INTER-AMERICAN TROPICAL TUNA COMMMISSION
COMISIÓN INTERAMERICANA DEL ATÚN TROPICAL

QUARTERLY REPORT—INFORME TRIMESTRAL

April-June 2013—Abril-Junio 2013

The Quarterly Report of the Inter-American Tropical Tuna Commission is an informal account 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 de la Comisión Interamericana del Atún Tropical es un relato informal 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.

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INTRODUCTION

The Inter-American Tropical Tuna Commission (IATTC) operated from 1950 to 2010 under the authority and direction of a Convention signed by representatives of the governments of Costa Rica and the United States of America on 31 May 1949. The Convention was open to the adherence by other governments whose nationals participated in the fisheries for tropical tunas and tuna-like species in the eastern Pacific Ocean (EPO). The original convention was replaced by the "Antigua Convention" on 27 August 2010, 15 months after it had been ratified or acceded to by seven Parties that were Parties to the original Convention on the date that the Antigua Convention was open for signature. On that date, Belize, Canada, China, Chinese Taipei, and the European Union became members of the Commission, and Spain ceased to be a member. Spanish interests were henceforth handled by the European Union. Kiribati joined the IATTC in June 2011. There were 21 members of the IATTC at the end of the second quarter of 2013.

The Antigua Convention states that the "Scientific Staff shall operate under the supervision of the Director," that it will "conduct scientific research … approved by the Commission," and "provide the Commission, through the Director, with scientific advice and recommendations in support of the formulation of conservation and management measures and other relevant matters." It states that "the objective of this Convention is to ensure the long-term conservation and sustainable use of the "tunas and tuna-like species and other species of fish taken by vessels fishing for tunas and tuna-like species," but it also states that the Commission is to "adopt, as necessary, conservation and management measures and recommendations for species belonging to the same ecosystem and that are affected by fishing for, or dependent on or associated with, the fish stocks covered by this Convention, with a view to maintaining or restoring populations of such species above levels at which their reproduction may become seriously threatened."

The scientific program is now in its 63rd 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 meetings

The 4th meeting of the Scientific Advisory Committee took place in La Jolla, California. USA, on 29 April-3 May 2013. The following background papers were presented at the meeting:

SAC-04-03 (Revised) The Fishery for Tunas and Billfishes in the Eastern Pacific Ocean in 2012

SAC-04-04b Status of Yellowfin Tuna in the Eastern Pacific Ocean in 2012 and Outlook for the Future, by Carolina V. Minte-Vera, Alexandre Aires-Da-Silva, and Mark N. Maunder

SAC-04-04c Indices of Relative Abundance of Yellowfin Tuna Derived from Purse-Seine Catch and Effort Data, by Cleridy E. Lennert-Cody, Carolina Minte-Vera, Mark N. Maunder, and Alexandre Aires-Da-Silva

SAC-04-04d Analysis of Large-Scale Spatial Patterns in Yellowfin Tuna Catch Data from Purse-Seine and Longline Fisheries, by Cleridy E. Lennert-Cody, Mark N. Maunder, and Alexandre Aires-Da-Silva

SAC-04-05a Status of Bigeye Tuna in the Eastern Pacific Ocean in 2012 and Outlook for the Future, by Alexandre Aires-Da-Silva and Mark N. Maunder

SAC-04-05b Analyses of Japanese Longline Operational-Level Catch and Effort Data for Bigeye Tuna in the Eastern Pacific Ocean, by Cleridy E. Lennert-Cody, Hiroaki Okamoto, and Mark N. Maunder

SAC-04-05d Kobe II Strategy Matrix for the Bigeye and Yellowfin Tuna Stocks of the Eastern Pacific Ocean in 2012, by Carolina V. Minte-Vera, Mark N. Maunder, and Alexandre Aires-Da-Silva

SAC-04-06a Updated Indicators of Stock Status for Skipjack Tuna in the Eastern Pacific Ocean, by Mark N. Maunder

SAC-04-07c Status of Sailfish in the Eastern Pacific Ocean in 2011 and Outlook for the Future, by Michael G. Hinton and Mark N. Maunder

SAC-04-08 Ecosystem Considerations: Ecological and Physical Changes in the EPO

SAC-04-09 Reference Points and Harvest Rate Control Rules, by Mark N. Maunder and Richard B. Deriso

SAC-04-11 Individual-Vessel Quotas for Purse-Seine Vessels that Fish on Fish-Aggregating Devices (FADs)

SAC-04-12 Current and Planned Activities of the IATTC Staff

SAC-04-Inf A Recommendations of the Review Panel on the IATTC Assessment of Yellowfin Tuna

SAC-04-INF B Fishing Capacity and Efficient Fleet Configuration for the Tuna Purse-Seine Fishery in the Eastern Pacific Ocean: An Economic Approach, by Jeffrey

Shrader (Department of Economics, University of California at San Diego; NOAA Fisheries, Southwest Fisheries Science Center, La Jolla, California) and Dale Squires (NOAA Fisheries, Southwest Fisheries Science Center, La Jolla, California)

SAC-04-INF C Independent Review of the IATTC's EPO Dolphin Population Assessment, by André E. Punt (School of Aquatic and Fishery Sciences, University of Washington, Seattle, Washington, USA)

SAC-04-INF D Management Options: Total Allowable Catch (TAC) Scheme

SAC-04-Prop A-1 Initiative to Create a System for Collecting and Presenting Scientific Documents of the Scientific Advisory Committee and Scientific Working Groups of the Inter-American Tropical Tuna Commission, by Javier Ariz (Instituto Español de Oceanografía, Centro Oceanográfico de Canarias, Spain) and Alain Fonteneau (European Union Scientist Emeritus, Institut de Recherche pour le Développement, France)

The following IATTC meetings were held in Veracruz, Mexico, in June 2013.

No.	Meeting	Dates
32	Permanent Working Group on Tuna Tracking	3 June
18	Working Group to Promote and Publicize the AIDCP Dolphin Safe Tuna Certification System	3 June
53	International Review Panel	3 June
27	Parties [to the AIDCP]	4 June
1	Committee on Administration and Finance	5 June
4	Committee for the Review of Implementation of Measures Adopted by the Commission	6-7 June
14	Permanent Working Group on Fleet Capacity	8-9 June
85	Inter-American Tropical Tuna Commission	10-14 June

The following resolutions were adopted at the 85th meeting of the IATTC:

C-13-01	Multiannual Program for the Conservation of Tuna in the Eastern Pacific Ocean during 2014-2016
C-13-02	Measures for the Conservation and Management of Bluefin Tuna in the Eastern Pacific Ocean
C-13-03	Supplemental Resolution on North Pacific Albacore
C-13-04	Collection and Analyses of Data on Fish-Aggregating Devices
C-13-05	Data Confidentiality Policy and Procedures
C-13-06	Financing for Fiscal Year 2014

Other meetings

Dr. Michael D. Scott served as chairman of the 23rd meeting of the Pacific Scientific Review Group, held in San Diego, California, USA, on 2-4 April 2013. This group advises the U.S. National Marine Fisheries Service on stock assessments and scientific research conducted on marine mammals in the U.S. waters of the eastern and central Pacific Ocean.

Mr. Ernesto Altamirano participated in the 7th International Fisheries Observer and Monitoring Conference in Viña del Mar, Chile, on 8-12 April 2013, where he gave a talk entitled "Observers without Borders: the Cross-Endorsement of Tuna Purse Seine Observers in the Pacific Ocean."

Dr. Guillermo A. Compeán participated in a meeting of the Organización del Sector Pesquero y Acuícola de Centroamerica (OSPESCA) in San José, Costa Rica, on 25-26 April 2013. The principal purpose of the meeting was to discuss the findings to be presented at the 4th meeting of the Scientific Advisory Committee, which was to take place on 29 April-3 May 2013, and the 85th meeting of the IATTC, which was to take place on 10-13 June 2013.

Drs. Martín A. Hall and Michael D. Scott participated in the 51st Annual Meeting of the U.S. Marine Mammal Commission in La Jolla, California, USA, on 7-9 May 2013. Dr. Hall gave a presentation entitled "Balanced Harvesting and Marine Mammal Conservation" at the meeting.

Many members of the IATTC staff (but fewer than usual) participated in all or parts of the 64th Tuna Conference at Lake Arrowhead, California, USA, on 20-23 May 2013. Mr. Daniel W. Fuller and Ms. Joydelee C. Marrow served as co-chairs of the conference, and Mr. Kurt M. Schaefer served as moderator for a session on Life History. Talks were given by Dr. Daniel Margulies, Messrs. Marlon H. Román Verdesoto and Kurt M. Schaefer, and Mss. Leanne M. Duffy and Maria C. Stein. In addition, research in which Drs. Alexandre Aires-da-Silva, Daniel Margulies, Mark N. Maunder, and Robert J. Olson, Messrs. Daniel W. Fuller and Vernon P. Scholey, and Mss. Maria C. Stein and Jeanne B. Wexler had participated was presented by other speakers. Also, Drs. Aires-da-Silva and Maunder were co-presenters (with five other scientists) of a poster.

Dr. Michael G. Hinton participated in the International Scientific Committee (ISC) Billfish Working Group meeting held in Shimizu, Japan, on 20-29 May 2013. The working group reviewed several stock assessment models and analyses of the status and trends of blue marlin in the Pacific Ocean. In general, the results obtained with the various models were consistent with one another. Following the reviews, the group decided to conduct the assessment of blue marlin using Stock Synthesis, which is the model used in most assessments conducted by the IATTC staff. The final results of the assessment were to be available following additional sensitivity analyses and presentation of the working group's report to the ISC Plenary in July 2013.

Dr. Carolina Minte-Vera participated in a meeting of the Fisheries Single Stock Status sub-group of the FAO Working Group on Developing New Approaches to Global Stock Assessment and Maximum Sustainable Production of the Seas, at the Joint Research Center of the European Commission in Ispra, Italy, on 3-5 June 2013.

Dr. Richard B. Deriso participated in a meeting of the Science and Statistical Committee of the Western Pacific Regional Fisheries Management Council in Honolulu, Hawaii, USA, on 18-20 June 2013.

Dr. Carolina Minte-Vera participated in a meeting of the entire FAO Working Group on Developing New Approaches to Global Stock Assessment and Maximum Sustainable Production of the Seas at the New England Aquarium in Boston, Massachusetts, USA, on 24-26 June 2013.

RESEARCH

DATA COLLECTION AND DATABASE PROGRAM

There are two major fisheries for tunas in the eastern Pacific Ocean (EPO; the region east of 150ºW, south of 50ºN, and north of 50°S), the commercial surface fishery and the longline fishery. The catches by the commercial surface fishery are taken almost entirely by purse-seine and pole-and-line vessels based in ports of Western Hemisphere nations. The longline catches are taken almost entirely by vessels registered and based in Far Eastern nations. The staff of the IATTC collects data on the catches by purse-seine and pole-and-line vessels and samples the catches of these vessels at unloading facilities in Las Playas and Manta, Ecuador; Manzanillo and Mazatlan, Mexico; Panama, Republic of Panama; and Cumaná, Venezuela, where it has field offices, and also, to a lesser extent, at other ports. The governments of the nations in which the catches of the longliners that fish in the EPO are registered compile the catch and size composition data for those vessels and make the data, in aggregated form, available to the IATTC staff. The rest of this section deals almost entirely with the surface fisheries.

Compilation of data on the amounts of catch, and on species and length composition of the catch for the surface fisheries is complicated. Observers accompany all trips of Class-6 purse seiners (vessels with fish-carrying capacities greater than 363 metric tons) that fish in the EPO, and the data that they collect include the locations and dates of each set, the type of each set (dolphin, floating object, or unassociated), the approximate total weights of each species caught in each set, and the wells in which the fish caught in each set are stored. Similar data are obtained from the logbooks of smaller purse seiners and of pole-and-line vessels, although these data may be less accurate or less precise than those collected by the observers. Then, when a vessel unloads its catch, the weight of the contents of each well is made available to the IATTC staff. These "reported catch statistics"—catch statistics obtained from every possible source, including observer records, fishing vessel logbooks, unloading records, and data compiled by governmental agencies—are compiled to provide an estimate of the total amount of tropical tunas (yellowfin, bigeye, and skipjack combined) caught annually by the surface fisheries. In addition, sample data on the species and length compositions of the catch are also obtained when a vessel unloads. The methods for collection of these sample data are described in the IATTC Annual Report for 2000 and in IATTC Stock Assessment Reports 2, 4, 10, 11, 12, and 13. Briefly, the fish in a well of a purse-seine or pole-and-line vessel are selected for sampling only if all of the fish in the well were caught in the same sampling area, during the same calendar month, and by the same type of gear (pole-and-line, or in the same type of set of a Class 1-5 or a Class-6 vessel). These data are then categorized by fishery (Figure 1).

The sample data on species and length compositions of the catch are eventually combined with the reported catch statistics to make the "final" estimates of the catches by species and length- and weight-frequency distributions by species that appear in the IATTC's Stock Assessment Reports, Fishery Status Reports, and papers in outside journals, but this does not take place until two or more months after the end of the calendar year. (If additional information

is acquired after the "final" estimates are calculated, that information is used to recalculate the estimates.) Most of the catch statistics that appear in the rest of this report are preliminary, as the calculations cannot be performed until after the end of the year.

IATTC personnel stationed at its field offices collected 388 length-frequency samples from 251 wells and abstracted logbook information for 282 trips of commercial fishing vessels during the second quarter of 2013.

Reported fisheries statistics

Information reported herein is for the EPO, unless noted otherwise. Catch is reported in metric tons (t), vessel capacity in cubic meters (m^3), and effort in days of 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 after 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.

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. 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 2013 is about 215,000 m^3 (Table 1). The average weekly at-sea capacity for the fleet, for the weeks ending 7 April through 30 June, was about 152,100 m^3 (range: 139,500 to 163,200 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 2013, and comparative statistics for 2008-2012, were:

Species	2013	2008-2012			Weekly average, 2013
		Average	Minimum	Maximum	
Yellowfin	124,800	127,400	110,500	135,700	4,800
Skipjack	158,900	133,300	88,700	179,200	6,100
Bigeye	26,800	29,100	23,800	37,700	1,000

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

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 363 metric tons), 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 fish-carrying capacities.

The estimated nominal catches per day of fishing for yellowfin, skipjack, and bigeye in the EPO during the first quarter of 2013 and comparative statistics for 2008-2012 were:

Region	Species	Gear	2013	2008-2012		
				Average	Minimum	Maximum
N of 5° N	Yellowfin	PS	16.4	14.7	11.1	17.1
S of 5° N			1.7	3.8	2.9	4.7
N of 5° N	Skipjack	PS	1.6	1.0	0.4	2.4
S of 5° N			12.1	11.8	9.4	14.9
EPO	Bigeye	PS	1.3	2.1	1.4	3.2
EPO	Yellowfin	LP	0.0	0.8	0.0	2.7
EPO	Skipjack	LP	0.0	2.1	0.0	4.5

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 (C-09-01-Tuna-conservation-2009-2011). Preliminary estimates of the catches reported for the first two quarters of 2013 are shown in Table 3.

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.

Data for fish caught during the first quarter of 2008-2013 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 2013, and the second shows data for the combined strata for the first quarter of each year of the 2008-2013 period. Samples were obtained from 230 wells containing fish that were caught during the first quarter of 2013.

There are ten surface fisheries for yellowfin defined for stock assessments: four associated with floating objects, two with unassociated schools, three associated with dolphins, and one pole-and-line (Figure 1). The last fishery includes all 13 sampling areas. Of the 230 wells sampled that contained fish caught during the first quarter of 2013, 149 contained yellowfin. The estimated size compositions of these fish are shown in Figure 2a. The area of greatest yellowfin catch during the first quarter was taken by sets on dolphins in the Inshore area. Lesser amounts were taken in the Northern and Southern dolphin areas and all areas of the floating-object and unassociated fisheries.

The estimated size compositions of the yellowfin caught by all fisheries combined during the first quarters of 2008-2013 are shown in Figure 2b. The average weight of yellowfin caught during the first quarter of 2013 (11.1 kg) was less than the 2012 average (13.4 kg), and considerably less than that of 2009 (22.8 kg). The sizes of the yellowfin caught during the first quarter of 2013 were fairly evenly distributed between about 50 and 150 cm.

There are eight fisheries for skipjack defined for stock assessments: four associated with floating objects, two with unassociated schools, one associated with dolphins, and one pole-and-line (Figure 1). The last two fisheries include all 13 sampling areas. Of the 230 wells sampled that contained fish caught during the first quarter of 2013, 165 contained skipjack. The estimated size compositions of these fish are shown in Figure 3a. Large amounts of skipjack in the 40- to 60-cm range were caught in the Inshore and Southern floating-object fisheries, and in the Southern unassociated fishery.

The estimated size compositions of skipjack caught by all fisheries combined during the first quarter of 2008-2013 are shown in Figure 3b. The average weight of skipjack caught during the first quarter of 2013 (2.1 kg) was about the same as the averages for 2012 and 2011, but less than the averages for 2010 and 2009.

There are seven surface fisheries for bigeye defined for stock assessments: four associated with floating objects, one with unassociated schools, one associated with dolphins, and one pole-and-line (Figure 1). The last three fisheries include all 13 sampling areas. Of the 230 wells sampled that contained fish caught during the first quarter of 2013, 27 contained bigeye. The estimated size compositions of these fish are shown in Figure 4a. The majority of the catch was taken in floating-object sets in the Southern area, with lesser amounts taken in floating-object sets in the Northern and Equatorial areas.

The estimated size compositions of bigeye caught by all fisheries combined during the first quarter of 2008-2013 are shown in Figure 4b. The average weight of bigeye caught during the first quarter of 2013 (5.7 kg) was far less than the average for 2012 (11.0 kg), and less than any of the averages for 2008-2011.

The estimated retained purse-seine catch of bigeye less than 60 cm in length during the first quarter of 2013 was 2,700 t, or about 40 percent of the estimated total retained purse-seine catch of bigeye during that period. The corresponding amounts for 2008-2012 ranged from 1,700 to 3,200 t, or 10 to 16 percent respectively. These values may differ slightly from those given in previous Quarterly Reports due to changes in the estimation procedure.

BIOLOGY AND ECOSYSTEM PROGRAM

Tuna tagging

The IATTC and Lotek Wireless Inc. (Saint Johns, Newfoundland, Canada) held their second workshop, "Lotek Wireless Tag Designs, Attachment Techniques, Data Analysis, and Applications," at the IATTC's Achotines Laboratory in Panama on 7-11 April 2013. Messrs. Kurt M. Schaefer and Vernon P. Scholey organized the workshop and Messrs. Schaefer and Daniel W. Fuller, along with Messrs. Padraic O'Flaherty and Colin Hunter of Lotek Wireless, Inc., served as instructors. The following participants attended the workshop: Kaycee Coleman, graduate student, Rutgers, the State University of New Jersey, New Brunswick, New Jersey, USA; Marcus Drymon, Assistant Professor in the Department of Marine Sciences at the University of South Alabama, Mobile, Alabama, USA; David Kerstetter, Research Scientist/Adjunct Faculty at Nova Southeastern University Oceanographic Center, Hollywood, Florida, USA; Jennifer McKinney, Biologist, Louisiana Department of Wildlife and Fisheries, Baton Rouge, Louisiana, USA; Julie Nielsen, Ph. D. candidate, Fairbanks School of Fisheries and Ocean Sciences, University of Alaska, Fairbanks, Alaska; and Evgeny V. Romanov, Technical Centre for Support of Fisheries, Association Réunionnaise de Développement de l'Aquaculture. Each of the participants presented information regarding past, current, and/or proposed research involving the use of archival tags or pop-up satellite archival tags in experiments with fish for investigations of movements and behavior. A fee paid by the participants covered the expenses of putting on the workshop.

Early life history studies

Yellowfin broodstock

The yellowfin broodstock in Tank 1 (1,362,000 L) at the Achotines Laboratory spawned on only one date, June 25, during the quarter. The number of eggs collected after the June 25 spawning event was about 3,200. The water temperatures in the tank during the quarter ranged from 24.0° to 28.6°C, and the spawning on June 25 occurred at a water temperature of approximately 28.0°C. The sustained cessation in spawning during the quarter was likely related to a decreasing number of broodstock fish resulting from an unusually-high number of wall-strike mortalities during the previous 6 months. Increased fishing effort for new broodstock fish is planned for the third quarter to rebuild the broodstock population.

At the end of the quarter there were two 65- to 70-kg yellowfin, four 26- to 48-kg yellowfin, and two 15-kg yellowfin in Tank 1.

Rearing of yellowfin eggs, larvae, and juveniles

During the quarter, the following parameters were recorded for the June 25 spawning event: time of spawning, egg diameter, duration of egg stage, hatching rate, lengths of hatched larvae, duration of yolk-sac stage, and selected morphometrics of yolk-sac larvae.

Comparative studies of yellowfin and Pacific bluefin larvae

A joint Kinki University (KU)-IATTC-ARAP [Autoridad de los Recursos Acuáticos de Panamá] 5-year research project is being supported in Panama by the Japan International Cooperation Agency (JICA) (see Quarterly Report for January-March 2011). This project, which is being conducted through the Science and Technology Research Partnership for Sustainable Development (SATREPS) Program, involves comparative studies of the early life histories of Pacific bluefin and yellowfin.

As part of the SATREPS project, numerous KU professors, graduate students, and post-doctoral researchers visited the Achotines Laboratory from mid-April through June. The KU scientists worked with ARAP biologists and IATTC Achotines staff members to continue SATREPS research investigations of the genetics, nutrition, and early life history of yellowfin. Although there was no yellowfin spawning during their visits, the KU scientists continued to analyze genetic samples of yellowfin collected previously, continued analysis of weaning diets to be used in future rearing trials with yellowfin juveniles, and conducted comparative trials of enrichment media used to nutritionally enhance the zooplankton prey of yellowfin larvae.

Since late 2012, the IATTC early life history group has been discussing possible joint research activities with Dr. Yonathan Zohar, Professor and Chair of the Department of Marine Biotechnology at the Institute of Marine and Environmental Technology, University of Maryland, Baltimore County (UMBC), USA. The joint studies being planned include rearing trials with yellowfin larvae at the Achotines Laboratory. As a result of these planning discussions, Dr. Francisco de Asis de la Serna Sabate of the UMBC spent the period of 12-25 April 2013 at the Achotines Laboratory, where he intended to conduct experimental preparations and to carry out preliminary rearing trials with yellowfin larvae. (Since the yellowfin broodstock fish were not spawning during this time, it was decided to defer the first joint rearing trials until October 2013.)

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, the ARAP staff had conducted full life cycle research on spotted rose snappers (*Lutjanus guttatus*) in captivity. Efforts to rebuild the broodstock population of this species had been unsuccessful in recent years. During the quarter, a major fishing effort was undertaken to collect new broodstock of spotted rose snapper in local waters. The collection efforts were successful, and at the end of the quarter a large group of fish (>100) was being held in the broodstock snapper tank.

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.

In February and March of 2012 an area of cool water extended from southern Baja California to the Equator at about 125°W, and then westward along the Equator to west of 180° (IATTC Quarterly Report for January-March 2012: Figure 8). This area of cool water moved northward during the ensuing months and persisted through September. A large area of warm water appeared off southern Peru and northern Chile in February 2012, and this persisted through July. In April a portion of this area of warm water extended westward along the equator to about 115°W. This extension retreated in May, but then extended further to the west in June (IATTC Quarterly Report for April-June 2012: Figure 5). It began to weaken in August and nearly disappeared in September. In December a small area of warm water formed off Mexico and a short tongue of cool water formed along the Equator off Ecuador (IATTC Quarterly Report for October-December 2012: Figure 6). There were spots of cool water along the Equator during January-February 2013 and offshore off Mexico and far offshore south 20°S during January-March 2013 (IATTC Quarterly Report for January-March 2013: Figure 8). During April 2013 the SSTs were mostly normal except for a narrow band of cool water close to the coast of Peru and some warm water far offshore south of about 15°S. During May and June the area of cool water expanded westward along the equator to slightly west of 120°W (Figure 5). The SSTs were mostly above normal from June through November 2012 and mostly below normal from December 2012 through June 2013 (Table 4). The value of 8.00 for the NOI* for February 2013 is particularly noteworthy, as it has been exceeded only four times (8.68 in January 1989, 8.10 in December 1998, 8.06 in January 2007, and 8.12 in March 2008) during the period since 1948 for which records exist. According to the Climate Diagnostics Bulletin of the U.S. National Weather Service for June 2013, "The forecast consensus favors … neutral [conditions] into the Northern Hemisphere fall 2013."

BYCATCH PROGRAM AND INTERNATIONAL DOLPHIN CONSERVATION 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 2013. Members of the field office staffs placed IATTC observers on 121 fishing trips by vessels that participate in the International Dolphin Conservation Program (IDCP) during the quarter.

Observer program

Coverage

The Agreement on the International Dolphin Conservation Program (AIDCP) requires 100-percent coverage by observers on trips by Class-6 purse seiners (vessels with fish-carrying capacities greater than 363 metric tons) that fish for tunas in the eastern Pacific Ocean (EPO). This mandate is carried out by the IDCP 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, Venezuela and the Regional Observer Program (ROP) under the umbrella of the WCPFC, based on a Memorandum of Cooperation (MOC) signed by representatives of the IATTC and the WCPFC.

In addition, Resolution C-12-08 of the IATTC indicates that "Any vessel [regardless of size class] with one or more of its wells sealed to reduce its well volume recorded on the Regional Vessel Register shall be required to carry an observer from the International Dolphin Conservation Program (IDCP) on board." Furthermore, Resolution C-12-01 allows Class-4 purse-seine vessels (vessels with fish-carrying capacities of 182 to 272 metric tons) to make a single fishing trip of up to 30 days duration during the specified closure periods, provided that such vessel carries an observer of the IDCP On-Board Observer Program.

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 2013 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 IDCP 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 IDCP On-Board Observer Program is not practical. In 2011, the IATTC and the WCPFC agreed on the MOC described above. As part of the implementation of the MOC, representatives of the two organizations put together a series of procedures for the observers of the ROP to follow under the umbrella of the WCPFC for tuna purse seiners, while observing fishing activity in the IATTC convention area. Under that MOC, two Parties to both regional fisheries management organizations, and to the AIDCP, requested that cross-endorsed observers

be allowed to be deployed on 11 trips of vessels planning to operate in both areas during the second quarter of 2013. These requests were granted.

Observers from the IDCP On-Board Observer Program departed on 226 fishing trips aboard purse seiners covered by that program during the second quarter of 2013. Preliminary coverage data for these vessels during the quarter are shown in Table 5. Two of these trips were made on Class-4 purse seiners (182 to 272 metric tons of fish-carrying capacity). Only Class-6 purse-seine vessels are required to carry observers on all fishing trips in the EPO. There are three reasons why a smaller vessel would carry an observer. First, it might have been required to carry an observer because it had been reported to have made one or more sets on tunas associated with dolphins, which vessels other than Class-6 vessels are not permitted to do by the AIDCP. Second, Paragraph 4 of IATTC Resolution C-12-01, adopted at the 83rd meeting of the IATTC in June 2012, specifies that a Class-4 purse seiner may make one trip of not more than 30 days duration during the closure period applying to that vessel, provided there is an observer aboard the vessel. Third, IATTC Resolution C-12-08, also adopted at the 83rd meeting of the IATTC, requires that "any vessel with one or more of its wells sealed to reduce its well volume recorded on the Regional Vessel Regster shall be required to carry an observer from the [IDCP]." The two trips by a Class-4 vessel in Table 5 were made by a vessel with one or more wells sealed. (According to IATTC Resolution C-12-08, wells are sealed "in order for the reduced well volume of the vessel to be recorded on the Regional Vessel Register for purposes of the implementatioin of Resolution C-02-03 on fleet capacity …" The vessel had a fish-carrying capacith of 182 to 272 metric tons before one or more of its well were sealed, and, for purposes of regulation, it would have remained a Class-4 vessel even if its fish-carrying capacity had been reduced to less than 182 metric tons after one or more of its wells were sealed.)

Training

One training session was held in Manta, Ecuador, from 24 June through 1 July 2013. There were 13 attendees, 2 from the Programa Nacional de Observadores Pesqueros de Ecuador (PROBECUADOR) and 11 from the IATTC observer program.

Gear project

There were no dolphin safety-gear inspections and safety-panel alignment procedures carried out aboard purse seiners during the second quarter of 2013.

INTER-AGENCY COOPERATION

Dr. Cleridy E. Lennert-Cody gave a guest lecture for Dr. Jay Barlow's statistics class at Scripps Institution of Oceanography on 6 June 2013.

PUBLICATIONS

Bolker, B.M., B. Gardner, M. Maunder, C.W. Berg, M. Brooks, L. Comita, E. Crone, S. Cubaynes, T. Davies, P. de Valpine, J. Ford, O. Gimenez, M. Kéry, E.J. Kim, C. Lennert-Cody, A. Magnusson, S. Martell, J. Nash, A. Nielsen, J. Regetz, H. Skaug, and E. Zipkin. 2013. Strategies for fitting nonlinear ecological models in R, AD Model Builder, and BUGS. Methods in Ecology and Evolution, 4: 501-512.

Cort, José L., Simeon Deguara, Txema Galaz, Begonya Mèlich, Iñaki Artetxe, Igor Arregi, John Neilson, Irene Andrushchenko, Alex Hanke, Miguel Neves dos Santos, Vicente Estruch, Molly Lutcavage, Jessica Knapp, Guillermo Compeán-Jiménez, Rafael Solana-Sansores, Antonio Belmonte, David Martínez, Corrado Piccinetti, Ai Kimoto, Piero Addis, Marta Velasco, José M. De la Serna, Dolores Godoy, Tevfik Ceyhan, Işik Oray, Saadet Karakulak, Leif Nøttestad, Antonio López, Oriol Ribalta, Noureddine Abid, and M'Hamed Idrissi. 2013. Determination of L_{max} for Atlantic bluefin tuna. *Thunnus thynnus* (L.), from meta-analysis of published and available biometric data. Rev. Fish. Sci., 21 (2): 181-212.

Gilman, E., P. Suuronen, M. Hall, and S. Kennelly. 2013. Causes and methods to estimate cryptic sources of fishing mortality. Jour. Fish Biol., DOI:10.1111/jfb.12148.

Maunder, Mark N. and Richard B. Deriso. 2013. A stock–recruitment model for highly fecund species based on temporal and spatial extent of spawning. Fish. Res., 146: 96-101.

Nicol, Simon J., Valerie Allain, Graham M. Pilling, Jeff Polovina, Marta Coll, Johann Bell, Paul Dalzell, Peter Sharples, Robert Olson, Shane Griffiths, Jeffrey M. Dambacher, Jock Young, Antony Lewis, John Hampton, Jesus Jurado-Molina, Simon Hoyle, Karine Briand, Nic Bax, Patrick Lehodey, and Peter Williams. 2013. An ocean observation system for monitoring the effects of climate change on the ecology and sustainability of pelagic fisheries in the Pacific Ocean. Climatic Change, 119 (1): 131-145.

Olson, Robert J., Leanne M. Duffy, Petra M. Kuhnert, Felipe Galván-Magaña, Vanessa Alatorre-Ramírez, and Noemi Bocanegra-Castillo. 2013. Are pelagic food webs changing in the eastern tropical Pacific Ocean? Ask the tuna**.** IMBER Newsletter, 23: 7-9.

The following three papers, and eight others, were published in a special issue of Fisheries Research devoted entirely to Stock Synthesis, a widely-used general stock assessment computer program:

Punt, André E., and Mark N. Maunder. 2013. Stock Synthesis: advancing stock assessment application and research through the use of a general stock assessment computer program. Fish. Res., 142: 1-2.

Taylor, Ian G., Vladlena Gertseva, Richard D. Methot Jr., and Mark N. Maunder. 2013. A stock–recruitment relationship based on pre-recruit survival, illustrated with application to spiny dogfish shark. Fish. Res., 142: 15-21.

Maunder, Mark N., and André E. Punt. 2013. A review of integrated analysis in fisheries stock assessment. Fish. Res., 142: 61-74.

Dr. Mark N. Maunder served as guest editor for this special issue.

ADMINISTRATION

Mr. Bradley A. Wiley joined the IATTC staff on 16 May 2013. He had worked for the U.S. National Oceanic and Atmospheric Administration for the last 12 years and had been a member of the U.S. delegations to IATTC and AIDCP meetings since 2005. His educational background includes an M.S. degree in marine biology from the University of Charleston, South Carolina, USA, and a J.D. degree with a specialty in environmental and natural resource law from Lewis and Clark Law School in Portland, Oregon, USA. He also spent two years managing an ichthyology-herpetology genetics research laboratory at the University of Kansas in Lawrence, Kansas, USA.

VISITING SCIENTISTS AND STUDENTS

La Jolla

Ms. Ximena Escovar-Fadul, a master's degree candidate at the University of Pennsylvania, Philadelphia, Pennsylvania, USA, began a two-month internship at the IATTC on 17 June 2013. She is working with Mr. Jean-Francois Pulvenis and Drs. Alexandre Aires-da-Silva and Mark N. Maunder on shark policy and management in the eastern Pacific Ocean.

Ms. Elizabeth Hetherington, a master's degree candidate at the University of San Diego, San Diego, California, U.S.A. spent the week of 10-14 June 2013, working with Dr. Robert J. Olson at the La Jolla office. Ms. Hetherington's thesis entails a study of the trophic structure across a productivity gradient in the EPO, using compound-specific isotopic analysis of amino acids on taxa from different levels of the food web, from euphausiid crustaceans to tunas. The study is part of a grant from the Comparative Analysis of Marine Ecosystem Organization (CAMEO) program of the U.S. National Science Foundation.

Achotines Laboratory

Dr. Francisco de Asis de la Serna Sabate of the University of Maryland, Baltimore County, USA, spent the period of 12-25 April 2013 at the Achotines Laboratory, where he intended to conduct experimental preparations and to carry out preliminary rearing trials with yellowfin tuna larvae. (Since the yellowfin broodstock fish were not spawning during this time, it was decided to defer the first joint rearing trials until October 2013.)

IN MEMORIUM

Mr. Witold L. Klawe), an IATTC scientist from 1955 to 1999, passed away at his home in La Jolla, California, USA, on 7 June 2013.

He was born in Piotrkow Trybunalski, Poland, on 9 June 1923. After World War II he emigrated from Poland to Canada, where he earned his B.A. and M.A. degrees at the University of Toronto in 1953 and 1955, respectively. His master's thesis was on **the** biology of the bloodworm, *Glycera dibranchiate*, of the Maritime Provinces of Canada. Later, in 1991, he was awarded the degree of Doctor Honoris Causa by the Academy of Agriculture in Szczecin, Poland.

Mr. Klawe joined the staff of the IATTC in 1955. His first assignment was to study larval tunas. He was very good at that, and soon became recognized worldwide as an authority on that subject. He was a prolific writer. He is probably best known for the book, Tuna and Billfish—Fish without a Country, by James Joseph, Witold Klawe, and Pat Murphy, and the Spanish version of it, Atunes y Peces Espada—los Peces sin Patria, and for his paper, What is a tuna?, published in Marine Fisheries Review, Vol. 39, No. 11, and reproduced in FINS [Fishing Industry News Service, Department of Fisheries and Wildlife, Western Australia], Vol. 11, No. 2. His other works include 3 IATTC Bulletins, 2 IATTC Data Reports, about 50 papers in outside journals, and 20 translations, mostly from Russian to English.

He was interested in almost everything—botany, gardening, marine invertebrates, birds, philately, languages, the Southern California desert, and other subjects too numerous to mention. Most importantly, he was interested in other people. He was a generous host, and whenever scientists or students from other countries visited the Tuna Commission for periods of work or study, Mr. Klawe and his wife Barbara welcomed them, inviting them to fine restaurants, visits to the many attractions of San Diego, and trips to the desert. Some visitors spent many months with the Klawes in their home in La Jolla.

Mr. and Mrs. Klawe travelled extensively, particularly to Hawaii and Europe. He had extensive contacts with Polish scientists, and in 1988 he was awarded the Gold Insignia of the Order of Merit, Polish People's Republic, for his many contributions to Polish science.

Mr. Klawe is survived by his wife Barbara, son David, and daughter-in-law Lisa. Everyone who knew him will miss him greatly.

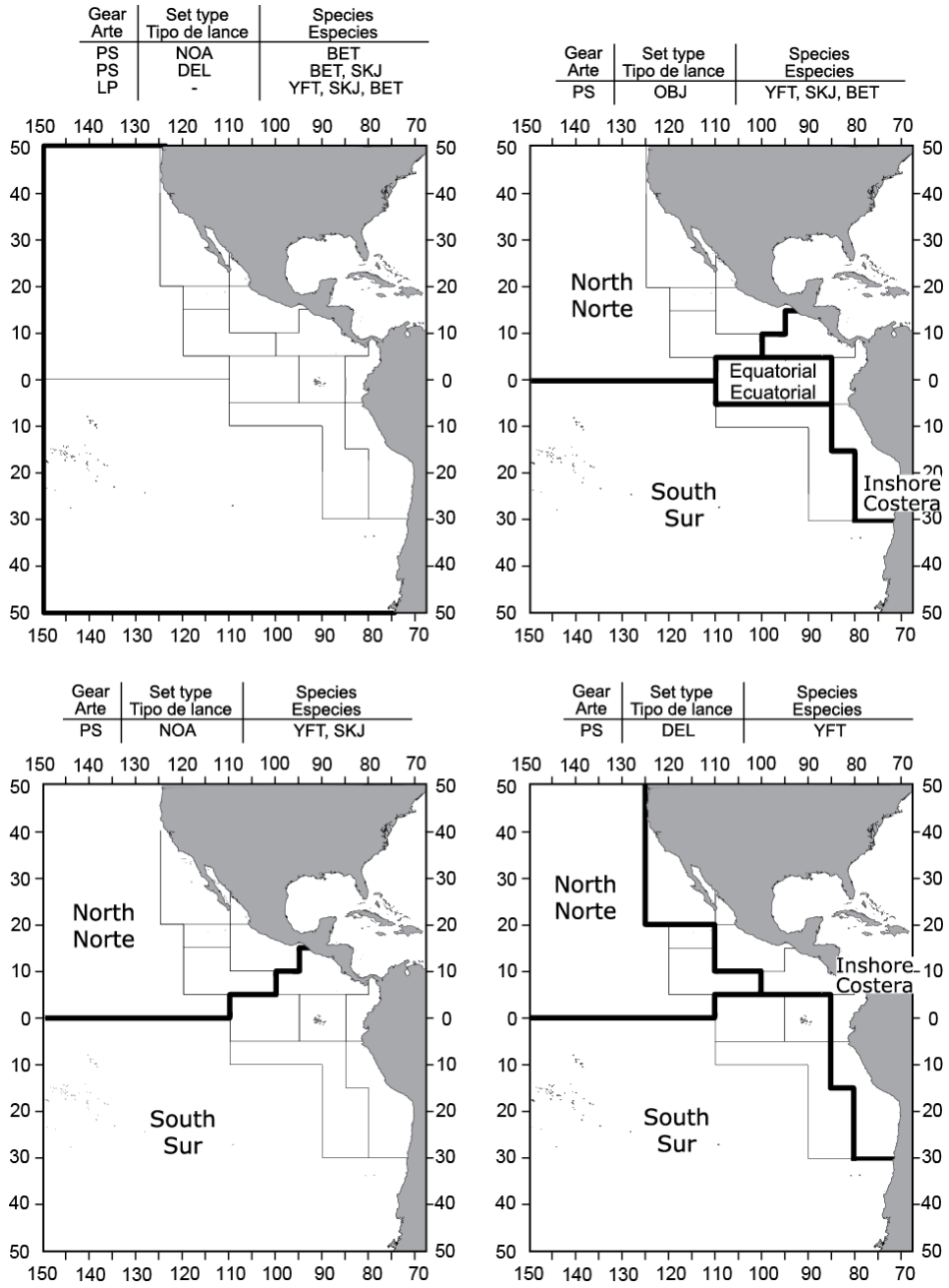

FIGURE 1. Spatial extents of the fisheries defined by the IATTC staff for stock assessment of yellowfin, skipjack, and bigeye in the EPO. The thin lines indicate the boundaries of the 13 length-frequency sampling areas, and the bold lines the boundaries of the fisheries. Gear: PS = purse seine, LP =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

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

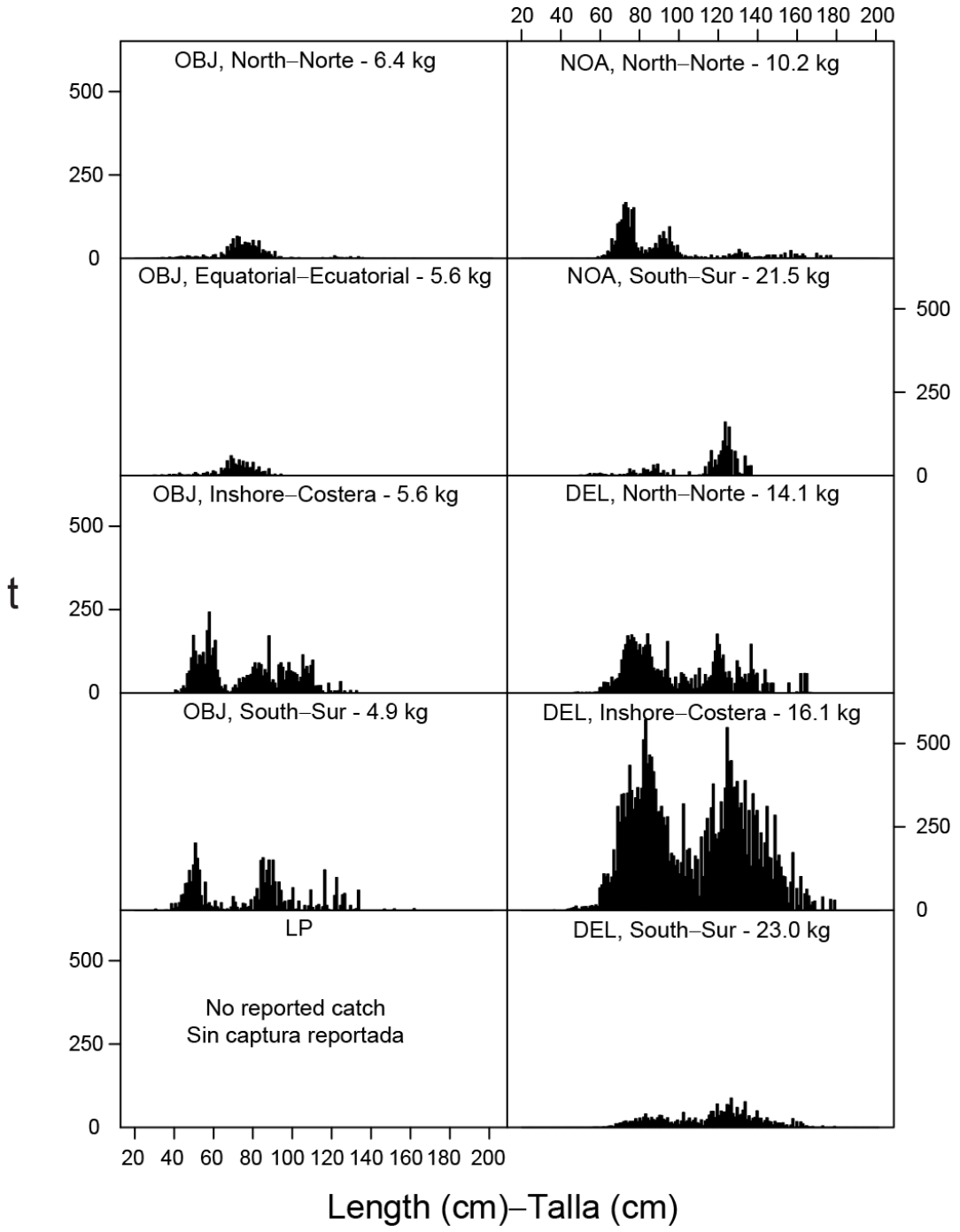

FIGURE 2a. Estimated size compositions of the yellowfin caught in each fishery of the EPO during the first quarter of 2013. The average weights of the fish in the samples are given at the tops of the panels. OBJ = floating object; LP = pole and line; NOA = unassociated; DEL = dolphin; t = metric tons.

FIGURA 2a. Composición por tallas estimada para el aleta amarilla capturado en cada pesquería del OPO durante el primero trimestre de 2013. 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.

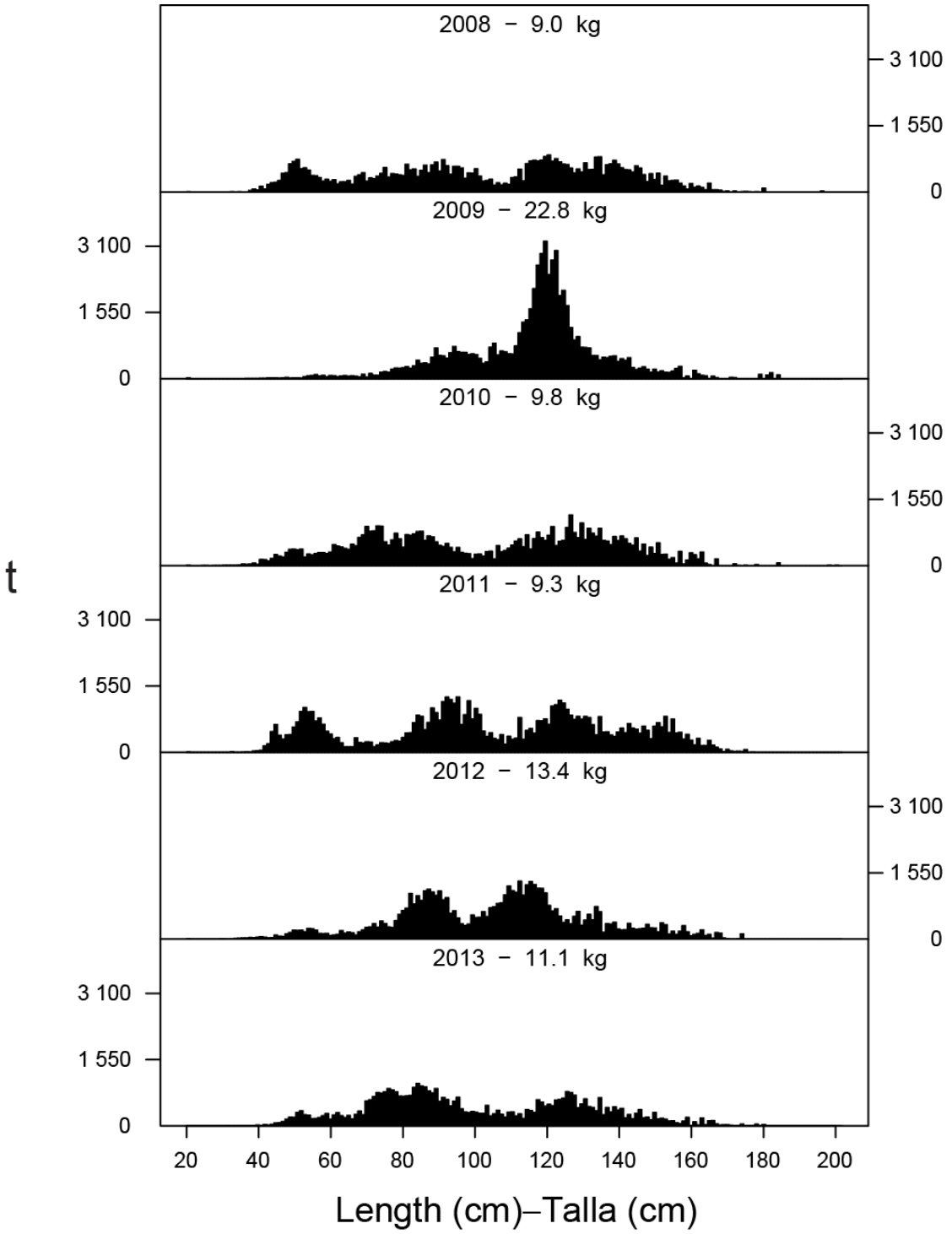

FIGURE 2b. Estimated size compositions of the yellowfin caught in the EPO during the first quarter of 2008-2013. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons.

FIGURA 2b. Composición por tallas estimada para el aleta amarilla capturado en el OPO en el cuarto trimestre de 2007-2012. En cada recuadro se detalla el peso promedio de los peces en las muestras; t = toneladas métricas.

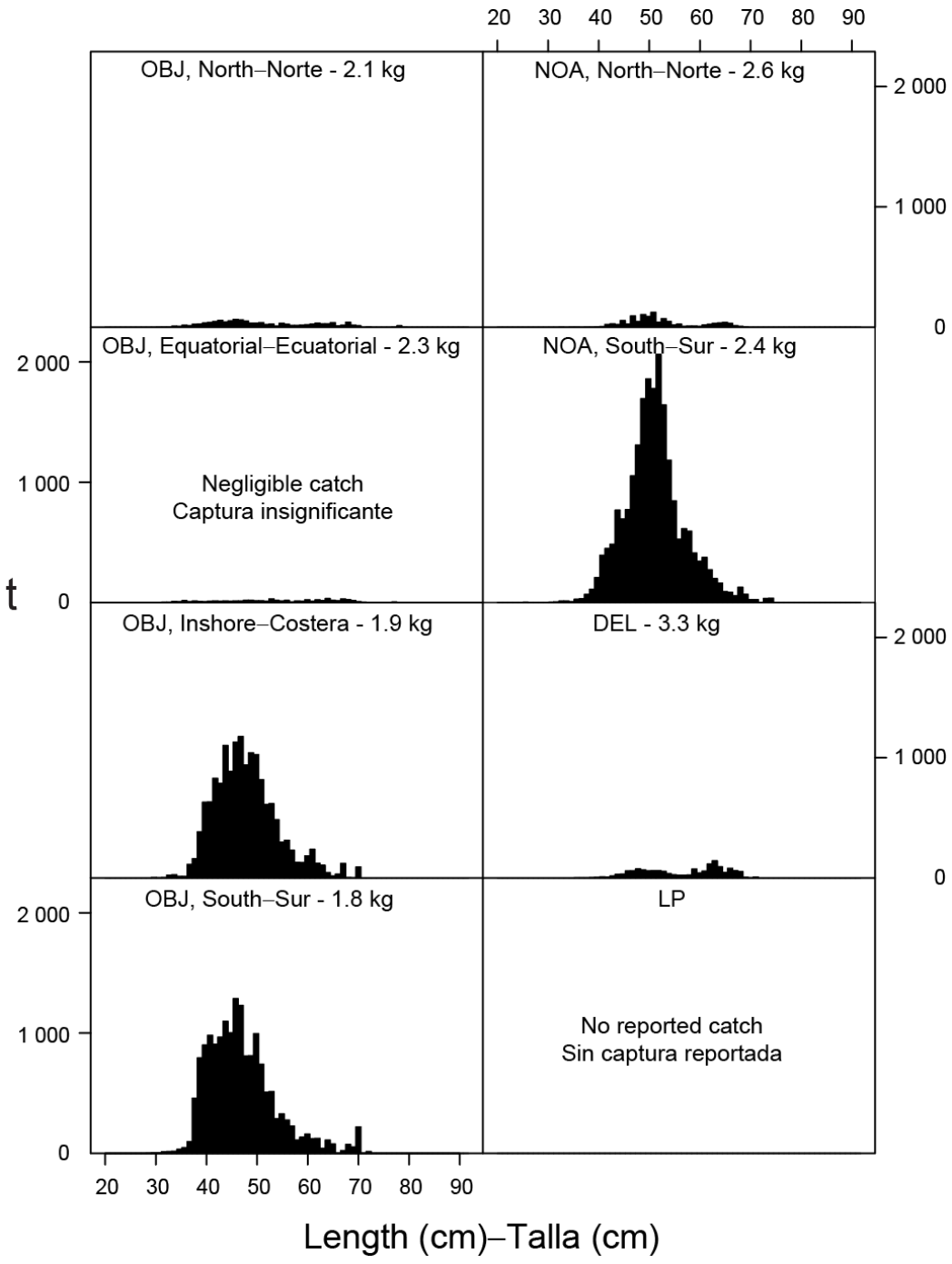

FIGURE 3a. Estimated size compositions of the skipjack caught in each fishery of the EPO during the first quarter of 2013. The average weights of the fish in the samples are given at the tops of the panels. OBJ = floating object; LP = pole and line; NOA = unassociated; DEL = dolphin; t = metric tons.

FIGURA 3a. Composición por tallas estimada para el barrilete capturado en cada pesquería del OPO durante el primero trimestre de 2013. 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.

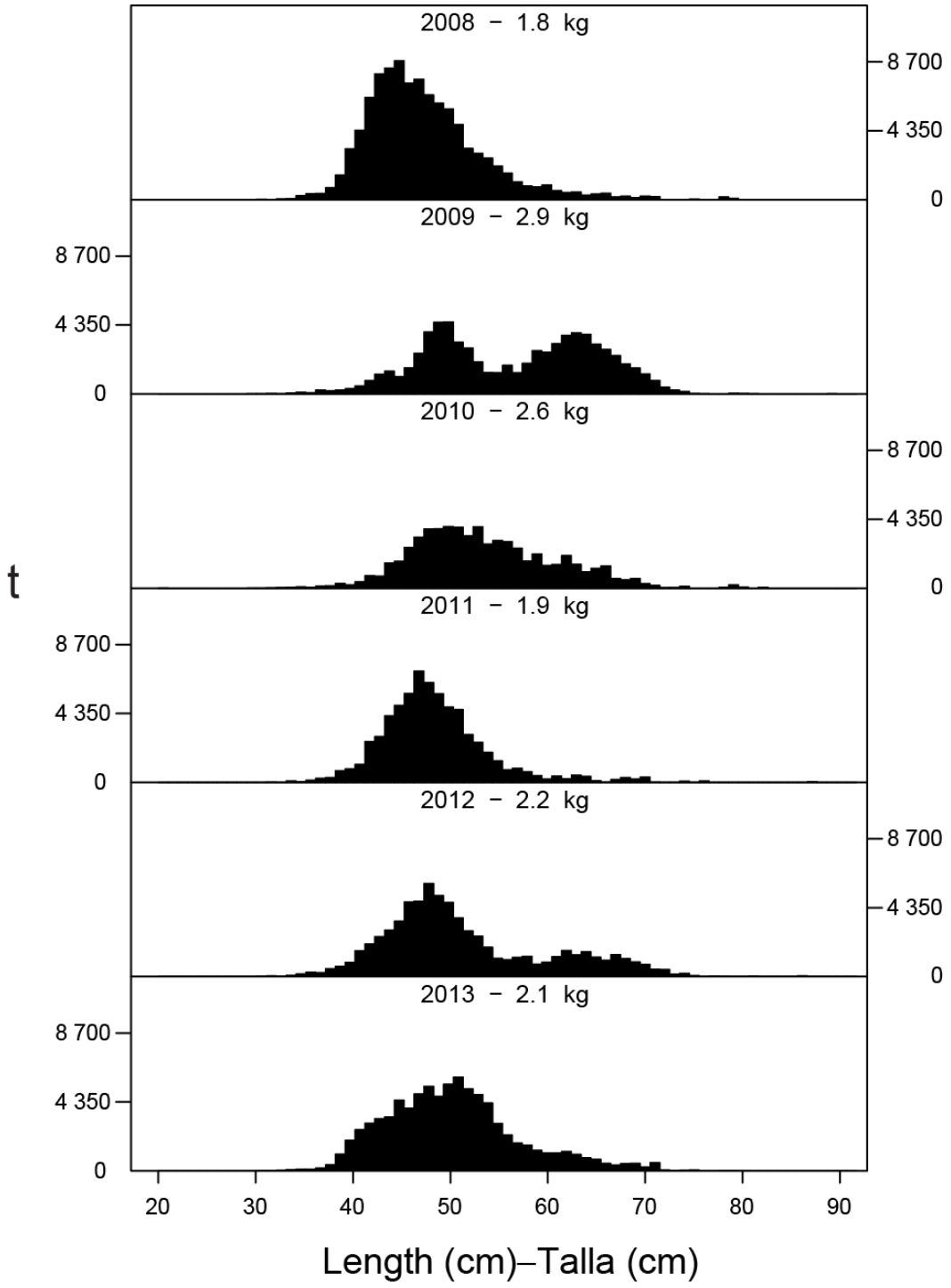

FIGURE 3b. Estimated size compositions of the skipjack caught in the EPO during the first quarter of 2008-2013. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons.

FIGURA 3b. Composición por tallas estimada para el barrilete capturado en el OPO en el primero trimestre de 2008-2013. En cada recuadro se detalla el peso promedio de los peces en las muestras. t = toneladas métricas.

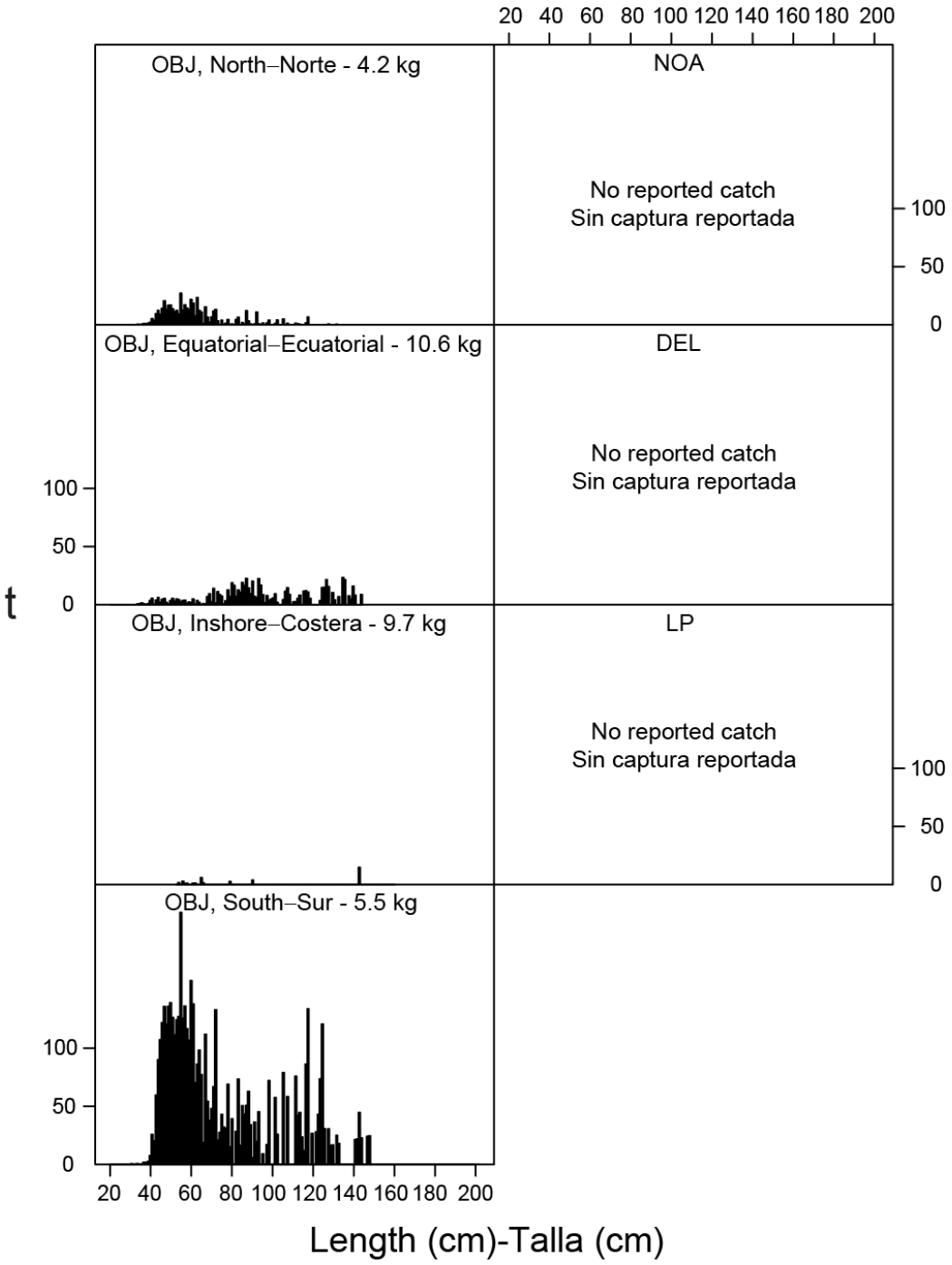

FIGURE 4a. Estimated size compositions of the bigeye caught in each fishery of the EPO during the first quarter of 2013. The average weights of the fish in the samples are given at the tops of the panels. OBJ = floating object; LP = pole and line; NOA = unassociated; DEL = dolphin; t = metric tons.

FIGURA 4a. Composición por tallas estimada para el patudo capturado en cada pesquería del OPO durante el primero trimestre de 2013. 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.

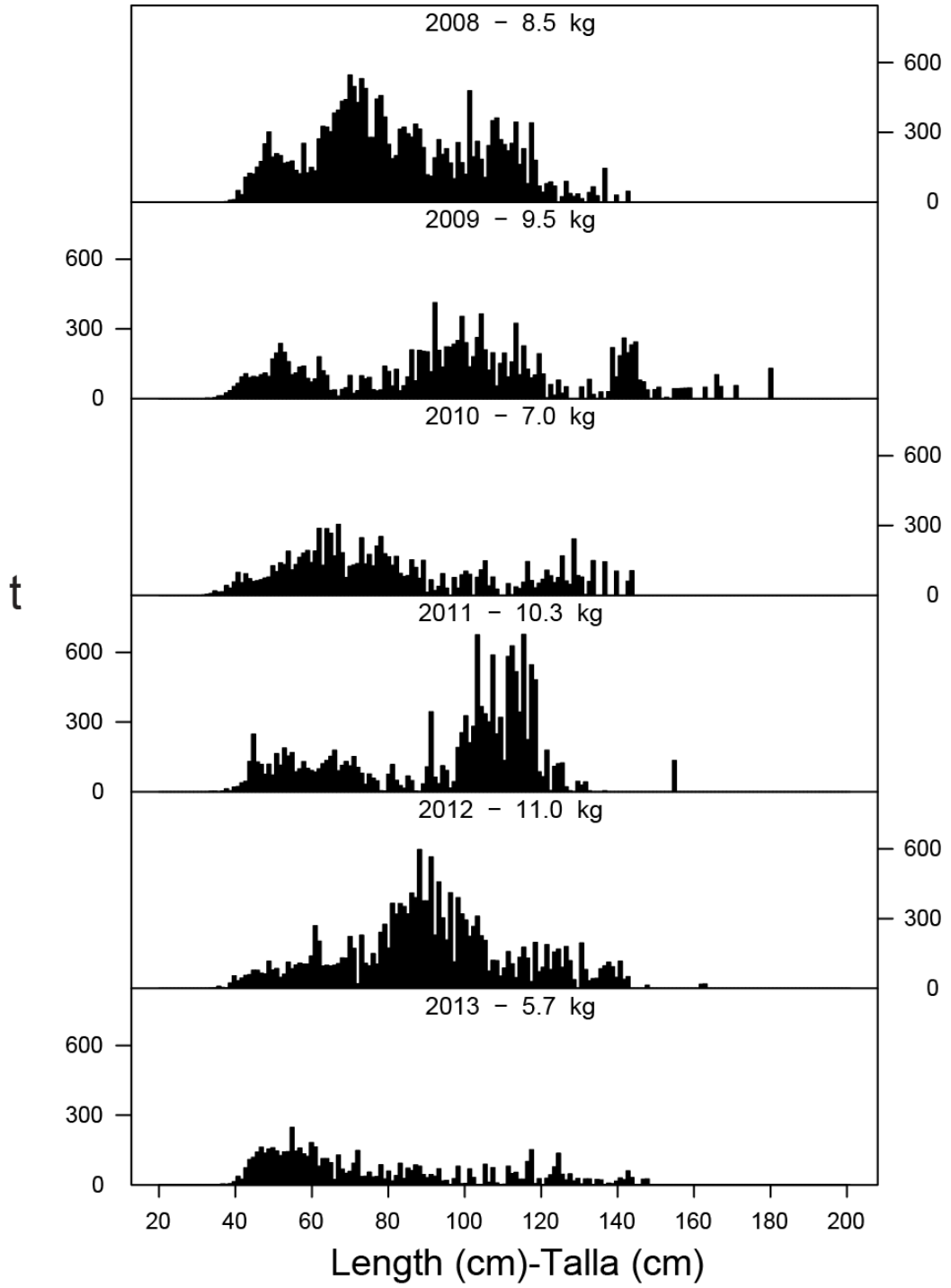

FIGURE 4b. Estimated size compositions of the bigeye caught in the EPO during the first quarter of 2008-2013. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons.

FIGURA 4b. Composición por tallas estimada para el patudo capturado en el OPO en el primero trimestre de 2008-2013. En cada recuadro se detalla el peso promedio de los peces en las muestras; t = toneladas métricas.

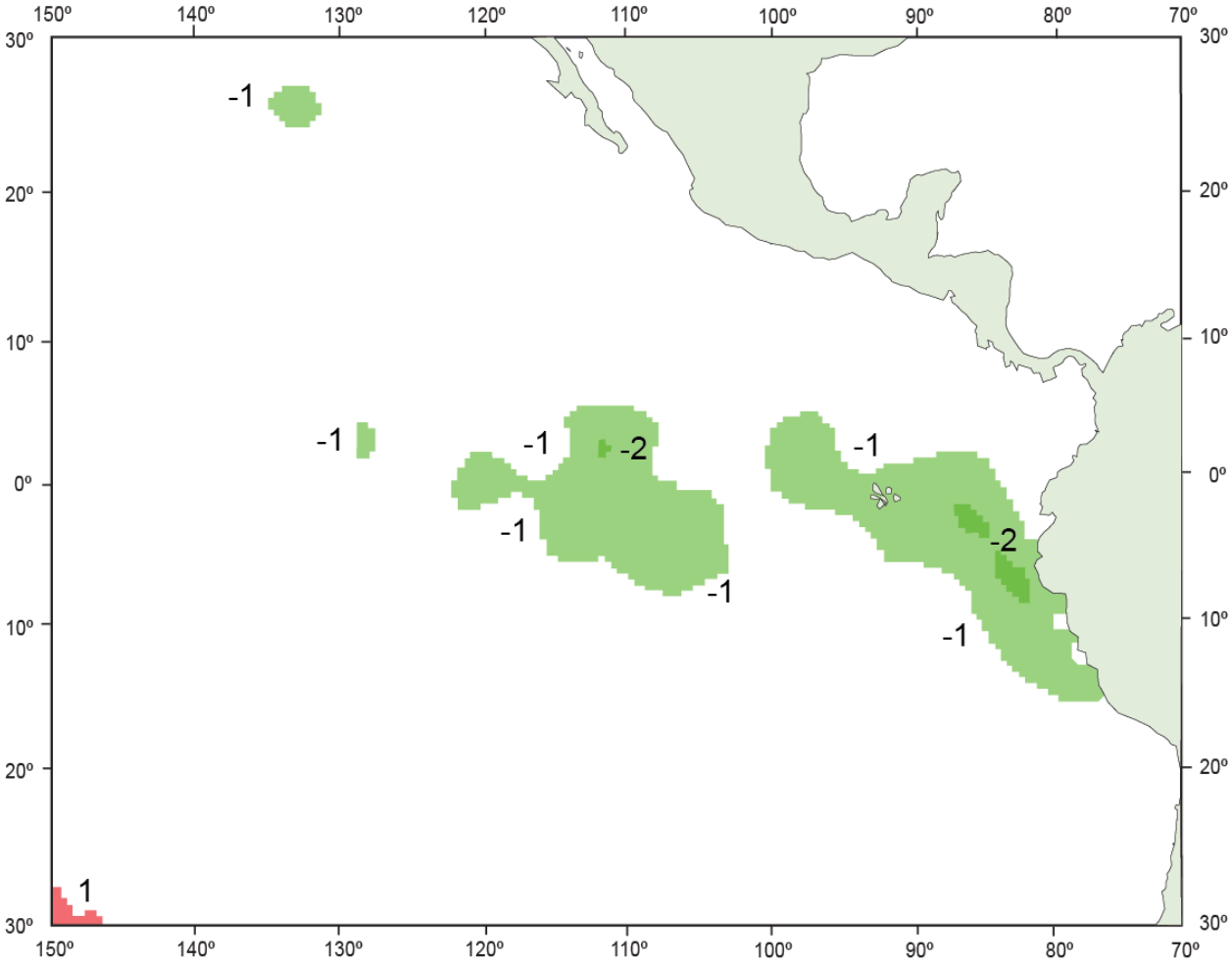

FIGURE 5. Sea-surface temperature (SST) anomalies (departures from long-term normals) for March 2013, based on data from fishing boats and other types of commercial vessels.
FIGURA 5. Anomalías (variaciones de los niveles normales a largo plazo) de la temperatura superficial del mar (TSM) en marzo de 2013, 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 2013 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 2013, 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 Bandera	Gear Arte	Well volume–Volumen de bodega				Capacity Capacidad
		1-900	901-1700	>1700	Total	
			Number—Número			
Colombia	PS	4	10	-	14	14,860
Ecuador	PS	73	21	11	105	81,444
Unión Europea (España)—European Union (Spain)	PS	-	-	4	4	10,116
Guatemala	PS	-	1	-	1	1,475
México	PS	10	31	1	42	48,054
	LP	3	-	-	3	268
Nicaragua	PS	-	6	1	7	9,966
Panamá	PS	2	8	3	13	17,976
Perú	PS	1	-	-	1	299
El Salvador	PS	-	1	3	4	7,892
Venezuela	PS	-	15	1	16	22,300
Vanuatu	PS	-	1	-	1	1,360
All flags—Todas banderas	PS	90	93	24	207	
	LP	3	-	-	3	
	PS + LP	93	93	24	210	
			Capacity—Capacidad			
All flags—Todas banderas	PS	42,247	120,825	51,675	214,747	
	LP	268	-	-	268	
	PS + LP	42,515	120,825	51,675	215,015	

TABLE 2. Estimates of the retained catches of tunas in the EPO, from 1 January through 30 June 2013, 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 30 de junio 2013, 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	12,772	96,338	19,430	-	774	-	80	258	129,652	41.2
El Salvador	932	3,341	1,678	-	-	-	-	-	5,951	1.9
México	68,150	10,137	44	1,357	-	-	1,572	15	81,275	25.8
Nicaragua	3,629	1,312	766	-	-	-	-	-	5,707	1.8
Panamá	11,788	18,795	3,101	-	-	-	-	-	33,684	10.7
Venezuela	14,831	12,774	258	-	-	-	-	-	27,863	8.9
Other—Otros[2]	12,678	16,185	1,481	-	-	-	2	1	30,347	9.7
Total	124,780	158,882	26,758	1,357	774	-	1,654	274	314,479	

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

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

[2] Includes Colombia, European Union (Spain), Guatemala, Peru, and Vanuatu; this category is used to avoid revealing the operations of individual vessels or companies.

[2] Incluye Colombia, Guatemala, Perú, Unión Europea (España), y Vanuatú; se usa esta categoría para no revelar información sobre faenas de buques o empresas individuales.

TABLE 3. Preliminary estimates of the catches of bigeye tuna, in metric tons, in the eastern Pacific Ocean during the first and second quarters of 2013 by longline vessels more than 24 meters in overall length.
TABLA 3. Estimaciones preliminares de las capturas de atún patudo, en toneladas métricas, en el Océano Pacífico oriental durante el primero y segundo trimestres de 2013 por buques palangreros de más de 24 metros en eslora total.

Flag	First quarter	Month			Second quarter	Total to date
Bandera	**Primer trimestre**	**Mes**			**Segundo trimestre**	**Total al fecha**
		4	**5**	**6**		
China	1,279	-	-	-	-	1,279
Republic of Korea—República de Corea*	2,801	583	675	398	1,656	4,457
Japan—Japón	-	-	-	-	-	-
Chinese Taipei—Taipei Chino	928	236	79	158	473	1,401
USA—EE.UU.	-	-	-	-	-	-
Vanuatu	-	-	-	-	-	-
Total	5,008	819	754	556	2,129	7,137

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

TABLE 4. Oceanographic and meteorological data for the Pacific Ocean, July 2012-June 2013. The values in parentheses are anomalies. SST = sea-surface temperature; SOI = Southern Oscillation Index; SOI* and NOI* are defined in the text.
TABLA 4. Datos oceanográficos y meteorológicos del Océano Pacífico, julio 2012-junio 2013. 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)	22.8 (1.2)	21.0 (0.4)	20.8 (0.5)	20.7 (-0.1)	21.2 (-0.4)	22.0 (-0.9)
Area 2 (5°N-5°S, 90°-150°W	26.6 (1.0)	25.7 (0.7)	25.3 (0.4)	24.9 (0.0)	25.1 (0.1)	24.9 (-0.2)
Area 3 (5°N-5°S, 120°-170°W)	27.8 (0.6)	27.6 (0.7)	27.2 (0.5)	27.0 (0.3)	27.0 (0.4)	26.5 (-0.1)
Area 4 (5°N-5°S, 150W°-160°E)	28.8 (0.0)	29.1 (0.4)	29.1 (0.4)	29.2 (0.5)	29.2 (0.5)	28.7 (0.3)
Thermocline depth—Profundidad de la termoclina, 0°, 80°W	25	30	40	35	30	35
Thermocline depth—Profundidad de la termoclina, 0°, 110°W	80	45	65	100	100	100
Thermocline depth—Profundidad de la termoclina, 0°, 150°W	140	140	140	150	150	150
Thermocline depth—Profundidad de la termoclina, 0°, 180°W	175	175	170	175	165	180
SOI—IOS	0.0	-0.2	0.2	0.3	0.3	-0.6
SOI*—IOS*	5.60	2.99	2.28	1.08	-0.23	1.51
NOI*—ION*	1.87	-1.32	2.83	-0.19	-2.34	0.02

TABLE 4. (continued)
TABLA 4. (continuación))

Month—Mes	**1**	**2**	**3**	**4**	**5**	**6**
SST—TSM (°C)						
Area 1 (0°-10°S, 80°-90°W)	24.0 (-0.5)	25.7 (-0.4)	26.7 (0.1)	24.7 (-0.9)	22.9 (-1.4)	21.5 (-1.4)
Area 2 (5°N-5°S, 90°-150°W	25.1 (-0.6)	25.9 (-0.5)	27.2 (0.1)	27.4 (-0.2)	26.4 (-0.7)	25.8 (-0.6)
Area 3 (5°N-5°S, 120°-170°W)	26,2 (-0.4)	26.3 (-0.4)	27.0 (-0.2)	27.7 (-0.1)	27.6 (-0.3)	27.4 (-0.2)
Area 4 (5°N-5°S, 150W°-160°E)	28.3 (0.0)	28.1 (0.0)	28.0 (-0.2)	28.5 (0.0)	28.7 (-0.1)	28.8 (-0.1)
Thermocline depth—Profundidad de la termoclina, 0°, 80°W	20	20	10	10	25	25
Thermocline depth—Profundidad de la termoclina, 0°,	20	25	75	55	30	60
Thermocline depth—Profundidad de la termoclina, 0°,	125	130	120	120	105	130
Thermocline depth—Profundidad de la termoclina, 0°,	175	175	180	175	180	175
SOI—IOS	-0.1	-0.2	1.5	0.2	0.8	1.2
SOI*—IOS*	0.52	-1.89	1.52	-1.29	4.79	6.91
NOI*—ION*	6.64	8.00	2.06	2.73	1.36	1.16

TABLE 5. Preliminary data on the sampling coverage of trips of tuna purse-seine vessels fishing in the EPO by the observer program of the IATTC, Colombia, Ecuador, the European Union, Mexico, Nicaragua, Panamá, la Unión Europea, Venezuela, and under the MOC described above departing during the second quarter of 2013. The numbers in parentheses indicate cumulative totals for the year.

TABLA 5. Datos preliminares de la cobertura de muestreo de viajes de buques atuneros de cerco que pescaron en el OPO por los programas de observadores de la CIAT, Colombia, Ecuador, México, Nicaragua, Panamá, Venezuela y bajo el MDC descrito arriba, durante el segundo trimestre de 2013. Los números entre paréntesis indican los totales acumulados para el año.

Flag	Trips		Class-6—Observed by program						Percent observed	
			IATTC		National		Total			
Bandera	Viajes		Clase-6—Observado por programa						Porcentaje observado	
			CIAT		Nacional		Total			
Colombia	10	(28)	4	(12)	6	(16)	10	(28)	100.0	(100)
Ecuador	93	(193)	57	(121)	36[1]	(72)[1]	93	(193)	100.0	(100)
El Salvador	6	(10)	3	(7)	3[1]	3[1]	6	(10)	100.0	(100)
EU—UE (España)	8	(18)	2	(7)	6	(11)	8	(18)	100.0	(100)
Guatemala	2	(3)	2	(3)			2	(3)	100.0	(100)
México	58	(120)	27	(60)	31	(60)	58	(120)	100.0	(100)
Nicaragua	7	(13)	4	(7)	3	(6)	7	(13)	100.0	(100)
Panamá	20	(40)	9	(18)	11	(22)	20	(40)	100.0	(100)
Vanuatu	2	(3)	2	(3)			2	(3)	100.0	(100)
Venezuela	18	(41)	10	(22)	8	(19)	18	(41)	100.0	(100)
Subtotal	224	(469)	120	(260)	104	(209)	224	(469)	100.0	(100)
Class 4—Clase 4										
Ecuador	2	(3)	1	(2)	1	(1)	2	(3)	-[2]	-[2]
Total	226	(472)	121	(262)	105	(210)	226	(472)	100.0	(100)

[1] Includes 11 trips sampled with observers of the WCPFC—Incluye 11 viajes muestreados por observadores del WCPFC

[2] The AIDCP does not require 100-percent observer coverage for Class-4 vessels—El APICD no require que buques de Clase 4 sean muestreados al 100%