and planning phase until September 2010. If officially approved, the joint research could begin in late 2010. On 11 June 2010, Messrs. Tomoyuki Oki and Masanosuke Sakaki of the JICA headquarters in Tokyo, Japan, accompanied by members of the JICA staff from its Panama City office, visited the Achotines Laboratory. Their visit was related to the IATTC-Kinki University-ARAP project.

Oceanography and meteorology

Easterly surface winds blow almost constantly over northern South America, which cause upwelling of cool, nutrient-rich subsurface water along the equator east of 160ºW, in the coastal regions off South America, and in offshore areas off Mexico and Central America. El Niño events are characterized by weaker-than-normal easterly surface winds, which cause above-normal sea-surface temperatures (SSTs) and sea levels and deeper-than-normal thermoclines over much of the tropical eastern Pacific Ocean (EPO). In addition, the Southern Oscillation Indices (SOIs) are negative during El Niño episodes. (The SOI is the difference between the anomalies of sea-level atmospheric pressure at Tahiti, French Polynesia, and Darwin, Australia. It is a measure of the strength of the easterly surface winds, especially in the tropical Pacific in the Southern Hemisphere.) Anti-El Niño events, which are the opposite of El Niño events, are characterized by stronger-than-normal easterly surface winds, below-normal SSTs and sea levels, shallower-than-normal thermoclines, and positive SOIs. Two additional indices, the NOI* (Progress Ocean., 53 (2-4): 115-139) and the SOI*, have recently been devised. The NOI* is the difference between the anomalies of sea-level atmospheric pressure at the North Pacific High (35°N-130°W) and Darwin, Australia, and the SOI* is the difference between the anomalies of sea-level atmospheric pressure at the South Pacific High (30°S-95°W) and Darwin. Ordinarily, the NOI* and SOI* values are both negative during El Niño events and positive during anti-El Niño events.

Weak El Niño conditions were in effect in the EPO during the last seven months of 2009. The SSTs were all normal or above normal during the third and fourth quarters of that year (IATTC Quarterly Report for October-December 2009: Figure 6; Table 5). Also, the depths of the thermoclines were greater and the sea levels at Callao, Peru, were higher during the fourth quarter. The band of warm water that had existed along the equator since June 2009 persisted throughout the first quarter of 2010 (IATTC Quarterly Report for January-March 2010: Figure 5). An area of cool water that had formed offshore off Peru in late 2009 reached its maximum size in January 2010, and then it diminished in February and March. The conditions were quite different in April 2010, with cool water along the equator from about 120°W to about 160°E and a large area of cool water centered at about 15°N-125°W. Most of the cool water dissipated during May, but in June it reappeared as a narrow band of cool water extending along the equator from about 90°W to about 150°W (Figure 5). The SSTs were mostly above average from January through April, about average during May, and mostly below average during June (Table 6). The thermoclines along the equator at 110°W and 150°W during May and June were relatively shallow, and the sea levels at Callao, Peru, during the second quarter were below average, both indicating anti-El Niño conditions. Also, the NOI*s and SOI*s during the second quarter were mostly positive, indicating anti-El Niño conditions. According to the Climate Diagnostics Bulletin of the U.S. National Weather Service for June 2010, anti-El Niño "conditions are likely to develop during July-August 2010" … "and to continue through early 2011."

BYCATCH PROGRAM AND AIDCP PROGRAM

Data collection

The IATTC had field offices at Las Playas and Manta, Ecuador; Manzanillo and Mazatlan, Mexico; Panama, Republic of Panama; and Cumaná, Venezuela, during the second quarter of 2010. Members of the field office staffs placed IATTC observers on 114 fishing trips by vessels that participate in the AIDCP On-Board Observer Program during the quarter. In addition, 116 IATTC observers completed trips during the quarter, and were debriefed by field office personnel.

Observer program

Coverage

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

In 2010 the observer programs of Colombia, the European Union, Mexico, Nicaragua, Panama, and Venezuela are to sample half, and that of Ecuador approximately one-third, of the trips by vessels of their respective fleets, while IATTC observers are to sample the remainder of those trips. Except as described in the next paragraph, the IATTC is to cover all trips by vessels registered in other nations that are required to carry observers.

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

Observers from the On-Board Observer Program departed on 187 fishing trips aboard purse seiners covered by that program during the second quarter of 2010. Preliminary coverage data for these vessels during the quarter are shown in Table 7.

Training

There were no IATTC observer training courses conducted during the quarter.

GEAR PROJECT

IATTC staff members did not participate in any dolphin safety-gear inspections or safety-panel alignment procedures aboard purse-seiners during the second quarter of 2010.

PUBLICATIONS

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IATTC. 2010. Status of the Tuna and Billfish Stocks in 2008. Inter-Amer. Trop. Tuna Comm., Stock Asses. Rep., 10: 309 pp.

IATTC. 2010. Tunas and Billfishes in the Eastern Pacific Ocean in 2008. Inter-Amer. Trop. Tuna Comm., Fish. Status Rep., 7: 143 pp.

Outside journals

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Dambacher, Jeffrey M., Jock W. Young, Robert J. Olson, Valerie Allain, Felipe Galván-Magaña, Matthew J. Lansdell, Noemí Bocanegra-Castillo, Vanessa Alatorre-Ramírez, Scott P. Cooper, and Leanne M. Duffy. 2010. Analyzing pelagic food webs leading to top predators in the Pacific Ocean: a graph-theoretic approach. Prog. Oceanogr., 86 (1-2): 152-165.

Humphries, Nicolas E., Nuno Queiroz, Jennifer R.M. Dyer, Nicolas G. Pade, Michael K. Musyl, Kurt M. Schaefer, Daniel W. Fuller, Juerg M. Brunnschweiler, Thomas K. Doyle, Jonathen D.R. Houghton, Graeme C. Hays, Catherine S. Jones, Leslie R. Noble, Victoria

J. Wearmouth, Emily J. Southall, and David W. Sims. 2010. Environmental context explains Lévy and Brownian movement patterns of marine predators. Nature, 465 (7301): 1066-1070.

Lennert-Cody, Cleridy E., Mihoko Minami, Patrick K. Tomlinson, and Mark N. Maunder. 2010. Exploratory analysis of spatial-temporal patterns in length-frequency data: an example of distributional regression trees. Fish. Res., 102 (3): 323-326.

Olson, Robert J., Brian N. Popp, Brittany S. Graham, Gladis A. López-Ibarra, Felipe Galván-Magaña, Cleridy E. Lennert-Cody, Noemi Bocanegra-Castillo, Natalie J. Wallsgrove, Elizabeth Gier, Vanessa Alatorre-Ramírez, Lisa T. Ballance, and Brian Fry. 2010. Food web inferences of stable isotope spatial patterns in copepods and yellowfin tuna in the pelagic eastern Pacific Ocean. Prog. Oceanogr., 86 (1-2): 124-138.

VISITING SCIENTIST

Dr. Pedro Afonso of the University of the Azores, Horta, Azores, Portugal, spent the period of 21 May-1 June 2010, at the IATTC headquarters in La Jolla, California, USA, where he worked with Dr. Alexandre Aires-da-Silva on analysis of tagging data for coastal species of the Azores Islands.

ADMINISTRATION

Mr. Roberto Uriarte, who had been an IATTC employee since January 2004, mostly recently as assistant systems manager under Mr. Milton F. Lopez, resigned effective 8 June 2010 to accept a one-year contract as a Network Administrator for ITT Corporation at a U.S. Army base in Iraq. Mr. Uriarte says that he expects to learn at lot in his new position. He adds that he has enjoyed his work at the IATTC, and will miss the people with whom he has associated for the past several years. Everyone wishes him the best in Iraq and in his future endeavors after that.

Mr. Pablo Mosley, in charge of maintenance at the Achotines Laboratory since 2002, passed away unexpectedly on 10 June 2010, following a brief illness. During his time at the Achotines Laboratory, Mr. Mosley carried out his duties cheerfully and efficiently, and he will be greatly missed by his fellow workers and friends. He is survived by his wife, three daughters, and two grandchildren.

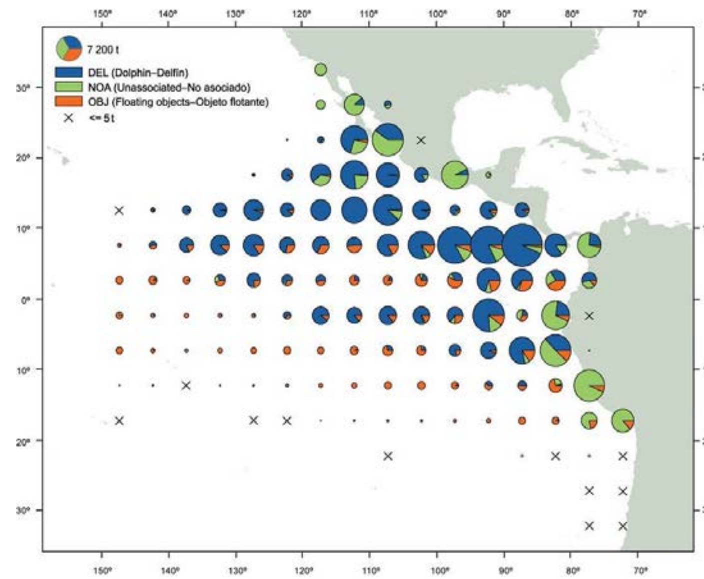

FIGURE 1a. Average annual distributions of the purse-seine catches of yellowfin, by set type, 2004-2008. The sizes of the circles are proportional to the amounts of yellowfin caught in those 5° by 5° areas.

FIGURA 1a. Distribución media anual de las capturas cerqueras de aleta amarilla, por tipo de lance, 2004-2008. El tamaño de cada círculo es proporcional a la cantidad de aleta amarilla capturado en la cuadrícula de 5° x 5° correspondiente.

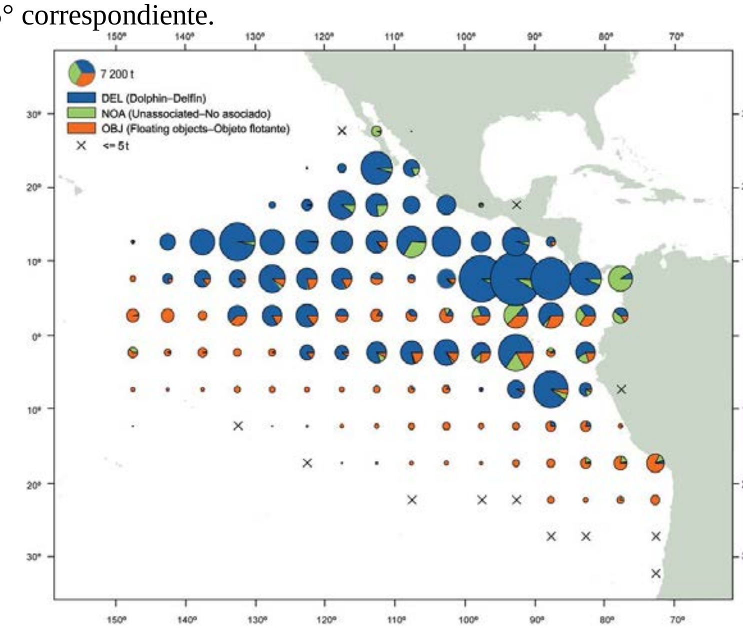

FIGURE 1b. Annual distributions of the purse-seine catches of yellowfin, by set type, 2009. The sizes of the circles are proportional to the amounts of yellowfin caught in those 5° by 5° areas.

FIGURA 1b. Distribución anual de las capturas cerqueras de aleta amarilla, por tipo de lance, 2009. El tamaño de cada círculo es proporcional a la cantidad de aleta amarilla capturado en la cuadrícula de 5° x 5° correspondiente.

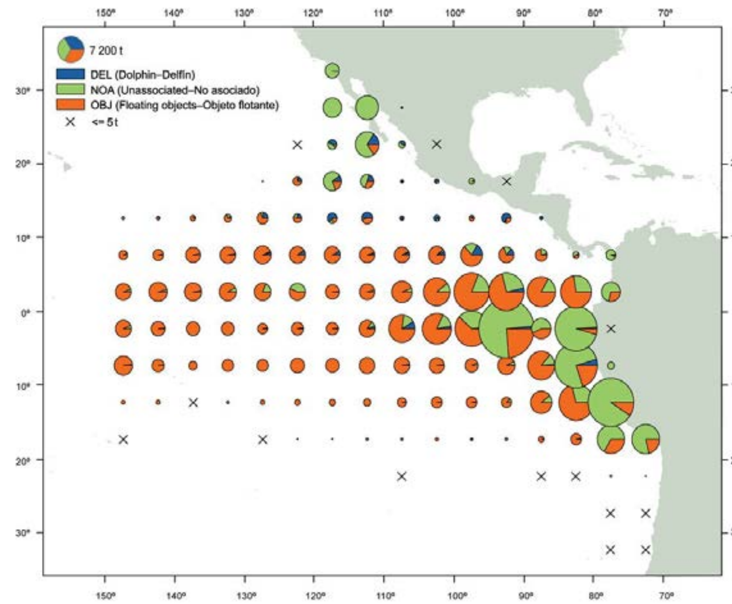

FIGURE 2a. Average annual distributions of the purse-seine catches of skipjack, by set type, 2004-2008. The sizes of the circles are proportional to the amounts of skipjack caught in those 5° by 5° areas.

FIGURA 2a. Distribución media anual de las capturas cerqueras de barrilete, por tipo de lance, 2004-2008. El tamaño de cada círculo es proporcional a la cantidad de barrilete capturado en la cuadrícula de 5° x 5° correspondiente.

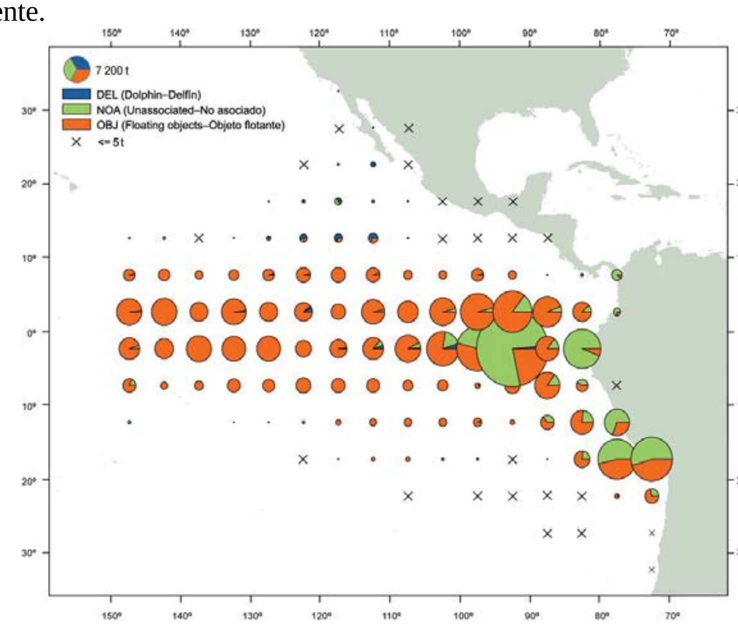

FIGURE 2b. Annual distributions of the purse-seine catches of skipjack, by set type, 2009. The sizes of the circles are proportional to the amounts of skipjack caught in those 5° by 5° areas.

FIGURA 2b. Distribución anual de las capturas cerqueras de barrilete, por tipo de lance, 2009. El tamaño de cada círculo es proporcional a la cantidad de barrilete capturado en la cuadrícula de 5° x 5° correspondiente.

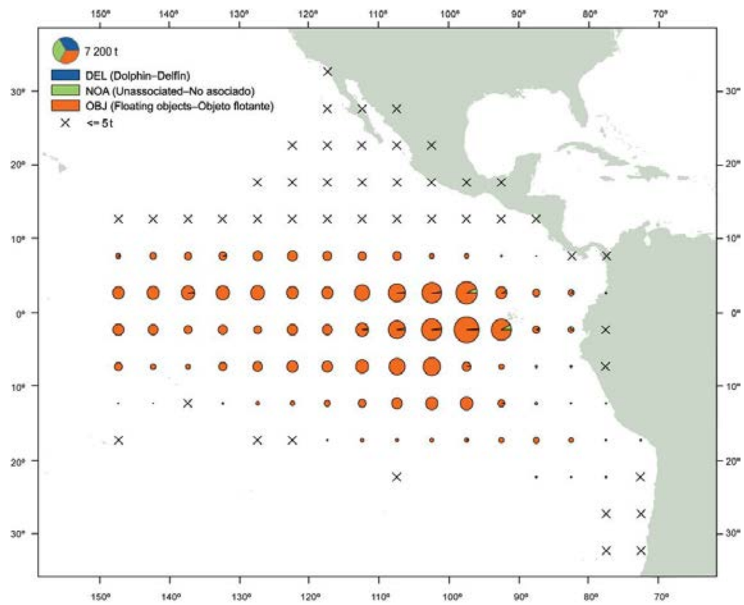

FIGURE 3a. Average annual distributions of the purse-seine catches of bigeye, by set type, 2004-2008. The sizes of the circles are proportional to the amounts of bigeye caught in those 5° by 5° areas.

FIGURA 3a. Distribución media anual de las capturas cerqueras de patudo, por tipo de lance, 2004-2008. El tamaño de cada círculo es proporcional a la cantidad de patudo capturado en la cuadrícula de 5° x 5° correspondiente.

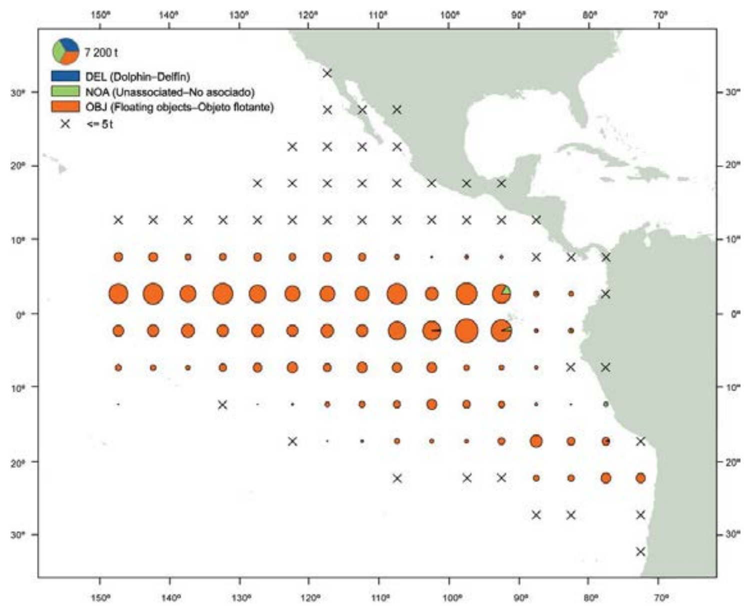

FIGURE 3b. Annual distributions of the purse-seine catches of bigeye, by set type, 2009. The sizes of the circles are proportional to the amounts of bigeye caught in those 5° by 5° areas.

FIGURA 3b. Distribución anual de las capturas cerqueras de patudo, por tipo de lance, 2009. El tamaño de cada círculo es proporcional a la cantidad de patudo capturado en la cuadrícula de 5° x 5° correspondiente.

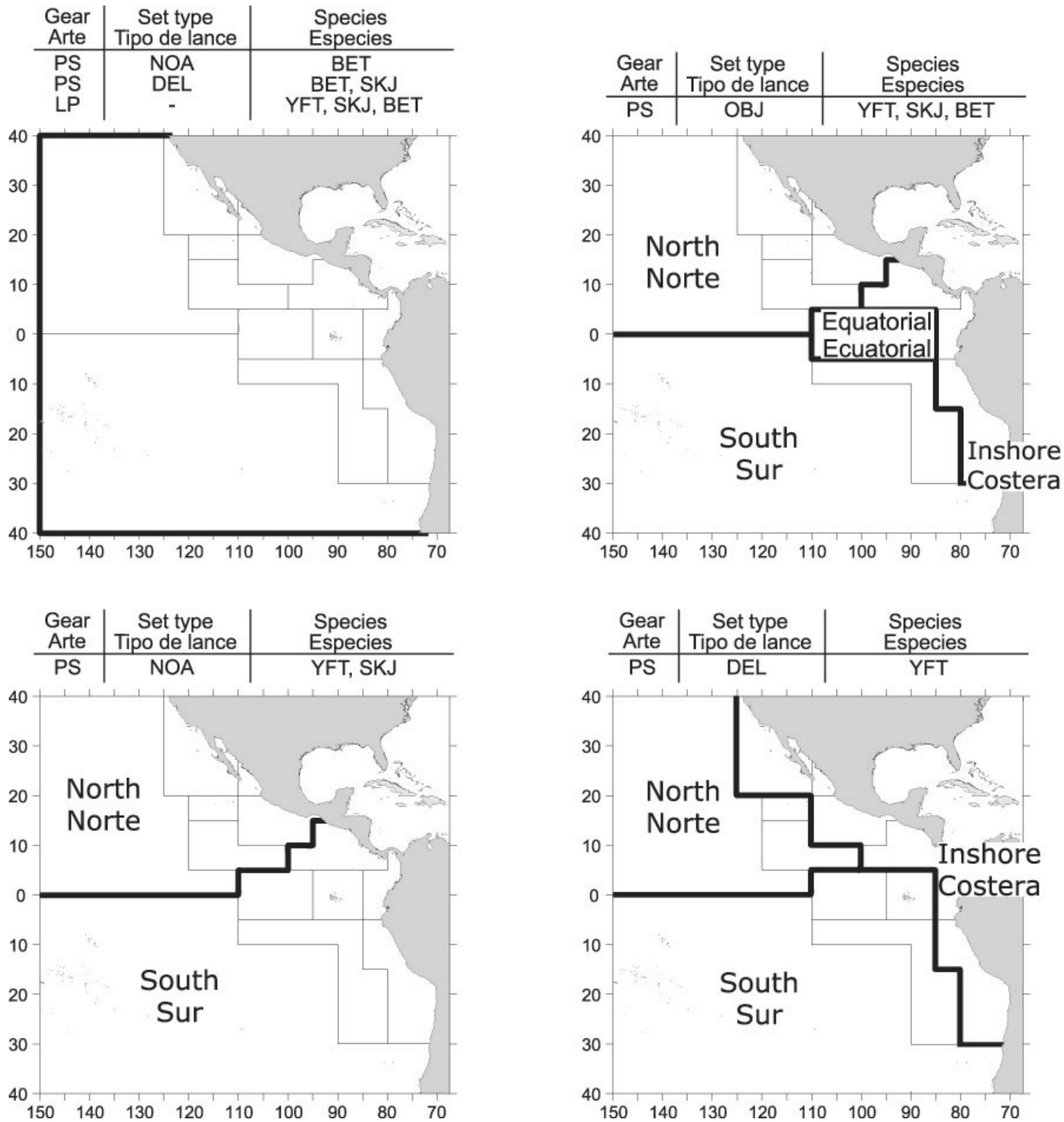

FIGURE 4. Spatial extents of the fisheries defined by the IATTC staff for stock assessment of yellowfin, skipjack, and bigeye in the EPO. The thin lines indicate the boundaries of the 13 length-frequency sampling areas, and the bold lines the boundaries of the fisheries. Gear: PS = purse seine, LP = pole and line; Set type: NOA = unassociated, DEL = dolphin, OBJ = floating object; Species: YFT = yellowfin, SKJ = skipjack, BET = bigeye.

FIGURA 4. Extensión espacial de las pesquerías definidas por el personal de la CIAT para la evaluación de las poblaciones de atún aleta amarilla, barrilete, y patudo en el OPO. Las líneas delgadas indican los límites de las 13 zonas de muestreo de frecuencia de tallas, y las líneas gruesas los límites de las pesquerías. Artes: PS = red de cerco, LP = caña; Tipo de lance: NOA = peces no asociados, DEL = delfín; OBJ = objeto flotante; Especies: YFT = aleta amarilla, SKJ = barrilete, BET = patudo.

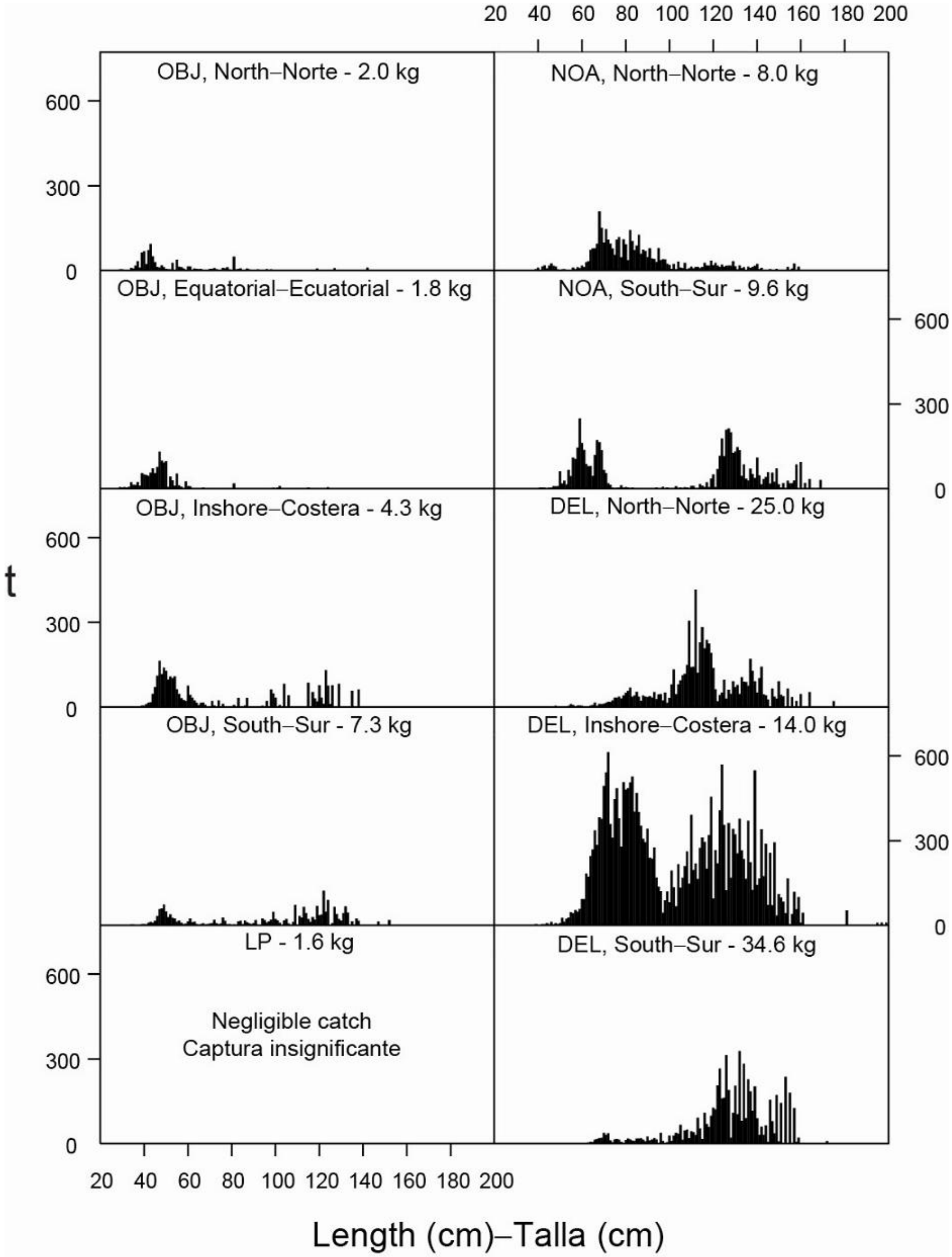

FIGURE 5a. Estimated size compositions of the yellowfin caught in each fishery of the EPO during the first quarter of 2010. The average weights of the fish in the samples are given at the tops of the panels. OBJ = floating object; LP = pole and line; NOA = unassociated; DEL = dolphin; t = metric tons.

FIGURA 5a. Composición por tallas estimada para el aleta amarilla capturado en cada pesquería del OPO durante el primer trimestre de 2010. En cada recuadro se detalla el peso promedio de los peces en las muestras. OBJ = objeto flotante; LP = caña; NOA = peces no asociados; DEL = delfín; t = toneladas métricas.

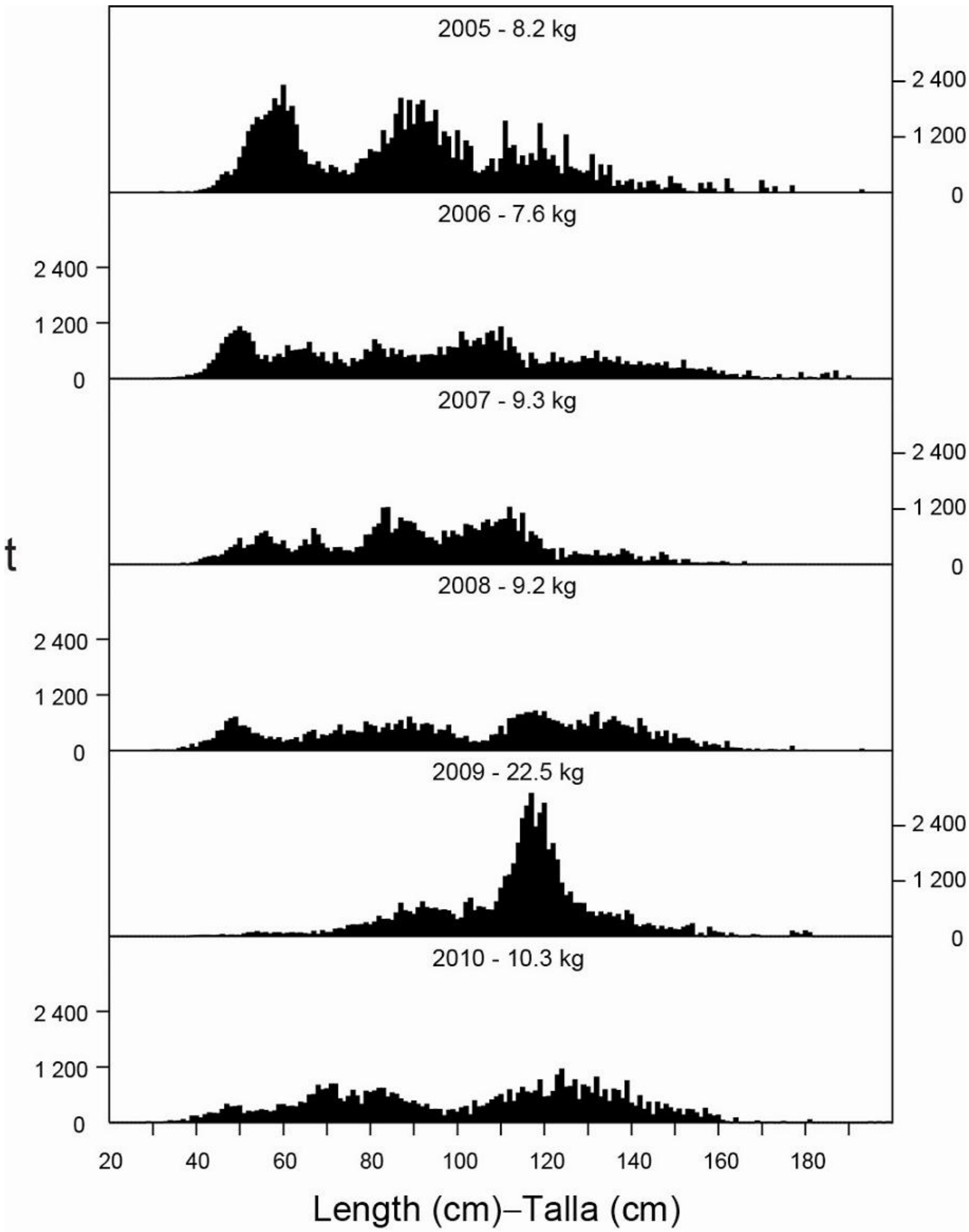

FIGURE 5b. Estimated size compositions of the yellowfin caught in the EPO during the first quarter of 2005-2010. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons.

FIGURA 5b. Composición por tallas estimada para el aleta amarilla capturado en el OPO en el primer trimestre de 2005-2010. En cada recuadro se detalla el peso promedio de los peces en las muestras; t = toneladas métricas.

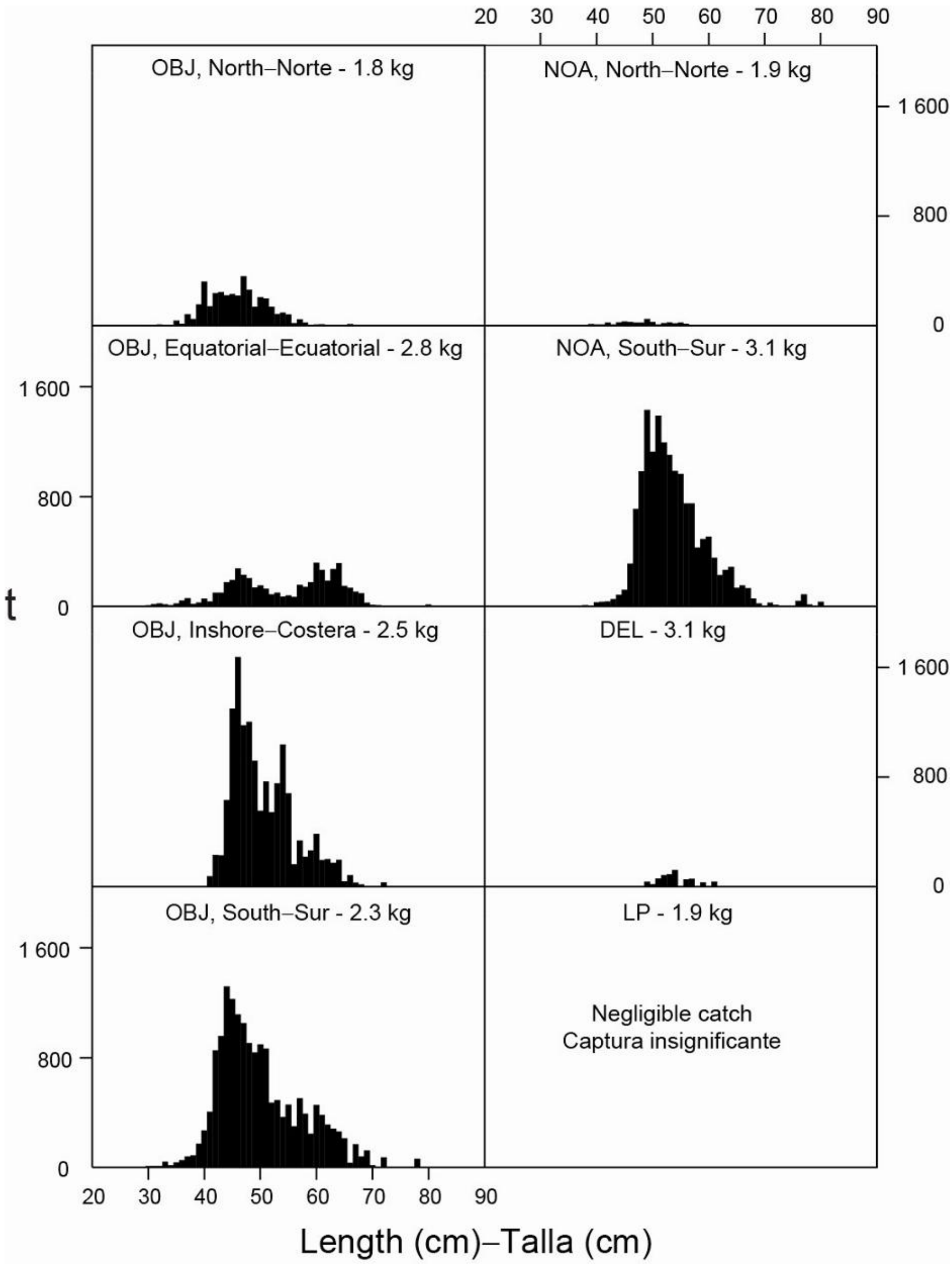

FIGURE 6a. Estimated size compositions of the skipjack caught in each fishery of the EPO during the first quarter of 20010. The average weights of the fish in the samples are given at the tops of the panels. OBJ = floating object; LP = pole and line; NOA = unassociated; DEL = dolphin; t = metric tons.

FIGURA 6a. Composición por tallas estimada para el barrilete capturado en cada pesquería del OPO durante el primer trimestre de 2010. En cada recuadro se detalla el peso promedio de los peces en las muestras. OBJ = objeto flotante; LP = caña; NOA = peces no asociados; DEL = delfín; t = toneladas métricas.

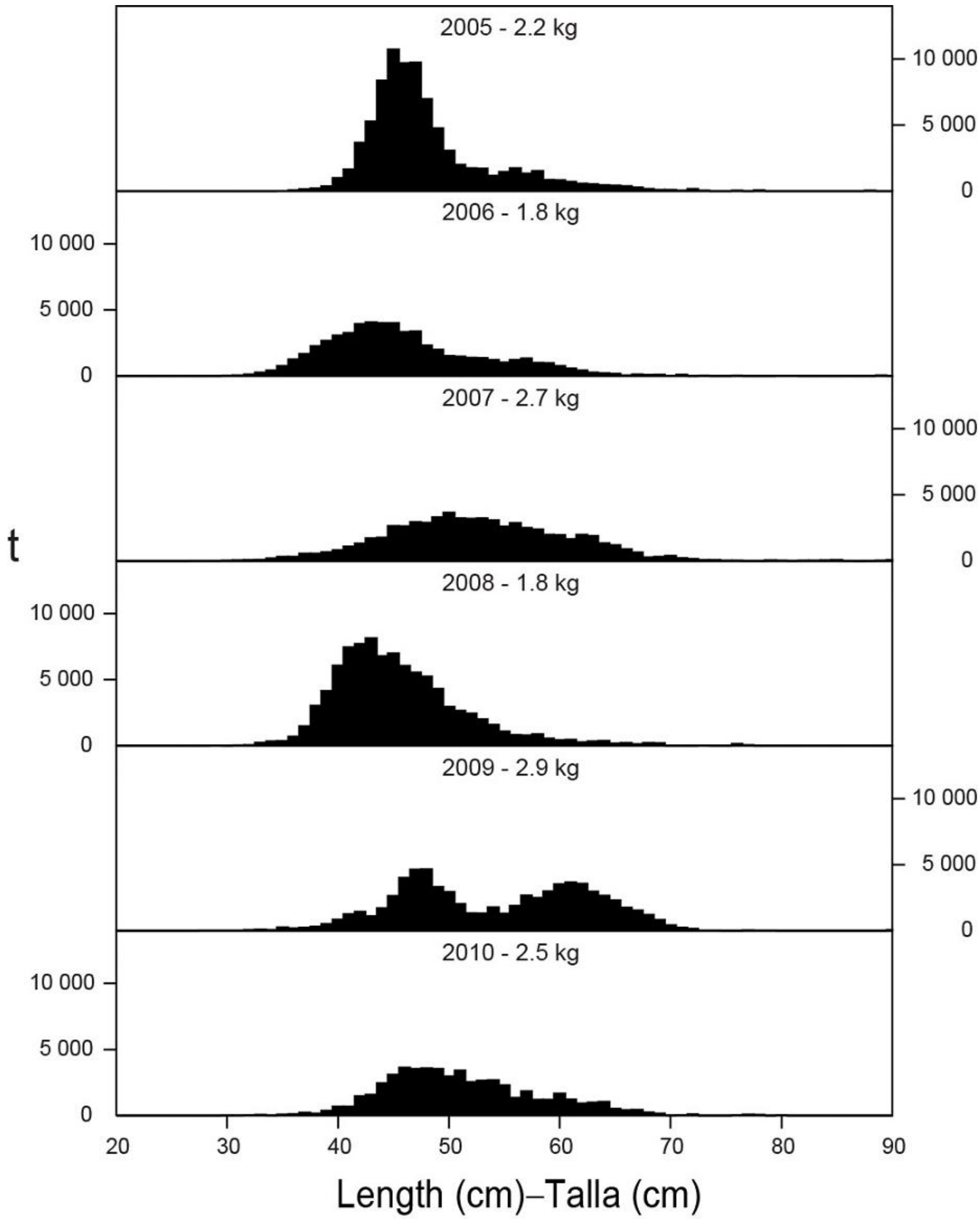

FIGURE 6b. Estimated size compositions of the skipjack caught in the EPO during the first quarter of 2005-2010. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons.

FIGURA 6b. Composición por tallas estimada para el barrilete capturado en el OPO en el primer trimestre de 2005-2010. En cada recuadro se detalla el peso promedio de los peces en las muestras. t = toneladas métricas.

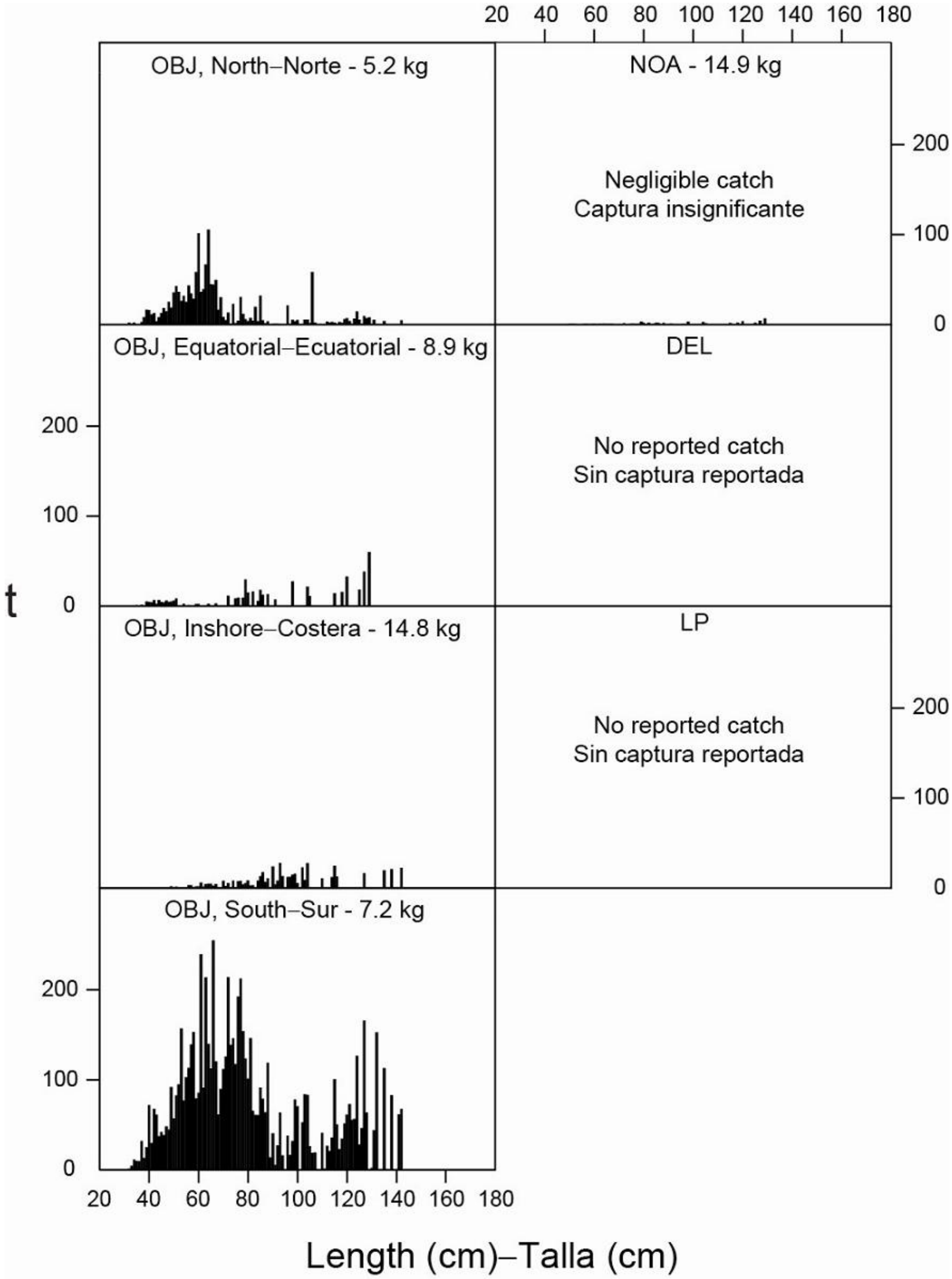

FIGURE 7a. Estimated size compositions of the bigeye caught in each fishery of the EPO during the first quarter of 2010. The average weights of the fish in the samples are given at the tops of the panels. OBJ = floating object; LP = pole and line; NOA = unassociated; DEL = dolphin; t = metric tons.

FIGURA 7a. Composición por tallas estimada para el patudo capturado en cada pesquería del OPO durante el primer trimestre de 2010. En cada recuadro se detalla el peso promedio de los peces en las muestras. OBJ = objeto flotante; LP = caña; NOA = peces no asociados; DEL = delfín; t = toneladas métricas.

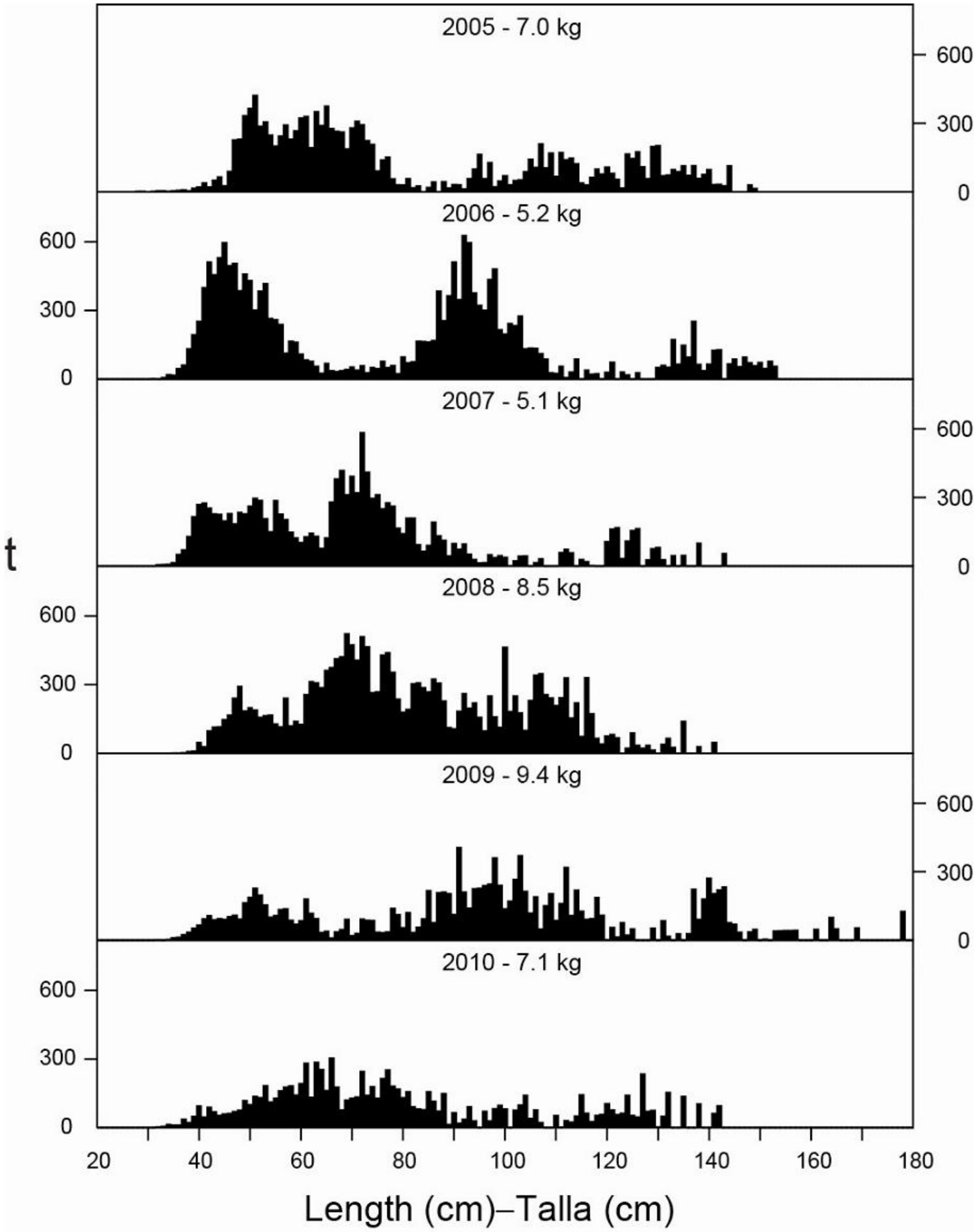

FIGURE 7b. Estimated size compositions of the bigeye caught in the EPO during the first quarter of 2005-2010. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons.

FIGURA 7b. Composición por tallas estimada para el patudo capturado en el OPO en el primer trimestre de 2005-2010. En cada recuadro se detalla el peso promedio de los peces en las muestras; t = toneladas métricas.

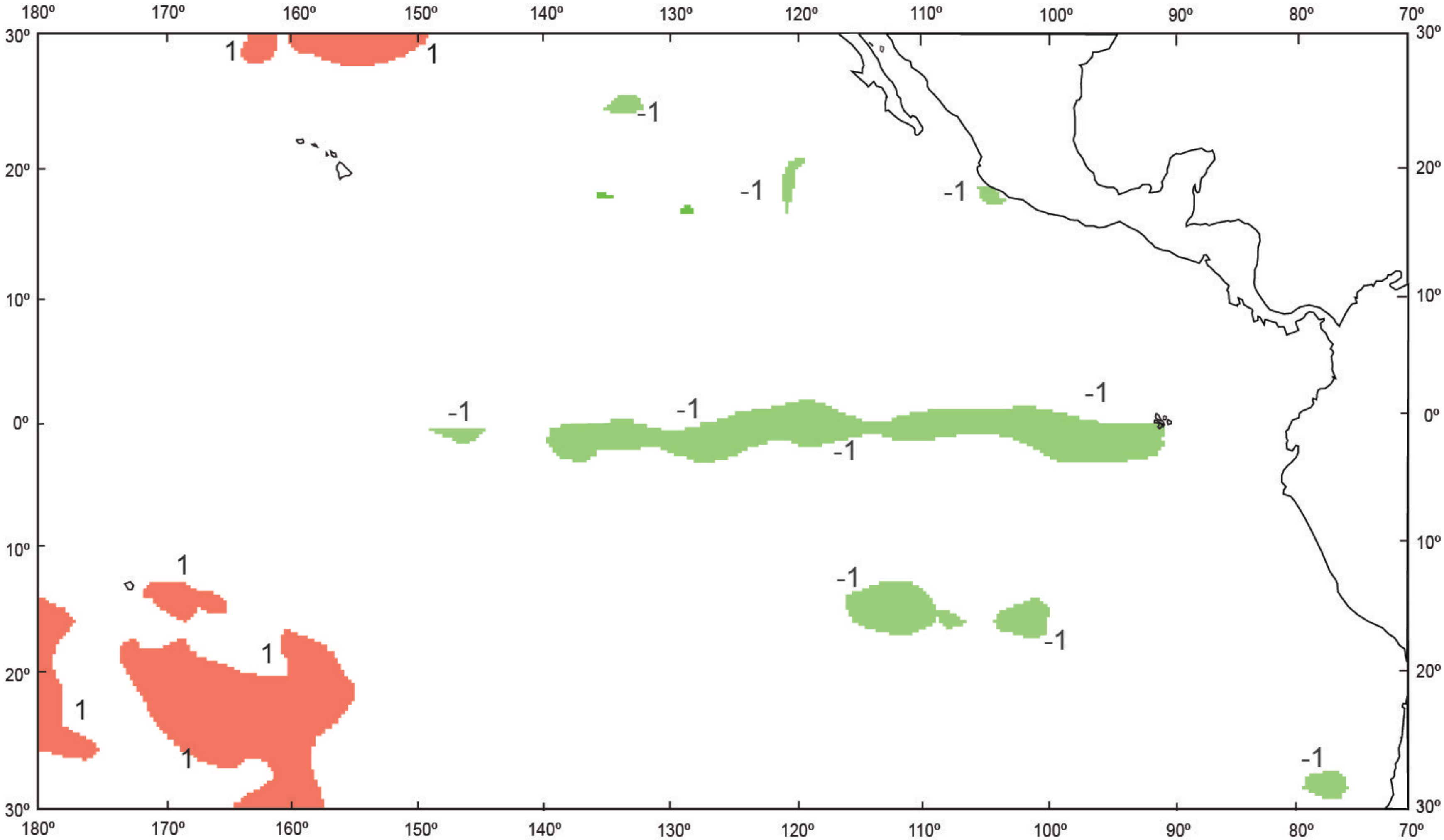

FIGURE 8. Sea-surface temperature (SST) anomalies (departures from long-term normals) for June 2010, based on data from fishing boats and other types of commercial vessels.
FIGURA 8. Anomalías (variaciones de los niveles normales a largo plazo) de la temperatura superficial del mar (TSM) en junio de 2010, basadas en datos tomados por barcos pesqueros y otros buques comerciales.

TABLE 1. Estimates of the numbers and capacities (m^3) of purse seiners and pole-and-line vessels operating in the EPO in 2010 by flag, gear, and well volume. Each vessel is included in the totals for each flag under which it fished during the year, but is included only once in the fleet total. Therefore the totals for the fleet may not equal the sums of the individual flag entries. PS = purse seine; LP = pole-and-line.

TABLA 1. Estimaciones del número de buques cerqueros y cañeros que pescan en el OPO en 2010, y de la capacidad de acarreo (m^3) de los mismos por bandera, arte de pesca, y volumen de bodega. Se incluye cada buque en los totales de cada bandera bajo la cual pescó durante el año, pero solamente una vez en el total de la flota; por consiguiente, los totales de las flotas no son siempre iguales a las sumas de las banderas individuales. PS = cerquero; LP = cañero.

Flag	Gear	Well volume–Volumen de bodega				Capacity
Bandera	Arte	1-900	901-1700	>1700	Total	Capacidad
				Number—Número		
Bolivia	PS	1	-	-	1	222
Colombia	PS	4	10	-	14	14,860
Ecuador	PS	62	12	9	83	59,611
España—Spain	PS	-	-	4	4	10,116
Guatemala	PS	-	2	1	3	4,819
Honduras	PS	1	1	-	2	1,559
México	PS	11	31	1	43	47,920
	LP	4	-	-	4	380
Nicaragua	PS	-	5	-	5	6,353
Panamá	PS	3	17	4	24	32,599
Perú	PS	1	-	-	1	458
El Salvador	PS	-	1	3	4	7,415
Venezuela	PS	-	17	-	17	22,747
Vanuatu	PS	1	3	-	4	4,807
All flags—	PS	84	98	22	204	
Todas banderas	LP	4	-	-	4	
	PS + LP	88	98	22	208	
				Capacity—Capacidad		
All flags—	PS	38,057	127,534	46,697	212,288	
Todas banderas	LP	380	-	-	380	
	PS + LP	38,437	127,534	46,697	212,668	

TABLE 2. Estimates of the retained catches of tunas in the EPO, from 1 January through 27 June 2010, by species and vessel flag, in metric tons.
TABLA 2. Estimaciones preliminares de las capturas retenidas de atunes en el OPO del 1 de enero al 27 de junio 2010, 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 Pacífi-co**	**Bonitos (*Sarda* spp.)**	**Albacora**	**Barrilete negro**	**Otras[1]**	**Total**	**Porcentaje del total**
Ecuador	14,173	48,852	13,615	-	3	-	28	140	76,811	31.6
México	60,086	4,066	-	1,744	3	3	2,001	3	67,906	27.9
Nicaragua	6,015	2,292	814	-	-	-	-	-	9,121	3.8
Panamá	18,944	11,245	4,383	-	-	-	-	2	34,574	14.2
Venezuela	12,929	4,063	144	-	-	-	3	18	17,157	7.1
Other—Otros[2]	18,092	15,758	3,651	1	-	-	11	2	37,515	15.4
Total	130,239	86,276	22,607	1,745	6	3	2,043	165	243,084	

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

TABLE 3. Estimated retained and discarded catches, in metric tons, by purse-seine and pole-and-line vessels of the EPO tuna fleet. “Other” includes other tunas, sharks, and miscellaneous fishes. The data for 2008-2009 are preliminary. Discard data were first collected by observers in 1993.

TABLA 3. Estimaciones de capturas retenidas y descartadas, en toneladas métricas, de buques cerqueros y caneros de la flota atunera del OPO. “Otros” incluye otros atunes, tiburones, y peces diversos. Los datos de 2008-2009 son preliminares. Los observadores toman datos sobre descartes desde 1993.

Year	Yellowfin			Skipjack			Bigeye			Pacific bluefin		
	Retained	Discarded	Total	Retained	Discarded	Total	Retained	Discarded	Total	Retained	Discarded	Total
Año	Aleta amarilla			Barrilete			Patudo			Aleta azul del Pacífico		
	Retenido	Descartado	Total	Retenido	Descartado	Total	Retenido	Descartado	Total	Retenido	Descartado	Total
1980	144,523	-	144,523	136,137	-	136,137	21,938	-	21,938	2,909	-	2,909
1981	169,711	-	169,711	125,071	-	125,071	14,921	-	14,921	1,085	-	1,085
1982	116,293	-	116,293	104,259	-	104,259	6,981	-	6,981	3,145	-	3,145
1983	87,936	-	87,936	61,238	-	61,238	4,614	-	4,614	836	-	836
1984	138,776	-	138,776	62,743	-	62,743	8,863	-	8,863	839	-	839
1985	212,529	-	212,529	51,775	-	51,775	6,058	-	6,058	3,996	-	3,996
1986	263,049	-	263,049	67,555	-	67,555	2,686	-	2,686	5,040	-	5,040
1987	267,115	-	267,115	66,252	-	66,252	1,177	-	1,177	980	-	980
1988	281,016	-	281,016	91,438	-	91,438	1,540	-	1,540	1,379	-	1,379
1989	282,141	-	282,141	97,874	-	97,874	2,030	-	2,030	1,108	-	1,108
1990	265,929	-	265,929	75,192	-	75,192	5,921	-	5,921	1,491	-	1,491
1991	234,113	-	234,113	63,945	-	63,945	4,901	-	4,901	419	-	419
1992	231,910	-	231,910	86,240	-	86,240	7,179	-	7,179	1,928	-	1,928
1993	224,443	4,758	229,201	87,602	10,598	98,200	9,657	653	10,310	580	-	580
1994	212,033	4,527	216,560	73,366	10,501	83,867	34,899	2,266	37,165	969	-	969
1995	216,702	5,275	221,977	132,300	16,373	148,673	45,321	3,251	48,572	629	-	629
1996	242,369	6,312	248,681	106,528	24,503	131,031	61,311	5,689	67,000	8,223	-	8,223
1997	249,296	5,516	254,812	156,716	31,338	188,054	64,272	5,402	69,674	2,609	3	2,612
1998	259,044	4,698	263,742	142315	22,644	164,959	44,129	2,822	46,951	1,772	-	1,772
1999	283,703	6,547	290,250	263609	26,046	289,655	51,158	4,932	56,090	2,558	54	2,612
2000	257,662	6,207	263,869	204,538	24,508	229,046	94,640	5,417	100,057	3,773	0	3,773
2001	386,618	7,028	393,646	144,009	12,815	156,824	61,156	1,254	62,410	1,156	3	1,159
2002	413,457	4,140	417,597	153,919	12,506	166,425	57,440	949	58,389	1,761	6	1,767
2003	381,577	5,950	387,527	275,167	22,453	297,620	54,174	2,326	56,500	3,236	-	3,236
2004	271,481	3,009	274,490	199,192	17,182	216,374	67,592	1,749	69,341	8,880	19	8,899
2005	269,420	2,929	272,349	263,080	17,228	280,308	69,826	1,952	71,778	4,743	15	4,758
2006	167,016	1,665	168,681	297,843	12,403	310,246	83,978	2,385	86,363	9,806	-	9,806
2007	171,158	1,946	173,104	208,566	7,159	215,725	63,074	1,039	64,113	4,270	-	4,270
2008	185,899	1,019	186,918	297,147	9,166	306,313	75,040	2,287	77,327	4,407	14	4,421
2009	236,599	1,478	238,077	229,819	6,826	236,645	76,513	1,092	77,605	3,398	24	3,422

TABLE 3. (continued)
TABLA 3. (continuación)

Year	Albacore			Bonitos (*Sarda* spp.)			Black skipjack			Other			Total		
	Retained	Discarded	Total	Retained	Discarded	Total	Retained	Discarded	Total	Retained	Discarded	Total	Retained	Discarded	Total
Año	Albacora			Bonitos (*Sarda* spp.)			Barrilete negro			Otros			Total		
	Retenido	Descartado	Total	Retenido	Descartado	Total	Retenido	Descartado	Total	Retenido	Descartado	Total	Retenido	Descartado	Total
1980	601	-	601	6,125	-	6,125	3,680	-	3,680	442	-	442	316,355	-	316,355
1981	707	-	707	5,717	-	5,717	1,911	-	1,911	216	-	216	319,339	-	319,339
1982	553	-	553	2,122	-	2,122	1,338	-	1,338	47	-	47	234,738	-	234,738
1983	456	-	456	3,829	-	3,829	1,222	-	1,222	60	-	60	160,191	-	160,191
1984	5,351	-	5,351	3,514	-	3,514	662	-	662	6	-	6	220,754	-	220,754
1985	919	-	919	3,604	-	3,604	288	-	288	19	-	19	279,188	-	279,188
1986	133	-	133	490	-	490	569	-	569	181	-	181	339,703	-	339,703
1987	321	-	321	3,316	-	3,316	571	-	571	481	-	481	340,213	-	340,213
1988	288	-	288	9,550	-	9,550	956	-	956	79	-	79	386,246	-	386,246
1989	22	-	22	12,096	-	12,096	801	-	801	36	-	36	396,108	-	396,108
1990	209	-	209	13,856	-	13,856	787	-	787	200	-	200	363,585	-	363,585
1991	834	-	834	1,289	-	1,289	421	-	421	4	-	4	305,926	-	305,926
1992	255	-	255	977	-	977	105	-	105	24	-	24	328,618	-	328,618
1993	1	-	1	600	12	612	104	4,144	4,248	9	2,013	2,022	322,996	22,178	345,174
1994	85	-	85	8,693	147	8,840	188	854	1,042	9	497	506	330,242	18,792	349,034
1995	465	-	465	8,010	55	8,065	203	1,448	1,651	11	626	637	403,641	27,028	430,669
1996	83	-	83	654	1	655	704	2,304	3,008	37	1,028	1,065	419,909	39,837	459,746
1997	60	-	60	1,105	4	1,109	100	2,512	2,612	71	3,383	3,454	474,229	48,158	522,387
1998	123	-	123	1,337	4	1,341	528	1,876	2,404	13	1,233	1,246	449,261	33,277	482,538
1999	274	-	274	1,719	0	1,719	171	3,412	3,583	27	3,092	3,119	603,219	44,083	647,302
2000	157	-	157	636	-	636	293	1,995	2,288	190	1,410	1,600	561,889	39,537	601,426
2001	160	-	160	17	-	17	2,258	1,019	3,277	191	679	870	595,565	22,798	618,363
2002	412	-	412	-	-	-	1,467	2,283	3,750	576	1,863	2,439	629,032	21,747	650,779
2003	93	-	93	1	-	1	439	1,535	1,974	80	1,238	1,318	714,767	33,502	748,269
2004	231	-	231	16	35	51	884	387	1,271	256	973	1,229	548,532	23,354	571,886
2005	68	-	68	313	18	331	1,472	2,124	3,596	190	1,922	2,112	609,112	26,188	635,300
2006	110	-	110	3,519	80	3,599	1,999	1,977	3,976	49	1,910	1,959	564,320	20,420	584,740
2007	208	-	208	16,013	628	16,641	2,307	1,625	3,932	600	1,221	1,821	466,196	13,618	479,814
2008	16	-	16	7,395	38	7,433	3,624	2,424	6,048	136	1,850	1,986	573,664	16,798	590,462
2009	59	2	61	9,807	15	9,822	3,992	1,241	5,233	158	482	640	560,345	11,160	571,505

TABLE 4. Preliminary estimates of the retained catches in metric tons, of tunas and bonitos caught by purse-seine, pole-and-line, and recreational vessels in the EPO in 2008 and 2009, by species and vessel flag. The data for yellowfin, skipjack, and bigeye tunas have been adjusted to the species composition estimates, and are preliminary.

TABLA 4. Estimaciones preliminares de las capturas retenidas, en toneladas métricas, de atunes y bonitos por buques cerqueros, cañeros, y recreacionales en el OPO en 2008 y 2009, por especie y bandera del buque. Los datos de los atunes aleta amarilla, barrilete, y patudo fueron ajustados a las estimaciones de composición por especie, y son preliminares.

Flag	Yellowfin	Skipjack	Bigeye	Pacific bluefin	Albacore	Black skipjack	Bonitos	Unidentified tunas	Total	Percent
Bandera	**Aleta amarilla**	**Barrilete**	**Patudo**	**Aleta azul del Pacífico**	**Albacora**	**Barrilete negro**	**Bonitos**	**Atunes no identificados**	**Total**	**Porcenta-je**
2008	**Retained catches–Capturas retenidas**									
Ecuador	18,472	143,501	41,197	*	*	154	23	89	203,436	35.4
México	85,268	22,135	328	4,407	10	3,366	6,969	40	122,523	21.3
Nicaragua	5,723	6,081	855	*	*	3	*	*	12,662	2.2
Panamá	26,853	42,930	11,723	*	*	47	66	4	81,623	14.2
Venezuela	21,704	27,055	2,196	*	*	52	9	3	51,019	8.9
Other—Otros[1]	28,092	55,458	18,741	103	387	2	328	*	103,111	18.0
Total	186,112	297,160	75,040	4,510	397	3,624	7,395	136	574,374	
2009	**Retained catches–Capturas retenidas**									
Ecuador	18,095	130,850	35,652	*	3	109	*	146	184,855	33.0
México	101,985	6,679	1,262	3,019	17	3,742	7,885	2	124,591	22.2
Nicaragua	8,305	3,980	1,615	*	*	*	*	*	13,900	2.5
Panamá	36,402	24,581	13,404	*	*	133	*	*	74,520	13.3
Venezuela	29,797	17,732	3,554	*	*	8	*	1	51,092	9.1
Other—Otros[1]	42,375	46,021	21,026	530	39	*	1,922	9	111,922	20.0
Total	236,959	229,843	76,513	3,549	59	3,992	9,807	158	560,880	

[1] Includes Bolivia, Colombia, El Salvador, Guatemala, Honduras, Peru, Spain, United States, and Vanuatu This category is used to avoid revealing the operations of individual vessels or companies.

[1] Incluye Bolivia, Colombia, El Salvador, España, Estados Unidos, Guatemala, Honduras, Perú, y Vanuatú Se usa esta categoría para no revelar información sobre las actividades de buques o empresas individuales.

TABLE 5. Preliminary estimates of the catches of bigeye tuna, in metric tons, in the eastern Pacific Ocean during the first and second quarters of 2010 by longline vessels more than 24 meters in overall length.

TABLA 5. Estimaciones preliminares de las capturas de atún patudo, en toneladas métricas, en el Océano Pacífico oriental durante el primero y segundo trimestres de 2010 por buques palangreros de más de 24 metros en eslora total.

	First quarter	**Month**			**Second quarter**	**Total to date**
		4	**5**	**6**		
	Primer trimestre	**Mes**			**Segundo trimestre**	**Total al fecha**
		4	**5**	**6**		
China	718	155	208	267	630	1,348
Chinese Taipei—Taipei Chino	1,435	349	289	187	825	2,260
European Union—Unión Europea	-	-	-	-	-	-
Japan—Japón	3,685	1,202	-	-	1,202	4,887
Republic of Korea—República de Corea*	-	-	-	-	-	-
USA—EE.UU.	-	-	-	-	-	-
Vanuatu	483	76	93	64	233	716
Total	6,321	1,782	590	518	2,890	9,211

* Round weight obtained by adjustment applied to processed weight—Peso entero obtenido mediante ajuste aplicado al peso procesado provisto

TABLE 6. Oceanographic and meteorological data for the Pacific Ocean, July 2009-June 2010. The values in parentheses are anomalies. SST = sea-surface temperature; SOI = Southern Oscillation Index; SOI* and NOI* are defined in the text.
TABLA 6. Datos oceanográficos y meteorológicos del Océano Pacífico, julio 2009-junio 2010. Los valores en paréntesis son anomalías. TSM = temperatura superficie del mar; IOS = Índice de Oscilación del Sur; IOS* y ION* están definidas en el texto.

Month—Mes	7	8	9	10	11	12
SST—TSM (°C)						
Area 1 (0°-10°S, 80°-90°W)	23.7 (0.9)	21.6 (0.8)	20.8 (0.3)	20.9 (0.0)	22.1 (0.5)	23.1 (0.3)
Area 2 (5°N-5°S, 90°-150°W	26.6 (1.0)	25.9 (1.0)	25.7 (0.8)	25.7 (0.8)	26.2 (1.3)	26.7 (1.6)
Area 3 (5°N-5°S, 120°-170°W)	28.0 (0.9)	27.5 (0.8)	27.5 (0.8)	27.6 (1.0)	28.2 (1.7)	28.3 (1.8)
Area 4 (5°N-5°S, 150W°-160°E)	29.2 (0.6)	29.2 (0.8)	29.3 (0.8)	29.6 (1.2)	29.9 (1.5)	29.7 (1.4)
Talara, Perú	20.0 (2.3)	18.3 (0.7)	17.3 (-0.6)	16.8 (-1.1)	18.4 (0.3)	21.2 (2.5)
Callao, Perú	17.6 (1.4)	15.7 (-0.1)	15.5 (0.1)	15.1 (-0.1)	16.6 (0.9)	16.0 (-0.2)
Thermocline depth—Profundidad de la termoclina, 0°, 80°W (m)	20	25	25	40	45	55
Thermocline depth—Profundidad de la termoclina, 0°, 110°W (m)	70	40	90	75	130	110
Thermocline depth—Profundidad de la termoclina, 0°, 150°W (m)	140	155	130	155	165	165
Thermocline depth—Profundidad de la termoclina, 0°, 180°W (m)	180	175	180	180	170	170
Sea level—Nivel del mar, Callao, Perú (cm)	105.4 (-0.6)	112.0 (1.9)	108.4 (0.8)	107.0 (1.4)	113.2 (6.3)	117.2 (8.6)
SOI—IOS	0.1	-0.7	0.3	-1.7	-0.8	-1.0
SOI*—IOS*	4.55	-2.58	4.92	-3.40	0.07	-0.54
NOI*—ION*	0.20	-0.26	1.42	-0.42	1.02	-3.44

Month—Mes	1	2	3	4	5	6
SST—TSM (°C)						
Area 1 (0°-10°S, 80°-90°W)	24.7 (0.2)	26.0 (0.0)	26.2 (-0.2)	26.1 (0.6)	24.5 (0.1)	22.8 (-0.2)
Area 2 (5°N-5°S, 90°-150°W	26.6 (1.0)	27.1 (0.7)	27.7 (0.7)	28.7 (0.7)	27.1 (0.0)	25.9 (-0.5)
Area 3 (5°N-5°S, 120°-170°W)	28.1 (1.6)	27.9 (1.2)	28.3 (1.1)	28.4 (0.7)	27.7 (0.0)	27.1 (-0.4)
Area 4 (5°N-5°S, 150W°-160°E)	29.6 (1.4)	29.1 (1.1)	29.2 (1.1)	29.2 (0.8)	29.1 (0.4)	28.7 (0.1)
Talara, Perú	21.8 (1.8)	22.5 (1.1)	20.7 (-0.5)	18.2 (-1.8)	20.8 (1.5)	17.4 (-1.3)
Callao, Perú	19.5 (3.1)	18.7 (1.2)	18.7 (0.6)	16.6 (-1.0)	17.0 (-0.2)	16.2 (-0.4)
Thermocline depth—Profundidad de la termoclina, 0°, 80°W (m)	40	25	25	25	40	35
Thermocline depth—Profundidad de la termoclina, 0°, 110°W (m)	95	60	85	70	40	30
Thermocline depth—Profundidad de la termoclina, 0°, 150°W (m)	150	150	125	150	110	90
Thermocline depth—Profundidad de la termoclina, 0°, 180°W (m)	145	155	160	200	150	160
Sea level—Nivel del mar, Callao, Perú (cm)	113.3 (1.8)	107.1 (-7.1)	116.4 (1.7)	112.4 (-2.1)	108.4 (-4.9)	101.2 (-10.5)
SOI—IOS	-1.5	-2.1	-1.4	1.2	0.8	0.1
SOI*—IOS*	2.31	-1.43	-2.03	2.93	6.13	5.58
NOI*—ION*	-8.05	-6.33	-0.18	-1.75	3.50	2.77

TABLE 7. Preliminary data on the sampling coverage of trips by vessels with capacities greater than 363 metric tons by the observer programs of the IATTC, Colombia, Ecuador, the European Union, Mexico, Nicaragua, Panama, and Venezuela during the second quarter of 2010. The numbers in parentheses indicate cumulative totals for the year.
TABLA 7. Datos preliminares de la cobertura de muestreo de viajes de buques con capacidad más que 363 toneladas métricas por los programas de observadores de la CIAT, Colombia, Ecuador, México, Nicaragua, Panamá, el Unión Europea, y Venezuela durante el segundo trimestre de 2010. Los números en paréntesis indican totales acumulados para el año.

Flag	Trips		Observed by program						Percent observed	
			IATTC		National		Total			
Bandera	Viajes		Observado por programa						Porcentaje observado	
			CIAT		Nacional		Total			
Colombia	8	(19)	2	(9)	6	(10)	8	(19)	100.0	(100.0)
Ecuador	66	(126)	46	(86)	20	(40)	66	(126)	100.0	(100.0)
España—Spain	7	(12)	4	(6)	3	(6)	7	(12)	100.0	(100.0)
Guatemala	2	(5)	2	(5)			2	(5)	100.0	(100.0)
Honduras	1	(2)	1	(2)			1	(2)	100.0	(100.0)
México	50	(108)	25	(53)	25	(55)	50	(108)	100.0	(100.0)
Nicaragua	4	(12)	2	(5)	2	(7)	4	(12)	100.0	(100.0)
Panamá	26	(54)	15	(28)	11	(26)	26	(54)	100.0	(100.0)
Perú										
El Salvador	6	(12)	6	(12)			6	(12)	100.0	(100.0)
U.S.A.—EE.UU.										
Venezuela	13	(31)	7	(14)	6	(17)	13	(31)	100.0	(100.0)
Vanuatu	4	(8)	4	(8)			4	(8)	100.0	(100.0)
Total	187	(389)[1]	114	(228)	73	(161)	187	(389)[1]	100.0	(100.0)

[1] Includes 50 trips (29 by vessels with observers from the IATTC program and 21 by vessels with observers from the national programs) that began in late 2009 and ended in 2010

[1] Incluye 50 viajes (29 por observadores del programa del CIAT y 21 por observadores de los programas nacionales) iniciados a fines de 2009 y completados en 2010.