Col.Vol.Sci.Pap. ICCAT, 3: 125-136(1974)

ICCAT's Statistical Program and its Problems

by

P. M. Miyake
ICCAT Assistant Executive Secretary

CONTENTS

1. Catch and effort statistics

a. Requirements

All requirements for catch and effort statistics as well as for biological data are explained in the ICCAT "Field Manual for Statistics and Sampling of Atlantic Tunas and Tuna-Like Fishes". The following is only a summary of these requirements.

Task 1 Statistics.

Catch - Annual tuna catch (in weight) by flag, by species and by gear, for the total Atlantic and its adjacent seas (Mediterranean).

Effort - Number of boats engaged in tuna fisheries, by size class of vessel, and by gear.

Task 2 Statistics.

Surface fishery - Catch (in weight) and effort (in number of days fishing, etc.) by gear, by species, by month and by 1º longitude x 1º latitude area.

Longline fishery - Catch (in weight or number of fish) and effort (in no. of hooks, etc.) by species, by quarterly period and by 5º x 5º area.

The above data are collected from three possible sources:

i) through National Offices
ii) through the CWP Secretary
iii) by direct contact with industries at the ports.

b. Collection through National Offices and CWP

Requests for statistics (see forms attached as Appendix 1) are sent out by the Secretariat every year in February either - directly to member countries and to non-members which fish significant amounts of tuna in the Atlantic Ocean (1,000 MT),

- or via the CWP Secretary to non-member countries which fish only insignificant amounts of tuna.

The deadlines are May for Task 1 statistics, and August for Task 2 data.

With a few exceptions, countries which receive the request directly, forward the Task 1 statistics by mid August. At that time, the ICCAT Secretariat contacts the CWP Secretary to make arrangements for obtaining data from the missing countries.

In regard to Task 2 statistics, ICCAT is interested in covering all the major tuna fisheries. Most of these are covered by the National Offices, which generally submit the data with a delay ranging from 6 to 18 months.

c. Direct contact with industries at the ports

Since 1972, the ICCAT Secretariat has employed an expert to visit the important ports, contact industries (canneries, shipping agencies, brokers, fishermen, etc.), obtain catch and effort data and also landing data, and collect logbooks. Besides, in 1973, another expert was offered by the U.S. to work on a similar assignment under the Secretariat's instructions.

Tuna fishing fleets are international, and the registration of a vessel does not necessarily coincide with the nationality of the owners and/or crew. As a result, information on many boats is missing from statistics provided by the National Offices. This situation made it necessary for us to take direct action and we are presently collecting statistics for about 250 boats. The forms developed for this activity appear as Appendix 2.

d. Secretariat assistance in developing national statistical systems (Appendix 3)

The Secretariat agreed to assist a few countries in collecting more adequate statistics for their own vessels. In such cases, the following steps were taken:

Step 1. Fishermen, industries, and government statisticians were contacted to ascertain what data were available.

Step 2. The nature, coverage, accuracy, etc. of the data were studied carefully. At this stage, we invited national scientists to participate in the program.

Step 3. In collaboration with national scientists, we examined carefully ways of establishing a statistical system for each fishery.

Step 4. The systems were established and the work of collecting statistics and sampling got under way. At this stage, national scientists have generally taken the initiative and the Secretariat staff just assists for the first 1 or 2 years.

Step 5. National scientists have completely taken over the work and the Secretariat has only a consultative function.

The outcome of these projects has been very successful and, in most of the areas, very satisfactory and adequate data are becoming available.

2. Biological Data

ICCAT's requirements can be summarized as follows (see forms in Appendix 4):

i) Actual size frequencies of fish should be provided for the major surface fisheries by 5º x 10º area, by month, and for major longline fisheries by 10º x 20º area, by quarterly period.

ii) Size frequencies weighted by catch (catch by size of fish) should be provided for major fisheries by larger temporal-spatial stratum.

The above data are generally sent to the Secretariat by the National Offices. However, in cases where an important fishery is not covered by the country concerned, the Secretariat assists in developing sampling programs for this fishery, as in the case for catch and effort statistics.

3. Present problems in data collecting

a. Accuracy and adequacy of data

i) Species breakdown. Many countries fail to compile their statistics by species, or do not make accurate species breakdowns. The main reasons for this are as follows:

- Incorrect species identification by fishermen.
- No species distinction made between two or more species which have the same commercial value.
- Using a common local name in different regions for different species.
- Using different local names for the same species, depending on the size of the fish and/or the region.
- Unsuitability of reporting forms used between regional offices and Central Office.
- Confusion with the translation of names.

ii) Catch versus landing. In ICCAT, we define "catch" as the amount of fish taken from the sea by the fishing gear while "landing" refers to the amount of fish brought back to the port and unloaded.

Discrepancies between catches and landings may be due to the following factors:

- Time and area of catch not coinciding with those of landings.
- Discarding of part of the catch.
- Consumption of part of catch by the boat crew.
- Estimates being given for the catch while actual weights are used for landings.

iii) Flag country. All ICCAT statistics are supposed to be classified by flag country. Because of the complexity of tuna fishing and its industry, at times the responsibility for collecting statistics lies nowhere. Consequently we have found that many boats have not been covered by our statistical systems. This fraction of data now represents an important part of Atlantic tuna catches. ICCAT is trying to establish a system to cover these vessels, with the collaboration of all the National Statistical Offices involved.

iv) Discarding. "Catch" data are supposed to include the amounts of fish discarded at sea (although this is not always the case), while "landing" data do not. The amount discarded would increase considerably if, and when, regulations such as quotas or minimum size controls enter into effect.

v) Sport fisheries. Sport fisheries are generally scattered and catches are rather sporadic. Besides, the fish captured do not appear on the commercial market. Moreover, in many countries, commercial fisheries and sport fisheries are controlled by separate government organizations.

vi) Condition of the fish. Particularly in the case of the longline fishery, large fish are generally gilled and gutted or filleted. Therefore some conversion factors are needed to estimate the live weight from the record of the fish unloaded in a condition other than round. Conversion factors can be obtained by adequate sampling. Nevertheless statistical reports should clarify in what condition fish are unloaded.

b. Timeliness in the reporting of data

i) The delay of fishermen in submitting reports to the authorities or scientists.

In small scale local fisheries using a large number of boats, a delay may be anticipated in gathering statistics because of the wide geographical distribution of the boats. Nominating coordinators at each port may partly solve the problem.

More serious problems affect vessels of distant water fisheries. These boats stay for long periods at sea and unload their catches at foreign bases.

ii) Delay in checking the data. Before the data can be processed, careful checking is always necessary (species, area, gear, etc.) and can be very time consuming.

iii) Delay in processing. This is another problem difficult to solve. When the fishery is complicated, such as high sea longline fishery, purse seine fishery, etc. the data have, of course, to be processed by computer, which could involve a considerable delay.

iv) Delay in disseminating information. Generally there is a large amount of processed data, particularly for Task 2. To disseminate this information to everybody requires printing, and this can give rise to economic problems, Some countries are solving this by using photo-processed printing of computer printouts.

v) Delay in reporting due to bureaucratic red-tape. This would appear to be a minor problem but it is a difficult one to solve.

4. Monitoring system

When measures of conservation, for example a catch quota system, are brought into effect, the Commission requires some system by which current catches by each country can be monitored, according to gear. For a Commission such as ICCAT, this task is not an easy one since national offices are principally responsible for reporting catches. Besides, many of the catches are unloaded in foreign ports. As explained in previous sections of this document, the Commission now has a member of the Secretariat staff making direct contact with the

laboratories, port authorities, scientists, fishing companies and transshipment agencies at various ports where most of such foreign vessels transship. As a result, it seems that to establish such a monitoring system is no longer impossible, though it may still be difficult. With the cooperation of national scientists at ports where transshipments are made, it appears that we are now monitoring almost 60-80% of the boats fishing for tropical tuna and, if necessary, we can establish a similar system for temperate tuna.

5. Dissemination of data

a. Preliminary statistics

The Secretariat issues, for the important species of tuna, a preliminary estimate of the total annual catch, by country, in March-April of the following year.

b. Statistical Bulletin

This is published annually and includes all the Task 1 data for the previous year.

1st edition - end of August
2nd " - October
Final " - December/January.

The Bulletin is in three parts:

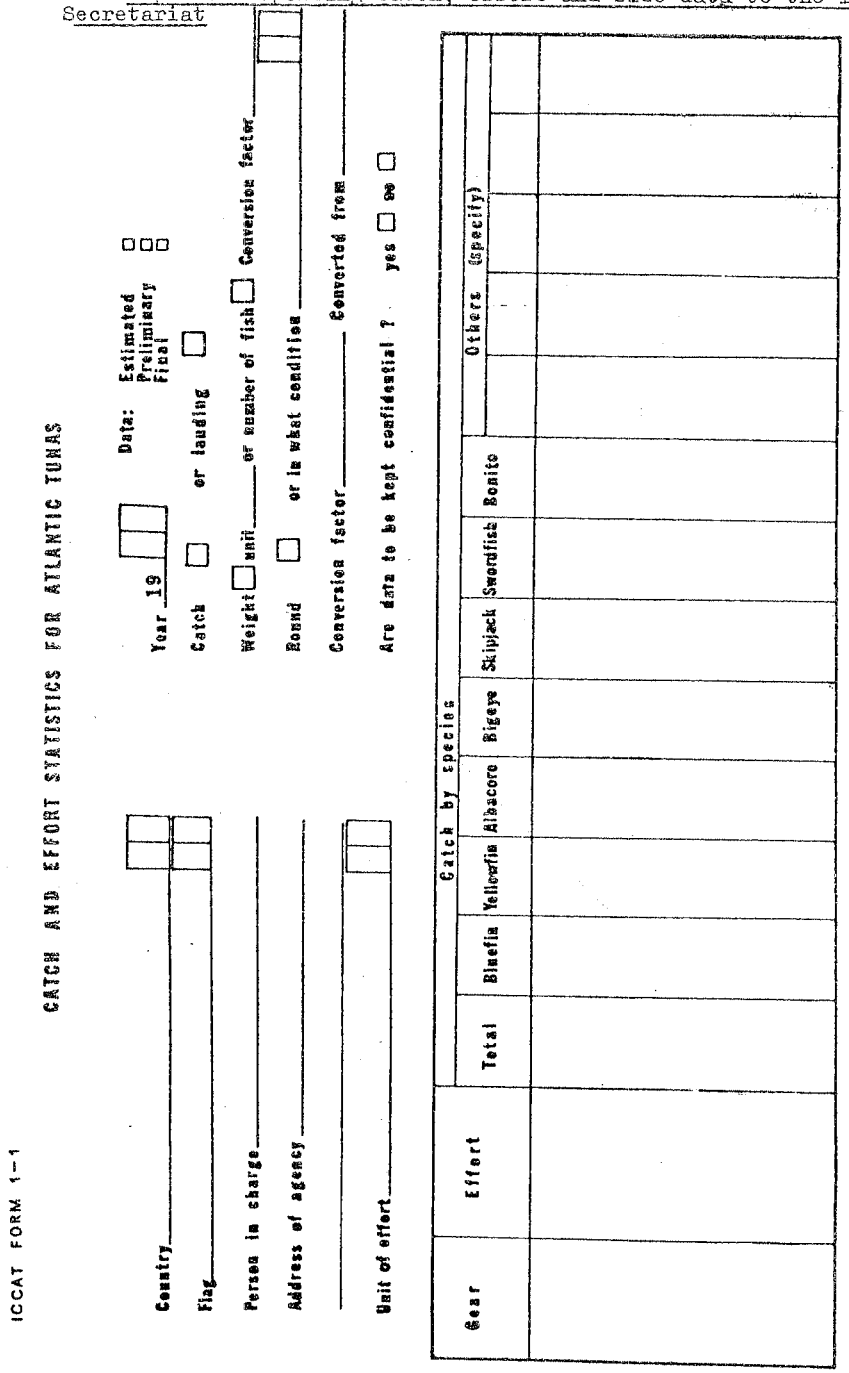
Part I - Total catch by species and total catch by country
Part II - Total catch by species and by country
Part III - Catch and effort by country, by gear, etc.

c. Other publications

All Task 2 (catch and effort by area and period) and biological data submitted by National Offices or collected by the Secretariat are published in a compendium called the "Data Record", twice a year, in March and October.

In 1972, ICCAT published the "Field Manual for Statistics and Sampling of Atlantic Tunas and Tuna-Like Fishes". This publication has proved to be of great assistance to the National Offices responsible for tuna statistics.

Appendix 1. - Form for reporting catch, effort and size data to the ICCAT Secretariat



ICCAT FORM 1-2

CLASSIFICATION OF BOATS FISHING TUNA IN THE ATLANTIC

FLAG COUNTRY_____ YEAR _____

REMARKS_____

	WOOD CONSTRUCTION				STEEL CONSTRUCTION	
	WITHOUT POWER		WITH POWER		WITH POWER	
	MULTI PURPOSE	TUNA ONLY	MULTI PURPOSE	TUNA ONLY	MULTI PURPOSE	TUNA ONLY
LONGLINERS (Gross Tons) Decklooded-type motherboat 201 – 500						
501–1000						
1000 above						
Self operating motherboat 51 – 200						
201 – 500						
501–1000						
1001 above						
Homeland – based 0 – 50						
51 – 200						
201 – 500						
501–1000						
1001 above						
Foreign – based 0 – 50						
51 – 200						
201 – 500						
501–1000						
1001 above						
PURSE SEINERS (Capacity - MT) 1 – boat type 0 – 50						
51 – 100						
101 – 200						
201 – 300						
301 – 400						
401 above						

	WOOD CONSTRUCTION				STEEL CONSTRUCTION	
	WITHOUT POWER		WITH POWER		WITH POWER	
	MULTI PURPOSE	TUNA ONLY	MULTI PURPOSE	TUNA ONLY	MULTI PURPOSE	TUNA PURPOSE
PURSE SEINERS 2 – boat type (GT) 0 – 50						
51 – 150						
151 above						
BAITBOATS Ice well (GT) 0 – 50						
51 – 150						
151 above						
Freezer (Capacity – MT) 0 – 50						
51 – 151						
151 above						
No cooling No class						
TROLLERS (GT) 0 – 50						
51 – 150						
151 above						
OTHERS No class						
SPORT FISHERIES No class						

ICCAT FORM 2

TUNA CATCH AND EFFORT STATISTICS BY AREA, MONTH, AND SPECIES (TASK 2)

Country ______ [1] [2]

Flag ______ [3] [4]

Gear ______ [5] [6]

Unit of effort ______ [7] [8]

Year 19 [9] [10]

Data: Estimated ☐ Preliminary ☐ Final ☐

Catch [11] ☐ or landing ☐

Weight ☐ (express unit) ______ or no. of fish ☐ Conversion factor ______ [12]

Round ☐ or in what condition ______

Conversion factor ______ converted from ______

Data: Sampled ☐ 100 % coverage ☐ Coverage rate [13 … 16] %

Are data to be kept confidential ? yes ☐ no ☐

REMARKS

Month	AREA: Size	AREA: Quadrant	AREA: Lat. 22	AREA: Long. 26	Effort 32	Catch by species: Total 33–38	Bluefin 39–43	Yellowfin 48	Albacore 53	Bigeye 58	Skipjack 63	Swordfish 68	Bonito 73	Other species (specify)			

Month	AREA: Size	AREA: Quadrant	AREA: Lat. 22	AREA: Long. 26	Effort 32	Catch by species: Total 33–38	Bluefin 39–43	Yellowfin 48	Albacore 53	Bigeye 58	Skipjack 63	Swordfish 68	Bonito 73	Other species (specify)			

ICCAT FORM 3 – 5

SUMMARIZED SIZE FREQUENCY WEIGHTED BY CATCH

REPORTING COUNTRY [1 2] YEAR 19 [9 9]

FLAG COUNTRY [3 4] GEAR [10 11]

SPECIES [5 6] REMARKS

SAMPLE REPRESENTS CATCH ☐ [7]
OR LANDING ☐

REGION (Columns 13 – 19)								
MONTH (S) (20 – 21)								
TOTAL NO OF SPECIMENS (22 – 25)								
NUMBER OF SAMPLES (26 – 28)								
TOTAL WEIGHT OF SAMPLES								
TOTAL WEIGHT OF CATCHES FOR EACH PERIOD AND REGION								
WEIGHTING FACTOR (29 – 32)								
(33 – 34)								

CARD NO.	COLUMNS	CLASS							
1	35 – 37	0 –							
	38 – 40	1 –							
	41 – 43	2 –							
	44 – 46	3 –							
	47 – 49	4 –							
	50 – 52	5 –							
	53 – 55	6 –							
	56 – 58	7 –							
	59 – 61	8 –							
	62 – 64	9 –							
	65 – 67	0 –							
	68 – 70	1 –							
	71 – 73	2 –							
	74 – 76	3 –							
	77 – 79	4 –							
2	35 – 37	5 –							
	38 – 40	6 –							
	41 – 43	7 –							
	44 – 46	8 –							
	47 – 49	9 –							
	50 – 52	0 –							
	53 – 55	1 –							
	56 – 58	2 –							
	59 – 61	3 –							
	62 – 64	4 –							
	65 – 67	5 –							
	68 – 70	6 –							
	71 – 73	7 –							
	74 – 76	9 –							
	77 – 79	9 –							
3	35 – 37	0 –							
	38 – 40	2 –							
	41 – 43	4 –							
	44 – 46	6 –							
	47 – 49	8 –							
	50 – 52	0 –							
	53 – 55	2 –							
	56 – 58	4 –							
	59 – 61	6 –							
	62 – 64	8 –							
	65 – 67	0 –							
	68 – 70	2 –							
	71 – 73	4 –							
	74 – 76	6 –							
	77 – 79	8 –							
4	35 – 37	0 –							
	38 – 40	2 –							
	41 – 43	4 –							
	44 – 46	6 –							
	47 – 49	8 –							
	50 – 52	0 –							
	53 – 55	2 –							
	56 – 58	4 –							
	59 – 61	6 –							
	62 – 64	8 –							
	65 – 67	0 –							
	68 – 70	2 –							
	71 – 73	4 –							
	74 – 76	6 –							
	77 – 79	8 –							

Appendix 2. - Form used for collecting landing statistics directly at ports

PORT FORM I

ICCAT FORM for recording UNLOADING AND TRANSSHIPMENT

Date _____ Report _____

Port _____ Data Origin _____

Name of Vessel _____ Flag _____

Fishing Gear _____ Total Effort _____

Trip started from _____ On _____

terminated at _____ On _____

General Area of Catch _____

Species	Condition	Average Size	Unloading Weight Short Tons	Catch Metric Tons	Destination Trans-Shipment	Agency	Cargo Boats
TOTALS							

REMARKS:

PORT FORM II

ICCAT FORM for recording UNLOADING AND TRANSSHIPMENT

Date _____ Report _____

Port _____ Data Origin _____

Name of Vessel _____ Flag _____

Fishing Gear _____ Total Effort _____

Trip started from _____ On _____

terminated at _____ On _____

General Area of Catch _____

Species	Condition	Average Size	Unloading Weight Short Tons	Catch Metric Tons	Destination Trans-Shipment	Agency	Cargo Boats
Albacore	RD						
Yellowfin	GG						
"	RD						
Bigeye	GG						
"	RD						
Bluefin	GG						
"	RD						
Swordfish	DWT						
"	Fillet						
BlackMarlin	DWT						
BlueMarlin	DWT						
WhiteMarlin	DWT						
TOTALS							

REMARKS:

ICCAT FORM FOR RECORDING LANDINGS

PORT FORM 'B'

DATE ______________________

REPORTER ______________________

ADDRESS ______________________

FISHING GEAR ______________________

COVERING PERIOD ______________________

REMARKS ______________________

BOAT NAMES	FLAG	TRIP			GENERAL AREA	ALBACORE CONDITION: ( )	YELLOWFIN CONDITION: ( )	BIGEYE CONDITION: ( )	BLUEFIN CONDITION: ( )	SWORDFISH CONDITION: ( )	SAILFISH CONDITION: ( )	MARLINS CONDITION: ( )	OTHERS ( )	TOTAL
		DATE OF DEPARTURE	DATE OF ENTRY	PORT OF ENTRY										

Boat Name ______________________ Nationality ______________________ Owner ______________________

Gear ______________________ G. T. ____________ Hp. ____________ Capacity ____________ Agency ______________________

Port ______________________

UNIT:

Year: Trip No.	Period	Port of Landing	No. Days At Sea	No. Days Fishing	Effort ( )	Bluefin	Albacore	Yellowfin	Bigeye	Skipjack	Swordfish	Billfishes	Others			TOTAL	Remarks

Form used for monitoring landings for each boat

Appendix 3. - Example of forms developed by ICCAT to assist in the establishment of statistical systems for National Offices

Página _____ de _____ Páginas

I - 1 ENCUESTA - ESTADISTICAS DE DESEMBARCO

Entrevistador

Puerto de Desembarco

Fecha de Desembarco: Mes / Día / Año

Total desembarcado en el puerto (Kg) * *

Atún blanco "Bonito"	
Atún	
Atún blanco y Atún(mezclado)	
Otros	
T o t a l	

ATUNEROS ("BONITEROS")

Nombre del barco	Características. Número de folio	Modalidad de pesca CV y L *	Tonelaje	Número de millas	Tripulación	Datos de la Marea. Fechas partida	Puerto Partida	Nº días buscando Cebo	Nº días pescando	CAPTURAS. Atún blanco ("Bonito")	Atún	Atún blanco ("Bonito") y Atún (mezclados)	Otros túnidos	Total

Si es necesario, continuar sobre otra hoja reproduciendo los datos del encabezamiento

* CV = Cebo vivo L = Liña (Curricán o pluma)

* * Fuente de estos Datos: _____

I-2 ENCUESTA SOBRE LAS MAREAS ANTERIORES

Página _____ de _____ páginas

Puerto de encuesta

Nombre del barco

Folio

Entrevistador

Fecha

Fecha de partida	Puerto de partida	Fecha llegada	Puerto llegada	Modalidad de pesca CV, L, CV y L	Nº días buscando cebo	días pescando	CAPTURAS. Atún blanco "Bonito" Número	Peso	Atún Número	Peso	Atún blanco y Atún (mezclado) Número	Peso	Otros Túnidos Peso	TOTAL Número	Peso		Observaciones
																P	
																G	
																P	
																G	
																P	
																G	
																P	
																G	
																P	
																G	
																P	
																G	
																P	
																G	

II(a) - ENCUESTA - CAPTURAS Y ZONAS DE PESCA

Páginas ____ de ____ Páginas

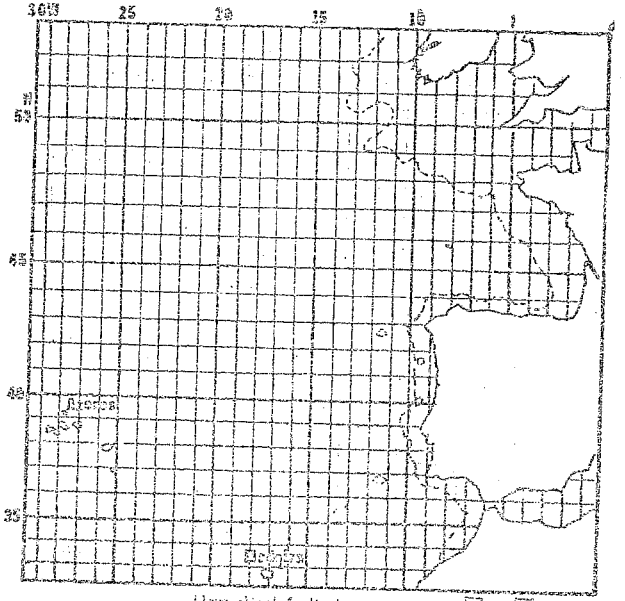
Entrevistador | Puerto | Fecha (Día, Mes)

Nombre del atunero ("Bonitero") | Folio

	Día	Mes
Fecha partida		
Puerto partida		
Nº Días buscando cebo		
Fecha comienzo pesca		
Fecha fin pesca		

Modalidad de Pesca | Tonelaje | Nº de líneas | Tripulación

Capturas reales desembarcadas (Número de Peces)	P	G
Atún blanco		
Atún		
Atún blanco y Atún		
Otros		
Total		



COMENTARIOS MAPA:
- Indicar (CV)s en la posición donde se pescó el cebo.
- Señalar las zonas de pesca inscribiendo (A) (B) (C) etc...

Lleva el patrón diario de pesca ? Sí ☐ No ☐

Zonas de pesca frecuentadas

Zona	Atún blanco ("Bonito") nº	Atún blanco ("Bonito") peso	Atún nº	Atún peso	Otros peso	Fechas aproxim. de	Fechas aproxim. hasta	Modalidad de pesca CV, L y CV	Días rastreando *	Bodegas **	Observaciones sobre tallas y barcos
Total											

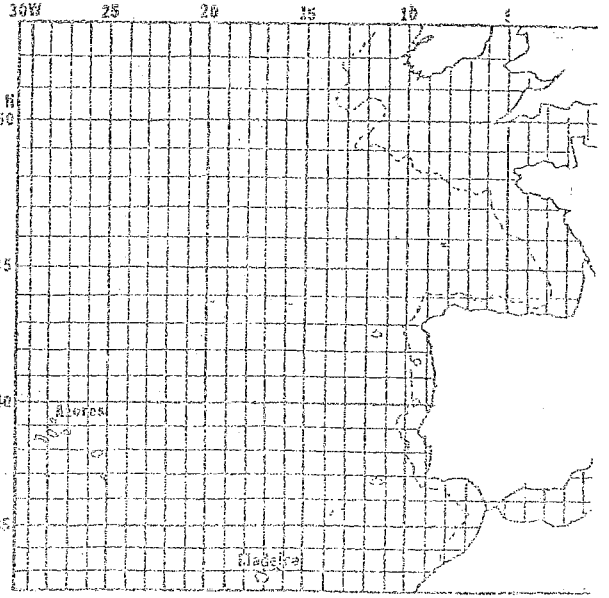
* No incluir los días en que no hubo pesca ni búsqueda (aún encontrándose en los caladeros), o por cualquier razón.

** Se tomará esta información siempre que haya posibilidad.

II(b) ENCUESTA - CAPTURAS Y ZONAS DE PESCA
(Cuestionario detallado)

DIAS	Atún blanco ("Bonito") P	Atún blanco ("Bonito") G	Atún P	Atún G	Posición

RELLENAR LOS DATOS DE LA OTRA CARA



	Día	Mes	Observaciones
Fecha partida			
Puerto Partida			
Nº días buscando cebo			
Fecha comienzo pesca			
Fecha fin pesca			

III - ENCUESTA - MUESTREO

Página ______ de ______ Páginas
Información tomada del Impreso II

Localización de las capturas	
Fechas de las capturas	
Arte utilizado	

	Desembarco total en el puerto el día del muestreo	Desembarco total del barco en esta Marea
Atún blanco("Bonito)		
Atún		
Atún blanco y Atún		
Otros		
Total		

Puerto ______

Fecha ______ ______ 19 ______
Día Mes año

Nombre del barco ______

Folio ______

Lugar del muestreo:
barco ☐ lonja ☐
fábrica ☐ comprador ☐

peso de la muestra (Kg) ______

Instrumento utilizado para medir ______

Persona que ha efectuado las mediciones ______

Frecuencia de la muestra							
Número de la bodega o zona de captura — Especies	Atún blanco ☐ Atún ☐ Otro ___	Atún blanco ☐ Atún ☐ Otro ___	Atún blanco ☐ Atún ☐ Otro ___	Atún blanco ☐ Atún ☐ Otro ___	Atún blanco ☐ Atún ☐ Otro ___	Atún blanco ☐ Atún ☐ Otro ___	Atún blanco ☐ Atún ☐ Otro ___
Tipo de medición	LH ☐ LD₁ ☐ LC ☐ Otro ___	Bodega o zona — LH ☐ LD₁ ☐ LC ☐ Otro ___	Bodega o zona — LH ☐ LD₁ ☐ LC ☐ Otro ___	Bodega o zona — LH ☐ LD₁ ☐ LC ☐ Otro ___	Bodega o zona — LH ☐ LD₁ ☐ LC ☐ Otro ___	Bodega o zona — LH ☐ LD₁ ☐ LC ☐ Otro ___	Bodega o zona — LH ☐ LD₁ ☐ LC ☐ Otro ___
Nº total de peces							

TOTAL ______

LH = Longitud horquilla
LD_1 = Longitud dorsal
LC = Longitud curva