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**DISTRIBUTION OF FISHING EFFORT AND RESULTING TUNA
CATCHES FROM THE EASTERN TROPICAL PACIFIC OCEAN,
BY QUARTERS OF THE YEAR, 1959 - 1962**

**DISTRIBUCION DEL ESFUERZO DE LA PESCA DE ATUN EN EL
OCEANO PACIFICO ORIENTAL TROPICAL Y LAS CAPTURAS
RESULTANTES, POR TRIMESTRES DEL AÑO, DE 1959 A 1962**

by — por
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La Jolla, California
1963

CONTENTS — INDICE

ENGLISH VERSION — VERSION EN INGLES

	Page
INTRODUCTION.....	319
METHODS.....	320
Source of data.....	320
Statistical system.....	320
RESULTS.....	321
Composition of fleet.....	321
Species recorded.....	321
Total tonnage logged and landed.....	322
Overall effort, catch and catch-per-unit-of-effort by five-degree areas.....	322
Total catch by one-degree areas.....	322
<hr/>	
FIGURES — FIGURAS.....	323
<hr/>	
TABLES — TABLAS.....	356

SPANISH VERSION — VERSION EN ESPAÑOL

	Página
INTRODUCCION.....	374
METODOS.....	375
Fuente de datos.....	375
Sistema estadístico.....	375
RESULTADOS.....	376
Composición de la flota.....	376
Especies registradas.....	376
Tonelaje total registrado y desembarcado.....	377
Esfuerzo global, captura y captura por unidad de esfuerzo por áreas de cinco grados.....	377
Captura total por área de un grado.....	377
<hr/>	
LITERATURE CITED — BIBLIOGRAFIA CITADA.....	378

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INTRODUCTION

This report is a sequel to one previously published by the Commission (Alverson, 1960) which covered the years 1951 through 1958. It is based entirely on information collected from the logbooks of purse-seiners and baitboats engaged in the fishery for yellowfin (*Thunnus albacares*) and skipjack (*Katsuwonus pelamis*) tuna in the Eastern Pacific from 1959 through 1962.

During the past four years, 1959-1962, inclusive, dramatic changes have taken place in the fishery for yellowfin and skipjack in the Eastern Pacific (Orange and Broadhead, 1959; Broadhead and Marshall, 1960; McNeely, 1961; and Broadhead, 1962). These changes were initiated in 1957 and 1958 by the success of the purse-seiners M/V *Sun King* and M/V *Southern Pacific*, converted baitboats. The demonstration that purse-seiners, equipped with power blocks and nets of synthetic fiber, were more efficient than baitboats for taking tropical tunas, especially yellowfin tuna associated with spotted and spinner porpoises (*Stenella* sps.), led to a revolution within the industry. The baitboat, from the very inception of the tropical tuna fishery through 1959, had been the major producer (Shimada and Schaefer, 1956; Schaefer, 1963). However, with the rapid withdrawal of vessels from the baitboat fleet, their conversion, and addition to the purse-seine fleet, the latter has been the paramount producer since 1960. In addition to the conversion of baitboat hulls, the success of the converted purse-seiners stimulated the conversion of a number of military and other hulls, and new construction.

The rapid change from one gear to another is reflected by the data presented in this report. There is a sharp drop in catch of tunas by the baitboats concomitant with a precipitous increase in the purse-seine catch. Also, the geographic scope and character of the purse-seine fishery has changed from a rather parochial one primarily exploiting the yellowfin resource north of the Gulf of Tehuantepec during the first six months of the year to one that fishes the entire range of the Eastern Pacific tropical tuna fishery, Cedros Island, Mexico, to northern Chile, the year around.

A direct result of the increased use of this more efficient gear, and consequent increase in fishing intensity, was the capture, in 1960 and 1961, of yellowfin in excess of the maximum sustainable yield for the Eastern Pacific (Schaefer, 1961 and 1962). Because of the overfishing

in 1960 and 1961, the Commission recommended a catch quota for 1962 to conserve and rebuild this valuable resource.

The greater part of this report consists of charts which show the geographic distribution of yellowfin and skipjack catches, by quarters of the year, and one-degree areas, for both purse-seiners and baitboats. Tabular data on catch, effort, and catch-per-unit-of-effort, by five-degree areas, have been compiled for both types of gear.

Previously, the Commission has published a number of *Bulletins* concerned with the geographic distribution of the catch and/or effort for yellowfin and skipjack (Shimada, 1958; Alverson, 1959 and 1960; Griffiths, 1960; Calkins, 1961 and 1963; and Martin, 1962).

METHODS

Source of data

The information on areas of fishing, effort expended, and the amounts of each species captured, has been obtained solely from the logbook records of the purse-seiners and baitboats engaged in the fishery. These data are collected by the Commission through its logbook system (Schaefer, 1953; Shimada and Schaefer, 1956).

The methods used in analyzing and tabulating vessel logbook information have been described by Shimada (1958) and Martin (1962). The quantity of each species allotted to each statistical area is based on the estimates recorded by fishermen in their logbooks. Bait and purse-seine fishermen are, however, accurate in estimating their catches of both species (Shimada, 1958), as indicated by comparing the summation of the daily catches logged with the quantities weighed at unloading for individual trips. Logbook data, for individual trips, were used only if the catch consisted of at least 2/3 by weight yellowfin and/or skipjack.

Logbook data have been obtained from vessels operating out of Mexico, Costa Rica, Panama, Peru and Puerto Rico, in addition to those landing in the United States. Because our coverage of vessels operating out of southern ports is less complete, the total catches for the more southerly areas are somewhat under-estimated relative to those of more northerly areas.

Statistical system

The Commission's statistical areas and their assigned code numbers are shown in Figure 1. Catches are normally tabulated by one-degree areas, the smallest statistical unit employed. Catches of general origin within a five-degree area, i.e., those which cannot be assigned to a specific one-degree unit, have not been included in any of the figures showing catch distribution. In no year do these amounts exceed one per cent of the total tonnage logged for each type of gear. The tables, however, include all catches of general origin.

128-176

RESULTS

Composition of the fleet

The composition of the high-seas fleet, operating from ports in the Americas, including Puerto Rico, fishing tropical tunas in the Eastern Pacific has changed radically since 1957. The major portion of this change has occurred over the past four years, 1959-1962.

In 1957, baitboats with approximate capacity of 40,700 tons made during the year at least one trip each for tropical tunas. Commencing with the M/V *Sun King* in 1957, a total of 29,460 tons of baitboat capacity has been converted to purse-seine gear. The capacity tonnage withdrawn from the baitboat fleet, during the period 1957 through 1962, for conversion to purse-seiners is tabulated, by quarters of the year, in Table 1. In most cases, the quarter of removal has been considered as that in which a vessel completed unloading the fish caught on its final trip as a baitboat. The exceptions were a few vessels that were inactive; in that case, the quarter in which they commenced conversion was considered the quarter of withdrawal from the baitboat fleet. The removal of vessels for conversion, sinkings, transferral to other fisheries, and other factors, reduced the baitboat fleet to such a degree that the approximate capacity tonnage that made at least one trip during 1962 was only 7,500 tons.

The purse-seine picture was a mirror image of the baitboat one. The capacity tonnage was low in 1957, approximately 6,600 tons of capacity was fished at least one trip that year for tropical tunas. Through the end of 1962, an approximate total of 29,800 tons of capacity had been added to the purse-seine fleet through conversion of baitboats, military and other hulls, and through new construction. The capacity tonnage added to the purse-seine fleet, during the period 1957 through 1962, is tabulated by quarters of the year, in Table 2. The quarter in which a vessel made its maiden voyage as a seiner was considered the quarter of entry. The net growth, addition less withdrawals, was such that, in 1962, approximately 31,000 tons of purse-seine capacity made at least one trip during the year.

Species recorded

The catches recorded by fishermen in their logbooks fall into four categories: yellowfin; skipjack; mixed yellowfin and skipjack, not separately identified; and yellowfin and/or skipjack, species not specified. The tonnages in the latter two categories have been prorated in the ratio of identified tonnage of yellowfin and skipjack reported for each one-degree area by quarters of the year (Martin, 1962). Therefore, the catch data tabulated in Tables 3 and 4 are by two categories: yellowfin and skipjack. During the four-year period, 1959-1962, 2.5 per cent of the total tonnage logged by baitboats fell in the mixed categories; in no year did it exceed four per cent of the total logged catch. The tonnage logged in the same two categories by seiners, in the same period, amounted also to 2.5 per

cent of the total logged catch, and in no year did it exceed 3.2 per cent of the logged catch.

Total tonnage logged and landed

The total tonnages, by species, reported in baitboat and purse-seine logbooks for the individual years are compared in Table 3 with the total tonnages landed in each year. Logbook coverage varied from 76.4 to 91.9 per cent for yellowfin and from 51.6 to 74.7 per cent for skipjack.

Overall effort, catch and catch-per-unit-of-effort by five-degree areas

The effort logged, the resulting catches, and the catch-per-unit-of-effort of the baitboats and purse-seiners, by five-degree areas, by quarters of the year, for the period 1959-1962, are given in Table 4. The geographic location of any five-degree area listed in the table may be found by examining Figure 1. The Area 25-110, which is divided into two portions by Baja California, has two code numbers: 25-110A represents that part of the area in the Gulf of California and 25-110B, that in the Pacific Ocean proper. The effort, expressed in days, has been standardized to vessels of 201-300 tons capacity for baitboats and to vessels of 101-200 tons capacity for purse-seiners. The methods used in standardizing the effort of baitboats have been described in some detail by Shimada and Schaefer (1956) and Griffiths (1960). A similar procedure was used to standardize the purse-seine effort. The catch is given in tons, to the nearest ton, except where the total catch was less than one ton, in which case it is given to the nearest 1/4 ton, and is listed by species. The effort employed, the catch of each species, and the total of both, are summarized for each quarter of every year. An annual total follows all fourth quarter summaries.

Total catch by one-degree areas

The distribution of yellowfin and skipjack catches by one-degree areas, by quarters of the year, as reported by baitboats and purse-seiners for the years 1959-1962, is given in Figures 2 through 33. Separate figures have been made for the baitboats (Figures 2 through 17) and purse-seiners (Figures 18 through 33) depicting the catch of yellowfin and skipjack separately. The catches reported in vessel logbooks as yellowfin and skipjack and yellowfin and/or skipjack have been prorated and are included in the plots. In the figures, the catch is presented by five intervals of magnitude: fished, no catch; under 25 tons; 25-99 tons; 100-499 tons; and 500 tons or more.

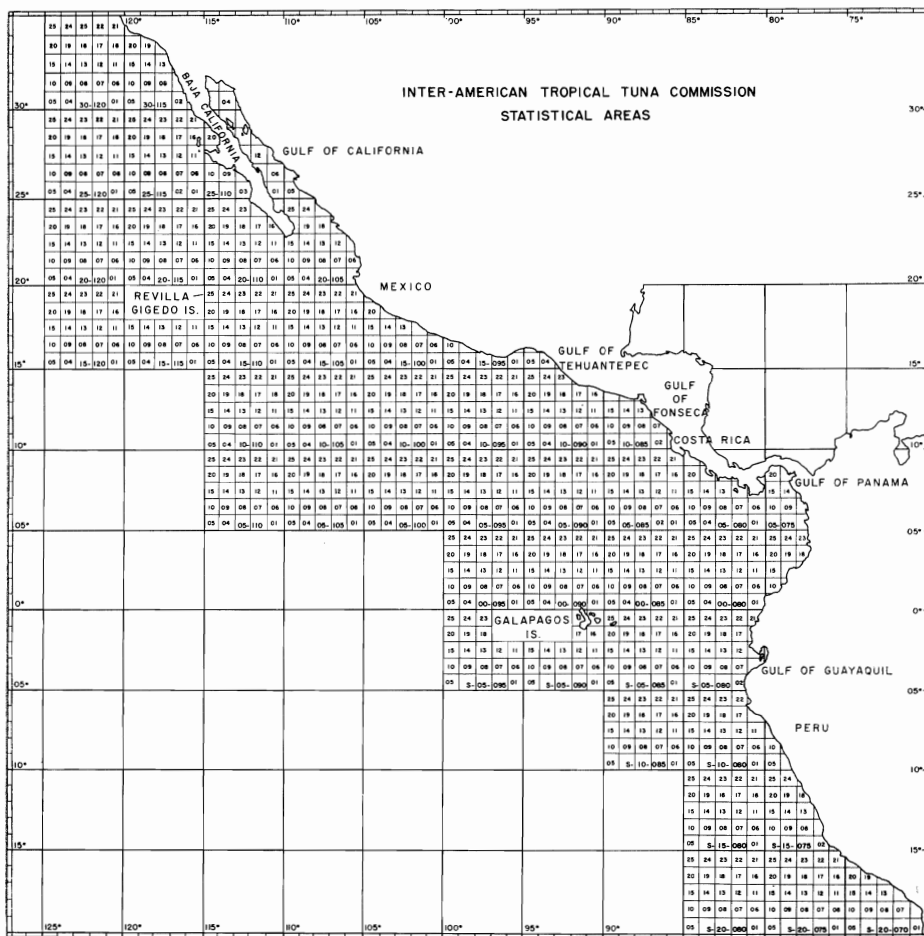


FIGURA 1. The statistical areas employed by the Inter-American Tropical Tuna Commission.
FIGURA 1. Las áreas estadísticas utilizadas por La Comisión Interamericana del Atún Tropical.

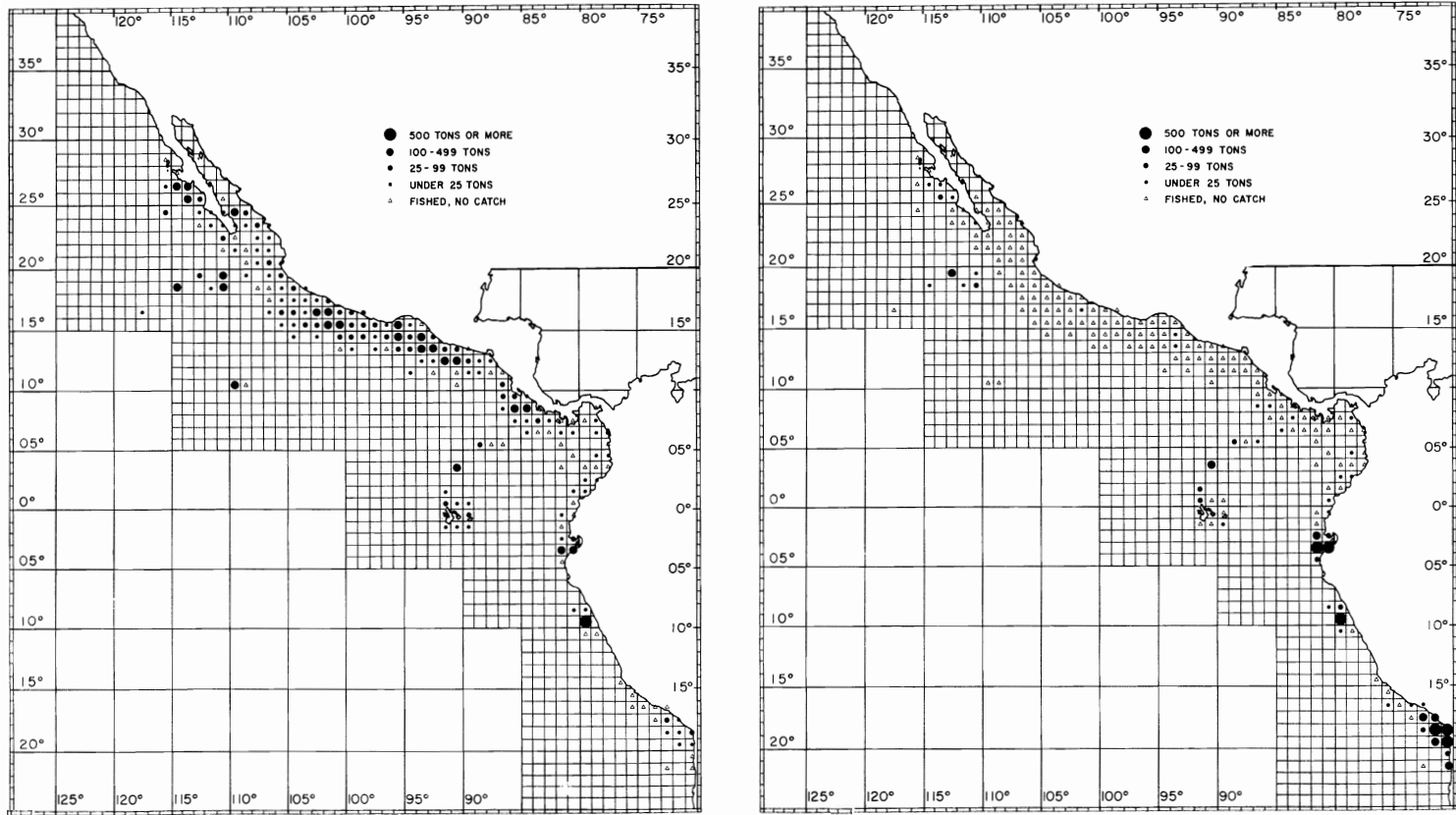


FIGURE 2. Distribution of the catches by baitboats in the first quarter, 1959; left—yellowfin, right—skipjack.

FIGURA 2. Distribución de las capturas por los barcos de carnada, correspondientes al primer trimestre de 1959; izquierda—atún aleta amarilla, derecha—barrilete.

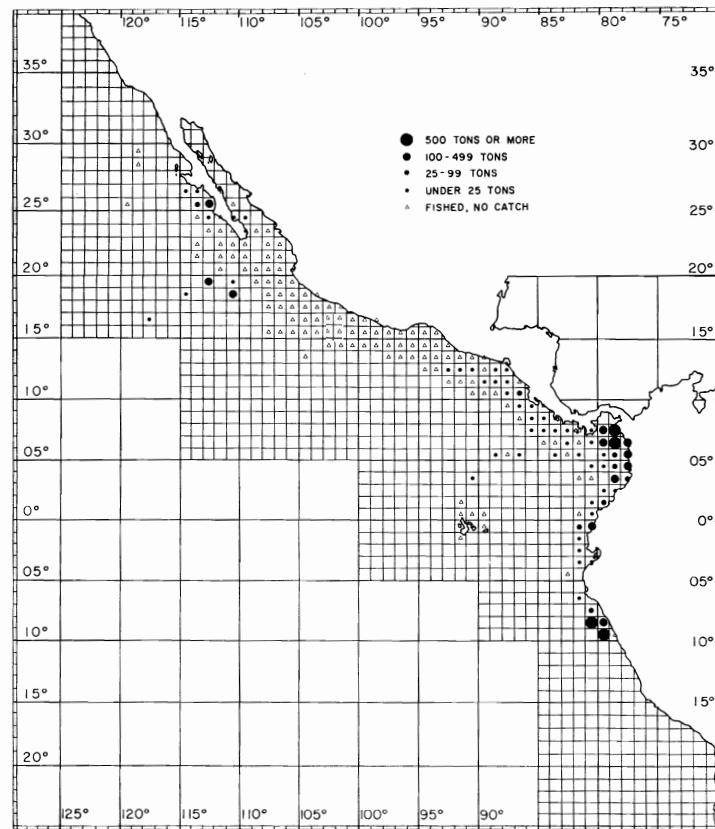
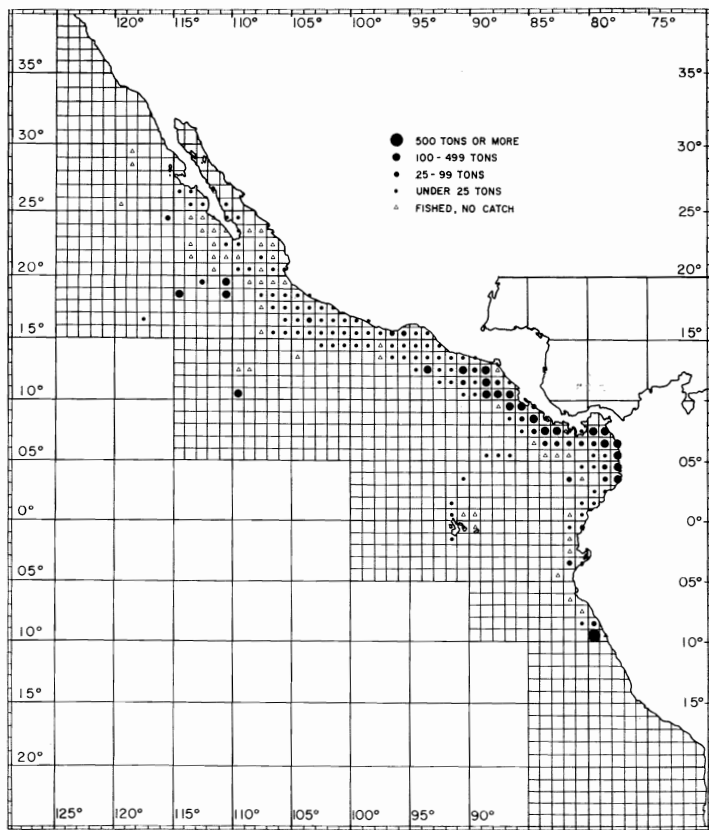


FIGURE 3. Distribution of the catches by baitboats in the second quarter, 1959; left—yellowfin, right—skipjack.

FIGURA 3. Distribución de las capturas por los barcos de carnada, correspondientes al segundo trimestre de 1959; izquierda atún aleta amarilla, derecha—barrilete.

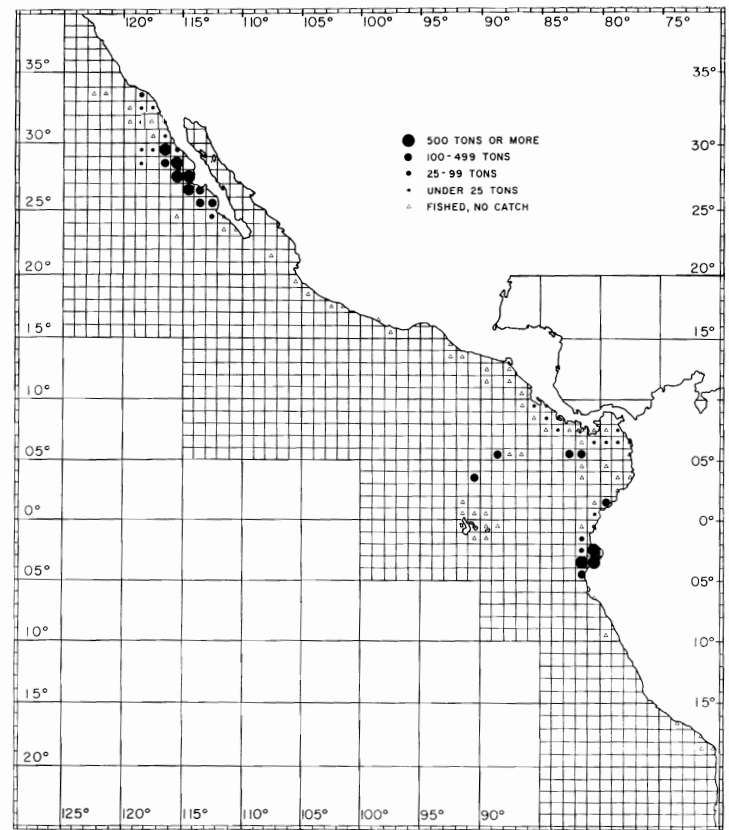
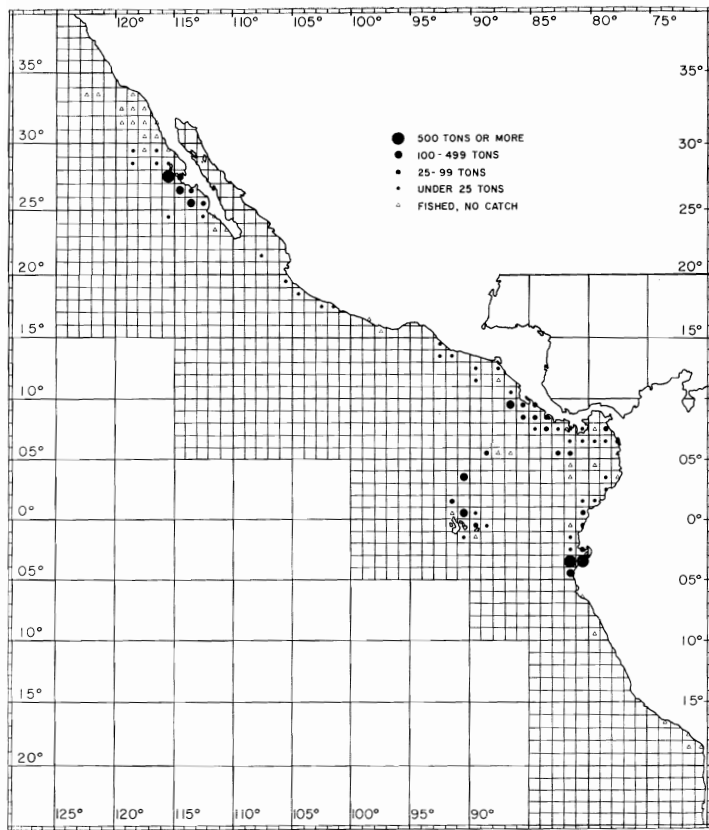


FIGURE 4. Distribution of the catches by baitboats in the third quarter, 1959; left—yellowfin, right—skipjack.

FIGURA 4. Distribución de las capturas por los barcos de carnada, correspondientes al tercer trimestre de 1959; izquierda—atún aleta amarilla, derecha—barrilete.

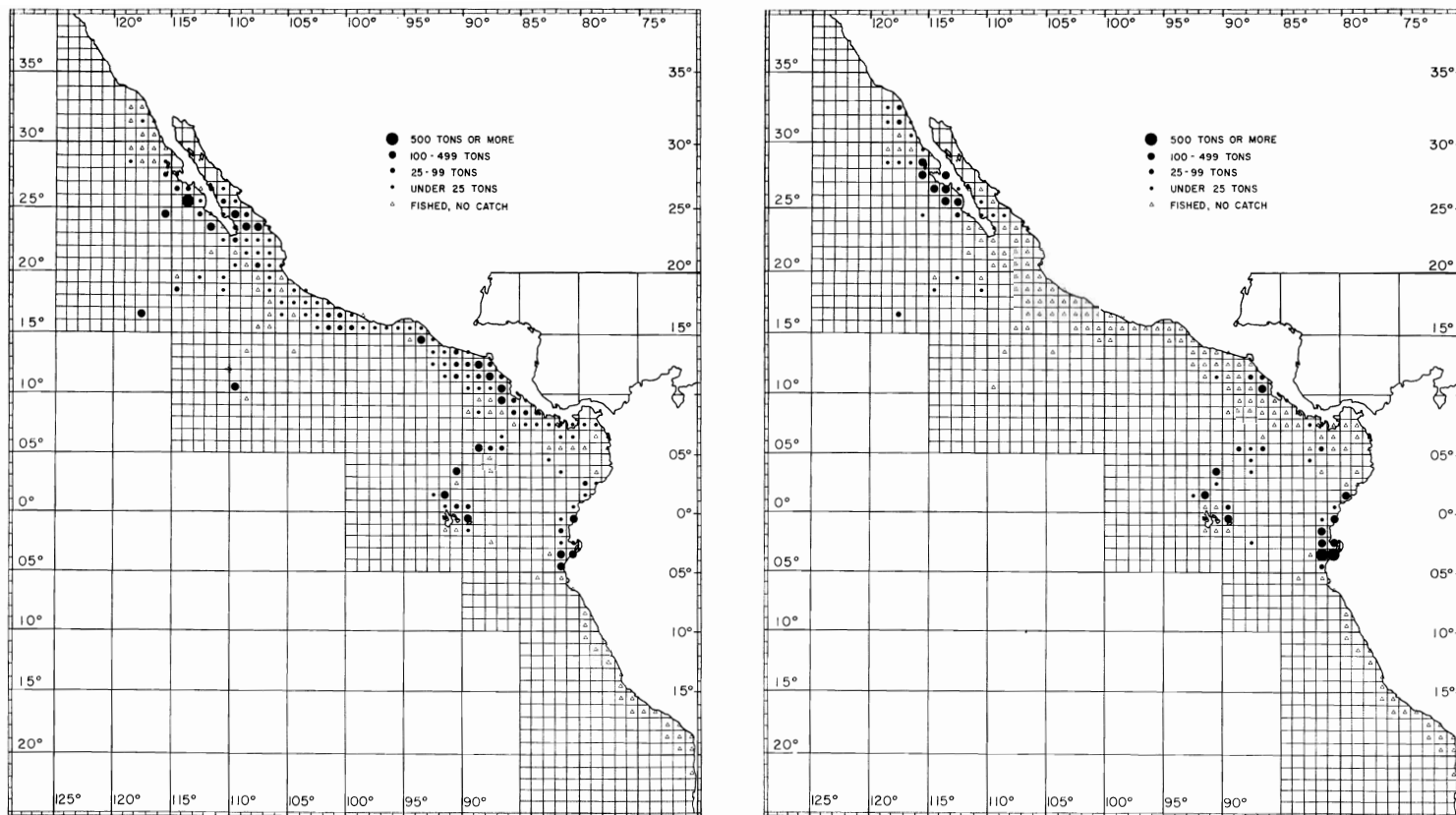


FIGURE 5. Distribution of the catches by baitboats in the fourth quarter, 1959; left—yellowfin, right—skipjack.

FIGURA 5. Distribución de las capturas por los barcos de carnada, correspondientes al cuarto trimestre de 1959; izquierda—atún aleta amarilla, derecha—barrilete.

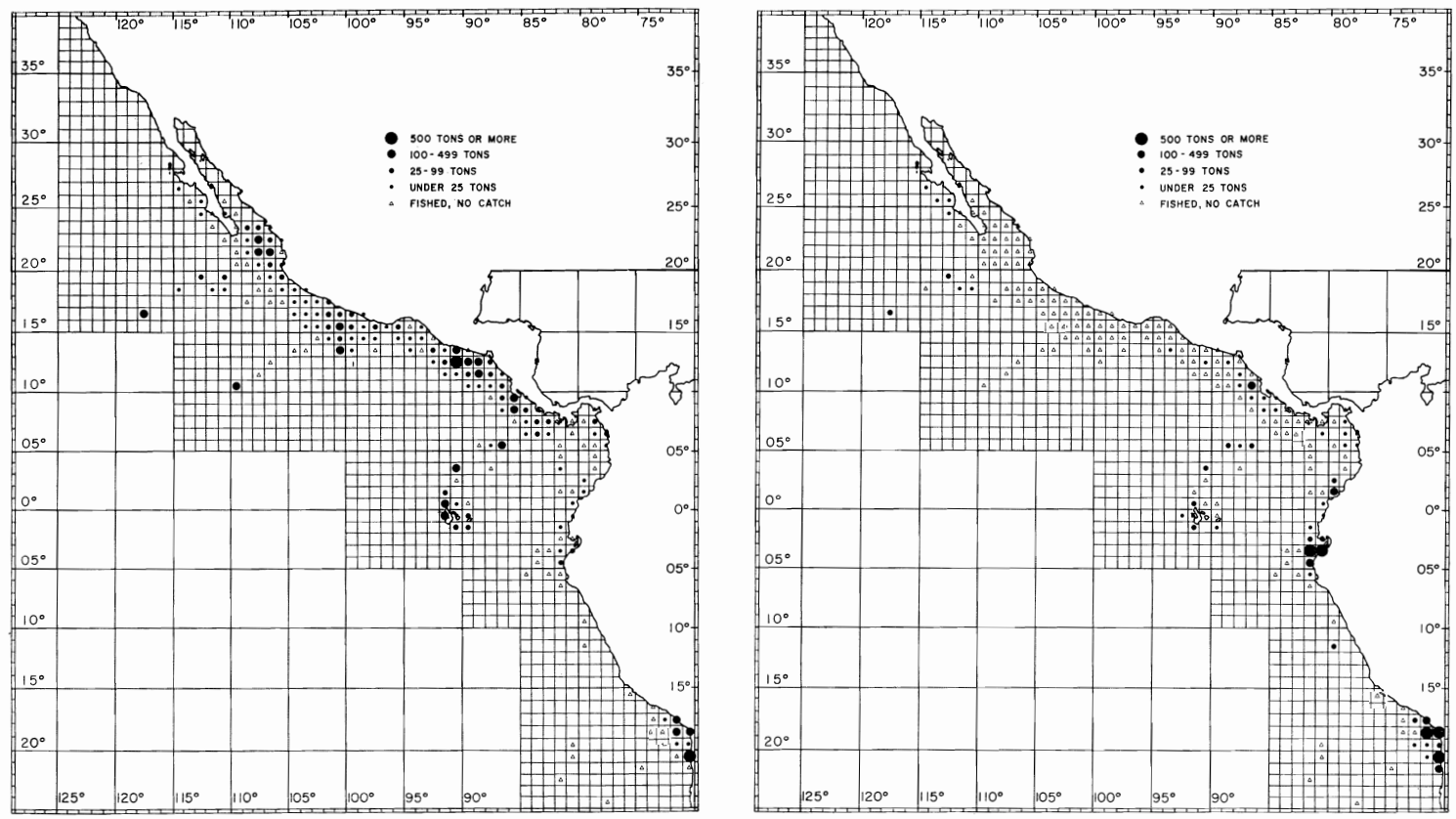


FIGURE 6. Distribution of the catches by baitboats in the first quarter, 1960; left—yellowfin, right—skipjack.

FIGURA 6. Distribución de las capturas por los barcos de carnada, correspondientes al primer trimestre de 1960; izquierda—atún aleta amarilla, derecha—barrilete.

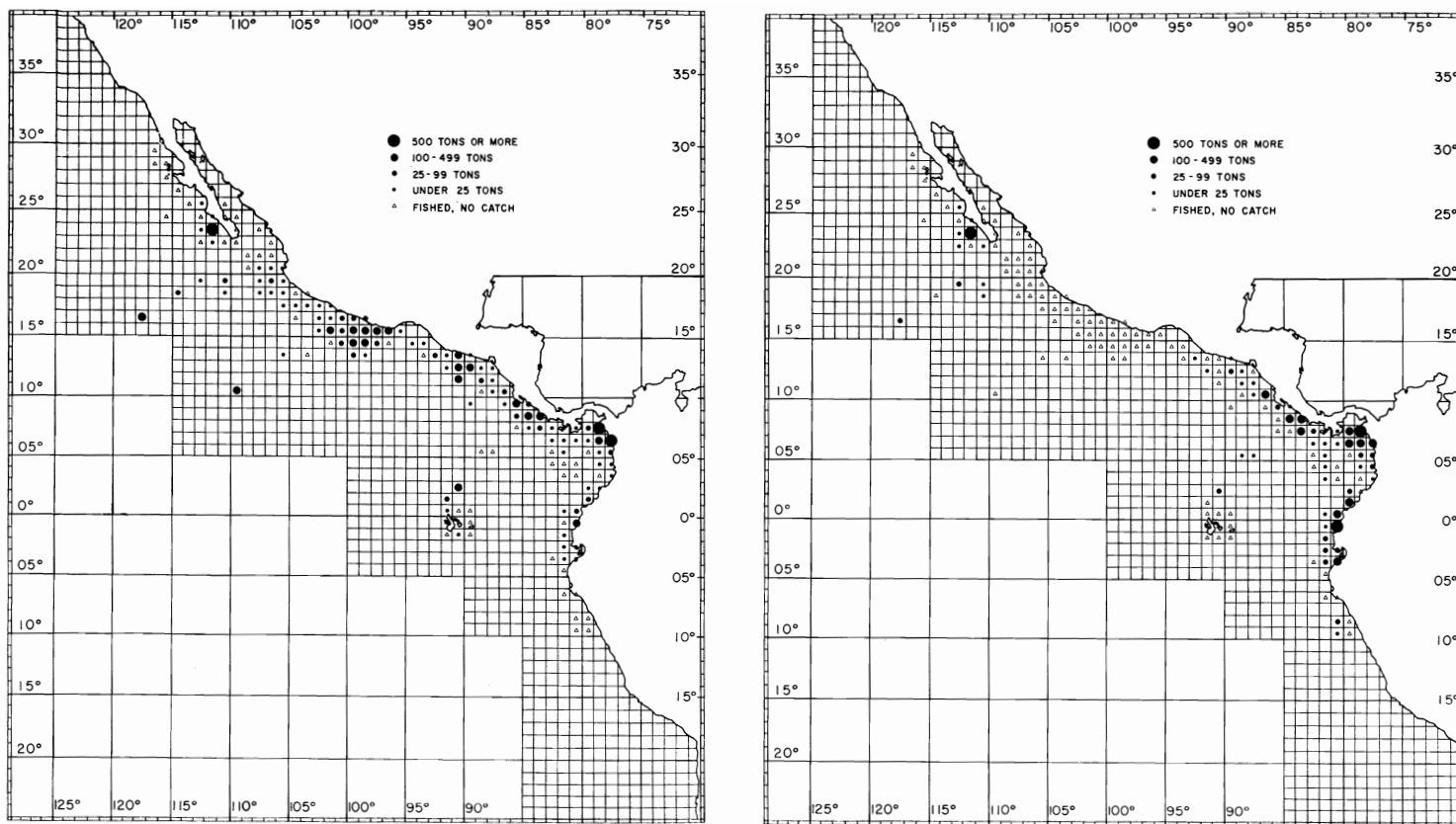


FIGURE 7. Distribution of the catches by baitboats, in the second quarter, 1960; left—yellowfin, right—skipjack.

FIGURA 7. Distribución de las capturas por los barcos de carnada, correspondientes al segundo trimestre de 1960; izquierda—atún aleta amarilla, derecha—barrilete.

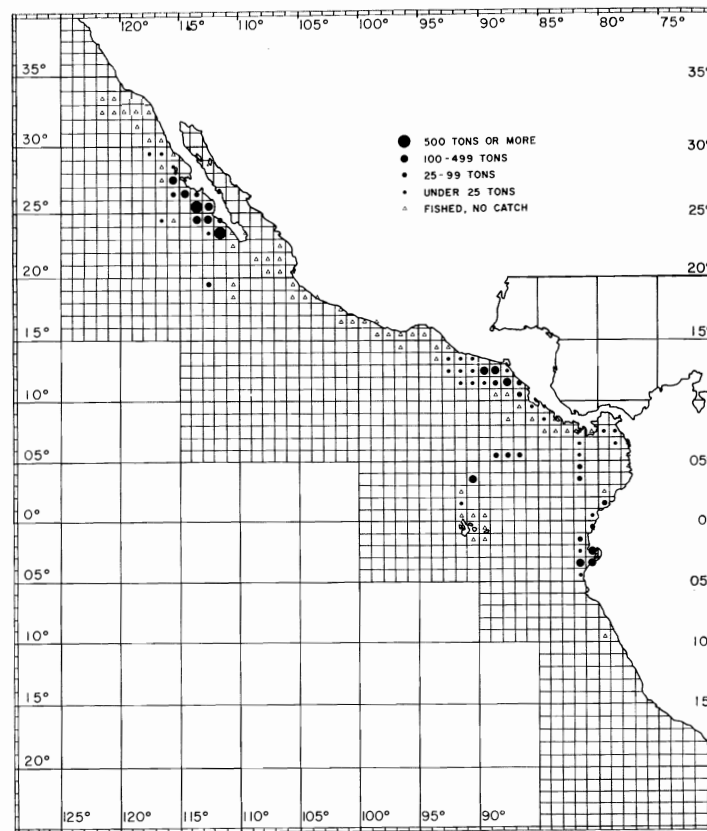
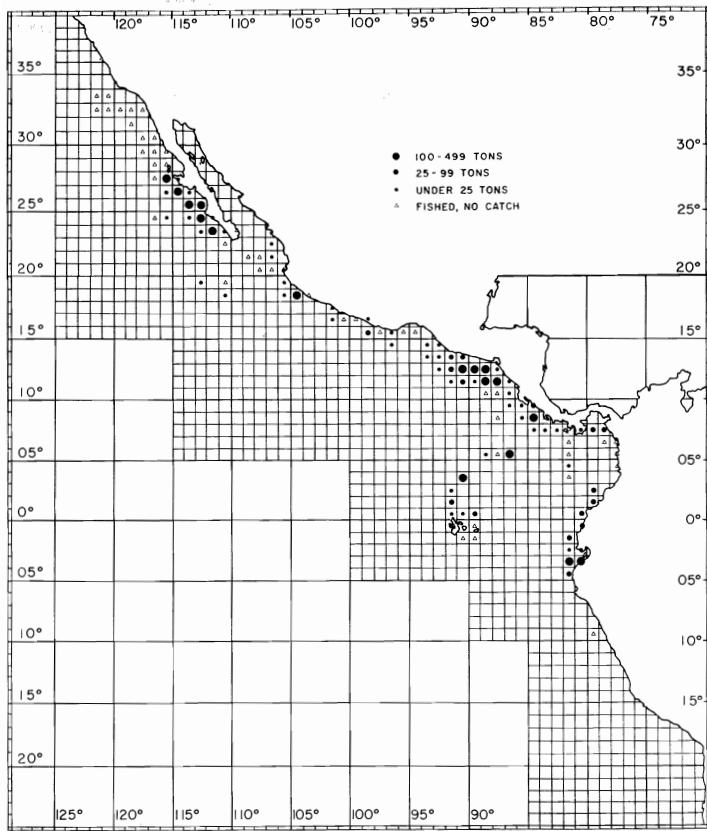


FIGURE 8. Distribution of the catches by baitboats in the third quarter, 1960; left—yellowfin, right—skipjack.

FIGURA 8. Distribución de las capturas por los barcos de carnada, correspondientes al tercer trimestre de 1960; izquierda—atún aleta amarilla, derecha—barrilete.

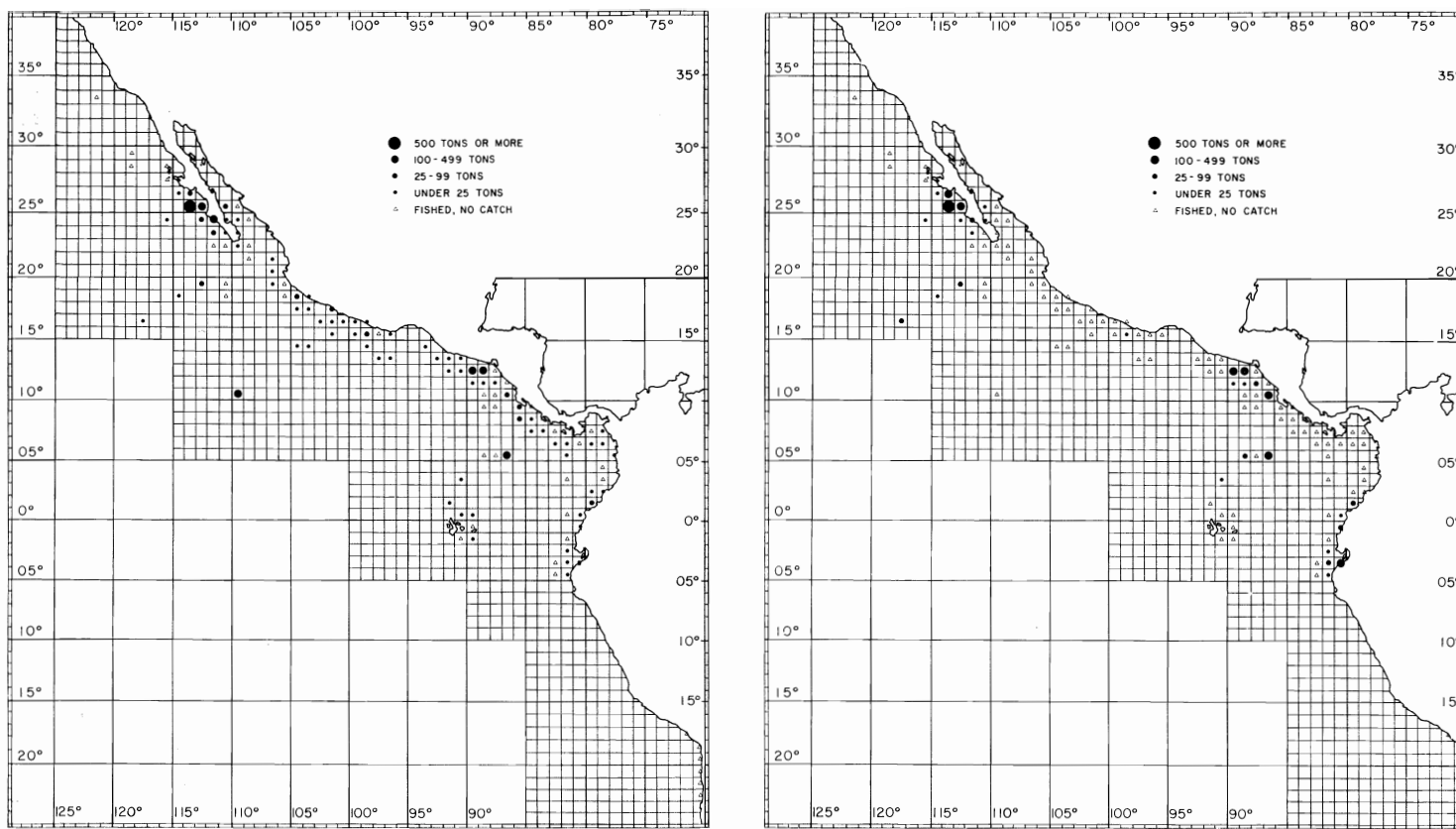


FIGURE 9. Distribution of the catches by baitboats in the fourth quarter, 1960; left—yellowfin, right—skipjack.

FIGURA 9. Distribución de las capturas por los barcos de carnada, correspondientes al cuarto trimestre de 1960; izquierda—atún aleta amarilla, derecha—barrilete.

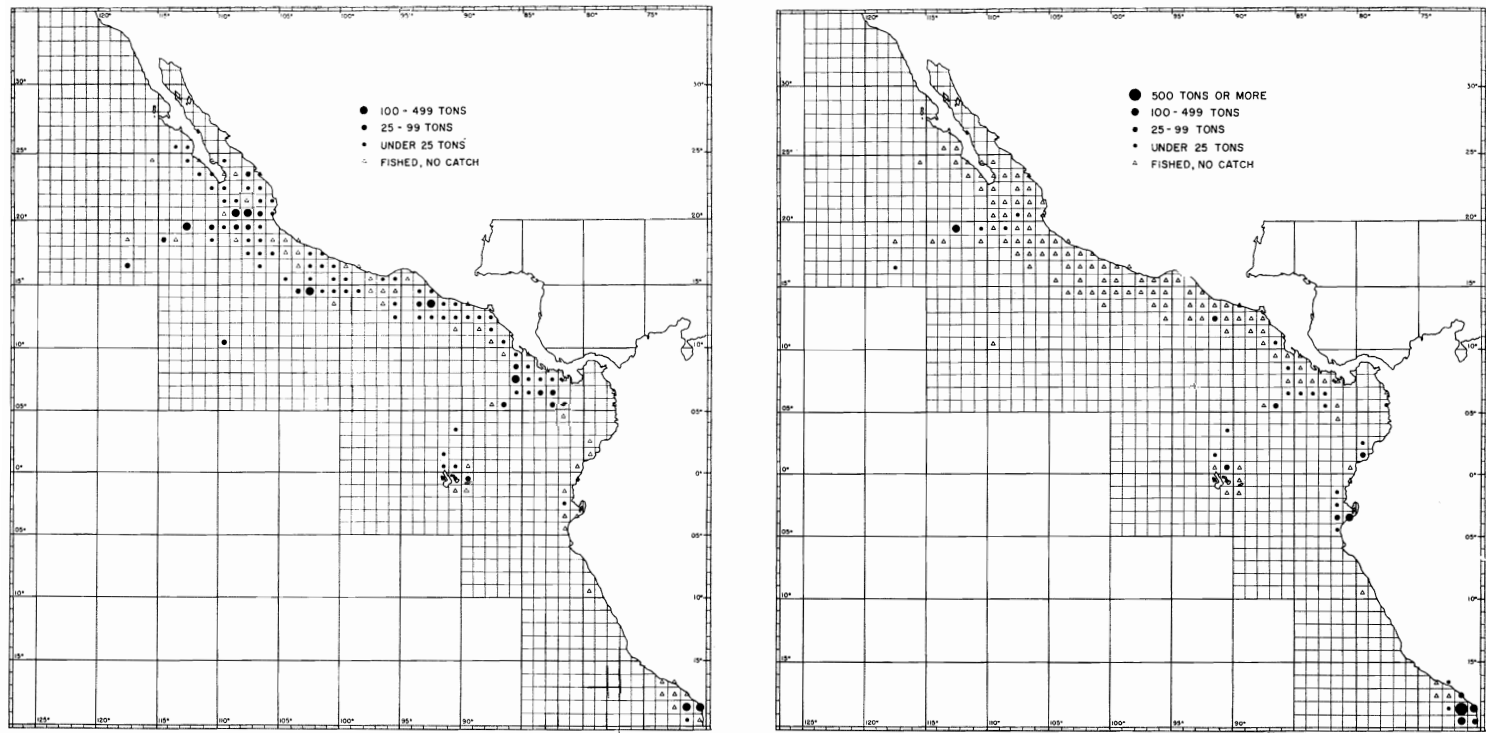


FIGURE 10. Distribution of the catches by baitboats in the first quarter, 1961; left—yellowfin, right—skipjack.

FIGURA 10. Distribución de las capturas por los barcos de carnada, correspondientes al primer trimestre de 1961; izquierda—atún aleta amarilla, derecha—barrilete.

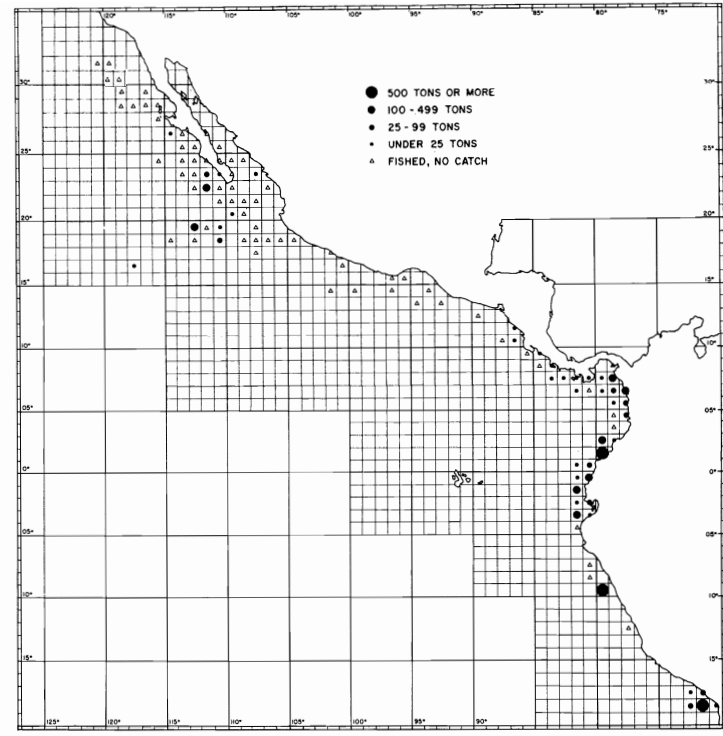
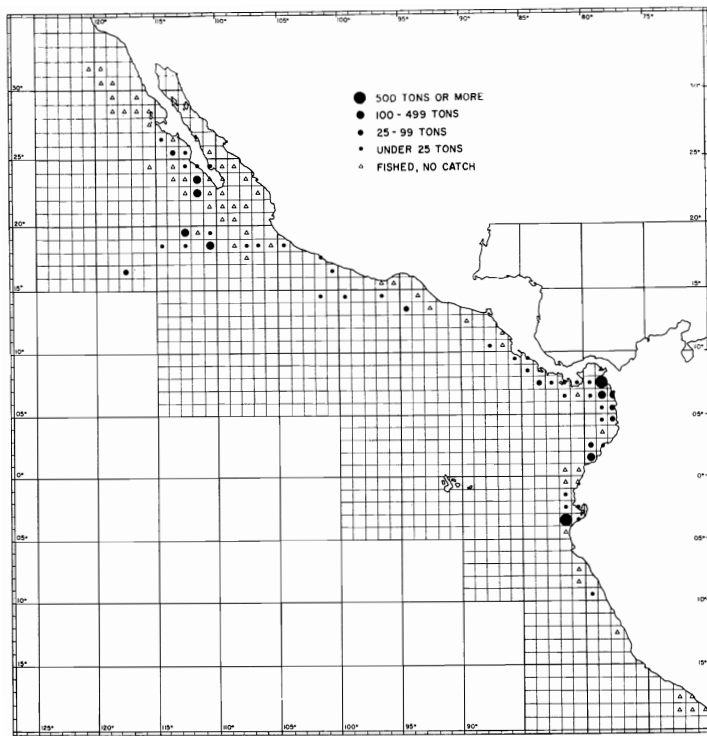


FIGURE 11. Distribution of the catches by baitboats in the second quarter, 1961; left—yellowfin, right—skipjack.

FIGURA 11. Distribución de las capturas por los barcos de carnada, correspondientes al segundo trimestre de 1961; izquierda—atún aleta amarilla, derecha—barrilete.

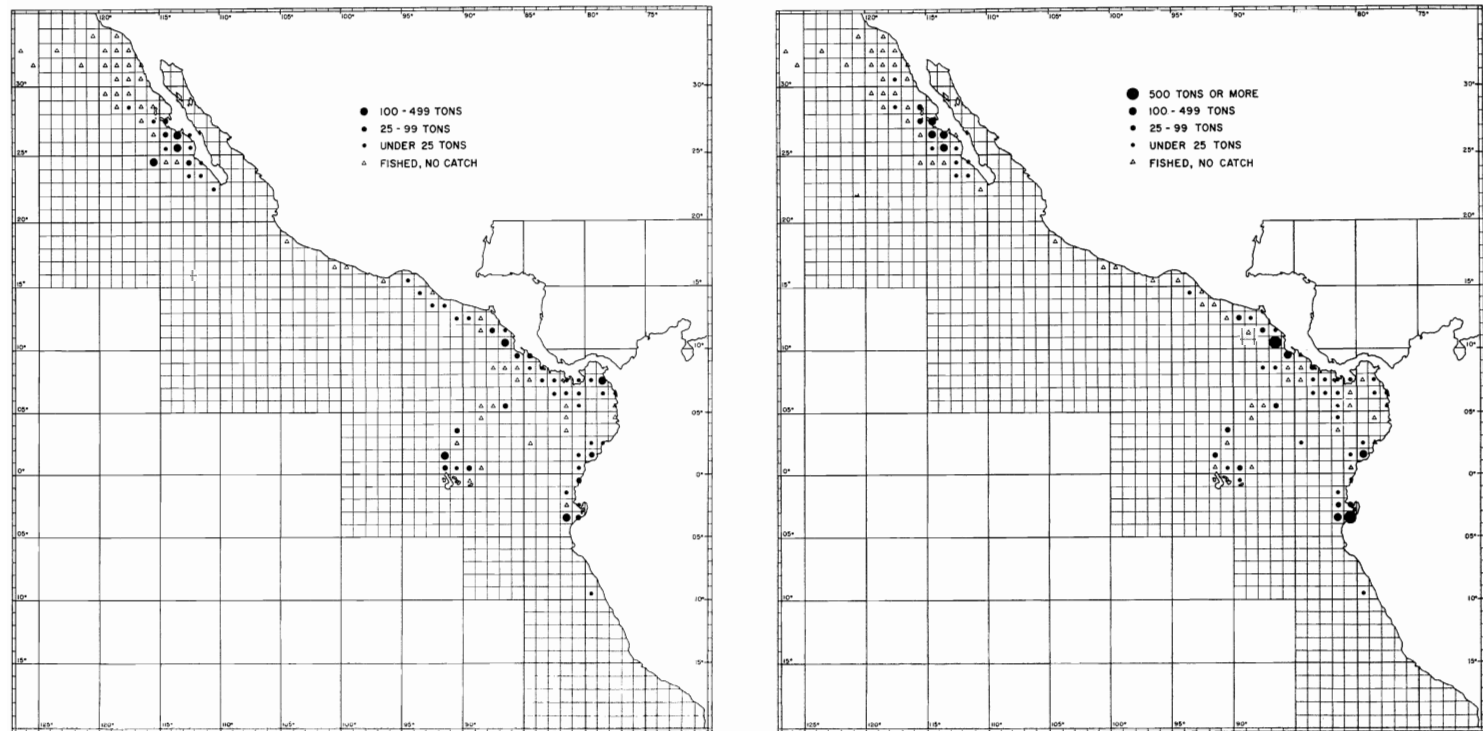


FIGURE 12. Distribution of the catches by baitboats in the third quarter, 1961; left—yellowfin, right—skipjack.

FIGURA 12. Distribución de las capturas por los barcos de carnada, correspondientes al tercer trimestre de 1961; izquierda—atún aleta amarilla, derecha—barrilete.

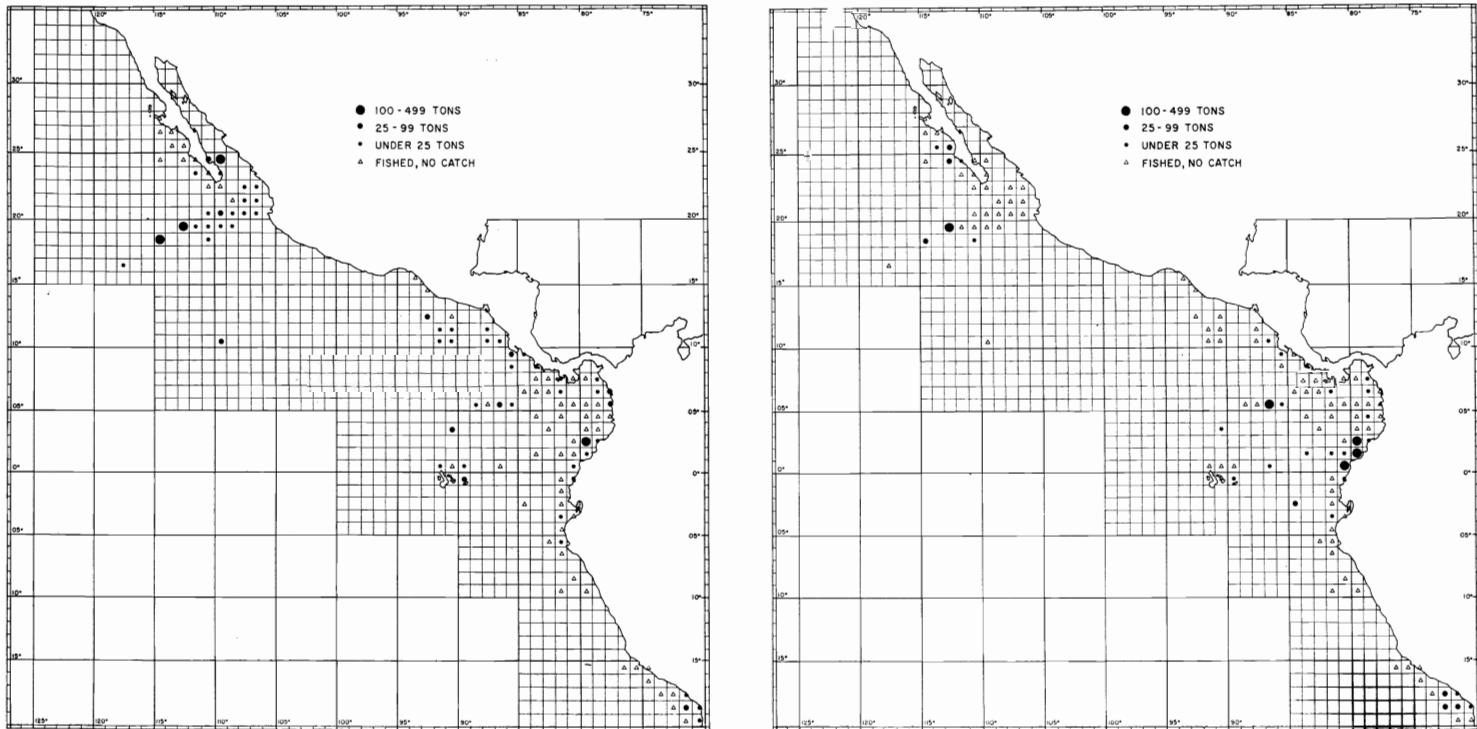


FIGURE 14. Distribution of the catches by baitboats in the first quarter, 1962; left—yellowfin, right—skipjack.

FIGURA 14. Distribución de las capturas por los barcos de carnada, correspondientes al primer trimestre de 1962; izquierda—atún aleta amarilla, derecha—barrilete.

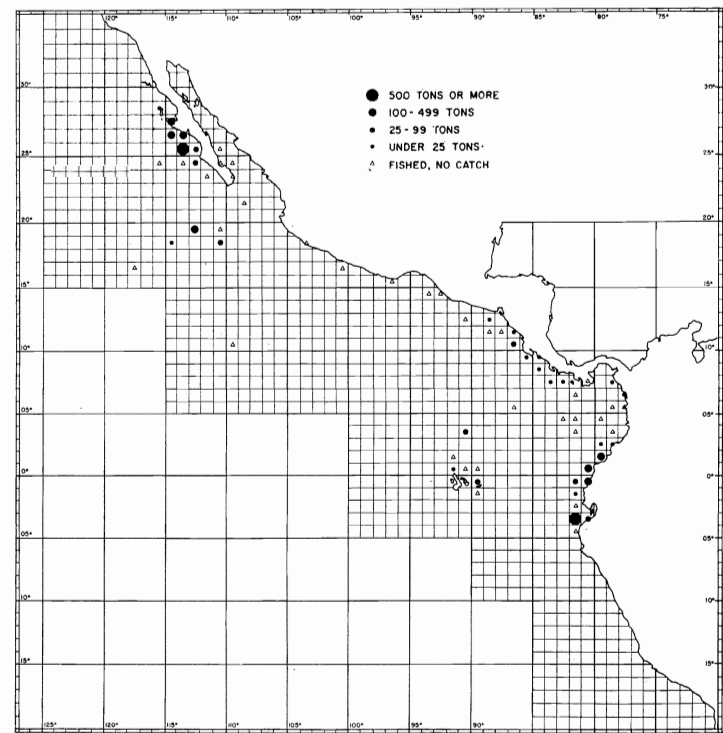
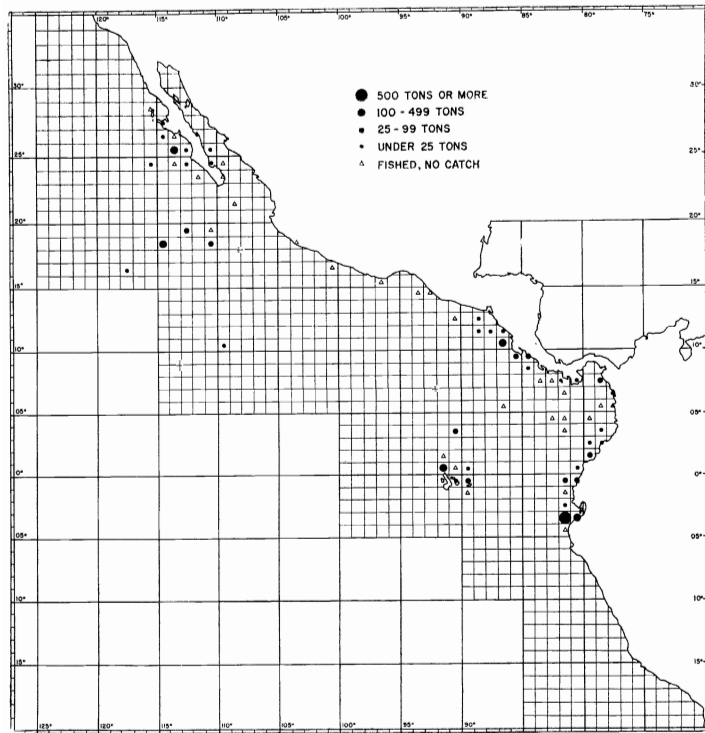


FIGURE 13. Distribution of the catches by baitboats in the fourth quarter, 1961; left—yellowfin, right—skipjack.

FIGURA 13. Distribución de las capturas por los barcos de carnada, correspondientes al cuarto trimestre de 1961; izquierda—atún aleta amarilla, derecha—barrilete.

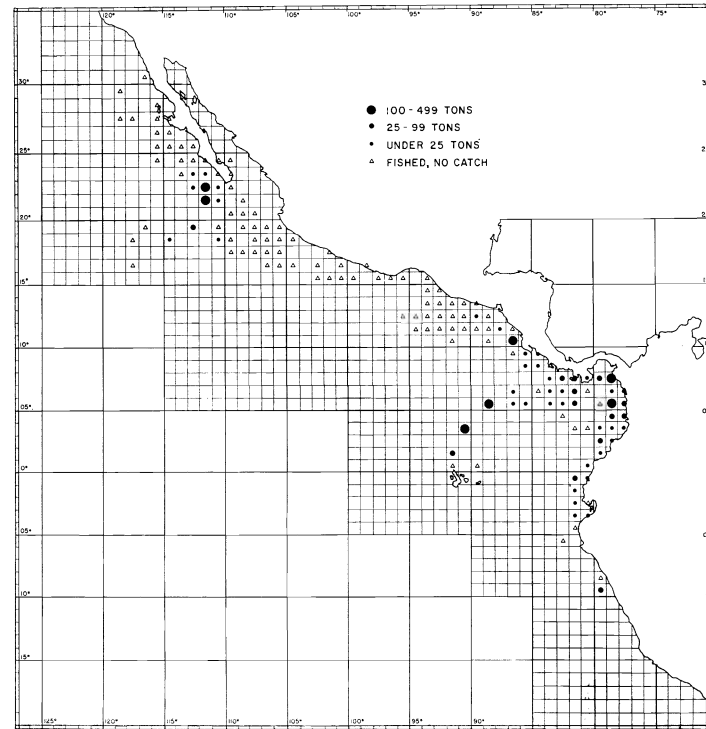
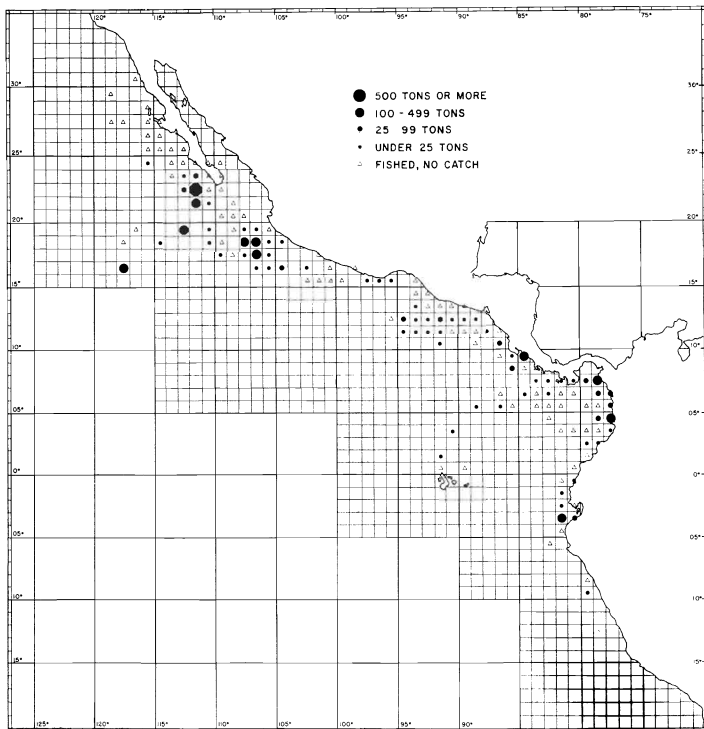


FIGURE 15. Distribution of the catches by baitboats in the second quarter, 1962; left—yellowfin, right—skipjack.

FIGURA 15. Distribución de las capturas por los barcos de carnada, correspondientes al segundo trimestre de 1962; izquierda—atún aleta amarilla, derecha—barrilete.

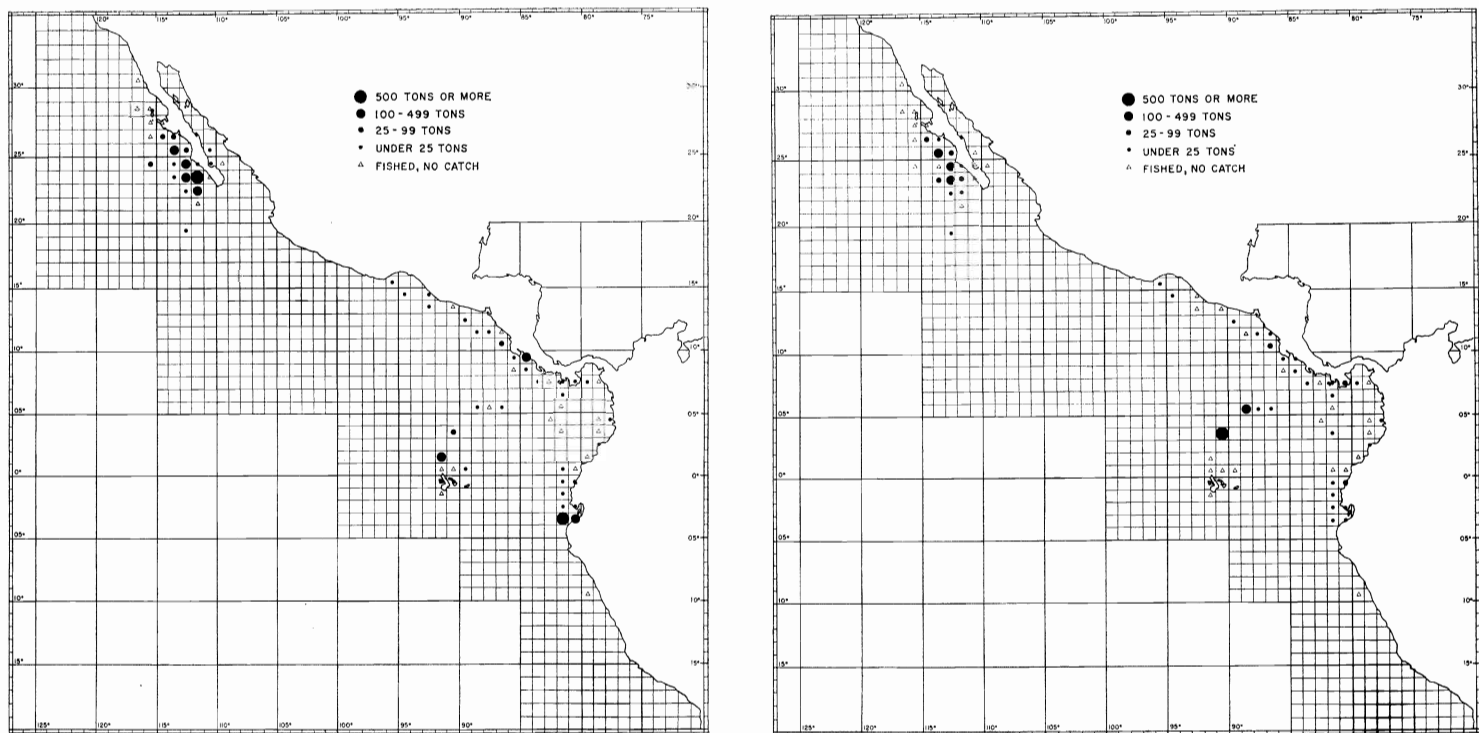


FIGURE 16. Distribution of the catches by baitboats in the third quarter, 1962; left—yellowfin, right—skipjack.

FIGURA 16. Distribución de las capturas por los barcos de carnada, correspondientes al tercer trimestre de 1962; izquierda—atún aleta amarilla, derecha—barrilete.

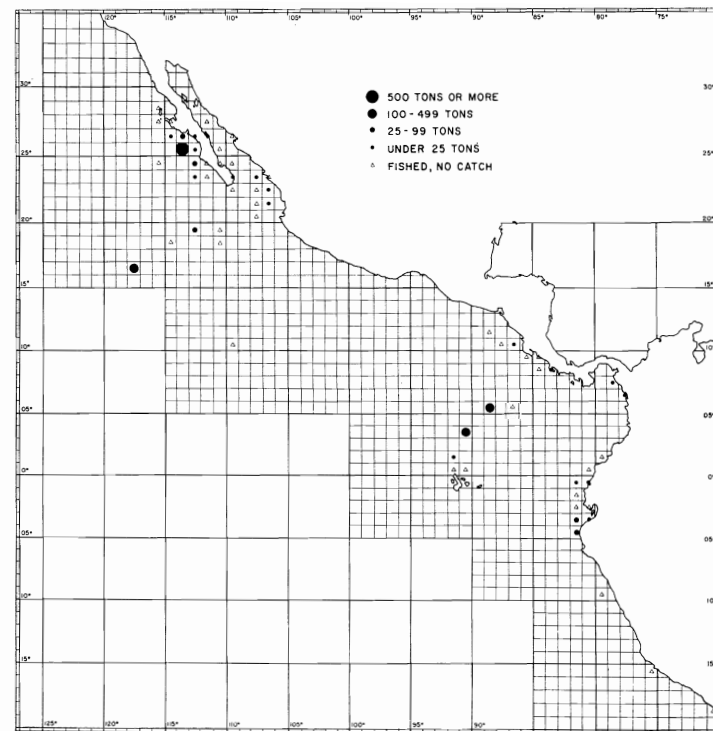
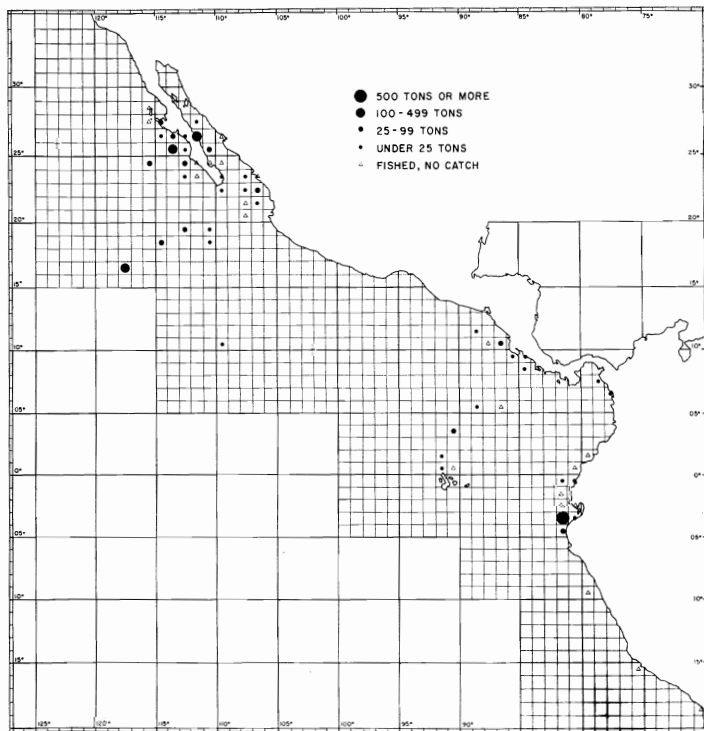


FIGURE 17. Distribution of the catches by baitboats in the fourth quarter, 1962; left—yellowfin, right—skipjack.

FIGURA 17. Distribución de las capturas por los barcos de carnada, correspondientes al cuarto trimestre de 1962; izquierda—atún aleta amarilla, derecha—barrilete.

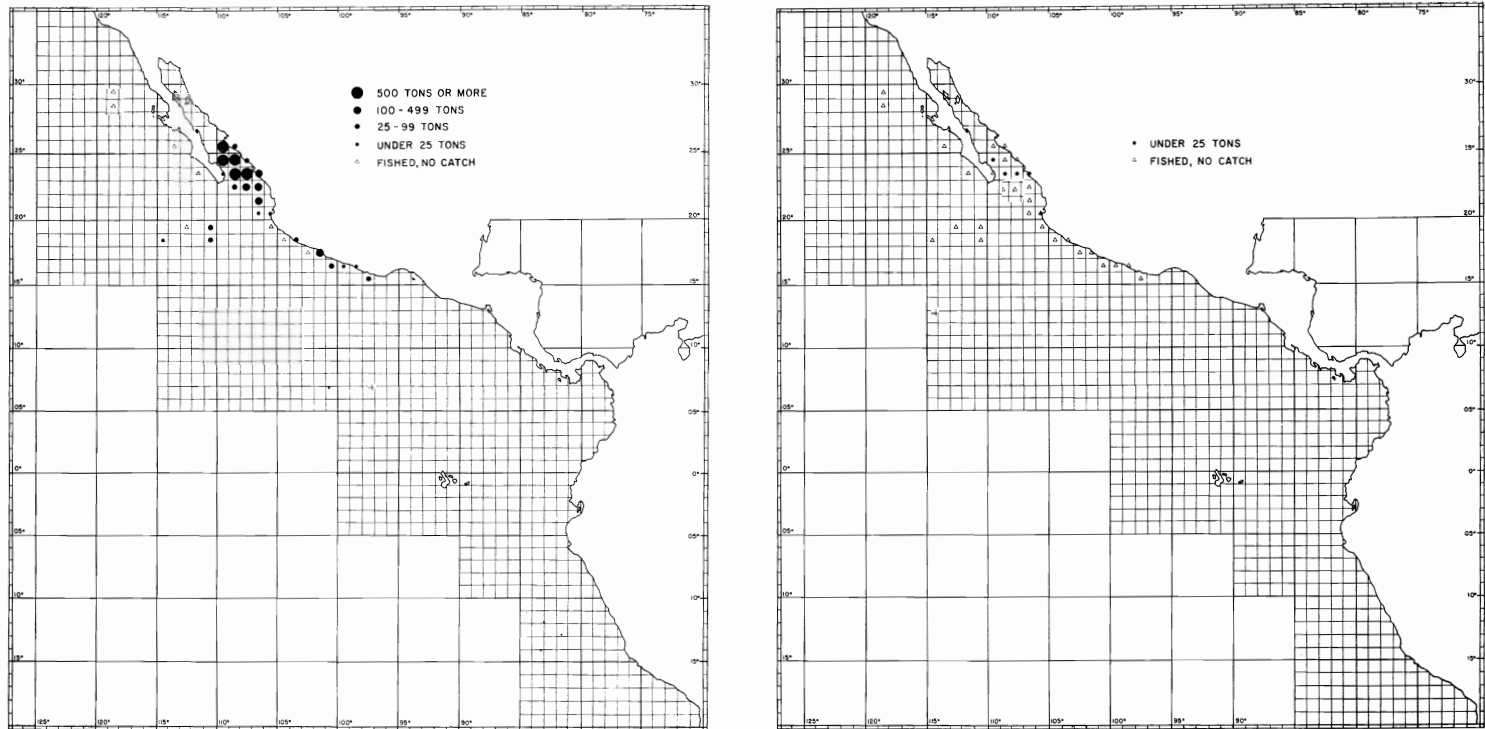
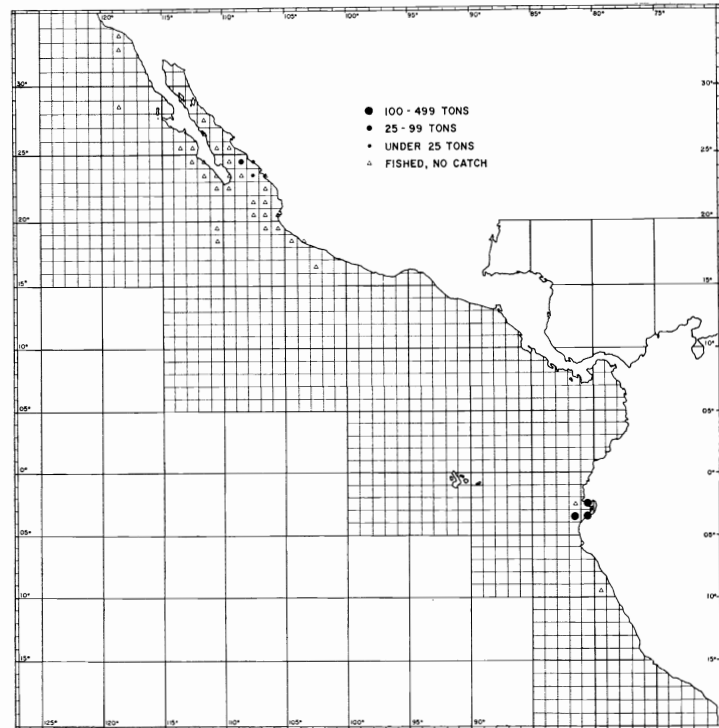
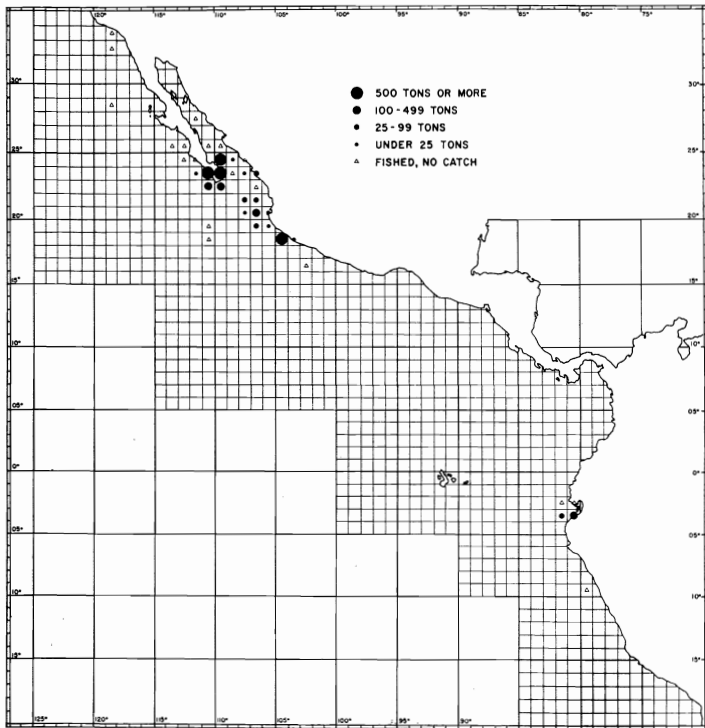


FIGURE 18. Distribution of the catches by purse-seiners in the first quarter, 1959; left—yellowfin, right—skipjack.

FIGURA 18. Distribución de las capturas por los barcos rederos, correspondientes al primer trimestre de 1959; izquierda—atún aleta amarilla, derecha—barrilete.



DISTRIBUTION OF FISHING EFFORT AND CATCH

FIGURE 19. Distribution of the catches by purse-seiners in the second quarter, 1959; left—yellowfin, right—skipjack.

FIGURA 19. Distribución de las capturas por los barcos rederos, correspondientes al segundo trimestre de 1959; izquierda—atún aleta amarilla, derecha—barrilete.

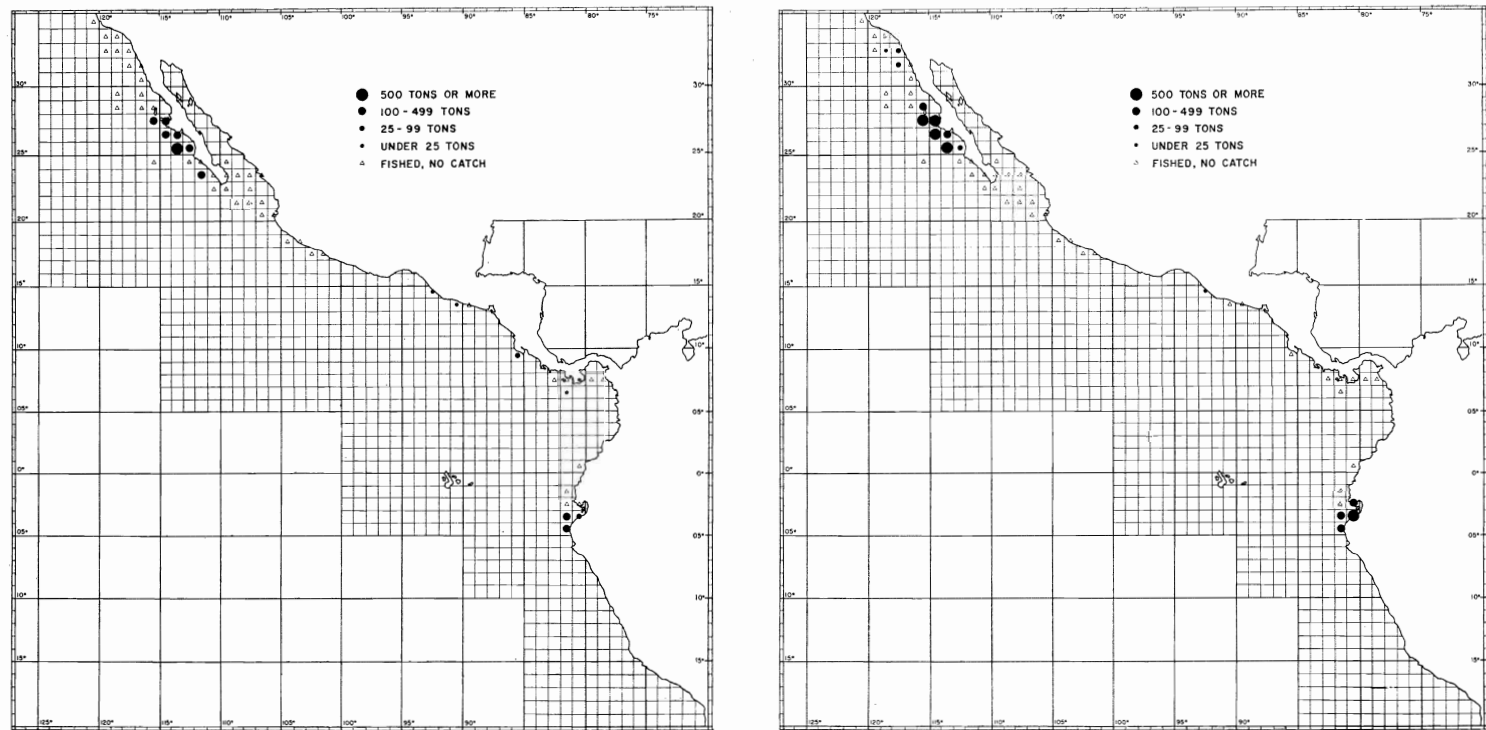


FIGURE 20. Distribution of the catches by purse-seiners in the third quarter, 1959; left—yellowfin, right—skipjack.

FIGURA 20. Distribución de las capturas por los barcos rederos, correspondientes al tercer trimestre de 1959; izquierda—atún aleta amarilla, derecha—barrilete.

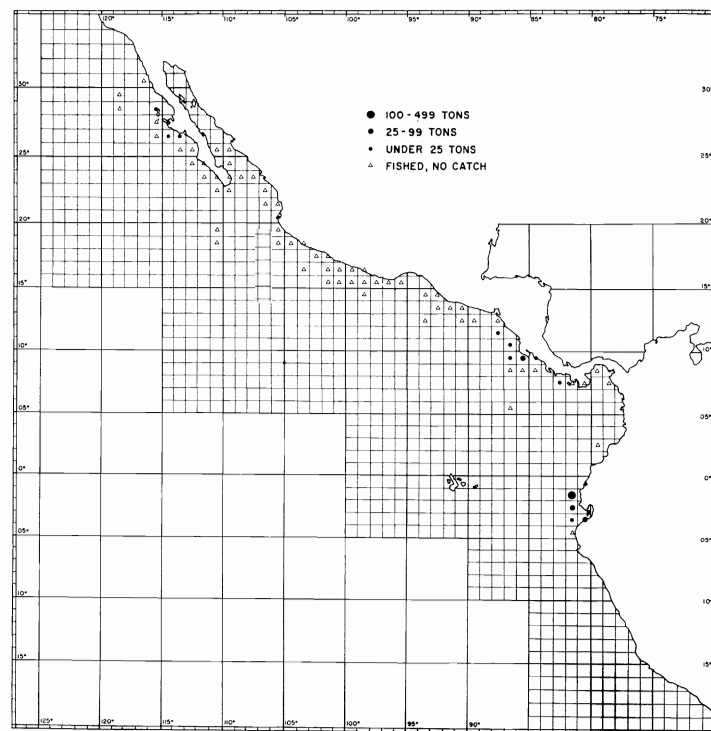
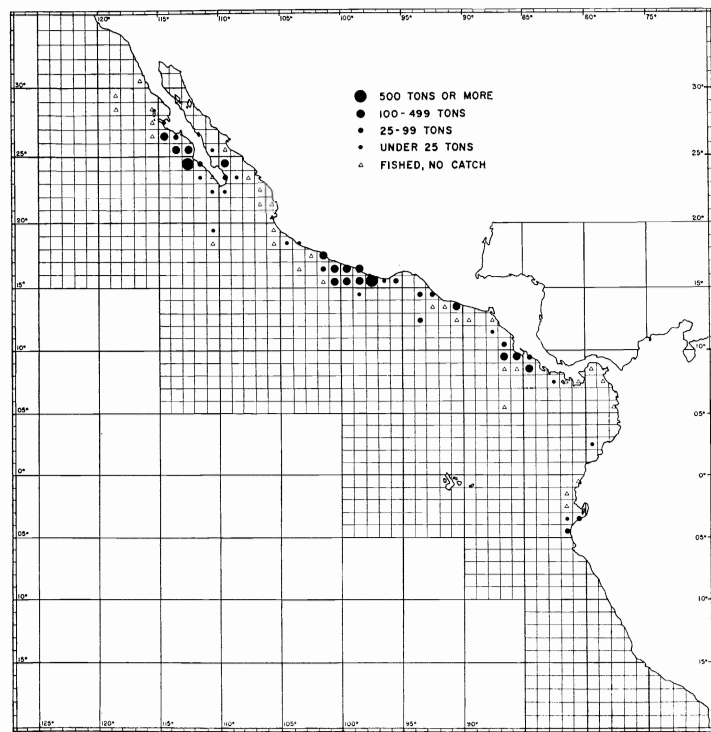


FIGURE 21. Distribution of the catches by purse-seiners in the fourth quarter, 1959; left—yellowfin, right—skipjack.

FIGURA 21. Distribución de las capturas por los barcos rederos, correspondientes al cuarto trimestre de 1959; izquierda—atún aleta amarilla, derecha—barrilete.

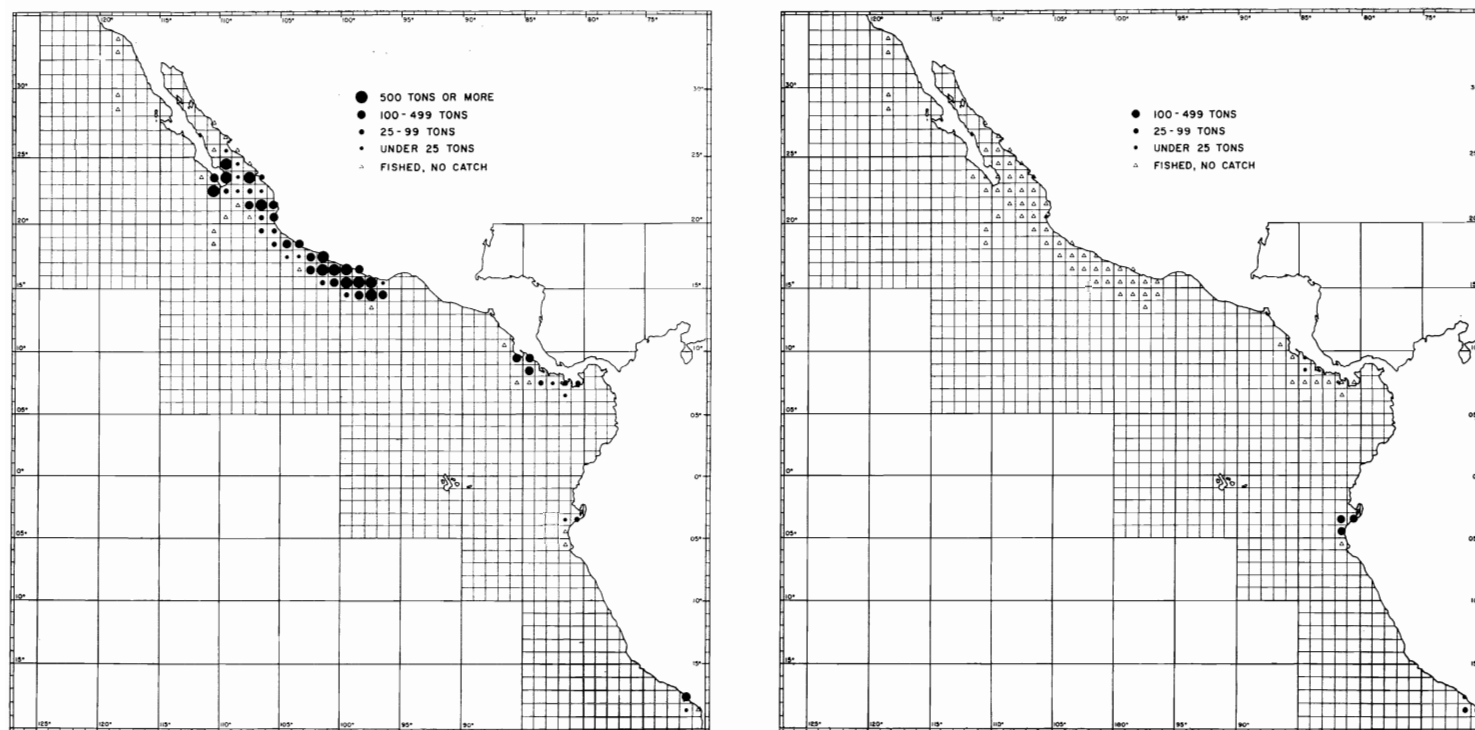


FIGURE 22. Distribution of the catches by purse-seiners in the first quarter, 1960; left—yellowfin, right—skipjack.

FIGURA 22. Distribucion de las capturas por los barcos rederos, correspondientes al primer trimestre de 1960; izquierda—atún aleta amarilla, derecha—barrilete.

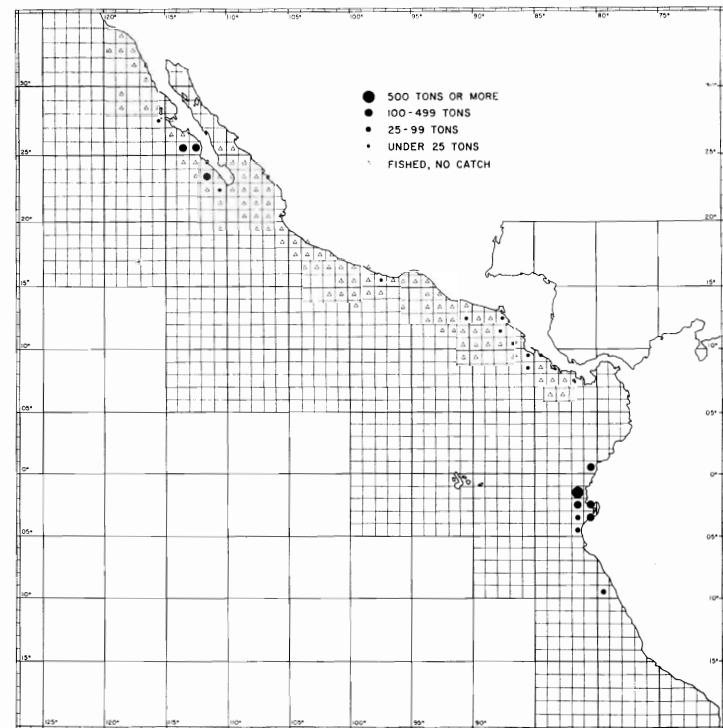
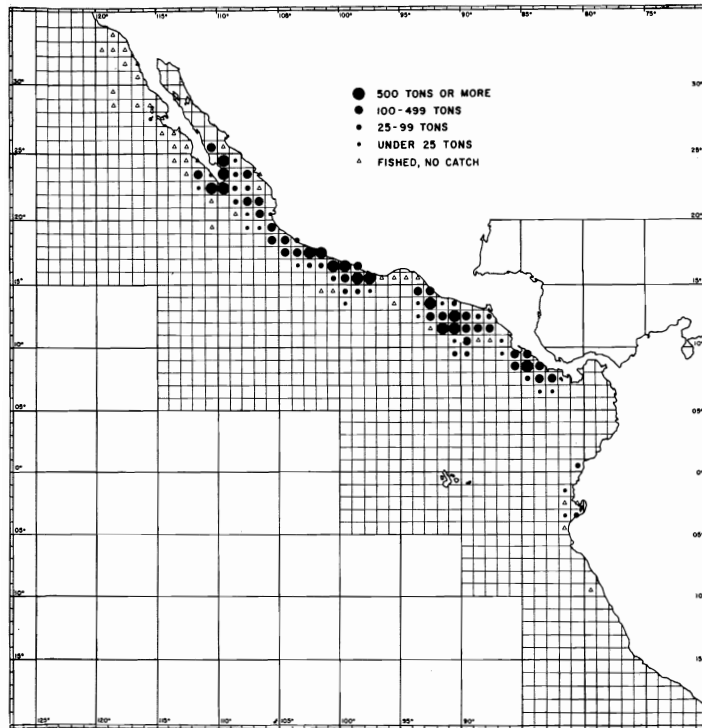


FIGURE 23. Distribution of the catches by purse-seiners in the second quarter, 1960; left—yellowfin, right—skipjack.

FIGURA 23. Distribución de las capturas por los barcos rederos, correspondientes al segundo trimestre de 1960; izquierda—atún aleta amarilla, derecha—barrilete.

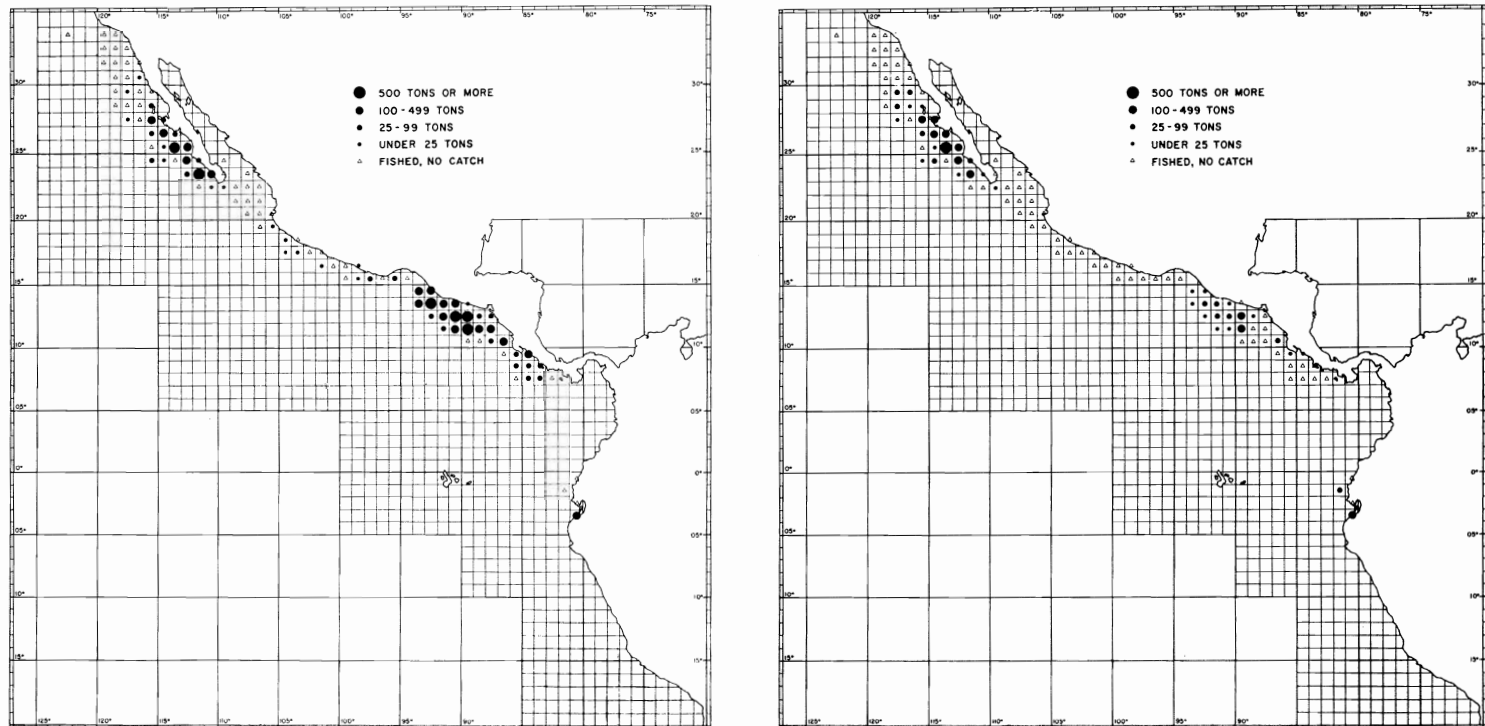


FIGURE 24. Distribution of the catches by purse-seiners in the third quarter, 1960; left—yellowfin, right—skipjack.

FIGURA 24. Distribución de las capturas por los barcos rederos, correspondientes al tercer trimestre de 1960; izquierda—atún aleta amarilla, derecha—barrilete.

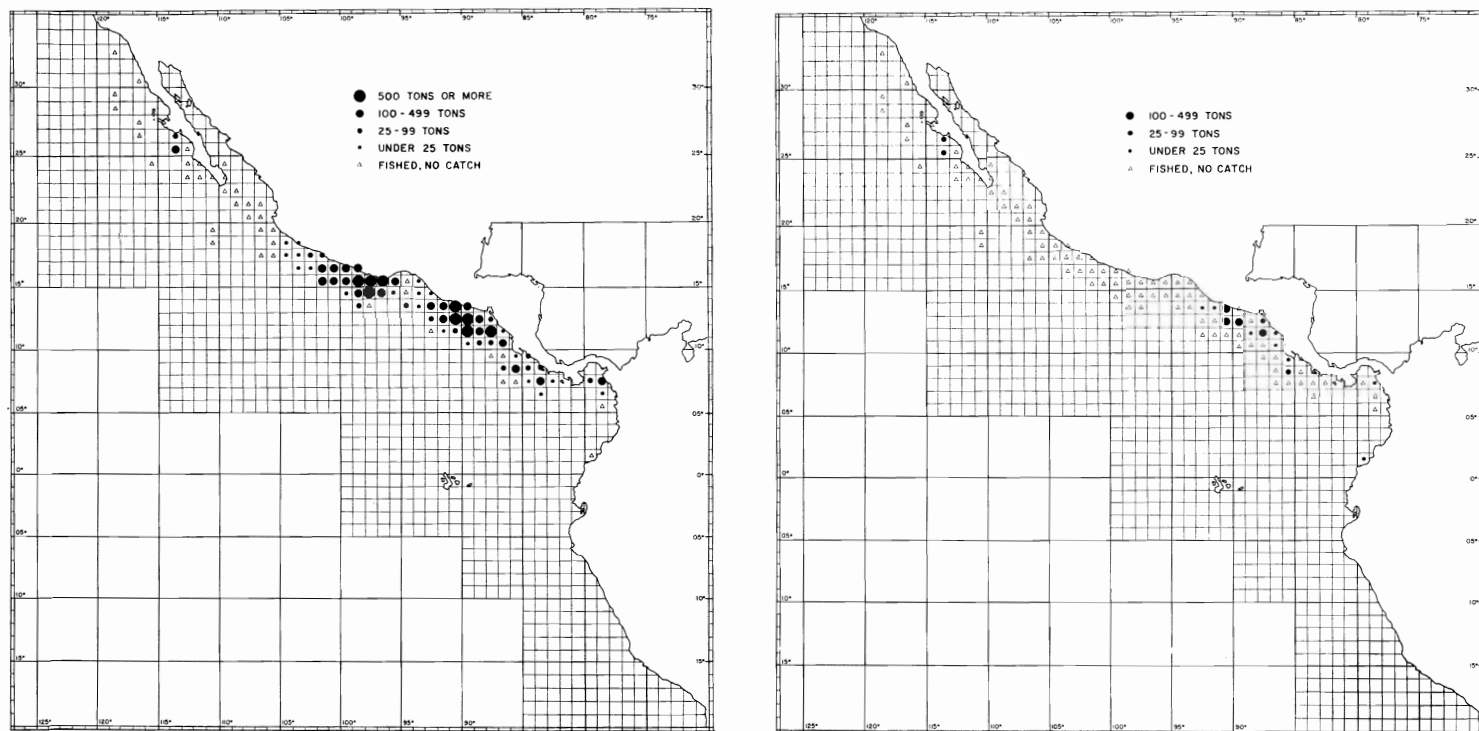


FIGURE 25. Distribution of the catches by purse-seiners in the fourth quarter, 1960; left—yellowfin, right—skipjack.

FIGURA 25. Distribución de las capturas por los barcos rederos, correspondientes al cuarto trimestre de 1960; izquierda—atún aleta amarilla, derecha—barrilete.

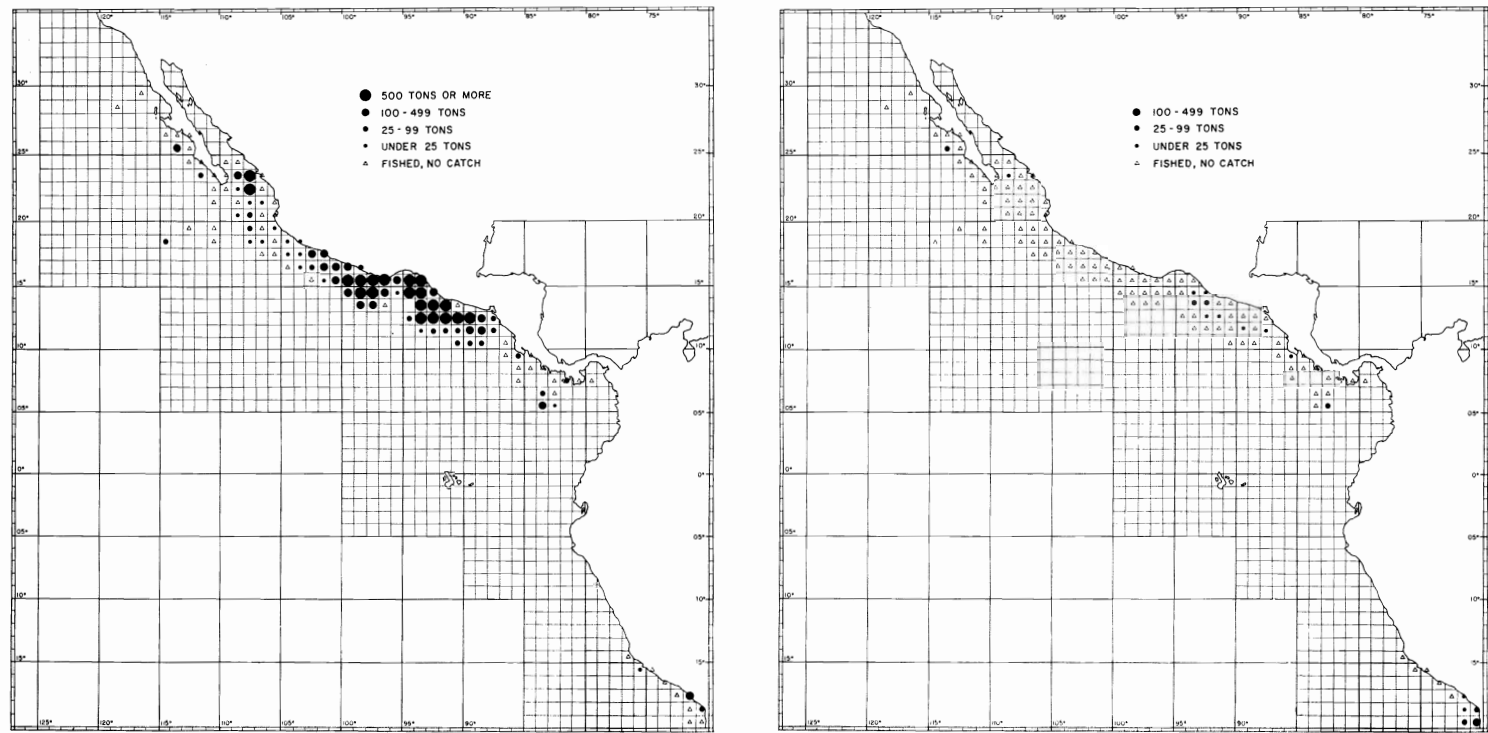


FIGURE 26. Distribution of the catches by purse-seiners in the first quarter, 1961; left—yellowfin, right—skipjack.

FIGURA 26. Distribución de las capturas por los barcos rederos, correspondientes al primer trimestre de 1961; izquierda—atún aleta amarilla, derecha—barrilete.

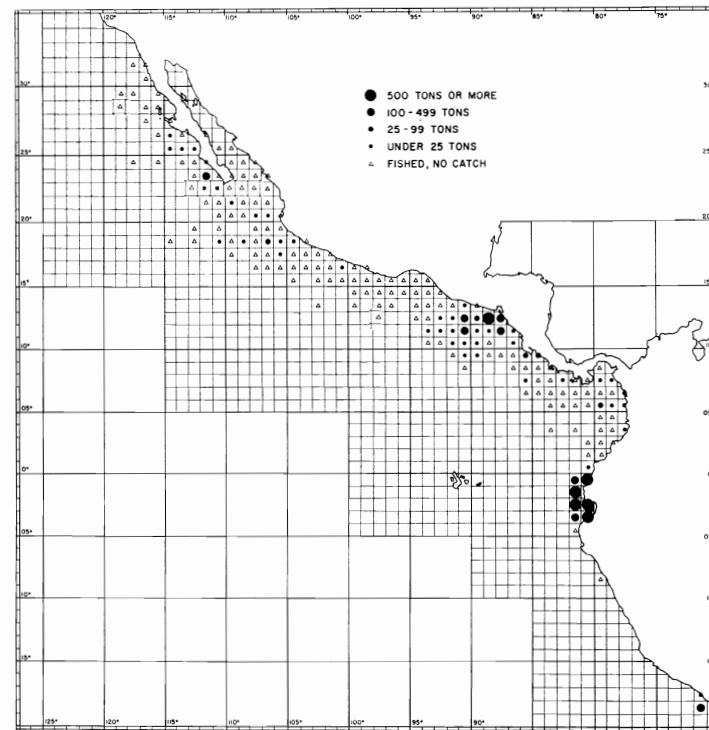
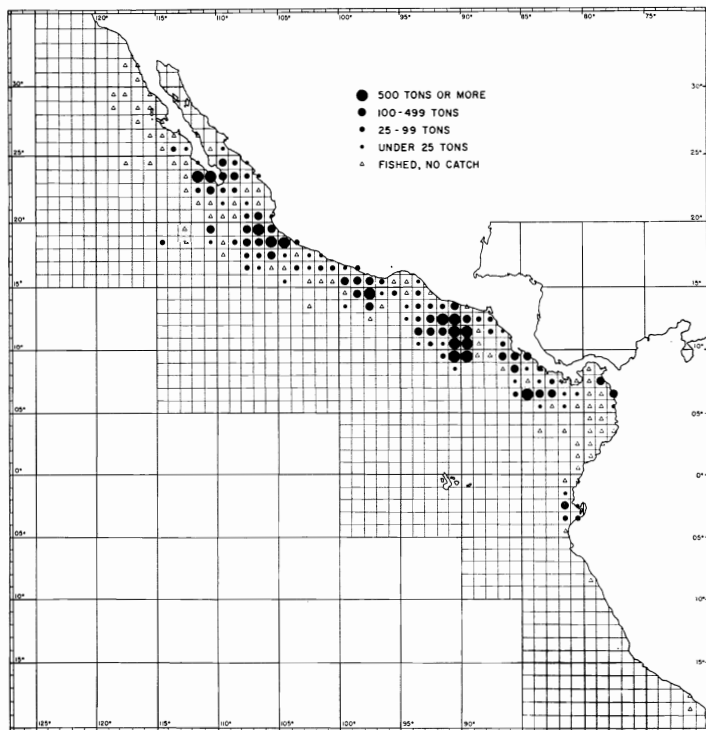


FIGURE 27. Distribution of the catches by purse-seiners in the second quarter, 1961; left—yellowfin, right—skipjack.

FIGURA 27. Distribución de las capturas por los barcos rederos, correspondientes al segundo trimestre de 1961; izquierda—atún aleta amarilla, derecha—barrilete.

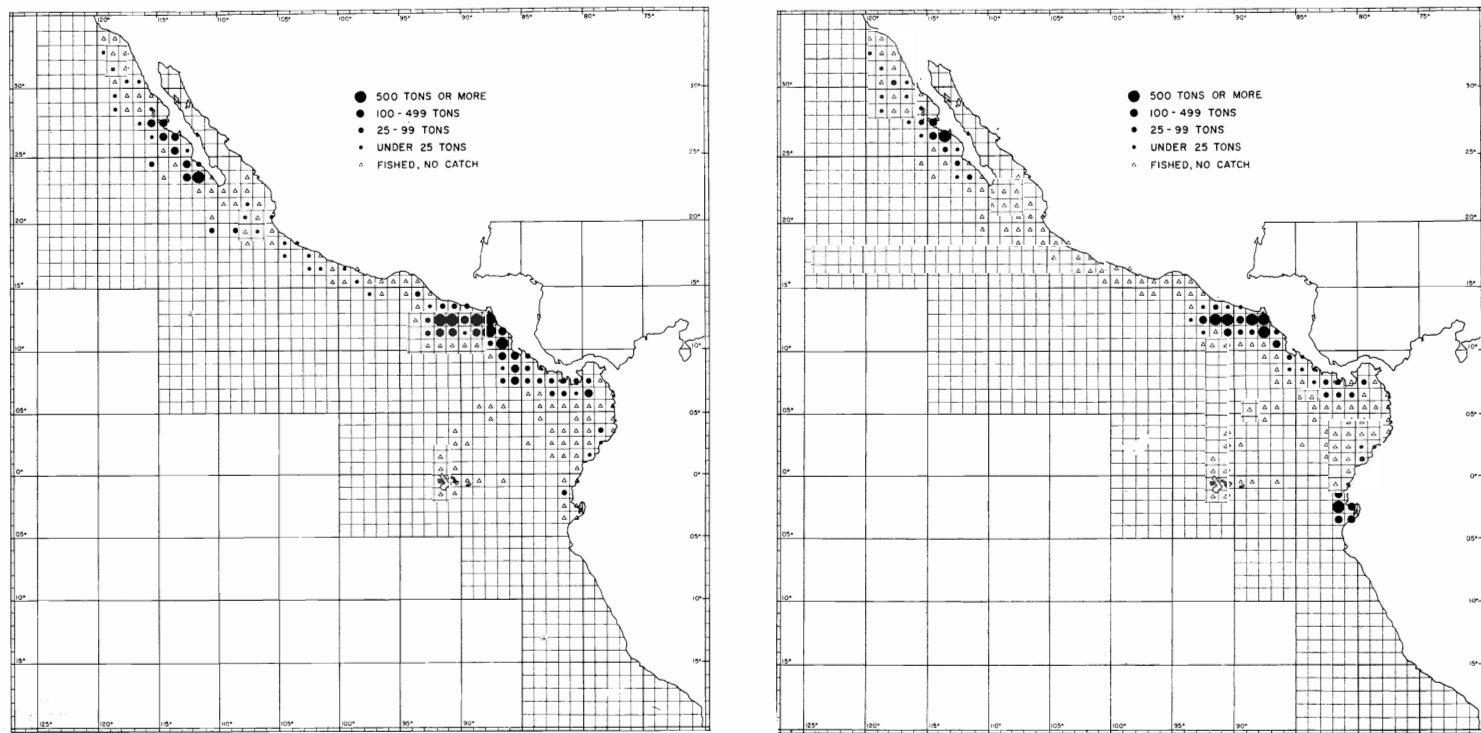


FIGURE 28. Distribution of the catches by purse-seiners in the third quarter, 1961; left—yellowfin, right—skipjack.

FIGURA 28. Distribución de las capturas por los barcos rederos, correspondientes al tercer trimestre de 1961 ;izquierda—atún aleta amarilla, derecha—barrilete.

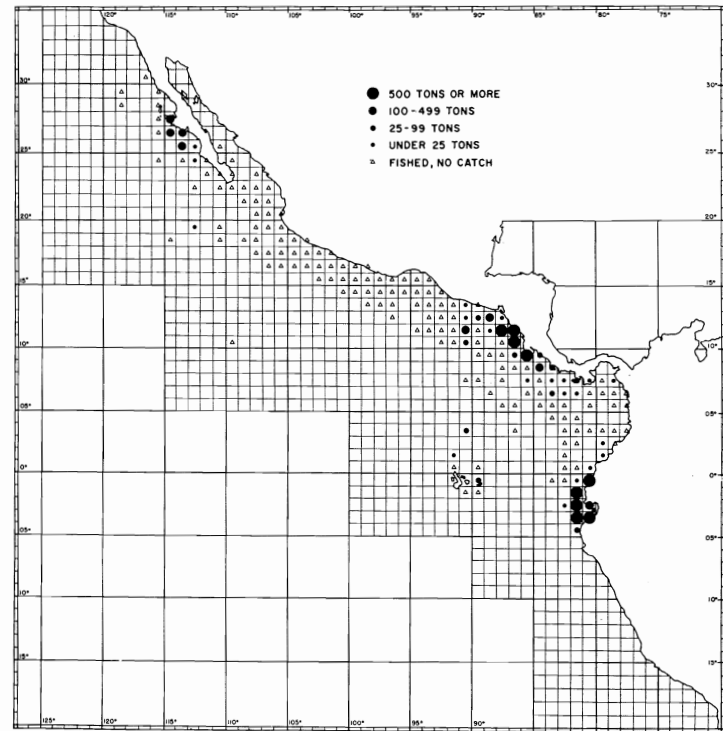
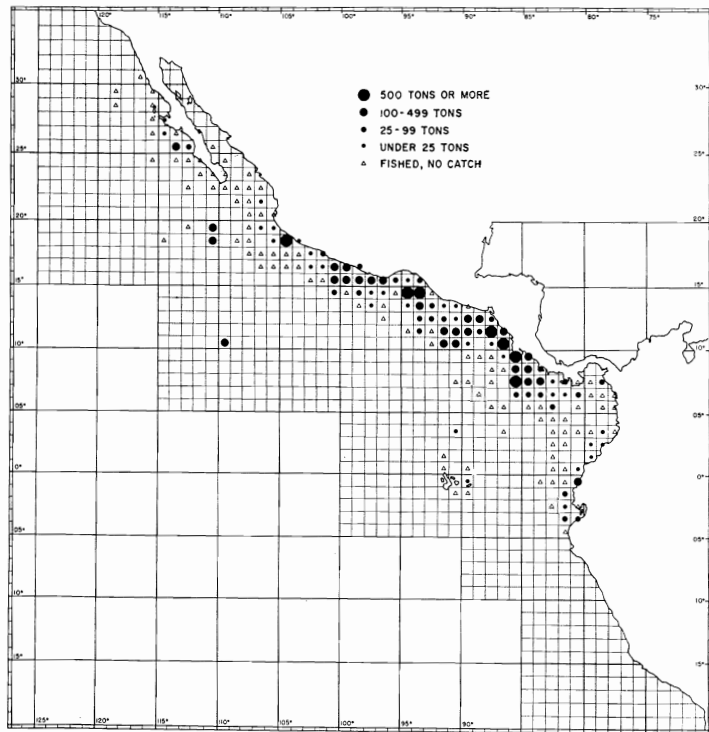


FIGURE 29. Distribution of the catches by purse-seiners in the fourth quarter, 1961; left—yellowfin, right—skipjack.

FIGURA 29. Distribución de las capturas por los barcos rederos, correspondientes al cuarto trimestre de 1961; izquierda—atún aleta amarilla, derecha—barrilete.

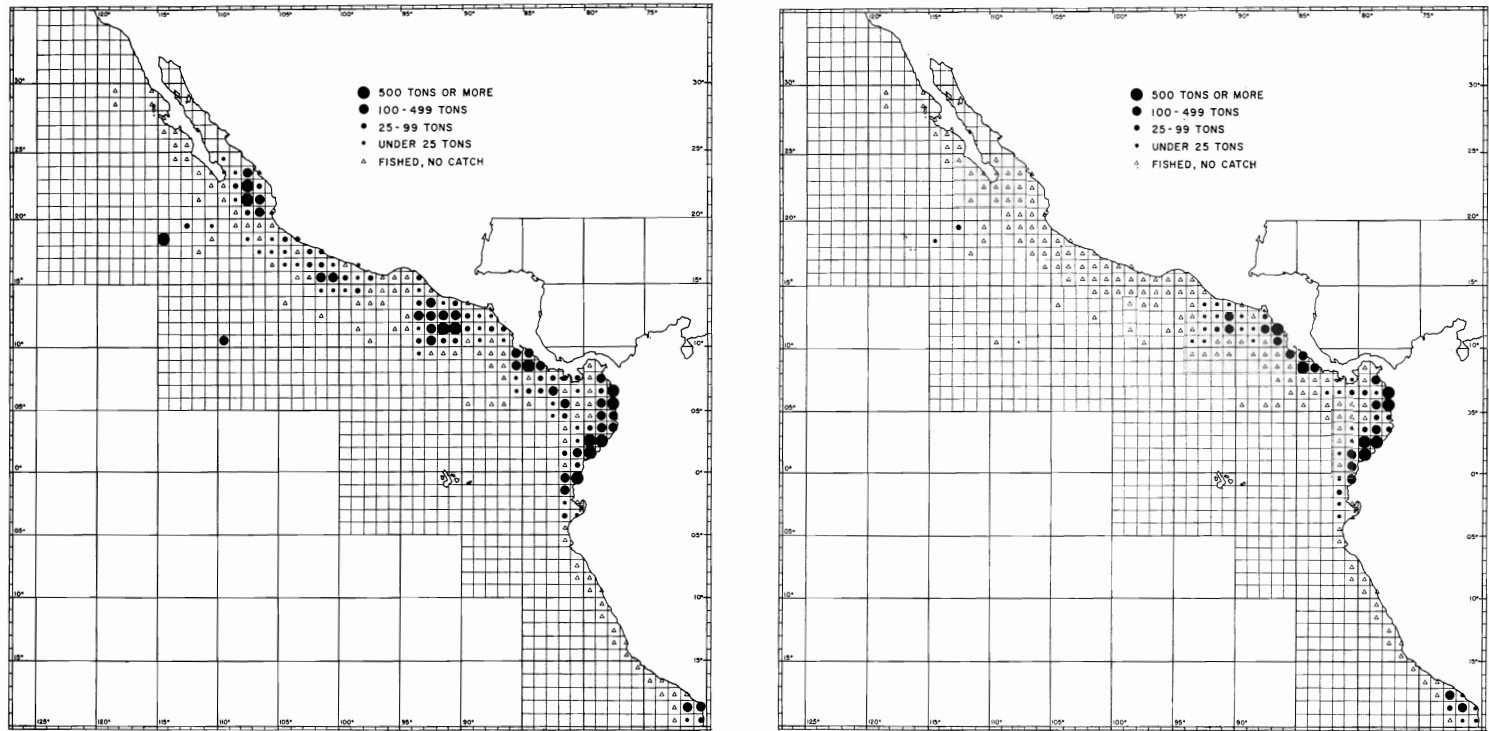


FIGURE 30. Distribution of the catches by purse-seiners in the first quarter, 1962; left—yellowfin, right—skipjack.

FIGURA 30. Distribución de las capturas por los barcos rederos, correspondientes al primer trimestre de 1962; izquierda—atún aleta amarilla, derecha—barrilete.

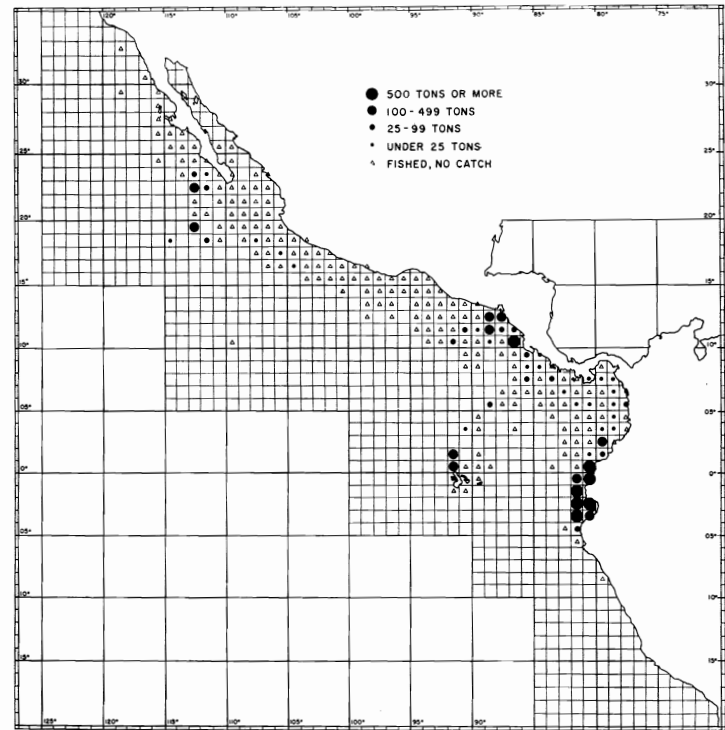
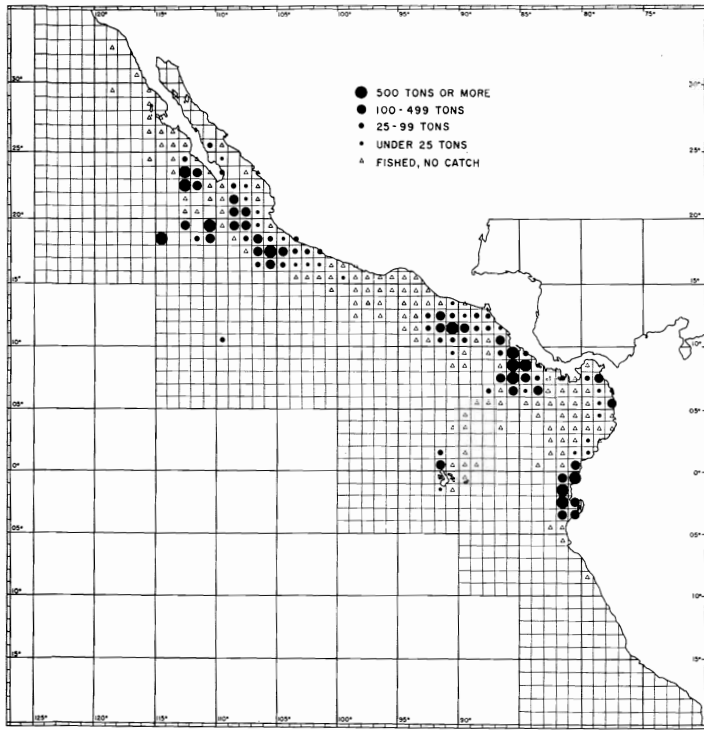


FIGURE 31. Distribution of the catches by purse-seiners in the second quarter, 1962; left—yellowfin, right—skipjack.

FIGURA 31. Distribución de las capturas por los barcos rederos, correspondientes al segundo trimestre de 1962; izquierda—atún aleta amarilla, derecha—barrilete.

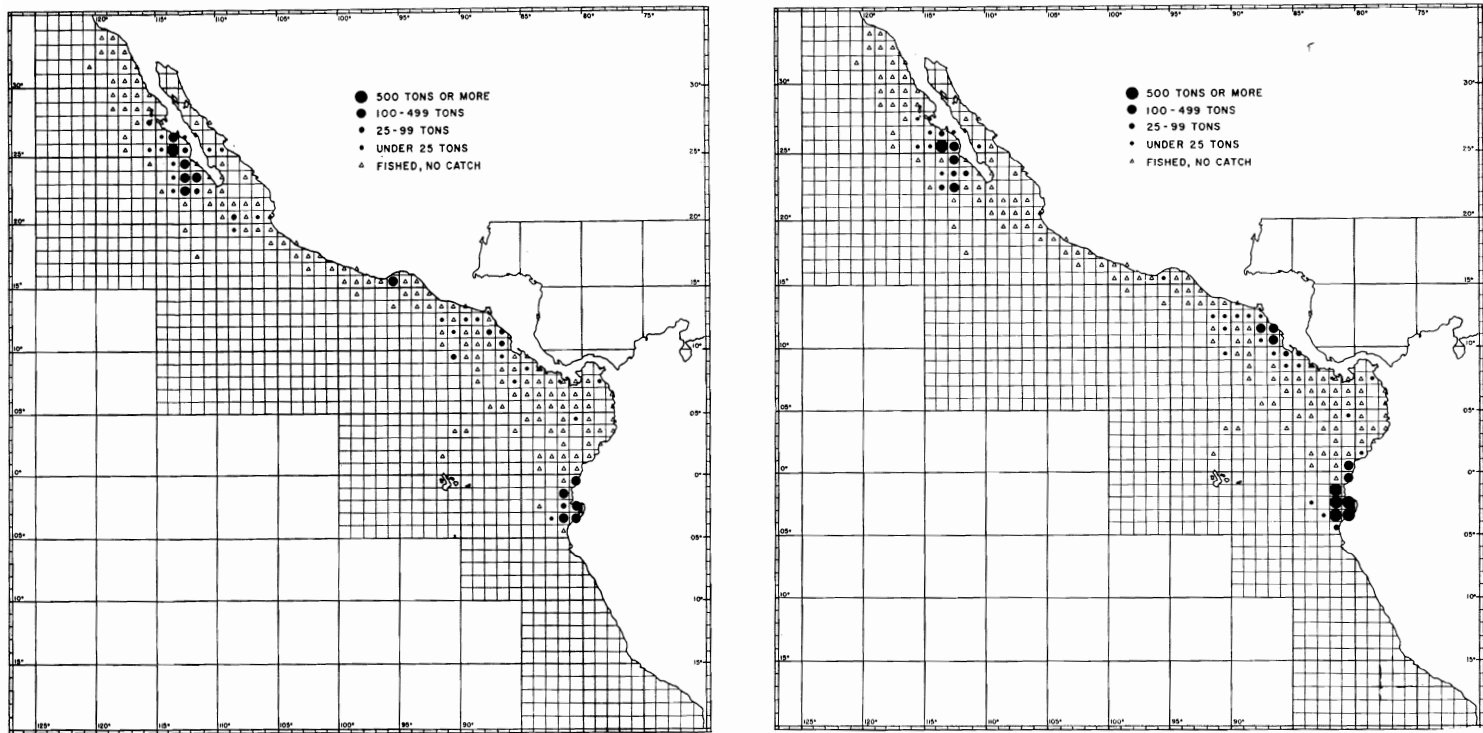


FIGURE 32. Distribution of the catches by purse-seiners in the third quarter, 1962; left—yellowfin, right—skipjack.

FIGURA 32. Distribución de las capturas por los barcos rederos, correspondientes al tercer trimestre de 1962; izquierda—atún aleta amarilla, derecha—barrilete.

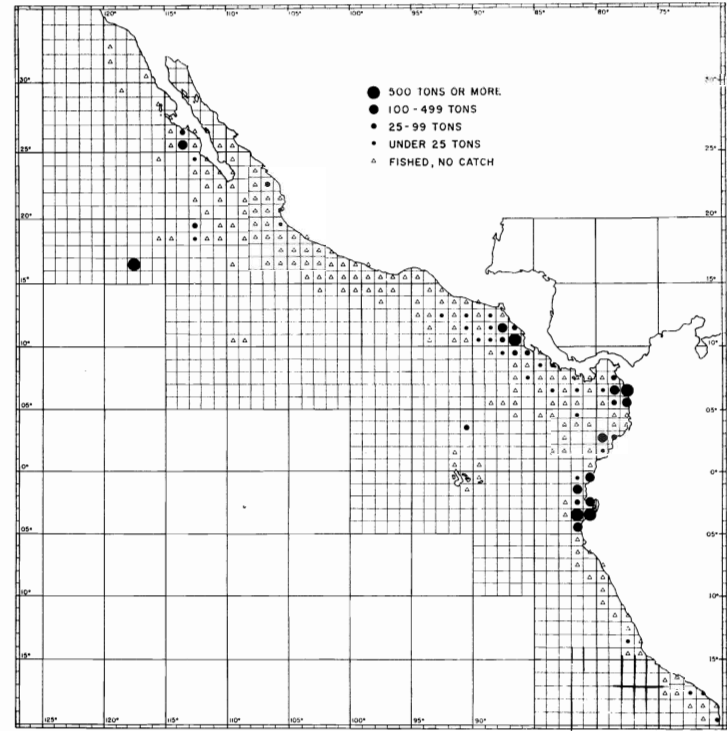
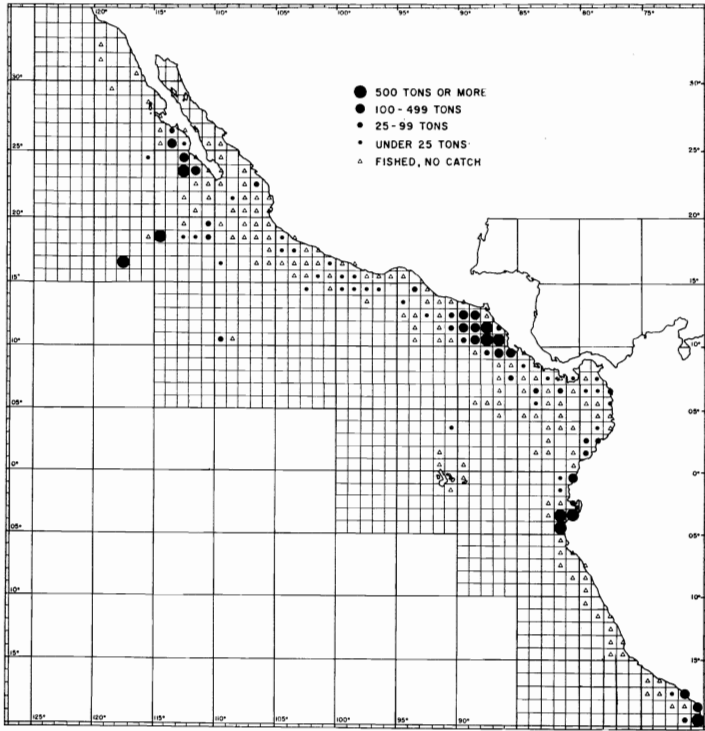


FIGURE 33. Distribution of the catches by purse-seiners in the fourth quarter, 1962; left—yellowfin, right—skipjack.

FIGURA 33. Distribución de las capturas por los barcos rederos, correspondientes al cuarto trimestre de 1962; izquierda—atún aleta amarilla, derecha—barrilete.

TABLE 1. Capacity tonnage withdrawn from baitboat fleet for conversion to purse-seine gear.

TABLA 1. Capacidad de tonelaje removida de la flota de los barcos de carnada para la conversión a barcos rederos.

Year	Quarter	Tonnage in quarter	Six-year cumulative tonnage	Year	Quarter	Tonnage in quarter	Six-year cumulative tonnage
Año	Trimestre	Tonelaje en el trimestre	Tonelaje acumulativo de seis años	Año	Trimestre	Tonelaje en el trimestre	Tonelaje acumulativo de seis años
1957	1	250	250	1960	1	5855	14220
	2	—	250		2	5765	19985
	3	—	250		3	1470	21455
	4	—	250		4	1820	23275
	Annual total	250			Annual total	14910	
1958	1	—	250	1961	1	2325	25600
	2	—	250		2	485	26085
	3	525	775		3	345	26430
	4	890	1665		4	960	27390
	Annual total	1415			Annual total	4115	
1959	1	520	2185	1962	1	—	27390
	2	2700	4885		2	690	28080
	3	1130	6015		3	690	28770
	4	2350	8365		4	690	29460
	Annual total	6700			Annual total	2070	

TABLE 2. Capacity tonnage added to the purse-seine fleet by conversion of baitboats, military and other hulls, and new construction.

TABLA 2. Capacidad de tonelaje agregada a la flota de los barcos rederos por la conversión de los barcos de carnada, de cascos militares y otros, y la construcción nueva.

Year	Quarter	Tonnage in quarter	Six-year cumulative tonnage	Year	Quarter	Tonnage in quarter	Six-year cumulative tonnage
Año	Trimestre	Tonelaje en el trimestre	Tonelaje acumulativo de seis años	Año	Trimestre	Tonelaje en el trimestre	Tonelaje acumulativo de seis años
1957	1	—	—	1960	1	1960	6155
	2	—	—		2	4682	10837
	3	—	—		3	4186	15023
	4	252	252		4	2203	17226
	Annual total	252			Annual total	13031	
1958	1	—	252	1961	1	3042	20268
	2	—	252		2	1542	21810
	3	—	252		3	1684	23494
	4	240	412		4	1865	25359
	Annual total	240			Annual total	8133	
1959	1	595	1087	1962	1	1140	26499
	2	673	1760		2	—	26499
	3	1530	3290		3	1345	27844
	4	905	4195		4	1915	29759
	Annual total	3703			Annual total	4400	

TABLE 3. Comparison of the total number of tons of yellowfin and skipjack recorded in fishermen's logbook records and the total amount landed from the Eastern Tropical Pacific, 1959-1962.

TABLA 3. Comparación del número total de toneladas de atún aleta amarilla y barrilete registradas en los cuadernos de bitácora de los pescadores y la cantidad total desembarcada del Océano Pacífico Oriental Tropical, 1959-1962.

Gear	1959		1960		1961		1962	
	Yellow-fin	Skip-jack	Yellow-fin	Skip-jack	Yellow-fin	Skip-jack	Yellow-fin	Skip-jack
Equipo	Atún aleta amarilla	Barrilete	Atún aleta amarilla	Barrilete	Atún aleta amarilla	Barrilete	Atún aleta amarilla	Barrilete
Baitboats (logged) Barcos de carnada (registradas)	27,472	57,040	23,714	19,688	14,031	14,588	9,975	7,012
Purse-seiners (logged) Barcos rederos (registradas)	28,042	9,284	83,958	8,824	89,303	33,434	58,182	51,710
	55,514	66,324	107,672	28,512	103,334	48,022	68,157	58,722
Total Eastern Pacific landings	72,700	88,800	117,100	55,250	119,900	71,550	85,250	79,900
Desembarques totales del Pacífico Oriental								
Per cent coverage Porcentaje cubierto	76.4	74.7	91.9	51.6	86.2	67.1	79.9	73.5

TABLE 4. Recorded effort and resulting catches of yellowfin and skipjack according to gear, five-degree areas, and quarters of the year, 1959-1962.

TABLA 4. Esfuerzo registrado y capturas resultantes de atún aleta amarilla y barrilete según los equipos de pesca, por áreas de cinco grados y por trimestres del año, 1959-1962.

Year	Quarter	Area	BAITBOATS						PURSE-SEINERS					
			Effort	Yellow-fin	CPUE	Skip-jack	CPUE	Total	Effort	Yellow-fin	CPUE	Skip-jack	CPUE	Total
Año	Trimestre	Area	Esfuerzo	Atún aleta amarilla	CPUE	Barrilete	CPUE	Total	Esfuerzo	Atún aleta amarilla	CPUE	Barrilete	CPUE	Total
1959	1	00-075	31.9	33	1.03	2	0.06	35						
		-080	10.7	2	0.19	1	0.09	3						
		-085	2.0	8	4.00			8						
		-090	47.2	169	3.58	211	4.47	380						
		05-075	24.7	35	1.42	1	0.04	36						
		-080	71.2	217	3.05	3	0.04	220						
		-085	80.7	278	3.44	61	0.76	339						
		-115	1.1					*						
		10-085	62.0	106	1.71			106						
		-090	259.3	1381	5.32	5	0.02	1386						
		-095	74.7	258	3.45			258						
		-100	7.4	48	6.49			48						
		-105	28.0	124	4.43			124						
		15-090	13.1	13	0.99			13						
		-095	158.0	413	2.61			413	13.7	96	7.01			96
		-100	336.8	1075	3.19	0.50		1075.50	34.4	225	6.54			225
		-105	66.2	159	2.40			159	0.8					*
		-110	236.4	718	3.04	230	0.97	948	46.0	71	1.54			71
		-115	13.2	14	1.06			14						
		20-105	131.0	293	2.24			293	712.7	9986	14.01	28		10014
		-110	40.8	61	1.50	1	0.02	62	2.0					*
		-115	20.5	82	4.00			82						
		25-105							46.5	904	19.44			904
		-110A	0.9					*						
		-110B	128.0	815	6.37	38	0.30	853	2.6					*
		-115	1.5	9	5.00			9	13.4					*
		S05-080	287.3	436	1.52	2531	8.81	2967						
		-085	8.4	42	5.00	13	1.55	55						
		-090	12.0	27	2.25			27						
		S10-075	403.3	546	1.35	4854	12.04	5400						
		-080	1.7	3	1.76	12	7.06	15						

Table 4, No. 2

Year	Quarter	Area	BAITBOATS					PURSE-SEINERS							
			Effort	Yellow-fin	CPUE	Skip-jack	CPUE	Total	Effort	Yellow-fin	CPUE	Skip-jack	CPUE	Total	
		S15-075	3.1			9	2.90	9							
		S20-070	565.7	110	0.19	6322	11.18	6432							
		-075	2.6			1	0.38	1							
		S25-070	18.9			199	10.53	199							
	Total		3150.3	7475	2.37	14494.50	4.60	21969.50	872.1	11282	12.94	28		11310	
2		00-075	100.1	672	6.71	481	4.81	1153							
		-080	16.6	56	3.37	8	0.48	64							
		-085	0.6					*							
		-090	6.8	26	3.82	7	1.03	33							
		05-075	387.5	1399	3.61	2405	6.21	3804							
		-080	210.0	859	4.09	78	0.37	937							
		-085	94.1	568	6.04	45	0.48	613							
		10-085	160.8	1306	8.12	117	0.73	1423							
		-090	113.2	408	3.60	7	0.06	415							
		-095	16.5	34	2.06			34							
		-100	4.8	9	1.88			9							
		-105	34.6	114	3.29			114							
		15-090	12.7	18	1.42			18							
		-095	47.2	165	3.50			165							
		-100	65.6	94	1.43			94	103.9	950	9.14			950	
		-105	19.2	22	1.14			22	11.2	89	7.95			89	
		-110	387.7	992	2.56	404	1.04	1396	1.0					*	
		-115	5.8	14	2.41	1	0.17	15						*	
		20-105	37.7	14	0.37	16	0.42	30	591.1	3904	6.60	43	0.07	3947	
		-110	42.4	13	0.31	13	0.31	26	205.2	1750	8.52			1750	
		-115	18.8	42	2.23			42						*	
		25-105							0.5					*	
		-110A	1.1	0.25	0.23			0.25	4.1					*	
		-110B	34.2	39	1.14	244	7.13	283	8.7					*	
		-115	1.9					*	1.0					*	
		30-115							12.0					*	
		S05-080	59.5	71	1.19	224	3.76	295	39.1	199	5.09	822	21.02	1021	
		-085	1.1					*							
		-090	1.1	4	3.64			4							
		S10-075	679.9	979	1.44	14944	21.98	15923	2.6					*	
		-080	100.2	0.50		1034	10.32	1034.50							
	Total		2661.5	7918.75	2.98	20028	7.25	27946.75	980.4	6892	7.03	865	0.88	7757	

Table 4, No. 3

Year	Quar- ter	Area	BAITBOATS						PURSE-SEINERS						
			Effort	Yellow- fin	CPUE	Skip- jack	CPUE	Total	Effort	Yellow- fin	CPUE	Skip- jack	CPUE	Total	
1959	3	00-075	17.3	20	1.16	102	5.90	122							
		-080	10.8	66	6.11	6	0.56	72							*
		-085	1.2	2	1.67			2	1.2						
		-090	64.3	505	7.85	366	5.69	871							
		05-075	25.2	33	3.29	29	1.15	112	2.4						*
		-080	71.3	240	3.36	274	3.84	514	12.0	32	2.67				32
		-085	59.3	330	5.56	156	2.63	486	4.8	30	6.25				30
		10-085	10.5	37	3.52			37	1.2						*
		-090	2.0	9	4.50			9	2.4	28	11.67	10	4.17		38
		15-095	2.0					*							*
		-100	1.5	1	0.67			1	9.5						*
		-105	1.5	12	8.00			12							*
		20-105	1.0	7	7.00			7	21.0						*
		-110	8.1	8	0.99	74	9.14	82	14.0	110	7.86				110
		-115	9.5	14	1.47			14	2.3						*
		25-110B	352.1	673	1.91	2516	7.14	3189	651.7	1690	2.59	4629	7.10		6319
		-115	542.2	522	0.96	4549	8.39	5071	189.1	383	2.02	796	4.21		1179
		30-115	43.6			98	2.25	98	67.6			69	1.02		69
		-120	1.7					*	1.0						*
		S05-080	714.4	2400	3.36	6261	8.76	8661	122.7	722	5.88	2410	19.64		3132
		-085	6.1	58	9.51			58							
		-090	1.5	1	0.67			1							
		S10-075	5.7					*							
		-080	1.0					*							
		S20-070	3.4					*							
		Total	1957.2	4988	2.55	14431	7.37	19419	1102.9	2995	2.46	7914	7.18		10909
	4	00-075	50.1	38	0.76	187	3.73	225	6.0	5	0.83				5
		-080	17.9	18	1.00	4	0.22	22							
		-085	15.6	44	2.82	56	3.59	100							
		-090	207.8	881	4.24	698	3.36	1579							
		05-075	24.2	22	0.91	14	0.58	36	2.4						*
		-080	78.7	96	1.22	49	0.62	145	27.1	381	14.06	3	0.11		384
		-085	140.6	535	3.80	155	1.10	690	103.2	946	9.17	44	0.43		990
		-105	0.5					*							
		10-085	153.6	703	4.58	252	1.64	955	25.0	64	2.56	12	0.48		76
		-090	105.7	529	5.00	2	0.02	531	25.5	278	10.90				278
		-095	2.3	4	1.74			4	1.2	12	10.00				12

DISTRIBUTION OF FISHING EFFORT AND CATCH

Table 4, No. 4

Year	Quar- ter	Area	BAITBOATS					PURSE-SEINERS								
			Effort	Yellow- fin	CPUE	Skip- jack	CPUE	Total	Effort	Yellow- fin	CPUE	Skip- jack	CPUE	Total		
1959	4	10-100	1.4	1	0.71			1								
		-105	30.7	253	8.24			253								
		15-090	4.8	15	3.12			15								
		-095	41.4	70	1.69			70	213.9	2702	12.63				2702	
		-100	87.1	280	3.21			280	80.6	542	6.72				542	
		-105	12.8	4	0.31			4	2.5						*	
		-110	49.4	71	1.44	30	0.61	101	9.1	4	0.44				4	
		-115	13.5	115	0.85	53	3.92	168								
		20-105	191.1	816	4.27	9	0.05	825	92.4	182	1.97				182	
		-110	134.6	223	1.66	50	0.37	273	205.6	804	3.91				804	
		-115	47.5	209	4.40	3	0.06	212								
		25-105	1.9	.50				.50	1.0						*	
		-110A	16.5	75	4.57	.50		75.50	4.7	2	0.42				2	
		-110B	551.8	849	1.54	1116	2.02	1965	193.8	770	3.97	30	0.15		800	
		-115	140.5	61	0.43	586	4.17	647	25.2	7	0.28				7	
		30-115	27.7	.50	0.02	84	3.03	84.50	1.3						*	
		S05-080	1001.0	1034	1.03	4491	4.49	5525	46.6	181	3.88	381	8.18		562	
		-085	39.2	125	3.19	242	6.17	367								
		-090	5.9	18	3.05	5	0.85	23								
		S10-075	16.4					*								
		-080	3.6					*								
		S15-075	11.3					*								
		S20-070	21.4					*								
		-075	7.4					*								
		S25-070	2.6					*								
		Total			3258.5	7090	2.18	8086.50	2.48	15176.50	1067.1	6873	6.44	477	0.45	7350
		Annual Total			11027.50	27471.75		57040		84511.75	4022.5	28042		9284		37326
1960	1	00-075	74.8	35	0.47	246	3.29	281								
		-080	20.7	12	0.58	22	1.06	34								
		-085	4.7					*								
		-090	175.7	708	4.03	75	0.43	783								
		05-075	51.6	121	2.34	56	1.08	177								
		-080	91.0	366	4.02	14	0.15	380	44.0	744	16.91	5	0.11	749		
		-085	106.0	466	4.40	98	0.92	564	8.6	244	28.37			244		
		10-085	161.7	1347	8.33	224	1.38	1571	2.0					*		
		-090	127.7	912	7.14	15	0.12	927								

Table 4, No. 5

Year	Quarter	Area	BAITBOATS					PURSE-SEINERS						
			Effort	Yellow-fin	CPUE	Skip-jack	CPUE	Total	Effort	Yellow-fin	CPUE	Skip-jack	CPUE	Total
1960	1	10-095	17.2	58	3.37			58	102.4	1666	16.27			1666
		-100	23.9	164	6.86			164						
		-105	42.4	207	4.88			207						
		15-090	8.2	4	0.49			4						
		-095	69.9	188	2.69			188	471.8	6371	13.50			6371
		-100	136.5	434	3.18			434	709.2	7414	10.45			7414
		-105	28.2	78	2.76			78	24.9	173	6.95			173
		-110	66.6	104	1.56	34	0.51	138	5.1					*
		-115	32.4	141	4.35	73	2.25	214						*
		20-105	211.9	728	3.44			728	558.4	5082	9.01			5082
		-110	10.8	.50		.25		.75	161.9	2473	15.27			2473
		25-105							4.8	1	0.21			1
		-110A	1.2					*	1.3					*
		-110B	10.5	10	0.95	22	2.10	32	0.5					*
		-115							2.0					*
		30-115							8.3					*
		S05-080	480.7	137	0.28	2096	4.36	2233	25.0	102	4.08	479	19.16	581
		-085	27.3	100	3.66	22	0.80	122						
		-090	58.1	442	7.61	65	1.12	507						
		S10-075	10.0					*						*
		-080	7.6			13	1.71	13	1.4					*
		S15-075	2.0			28	14.00	28						
		S20-070	137.8	496	3.60	1366	9.91	1862	17.4	345	19.83	144	8.28	489
		-075	2.5					*						
		-080	2.6					*						
		S25-070	95.5	1285	13.46	1824	19.10	3109	5.6	122	21.78	1	0.18	123
		-075	2.6					*						
		-080	3.6					*						
		S30-075	0.6					*						
		-080	0.6					*						
Total			2305.1	8543.50	3.71	6293.25	2.73	14836.75	2154.6	24737	11.48	629	0.29	25366
	2	00-075	70.5	104	1.48	363	5.15	467						
		-080	57.9	26	0.45	346	5.98	372	7.8	37	4.74	208	26.67	245
		-085	0.5					*						
		-090	30.4	222	7.30	26	0.86	248						
		05-075	360.3	1747	4.85	2089	5.80	3836						
		-080	190.6	729	3.82	932	4.89	1661	141.1	1979	14.02	4	0.03	1983

DISTRIBUTION OF FISHING EFFORT AND CATCH

Table 4, No. 6

Year	Quarter	Area	BAITBOATS						PURSE-SEINERS							
			Effort	Yellow-fin	CPUE	Skip-jack	CPUE	Total	Effort	Yellow-fin	CPUE	Skip-jack	CPUE	Total		
1960	2	05-085	40.7	139	3.42	62	1.52	201	50.6	726	14.35	20	0.40	746		
		-090							1.3	70	53.85			70		
		10-085	72.9	307	4.21	242	3.32	549	86.2	1517	17.60	28	0.32	1545		
		-090	62.1	613	9.87	22	0.35	635	263.3	4856	18.44	1		4857		
		-095	59.9	469	7.83			469	15.0	140	9.33			140		
		-100	8.7	63	7.24			63	2.1					*		
		-105	34.1	249	7.30			249								
		15-090							8.9						*	
		-095	121.4	995	8.20			995	257.5	3866	15.01	1		3867		
		-100	85.2	288	3.38			288	581.9	7138	12.27			7138		
		-105	19.5	42	2.15			42	43.7	280	6.41			280		
		-110	70.5	110	1.56	68	0.96	178	1.0					*		
		-115	21.2	131	6.18	82	3.87	213								
		20-105	20.9	10	0.48	7	0.33	17	921.7	4425	4.80	10	0.01	4435		
		-110	126.5	912	7.21	667	5.27	1579	174.5	960	5.50	129	0.74	1089		
		-115	0.9					*								
		25-105							3.3						*	
		-110A	0.6					*	61.8	358	5.79			358		
		-110B	5.8	.50		.50		1	128.5			590	4.59	590		
		-115	2.4					*	53.5	6	0.11	20	0.37	26		
		30-115							41.9					*		
		S05-080	137.0	209	1.52	907	6.62	1116	78.6	61	0.78	1733	22.05	1794		
		-085	4.8					*								
		-090	3.4	12	3.53			12								
		S10-075	14.5					*	5.2			70	13.46	70		
		-080	10.6				78	7.36	78							
		Total			1633.8	7377.50	4.52	5891.50	3.61	13269	2929.4	26419	9.02	2814	0.96	29233
		1960	3	00-075	17.3	134	7.74	42	2.43	176						
				-080	18.3	40	2.18	72	3.93	112						
				-085	2.5	29	11.60			29						
-090	51.3			411	8.01	122	2.38	533								
05-075	33.6			93	2.77	23	0.68	116								
-080	61.6			179	2.90	14	2.27	193	44.3	368	8.31	8	0.18	376		
-085	60.6			188	3.10	196	3.23	384	19.4	118	6.08	14	0.72	132		
10-085	178.4			931	5.22	725	4.06	1656	381.9	3864	10.12	481	1.26	4345		
-090	60.8			352	5.79	40	0.66	392	376.8	4007	10.63	355	0.94	4362		
-095	1.3			4	3.08			4								

Table 4, No. 7

Year	Quarter	Area	BAITBOATS						PURSE-SEINERS					
			Effort	Yellow-fin	CPUE	Skip-jack	CPUE	Total	Effort	Yellow-fin	CPUE	Skip-jack	CPUE	Total
1960	3	15-090	1.3					*	6.2					*
		-095	10.7	32	2.99			32	48.0	84	1.75			84
		-100	14.5	114	7.86			114	51.5	48	0.93			48
		-105	1.3	6	4.62			6	12.9	22	1.70			22
		-110	6.3	8	1.27	41	6.51	49						
		20-105	8.2	4	0.49			4	51.5	.50		.50		1
		-110	169.1	549	3.25	1262	7.46	1811	435.7	1898	4.36	797	1.83	2695
		-115	6.2	14	2.26	2	0.32	16	7.1	25	3.52	20	2.82	45
		25-110B	217.3	685	3.15	1436	6.61	2121	466.4	1335	2.86	1569	3.36	2904
		-115	124.3	175	1.41	312	2.51	487	288.7	277	0.96	597	2.07	874
		30-115	11.0					*	314.2	3				3
		-120	10.2					*	1.3					*
		S05-080	165.5	615	3.72	782	4.72	1397	25.2	101	4.01	567	22.50	668
		-085	3.8					*						*
		-090	2.0					*						*
		S10-075	2.2					*						*
			Total		1239.6	4563	3.68	5069	4.09	9632	2531.1	12150.50	4.80	4408.50
1960	4	00-075	16.1	41	2.55	95	5.90	136	1.3			3	2.31	3
		-080	3.6	4	1.11	4	1.11	8						
		-085	3.4	22	6.47			22						
		-090	21.3	40	1.88	8	0.38	48						
		05-075	9.5	15	1.58			15	18.6	182	9.78	3	0.16	185
		-080	17.9	28	1.56			28	71.6	312	4.36			312
		-085	86.4	246	2.85	245	2.84	491	90.8	464	5.11	32	0.35	496
		10-085	148.1	634	4.28	687	4.64	1321	647.9	4046	6.24	599	0.92	4645
		-090	18.6	26	1.40			26	547.3	3826	6.99	263	0.48	4089
		-095	4.8	11	2.29			11	187.3	2031	10.84			2031
		-100	1.5	4	2.67			4						
		-105	8.6	131	15.23			131						
		15-090							13.0	5	0.38			5
		-095	22.7	56	2.47	.50	0.02	56.50	859.0	8076	9.40			8076
		-100	41.9	129	3.08			129	274.5	1218	4.44			1218
		-105	3.6	.25	0.07			.25	16.1					*
		-110	25.9	48	1.85	34	1.31	82	2.0					*
-115	3.1	5	1.61	25	8.06	30						*		
20-105	23.7	29	1.22			29	37.5					*		
-110	82.4	249	3.02	65	0.79	314	16.3					*		

Table 4, No. 8

Year	Quarter	Area	BAITBOATS						PURSE-SEINERS																			
			Effort	Yellow-fin	CPUE	Skip-jack	CPUE	Total	Effort	Yellow-fin	CPUE	Skip-jack	CPUE	Total														
1960	4	20-115	3.1	7	2.26	2	0.64	9	1.0						*													
		25-105	0.8					*																				
		-110A	3.1	26	8.39	1	0.32	27																				
		-110B	409.5	1432	3.50	1074	2.62	2506								99.5	492	4.94	73	0.73	565							
		-115	4.9													4.0					*							
		30-115														3.0					*							
		-120	5.0					*																				
		S05-080	44.0	38	0.86	194	4.41	232																				
		-085	2.5	9	3.60			9																				
		-090	0.6					*																				
		S20-070	6.5					*																				
		S25-070	5.0					*																				
		S30-075	1.0					*																				
		Total			1029.1	3230.25	3.14	2434.50								2.36	5664.75	2891.1	20652	7.14	973	0.34	21625					
		Annual Total			6207.6	23714.25		19688.25									43402.50	10506.2	83958.50		8824.50		92783					
1961	1	00-075	8.4			46	5.48	46																				
		-080	2.4					*																				
		-085	1.2					*																				
		-090	26.5	63	2.38	8	0.30	71								1.3												
		05-075	2.4			2	0.83	2																				
		-080	53.7	172	3.20	51	0.95	223															22.6	350	15.49	35	1.55	385
		-085	63.1	295	4.68	69	1.09	364															20.1	32	1.59	2	0.10	34
		10-085	29.6	28	0.94	16	0.54	44															111.2	1742	15.66	10	0.09	1752
		-090	94.5	366	3.87	43	0.46	409															1268.5	16395	12.92	96	0.08	16491
		-095	20.0	10	0.50			10															405.5	4236	10.45			4236
		-100	22.3	156	7.00			156																				
		-105	14.9	99	6.64			99																				
		15-090	0.6					*															161.3	3719	23.06			3719
		-095	24.9	21	0.84			21															1003.0	6860	6.84			6860
		-100	26.6	32	1.20			32															391.2	1024	2.62			1024
		-105	78.8	241	3.06		.25	241.25															43.4	92	2.12			92
		-110	115.0	232	2.45	111	0.96	593															19.0	64	3.37			64
		-115	7.9	31	3.92	6	0.76	37																				
		20-105	177.7	805	4.53	13	0.07	818															444.3	4823	10.86	4		4827
		-110	28.5	27	0.95			27															49.7	32	0.64			32
-115	0.8					*																						

Table 4, No. 9

Year	Quarter	Area	BAITBOATS					PURSE-SEINERS						
			Effort	Yellow-fin	CPUE	Skip-jack	CPUE	Total	Effort	Yellow-fin	CPUE	Skip-jack	CPUE	Total
1961	1	25-110B	13.3	17	1.28			17	36.6	104	2.84	30	0.82	134
		-115							1.9					*
		S05-080	33.8	1	0.03	330	9.76	331						
		-085	6.5	39	6.00			39						
		-090	5.0	2	0.40			2						
		S10-075	8.2					*						
		S15-075							1.4					*
		S20-070	157.1	618	3.93	1077	6.86	1695	33.3	439	13.18	218	6.55	657
		-075							4.0	6	1.50			6
		S25-070	15.8	61	3.86	61								
	Total		1039.5	3305	3.18	1833.25	1.76	5138.25	4018.3	39918	9.93	395	1.00	40313
1961	2	00-075	84.9	191	2.25	834	9.82	1025	21.1			15	0.71	15
		-080	8.0			32	4.00	32	25.2			14	0.56	14
		05-075	149.0	1542	10.35	664	4.46	2206	68.4	506	7.40	66	0.96	572
		-080	17.1	77	4.50	31	1.81	108	166.0	1556	9.37	48	0.30	1604
		-085	1.2	20	16.67			20	155.7	1216	7.81	45	0.29	1261
		-090							71.5	901	12.60	5	0.07	906
		10-085	8.3	4	0.48	14	1.69	18	435.5	1642	3.77	2168	4.98	3810
		-090	5.6	26	4.64			26	917.7	7282	7.94	423	0.46	7705
		-095	2.8	4	1.43			4	168.9	1606	9.51			1606
		-100	0.8	1	1.25			1	1.0					*
		15-090							34.2	12	0.35			12
		-095	3.2					*	228.3	750	3.28			750
		-100	6.0	24	4.00			24	413.8	1168	2.82	16	0.04	1184
		-105	11.6	31	2.67			31	430.9	3358	7.79	49	0.11	3407
		-110	245.6	573	2.33	245	1.00	818	115.7	422	3.65	17	0.15	439
		-115	6.7	35	5.22	20	2.98	55						
		20-105	16.0			3	0.19	3	790.7	1433	1.81	16	0.02	1449
		-110	199.3	513	2.57	247	1.24	760	498.1	2756	5.53	213	0.43	2969
		-115	3.1					*	6.4					*
		25-105							2.5	14	5.60			14
		-110A	2.6					*	9.0					*
		-110B	27.3	42	1.54	20	0.73	62	259.6	50	0.19	29	0.11	79
		-115	8.4					*	28.6					*
		30-115	13.6					*	4.0					*
		-120	0.8					*						*
		S05-080	107.5	1354	12.60	712	6.62	2066	504.2	268	0.53	8620	17.10	8888

DISTRIBUTION OF FISHING EFFORT AND CATCH

Table 4, No. 10

Year	Quar- ter	Area	BAITBOATS						PURSE-SEINERS						
			Effort	Yellow- fin	CPUE	Skip- jack	CPUE	Total	Effort	Yellow- fin	CPUE	Skip- jack	CPUE	Total	
1961	2	S10-075	50.1	11	0.22	1734	34.61	1745	2.0						*
		-080	2.4					*							
		S15-075	0.6					*							
		S20-070	48.5			599	12.35	599	6.4			130	20.31	130	
Total			1031.0	4448	4.31	5155	5.00	9603	5365.4	24940	4.65	11874	2.21	36814	
1961	3	00-075	76.3	96	1.26	460	6.03	556	96.6	64	0.66	93	0.96	157	
		-080	10.4	4	0.38	48	4.62	52	55.6					*	
		-085	9.5	71	7.47	64	6.74	135	2.7					*	
		-090	56.0	238	4.25	164	2.93	402	12.0					*	
		05-075	30.3	134	4.42	48	1.58	182	42.2	206	4.88	21	0.50	227	
		-080	66.9	136	2.03	94	1.40	230	204.4	413	2.02	260	1.27	673	
		-085	44.1	126	2.86	156	3.54	282	191.9	840	4.38	36	0.18	376	
		10-085	85.7	533	6.22	586	6.84	1119	1017.1	4047	3.98	3486	3.43	7533	
		-090	8.3	18	2.17	1	0.12	19	638.7	2210	3.46	1483	2.32	3693	
		-095							4.3	15	3.49			15	
		15-090	1.2	5	4.17			5	29.9					*	
		-095	2.4					*	112.2	15	0.13			15	
		-100	2.4						115.8	68	0.59			68	
		-105							35.7	34	0.95			34	
		-110							11.6	62	5.34			62	
		20-105							80.3	15	0.19			15	
		-110	27.6	71	2.57	46	1.67	117	309.8	1146	3.70	116	0.37	1262	
		-115	46.1	399	8.66			399	7.4	34	4.59			34	
		25-110B	294.4	661	2.24	1163	3.95	1824	561.7	1010	1.80	1484	2.64	2494	
		-115	56.1	20	0.36	101	1.80	121	119.4	119	1.00	68	0.57	187	
		30-115	69.1			.25		.25	190.3	33	0.17	45	0.24	78	
		-120	3.3					*						*	
		-125	1.6					*						*	
S05-080	129.4	416	3.21	1048	8.10	1464	260.0	68	0.26	1890	7.27	1958			
-085	0.6			3	5.00	3	2.7					*			
-090	0.6					*	4.1					*			
S10-075	2.0	1	0.50	4	2.00	5						*			
Total			1024.3	2929	2.86	3986.25	3.89	6915.25	4106.4	10399	2.53	8982	2.19	19381	
1961	4	00-075	38.5	114	2.96	302	7.84	416	39.4	49	1.24	9	0.23	58	
		-080	7.1	1	0.14	113	15.92	114	43.3	11	0.75	3	0.06	14	
		-085	1.2	3	2.50			3	4.1					*	

Table 4, No. 11

Year	Quarter	Area	BAITBOATS						PURSE-SEINERS					
			Effort	Yellow-fin	CPUE	Skip-jack	CPUE	Total	Effort	Yellow-fin	CPUE	Skip-jack	CPUE	Total
1961	4	00-090	25.5	170	6.67	78	3.06	248	24.2	15	0.62	49	2.02	64
		05-075	16.0	68	4.25	7	0.44	75	36.8	51	1.38	14	0.38	65
		-080	16.6	37	2.23	23	1.38	60	409.9	1190	2.90	652	1.59	1842
		-085	13.0	32	2.46	18	1.38	50	439.5	1401	3.19	991	2.25	2392
		-090							1.3					*
		10-085	34.4	201	5.84	77	2.24	278	933.5	3502	3.75	3981	4.26	7483
		-090	3.0					*	625.9	3756	6.00	190	0.30	3946
		-095							51.3	132	2.57			132
		-100							11.8	34	2.88			34
		-105	3.6	4	1.11			4	50.1	445	8.88			445
		15-090							22.3	73	3.27			73
		-095	1.2					*	592.8	1513	2.55			1513
		-100	2.4					*	455.2	1165	2.56			1165
		-105							46.4	24	0.52			24
		-110	74.0	297	4.01	257	3.47	554	93.9	246	2.62	10	0.11	256
		-115	0.8	1	1.25			1						
		20-105	3.7					*	84.4	2	0.02			2
		-110	15.2	26	1.71	26	1.71	52	55.9			1	0.02	1
		-115	1.7	3	1.76			3	2.7					*
		25-110A	1.7	1	0.59	1	0.59	2	0.7					*
		-110B	315.2	127	0.40	1878	5.96	2005	299.3	176	0.59	1131	3.78	1307
		-115	3.5			1	0.28	1	14.8					*
		30-115							1.0					*
		S05-080	239.2	2161	0.03	800	3.34	2961	663.0	260	0.39	5114	7.71	5374
		-085	12.3	95	7.72	32	2.60	127	14.7	1	0.07	38	2.58	39
		-090	0.6	8	1.33			8	1.3					*
		Total			830.4	3349	4.03	3613	4.35	6962	5019.5	14046	2.80	12183
Annual	Total		3925.2	14031		14587.50		28618.50	18509.6	89303		33434		122737
1962	1	00-075	65.9	134	2.03	354	5.37	488	622.6	3071	4.93	3612	5.80	6683
		-080	33.3	1	0.03	173	5.20	174	117.5	429	3.65	524	4.46	953
		-085	4.2	11	2.62	.50	0.12	11.50						
		-090	19.0	46	2.42	8	0.42	54						
		05-075	31.7	80	2.52	13	0.41	93	510.5	3825	7.49	3163	6.20	6988
		-080	27.6	39	1.41	19	0.69	58	611.1	2407	3.94	2315	3.79	4722
		-085	54.4	132	2.43	346	6.36	478	143.5	342	2.38	110	0.77	452
		-090							5.5	10	1.82	*		10

Table 4, No. 12

Year	Quarter	Area	BAITBOATS						PURSE-SEINERS							
			Effort	Yellow-fin	CPUE	Skip-jack	CPUE	Total	Effort	Yellow-fin	CPUE	Skip-jack	CPUE	Total		
1962	1	10-085	3.6	16	4.44	5	1.39	21	368.7	313	0.85	1786	4.84	2099		
		-090	13.5	87	6.44			87	591.0	3032	5.13	401	0.68	3433		
		-095							41.4	64	1.54			64		
		-100							14.9	30	2.01			30		
		-105	4.0	85	21.25			85	51.1	282	5.52			282		
		15-090	0.8					*	19.2	30	1.56			30		
		-095							197.6	172	0.87	13	0.07	185		
		-100							426.0	802	1.88			802		
		-105	3.0	2	0.67			2	69.2	23	0.33			23		
		-110	203.1	246	1.21	520	2.56	766	169.3	898	5.30	59	0.35	957		
		-115	4.0	2	0.50			2								
		20-105	64.0	289	4.52			289	511.6	2024	3.96			2024		
		-110	28.6	50	1.75	78	2.73	128	39.4					*		
		25-110B	11.4			57	5.00	57	20.0						*	
		-115							24.3						*	
		S05-080	24.2	10	0.41	43	1.78	53	161.9	1496	9.24	222	1.37	1718		
		-085	5.3	29	5.47	4	0.75	33								
		-090	0.6					*								
		S10-075	8.1					*	5.2						*	
		-080	5.8	5	0.86			5	6.8						*	
		S15-075							10.6						*	
		S20-070	168.1	53	0.32	149	0.89	202	109.6	500	4.56	392	3.58	892		
		-075	2.4					*	1.8						*	
		S25-070	8.3	20	2.41			20	13.4	358	26.72	40	2.98	398		
		Total			794.9	1337	1.68	1769.50	2.23	3106.50	4863.7	20108	4.13	12637	2.60	32745
			2	00-075	72.5	255	3.52	185	2.55	440	116.2	36	0.31	208	1.79	244
				-080	8.2			4	0.49	4	148.0	127	0.86	556	3.76	683
-085	0.6							*	7.7					*		
-090	18.3			20	1.09	141	7.70	161	57.9	191	3.30	586	10.12	777		
05-075	111.8			453	4.05	394	3.52	847	146.2	538	3.68	121	0.83	659		
-080	56.8			206	3.63	200	3.52	406	309.2	1090	3.52	133	0.43	1223		
-085	47.3			80	1.69	220	4.65	300	398.7	2826	7.09	156	0.39	2982		
-090									3.7	3	0.81			3		
10-085	29.9			62	2.07	213	7.12	275	589.2	620	1.52	2318	3.93	2938		
-090	51.2			110	2.15			110	378.4	1253	3.31	95	0.25	1348		
-095	1.2							*	12.3					*		

Table 4, No. 13

Year	Quarter	Area	BAITBOATS					PURSE-SEINERS						
			Effort	Yellow-fin	CPUE	Skip-jack	CPUE	Total	Effort	Yellow-fin	CPUE	Skip-jack	CPUE	Total
1962	2	10-100							3.8					*
		-105							7.3	28	3.84			28
		15-090	0.4					*	14.8					*
		-095	10.8	24	2.22			24	111.6	1				1
		-100	17.6	49	2.78			49	253.0	631	2.49	1		632
		-105	60.0	384	6.40			384	381.2	3050	8.00	7	0.02	3057
		-110	108.1	152	1.41	96	0.89	248	336.6	2052	6.10	143	0.42	2195
		-115	13.8	149	10.80			149						
		20-105	5.6					*	285.3	688	2.41			688
		-110	139.9	953	6.81	393	2.81	1346	856.1	2872	3.35	400	0.47	3272
		-115	2.9	2	0.69			2	1.3					*
		25-105							1.0					*
		25-110A							3.0	42	14.0			42
		-110B	7.3					*	47.9					*
		-115	5.3					*	15.4					*
		30-115	0.8					*	6.4					*
		S05-080	55.3	222	4.01	96	1.74	318	1188.7	3928	3.30	8354	7.03	12282
		-085							3.1					*
		-090							5.7	1	0.18			1
		S10-075	16.5	4	0.24	39	2.36	43	1.3					*
		-080	1.0					*	1.0					*
	Total		843.1	3125	3.71	1981	2.35	5106	5692.0	19977	3.51	13078	2.30	33055
	3	00-075	5.8	6	1.03	9	1.55	15	41.1			3	0.07	3
		-080	5.2	6	1.15	.50	0.10	6.50	80.0	8	0.10	104	1.42	112
		-085	1.1	2	1.82			2	2.5					*
		-090	52.3	186	3.56	601	11.49	787	6.4					*
		05-075	3.4	5	1.47	2	0.59	7	20.4	4	0.20	21	1.03	25
		-080	44.6	275	6.17	103	2.31	378	85.9	.50	0.01	32	0.37	32.50
		-085	41.0	26	0.63	263	6.41	289	66.2	18	0.27	84	1.27	102
		-090							6.3	76	12.06	10	1.59	86
		10-085	21.7	54	2.49	77	3.55	131	300.0	198	0.66	1205	4.02	1403
		-090	3.0	18	6.00	3	1.00	21	61.4	17	0.28	36	0.59	53
		-095							2.5					*
		15-090							6.2					*
		-095	0.6	5	8.33	2	3.33	7	59.0	118	2.00	14	0.24	132
		-100						47.1					*
		-105							11.2	11	0.98			11

DISTRIBUTION OF FISHING EFFORT AND CATCH

Table 4, No. 14

Year	Quarter	Area	BAITBOATS					PURSE-SEINERS						
			Effort	Yellow-fin	CPUE	Skip-jack	CPUE	Total	Effort	Yellow-fin	CPUE	Skip-jack	CPUE	Total
1962	3	15-110	0.8	3	3.75	3	3.75	6	3.9					*
		20-105	0.2					*	61.4	34	0.55			34
		-110	179.8	1570	8.77	615	3.42	2185	302.6	1199	3.96	570	1.88	1769
		-115	15.4	86	5.58			86	3.6					*
		25-105							1.3	1	0.77			1
		25-110A	2.1	24	11.43			24	1.6	.50	0.31			.50
		-110B	88.7	288	3.25	215	2.42	503	611.5	1758	2.87	1858	3.04	3616
		-115	4.5					*	156.1	47	0.30	14	0.09	61
		30-115	0.5					*	177.2					*
		-120							1.3					*
		S05-080	110.3	835	7.57	71	0.64	906	1621.6	1379	0.85	14729	8.93	16108
		-090	4.0	2	0.50			2						
		S10-075	1.5					*						
		Total			586.5	3391	5.78	1964.50	3.35	5355.50	3738.3	4869	1.30	18680
1962	4	00-075	1.0					*	84.2	146	1.73	252	2.99	398
		-080	1.0					*	33.6			5	0.15	5
		-085							1.8					*
		-090	52.5	96	1.83	246	4.69	242	20.0	.50	0.025	30	1.50	30.50
		05-075	2.4	25	10.42	2	0.83	27	182.7	124	0.68	1459	7.99	1583
		-080	7.1	19	2.68	1	0.14	20	132.7	116	0.87	12	0.09	128
		-085	12.6	14	1.11	109	8.65	123	173.0	453	2.62	160	0.92	613
		10-085	5.4	64	11.85	.50	0.09	64.50	1129.4	4335	3.84	916	0.81	5251
		-090							134.1	147	1.10	14	0.10	161
		-095							20.7	40	1.93			40
		-100							4.5	.50	0.11			.50
		-105	1.6	3	1.88			3	29.2	63	2.16			63
		15-090							2.6					*
		-095							86.8	20	0.23			20
		-100							124.1	19	0.15			19
		-105							36.5	4	0.11	.50	0.01	4.50
		-110	54.8	115	2.10	65	1.19	180	252.9	1487	5.88	45	0.18	1532
		-115	14.1	123	8.72	112	7.94	235	137.0	704	5.14	706	5.15	1410
		20-105	27.0	98	3.63	6	0.22	104	105.2	46	0.44	35	0.33	81
		-110	32.9	42	1.28	37	1.12	79	181.2	1166	6.43	1	0.01	1167
		-115	7.3	36	4.93			36	6.3	2	0.32			2
25-105	0.8					*	0.6					*		
-110A	30.2	200	6.62	8	0.26	208	3.8					*		

Table 4, No. 15

Year	Quar- ter	Area	BAITBOATS						PURSE-SEINERS					
			Effort	Yellow- fin	CPUE	Skip- jack	CPUE	Total	Effort	Yellow- fin	CPUE	Skip- jack	CPUE	Total
1962	4	25-110B	229.9	518	2.25	603	2.62	1121	321.8	236	0.73	270	0.84	506
		-115	0.8					*	3.0					*
		30-115							3.6					*
		S05-080	119.5	769	6.43	108	0.90	877	1122.2	3173	2.83	3370	3.00	6543
		-085							3.7					*
		-090							1.9					*
		S10-075	1.0					*	16.8					*
		-080							6.3					*
		S15-075							18.1			9	0.50	9
		S20-070	3.0					*	320.8	901	2.81	30	0.09	931
		-075	1.0					*						
		S25-070	1.0					*	18.8	45	2.39			45
		Total	606.9	2122	3.50	1297.50	2.14	3419.50	4719.9	13228	2.80	7314.50	1.55	20542.50
		Annual Total	2731.4	9975		7012.50		16987.50	19013.9	58182		51709.50		109891.50

* Effort—no catch

Esfuerzo—no hubo captura

DISTRIBUCION DEL ESFUERZO DE LA PESCA DEL ATUN EN EL
OCEANO PACIFICO ORIENTAL TROPICAL Y LAS CAPTURAS
RESULTANTES, POR TRIMESTRES DEL AÑO. 1959 - 1962

por

Franklin G. Alverson

INTRODUCCION

Este informe es una secuela de uno publicado previamente por la Comisión (Alverson, 1960) que cubrió los años de 1951 a 1958. Se basa enteramente en la información recolectada de los diarios de pesca de los barcos rederos y de carnada, que se ocupan de la pesquería del atún aleta amarilla (*Thunnus albacares*) y del barrilete (*Katsuwonus pelamis*) en el Pacífico Oriental, desde 1959 a 1962.

Durante los cuatro últimos años de 1959-1962 inclusive, han ocurrido cambios dramáticos en la pesquería del atún aleta amarilla y del barrilete en el Pacífico Oriental (Orange y Broadhead, 1959; Broadhead y Marshall, 1960; McNeely, 1961; y Broadhead, 1962). Estos cambios se iniciaron en 1957 y 1958 debido al éxito de los barcos de carnada M/V *Sun King* y M/V *Southern Pacific* al ser convertidos a barcos rederos. La demostración de que los barcos rederos, equipados con poleas de fuerza hidráulica y redes de fibras sintéticas, eran más eficientes que los barcos de carnada en la captura de los atunes tropicales, especialmente el atún aleta amarilla junto con *spotted and spinner porpoises* (*Stenella* spp.), causó una revolución en la industria. Los barcos de carnada, desde el comienzo de la pesquería del atún tropical hasta 1959, han sido los mayores productores (Shimada y Schaefer, 1956; Schaefer, 1963). Sin embargo, con el rápido retiro de los barcos de carnada de la flota, su conversión y adición a la flota de los barcos rederos, han sido estos últimos los productores principales desde 1960. Además de la conversión de los cascos de los barcos de carnada, el éxito de los barcos rederos estimuló la conversión de una cantidad de cascos de barcos militares y otros, y nuevas construcciones.

El cambio rápido de un equipo a otros se refleja en los datos presentados en este informe. Existe una fuerte caída en la captura de los atunes por los barcos de carnada, concomitante con un aumento precipitado de la captura de los barcos rederos. Además el alcance geográfico y el carácter de la pesquería de los barcos rederos, ha cambiado más bien del límite primario explotando los recursos del atún aleta amarilla al norte del Golfo de Tehuantepec durante los primeros seis meses del año, a uno que cubre la región entera de la pesquería del atún tropical en el Pacífico Oriental, la Isla Cedros, México, hasta el norte de Chile, durante todo el año.

Un resultado directo del aumento en el uso de este equipo más eficiente, y el consiguiente aumento en la intensidad de pesca, fue la captura, en 1960 y 1961, del atún aleta amarilla en exceso al rendimiento máximo sostenible en el Pacífico Oriental (Schaefer, 1961 y 1962). Debido a la pesca excesiva en 1960 y 1961, la Comisión recomendó una cuota de captura en 1962 para conservar y restaurar estos recursos valiosos.

La mayor parte de este informe consiste de cartas que muestran la distribución geográfica de las capturas del atún aleta amarilla y del barrilete, por trimestres del año, y áreas de un grado tanto para los barcos rederos como los de carnada. Se han recopilado los datos tabulados de la captura, el esfuerzo y captura por unidad de esfuerzo por áreas de cinco grados, para ambos tipos de equipo.

Anteriormente, la Comisión ha publicado una cantidad de Boletines que tratan de la distribución geográfica de la captura y/o el esfuerzo del atún aleta amarilla y del barrilete (Shimada, 1958; Alverson, 1959 y 1960; Griffiths, 1960; Calkins 1961 y 1963, y Martin 1962).

METODOS

Fuente de datos

La información sobre las áreas de pescas, el esfuerzo gastado, y las cantidades capturadas de cada especie, ha sido obtenida solamente de los registros de los diarios de pesca de los barcos rederos y de carnada ocupados en la pesquería. Estos datos son recolectados por la Comisión mediante su sistema de diarios de pesca (Schaefer, 1953; Shimada y Schaefer, 1956).

Los métodos usados en el análisis y la tabulación de la información de los diarios de pesca han sido descritos por Shimada (1958) y Martin (1962). La cantidad asignada de cada especie a cada área estadística se basa en las estimaciones registradas por los pescadores en sus diarios de pesca. Sin embargo, las estimaciones de las capturas de ambas especies hechas por los pescadores de los barcos rederos y de carnada son exactas (Shimada, 1958), como lo indica la comparación de la suma de las capturas diarias registradas con las cantidades pesadas en el desembarque de viajes individuales. Los datos de los diarios de pesca, para viajes individuales, se usaron solamente si la captura consistía por los menos de 2/3 por peso de atún aleta amarilla y/o barrilete.

Se han obtenido los datos de los diarios de pesca de los barcos que operan fuera de los puertos de México, Cosca Rica, Panamá, Perú y Puerto Rico, además de aquellos que desembarcan en los Estados Unidos. Las capturas totales para las áreas más meridionales, están en alguna forma relativamente subestimadas a las áreas más hacia al norte, debido a que se cubre en forma menos completa los barcos que operan fuera de los puertos del sur.

Sistema estadístico

Las áreas estadísticas y los números del código asignados a ellas se indican en la Figura 1. Las capturas se tabulan normalmente por áreas de un grado, la unidad estadística más pequeña que se emplea. Las capturas de origen general dentro de un área de cinco grados, esto es las que no pueden asignarse a una unidad específica de un grado, no han sido incluidas en ninguna de las figuras que muestran la distribución de la captura. En ningún año estas cantidades exceden el uno por ciento del tonelaje total registrado para cada equipo de pesca. Las tablas incluyen sin embargo, todas las capturas de origen general.

RESULTADOS

Composición de la flota

La composición de la flota de alta mar, operando desde puertos en las Américas, incluyendo a Puerto Rico, que pescan los atunes tropicales en el Pacífico Oriental ha cambiado radicalmente desde 1957. La mayor parte de este cambio ha ocurrido en los últimos cuatro años, 1959-1962.

En 1957, los barcos de carnada, con una capacidad aproximada de 40,700 toneladas hicieron por lo menos un viaje durante cada año, pescando atunes tropicales. Comenzando con el M/V *Sun King* en 1957, un total de 29,460 toneladas de la capacidad de los barcos de carnada han sido convertidos al equipo redero. En la Tabla 1 se ha tabulado por trimestres del año la capacidad de tonelaje substraída de la flota de los barcos de carnada, para su conversión a barcos rederos durante el período de 1957 a 1962. En la mayoría de los casos, se consideró el trimestre del retiro como el en que el barco completó el desembarque de los peces tomados en su último viaje como barco de carnada. Como excepción hubo unos pocos barcos que estaban inactivos; en ese caso, el trimestre en el cual comenzaron su conversión se consideró el trimestre de su retiro de la flota de los barcos de carnada. La remoción de los barcos para su conversión, hundimientos, transferencia a otras pesquerías y otros factores, redujeron la flota de los barcos de carnada a tal grado que la capacidad de tonelaje aproximado que se hizo por lo menos en un viaje durante 1962 fue solamente de 7,500 toneladas.

El cuadro de los barcos rederos es una imagen reflejada de la de los barcos de carnada. La capacidad de tonelaje fue baja in 1957; aproximadamente se pescaron 6,600 toneladas de capacidad de atunes tropicales por lo menos en un viaje ese año. Al final de 1962, se había agregado un total aproximado de 29,800 toneladas de capacidad a la flota de los barcos rederos por medio de la conversión de los barcos de carnada, militares y otros cascos de barcos, y por medio de nuevas construcciones. La capacidad de tonelaje agregado a la flota de los barcos rederos, durante el período de 1957 a 1962 es tabulado en la Tabla 2, por trimestres del año. El trimestre en el cual un barco hizo su primer viaje como barco redero se consideró como el trimestre de entrada. El crecimiento neto, adiciones menos los retiros, fue tal, que en 1962 aproximadamente 31,000 toneladas de la capacidad de los rederos hicieron por lo menos un viaje durante este año.

Especies registradas

Las capturas registradas por los pescadores en sus diarios de pesca entran en cuatro categorías: atún aleta amarilla, barrilete, atún aleta amarilla y barrilete mezclados y no identificados separadamente, y atún aleta amarilla y/o barrilete, especies no especificadas. El tonelaje de las dos últimas categorías ha sido prorrateado según la proporción de tonelaje identificado de atún aleta amarilla y barrilete registrado para cada área de un grado por trimestres del año (Martin, 1962). Por lo tanto, los datos de la captura tabulados en las Tablas 3 y 4 están en dos categorías: atún aleta amarilla y barrilete. Durante el período de cuatro años 1959 a 1962,

el 2.5 por ciento del tonelaje registrado por los barcos de carnada cayó en las categorías mezcladas; en ningún año excedió el cuatro por ciento de la captura total registrada. El tonelaje registrado en las mismas dos categorías por los barcos rederos en el mismo período, ascendió también al 2.5 por ciento de la captura total registrada, y en ningún año excedió al 3.2 por ciento de la captura registrada.

Tonelaje total registrado y desembarcado

En la Tabla 3 se compara el tonelaje total por especies, registrado en los diarios de pesca de los barcos rederos y de carnada para los años individuales con el tonelaje total desembarcado en cada año. Lo cubierto por los diarios de pesca varía del 76.4 al 91.9 por ciento para el atún aleta amarilla y del 51.6 por ciento al 74.7 por ciento para el barrilete.

Esfuerzo global, captura y captura por unidad de esfuerzo por áreas de cinco grados

El esfuerzo registrado, el resultado de las capturas y la captura por unidad de esfuerzo de los barcos de carnada y rederos, para el período de 1959 a 1962 por áreas de 5 grados, y por trimestres del año se dan en la Tabla 4. La localidad geográfica de cualquiera de las áreas de cinco grados enumeradas en la tabla pueden encontrarse examinando la Figura 1. El Area 25-110, que está dividida en dos porciones en Baja California, tiene dos números de código: 25-110A representa la parte del área en el Golfo de California y 25-110B aquella propia del Océano Pacífico. El esfuerzo, expresado en días, ha sido estandarizado a barcos de 201-300 toneladas de capacidad para los barcos de carnada, y a barcos de 101-200 toneladas de capacidad para los barcos rederos. Los métodos usados para la estandarización del esfuerzo de los barcos de carnada ha sido descrito detalladamente por Shimada y Schaefer (1956) y Griffiths (1960). Se usó un procedimiento similar para estandarizar el esfuerzo de los barcos rederos. La captura se da en toneladas, a la tonelada más cerca, excepto donde la captura es de menos de una tonelada, en tal caso se da a 1/4 de tonelada más cercano, y es enumerada por especies. El esfuerzo empleado, la captura de cada especie, y el total de ambos, se suman para cada trimestre de cada año. Un total anual sigue a todos los resúmenes de los cuatro trimestres.

Captura total por áreas de un grado

La distribución de las capturas del atún aleta amarilla y del barrilete por áreas de un grado, por trimestres del año, como ha sido informada por los barcos rederos y de carnada para los años de 1959-1962, se dan en las Figuras 2 a 33. Se han hecho figuras separadas para los barcos de carnada (Figuras 2 a 17) y para los barcos rederos (Figuras 18 a 33), describiendo la captura del atún aleta amarilla y del barrilete separadamente. Las capturas registradas en los diarios de pesca como atún aleta amarilla y barrilete, y atún aleta amarilla y/o barrilete han sido prorrateadas y están incluidas en los gráficos. En estas figuras, la captura se presenta en cinco intervalos de magnitud: pescado, no hubo captura; menos de 25 toneladas; 25-99 toneladas; 100-499 toneladas y 500 toneladas o más.

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