INTER-AMERICAN TROPICAL TUNA COMMMISSION
COMISIÓN INTERAMERICANA DEL ATÚN TROPICAL

QUARTERLY REPORT—INFORME TRIMESTRAL

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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 first quarter of 2014.

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

Mr. Kurt M. Schaefer spent the period of 27-31 January 2014 in Sète, France, where he participated in two meetings. First, he was an invited speaker at a workshop on the ecological trap hypothesis. Second, he participated, as a committee member of the International Seafood Sustainability Foundation's (ISSF's) purse-seine bycatch project, at a workshop, to discuss planning of purse-seine bycatch research cruises in the Atlantic and Pacific Oceans during 2014. His travel expenses were paid by the ISSF.

Dr. Robert J. Olson organized and led a workshop to analyze a global data set on stable nitrogen isotopes of tunas and other pelagic fishes at the University of Hawaii, Honolulu, Hawaii, USA, on 17-21 February 2014. The workshop, an initiative of the IMBER–CLIOTOP (Integrated Marine Biogeochemistry and Ecosystem Research-Climate Impacts on Oceanic Top Predators) Working Group 3, was the fourth in a series of international workshops organized between 2009 and 2014 to attempt the first worldwide interpretation of predation patterns of top predator fishes in oceanic food webs, using data on their diets and on their stable isotope values. The overall goal of the series of workshops is to use, in the absence of long-term temporal data, a comparative approach to assess the impact of ocean warming on the forage base of these top predators and to explore differences in trophic levels. The focus of the February 2014 workshop was to adjust predator $\delta^{15}N$ values for regional isotopic differences at the base of the food webs that were predicted from a published global marine biogeochemistry and isotopes model. The workshop was sponsored by the Commonwealth Scientific and Industrial Research Organisation of Australia, the IATTC, and IMBER.

Drs. Mark N. Maunder and Alexandre Aires-da-Silva participated in a workshop of the International Scientific Committee Bluefin Working Group in La Jolla, California, USA, on 17-23 February 2014. Dr. Maunder gave talks entitled "Exploratory Analysis of PBF Longline Length Composition Data" and "Management Strategy Evaluation (MSE) Implementation in Stock Synthesis" at the workshop.

Dr. Guillermo A. Compeán participated in the Fourth Global Fisheries Enforcement Training Workshop, sponsored by the government of Costa Rica and the International Monitoring, Control and Surveillance Network, in San José, Costa Rica, on 17-21 February 2014. The Workshop focused on the protection of artisanal and regional fishing communities dependent on sustainable fisheries. He presented the theme "International Cooperation in High Seas RFMOs" (Cooperación Internacional en Alta Mar-OROPs).

Dr. Compeán also participated in a Capacity Transfer Workshop, sponsored by the International Seafood Sustainability Foundation, in Barcelona, Spain, on 3-5 March 2014. The purpose of this workshop was to initiate a meaningful dialogue on how fishing capacity transfers from developed nations to developing coastal states could work in practice. The workshop brought together experts from the fishing industry, coastal state and flag state fishery managers, policy-makers and other stakeholders, and representatives of academic institutions.

Dr. Compeán also participated in a Global Environmental Facility-Project Sustainable Management of Tuna Fisheries and Biodiversity Conservation in the Areas beyond National Jurisdiction meeting in Rome, Italy, on 10-12 March 2014. The principal objective of the

meeting was to review the activities and implementations programmed under the Sustainable Management of Tuna Fisheries and Biodiversity Conservation in the Areas beyond National Jurisdiction. The workshop brought together experts from various regional fisheries management organizations.

Mr. Marlon H. Román Verdesoto participated in the "1er Congreso Latino Americano de Rayas y Quimeras," held in Manta, Ecuador, on 10-12 March 2014, at which he gave the following presentation: "Interacciones de las Mantarrayas con la Pesquería Atunera con Red de Cerco en el Océano Pacífico Oriental."

Dr. Richard B. Deriso participated a meeting of the Scientific and Statistical Committee of the Western Pacific Fisheries Management Council in Honolulu, Hawaii, USA, on 11-13 March 2014.

Mr. Ernesto Altamirano Nieto participated in the 14th Regional Observer Coordinator's Workshop for the fisheries observer programs of the South Pacific nations in Noumea, New Caledonia, on 10-14 March 2014. The event was sponsored by the Forum Fisheries Agency, the Secretariat of the Pacific Community, the U.S. National Oceanic and Atmospheric Administration, the Western and Central Pacific Fisheries Commission (WCPFC), and the Parties of the Nauru Agreement (the Federated States of Micronesia, Kiribati, the Marshall Islands, Nauru, Palau, Papua New Guinea, the Solomon Islands, and Tuvalu). Mr. Altamirano presented a report on the results of the first complete year of the cross-endorsement observer program, which went into effect with a Memorandum of Cooperation signed by representatives of the IATTC and the WCPFC in August 2011. Representatives of 16 regional observer programs were at the meeting, and all expressed interest in participating in that program.

Dr. Guillermo A. Compeán attended a meeting entitled "Science, Technology and Innovation: New Opportunities for International Collaboration" by the Institute of the Americas in La Jolla, California, USA, on 20 March 2014. The presentation was about the environmental impacts, and economic factors on the fisheries off the Pacific Coast of the United States.

RESEARCH

DATA COLLECTION AND DATABASE PROGRAM

There are two major fisheries for tunas in the eastern Pacific Ocean (EPO; the region bounded by the coastline of the Americas, 50°N, 150ºW, and 50°S), the commercial surface fishery and the industrial 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 industrial 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 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 compositions 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 4).

The sample data on species and length composition 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 188 length-frequency samples from 130 wells and abstracted logbook information for 238 trips of commercial fishing vessels during the first quarter of 2014.

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 2014 is about 215,000 m^3 (Table 1). The average weekly at-sea capacity for the fleet, for the weeks ending 1 January through 30 March, was about 135,600 m^3 (range: 37,000 to 177,000 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 (t) of tropical tunas from the EPO during the period of January-March 2014, and comparative statistics for 2009-2013, were:

Species	2014	2009-2013			Weekly average, 2014
		Average	Minimum	Maximum	
Yellowfin	56,600	60,900	51,800	66,900	4,400
Skipjack	71,400	64,600	50,800	78,600	5,500
Bigeye	8,200	9,800	8,400	12,200	600

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

Catch statistics for 2013

Estimates of the annual retained and discarded EPO catches of the various species of tunas and other fishes by purse seiners and pole-and-line vessels from 1984-2013 are shown in Table 3. Discard data were first collected by observers, who accompany virtually all trips of Class-6 purse seiners, in 1993, so the data on discards for yellowfin, skipjack, and bigeye are virtually complete for the 1993-2013 period. Such is not necessarily the case for the other species in Table 3, however, as those species are often caught by vessels other than Class-6 purse seiners. (The surface catches of albacore, in fact, are virtually all taken by trollers and pole-and-line vessels, which do not carry observers.) 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 2 to 12 percent of the total catch of yellowfin is taken by longliners. Until about the mid-1990s, the great majority of the catch of bigeye had been harvested by the longline fishery.

The regulations for surface fishing in 2013 applied only to Class-4, -5, and -6 purse seiners (vessels with fishing-carrying capacities greater than 181 metric tons). All such vessels registered in a nation or other fishing entity were required to cease fishing during one of the following periods:

Period 1	Period 2
29 July 2013-28 September 2013	18 November 2013-18 January 2014

(Each CPC (Contracting Party, Cooperating Non-Party, Fishing Entity, or Regional Economic Integration Organization) was required to inform the Director, by 15 July 2013, of the names of the vessels that were to observe each closure period. Notwithstanding the above, any Class-4 vessel (vessel with a fish-carrying capacity of 182-272 metric tons), provided it had an observer aboard, could make one trip of not more than 30 days during the closed period that had been selected for it. Also, the area bounded by 4°N, 3°S, 96°W, and 110°W was closed to fishing by purse-seine vessels from 29 September through 29 October 2013. In addition, the following limits on the catches of bigeye tuna were imposed on longline vessels of four Far East nations: China, 2,507 metric tons (t); Japan, 32,372 t; Republic of Korea, 11,947 t; Chinese Taipei, 7,555 t.

Preliminary estimates of the retained catches, in metric tons, of yellowfin, skipjack, and bigeye in the EPO during 2013, and final estimates of the 1998-2012 annual averages of those species, based on the methods described at the beginning of this section, are as follows:

Species	2013	Average	Minimum	Maximum
			1998-2012	
Yellowfin	218,000	263,000	167,000	413,000
Skipjack	279,000	225,000	142,000	297,000
Bigeye	49,000	65,000	44,000	95,000

The 2013 catch of yellowfin was about 45 thousand t (17 percent) less than the average for 1998-2012. The 2013 skipjack catch was about 54 thousand t (24 percent) greater than the average for 1998-2012 The 2013 bigeye catch was about 16 thousand t (24 percent) less than the average for 1998-2012.

The average annual distributions of the purse-seine catches of yellowfin, skipjack, and bigeye, by set type, in the EPO during 2008-2012 are shown in Figures 1a, 2a, and 3a, and preliminary estimates for 2013 are shown in Figures 1b, 2b, and 3b.

The majority of the yellowfin catches in 2013 were taken in sets associated with dolphins from two general areas: from the 10°N to the coast of Mexico and west of 105°W longitude, and from 5°N to the coast of Central America and east of 100°W longitude. Offshore catches of yellowfin associated with dolphins occurred further to the north than in the previous year. Yellowfin catches on unassociated schools in 2013 were concentrated mainly in the inshore areas off southern Mexico. Inshore catches around the equator were lower than the 2008-2012 average. Smaller amounts of yellowfin were caught south of the equator throughout the EPO, mostly in association with floating objects.

The inshore skipjack catches in 2013 were similar to those of previous years, although the percentage of catch associated with floating objects increased. The offshore catches of skipjack were almost exclusively association with floating objects, and the overall 2013 offshore catches decreased from the previous year.

Bigeye are not often caught by surface gear 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 fish-aggregating devices (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 fish associated with FADs between 5°N and 5°S.

While yellowfin, skipjack, and bigeye tunas comprise the most significant portion of the retained catches of the purse-seine and pole-and-line fleets in the EPO, other tunas and tuna-like species, such as black skipjack, bonito, wahoo, and frigate and bullet tunas, contribute to the overall harvest in this area. The total retained catch of those other species by these fisheries was about 5.7 thousand t in 2013, which is slightly less than the 1998-2012 annual average retained catch of about 5.8 thousand t (range: 500 to 19 thousand t).

Preliminary estimates of the retained catches in the EPO in 2013, by flag, and by country, are given in Table 4.

Preliminary estimates of the most significant (equal to or greater than about 5 percent of the total) retained catches, of all species combined, during 2013 were as follows:

Flag	Retained catches	
	Metric tons	Percentage
Ecuador	234,000	42
Mexico	139,200	25
Panama	55,200	10
Venezuela	43,400	8
Colombia	40,000	7

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

There are no adjustments included for factors, such as type of set or vessel operating costs and market prices that 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 capacity.

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

Region	Species	Gear	2013	2008-2012		
				Average	Minimum	Maximum
N of 5° N	Yellowfin	PS	13.6	11.8	10.5	13.2
S of 5° N			2.4	2.8	2.4	3.2
N of 5° N	Skipjack	PS	2.4	2.2	1.1	3.1
S of 5° N			9.6	9.8	8.1	11.4
EPO	Bigeye	PS	2.5	2.5	2.2	2.8
EPO	Yellowfin	LP	5.6	4.7	2.1	9.2
EPO	Skipjack	LP	0.7	1.0	0.5	1.8

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-11-01 Tuna Conservation 2011-2013, and C-13-01 Tuna Conservation 2014-2016). The catches that have been reported for January-December 2013 are shown in Table 5a, and preliminary estimates of those reported for the first quarter of 2014 are shown in Table 5b.

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, 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 fourth 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 fourth quarter of 2013, and the second shows data for the combined strata for the fourth quarter of each year of the 2008-2013 period. Samples were obtained from 126 wells that contained fish caught during the fourth 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 4). The last fishery includes all 13 sampling areas. Of the 126 wells sampled that contained fish caught during the fourth quarter of 2013, 88 contained yellowfin. The estimated size compositions of these fish are shown in Figure 5a. The majority of the yellowfin catch during the fourth quarter was taken by sets on dolphins in the Northern and Inshore areas. Smaller amounts of yellowfin were also taken in the Southern dolphin fishing area, and in the Northern, Equatorial and Southern floating-object fisheries.

The estimated size compositions of the yellowfin caught by all fisheries combined during the fourth quarters of 2008-2013 are shown in Figure 5b. The average weight of the yellowfin caught during the fourth quarter of 2013 (10.8 kg) was nearly identical to the average weight for

2012 (10.7 kg), and was consistent with the average weight of the previous five years combined. The size distribution of yellowfin in 2013 was very similar to those of the previous two years.

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 4). The last two fisheries include all 13 sampling areas. Of the 126 wells sampled that contained fish caught during the fourth quarter of 2013, 81 contained skipjack. The estimated size compositions of these fish are shown in Figure 6a. The majority of the skipjack catch was in the 60- to 70-cm range, significantly greater than the 40- to 50-cm range for the same period in 2012. Large amounts were caught in the Equatorial and Southern floating-object fisheries and the Southern unassociated fishery, with lesser amounts in the Northern and Inshore floating-object fisheries and the Northern unassociated fishery.

The estimated size compositions of the skipjack caught by all fisheries combined during the fourth quarters of 2008-2013 are shown in Figure 6b. The average weight of the skipjack caught during the fourth quarter of 2013 (3.0 kg) was greater than the average weight of 2012 (2.4 kg), yet less than the average of 2011 (3.6 kg), which was the greatest of the 2008-2012 period.

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 4). The last three fisheries include all 13 sampling areas. Of the 126 wells sampled that contained fish caught during the fourth quarter of 2013, 30 contained bigeye. The estimated size compositions of these fish are shown in Figure 7a. Nearly all of the catch was taken in floating-object sets, primarily in the Northern, Equatorial, and Southern areas. The catch was fairly evenly distributed from about 40- to 110-cm.

The estimated size compositions of the bigeye caught by all fisheries combined during the fourth quarter of 2008-2013 are shown in Figure 7b. The average weight of bigeye caught during the fourth quarter of 2013 (6.3 kg) was greater than the average weight in 2012 (5.1 kg), but less than the average of 2011 (7.3 kg), which was the greatest of the 2008-2012 period.

The estimated retained purse-seine catch of bigeye less than 60 cm in length during the fourth quarter of 2013 was 2,800 t, or about 24 percent of the estimated total retained purse-seine catch of bigeye during that period. The corresponding amounts for 2008-2012 ranged from 1,400 to 5,300 t, or 15 to 31 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

Early life history studies

Yellowfin broodstock

The yellowfin broodstock resumed spawning at the Achotines Laboratory in Tank 1 during February and March. The fish spawned once in February and daily in March, except on 4-7 and 12-13 March. The number of eggs collected ranged from 2,000 to 315,000. The temperatures in the tank ranged from 24.5° to 26.2°C. The sustained cessation of spawning

during the previous quarters was likely related to the small number of older broodstock fish in the tank and the presence of newly-stocked younger fish. At the end of the quarter there were two 38-kg yellowfin, eight 20- to 28-kg yellowfin, and eight 9- to 11-kg yellowfin in Tank 1.

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 IATTC 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. The research on Pacific bluefin, which is conducted at the Fisheries Laboratories of KU in Wakayama Prefecture, Japan, is being supported by the Japan Science and Technology Agency (JST).

As part of this project, trial rearing of early juvenile yellowfin tuna (grown from larvae obtained from captive yellowfin tuna broodstock) in moored sea cages is planned for 2014 and 2015. In January anchors, lines, and buoys were installed offshore by staff members of KU, ARAP, and Nitto Seimo Co., Ltd. (makers of the mooring system) and a Panamanian marine contractor. In February, personnel from KU, ARAP, the Dainichi Corporation (cage manufacturer), and the Achotines staff assembled two sea cages at a beach site near Achotines Bay. During March, KU, ARAP, and Achotines Laboratory staff members, launched both sea cages and towed them to the cage frames, where they were successfully installed. The sea cages are located approximately 1/4 mile seaward (south) of the entrance to Achotines Bay. Early juvenile yellowfin (6 weeks of age) will be reared in tanks at the Laboratory and stocked in the sea cages for short-term rearing trials beginning in the fourth quarter of 2014.

Studies of snappers

The work on snappers (*Lutjanus* spp.) is carried out by the 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 second quarter of 2013, a major fishing effort was undertaken, and more than 100 spotted rose snappers were collected in local waters. At the end of March 2014 a large group of fish continued to be 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.

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 (IATTC Quarterly Report for April-June 2013: Figure 5). During July, August, and September this band retreated eastward. However a spot of cool water appeared at about 20°S-125° to 140°W in September (IATTC Quarterly Report for July-September 2013: Figure 5). This spot of cool water had disappeared by October, but there were areas of cool water near the coast off the Baja California peninsula and off South America from the Equator to about 35°S. In November most of this cool water had disappeared, except for two spots off South America between the Equator and 10°S. During December 2013 (IATTC Quarterly Report for October-December 2013: Figure 5) and January 2014, the SSTs were very close to normal throughout the entire tropical EPO. In February 2014, however, a band of cool water, which extended along the equator from the coast of South America to about 145°W, appeared. Also some spots of warm appeared off Mexico and Central America. The band of cool water along the equator mostly disappeared in March, but there was a spot of cool water along the coasts of Ecuador and Peru, and the spots of warm water off Mexico and Central America were more pronounced than they had been in February. The SSTs were mostly below normal from April 2013 through March 2014 (Table 6).

According to the Climate Diagnostics Bulletin of the U.S. National Weather Service for March 2014, "The model predictions of ENSO [El Niño-Southern Oscillation] for [the northern hemisphere] summer and beyond are indicating an increased likelihood of El Niño this year compared with [the outlook during February 2014]. Most of the models indicate that ENSO-neutral [conditions] will persist through much of the remainder of the Northern Hemisphere spring 2014, with many models predicting the development of El Niño sometime during the summer or fall. Despite this greater model consensus, there remains considerable uncertainty as to when El Niño will develop and how strong it may become. This uncertainty is amplified by the inherently lower forecast skill of the models for forecasts made in the spring. While ENSO-neutral is favored for Northern Hemisphere spring, the chances of El Niño increase during the remainder of the year, and exceed 50% by the summer."

BYCATCH PROGRAM AND INTERNATIONAL DOLPHIN CONSERVATION PROGRAM

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-13-01 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 2014 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 four trips of vessels planning to operate in both areas during the first quarter of 2014. These requests were granted.

Observers from the IDCP On-Board Observer Program departed on 239 fishing trips aboard purse seiners covered by that program during the first quarter of 2014. Preliminary coverage data for these vessels during the quarter are shown in Table 7.

Training

There were no observer training sessions held during the first quarter of 2014.

Gear project

There were no dolphin safety-gear inspections and safety-panel alignment procedures carried out aboard purse seiners during the first quarter of 2014.

PUBLICATIONS

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Olson, Robert J., Leanne M. Duffy, Petra M. Kuhnert, Felipe Galván-Magaña, Noemi Bocanegra-Castillo, and Vanessa Alatorre-Ramírez. 2014. Decadal diet shift in yellowfin tuna *Thunnus albacares* suggests broad-scale food web changes in the eastern tropical Pacific Ocean. Mar. Ecol. Prog. Ser., 497: 157-178.

Fuller, Daniel W., and Kurt M. Schaefer. 2014. Evaluation of a fishing captain's ability to predict species composition, sizes, and quantities of tunas associated with drifting fish-aggregating devices in the eastern Pacific Ocean. ICES Jour. Mar. Sci.; doi:10.1093/icesjms/fsu012

Lorrain, Anne, Brittany S. Graham, Brian N. Popp, Valérie Allain, Robert J. Olson, Brian P. V. Hunt, Michel Potier, Brian Fry, Felipe Galván-Magaña, Christophe Menkes, Sven Kaehler, and Frédéric Ménard. 2014. Nitrogen isotopic baselines and implications for estimating foraging habitat and trophic position of yellowfin tuna in the Indian and Pacific Oceans. Deep Sea Res. II Top. Stud. Oceanogr., http://www.sciencedirect.com/science/article/pii/S0967064514000472

Maunder, Mark N. and Kevin R. Piner. 2014. Contemporary fisheries stock assessment: many issues still remain. ICES Jour. Mar. Sci., doi:10.1093/icesjms/fsu015

VISITING SCIENTIST

Dr. R.I.C.C. Francis, formerly with the National Institute of Water and Atmospheric Research Ltd. of New Zealand, spent the period of 3 February-14 March 2014 at the IATTC headquarters in La Jolla, California, USA, where he did consulting work for the Center for the Advancement of Population Assessment Methodology (CAPAM). He worked principally with

Drs. Mark N. Maunder and Cleridy E. Lennert-Cody on composition data weighting in fisheries stock assessments. On 11 February 2014, he gave a talk entitled "The Treatment of Composition Data in Stock Assessment Models" at Scripps Institution of Oceanography in La Jolla.

ADMINISTRATION

Mr. Marlon H. Román Verdesoto was awarded the degree of Master of Science from the Centro de Investigación Científica y de Educación Superior de Ensenada (CICESE) on 13 February 2014. His thesis is entitled "Efectos Potenciales de Vedas Espaciales en la Demografía del Tiburón Sedoso (*Carcharhinus falciformis*) en el Océano Pacífico Oriental." Mr. Román is to be commended for his hard work.

SAD NEWS

Mr. Thomas P. Calkins, a long-time employee of the IATTC, passed away at his home in San Diego. California, on 7 February 2014.

Mr. Calkins was born in Seattle, Washington, on 12 June 1931, and graduated from the University of Washington in June 1953. After two years of military service, he worked for more than four years for the Fisheries Research Institute of the University of Washington on Alaska salmon. He was hired by the IATTC in November 1959, and continued as an IATTC staff member until he retired in June 1996. His service for the IATTC included two periods in Ecuador, one in 1960 and the other in 1963. Aside from those, he was stationed in La Jolla.

He was quite productive. He was author or co-author of 11 Bulletins, 9 on yellowfin and/or skipjack and 1 each on bigeye and bluefin. All of these were put to good use by the people who performed stock assessments. In addition, he was author of a species synopsis on bigeye for IATTC Special Report 2 and co-author of one on black skipjack for FAO Fisheries Report, Vol. 6, No. 2. He was a quiet and modest person; he never sought recognition for his work, but he was very conscientious, and everyone recognized the high quality of his work.

Mr. Calkins was a voracious reader, particularly about history and current events, and he seemed to be able to remember clearly most of what he had read.

He is survived by his wife, three sons, and three grandchildren. All who knew him will miss him greatly.

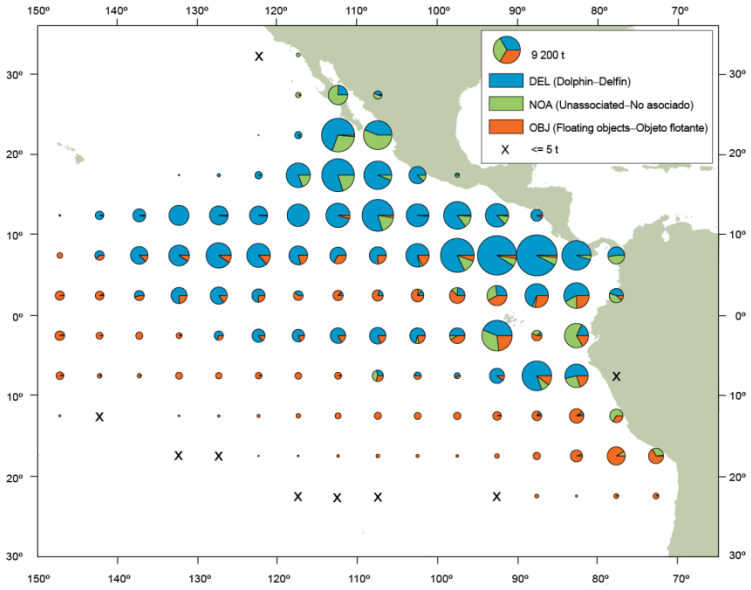

FIGURE 1a. Average annual distributions of the purse-seine catches of yellowfin, by set type, 2008-2012. The sizes of the circles are proportional to the amounts of yellowfin caught in those 5° by 5° areas.
FIGURA 1a. Distribución media anual de las capturas cerqueras de aleta amarilla, por tipo de lance, 2008-2012. El tamaño de cada círculo es proporcional a la cantidad de aleta amarilla capturado en la cuadrícula de 5° x 5° correspondiente.

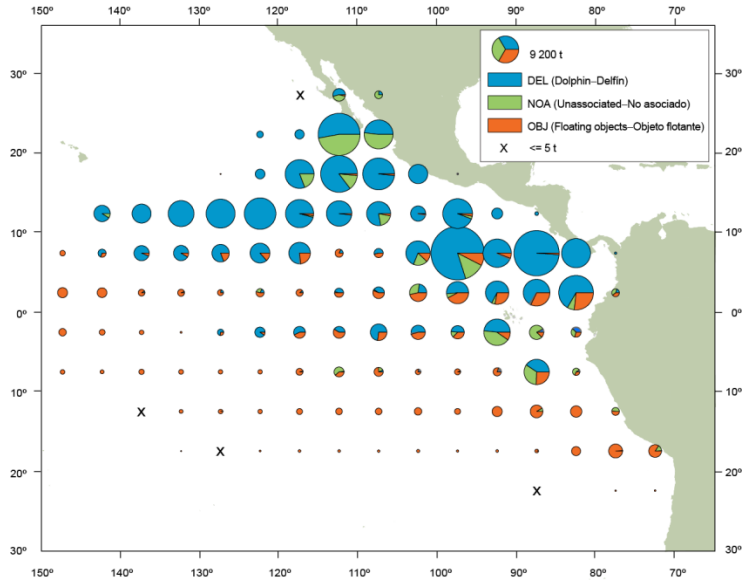

FIGURE 1b. Annual distributions of the purse-seine catches of yellowfin, by set type, 2013. The sizes of the circles are proportional to the amounts of yellowfin caught in those 5° by 5° areas.
FIGURA 1b. Distribución anual de las capturas cerqueras de aleta amarilla, por tipo de lance, 2013. El tamaño de cada círculo es proporcional a la cantidad de aleta amarilla capturado en la cuadrícula de 5° x 5° correspondiente.

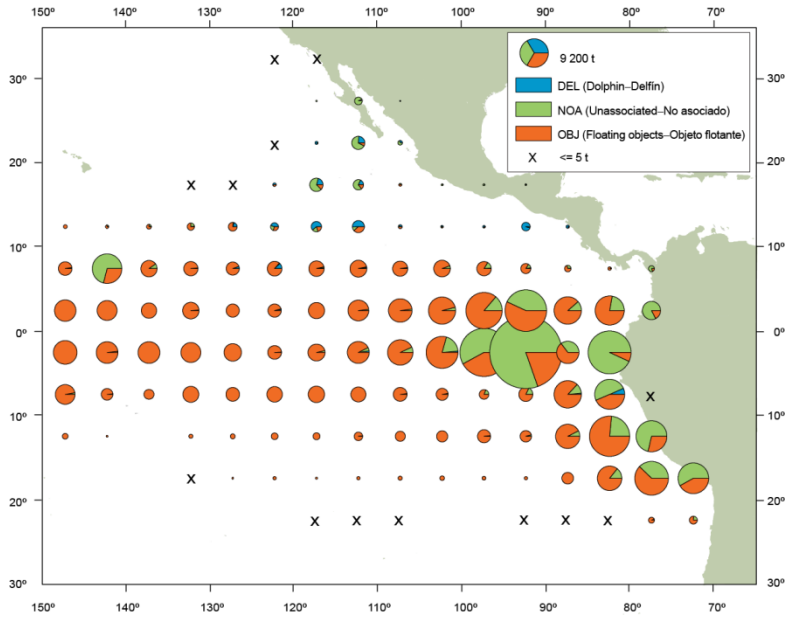

FIGURE 2a. Average annual distributions of the purse-seine catches of skipjack, by set type, 2008-2012. The sizes of the circles are proportional to the amounts of skipjack caught in those 5° by 5° areas.
FIGURA 2a. Distribución media anual de las capturas cerqueras de barrilete, por tipo de lance, 2008-2012. El tamaño de cada círculo es proporcional a la cantidad de barrilete capturado en la cuadrícula de 5° x 5° correspondiente.

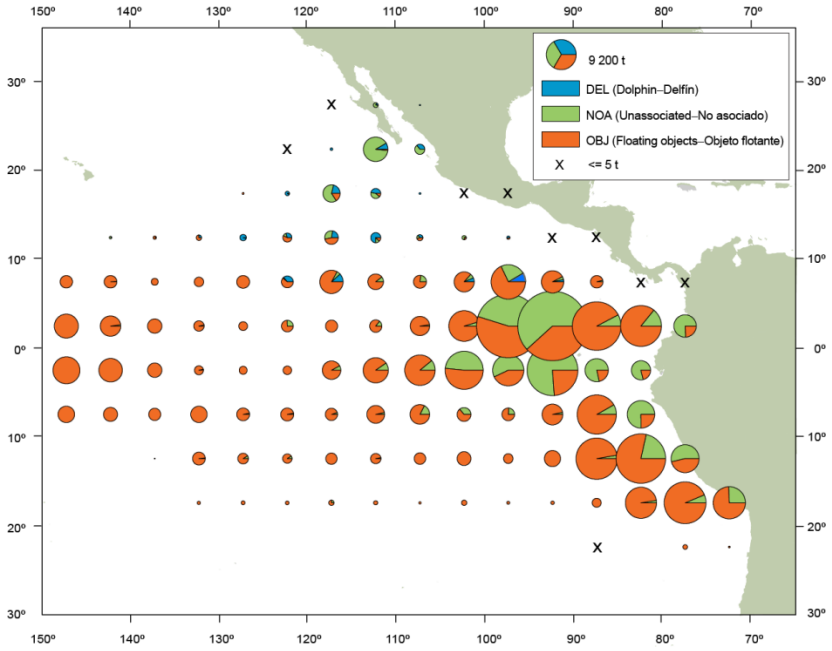

FIGURE 2b. Annual distributions of the purse-seine catches of skipjack, by set type, 2013. The sizes of the circles are proportional to the amounts of skipjack caught in those 5° by 5° areas.
FIGURA 2b. Distribución anual de las capturas cerqueras de barrilete, por tipo de lance, 2013. El tamaño de cada círculo es proporcional a la cantidad de barrilete capturado en la cuadrícula de 5° x 5° correspondiente.

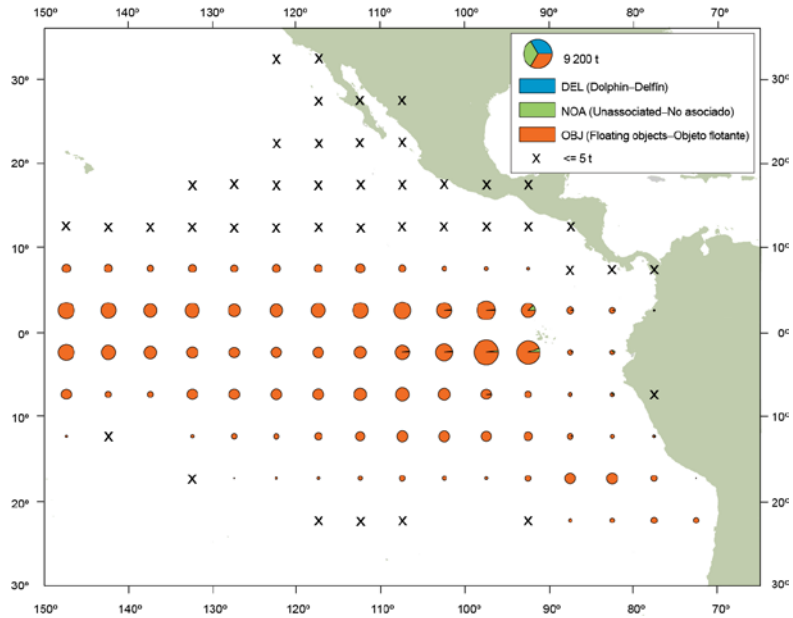

FIGURE 3a. Average annual distributions of the purse-seine catches of bigeye, by set type, 2008-2012. The sizes of the circles are proportional to the amounts of bigeye caught in those 5° by 5° areas.
FIGURA 3a. Distribución media anual de las capturas cerqueras de patudo, por tipo de lance, 2008-2012. El tamaño de cada círculo es proporcional a la cantidad de patudo capturado en la cuadrícula de 5° x 5° correspondiente.

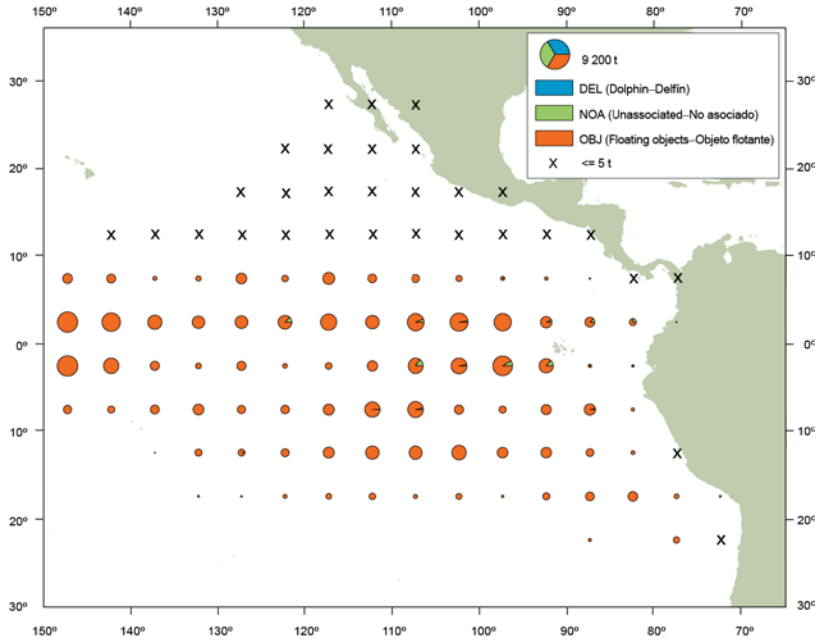

FIGURE 3b. Annual distributions of the purse-seine catches of bigeye, by set type, 2013. The sizes of the circles are proportional to the amounts of bigeye caught in those 5° by 5° areas.
FIGURA 3b. Distribución anual de las capturas cerqueras de patudo, por tipo de lance, 2013. El tamaño de cada círculo es proporcional a la cantidad de patudo capturado en la cuadrícula de 5° x 5° correspondiente.

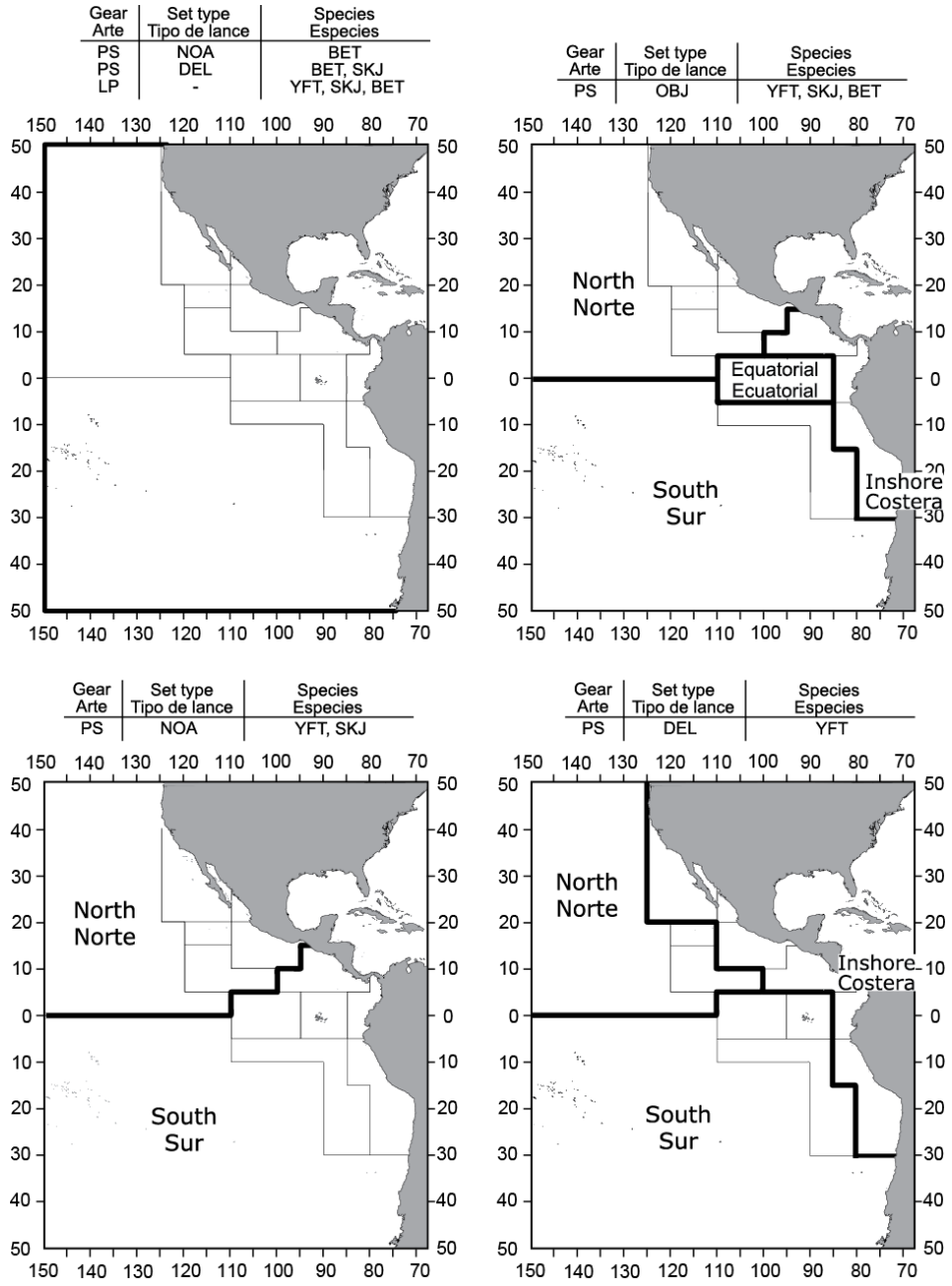

FIGURE 4. Spatial extents of the fisheries defined by the IATTC staff for stock assessment of yellowfin, skipjack, and bigeye in the EPO. The thin lines indicate the boundaries of the 13 length-frequency sampling areas, and the bold lines the boundaries of the fisheries. Gear: PS = purse seine, LP = 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.

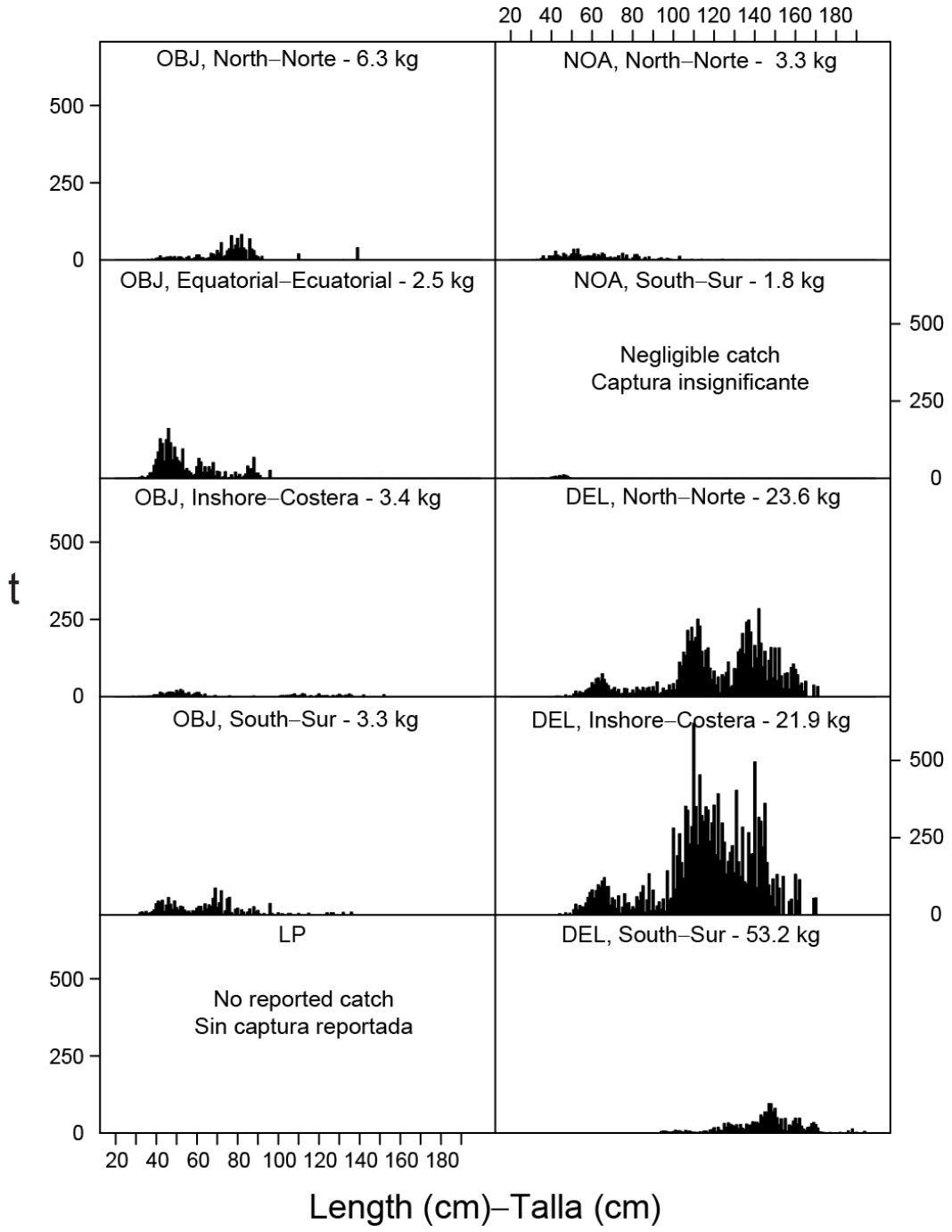

FIGURE 5a. Estimated size compositions of the yellowfin caught in each fishery of the EPO during the fourth quarter of 2013. The average weights of the fish in the samples are given at the tops of the panels. OBJ = floating object; LP = pole and line; NOA = unassociated; DEL = dolphin; t = metric tons.

FIGURA 5a. Composición por tallas estimada para el aleta amarilla capturado en cada pesquería del OPO durante el cuarto 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.

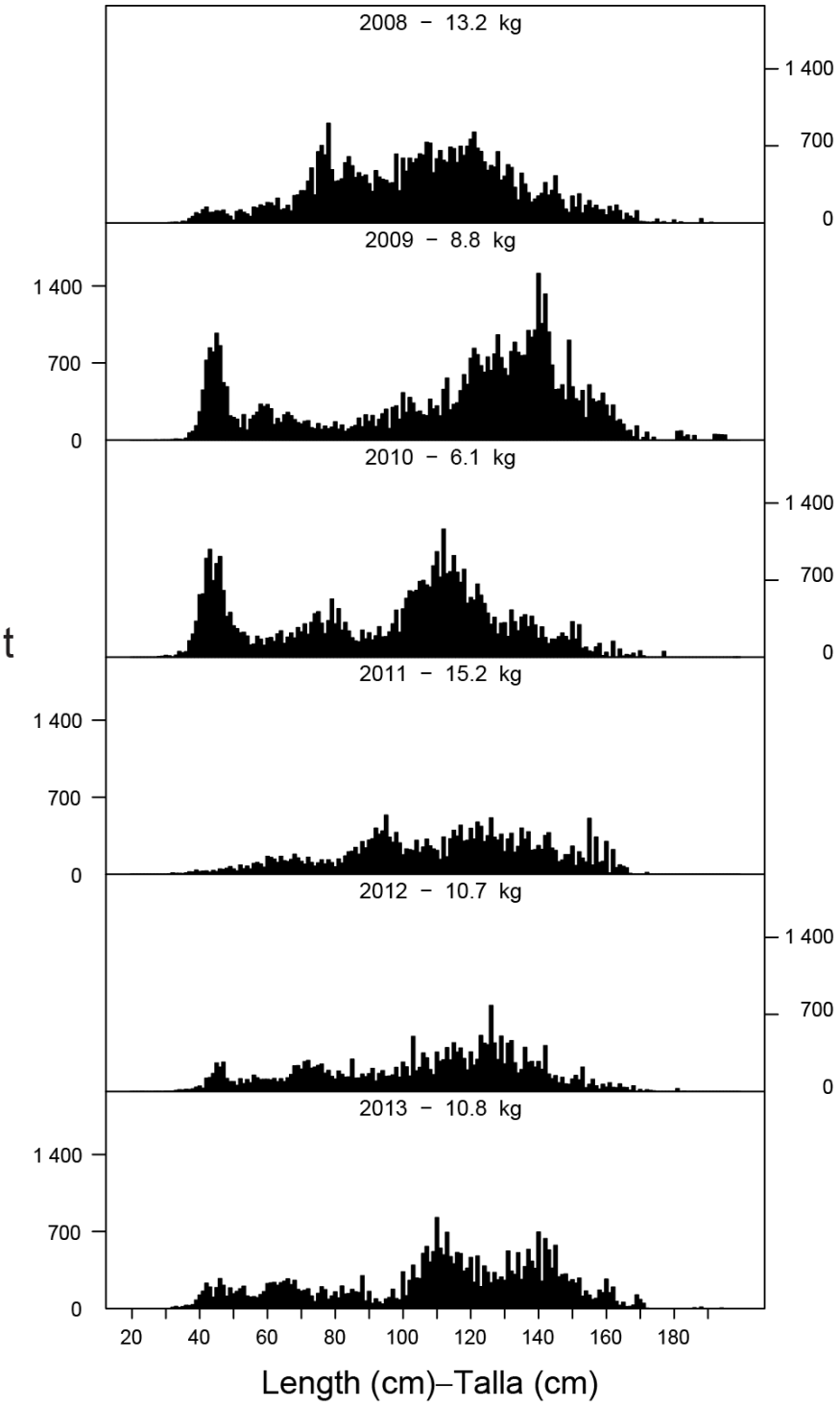

FIGURE 5b. Estimated size compositions of the yellowfin caught in the EPO during the fourth quarter of 2008-2013. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons.

FIGURA 5b. Composición por tallas estimada para el aleta amarilla capturado en el OPO en el cuarto trimestre de 2008-2013. En cada recuadro se detalla el peso promedio de los peces en las muestras; t = toneladas métricas.

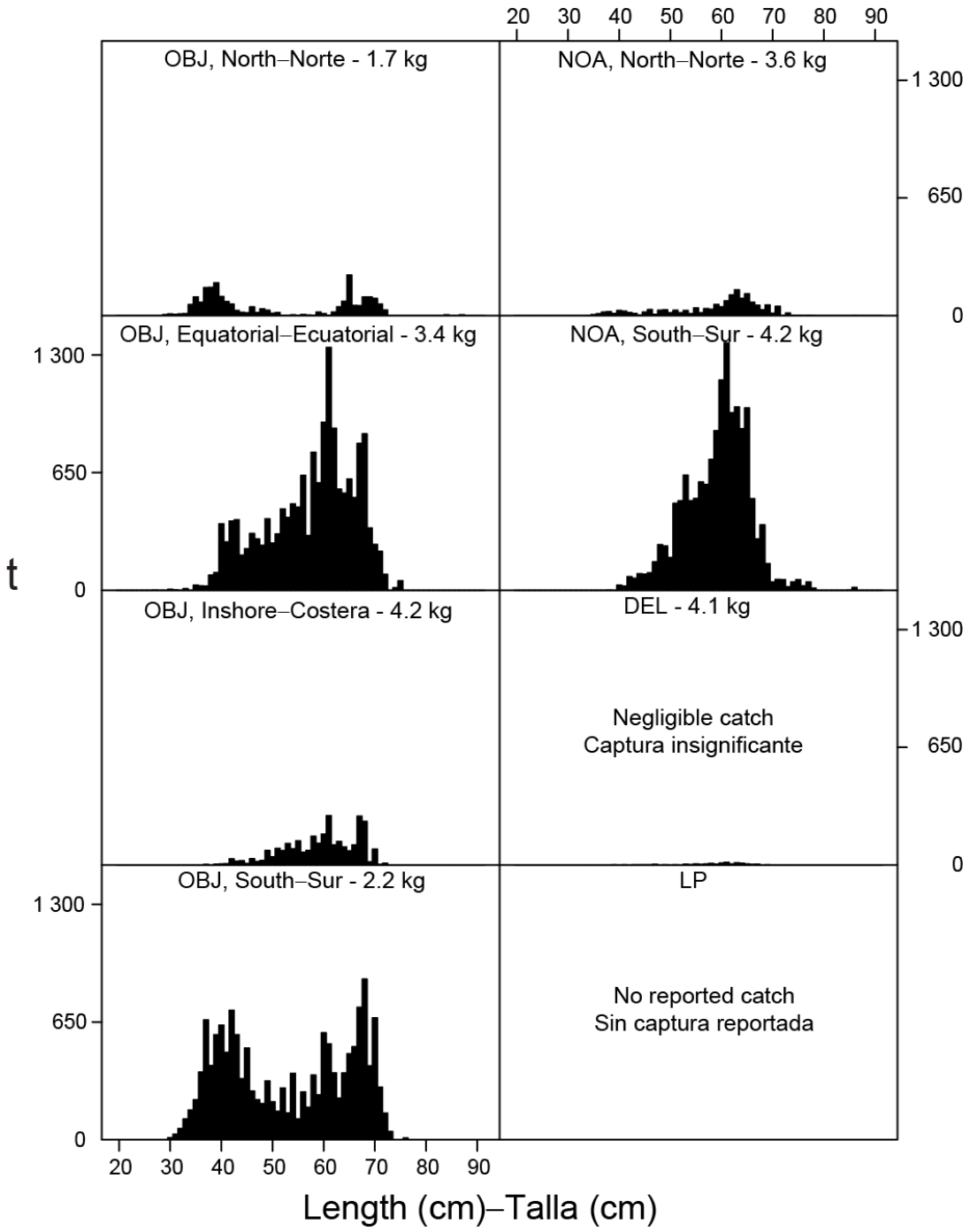

FIGURE 6a. Estimated size compositions of the skipjack caught in each fishery of the EPO during the fourth quarter of 2013. The average weights of the fish in the samples are given at the tops of the panels. OBJ = floating object; LP = pole and line; NOA = unassociated; DEL = dolphin; t = metric tons.

FIGURA 6a. Composición por tallas estimada para el barrilete capturado en cada pesquería del OPO durante el cuarto 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.

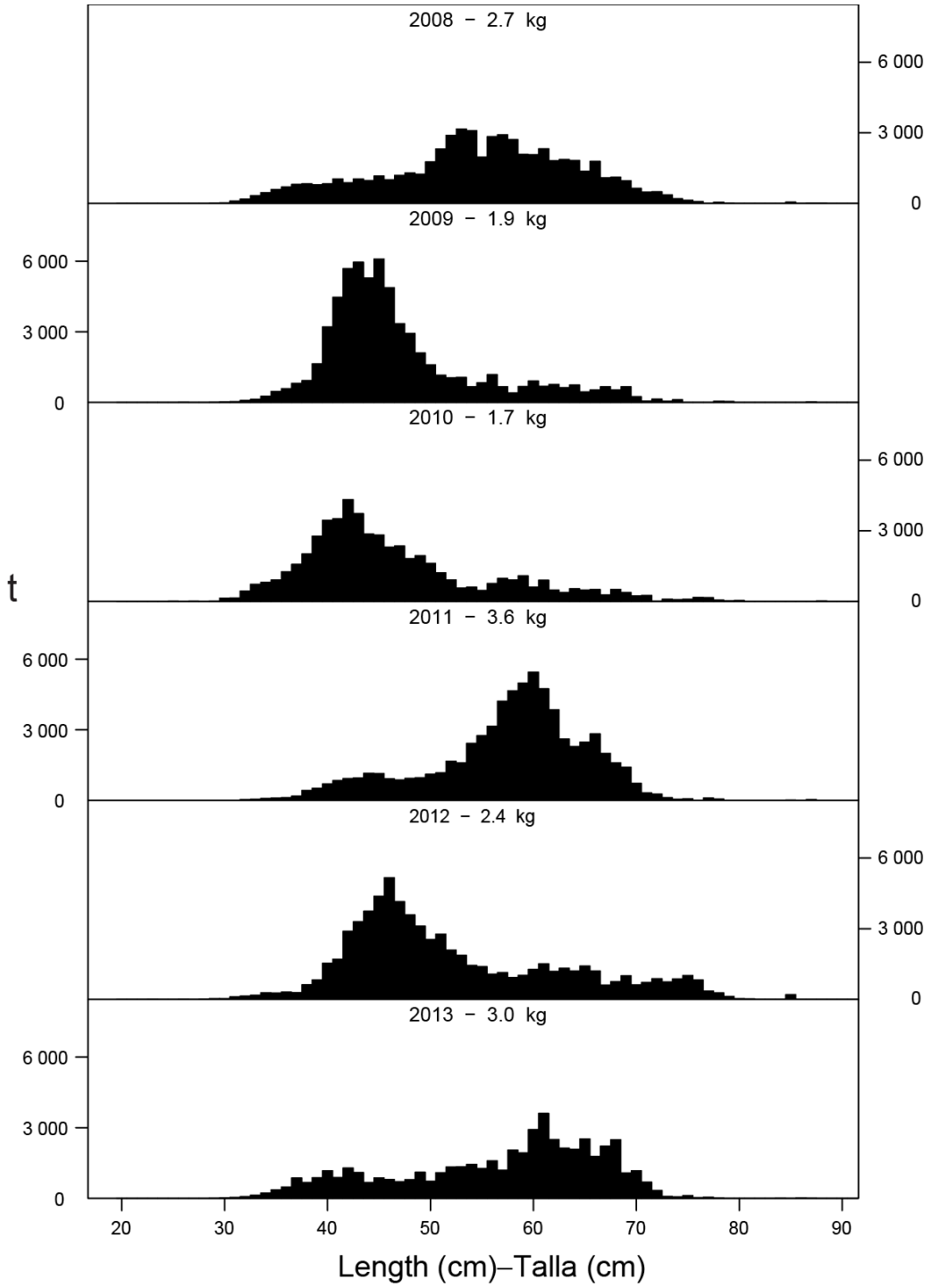

FIGURE 6b. Estimated size compositions of the skipjack caught in the EPO during the fourth quarter of 2008-2013. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons.

FIGURA 6b. Composición por tallas estimada para el barrilete capturado en el OPO en el cuarto trimestre de 2008-2013. En cada recuadro se detalla el peso promedio de los peces en las muestras. t = toneladas métricas.

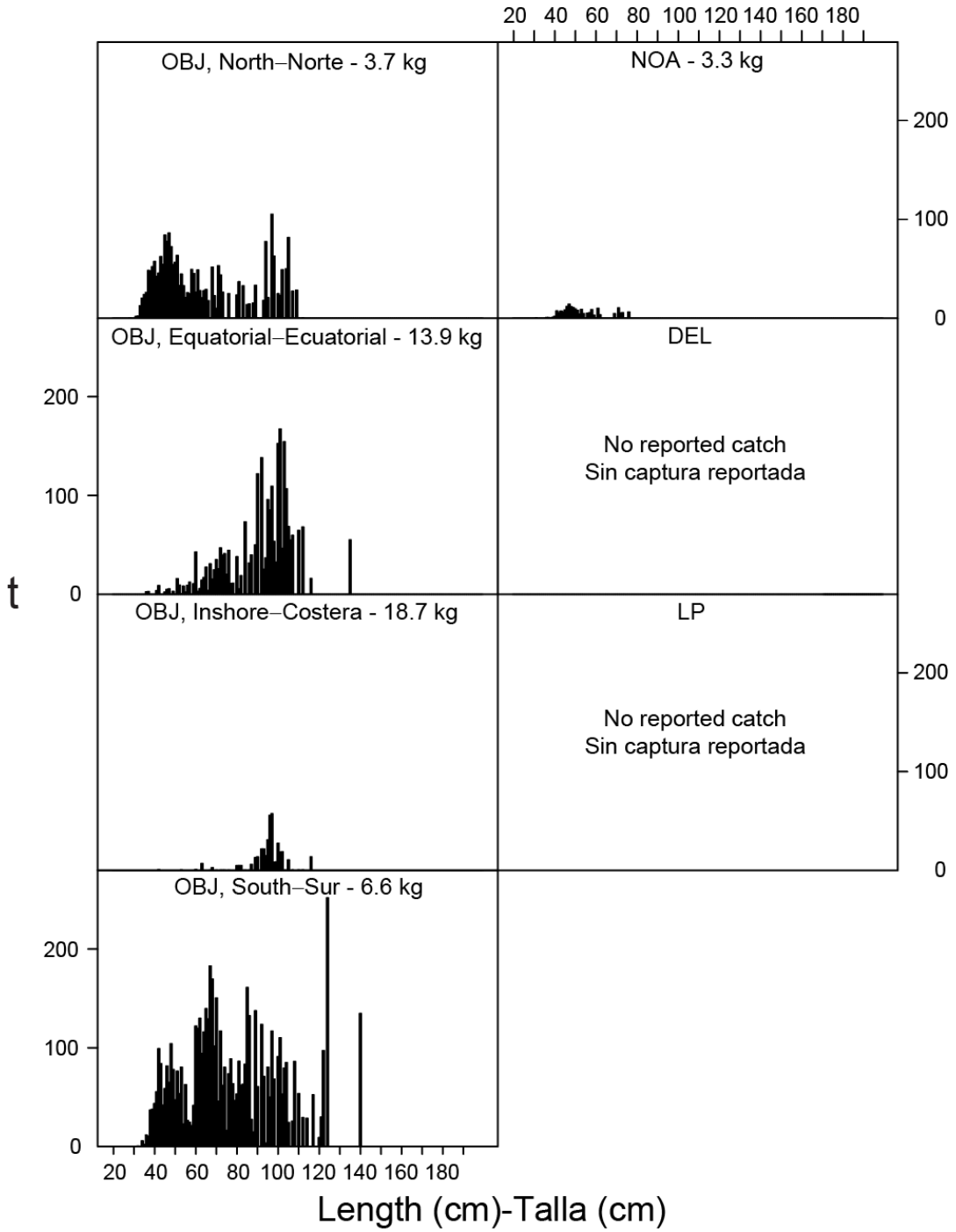

FIGURE 7a. Estimated size compositions of the bigeye caught in each fishery of the EPO during the fourth quarter of 2013. The average weights of the fish in the samples are given at the tops of the panels. OBJ = floating object; LP = pole and line; NOA = unassociated; DEL = dolphin; t = metric tons.

FIGURA 7a. Composición por tallas estimada para el patudo capturado en cada pesquería del OPO durante el cuarto 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.

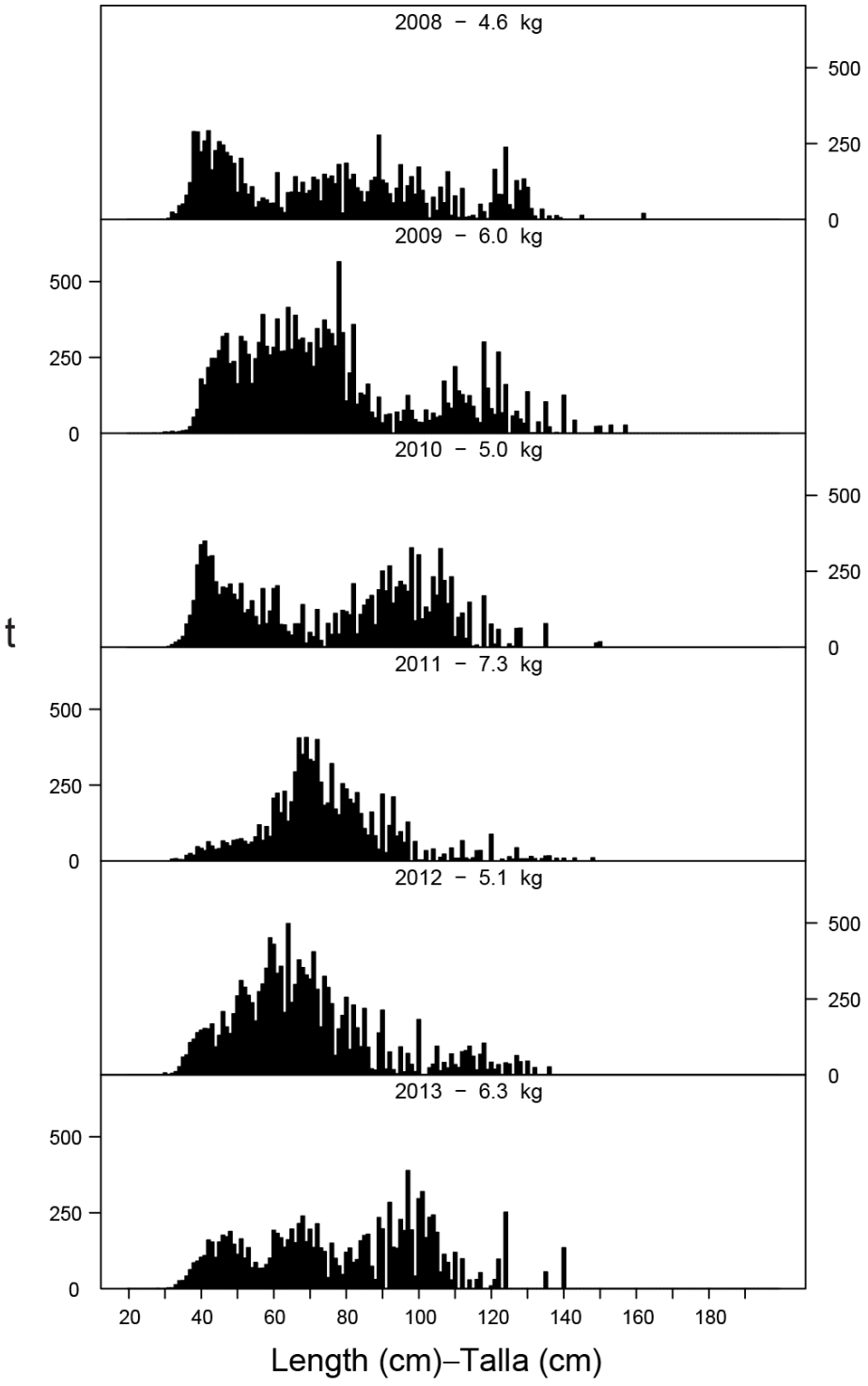

FIGURE 7b. Estimated size compositions of the bigeye caught in the EPO during the fourth quarter of 2008-2013. The average weights of the fish in the samples are given at the tops of the panels. t = metric tons.

FIGURA 7b. Composición por tallas estimada para el patudo capturado en el OPO en el cuarto trimestre de 2008-2013. En cada recuadro se detalla el peso promedio de los peces en las muestras; t = toneladas métricas.

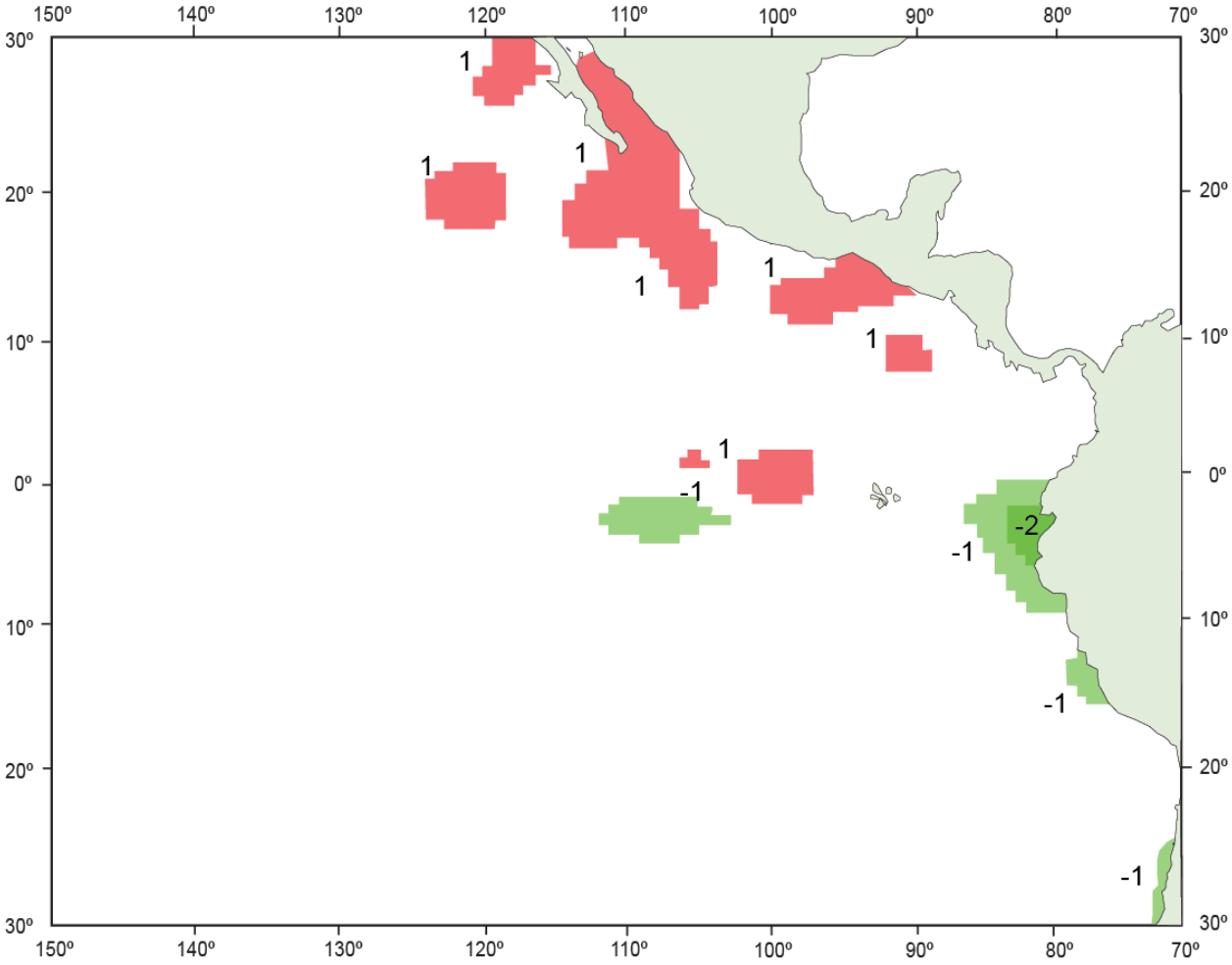

FIGURE 8. Sea-surface temperature (SST) anomalies (departures from long-term normals) for March 2014, based on data from fishing boats and other types of commercial vessels.
FIGURA 8. Anomalías (variaciones de los niveles normales a largo plazo) de la temperatura superficial del mar (TSM) en marzo de 2014, 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 2014 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 2014, 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	70	23	12	105	85,422
UE(España)—EU(Spain)	PS	-	-	4	4	10,116
Guatemala	PS	-	1	-	1	1,475
México	PS	10	30	1	41	47,662
	LP	3	-	-	3	268
Nicaragua	PS	-	6	1	7	9,966
Panamá	PS	2	8	2	12	16,158
Perú	PS	2	-	-	2	599
El Salvador	PS	-	1	3	4	7,892
Venezuela	PS	-	14	1	15	20,890
All flags—Todas banderas	PS	88	93	24	205	
	LP	3	-	-	3	
	PS + LP	91	93	24	208	
				Capacity—Capacidad		
All flags—Todas banderas	PS	42,105	121,260	51,675	215,040	
	LP	268	-	-	268	
	PS + LP	42,373	121,260	51,675	215,308	

TABLE 2. Preliminary estimates of the retained catches of tunas in the EPO, from 1 January through 30 March 2014, 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 marzo de 2014, 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	7,121	42,174	5,756	-	485	-	-	27	55,563	40.3
México	33,018	2,081	-	-	-	-	1,023	3	36,125	26.2
Panamá	4,823	7,606	1,209	-	-	-	-	-	13,638	9.9
Venezuela	5,395	4,785	8	-	-	-	1	1	10,190	7.4
Other—Otros[2]	6,218	14,785	1,263	-	-	-	-	-	22,266	16.2
Total	56,575	71,431	8,236	-	485	-	1,024	31	137,782	

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

TABLE 3. Estimated retained and discarded EPO catches, in metric tons, by purse-seine and pole-and-line vessels. "TUN" includes some catches reported by species (frigate or bullet tunas) along with the unidentified tunas. The data for 2012-2013 are preliminary.

TABLA 3. Estimaciones de capturas del OPO retenidas y descartadas, en toneladas métricas, de buques cerqueros y caneros. "TUN" incluye algunas capturas reportadas por especie (melvas o petos) junto con los atunes no identificados. Los datos de 2012-2013 son preliminares.

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
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	4,713	229,156	87,602	10,515	98,117	9,657	653	10,310	580	0	580
1994	212,033	4,525	216,558	73,366	10,491	83,857	34,899	2,266	37,165	969	0	969
1995	216,702	5,275	221,977	132,300	16,373	148,673	45,321	3,251	48,572	659	0	659
1996	242,369	6,312	248,681	106,528	24,494	131,022	61,311	5,689	67,000	8,333	0	8,333
1997	249,296	5,516	254,812	156,716	31,338	188,054	64,272	5,402	69,674	2,610	3	2,613
1998	259,044	4,697	263,741	142,315	22,643	164,958	44,129	2,822	46,951	1,772	0	1,772
1999	283,703	6,547	290,250	263,609	26,046	289,655	51,158	4,932	56,090	2,558	54	2,612
2000	255,694	6,207	261,901	205,878	24,468	230,346	95,282	5,417	100,699	3,773	0	3,773
2001	387,852	7,028	394,880	143,613	12,815	156,428	60,518	1,254	61,772	1,156	3	1,159
2002	413,236	4,140	417,376	154,162	12,506	166,668	57,421	949	58,370	1,761	1	1,762
2003	383,749	5,865	389,614	274,606	22,453	297,059	53,052	2,326	55,378	3,236	0	3,236
2004	274,441	3,000	277,441	198,352	17,078	215,430	65,471	1,574	67,045	8,880	19	8,899
2005	269,923	2,771	272,694	264,528	16,915	281,443	67,895	1,900	69,795	4,743	15	4,758
2006	167,317	1,534	168,851	296,703	11,177	307,880	83,838	1,680	85,518	9,928	0	9,928
2007	170,910	1,725	172,635	208,571	6,450	215,021	63,450	890	64,340	4,189	0	4,189
2008	185,871	696	186,567	297,102	8,249	305,351	75,028	2,086	77,114	4,407	14	4,421
2009	237,481	1,262	238,743	230,674	6,064	236,738	76,799	1,019	77,818	3,428	24	3,452
2010	251,469	1,031	252,500	147,239	2,769	150,008	57,752	564	58,316	7,746	0	7,746
2011	207,127	415	207,542	276,059	5,215	281,274	56,512	631	57,143	2,829	4	2,833
2012	198,417	451	198,868	266,518	3,511	270,029	66,020	473	66,493	6,705	0	6,705
2013	217,628	207	217,835	278,875	2,254	281,129	49,104	273	49,377	3,154	0	3,154

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

Year	Albacore			Bonitos (*Sarda* spp.)			Black skipjack			Unidentified tunas (TUN)			Total		
	Retained	Discarded	Total	Retained	Discarded	Total	Retained	Discarded	Total	Retained	Discarded	Total	Retained	Discarded	Total
Año	**Albacora**			**Bonitos (*Sarda* spp.)**			**Barrilete negro**			**Atunes no identificados (TUN)**			**Total**		
	Retenido	Descartado	Total	Retenido	Descartado	Total	Retenido	Descartado	Total	Retenido	Descartado	Total	Retenido	Descartado	Total
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	3,925	4,029	9	1,975	1,984	322,996	21,793	344,789
1994	85	-	85	8,693	147	8,840	188	857	1,045	9	498	507	330,242	18,784	349,026
1995	465	-	465	8,010	55	8,065	203	1,448	1,651	11	626	637	403,671	27,028	430,699
1996	83	-	83	654	1	655	704	2,304	3,008	37	1,028	1,065	420,019	39,828	459,847
1997	60	-	60	1,105	4	1,109	100	2,512	2,612	71	3,383	3,454	474,230	48,158	522,388
1998	123	-	123	1,337	4	1,341	528	1,876	2,404	13	1,233	1,246	449,261	33,275	482,536
1999	274	-	274	1,719	0	1,719	171	3,404	3,575	27	3,092	3,119	603,219	44,075	647,294
2000	157	-	157	636	0	636	293	1,995	2,288	190	1,410	1,600	561,903	39,497	601,400
2001	160	-	160	17	0	17	2,258	1,019	3,277	191	679	870	595,765	22,798	618,563
2002	412	-	412	0	0	0	1,467	2,283	3,750	576	1,863	2,439	629,035	21,742	650,777
2003	93	-	93	1	0	1	439	1,535	1,974	80	1,238	1,318	715,256	33,417	748,673
2004	231	-	231	16	35	51	884	387	1,271	256	973	1,229	548,531	23,066	571,597
2005	68	-	68	313	18	331	1,472	2,124	3,596	190	1,922	2,112	609,132	25,665	634,797
2006	110	-	110	3,519	80	3,599	1,999	1,972	3,971	50	1,910	1,960	563,464	18,353	581,817
2007	208	-	208	16,013	628	16,641	2,306	1,625	3,931	598	1,221	1,819	466,245	12,539	478,784
2008	1,099	-	1,099	7,883	37	7,920	3,624	2,251	5,875	137	1,380	1,517	575,151	14,713	589,864
2009	2,277	2	2,279	10,053	15	10,068	4,256	1,020	5,276	162	469	631	565,130	9,875	575,005
2010	25	-	25	2,824	19	2,843	3,425	1,079	4,504	136	709	845	470,616	6,171	476,787
2011	10	-	10	7,987	45	8,032	2,317	719	3,036	108	784	892	552,949	7,813	560,762
2012	-	-	-	8,191	156	8,347	4,504	440	4,944	41	354	395	550,396	5,385	555,781
2013	-	-	-	2,063	9	2,072	3,554	805	4,359	53	461	514	554,431	4,009	558,440

TABLE 4. Preliminary estimates of the retained catches in metric tons, of tunas and bonitos caught by purse-seine and pole-and-line vessels in the EPO in 2012 and 2013, 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 y cañeros en el OPO en 2012 y 2013, 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.

	Yellowfin	Skipjack	Bigeye	Pacific bluefin	Albacore	Black skipjack	Bonito	Unidentified tunas	Total	Percent
	Aleta amarilla	Barrilete	Patudo	Aleta azul	Albacora	Barrilete negro	Bonito	Atunes no identificados	Total	Porcentaje
2012	**Retained catches—Capturas retenidas**									
Colombia	20,924	15,760	1,873	-	-	-	-	-	38,557	7.0
Ecuador	29,485	151,280	45,633	-	-	872	3,837	38	231,145	42.0
EU (España)	1,065	15,773	3,866	-	-	10	-	-	20,714	3.8
México	93,686	18,259	255	6,667	-	3,614	4,329	-	126,780	23.0
Nicaragua	7,541	3,931	1,250	-	-	-	-	-	12,722	2.3
Panamá	15,932	25,786	7,238	-	-	-	25	-	48,981	8.9
Venezuela	23,408	20,829	848	-	-	7	-	2	45,094	8.2
Other-Otra[1]	6,376	14,900	5,087	38	-	1	-	1	26,403	4.8
Total	198,417	266,518	66,020	6,705	-	4,504	8,191	41	550,396	
2013	**Retained catches–Capturas retenidas**									
Colombia	16,643	22,037	1,346	-	-	14	-	-	40,040	7.2
Ecuador	27,194	172,963	32,422	-	-	629	802	18	234,028	42.2
EU (España)	524	2,932	1,627	-	-	-	-	-	5,083	0.9
México	114,496	17,261	118	3,154	-	2,858	1,260	16	139,163	25.1
Nicaragua	8,396	4,337	2,642	-	-	-	-	-	15,375	2.8
Panamá	18,518	30,783	5,832	-	-	40	-	-	55,173	10.0
Venezuela	25,068	17,432	929	-	-	13	-	6	43,448	7.8
Other-Otra[2]	6,789	11,130	4,188	-	-	-	1	13	22,121	4.0
Total	217,628	278,875	49,104	3,154	-	3,554	2,063	53	554,431	

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

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

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

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

TABLE 5a. Catches of bigeye tuna, in metric tons, in the eastern Pacific Ocean during 2013 by longline vessels more than 24 meters in overall length.
TABLA 5a. Capturas de atún patudo, en toneladas métricas, en el Océano Pacífico oriental durante 2013 por buques palangreros de más de 24 metros en eslora total.

Flag—Bandera	Quarter—Trimestre				Total
	1	2	3	4	
China	1,279	-	-	-	1,279
Japan—Japón	4,112	2,442	2,823	4,876	14,254
Republic of Korea—República de Corea*	2,791	1,656	838	3,037	8,322
Chinese Taipei—Taipei Chino	928	473	890	2,211	4,502
United States—Estados Unidos	-	-	-	-	595
Vanuatu	-	-	-	-	-
Total	9,110	4,571	4,551	10,124	28,951

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

TABLE 5b. Preliminary estimates of the catches of bigeye tuna, in metric tons, in the eastern Pacific Ocean during the first quarter of 2014 by longline vessels more than 24 meters in overall length.
TABLA 5b. Estimaciones preliminares de las capturas de atún patudo, en toneladas métricas, en el Océano Pacífico oriental durante el primer trimestre de 2014 por buques palangreros de más de 24 metros en eslora total.

Flag—Bandera	Month—Mes			Total
	1	2	3	
China	-	-	-	-
Japan—Japón	1,597	1,131	-	2,728
Republic of Korea—República de Corea*	725	416	525	1,666
Chinese Taipei—Taipei Chino	586	435	283	1,304
United States— Estados Unidos	-	-	-	-
Vanuatu	-	-	-	-

* 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, April 2013-March 2014. 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, abril 2013-marzo 2014. 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	**4**	**5**	**6**	**7**	**8**	**9**
SST—TSM (°C)						
Area 1 (0°-10°S, 80°-90°W)	24.7 (-0.9)	22.9 (-1.4)	21.5 (-1.4)	20.3 (-1.3)	19.7 (-1.0)	19.8 (-0.6)
Area 2 (5°N-5°S, 90°-150°W	27.4 (-0.2)	26.4 (-0.7)	25.8 (-0.6)	25.0 (-0.7)	24.4 (-0.6)	24.7 (-0.1)
Area 3 (5°N-5°S, 120°-170°W)	27.7 (-0.1)	27.6 (-0.3)	27.4 (-0.2)	26.9 (-0,3)	26.5 (-0.3)	26.7 (-0.1)
Area 4 (5°N-5°S, 150W°-160°E)	28.5 (0.0)	28.7 (-0.1)	28.8 (-0.1)	28.8 (0.0)	28.7 (0.0)	28.7 (0.0)
Thermocline depth—Profundidad de la termoclina, 0°-80°W	10	25	25	25	30	20
Thermocline depth—Profundidad de la termoclina, 0°-110°W	55	30	60	60	55	60
Thermocline depth—Profundidad de la termoclina, 0°-150°W	120	105	130	140	150	140
Thermocline depth—Profundidad de la termoclina, 0°-180°	175	180	175	170	170	160
SOI—IOS	0.2	0.8	1.2	0.8	0.2	0.3
SOI*—IOS*	-1.29	4.79	6.91	3.37	2.18	-0.80
NOI*—ION*	2.73	1.36	1.16	0.47	-1.30	-0.26

TABLE 6. (continued)
TABLA 6. (continuación)

Month—Mes	**10**	**11**	**12**	**1**	**2**	**3**
SST—TSM (°C)						
Area 1 (0°-10°S, 80°-90°W)	20.2 (-0.6)	21.1 (-0.5)	22.6 (-0.2)	24.8 (0.3)	25.4 (-0.8)	25.9 (-0.8)
Area 2 (5°N-5°S, 90°-150°W	24.7 (-0.2)	24.8 (-0.2)	25.1 (0.0)	25.3 (-0.4)	25.6 (-0.8)	26.9 (-0.2)
Area 3 (5°N-5°S, 120°-170°W)	26.4 (-0.3)	26.7 (0.0)	26.5 (0.0)	26.1 (-0.5)	26.2 (-0.6)	27.0 (-0.2)
Area 4 (5°N-5°S, 150W°-160°E)	28.7 (0.0)	28.9 (0.3)	28.6 (0.2)	28.1 (-0.2)	28.4 (0.3)	28.7 (0.5)
Thermocline depth—Profundidad de la termoclina, 0°-80°W	30	30	35	35	15	10
Thermocline depth—Profundidad de la termoclina, 0°-110°W	80	80	120	45	25	60
Thermocline depth—Profundidad de la termoclina, 0°-150°W	140	165	155	140	150	160
Thermocline depth—Profundidad de la termoclina, 0°-180°	180	180	170	185	180	180
SOI—IOS	-0.1	0.7	0.1	1.4	0.1	-0.9
SOI*—IOS*	-0.55	3.28	0.41	1.61	1.77	1.20
NOI*—ION*	0.93	0,14	4.97	3.98	-0.95	-0.60

TABLE 7. Preliminary data on the sampling coverage of trips of tuna purse seine vessels deployed by the observer programs of the IATTC, Colombia, Ecuador, the European Union, Mexico, Nicaragua, Panama, Venezuela, and under the MOC described in the text departing during the first quarter of 2014. The numbers in parentheses indicate cumulative totals for the year.
TABLA 7. Datos preliminares de la cobertura de muestreo de viajes de buques atuneros de cerco asignados por los programas de observadores de la CIAT, Colombia, Ecuador, México, Nicaragua, Panamá, la Unión Europea, Venezuela, y bajo el MDC descrito en el texto durante el primer trimestre de 2014. 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	17	(17)	8	(8)	9	(9)	17	(17)	100.0	(100)
Ecuador	100	(100)	67	(67)	33	(33)	100	(100)	100.0	(100)
El Salvador	6	(6)	4	(4)	2	2	6	(6)	100.0	(100)
EU–UE (Spain)	9	(9)	1	(1)	8	(8)	9	(9)	100.0	(100)
Guatemala	2	(2)	2	(2)			2	(2)	100.0	(100)
México	59	(59)	28	(28)	31	(31)	59	(59)	100.0	(100)
Nicaragua	8	(8)	5	(5)	3	(3)	8	(8)	100.0	(100)
Panamá	19	(19)	11	(11)	8	(8)	19	(19)	100.0	(100)
Venezuela	18	(18)	8	(8)	10	(10)	18	(18)	100.0	(100)
Total	239	(239)	134	(134)	104	(104)[1]	239	(239)	100.0	(100)

[1] Includes four trips sampled with observers of the WCPFC in accordance with the MOC—Incluye cuatro viajes muestreados por observadores del WCPFC, de acuerdo al MDC.