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**INTERNATIONAL COMMISSION  
for the  
CONSERVATION of ATLANTIC TUNAS**

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**R E P O R T  
for biennial period, 1980-81  
PART I (1980)  
English version**

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MADRID, SPAIN

1981

# INTERNATIONAL COMMISSION FOR THE CONSERVATION OF ATLANTIC TUNAS

## *Member Countries (as of April 1, 1981)*

Angola, Benin, Brazil, Canada, Cape Verde, Cuba, France, Gabon, Ghana, Ivory Coast, Japan, Korea, Morocco, Portugal, Senegal, South Africa, Spain, U.S.A., U.S.S.R.

## *Chairman of Commission*

Dr. L. KOFFI, Ivory Coast.  
(from November 20, 1979)

## *First Vice-Chairman of Commission*

Mr. H. ROSA, Brazil  
(from November 20, 1979)

## *Second Vice-Chairman of Commission*

Mr. T. ISOGAI, Japan  
(from November 20, 1979)

## *Panel Membership (as of April 1, 1981)*

<b>Panel</b>	<b>Contracting Parties</b>	<b>Chairman</b>
1	Angola, Brazil, Cape Verde, Cuba, France, Gabon, Ghana, Ivory Coast, Japan, Korea, Morocco, Portugal, Senegal, Spain, U.S.A., U.S.S.R.	Ghana
2	Canada, France, Japan, Korea, Morocco, Portugal, Spain, U.S.A.	Morocco
3	Brazil, Japan, Korea, South Africa, U.S.A.	Japan
4	Angola, Canada, Cuba, Japan, Korea, Portugal, Spain, U.S.A., U.S.S.R.	Spain

## *Council*

No election was conducted for the 1980-81 biennial period.

## *Standing Committees*

### **Committees:**

Committee on Finance and Administration (STACFAD)

Committee on Research and Statistics (SCRS)

### **Chairman**

Mr. C. J. BLONDIN, U.S.A.  
(from November 22, 1977)

Mr. A. FONTENEAU, France  
(from November 22, 1977)

## *Secretariat*

Príncipe de Vergara, 17, 28001 Madrid (Spain)  
*Executive Secretary:* O. RODRÍGUEZ-MARTÍN  
*Assistant Executive Secretary:* P. M. MIYAKE

## LETTER OF TRANSMITTAL

The Chairman of the International Commission for the Conservation of Atlantic Tunas presents his compliments to the Member Governments to the Convention for the Conservation of Atlantic Tunas (signed in Rio de Janeiro, May 14, 1966), and to the Delegates and Observers representing said Governments, and has the honor to transmit the "**Report for the Biennial Period, 1980-81, Part I (1980)**", describing the activities of the Commission during the first half of said biennial period.

The volume contains reports of the Second Special Meeting of the Commission, held in November, 1980, and of all the associated meetings of the Standing Committees and Sub-Committees. In addition, it contains a summary of the activities of the Secretariat, and the National Reports on scientific activities related to tuna fisheries carried out by the various countries.

This Report has been drafted, circulated and approved in compliance with Article III, paragraph 9, and Article IV, paragraph 2-d, of the Convention, and Rule 15 of the Commission's Rules of Procedure. The Report is available in the three official languages of the Commission: English, French and Spanish.

*L. Koffi*  
*Commission Chairman*

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# CHAPTER I

## Secretariat Reports

### ADMINISTRATIVE REPORT 1980

COM/80/9 (Amended)\*

#### 1. Member countries of the Commission

There are some governments which are seriously considering the incorporation of their countries to the Commission. However, since the 1979 meeting there have been no new members of the Commission. Consequently, ICCAT is currently comprised of nineteen member countries.

#### 2. ICCAT meetings

Between May 29 and June 7, three inter-sessional meetings, the Sub-Committee on Skipjack, the Working Group on Juvenile Tropical Tunas and the SCRS Officers Meeting, were held in Brest, France, at the invitation of the "Centre Océanologique de Bretagne". Twenty-two scientists representing twelve countries and organizations attended one or more of the meetings.

##### *2.1 Meeting of the Sub-Committee on Skipjack (COM-SCRS/80/16)*

Progress made in the Skipjack Program was reviewed and special mention was made of the new skipjack fishery off Brazil, the completion of a tagging cruise by the United States as well as the planning of several tagging cruises by Senegal. The Sub-Committee also reviewed the activities of the Program and specified, where necessary, the number of samples to be collected and the laboratories where these samples were to be analyzed. Data management for the Program was discussed. The Secretariat was represented by the Assistant Executive Secretary, the Skipjack Program Coordinator and two secretaries.

##### *2.2 Working Group on Juvenile Tropical Tunas (COM-SCRS/80/17)*

The discussions of the Working Group on Juvenile Tropical Tunas, (J.B. Kothias

\* The Administrative Report presented at the Commission meeting was revised.

Amon, Convener) centered on the data base problem and improvement of the statistical system. The Secretariat processed all the data (except FIS and Spain) used at this meeting. The Working Group had access to COB's computer so on-the-spot analyses of data could be made. Some analyses were made on the effects of possible closure of fisheries with respect to area and/or a period of the year on catches assuming that the current fishing strategy does not change. For this purpose, yield-per-recruit analyses were conducted and possible gains of yellowfin and bigeye catches by protecting small tunas against losses of skipjack catches by such measures were discussed.

CECAF provided funds for scientists from some of its member countries to attend the meeting.

### *2.3 SCRS Officers Meeting (SCRS/80/26)*

The SCRS Chairman (A. Fonteneau), the Convener of the Sub-Committee on Statistics (S. Kume), Convener of the Sub-Committee on Skipjack (G. T. Sakagawa), the Working Group on Data Management Convener (R. H. Planet), the Working Group on Juvenile Tropical Tunas Convener (J. B. Kothias Amon), FAO representative (G. Sharp) and a representative of the Secretariat staff attended.

The officers discussed at length the new SCRS meeting organization and the recommendations presented by the Working Group on SCRS Organization. The SCRS Chairman dissolved the Working Group on Data Management as the work of that Group has been completed. In addition, the officers reviewed the progress made on the Skipjack Year Program, biostatistical development and ICCAT publications.

### *2.4 Working Meeting on Bluefin Tuna (SCRS/80/28)*

An informal meeting took place in July in Palermo (Sicily), and was attended by the following scientists: P. Arena, R. Sara, C. Piccinetti, H. Farrugio, M. Parrack and P. M. Miyake. Mediterranean bluefin tuna statistics were reviewed and catch statistics were corrected and finalized. A lot of new data on Italian catches was presented. Also, the possibility of initiating an ICCAT-type port sampling scheme for biological sampling was discussed.

### *2.5 Coordinating Working Party on Atlantic Fishery Statistics (CWP) (SCRS/80/27)*

Although this was a FAO meeting, the ICSEAF and ICCAT Secretariats -- in constant consultation with Mr. L. P. D. Gertenbach, CWP Secretary -- collaborated in the organization of the meeting and provided secretariat services. The meeting took place in Madrid, July 22-29, 1980, and 24 participants attended representing 12 countries and several international organizations such as CECAF, EUROSTAT, FAO, ICCAT, ICES, ICSEAF, NAFO, OECD and WECAF. The purpose of the meeting was to standardize the criteria for the collection of statistics by promoting greater coordination among the regional fishery bodies existing in the Atlantic area.

### 3. Meetings at which ICCAT was represented

#### 3.1 CECAF

The Executive Secretary attended, in an observer capacity, the meeting of the FAO Fishery Committee for the Eastern Central Atlantic (CECAF) held in Agadir (Morocco) on December 11-14, 1979.

The Executive Secretary spoke of the close collaboration which exists between the Commission and CECAF. He made particular mention of the statistical training course held jointly in Tenerife in 1978 as well as the joint meeting on juvenile tropical tunas held in Abidjan in 1979.

Dr. Rodríguez-Martín held several working meetings with various delegations attending the CECAF meeting, such as: Mr. A. Bayone, Director of Marine Fishing of the Congo and the Messrs. Aderounmo, Ajayi and Okpanefe of the Nigerian delegation. Both countries showed considerable interest in knowing the details of the ICCAT organization and solicited information on the administrative procedures to be followed for incorporation to the Commission as member countries.

#### 3.2 ICES "Dialogue Meeting"

An ICES "Dialogue Meeting" was held in Copenhagen on May 20 and 21. The purpose of the meeting was to study and seek solutions to the problem of the lack of an effective dialogue between fishery scientists responsible for the assessment of fish stocks in the northeast Atlantic and the Commissions and national authorities responsible for the management of the stocks.

The Northeast Atlantic Fisheries Commission (NEAFC), the International Baltic Sea Fishery Commission and the European Economic Community attended the meeting. Also invited as observers were the FAO, Northwest Atlantic Fishery Organization (NAFO), Intergovernmental Oceanographic Commission (IOC) and ICCAT.

At the meeting, emphasis was placed on the necessity of close, permanent communication between scientists and administrators for a better knowledge of the problems and for mutual collaboration to resolve these problems.

Since some of the matters discussed could be of interest to ICCAT, the Executive Secretary presented the report of the "Dialogue Meeting," in its original language, to the Commission as document COM/80/Inf. 1.

#### 3.3 General Fisheries Council for the Mediterranean (GFCM)

The Executive Secretary attended the XV Meeting of the GFCM held in Palma de Mallorca, September 22-26, 1980. He explained about ICCAT activities as they regard tuna regulations, and referred particularly to the bluefin tuna regulations. (See document COM/80/27).

At the time of the meeting, the Executive Secretary held working meetings with FAO representatives and the delegates from such countries as Italy, Yugoslavia, Algeria and Libya.



### 3.4 ICSEAF

The Executive Secretary represented ICCAT at the meeting of the International Commission for the Southeast Atlantic Fisheries, held in Palma de Mallorca (Spain), December 2-16, 1980.

## 4. Collaboration with other organizations

### 4.1 FAO

As in the past, close working cooperation has been maintained with the FAO Fisheries Department. Mutual assistance in collecting statistics and other information continued as in other years.

Close working relationships were also maintained with other organizations of the FAO Fisheries Department, such as the FAO Fishery Committee for the Eastern Central Atlantic (CECAF), the Western Central Atlantic Fishery Commission (WECAFC), the General Fisheries Council for the Mediterranean (GFCM), and of course, the FAO Committee on Fisheries (COFI).

*4.2 ICCAT has also maintained close working relations with the following organizations:*

- International Commission for the Southeast Atlantic Fisheries (ICSEAF)
- Inter-American Tropical Tuna Commission (IATTC)
- Northwest Atlantic Fisheries Organization (NAFO)
- Indo-Pacific Fisheries Commission (IPFC)
- Indian Ocean Fisheries Commission (IOFC)
- International Council for the Exploration of the Sea (ICES)
- Intergovernmental Oceanographic Commission (IOC)

## 5. Coordination of research

The coordination of research carried out by the Secretariat during 1980 is summarized in the "Secretariat Report on Statistics and Coordination of Research" (included in Chapter I of this Biennial Report), with further details reported in other documents (see below).

### 5.1 Statistics and Sampling

Reporting of statistics this year was considerably behind schedule, but nevertheless was mostly completed in time for compilation of the Provisional Statistical Bulletin (COM-SCRS/80/14).

The coverage of catches by port samplers hired through the Secretariat decreased sharply in 1979 because many vessels of Korean, Panamanian and Taiwanese fleets relocated their unloading and transshipping operations from the Canary Islands to Venezuela, Uruguay or outside the Atlantic. This year the Secretariat tried to contract part-time sam-

plers in Venezuela and Uruguay. Up to now the results have not been satisfactory.

### *5.2 Data processing*

Data processing in 1980 again increased and the INFONET system became quite saturated at times. Costs were kept low by executing all work in batch with low priority, but any urgent future work will cause increased costs in addition to that of the increase in rates which this year was approximately 15 percent.

### *5.3 General biostatistical work*

Following the SCRS recommendation, the Secretariat attempted to estimate Task I statistics as realistically as possible instead of simply using official statistics. Bigeye catches were re-examined and reported according to procedures in SCRS/80/30; yellowfin catches were separated into east and west at 30°W. Both procedures should assist in the evaluation of hypotheses on stocks.

Since past data from two sources on the Taiwanese fleet did not match, a special study was made to calculate landing statistics by port for this fleet. The results are reported in SCRS/80/67.

Work to improve bluefin statistics, begun in 1979 by the ICCAT biostatistician, was continued. Mr. H. Farrugio was contracted by the ICCAT to collect data from the Tunisian trap fishery (SCRS/80/29). Mr. M. Parrack completed a file on bluefin size data, and visited the Secretariat to check these and other data being compiled there, then proceeded to an informal meeting in Palermo, Sicily, with the Messrs. Piccinetti, Arena and Sara (Italy), Farrugio (France) and Miyake of the Secretariat. This meeting was reported in SCRS/80/28.

A program to study species identification and size sampling problems of African landing ports was postponed until 1981 because of administrative difficulties.

### *5.4 Biostatistical work for the Working Group on Juvenile Tropical Tunas*

The Secretariat prepared data files for the meeting of the Working Group on Juvenile Tropical Tunas at Brest and was able to perform some analysis there. The meeting was reported in document COM-SCRS/80/17.

### *5.5 Biostatistical work for the Skipjack Program*

Progress in the planning and implementing of activities for the International Skipjack Year Program was generally satisfactory, and was reported in detail in documents COM-SCRS/80/16, 18 and 19. The attention of the Commissioners was specifically drawn to COM-SCRS/80/18 on vessel clearance.

## 6. Publications

<i>Title</i>	<i>Vol.</i>	<i>Published</i>	<i>Contents</i>
Biennial Report, Part II	1978-79	Oct. 1980	
Statistical Bulletin	9 (1978) Final	Feb. 1980	
Statistical Bulletin	10 (1979) Prov.	Sept. 1980	
Stat. Bull.-Historical Data	Draft	Sept. 1980	
Collective Volume	IX (Nos. 1, 2, 3)	April, 1980	1979 SCRS Documents.
Collective Volume	X	Feb. 1980	Report of the Working Group on Juv. Trop. Tunas (Abidjan, 1979).
Collective Volume	XI	Sept. 1980	Report of the Working Group on Bluefin (Santander, 1979).
Collective Volume	XII	Mar. 1980	Report of the Subcommittee on Skipjack (Las Palmas, 1979).
Collective Volume	XIII	Oct. 1980	Report of the Working Group on Juv. Trop. Tunas (Brest, 1980).
Data Record	15	Mar. 1980	Data received from Nov. 1979 to Feb. 1980.
Data Record	16	Oct. 1980	Data received from Mar. to Sept., 1980.
Stat. Series	9	July, 1980	ICCAT Port Sampling-1979.
Newsletter	3 issues		

## 7. Secretariat and administration

## 7.1 Personnel

The following people left the Secretariat during the year: M. Laurent (biostatistician), J. Manning (statistical assistant), A. Rick (secretary) and M. J. Trapero (secretary). New additions to the Secretariat staff included D. Da Rodda (statistical assistant), O. Rodríguez (part-time statistical assistant), G. Messeri (Secretary), D. Magermans (Skipjack secretary) and B. F. de Bobadilla (part-time Skipjack secretary).

## 7.2 Trips

Besides the trips made by the Secretariat staff to attend meetings mentioned in Section 3 of this Report, the following trips were also made:

### a) Executive Secretary

The Executive Secretary made an official visit to two African countries (Gabon and Benin) which were recently incorporated into the Commission.

The purpose of this visit was to establish working relations at a personal level with the governments and especially with the national fishing authorities, as well as with the scientists and laboratories involved, with the goal in mind to intensify their collaboration with the ICCAT programs.

The Executive Secretary prepared an Information Document on this trip for presentation to the Commission meeting (COM/80/23).

On his return trip, he stopped in Abidjan (Ivory Coast) to visit Dr. L. Koffi, the Chairman of ICCAT. The Executive Secretary had the opportunity to exchange points of view with Dr. Koffi on general problems of the Commission.

The Executive Secretary held working meetings with F. X. Bard and J. B. Kothias Amon, who explained to him the activities of the CRO in relation to the Skipjack Program. The Executive Secretary visited two tuna boats that were unloading in the port of Abidjan, the "Rospico," carrying a French flag and the "Txori-Urdin," a Spanish flag vessel.

He also visited the installations and equipment that CRO has in the fishing port which are utilized in gathering statistical data and for sampling.

### b) Assistant Executive Secretary

The Assistant Executive Secretary made an extended tour to Central and South America in March, 1980. The trip covered the following areas and involved various objectives.

#### i) St. Maarten

He reviewed the port sampling presently carried on and improved the data collection, particularly the catch and effort statistics.

#### ii) Venezuela (Caracas and Cumaná)

The Assistant Executive Secretary contacted government, laboratory and industry people to get past landing data by foreign flag vessels in order to separate Venezuelan boat catches from foreign landings. He also established a port sampling system in case unloading by foreign vessels is resumed.

iii) Brazil (Rio de Janeiro, Brasilia, Sao Paulo)

Here he contacted administrators, scientists and industry people to discuss the development of the new surface fishery and to establish a sampling system for it.

iv) Uruguay (Montevideo)

Dr. Miyake contacted government officials, ship handler agents, cold storage companies, etc., and contracted a person to work for the ICCAT port sampling program. He also collected some landing statistics by longliners for past years.

v) Argentina (Buenos Aires)

At this port various agencies who handle tuna transshipments in Montevideo were contacted. The new port sampling system was explained and cooperation was solicited, since all tuna handlers in Montevideo are based in Buenos Aires.

c) Skipjack Program Coordinator

Between April 20 and May 3, 1980, the Coordinator of the International Skipjack Year Program visited Cuba, Venezuela and Brazil to review progress in planning and other matters specific to each country.

i) Cuba

Plans to contribute tagging, larval surveying, fishery oceanography and sampling for maturity-fecundity were reviewed. The problem of obtaining statistics from small artisanal fisheries was also discussed. Arrangements were made for the provision of instructions and some materials for the field work.

ii) Panama (WECAFC)

Advantage was taken of a five-hour stop-over at the airport in Panama to meet Mr. L. Villegas of WECAFC, who suggested several possible sources of assistance to the Skipjack Program. Since the meeting, WECAFC has assisted considerably with the distribution in the Caribbean of posters and brochures on skipjack tagging activities.

iii) Venezuela

Some general information about the small local fishery for skipjack was gained, and the problem of gathering statistics and recovering tags was reviewed.

iv) Brazil

The newly developing fishery off Rio de Janeiro was discussed together with the possibility of gathering statistics and samples for the maturity-fecundity and biochemical

stock identification activities.

*7.3 Additional office space for the ICCAT Secretariat*

As was reported at the 1979 meeting, the Secretariat has rented additional office space on another floor of the same building, where the statistical department, the library and the Skipjack Coordinator have now been installed. This new office space was contracted by the Spanish Government, which assumes the corresponding financial responsibilities just as is the case for the offices on the seventh floor where the Secretariat has had its offices from the beginning. As the activities of the Secretariat continue to multiply, we may soon have to expand our offices even more.

O. Rodríguez-Martín  
*Executive Secretary*

## FINANCIAL REPORT 1980

COM/80/10 (Amended)\*

### I. REGULAR BUDGET

#### 1. Auditor's Report for the 1979 Fiscal Year

The Auditor has examined the accounts and balance sheet of the Commission up to December 31, 1979. In compliance with Regulations 9-3 and 12-7 of the Financial Regulations and in accordance with the recommendations of the Council at its Second Regular Meeting, the Secretariat sent a copy of the Auditor's Report to all member country governments in July, 1980. An abstract of the same was included as Statement 10 of the Biennial Report, 1978-79, Part II.

#### 2. 1980 Budget

The Regular Budget, approved by the Commission at its Sixth Regular Meeting (Madrid, November 1979), amounted to \$625,000 (US) (See Appendix 3 to Annex 6 of the 1979 Proceedings). In 1980, there were certain circumstances which affected the budget.

a) Since the time the budget was approved, the peseta was devalued with respect to the dollar: \$1.00 = 65 ptas. (October, 1979), \$1.00 = 73.5 ptas. (October, 1980). Consequently, a situation developed which is contrary to that which occurred in 1979, that is, since the budget is in dollars, the purchasing power was increased. The dollar continued rising with respect to the peseta and by the end of 1980, it reached 80 ptas. to the U.S. dollar.

b) An amount was budgeted for a biostatistician; however, the former biostatistician who left the Commission for personal reasons was not replaced.

Logically, as a result of these two aforementioned circumstances, the Fiscal Year ended with a substantial positive balance. However, there was also a negative circumstance:

c) The delay in the payment of member country contributions caused serious difficulties in carrying out various activities recommended by the Commission and the

\*Updated to the end of Fiscal Year 1980. Modifications approved by the Commission have been introduced.

development of the Skipjack Program was jeopardized, all due to the lack of funds in the Commission accounts.

### 3. Review of Commission accounts

*Statement 1* shows the Balance Sheet at the end of Fiscal Year 1979. There was a balance of \$32,890.42 in Cash and Bank. Pending contributions totaled \$40,392.94. Fiscal Year ended with a negative balance of \$23,211.53, which was compensated for by charging it to the Working Capital Fund (Statement 7).

*Statement 2* shows the status of the member country contributions. Contributions are pending payment to the 1980 budget from Benin and Senegal as well as partial payments from Ghana and Spain. A total of \$72,964.93 are pending payment pertaining to the 1980 regular budget and previous years.

*Statement 3* shows the Budget, Expenditures and Balance of the Commission Budget up to the end of the Fiscal Year and has a positive balance of \$121,780.66. The Commission decided that this amount would go into the Working Capital Fund of the Regular Budget.

### 4. Comments by Budget Chapter

#### Chapter 1 - SALARIES

Fiscal Year 1980 ended with a substantial positive balance in this chapter due to the temporary absence of the Assistant Executive Secretary, the cut-backs of part-time personnel and the general circumstances mentioned earlier in this Report.

#### Chapter 2 - TRAVEL

The trips taken by the Secretariat personnel are explained in detail in the Administrative Report (COM/80/9). Also included in this chapter are the travel expenses for the Assistant Executive Secretary and his family for "Home Leave."

#### Chapter 3 - MEETINGS

The actual expenses incurred under this budget chapter are very close to the estimate made in the budget, and are broken down as follows:

i) 6 simultaneous translators	\$10,264.56
ii) Extra staff	8,490.59
a) 2 multi-lingual translators	
b) 1 receptionist	
c) 1 assistant receptionist	
d) 1 multi-copy machine operator	
e) 1 assistant operator	



ICCAT REPORT 1980-81 (I)

iii) Secretariat	
a) Overtime (G category)	6,492.00
b) Transportation and meals during meeting and during transport of equipment to the hotel and back after meeting	4,278.06
iv) Hotel (various conference rooms) and coffee break	11,081.82
v) Cymen Company (electronic equipment)	4,509.47
vi) 3 Rank Xerox copiers (Models 7000, 4500 and 3100)	5,319.47
vii) Office material and typewriter rental	<u>6,100.78</u>
TOTAL	\$56,536.75

Chapter 4 - PUBLICATIONS

The following publications have been charged to this chapter:

Biennial Report 1978-79, Part II (English, French, Spanish)  
 Statistical Bulletin, Vol. 9 (1978) - Final edition  
 Statistical Bulletin, Vol. 10 (1979) - Provisional  
 Statistical Bulletin, Historical Series 1 (Draft)  
 Collective Volume of Scientific Papers - Vol. IX (1,2,3) - 1979 SCRS documents  
 Collective Volume of Scientific Papers - Vol. X - Juvenile Tropical Tunas (1979)  
 Collective Volume of Scientific Papers - Vol. XI - Bluefin Workshop  
 Collective Volume of Scientific Papers - Vol. XII - Skipjack Report (1979)  
 Collective Volume of Scientific Papers - Vol. XIII - Juvenile Tropical Tunas (1980)  
 Data Record - Vol. 15  
 Data Record - Vol. 16  
 Statistical Series, Vol. 9  
 Newsletter (3 issues)

As can be seen from this list, the number of publications in 1980 increased considerably and many of the issues are quite voluminous. With the use of the IBM MC Composer we were able to do the composition of the Biennial (in the three official languages of the Commission) at the Secretariat and thereby reduce publication costs notably.

Chapter 5 - OFFICE EQUIPMENT

This chapter surpassed considerably the amount budgeted and this was due to the installation of air conditioning in the newly acquired office space, as well as the purchase of office furniture and typewriters.

## Chapter 6 - OPERATING EXPENSES

This chapter includes those expenses corresponding to office material, reproduction of documents, postage, telegraph and telex services, telephone, electricity, office cleaning service, as well as the security bond and the auditor's fees, etc. Details of these expenses are as follows:

Office material	\$ 4,589.34
Duplication of documents (Rank Xerox)	6,474.67
Mailing expenses	15,608.29
Telegram service	1,818.83
Telex service	1,640.31
Telephone	4,294.19
Electricity	4,773.62
Office cleaning service	2,206.33
Security bond	1,697.91
Auditor's fees	1,000.00
Rent (3rd floor, paid in advance)	2,500.00
Painting (3rd floor)	2,000.00
Other expenses	<u>5,772.93</u>
Sub-total	54,376.42
Repayment by Spanish Government for office rental and other expenses	<u>- 6,818.18</u>
TOTAL	\$47,558.24

## Chapter 7 - MISCELLANEOUS

This chapter includes minor expenses such as repairs (plumbing, furniture repairs, equipment maintenance, etc.), local transportation for office business and general expenses which are not applicable to other budget chapters.

## Chapter 8 - COORDINATION OF RESEARCH

*a) Staff*

This sub-chapter includes V. Nordstrom (Systems analyst), D. Da Rodda and O. Rodríguez Muñoz (statistical assistants), R. Moreno (clerk). It also includes the expenses of the ICCAT port samplers in Tenerife, Las Palmas, St. Maarten and Cape Town.

The substantial positive balance in this sub-chapter is due to the absence of a permanent biostatistician.

*b) Travel*

Expenses credited to this sub-chapter included the trip of the Assistant Executive Secretary to South America concerning statistics. Also included is a trip by Mr. H. Farrugio

(France) to Tunisia, at Commission expense, to collect bluefin tuna statistics.

*c) Office equipment*

These expenses correspond to office material for the statistical department (office furniture, the purchase of a telex machine, typewriters, photocopy machine, etc.)

*d) Data processing*

Data processing expenses remained within the amount budgeted, in spite of the considerable increase in processing work.

*e) Inter-sessional meetings*

The expenses of the following inter-sessional meetings were included in this sub-chapter:

- i) SCRS Officers Meeting (Brest, France)
- ii) Working Group on Juvenile Tropical Tunas (Brest, France)
- iii) Sub-Committee on Skipjack (Brest, France)
- iv) Coordinating Working Party on Atlantic Fishery Statistics (CWP) (Madrid)
- v) Informal Working Meeting on Bluefin Tuna (Palermo, Sicily)

We would like to point out that the facilities and other services offered by the Brest Laboratory helped to reduce considerably the expenses for the meetings held there.

*f) Miscellaneous*

The cash prizes for the tag recovery lottery were charged to this sub-chapter, as well as some data collection expenses and some expenses for equipment and office material.

## II. SPECIAL SKIPJACK BUDGET

### 1. Status of the contributions to the Skipjack Budget

Fiscal Year 1979 ended with a negative balance of \$3,068.17, which was charged to the Working Capital Fund of the Regular Commission Budget (Statement 6). The 1980 Special Skipjack Budget was for \$185,840.00. (See Appendix 6 to Annex 6 of the 1979 Proceedings).

*Statement 4* shows the contributions corresponding to the member countries. A total of \$44,686.69 is pending payment by some member countries.

### 2. Review of the Special Skipjack Budget accounts

*Statement 5* shows the Budget, Expenditures and Balance of the Special Skipjack

Budget up to the end of the Fiscal Year, which has a positive balance of \$66,472.92.

When the budget was approved, a positive balance was forecasted in order to carry on Program activities at the beginning of 1981 just in case there were delays in the payment of member country contributions.

The positive balance was applied to a Working Capital Fund for Skipjack, for the exclusive use of the Skipjack Program.

## ACTIVITIES

### *a) Tagging*

This sub-chapter included such expenses as the purchase, distribution and transport expenses of tagging materials (tags, needles, etc.) and 2,500 tag reward T-shirts.

### *b) Statistics*

The purchase of sampling materials, flags for research vessels and assistance in sampling programs were included in this sub-chapter.

## ICCAT COORDINATION SERVICES

### *a) Salaries*

Included here are the salaries of P. Symons (Program Coordinator), B. F. de Bobadilla (part-time skipjack secretary), and since November, 1980, D. Magermans (full-time skipjack secretary).

### *b) Office equipment and materials*

The purchase of ichthyometers, typewriters, office furniture and the installation of air conditioning are included in this sub-chapter.

### *c) Trip expenses*

The following trips made by the Skipjack Coordinator were charged to this sub-chapter: Cuba, Venezuela and Brazil to collect skipjack statistics; Brest, France, to attend the Sub-Committee on Skipjack Meeting and La Jolla, California, U.S.A., to work on the final preparation of the Skipjack Program Manuals.

### *d) Operational expenses and contracts*

The expenses for the Skipjack Program brochures, miscellaneous office materials, reproduction of documents and mailing were charged to this sub-chapter.

### III. OTHER BUDGET STATEMENTS

#### 1. Breakdown of the Working Capital Funds

*Statement 6* shows a breakdown of the Working Capital Funds for both the Regular and Skipjack Budgets at the end of the Fiscal Year, with a balance of \$180,054.62 for the Regular Budget and \$66,472.92 for the Skipjack Budget.

#### 2. Income and Disbursements

*Statement 7* shows the statement of Income and Disbursements for both budgets combined for Fiscal Year 1980.

#### 3. Balance Sheets of the two Budgets

*Statement 8* shows the Balance Sheet for the Regular and Skipjack Budgets, with an overall balance of \$147,921.01 in Cash and Bank.

#### 4. Auditor's Report for Fiscal Year 1980

The Balance Sheet at the close of Fiscal Year 1980 has been extracted from the Auditor's Report and is included as Statement 9.

## STATEMENT 1

Balance Sheet at Close of Fiscal Year 1979\* (US\$)

<i>ASSETS</i>		<i>LIABILITIES</i>	
1. Banco Exterior de España:		1. Status of Working	
a) Checking account . . . . .	30,125.69	Capital Fund . . . . .	77,561.96
b) Domestic Ptas. . . . .	114,217.89	2. Bluefin Tagging	
c) Convert. Ptas. . . . .	17,395.69	Fund . . . . .	1,998.46
2. Cash on hand – Ptas. . . . .	<u>50,859.00</u>	3. In favor of:	
(1 US\$ = 66 Ptas.) . . . . .	182,472.58	Brazil . . . . .	813.00
	= <u>2,764.73</u>	Spain (1978) . . . . .	2,781.64
Sub-total . . . . .	32,890.42	U.S.A.	
		(Special SJ Bgt.) . . . . .	18,272.00
3. Pending Contributions:			
a) Regular Budget . . . . .	40,392.94		
b) Special SJ Budget . . . . .	1,863.00		
4. Negative Balance:			
a) Regular Budget . . . . .	23,211.53		
b) Special SJ Budget . . . . .	3,068.17		
c) Rounding off addition of contributions . . . . .	<u>1.00</u>		
TOTAL . . . . .	101,427.06	TOTAL . . . . .	101,427.06

\*Includes both the Regular Commission Budget and the Special Skipjack Budget.

## STATEMENT 2

## Status of Member Country Contributions in 1980 - Regular Commission Budget (US\$)

<i>Country</i>	<i>1979 Balance</i>	<i>Contributions for 1980 Budget, ap- proved by the Commission</i>	<i>Contribu- tions paid for the 1980 Budget</i>	<i>Other Contri- butions</i>	<i>Balance</i>
Angola .....	--	20,912	20,912.00 (15/ X/80)	--	--
Benin .....	--	4,387	--	--	- 4,387.00
Brazil .....	+ 813.00	15,365	15,365.00 (10/VI/80)	--	+ 813.00
Canada .....	--	14,157	14,157.00 ( 2/II/80)	--	--
Cape Verde .....	--	9,699	9,699.00 (15/IX/80)	--	--
Cuba .....	- 17.99	21,197	21,197.00 (10/IX/80)	687.58	+ 669.59
France .....	--	98,216	98,216.00 ( 1/IX/80)	--	--
Gabon .....	- 6,178.00	4,387	4,387.00 (20/ I/81)	6,178.00	--
Ghana .....	- 15,184.57	23,922	23,922.00 (15/ X/80) (23/XII/80)	--	- 15,184.57
Ivory Coast .....	- 7,826.38	31,744	31,744.00 (15/IX/80)	18,046.52	+ 10,220.14
Japan .....	--	52,372	52,372.00 (10/IV/80)	--	--
Korea .....	--	54,008	54,008.00 (15/XII/80)	--	--
Morocco .....	--	19,277	19,277.00 (15/IX/80)	--	--
Portugal .....	--	30,206	30,206.00 (29/IV/80)	--	--
Senegal .....	- 11,186.00	13,254	--	--	- 24,440.00
South Africa .....	--	9,058	9,058.00 (15/II/80)	--	--
Spain .....	+ 2,781.64	117,038	85,303.00 ( 1/IV/80)	--	- 28,953.36
United States .....	--	58,488	58,488.00 (29/IX/80)	--	--
U.S.S.R. ....	--	27,313	27,313.00 (10/II/80)	--	--
TOTAL	- 40,392.94 + 3,594.64	625,000	575,624.00	24,912.10	- 72,964.93 + 11,702.73

## STATEMENT 3

## Budget, Expenditures and Balance of the Regular Commission Budget for Fiscal Year 1980 (US\$)

<i>Chapter</i>	<i>I Amount Budgeted</i>	<i>II Actual Expense</i>	<i>III Difference</i>
1. Salaries . . . . .	260,000	213,676.24	+ 46,323.76
2. Travel . . . . .	16,000	16,049.33	- 49.33
3. Meetings . . . . .	58,000	56,536.75	+ 1,463.25
4. Publications . . . . .	30,000	31,806.59	- 1,806.59
5. Office Equipment . . . . .	4,000	8,394.35	- 4,394.35
6. Operating Expenses . . . . .	48,000	47,558.24	+ 441.76
7. Miscellaneous . . . . .	5,000	5,040.83	- 40.83
			<u>+ 48,228.77</u>
			<u>- 6,291.10</u>
<i>Sub-total</i> . . . . .	421,000	379,062.33	+ 41,937.67
8. Coordination of Research			
a) Staff . . . . .	130,000	71,703.88	+ 58,296.12
b) Travel . . . . .	14,000	7,364.48	+ 6,635.52
c) Office Equipment . . . . .	7,000	8,871.53	- 1,871.53
d) Data Processing . . . . .	28,000	23,139.12	+ 4,860.88
e) Inter-sessional Meetings (sub-committees, working groups, etc.). * . . . .	20,000	8,178.00	+ 11,822.00
f) Miscellaneous . . . . .	5,000	4,900.00	+ 100.00
9. Contingencies . . . . .	0	0	<u>0</u>
			+ 81,714.52
			<u>- 1,871.53</u>
<i>Sub-total</i> . . . . .	204,000	124,157.01	+ 79,842.99
TOTAL . . . . .	625,000	503,219.34	+ 121,780.66

\*New sub-chapter.



## STATEMENT 4

## Status of Member Country Contributions in 1980 — Special Skipjack Budget (US\$)

<i>Country</i>	<i>1979 Balance</i>	<i>Contributions for 1980 Budget, approved by the Commission</i>	<i>Contributions paid for the 1980 Budget</i>	<i>Other Contributions</i>	<i>Balance</i>
Angola . . . . .	---	3,762	3,762.00 (15/ X/80)	---	---
Benin . . . . .	- 246	1,087	---	---	- 1,333.00
Brazil . . . . .	---	3,629	3,629.00 (10/ VI/80)	3,629.00	+ 3,629.00
Canada . . . . .	---	4,585	4,585.00 ( 2/ II/80)	---	---
Cuba . . . . .	---	6,383	6,383.00 (10/ IX/80)	194.41	+ 194.41
France . . . . .	---	30,214	30,214.00 (20/ IX/80)	---	---
Gabon . . . . .	- 246	1,087	1,087.00 (20/ I/80)	246.00	---
Ghana . . . . .	- 1,371	6,068	5,089.31 (23/XII/80)	---	- 2,349.69
Ivory Coast . . . . .	---	6,143	6,143.00 (15/ IX/80)	1,521.49	+ 1,521.49
Japan . . . . .	---	17,628	17,628.00 (10/ IV/80)	---	---
Korea . . . . .	---	18,919	18,919.00 (15/XII/80)	---	---
Morocco . . . . .	---	4,938	4,938.00 (15/ IX/80)	---	---
Portugal . . . . .	---	8,532	8,532.00 (29/ IV/80)	---	---
Senegal . . . . .	---	4,666	---	---	- 4,666.00
South Africa . . . . .	---	2,258	2,258.00 (15/ II/80)	---	---
Spain . . . . .	---	36,338	---	---	- 36,338.00
United States . . . . .	+ 18,272*	21,223	2,951.00 ( 1/ X/80)	---	---
U.S.S.R. . . . .	---	8,379	8,379.00 (10/ II/80)	---	---
TOTAL . . . . .	- 1,863 + 18,272	185,839	124,497.31	5,590.90	- 44,686.69 + 5,344.90

\*Paid in advance in 1979.

## STATEMENT 5

## Budget, Expenditures and Balance of the Special Skipjack Budget for Fiscal Year 1980 (US\$)

<i>Chapter</i>	<i>I Amount Budgeted</i>	<i>II Actual Expense</i>	<i>III Difference</i>
<b>Activities</b>			
Tagging with Dart Tags . . . . .	60,000	28,297.50	+ 31,702.50
Improved Statistics (Port & Intensive Sampling) . . . .	35,000	8,805.34	+ 26,194.66
Biochemical Stock Identification (Genetics) . . . . .	8,000	---	+ 8,000.00
<i>Sub-total</i> . . . . .	103,000	37,102.84	+ 65,897.16
<b>ICCAT Coordination Services</b>			
Salaries . . . . .	58,440	56,425.20	+ 2,014.80
Office Equipment & Materials . . . . .	3,400	5,977.73	- 2,577.73
Trip Expenses . . . . .	8,000	7,319.99	+ 680.01
Operational Expenses & Contracts . . . . .	13,000	12,541.32	+ 458.68
			+ 3,153.49
			- 2,577.73
<i>Sub-total</i> . . . . .	82,840	82,264.24	+ 575.76
<b>TOTAL</b> . . . . .	185,840	119,367.08	+ 66,472.92

## STATEMENT 6

**I. Breakdown of the Working Capital Fund — Regular Budget (US\$)**

At the end of Fiscal Year 1978 . . . . .	63,441.59
Extrabudgetary contribution — Benin 1978 . . . . .	3,103.48
Extrabudgetary contribution — Benin 1979 . . . . .	3,220.00
Bank Interest . . . . .	7,698.22
Difference in currency exchange. . . . .	<u>98.67</u>
<i>Sub-Total</i> . . . . .	77,561.96

This Fund was used to cover the negative balance, as follows:

a) From the Regular Budget . . . . .	23,211.53
b) From the Special Skipjack Budget. . . . .	3,068.17
c) Rounding off of contributions . . . . .	<u>1.00</u>
Total Negative Balance . . . . .	- <u>26,280.70</u>
At the end of Fiscal Year 1979 . . . . .	51,281.26
Bank Interest in 1980. . . . .	6,036.54
Sale of ICCAT publications in 1980 . . . . .	450.00
1980 Regular Budget — Balance. . . . .	121,780.66
Difference in currency exchange. . . . .	<u>506.16</u>
TOTAL. . . . .	180,054.62

**II. Breakdown of the Working Capital Fund — Skipjack Budget (US\$)**

1980 Special Skipjack Budget — Balance . . . . .	66,472.92
--	-----------

## STATEMENT 7

Statement of Income and Disbursements –  
 Regular Commission Budget and Special Skipjack Budget (US\$)

<i>INCOME</i>		<i>DISBURSEMENTS</i>	
Cash and Bank at end of Fiscal Year 1979 . . . . .	32,890.42	From the Regular 1980 Budget . . .	503,219.34
Income corresponding to 1980 Regular Budget . . . . .	575,624.00	From the 1980 Spec. SJ Budget.	119,367.08
Income corresponding to 1980 Special SJ Budget. . . . .	124,497.31	Balance in Cash & Bank. . .	147,921.01
Other contributions to Regular Budget . . . . .	24,912.10		
Other contributions to Special SJ Budget . . . . .	5,590.90		
Bank Interest . . . . .	6,036.54		
Sale of ICCAT publi- cations. . . . .	450.00		
Difference in currency exchange . . . . .	506.16		
<b>TOTAL . . . . .</b>	<b>770,507.43</b>	<b>TOTAL . . . . .</b>	<b>770,507.43</b>

Balance Sheet for the Regular and Skipjack Budgets (US\$)

<i>ASSETS</i>	<i>LIABILITIES</i>
Cash and Bank . . . . . 147,921.01	Working Capital Funds:
Pending Contributions:	a) Regular Budget . . . . . 180,054.62
a) Regular Budget . . . . . 72,964.93	b) Special SJ Budget . . . . . 66,472.92
b) Special SJ Budget . . . . . 44,686.69	Bluefin Tagging Fund . . . . . 1,998.46
Rounding off . . . . . 1.00	in favor of:
	<i>Brazil</i>
	Regular Budget . . . . . 813.00
	Special SJ Budget . . . . . 3,629.00
	<i>Cuba</i>
	Regular Budget . . . . . 669.59
	Special SJ Budget . . . . . 194.41
	<i>Ivory Coast</i>
	Regular Budget . . . . . 10,220.14
	Special SJ Budget . . . . . 1,521.49
TOTAL . . . . . 265,573.63	TOTAL . . . . . 265,573.63

## STATEMENT 9

## International Commission for the Conservation of Atlantic Tunas - Balance Sheet at Close of Fiscal Year 1980

<i>ASSETS</i>		<i>LIABILITIES</i>	
<i>Available:</i>		<i>Acquired holdings:</i>	
BANCO EXTERIOR DE ESPAÑA		From previous fiscal years	\$66,357.58
Time deposit account	\$106,583.39	During Fiscal Year 1980	<u>29,582.37</u>
C/A 82-31279	34,982.37		\$95,939.95
C/A 30-17632A (in ptas.)	525,248.33		
C/A 30-17329F (convert. ptas.)	- 11,794.31		
Cash on hand (ptas.)	<u>45,809.00</u>		
(at 88 ptas. per \$1)	559,263.02		
	<u>\$6,355.25</u>	<i>Working Capital Fund:</i>	
	\$147,921.01	As shown in attachment	\$180,054.62
<i>Receivables:</i>			
From previous years:		Positive balance - Skipjack Budget	\$66,471.92
GHANA	\$16,555.57		
SENEGAL	11,186.00	Positive balance - Tagging Fund	\$1,998.46
BENIN	<u>246.00</u>		
	\$27,987.57		
From 1980 Regular Budget:		<i>Income received in advance:</i>	
BENIN	\$ 4,387.00	BRAZIL	\$ 4,442.00
SPAIN	28,953.36	IVORY COAST	11,741.63
SENEGAL	<u>13,254.00</u>	CUBA	<u>864.00</u>
	\$46,594.36		\$17,047.63
From 1980 Skipjack Budget:			
BENIN	\$ 1,087.00		
GHANA	978.69		
SPAIN	36,338.00		
SENEGAL	<u>4,666.00</u>		
	\$43,069.69		
<i>Equipment:</i>			
Before 1980	\$66,088.38		
During 1980	<u>29,582.37</u>		
	\$95,670.75		
<i>Bonds:</i>			
	<u>\$ 269.20</u>		
TOTAL ASSETS	\$361,512.58	TOTAL LIABILITIES	\$361,512.58
Furniture ceded by Undersecretariat of Merchant Marine of Spain	\$3,365.38	Furniture ceded by Undersecretariat of Merchant Marine of Spain	\$3,365.38

Madrid, May 5, 1981

The Executive Secretary:  
O. Rodríguez-MartínCertified:  
A. Oliver y Trujillo

## SECRETARIAT REPORT ON STATISTICS AND COORDINATION OF RESEARCH

COM-SCRS/80/15 (Amended)

### I. Statistics and sampling

#### 1. Collection of 1979 statistics through the national offices

The same routine procedure was adopted as has been used in previous years. Various reminders and requests were forwarded by letter, telephone and telegram to those countries which failed to provide the Commission with statistics. The progress made by the national offices and by the Secretariat is shown in Table 1 to Appendix 4 to Annex 8.

The reporting of Task I (nominal annual catch statistics), Task II (catch and effort statistics) and Task III (biological data) in 1980 was considerably behind schedule. Nevertheless, most countries had reported their catches by the time of the compilation of the Statistical Bulletin (see Table 1 to Appendix 4 to Annex 8).

#### 2. Port sampling by the Secretariat

The Secretariat's efforts to collect logbook records and size frequencies at Atlantic transshipping ports from longliners were continued during 1980. At Las Palmas, Tenerife, St. Maarten and Cape Town one local person was employed by the Secretariat as a part-time coordinator.

In 1979, some Korean and Panamanian boats which had been based in Las Palmas and Tenerife left the Atlantic. Others shifted their bases from Tenerife to Venezuela. As a result, transshipments at the Canary Islands dropped sharply, while almost 7,000 MT of tuna were unloaded in Venezuela. At the same time, many Taiwanese boats which previously unloaded at Las Palmas moved to Montevideo, Uruguay.

Unfortunately, a very tight 1979 budget did not permit the Secretariat to adjust its port sampling scheme to extend coverage to those two ports. Consequently, the general coverage rate of port sampling dropped sharply and bias in logbook coverage increased.

Early in 1980, the Assistant Executive Secretary traveled to South America and gathered as much landing information as possible to correct these sampling biases. At the same time, he contracted a part-time sampler at the ports of Cumaná (Venezuela) and Montevideo (Uruguay). It is hoped that this action will provide us with more complete data coverage for these fleets.

## II. Data processing (ICCAT data bank)

### 1. Facilities

The INFONET system was contracted again in 1980 for ICCAT data management. The unit cost was increased by approximately 15 percent as a result of inflation. This year, the system became quite saturated and additional difficulties resulted. In the future, if very urgent data processing is required, this will result in increased costs. At the present time, all the work is being executed in batch with low priority to reduce the operating costs.

### 2. Data processing

The amount of data processing in 1980 increased again. The following is a list of the major work carried out during the year:

- a) Updating all data bases (Task I, catch and effort and biological).
- b) Data entry and processing of port sampling statistics (Stat. Series-9).
- c) Compilation of Historical Statistical Bulletin (Draft) and subsequent updating of the historical data base.
- d) Separation of Task I catch data into major areas, using Task II and biological data (SCRS/80/30).
- e) Preparation of data files for the meeting of the Working Group on Juvenile Tropical Tunas.
- f) Output of the Statistical Bulletin.
- g) Output of data received recently (Data Record, Vols. 15 and 16).
- h) Preparation of species catch tables for the SCRS Report (both 1979 and 1980 Reports).
- i) Finalization of the bluefin catch and effort data base.
- j) Progress in the compilation of the bluefin biological data base.
- k) Updating tagging file and output of yearly recovery summary.
- l) Creation and distribution of tapes, upon request by the member countries.

### 3. Dissemination of information and publications

#### a) *Quick estimates*

- |               |    |                                     |
|---------------|----|-------------------------------------|
| April, 1980   | -- | for estimates of all of 1979        |
| October, 1980 | -- | for estimates of first half of 1980 |



*b) Statistical Bulletin*

February, 1980 -- Vol. 9 (Final)  
 September, 1980 -- Vol. 10 (Provisional)

*c) Statistical Bulletin Historical Series -1 (Draft)*

September, 1980 -- published (limited)

*d) Data Record*

Volume	When published	Data received on
15	March, 1980	Nov. 1979 - Feb. 1980
16	October, 1980	March- Sept., 1980

Following a recommendation made by the SCRS, the Data Record now has the "coverage rate" in catch and effort (Table 1 to Appendix 4 to Annex 8).

*e) Collective Volume of Scientific Papers*

Volume	When published	Contents
IX (nos. 1,2,3)	April, 1980	1979 SCRS documents
X	February, 1980	Report of the Working Group on Juvenile Tropical Tunas (Abidjan, 1979)
XI	September, 1980	Report of the Bluefin Workshop (Santander, 1979)
XII	March, 1980	Report of the Subcommittee on Skipjack (Las Palmas, 1979)
XIII	October, 1980	Report of the Working Group on Juvenile Tropical Tunas (Brest, 1979)

*f) Statistical Series*

Vol. 9	July, 1980	Port sampling summary
--------	------------	-----------------------

### III. Biostatistical work

At the end of 1979, Dr. Max Laurent, Biostatistician, resigned from ICCAT for personal reasons. Following the recommendation of the SCRS, the Secretariat did not hire anyone as a permanent biostatistician in 1980, but carried out programs on a con-

tract basis. Besides, some other biostatistical work was carried out by the present Secretariat staff.

### 1. Recompilation of TASKI base

One of the SCRS recommendations at its 1979 meeting was to estimate Task I statistics as realistically as possible, instead of the tendency to use official statistics. Following this decision, the Secretariat introduced the following changes to the TASKI base (consequently to the Statistical Bulletin).

#### *a) Bigeye-yellowfin catch estimates for all tropical fleets*

All the combined catches for yellowfin and bigeye reported earlier as yellowfin have been re-examined and reported according to the procedures agreed upon at the last SCRS meeting. Procedures used were reported in SCRS/80/30.

#### *b) North-south separation of bigeye catches*

At the 1979 SCRS meeting, bigeye tuna stocks were analyzed under two hypotheses: a single Atlantic stock and one stock each in the north and south Atlantic ( $5^{\circ}\text{N}$  as division line). In order to facilitate this work, all bigeye catches reported in the past as well as revised bigeye catch estimates by tropical fleets have been separated between north and south. The Task II catch and effort data were used for these purposes. Procedures were reported in SCRS/80/30.

#### *c) East-west separation of yellowfin catch*

Using Task II data, practically all catches of yellowfin are separated by east and west ( $30^{\circ}\text{W}$ ) of the Atlantic. We hope this improvement will assist stock evaluation studies.

### 2. North-south separation of albacore catches

Geographical distribution of catch and effort of the Taiwanese longline fleet was, in the past, a matter of discussion since the two sets of Task II data, one by Taiwan University and another by ICCAT port sampling, did not match. In order to solve this problem, the Secretariat made a contract with a Japanese company which further sub-contracted the Taiwan University to calculate landing statistics by port for the Taiwanese fleet. The results were reported in SCRS/80/67.

### 3. Mediterranean bluefin statistics

A program to improve Mediterranean bluefin statistics was started in 1979 by the

ICCAT biostatistician. This program was further continued in 1980 by the Secretariat staff and contracted biostatisticians. In early June, the ICCAT contracted Mr. H. Farrugio (France) to collect data from the Tunisian trap fishery. Mr. Farrugio visited Tunisia and collected trap catches and size data for 1980 and past years. His report on this mission was presented in SCRS/80/29.

At the Bluefin Workshop held in Santander (1979), it was agreed that Mr. M. L. Parrack (U.S.A.) would assemble all the size data available on bluefin, create and complete the file for them, while the Secretariat would assemble all the catch and effort data and complete a file. Since the work was almost completed by mid-June by both, Mr. Parrack agreed to visit the Secretariat. During his visit, all the data bases were cross-checked and perfected as much as possible.

Taking the opportunity of Mr. Parrack's visit, the Secretariat arranged a small, informal get-together of Mediterranean scientists. The Messrs. Piccinotti, Arena and Sara (Italy) kindly arranged a meeting on July 7 and 8, 1980, in Palermo, Sicily, where they met with the Messrs. Farrugio, Parrack and Miyake. For a more detailed report on the informal Palermo meeting, please refer to SCRS/80/28.

#### **4. Review of sampling of tropical surface-caught tunas**

The Secretariat intended to send, on a short-term basis, an ICCAT-contracted biostatistician to study the species identification and size sampling problems of the African landing ports. Unfortunately, authorization by SCRS and by the countries where such personnel were to be sent was not secured and this program has been postponed until 1981.

### **IV. Tagging Program**

No tagging cruise was organized by the Secretariat this year. However, many tags and materials were provided to various countries to facilitate their tagging operations. Those operations are reported as a part of the Skipjack Program, though many of the tags could be used on tunas other than skipjack, their costs being assigned to the regular Commission budget.

This year's tagging lottery was held on June 2, 1980, at the opening session of the meeting of the Sub-Committee on Skipjack in Brest, France. Two \$300 prizes were awarded: one to a U.S. skipper and the other to a Senegalese fisherman.

### **V. International Skipjack Year Program**

Two of the most important activities of the International Skipjack Year Program are Tagging and Improved Fishery Statistics. Preparations for tagging have included procuring and distributing material advertising the program and tag rewards, and purchasing tagging needles, T-shirts for tag rewards and tags themselves. The IATTC and Southwest

Fisheries Center, both of La Jolla, California (U.S.A.) considerably assisted the procuring of these materials, and the United States also supplied some surplus tags for use by other countries. Tag recovery stations were established in several ports for recuperation of information and samples from tagged fish, and for local distribution of tag rewards. All materials and instructions are now in place for tagging for the International Skipjack Year.

Preparations for the Improved Fishery Statistics activity have included writing of field manuals and accompanying field forms. Drafting of these was begun at the Secretariat in the spring, 1980, and continued at the Southwest Fisheries Center, La Jolla, through the summer. A semi-final draft of the Port Sampler's Manual was distributed for comments in July. A draft of the second manual for use by observers and technicians aboard vessels was "field tested" by A. Fonteneau in September. Completion of these manuals and a third "laboratory manual" is expected for the spring, 1981.

## **CHAPTER II**

### **Records of Meeting**

#### **PROCEEDINGS OF THE SECOND SPECIAL MEETING OF THE COMMISSION**

Madrid, Spain, November 12-18, 1980

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#### **Opening Plenary Session – November 12, 1980**

##### **Item 1. OPENING OF THE MEETING**

1.1 The Commission held its Second Special Meeting at the Hotel Castellana, Madrid, under the chairmanship of Dr. L. Koffi (Ivory Coast). He announced that this Special Meeting was set up at the 1979 Regular Meeting of the Commission, based on Rule 3 of the Rules of Procedure, in order to evaluate all scientific progress and to decide on fishery management steps if they become necessary, and to re-evaluate the second half of the 1980-81 Regular Budget and the Special Skipjack Budget. The Chairman introduced Mr. J. Lamo de Espinosa, Minister of Agriculture and Fisheries of Spain.

1.2 Mr. Lamo de Espinosa welcomed all the delegates, scientists and observers attending the meeting. His speech is attached as Annex 3. He stated that Spain has recently reorganized its administration and that the Fisheries and Agriculture Departments are now together in one Ministry. He felt that Spain is fortunate to have the ICCAT Headquarters in Spain as this Commission has a great future. He noted that excellent progress is being made by scientists, commissioners and the Secretariat for a better understanding of tuna resources. Some statistical difficulties are being solved by national offices and scientists, including those of Spain. He stated that the recent changes in the international fisheries regime forced his country to reorganize the fishing industry on a long-term basis, and that the recent energy crisis has changed it on a medium-term basis. He hoped that the new order would be very efficient in managing and utilizing fully the fisheries resources.

1.3 The Chairman, Dr. Koffi, formally opened the meeting and welcomed all the delegates and observers to the Commission meeting.

1.4 The Chairman's opening address is attached as Annex 4. Dr. Koffi referred to the remarkable progress made in scientific knowledge and statistical information on tunas as well as the Skipjack Year Program which is now in progress. He congratulated the SCRS Chairman, scientists and the Secretariat for all their achievements.

1.5 The Chairman further noted that progress has been made in the management of tunas. He emphasized the importance of port inspection which provides instruments to implement these management plans and the need for good will in carrying them out on a national level. He also hoped that further training of biologists and technicians could be carried out.

1.6 The delegations of the member countries were introduced. (See Annex 2.)

## Item 2. ADOPTION OF AGENDA, ARRANGEMENTS FOR THE MEETING AND APPOINTMENT OF SUBSIDIARY BODIES

2.1 The Commission reviewed the Tentative Agenda which was circulated 90 days before the meeting.

2.2 The delegate from the U.S.S.R. proposed the deletion of Agenda Item 8, "Request for admission to the Commission by the European Economic Community (EEC)". The basis for this proposal was that this matter is not in the Commission's competence, and in any case, could be discussed only after the procedure of adopting amendments to the Convention would be properly exercised, in accordance with the provisions of Article XIII of the ICCAT Convention. The U.S.S.R. delegate also noted that document COM/80/24, which is pertinent to consideration of the matter, was not received by the Soviet delegation before their arrival in Madrid. Some discussion ensued on this point and it was noted that some other countries had not received the document either. The letter ("Explanatory Note") from the EEC included in COM/80/24 was dated October 7, 1980, and was received by the Secretariat on October 15. The document, with translation, was circulated around October 19.

2.3 During the discussion it was noted that the inclusion of this Item in the Agenda

was proposed at the 1979 Commission Meeting and thereafter all the legal procedures were duly followed. However, the "Explanatory Note" was circulated very late, whereas it had been recommended that this be done in June, 1980. The majority of the delegates indicated that it was useful that this point be included in the Agenda since its inclusion would not in any way bind the decisions. The Commission could thus exchange points of view on this matter, which would be the subject of more profound discussions at a later time.

2.4 At the request of the U.S.S.R., each delegation was asked to take a stand on the motion to delete Item 8 from the Agenda. The U.S.S.R. voted in favor of deletion, while 15 countries (Angola, Brazil, Canada, Cape Verde, France, Ghana, Gabon, Ivory Coast, Japan, Korea, Morocco, Portugal, South Africa, Spain and the U.S.A.) voted against the motion. Cuba stated that it would agree with the majority in the discussion of this Item as long as it did not implicate a decision on its part, as Cuba did not receive the "Explanatory Note" and therefore, did not come prepared with an official statement.

2.5 The Commission decided that Item 8 would remain on the Agenda, with the understanding that no decision would be taken on the matter at this time. On a proposal by Spain, it was agreed that discussion on Item 8 would be carried out in the Plenary Session of the Commission, instead of at the STACFAD meeting, as was originally scheduled.

2.6 The Agenda was thus adopted without changes (attached as Annex 1).

2.7 The Commission decided that Agenda Items 4-7, 9-15 and 25 should be referred to the Standing Committee on Finance and Administration (STACFAD).

### Item 3. ADMISSION OF OBSERVERS

3.1 All the observers (countries and international organizations) attending the meeting were welcomed and admitted (see Annex 2, List of Participants).

3.2 The observer from the European Economic Community (EEC) asked to be seated next to the French delegation, as France is the only EEC member among the ICCAT member countries.

## Second Plenary Session — November 13, 1980

### Item 16. REPORT OF THE STANDING COMMITTEE ON RESEARCH AND STATISTICS (SCRS)

16.1 Mr. A. Fonteneau (France), Chairman of the SCRS, presented the Report of the Standing Committee on Research and Statistics (Annex 8) and summarized the scientific findings. He first explained the stock evaluation models used by the scientists.

16.2 The SCRS Chairman summarized results of studies on stock structure and the condition of each species which have been reported in the pertinent sections of the SCRS Report. He drew the attention of the Commission and Panels to the section on "Recommendations" for each species.

16.3 He also pointed out that the SCRS made various recommendations and asked that special attention be given by the Commission to the following points:

a) Communications between SCRS scientists and commissioners should be strengthened. In this aspect, the SCRS again asked the Commission to be very explicit when phrasing questions or instructions to the SCRS.

b) Responses to inquiries by the Commission as to whether bigeye tuna should be considered as a tropical species or a temperate species can be found in COM/80/25.

c) The SCRS sought the Commission's opinion of the new reporting format which the SCRS adopted this year.

d) The SCRS addressed a question to the Commission as to whether the terms of reference to the SCRS include any economic aspects.

16.4 The Commission congratulated the SCRS, the scientists and the Secretariat staff for a good job in carrying out scientific studies on tunas. The SCRS Chairman was also commended for this very precise explanation of SCRS findings to the Commission.

16.5 The Commission felt that the new format of the SCRS Report is clear and easy to understand and recommended that the same procedure be followed in 1981.

16.6 The terms of reference to the SCRS, found in the ICCAT Convention and Rules of Procedure, were reviewed. It was clear that the present terms to the SCRS do not include studies on any economic aspects. On the other hand, the members of the Commission felt that this question is a very complex one that relates to the basic policy of the Commission. They, therefore, were not prepared to discuss the matter at this meeting. The Commission decided that the matter in question be carefully studied in the future and that discussions be conducted at future sessions. It was further noted that the present terms of reference to the SCRS (which exclude studies on any economic aspects) should remain valid until such a time.

16.7 After review and some clarifications, the Commission adopted the SCRS Report (Annex 8).

#### Item 8. REQUEST FOR ADMISSION TO THE COMMISSION BY THE EUROPEAN ECONOMIC COMMUNITY (EEC)

8.1 The Executive Secretary referred to COM/80/24 and COM/80/24 Annex 1, both background documents for the discussion of this Agenda Item.

8.2 The delegate from Japan directed several questions to the observer from the European Economic Community (EEC). Those questions were as follows:

a) Will the proposal presented by France to amend the ICCAT Convention be affected by the changes in the Third Law of the Sea Conference Convention?

b) Does the Council of the European Communities determine the competence or authority to be given to the EEC inasmuch as the ICCAT Convention is concerned?



c) Adherence of the EEC to this Convention will considerably affect EEC member states other than France (especially Italy). Has there been full consultation completed to coordinate this aspect? In other words, can the provisions of this Convention and recommendations adopted under this Convention be implemented for these countries after the adherence of the EEC to this Convention?

d) Judging from the provisions of Article 1, the Convention shall apply to all waters of the Atlantic Ocean including the territorial waters as well as fishing zones and therefore the regulatory measures effective under the Convention shall apply to such waters and zones. Does the EEC competence with regard to fisheries extend to the fishing zones and territorial waters of its member states?

e) After adherence to the ICCAT Convention, the contribution to be paid by the EEC is determined in accordance with the relevant provisions of said Convention. Can the EEC immediately provide the ICCAT with the data on the catch and canned products of its member states, to be used as the basis for calculating the contribution? There are various statistical data requirements under the ICCAT Convention. Will these all be provided by the EEC even if there are some differences among the statistical methods used by its respective member states?

8.3 The EEC observer answered the questions asked by Japan as follows:

a) Considering the progress of the work during the Third Law of the Sea Conference, in particular concerning the present state of the question of participation of the European Economic Community, the proposal of amendment presented in 1979 by France is still valid and perfectly appropriate, but the Community would be prepared to review this text, if necessary, in light of the progress achieved concerning the above-mentioned work.

The EEC observer, on the other hand, noted that at the present level of debates on the effects of the adherence of the EEC to ICCAT, it would be convenient to consider convening a Conference of Plenipotentiaries to adopt the proposed amendments. This conference should be convened by one of the Contracting Parties, and could be held during the next regular meeting of the ICCAT Commission.

b) These competences flow directly from the EEC Treaty. The Council of the European Communities decided in November, 1976, that the Community should exercise these competences, in particular concerning international conventions in fisheries matters, with special reference to ICCAT. The discharge of these competences is the responsibility of the Commission of the European Communities as the executive body of the EEC; however, this Commission is assisted by its member states in its negotiations.

c) The answer to the previous question (b) already shows that all member states have given in the Council of the European Communities their agreement on the actions to be undertaken. However, a follow-up on these actions is subject to a regular exchange of opinions with the EEC member states, and the final decision is taken by the Council.

Referring to the NAFO Convention as a precedent, the Community will adopt the ICCAT Convention as well as its recommendations through regulations which make up the EEC law. These regulations are directly applicable, under the terms of Article 189

of the EEC Treaty, in all member states, just as their own national legislation. Therefore, it is not necessary nor possible to carry these rules over into the member states' domestic laws, and fishermen of all member states are directly subject to them.

d) As was stated in the reply to the third question (c) the Community ruling will apply to all EEC territories including the exclusive fishing zones and territorial waters.

e) There is no cause to believe that the EEC might be less capable than France has been up to now in submitting these data. By the same token, there is no reason to think that the collection of other statistical data might be a bigger problem for the EEC than it presently is for other Contracting Parties.

8.4 Other questions were raised by the delegations of Brazil, Ivory Coast and Canada.

a) With reference to the question raised by Brazil and Ivory Coast concerning the implications that Item D-1 of document COM/80/24, the EEC observer noted that he could only say that the EEC had no intention of claiming a number of votes equal to the number of its member states. Moreover, this subject would be of no particular interest at this time since only France is a member of the EEC and a Contracting Party of ICCAT. It might be appropriate not to prematurely judge at this time any eventual modification of this situation in the future, in particular with the adherence of ICCAT Contracting Parties to the EEC. The aforementioned delegations objected to this by asking that all the working hypotheses be supplied by the EEC so that the Commission can comment on the matter with full knowledge.

In pointing out the EEC's right to one vote in NAFO, the Canadian delegate asked whether the EEC plans to keep the votes of the Contracting Parties of ICCAT when they become members of the EEC. The EEC observer clearly answered negatively in the sense that double participation of the EEC and its member states is inconceivable in the case of an international convention whose aims are under the sole competence of the EEC.

b) Answering the question raised by Brazil, the EEC observer noted that scientific work, in particular within the SCRS, will not be affected in any way by the adherence of the EEC. In the case of NAFO, for instance, the EEC relies on scientists who continue, as before, to cooperate independently, the only difference being that they belong to the EEC delegation and that the costs of their participation are assumed by the EEC.

8.5 The Commission decided that the exchange of comments should be formally recorded in the Proceedings and that further discussions on the matter should be carried out at an appropriate time in the future.

### Third Plenary Session — Madrid, November 17, 1980

While apologizing for their delayed arrival, which was due to administrative problems, Gabon expressed their interest in tuna studies and in the development of their own fisheries. They will try to cooperate with all ICCAT activities, including authorizing research boats to enter their waters. The Commission welcomed Gabon's initial participation in the meeting.

Item 20. STATUS OF THE PROPOSALS ADOPTED BY THE COMMISSION REGARDING YELLOWFIN, BLUEFIN AND BIGEYE

20.1 The Executive Secretary referred the Commission to COM/80/21 and to the Summary Table showing the status of the regulatory measures, which had been put into effect by each member country.

20.2 Gabon noted that since there has been no tuna fishing or landings there by foreign fleets Gabon has not implemented the ICCAT regulatory measures. However, it is the intention of their government to implement them whenever it becomes necessary.

20.3 Other countries took the occasion to update their respective countries' dates of implementation of the regulations. However, the Executive Secretary asked that this information be officially notified to the Commission in writing. The Revised Summary Table is attached as Annex 5.

20.4 Regarding the setting up of an "Infractions Committee" the U.S. noted that there are areas of attention, such as the taking of undersized tropical tunas, which require the creation of a "body" to look into the adherence of the ICCAT regulations.

20.5 Cuba pointed out that some clarification was needed as to the status of the Port Inspection Scheme before discussing the setting up of an "Infractions Committee", since these two areas are very closely linked.

20.6 The Commission Chairman indicated that this matter would be discussed under Agenda Item 22.

Item 21. OTHER POSSIBLE REGULATORY MEASURES TO BE CONSIDERED

21.1 The SCRS Chairman reported on possible alternative regulatory measures such as time/area closure presently under study by the SCRS in relation to the protection of juvenile tropical tunas.

Item 22. STATUS OF THE PORT INSPECTION SCHEME

22.1 Document COM/80/22 was referred to and reviewed. It was noted that the following countries had accepted the Port Inspection Scheme: Brazil, Cuba, France, Gabon, Portugal, South Africa, Spain and the U.S.A.

22.2 The delegate from the U.S.S.R. said that his government refrains from accepting the Port Inspection Scheme and noted that high seas international inspection is more effective and in case of acceptance of the Scheme this control would be unilateral in relation to the U.S.S.R. The delegate emphasized that his country had adopted all the ICCAT regulations.

22.3 Korea appreciated the aim of port inspection, but added that the success of such a scheme depends on the fishermen's cooperation among themselves, as described in Article 3 of the Port Inspection Scheme. The Korean delegate further noted that such

a Scheme could involve considerable interference and degradation of the quality of the fish and asked that each member country well inform and notify crews and inspectors.

22.4 The delegate from Cuba mentioned that his country will cooperate with all countries which have accepted the Port Inspection Scheme and will observe all the regulations adopted by ICCAT, all of which are necessary for the conservation of the stocks. Portugal formally informed the Commission of their acceptance of the Scheme. The Executive Secretary pointed out that with the inclusion of Portugal, eight countries had accepted the Port Inspection Scheme and that a total of 10 countries (a simple majority) was needed for the Scheme's entry into effect.

22.5 It was decided that the matter of the "Infractions Committee" be included in next year's Commission Agenda for further study at that time.

### Item 23. INTERNATIONAL SKIPJACK YEAR PROGRAM

23.1 The Convener of the Sub-Committee on Skipjack, Dr. G. Sakagawa (U.S.A.) presented COM-SCRS/80/16 (the Sub-Committee's Report of their meeting in Brest) and referred the commissioners to the Sub-Committee's Report of their meeting held during the SCRS Session. Dr. Sakagawa highlighted the Program's aims and noted that six tagging cruises were carried out and that 10,700 fish had been tagged. He mentioned that three intensive sampling cruises were conducted and that preparations for the International Skipjack Year (1981) were in full swing with the development of manuals for the coordination of activities. In citing the four goals of the Program the Convener noted that catches have already been increased by the development of a new fishing area off Brazil and other western Atlantic areas; a fishery was developing off Ascension Island on large-sized skipjack; the effects of the above actions on existing fisheries would be looked at from the data collected throughout the Program period; and that better assessment of the skipjack fisheries would also be attained from analysis of the Program data next year.

23.2 Dr. P. E. K. Symons, ICCAT Skipjack Program Coordinator, gave a brief overview on the Program's progress and referred the Commission to COM-SCRS/80/19. He noted that the Secretariat was quite involved in the purchase and distribution of materials used in the Skipjack Program. He went on to explain the tag reward procedures. Dr. Symons also referred to COM-SCRS/80/18 which dealt with the matter of vessel clearance. He pointed out that the United States, Spain, Senegal, Ivory Coast, Japan and Korea have expressed an interest in the tagging activity and have carried out some tagging.

23.3 The delegate from Cape Verde noted his country's profound interest in the Skipjack Program, specifically in the tagging activities, and mentioned that as soon as "red tape" problems can be straightened out, Cape Verde will participate in the Skipjack Program.

23.4 Dr. L. Koffi, the Commission Chairman, expounded on the Commission's profound interest in the Skipjack Program and he congratulated the Convener of the Sub-Committee on Skipjack as well as the Skipjack Coordinator and all the scientists involved for their splendid achievements so far in this endeavor.

Item 24. OTHER ACTIVITIES IN RESEARCH AND STATISTICS

24.1 The SCRS Chairman commented that all the future activities of the Standing Committee are included in the SCRS Report and referred the Commission to that document. The Commission concurred with all the recommendations of the SCRS.

**Final Plenary Session — Madrid, November 18, 1980**

Item 18. REPORTS OF PANELS 1-4

18.1 The Reports of Panels 1 through 4 and the Report of the Joint Meeting of Panels 1 and 4 were presented by their respective Chairmen. All the Reports (attached as Annex 6) were carefully reviewed and adopted by the Commission, together with all the recommendations.

Item 19. REPORTS OF SUBSIDIARY BODIES APPOINTED BY THE COMMISSION FOR THE MEETING

19.1 There were no subsidiary bodies appointed by the Commission.

Item 17. REPORT OF THE STANDING COMMITTEE ON FINANCE AND ADMINISTRATION (STACFAD)

17.1 The Chairman of the Standing Committee on Finance and Administration (STACFAD) presented his Committee's Report. The Commission reviewed the Report, and paid particular attention to the following Commission Agenda Items:

*Item 4. Panels*

*4.1 Reconsideration of species distribution among the Panels*

*4.2 Review of Panel membership*

*Item 5. Administrative Report*

*Item 6. Relations with other organizations*

*Item 7. Commission publications*

*Item 9. Auditor's Report 1979*

*Item 10. Financial status of the Regular Budget 1980*

*Item 11. Working Capital Fund*

*Item 12. Review of the second half of the Biennial Budget (1981)*

*Item 13. Financial status of the Skipjack Program*

*Item 14. Review of the Special Skipjack Budget (1981-82)*

*Item 25. Date and place of the next regular meeting of the Commission*

17.2 While adopting the Report, an inquiry was raised as to how the panel of experts to review the salaries and remunerations, mentioned under Item 16 of the STACFAD Report, plans to carry out its work. The STACFAD Chairman commented that when the members were decided he would call a meeting of the group to carry out the work assigned. The conclusions reached will be presented well in advance of the next Commission meeting and will be circulated to all the other members of the Commission.

Item 26. OTHER MATTERS

26.1 No other matters were discussed.

Item 27. ADOPTION OF REPORT

27.1 The Proceedings of the Opening, Second and Third Plenary Sessions were reviewed and adopted by the Commission, together with their respective appendices.

27.2 The Commission decided that the Proceedings of the Final Plenary Session would be approved by mail, as soon as possible after the meeting.

Item 28. ADJOURNMENT

28.1 The Chairman of the Commission thanked the Chairmen of the Panels, the SCRS Chairman and the scientists for their excellent collaboration during the meeting. He also expressed his appreciation to the Secretariat and the interpreters for their efficient work during the course of the meeting.

28.2 The meeting was adjourned.

## **AGENDA**

### *Procedure of the meeting*

1. Opening of the meeting
2. Adoption of Agenda, arrangements for the meeting and appointment of subsidiary bodies
3. Admission of observers

### *Administration*

4. Panels
  - 4.1 Reconsideration of species distribution among the Panels
  - 4.2 Review of Panel membership
5. Administrative Report
6. Relations with other organizations
7. Commission publications
8. Request for admission to the Commission by the European Economic Community (EEC)

### *Finance*

- a) Regular Commission Budget
  9. Auditor's Report 1979
  10. Financial status of the Regular Budget 1980
  11. Working Capital Fund
  12. Review of the second half of the biennial budget (1981)
- b) Special Skipjack Budget
  13. Financial status of the Skipjack Program
  14. Review of the Special Skipjack Budget (1981-82)
  15. Review of the member country contributions to the Special Skipjack Budget (1981-82)

*Reports to the Commission*

16. Report of the Standing Committee on Research and Statistics (SCRS)
17. Report of the Standing Committee on Finance and Administration (STACFAD)
18. Reports of Panels 1-4
19. Reports of subsidiary bodies appointed by the Commission for the meeting

*Measures for the conservation of stocks*

20. Status of the proposals adopted by the Commission regarding yellowfin, bluefin and bigeye
21. Other possible regulatory measures to be considered
22. Status of the Port Inspection Scheme

*Research*

23. International Skipjack Year Program
24. Other activities in research and statistics

*Other matters*

25. Date and place of the next regular meeting of the Commission
26. Other matters
27. Adoption of Report

*Adjournment*

28. Adjournment



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**OPENING ADDRESS BY MR. J. LAMO DE ESPINOSA,  
SPANISH MINISTER OF AGRICULTURE AND FISHERIES**

Mr. Chairman, Commissioners, ladies and gentlemen:

I am very pleased to welcome you, on behalf of the Spanish Government, to the Second Special Meeting of the International Commission for the Conservation of Atlantic Tunas, an organization which gives us the chance to meet here in Madrid.

At a time when the majority of the international fishery organizations are facing difficulties, we are lucky to have this Commission here in Spain. It is perhaps one of the organizations which has a clear view towards the future. This is due to the fact that the ICCAT is concerned with tunas, species which because they are highly migratory, rely on the assistance of all countries for their rational management and conservation. But to this basic reasoning I would also add two other very important reasons which contribute to the prosperity of this organization.

The first is that ICCAT has a Research and Statistics Committee, comprised of highly qualified scientists from many different areas who work incessantly in the research of tuna species. As a result our knowledge of tunas is becoming more and more detailed, consequently improving the conditions by which recommendations are presented to the national administrations for a clear orientation towards more rational and fruitful exploitation of this important source of marine protein.

The second reason is that we can rely on a Secretariat which does excellent work in coordinating the research programs and which acts efficiently and clearly in its relations with the member country administrations, with other international organizations and collaborators.

As a result, the Commission presents a good image to other countries. Proof of this is that the Commission has grown from seven countries to 19 member countries, and I have heard that there are still others which are considering membership in the near future.

However, we have to be realists and we must not dwell on the positive aspects of this organization without analyzing some of the difficulties which confront the Commission and for which special attention must be given.

In the first place is the ICCAT area of competence. As you all know, this area includes the entire Atlantic Ocean and its adjacent seas such as the Mediterranean. Within the same ocean, there are also other international fishery organizations which are concerned with specific zones, such as:

- The Northwest Atlantic Fisheries Organization (NAFO; formerly ICNAF)
- The Northeast Atlantic Fisheries Commission (NEAFC)
- The International Commission for the Southeast Atlantic Fisheries (ICSEAF)
- The International Council for the Exploration of the Sea (ICES)

- The FAO Fishery Committee for the Eastern Central Atlantic (CECAF)
  - The Western Central Atlantic Fishery Commission (WECAFC)
  - The General Fisheries Council for the Mediterranean (GFCM)
- (The last three are FAO organizations.)

There are other organizations which are concerned with the same tuna species, but in other oceans, such as:

- The Inter-American Tropical Tuna Commission (IATTC)
- The Indo-Pacific Fisheries Council (IPFC)
- The Indian Ocean Fisheries Commission (IOFC)

In view of all this, I think it requires a great amount of skill to maintain the best working relations with all these organizations to carry out effective collaboration, thereby avoiding a duplication of efforts. I am of the opinion that such collaboration should be maintained and even increased for the mutual benefit of all concerned, and to arrive at a better knowledge of the status of the stocks, the fundamental basis on which any management measure can be considered.

With regard to statistics, I would like to point out the perseverance and effort which the Secretariat and the various member country scientists exert to compile more and better statistical information. This is done in spite of the difficulties which are encountered, the deficiencies in the national statistical services, etc. We should recognize, however, that fisheries management cannot be carried out at the national or the international level if we cannot rely on statistical services which provide complete and reliable data.

I am not implying that my country is a good example, since I am aware that as far as fishing is concerned, we are still far from a good organization of our statistical services. We are, in fact, initiating considerable efforts in this aspect which we hope to share with those who are in a similar situation. In mentioning my country, I mean only to show that in my position as the one responsible for Spanish fisheries policy, I am well aware of the problem at a general level. I want to improve these services in Spain because I am absolutely convinced that in this way I will be doing a great service to the fishery economy of my country, as well as to that of the international community.

In the same way, the fishing industry should be aware of the need for self discipline. It should accept fully the formulas imposed and recognized internationally as well as any administrative rigor necessary under the present circumstances, whose purposes are to manage a basic activity and to generate employment.

The fishing industry has been confronted in the last few years with important changes, by-products of the variation experienced in the rights to the fishing grounds. These changes are a consequence of the necessity to preserve marine species by means of protective measures, which will assure the fishery development for future generations.

Spain, a traditional fishing country, has been deeply affected by these changes and we find ourselves presently faced with the absolute necessity of clearly intensifying fishery management on both a short- and a long-term basis, to assure the future of this sector. No doubt the preparation of such a program must be set up in a clear perspective. This clarification will be forthcoming after negotiations with Morocco, Portugal and the

European Economic Community.

In any case, we should all be aware - society, industry and administration - that the present coordinates of the fishing industry, as a component of economic activity, have changed dramatically. The immobility of any of the agents which form part of that activity is unrealistic and cannot ever render positive results.

The present situation obliges us to adopt a series of measures which tend to improve and to update our structures, since this is the only way capable of assuring a healthy fishing industry which is competitive and capable of facing the new concept of the existing world fisheries.

None of this can be considered without the fishing industry's being aware that the overall economic system has been deeply affected by an energy crisis. This crisis should be accepted as a common denominator facing any short-term management policy which the industry hopes to carry out. This situation also involves the reconsideration of its competitiveness through non-artificial means and always within the new schemes.

Thirdly, I am going to refer to the regulations established by ICCAT for some species, such as bluefin, yellowfin and bigeye. Such regulations were recommended because there was a sound scientific basis for them. However, fishery administrations have the responsibility to see that these regulations are carried out. If not, then we are obliging our scientists to work in order to offer us ideas and solutions, when the measures suggested by them are not being observed. In this way, we are uselessly wasting our contributors' money on research, but we are also creating frustration for those who have given all their effort to the work they believed was useful.

We should not only try to put into effect officially the regulations by inserting them in our official state bulletins, but we should also utilize the monitoring and control services available to us, to ensure the strict completion of the regulations. In this aspect, if there are no reasons to the contrary, I think that the Port Inspection Scheme as agreed by the Commission should be put into practice soon.

I do not want to fail to mention another circumstance which we should bear in mind in our decisions. I am referring to the profound differences in the level of fishery development of the various countries of this Commission, and to the differences in the availability of resources.

I believe that we cannot ignore this reality, since we all have the obligation, especially those countries with more experience in this aspect, to help the developing countries which are new ICCAT members so that they can benefit from Commission activities for the development of their tuna fisheries.

These countries come to ICCAT willing to adhere to its rules as established in the text of the Convention, but I think that they also come, and rightfully so, in search of support and help which we have a moral obligation to offer them.

Finally, I would like to wish you all a pleasant stay in Madrid, a city which is familiar to most of you. I hope that this year, as in others, you will have a week of fruitful discussions as regards that marvelous marine fauna of the Atlantic Ocean, which far from separating us, serves to contribute to our unity.

Thank you.

## OPENING ADDRESS BY DR. L. KOFFI, COMMISSION CHAIRMAN

### Distinguished delegates:

Eleven years ago, the pages of history - as new as those of a schoolboy's notebook at the start of the school year - opened for the International Commission for the Conservation of Atlantic Tunas. The Commission was unsure of its future at that time, but it was determined to assume its role aimed at increasing our knowledge of tuna resources in the Atlantic and to determine the most adequate regulations to be applied by all countries. The purpose of these aims is to benefit from a rational exploitation of the stocks and to contribute to the conservation of tuna populations at a level permitting a maximum sustainable yield.

Even if we do not consider 1980 as a turning point, this Second Special Meeting of our Commission takes place at a time when we should make an appraisal of our activities, to reveal the positive aspects while being aware of the deficiencies that we must correct without delay if we do not want to jeopardize the future of the Commission.

Before going on, I would like to reiterate my welcome to all the commissioners, scientists and observers present, and particularly to the observers from Nigeria and Uruguay, who have shown a profound interest in our work and whose countries, we hope, will soon become ICCAT members. If any of the observers present would like to take advantage of this occasion to know more about our Commission, both the Executive Secretary and I would be very happy to provide you with all the information available.

Eleven years ago only the U.S. and Japan supplied tuna statistics; today, all member countries that fish for tuna provide statistics covering 50 to 100 percent of their catch. Size sampling, scarce in 1970, now covers all the species and hundreds of thousands of tunas are measured each year.

In the area of tuna research, in 1970 our knowledge of the state of the different tuna stocks was rudimentary, almost nonexistent. In 1980, various global and analytical methods have permitted us to make a better, although still approximate, evaluation of the state of the stocks and at the same time increase our knowledge of the biology of most of the species thanks to the tagging of tens of thousands of fish.

The multi-year Skipjack Program, initiated in 1979, is one of the most extensive international programs on the biology of one species. This Program should effectively complete partial and insufficient information currently available on this species.

The goal of the collection and analysis of all the statistical and biological data is the rational exploitation of this biological "capital" which is tuna. To achieve this goal, the Commission has already adopted various regulatory measures for the conservation of the species.

*Yellowfin:* On July 1, 1973, a minimum size regulation of 3.2 kg. or 55 cm. went into effect with a 15 percent tolerance of the number of fish landed.

*Bluefin:* A 6.4 kg. size limit regulation was adopted for bluefin tuna in 1975.

*Bigeye:* A 3.2 kg. minimum size limit went into effect in September, 1980.

The progress made by our Commission cannot be measured only in terms of statistical and biological data, but also in terms of training of scientific personnel. That is why in 1978 our Commission held a training course on statistics and sampling in the Canary Islands. Earlier training courses were held in Nantes, France, and La Coruña, Spain. The information derived from these training courses has allowed the majority of the member countries to benefit from the services of researchers and competent technicians in the area of stock evaluation.

It would be premature to try to measure the effective application and repercussions of these regulations, but it is fair to pay well-deserved homage to the artisans of the progress carried out by our Commission in very few years. I am referring to the Standing Committee on Research and Statistics and its Chairman, to the scientists of all nationalities, who each in his speciality and driven by a common ideal, are ever ready to give to the Commission the invaluable "capital" of their intelligence, experience and work.

I would also like to commend the untiring efforts, in the spirit of self-denial and efficiency, exerted by the Secretariat staff, under the supervision of Dr. Rodríguez-Martín, whose constant availability and winning manners are known to us all.

However, in recognizing the proof of the progress attained by our Commission, we cannot overlook our defects, errors and difficulties. To set up adequate regulations without relying on the necessary means to make them effective is like making a diagnosis and then not providing the patient with the necessary medicine. In the same way, just because we may be able to congratulate ourselves for having put into effect a port inspection scheme, and because we are studying the possibility of setting up an infractions committee does not mean that we can ignore the fact that individual susceptibilities and selfish national interests may stifle us and prevent us from rising above the inevitable circumstances.

This notorious lack of goodwill will have dramatic consequences for the future of our Commission, if we do not act prudently. Recognizing these deficiencies and remedying them as soon as possible is, in my opinion, a duty having repercussions beneficial to the countries in question as well as to the international community interest in tuna fisheries.

In expounding further on the matter of our defects, I would like to insist in my desire to give well-deserved importance to the problems of quick transmission of reliable statistical and biological data, upon which any management of the rational exploitation of tuna stocks should be based.

In finalizing this review of our "shaded" areas, I would like to say that the training of researchers and technicians from coastal Atlantic African countries should be one of our primary concerns. Although our Commission should not be the only organization to take initiative in this aspect, ICCAT should offer its collaboration.

Distinguished delegates, I believe I owed you a clear explanation and for this reason I have had to hold your attention for such a long time, for which I ask your pardon. However, I want to insist on the important tasks which are being started now and whose nuclei are the preparations for the International Skipjack Year in 1981.

During the course of last week, I have had the great privilege of attending the meetings of our scientists, who have carried out excellent and very interesting work.

In spite of the uncertainties which still persist and caution necessary to arrive at conclusions, our scientists deserve our full confidence.

I now declare officially inaugurated the sessions of the Second Special Meeting of the International Commission for the Conservation of Atlantic Tunas.

Thank you.

Summary Table on the Present Status of the Regulatory Measures taken by each Member Country (Date entered into effect) (as of May 1, 1981)

Country	YELLOWFIN (3.2 kg)	BLUEFIN (fishing mortality)					BIGEYE (3.2 kg)	
		1st (6.4 kg)	(a)	2nd (b)	(c)	(d)		
	In force July 1, 1973 for an in- definite period	In force Aug. 10, 1975 for an in- definite period	In force Aug. 10, 1975 until Aug. 10, 1976	Extended until Aug. 10, 1978	Extended until Aug. 10, 1980	Extended until Aug. 10, 1982	In force Sept. 7, 1980	
Angola	Jun. 17, 1979	-----	-----	No fishing	-----	-----		
Benin								
Brazil	Feb. 23, 1973	Aug. 18, 1977	Aug. 10, 1977	Aug. 18, 1977	Mar. 2, 1979	Nov. 17, 1980*	Nov.17, 1980*	
Canada	Sep. 4, 1973	Feb. 17, 1976	Feb. 17, 1976	Feb. 17, 1976	Feb. 15, 1979	Feb. 15, 1979	No fishing	
Cape Verde								
Cuba	Jul. 1, 1973	(No bluefin fishing for the 3-year period)						
France	Jun. 29, 1973	Aug. 8, 1975	Dec. 27, 1974	Dec. 27, 1974	Dec. 27, 1974	Dec. 27, 1974	Mar. 3, 1981	
Gabon	-----	(no fishing or landings)-----						Measures being considered
Ghana	Jun. 19, 1976							
Ivory Coast	March, 1970							
Japan	Jun. 14, 1973	Apr. 16, 1975	Apr. 16, 1975	Apr. 16, 1975	Apr. 16, 1975	Apr. 16, 1980	Sep. 7, 1980	
Korea	Jan. 21, 1973	Dec. 17, 1975	Dec. 17, 1975	Dec. 17, 1975	Oct. 14, 1978	Sep. 15, 1980	Sep. 15, 1980	
Morocco	(no fishing)							
Portugal	Jun. 26, 1973	Jun. 26, 1973						
Senegal	Jul. 2, 1973							
South Africa	May 1973	Jun. 27, 1975	Jun. 27, 1975	Oct. 19, 1976	Feb. 9, 1979	Jan. 11, 1980	Oct.22, 1980*	
Spain	May 29, 1974	Mar. 3, 1975	Feb. 19, 1976	Feb. 19, 1976	Feb. 19, 1976	Jan. 24, 1980	Sep.10,1980*	
U.S.A.	Nov. 5, 1975	Aug. 13, 1975	Aug. 13, 1975	May 18, 1976	Jun. 15, 1979	Jun. 13, 1980	Mar.30 1981	
U.S.S.R.	Sep. 28, 1978	Sep. 28, 1978	Sep. 28, 1978	Sep. 28, 1978			Nov. 4, 1980	

\*In process.



**REPORTS OF THE MEETINGS OF PANELS 1 – 4  
AND JOINT MEETING OF PANELS 1 AND 4**

**Report of the Meeting of Panel 1**

Madrid, November 1980

**1. OPENING**

The meeting was called to order by the Chairman, Dr. E. A. Kwei (Ghana).

**2. ADOPTION OF AGENDA**

The Tentative Agenda was adopted without change (Appendix 1).

**3. ELECTION OF RAPPORTEUR**

Mr. R. B. Stone (U.S.A.) was appointed rapporteur.

**4. REVIEW OF PANEL MEMBERSHIP**

There were no changes in panel membership. All the panel members were present.

**5. REVIEW OF THE REPORT OF THE STANDING COMMITTEE ON RESEARCH  
AND STATISTICS (SCRS)**

Dr. Kwei asked the SCRS Chairman, Mr. A. Fonteneau, to summarize the Committee's report on yellowfin and skipjack.

**5-a) *Yellowfin***

Mr. Fonteneau mentioned that there were a number of new documents available on yellowfin this year. One document described a new fishery off Cape Agulhas, South Africa, that took 9,000 MT in 1979. It is unclear if these fish were from the Atlantic or Indian Ocean population. The SCRS used production models to assess the status of stocks under two hypothesized stock structures: an Atlantic-wide stock and separate eastern and western stocks.

With an Atlantic-wide stock assumption, the CPUE has declined steadily in the

purse seine fishery since 1969. The MSY is in the range 119,000 MT to 144,000 MT. Current (1979) catch is within the range of estimated MSY, however, 1979 and 1980 effort levels are 20 percent to 25 percent greater than levels corresponding to MSY for  $m = 1$  and 2 models.

The Committee noted that the assumption that the coastal CPUE is a reliable index of Atlantic-wide yellowfin abundance has not been proven.

Production model analyses for an eastern Atlantic stock indicate abundance has declined. MSY is estimated to be between 108,000 MT and 133,000 MT. Current catch is within this range, however, effort is 14 percent to 24 percent greater than effort corresponding to MSY for the  $m = 1$  or 2 cases.

No new production model was presented for a western Atlantic stock. Based on last year's report, the MSY ranges between 16,000 MT and 22,000 MT and effort is about twice the optimum level.

#### 5-b) *Skipjack*

Mr. Fonteneau noted that considerable research was being conducted as part of the International Skipjack Year Program. He congratulated several participants for their outstanding efforts as part of this Program. Skipjack fisheries occur in the eastern and western Atlantic and data show little mixing; however, until data demonstrate differently, the stocks are considered as one stretching Atlantic-wide.

Because of limited data, no good index of abundance is available. The Committee's assessment of the conditions of the stock is the same as last year. The true potential yield is unknown, but available information suggests that this potential is larger than current catch levels and that larger fish seem to exist in the Atlantic but presently are not available in the fishery.

The delegate from Spain questioned the validity of separating catches between east and west with a line at 30°W. This gives the appearance of two stocks.

The delegate from France asked if there was information on concentrations of skipjack found offshore and the size composition of these fish. Mr. Fonteneau replied that there was little information available on the concentrations but they appeared to be bigger fish.

## 6. REVIEW OF POSSIBLE MEASURES FOR THE CONSERVATION OF STOCKS

### 6-a) *Yellowfin*

Mr. Fonteneau noted that the magnitude of undersized fish landed and those discarded remains a concern to the SCRS and recommended close monitoring of this problem.

The U.S.A. thanked Mr. Fonteneau for his fine presentation and noted the amount of undersized fish that had been caught. Mr. Blondin expressed the hope that the member countries would take all necessary measures to see that the size restrictions are followed.

6-b) *Skipjack* ... No specific conservation measures were recommended by the SCRS at this time.

7. RESEARCH NEEDED TO BE CARRIED OUT

7-a) *Yellowfin* ... The SCRS indicated that additional information is needed for estimating juvenile growth. Also, better information is needed on possible benefits from an increase in the size-at-first-capture. Improvement in statistical reports is desirable.

7-b) *Skipjack*

Mr. Fonteneau mentioned that the International Skipjack Year Program was proceeding successfully, and that other parameters such as the amount of east/west mixing, environmental impacts on skipjack, natural mortality and fishing mortality should be considered in the Program.

8. DATE AND PLACE OF THE NEXT MEETING

The Panel agreed to hold its next meeting at the same time and place as the next Commission meeting.

9. OTHER MATTERS

No other matters were discussed.

10. ADOPTION OF REPORT

During the adoption of the report, Gabon requested membership in Panel 1 and was accepted with pleasure by the Panel. Following this, the report was adopted.

11. ADJOURNMENT

The meeting was adjourned.

Report of the Meeting of Panel 2

Madrid, November 1980

1. OPENING

The meeting was called to order by the Chairman, Mr. Tazi-Sadek (Morocco).

## 2. ADOPTION OF AGENDA

The Tentative Agenda was adopted (Appendix 1).

## 3. ELECTION OF RAPPORTEUR

Mr. R. Pianet (France) was appointed rapporteur.

## 4. REVIEW OF PANEL MEMBERSHIP

There have been no changes in panel membership. All the panel members were present.

## 5. REVIEW OF REPORT OF THE STANDING COMMITTEE ON RESEARCH AND STATISTICS (SCRS)

### 5-a) Bluefin

The SCRS Chairman, Mr. A. Fonteneau (France) presented the report of the Bluefin Workshop (SCRS/80/24) and reviewed the most relevant parts of the SCRS Report presented (Annex 8), as well as its conclusions concerning the stocks of northern bluefin in the Atlantic.

Stock structure is still uncertain, and no new information has been brought forth on this subject. The Committee is inclined to think that the two-stock (east and west) hypothesis with some moderate and variable mixing is the most probable. However, this evidence is not strong enough to allow us to reject the hypothesis of a single stock.

In the eastern Atlantic the adult stock has been slowly increasing with the arrival into the fishery of the strong 1974 cohorts. Between 1976 and 1978 abundance of juveniles was stable and recruitment was at an average level.

With the implementation of ICCAT regulatory measures, fishing rates - for juveniles, adults or for the stock as a whole - have shown no increase since 1976. Juvenile catches have shown a decrease of 38 percent since the 6.4 kg size limit has been in force.

In the western Atlantic, the arrival into the fishery of the strong 1973 cohort has resulted in an increase in the adult stock. The abundance of juveniles was rather low in 1979, and recruitment was at levels slightly below the 1977-79 average.

Fishing rates for all segments of the stock have shown no increase since the implementation of the regulations, and juvenile catches have decreased 90 percent since the size limit was implemented.

On an Atlantic-wide basis, juvenile abundance has decreased since 1975, whereas adult abundance increased with the strong 1973-74 cohorts. However, the abundance of very large fish remained low and will continue to decrease until the arrival of the 1973 and 1974 year-classes. These cohorts apparently are representing the only opportunity of recuperation of this important part of the spawning stock. The yield-per-recruit of small-fish fisheries seems to be close to maximum level. On the other hand, a decrease in the mortality rate affecting these smaller fish would probably result in an

increase in the yield-per-recruit of large fish. Fishing rates have not increased in any segment of the stock since the implementation of regulations, and juvenile catches decreased by 50 percent.

#### 5-b) *Albacore*

The traditional separation of Atlantic albacore into north and south stocks is accepted by most experts and was not questioned.

For the northern stock, catches have been at a relatively stable level (about 50,000 MT) since 1971, close to that of the estimated MSY (60-65,000 MT); effort was 40 percent below the  $f_{opt}$ . Yield-per-recruit analyses show that the stock is heavily fished, but that yield-per-recruit could still increase with a shifting of effort towards larger fish. Recruitment is highly variable, and the probability of the occurrence of a very low level of recruitment cannot be ignored. On the whole, the northern stock seems to be rather heavily exploited, while still remaining rather healthy.

Concern expressed in past years by the SCRS concerning the northern stock has eased, and no special recommendation is being considered for any of the stocks.

### 6. REVIEW OF POSSIBLE MEASURES FOR THE CONSERVATION OF STOCKS

#### 6-a) *Bluefin*

The Chairman of Panel 2 called the attention of the delegates to two documents relating to conservation measures for bluefin tuna, COM/80/26 and 27. Document COM/80/26, which was presented by the U.S.A., comments on current regulatory measures and announces the intention of the U.S. to propose new measures. Document COM/80/27 was submitted by the Italian authorities and concerns conservation measures for bluefin tuna in the Mediterranean.

After congratulating the SCRS Chairman for his explanations, the United States expressed its concern over the large catches of undersized fish in the eastern Atlantic, noting in the eastern Atlantic, including the Mediterranean, a decrease of 38 percent in the average annual catch of age 0 and 1 fish after regulation, while in the western Atlantic a 90 percent decrease was experienced. In addition, the United States singled out the status of the Atlantic bluefin tuna stock as the most critical conservation and management issue currently facing the Commission. In this regard, the U.S. emphasized the stock size trends, which with the exception of the intermediate size group which presently includes the 1973 and 1974 year-classes, evidence sharp declines. The U.S. noted that the 1973-74 year-classes are increasingly vulnerable as they are now entering the age groups available to the longline fishery. In addition, the stocks of large bluefin (age 6 and over) could decline considerably by 1985 if the current catch by weight is maintained. The decline may still occur, although less sharply, even if current mortality rates are maintained. The United States emphasized that very restrictive measures have been implemented for U.S. fishermen and urged that, at a minimum, the current measures limiting mortality remain in effect. The U.S. also suggested that, in order to preserve a spawning stock for the future, participants in the fishery implement the limit

on fishing mortality to recent levels by segments of the fishery.

The delegate of Canada supported the U.S. comments and recognized that indeed the Commission must be ready to face this challenge.

He then made a statement (Appendix 2 to Annex 6). He repeated his conviction that further regulatory action should be taken for the western stock. These further measures in the west Atlantic should take into account the interests of all Contracting Parties whose fishermen exploit this stock. In the course of the ensuing debate the delegate of Brazil expressed his appreciation for the statement of Canada recognizing the rights of the countries that are beginning to develop their tuna fisheries, which should be taken into consideration by ICCAT in enforcing conservation measures. The delegate of Portugal also supported the Canadian statement and Brazil's comments.

The delegate of Japan presented a statement on the position of his country concerning the conservation of bluefin tuna in the Atlantic (Appendix 3 to Annex 6). He stressed that his country strictly implements the measures adopted by ICCAT, and that all member countries should likewise do so. He also repeated his concern regarding the protection of the spawning stock.

The delegate of Portugal suggested that, in view of the results presented, the two-stock hypothesis be selected, and appropriate regulatory measures be considered by the SCRS. This proposal was supported by Brazil and Canada. It was then forwarded to the SCRS Chairman who took due note of it and announced that the SCRS will also study the bluefin problem from this angle.

#### 6-b) *Albacore*

Since the situation of albacore, as presented by the Chairman, seems satisfactory, no comment was made by any delegation.

### 7. RESEARCH NEEDED TO BE CARRIED OUT

The SCRS Chairman referred the Panel to the recommendations on research which are stated in the SCRS Report (Annex 8), for both bluefin tuna and albacore. No comments were expressed in this respect.

### 8. DATE AND PLACE OF NEXT PANEL MEETING

The Panel agreed to meet at the same time and place as the next Commission meeting.

### 9. OTHER MATTERS

No other matters were discussed.

### 10. ADOPTION OF REPORT

The report was adopted.

**11. ADJOURNMENT**

The Panel was adjourned.

**Report of the Meeting of Panel 3**

Madrid, November 1980

**1. OPENING**

The meeting was called to order by the Chairman, Mr. T. Isogai (Japan).

**2. ADOPTION OF AGENDA**

The Tentative Agenda was adopted without change (Appendix 1).

**3. ELECTION OF RAPPOREUR**

Dr. P. Miyake (Secretariat) was designated rapporteur.

**4. REVIEW OF PANEL MEMBERSHIP**

There were no changes in panel membership. All the panel members were present.

**5. REVIEW OF THE REPORT OF THE STANDING COMMITTEE ON RESEARCH AND STATISTICS (SCRS)**

Mr. A. Fonteneau reviewed relevant parts of the SCRS Report for the Panel.

**5-a) Southern bluefin (*Thunnus maccoyii*)**

The species consists of a single stock distributed in the southern hemisphere throughout the Atlantic, Pacific and Indian Oceans and harvested by Japan and Australia. The CPUE has declined in the past and remains at a low level. Japanese longline effort recently shifted from the Indian Ocean to the Atlantic Ocean. The resources are studied jointly and management measures are taken by these two countries.

**5-b) Albacore, South**

The CPUE declined in the past. The production model studies showed the present catch level is lower than the MSY level with an effort level less than that corresponding to the MSY level. Yield-per-recruit is achieved at a high level due to the fact that only medium and large fish are caught by longline.

6. REVIEW OF POSSIBLE MEASURES FOR THE CONSERVATION OF STOCKS

6-a) *Southern bluefin*

No comments were made.

6-b) *Albacore, South*

No comments were made.

7. RESEARCH NEEDED TO BE CARRIED OUT

The Panel concurred with all the recommendations made by the SCRS concerning research needed on the stocks in question.

8. DATE AND PLACE OF NEXT PANEL MEETING

The Panel agreed to hold its next meeting at the same time and place as the next Commission meeting.

9. OTHER MATTERS

No other matters were discussed.

10. ADOPTION OF REPORT

The report was adopted.

11. ADJOURNMENT

The meeting was adjourned.

**Report of the Meeting of Panel 4**

Madrid, November 1980

1. OPENING

The meeting of Panel 4 was opened by the Chairman, Mr. J. L. Meseguer (Spain).

2. ADOPTION OF AGENDA

The Tentative Agenda was adopted without change (Appendix 1).



### 3. ELECTION OF RAPPORTEUR

Mr. B. García Moreno (Cuba) was nominated rapporteur.

### 4. REVIEW OF PANEL MEMBERSHIP

There were no changes in panel membership. All the panel members were present.

### 5. REVIEW OF THE REPORT OF THE STANDING COMMITTEE ON RESEARCH AND STATISTICS (SCRS)

#### 5-a) *Bigeye*

This species is taken in the entire Atlantic by surface and longline gears; longline is used more extensively for bigeye fishing in the Atlantic. The major surface fisheries which capture bigeye develop in local areas off the coasts of Madeira, the Azores, the Canary Islands, Dakar and the Gulf of Guinea. Bigeye catches in 1979 reached 42,000 MT. The 1980 catch is estimated at approximately 35,000 MT, somewhat less than the 1979 catch. Bigeye stock structure is still not well defined. However, the SCRS used the two-stock hypothesis to evaluate the stock: a single Atlantic-wide stock, and two independent stocks (north and south) separated at 5°N. Bearing in mind that the longline catches are comprised totally of adults, the CPUE of these catches would indicate the relative abundance of the spawning stock.

Under the one Atlantic stock hypothesis, the production model analysis shows results very similar to those of 1979, i.e. that the stock is being presently exploited at a high level.

Present fishing effort is considered probably below the corresponding estimated MSY level. We can expect that any new increases in effort, based on the present fishing schemes, would only result in marginal increases in yield.

Yield-per-recruit studies indicated that the increase in age-at-first-capture would contribute to an increase in yield-per-recruit. It should be pointed out that the Y/R would be adversely affected if the catches of small bigeye continue to increase.

Under the two-stock hypothesis and upon analysis of the north stock, it was noted that the fishery is operating at a level slightly below MSY, which indicates that an increase in effort with the same fishing pattern would only produce a slight increase in yield. Regarding the south stock, the analysis of the production model indicates that fishing levels have been high within the MSY. It was also noted that if the surface fishery catches larger quantities of small bigeye it could have adverse repercussions on the catches.

The present catch statistics are insufficient and in some cases are even deficient. Therefore, intense sampling is proposed in order to know the real quantity of bigeye landed, especially since sometimes mixed bigeye and small yellowfin catches are landed and reported.

Regarding research, studies aimed at a better knowledge of the growth parameters were recommended. Studies were also recommended on tagging activities. The effects of

the minimum size regulation for bigeye have still not been evaluated since the regulations entered into effect only in September, 1980.

#### 5-b) *Billfishes*

The species included in this category are caught basically by longline, sport and artisanal fisheries. The catch statistics are deficient since there is no adequate breakdown of the catches by species.

Regarding blue marlin, CPUE, and catch have shown downward trends in recent years. Comparison of CPUE for both Japanese and Taiwanese longline fisheries revealed the same downward trends.

The CPUE for white marlin dropped in spite of the decrease in Japanese fishing effort. It was suggested that the SCRS take note of the decrease in CPUE with regard to the repercussions which new increases in effort may have.

#### 5-c) *Sailfish*

The analysis of the CPUE of the Senegalese sport fishery and the CPUE of the Japanese longline fishery seems to indicate that the decrease of this index of abundance is not as pronounced for this species as for the aforementioned species. However, the need to monitor the development of the sport, artisanal and industrial fisheries along the western African coast was noted.

#### 5-d) *Swordfish*

This species is caught by longline and surface gears. The swordfish catches in the Atlantic and Mediterranean were reduced significantly between 1970 and 1978 due to problems relating to the mercury content levels found in the species.

After 1978 the catches increased appreciably due to an increase in effort and not to an increase in abundance. The adjusted CPUE based on the Japanese longline data indicated a slight increase, but it is uncertain if this means an increase in abundance or a change in strategy. The catch rate of the Canadian longline swordfish fishery upon resumption indicated only a minor increase when compared to the 1962-70 data.

It is necessary to determine the growth parameters of the species as well as the abundance indices.

#### 5-e) *Other species*

Regarding the fisheries and catch statistics of small tunas, the SCRS noted the necessity of improved statistics, since on many occasions the catches are not reported. Due to scant existing knowledge of all the billfish species combined, it is necessary that more detailed studies be carried out.

6. REVIEW OF POSSIBLE MEASURES FOR THE CONSERVATION OF STOCKS

The delegate from the U.S.A. noted that the CPUEs of blue marlin and white marlin have decreased notably in the last few years and reiterated their concern expressed in previous years in this respect. He expressed the future possibility of some type of recommendation for purposes of protective measures with regard to the aforementioned species. The U.S. was, at this time, considering a 20 percent reduction in catch by U.S. fishermen.

The delegate from Canada noted his country's concern about the present situation of the swordfish fisheries. He added that Canada is applying measures to regulate the catches and stated that the Commission should give serious thought to conservation measures.

The United States, as well as Canada and other countries, emphasized the importance of the meeting on statistics and research on billfish and swordfish scheduled in Miami in 1981 which specialists from a large group of countries will attend.

7. RESEARCH NEEDED TO BE CARRIED OUT

- 7-a) *Bigeye*: Studies on growth and tagging are recommended as well as intensified sampling.
- 7-b) *Billfishes*: Improvement of catch statistics, initiation of growth studies, improved identification of the species and better information on stock structure were recommended.
- 7-c) *Swordfish*: The need for determining growth parameters as well as indices of abundance was noted.
- 7-d) *Other species*: More detailed studies are needed on other species since these species, in general, are not adequately studied.

8. DATE AND PLACE OF NEXT PANEL MEETING

The Panel agreed to hold its next meeting at the same time and place as the next Commission meeting.

9. OTHER MATTERS

The delegate from Ghana proposed holding a joint meeting of Panels 1 and 4 since some aspects regarding yellowfin, skipjack and bigeye could not be amply analyzed during the meeting of Panel 1 (as bigeye is included in Panel 4). The SCRS Chairman referred to the common problems of Panels 1 and 4 and noted that it would be beneficial to hold a joint meeting of these two panels. Ghana's proposal to this effect was seconded by Ivory Coast, and Cuba, France, Portugal and the U.S.A. also approved.

10. ADOPTION OF REPORT

The Report was adopted.

11. ADJOURNMENT

The meeting was adjourned.

**Report of the Joint Meeting of Panels 1 and 4**

Madrid, November 1980

The Chairman of the Commission appointed the Chairman of Panel 1 (Dr. E. A. Kwei, Ghana) to chair the meeting of Panels 1 and 4. Spain supported this appointment on the basis that Spain, as chairman of Panel 4, was the chairman of the Joint Panel Meeting in 1979. Mr. D. S. Crestin (United States) served as rapporteur.

The Chairman, Dr. Kwei, reviewed the background of the Joint Panels 1 and 4. He noted the prime importance of yellowfin in the Atlantic with respect to both tonnage and value, and that regulatory measures in effect had not resulted in a reduced harvest of undersized fish. When bigeye was considered for the minimum size regulation due to the problem of misidentification of that species with yellowfin, it was determined that skipjack should also be studied since they are all taken in this mixed fishery. He emphasized the importance of conserving bigeye juveniles relative to the Atlantic-wide fishery since the source of recruitment for this species has not yet been defined. He then called upon the SCRS Chairman to outline the biological and statistical issues bearing on the multi-species fishery.

The SCRS Chairman reviewed in detail the characteristics of the fishery known to the SCRS, emphasizing the overlapping concentrations of juveniles of the species under consideration, the lack of adequate statistics on both harvest levels and discards and the resulting difficulties experienced by the SCRS in its ability to reach conclusions on the mixed fishery. The Chairman stressed the uncertainty inherent in recommending various regulatory regimes, including area and season closures designed to reduce the juvenile harvest since there existed no mechanism to define the impact on the existing skipjack fishery.

Because of uncertainties involving the fishery and behavior of the fishing fleet, the SCRS Chairman emphasized again the inability to project probable impacts associated with additional regulatory measures such as temporary closure of fishing areas. These measures would probably have a benefit on yellowfin and bigeye catches by reducing the fishing mortality of juveniles. They probably would have a negative impact on skipjack catches since it was not known whether skipjack would be available to the fishery in other areas or during other seasons. He was able to project a greater general impact on the baitboat fleet since its operation was localized, while purse seine fleets are capable of wide-ranging operations.

He concluded his remarks by offering that the Skipjack Program of research will facilitate work by the SCRS because more refined measurements will be available. He again stressed the inability of the SCRS to make positive recommendations to the Commission except for the need for more research and work.

Ivory Coast, noting the work of the SCRS, offered that a multi-species approach to management appeared necessary. They believed it significant that many undersized yellowfin continue to be harvested yet the SCRS does not recommend additional regulatory measures. Ivory Coast concluded by suggesting that additional regulatory measures should be considered.

The United States expected more discussion from those countries concerned with the fisheries under consideration. It was apparent that the data were inadequate for a rational decision to be made on skipjack and that the Skipjack Program will yield a better data base from which to proceed. Full gains in yield-per-recruit to the bigeye and yellowfin fisheries, however, are not being realized because of the continued harvest of undersized fish. Area closures would disadvantage the baitboat fleet due to its limited mobility. While the Commission has a better appreciation of the problem, it is not yet in a position to advocate a minimum size limit for skipjack.

Ivory Coast asked that the Commission request the SCRS to focus more detail on the problem and to be prepared to report further on the issue in 1981.

As there was no further discussion, the joint meeting of Panels 1 and 4 was adjourned.

**Agenda for Panel 1 (Tropical Tunas)**  
**Panel 2 (Temperate Tunas – North)**  
**Panel 3 (Temperate Tunas – South)**  
**Panel 4 (Other Species)**

1. Opening
2. Adoption of Agenda
3. Election of rapporteur
4. Review of Panel Membership
5. Review of the Report of the Standing Committee on Research and Statistics (SCRS)
6. Review of possible measures for the conservation of stocks:

Panel 1

- a) Yellowfin
- b) Skipjack

Panel 2

- a) Bluefin
- b) Albacore

Panel 3

- a) Bluefin
- b) Albacore

Panel 4

- a) Bigeye
- b) Atlan. bonito
- c) Billfishes
- d) Other species

7. Research needed to be carried out
8. Date and place of next Panel meeting
9. Other matters
10. Adoption of Report
11. Adjournment

## CANADIAN STATEMENT ON BLUEFIN TUNA

(Attached to Report of Panel 2)

Mr. Chairman, this delegation agrees with the comments of the U.S. delegation with respect to the real test facing ICCAT in its handling of the conservation of bluefin tuna. Members of this Panel will recall that the delegation of Canada has in previous years addressed the issue of conservation of northern bluefin tuna in this forum. This delegation supported the introduction of the original regulation which is now in effect for bluefin fisheries. It supported a United States proposal to amend the current regulation at the Commission's Fifth Regular Meeting in 1977, and introduced a proposal at the First Special Meeting in 1978 to manage northern bluefin on a two-stock basis. At the Sixth Regular Meeting of the Commission in 1979, we did not introduce a proposal, since it was clear that support from other delegations would not be forthcoming.

I delve into this history in order to remind our colleagues that the issue of conservation of bluefin tuna is of key importance to Canada. Our interest derives from two standpoints and I would like to explain this, because I fear that our motives may have been misunderstood in the past.

The conservation standpoint is one element from which our interest flows, and which, indeed, is the fundamental concern of our Convention which created this Commission. I shall wish to explore this aspect in a moment.

Of equal importance to Canada is the economic standpoint. The bluefin tuna which migrate off Canada's Atlantic coast contribute to regionally important fishing activity in the Maritime Provinces of Canada. The Maritime Provinces are a part of Canada comprised largely of small communities, many of which are coastal communities which rely on the fishery and a two-month tourist season for generation of income, income which is supplemented by economic support from other parts of the country through our Federal government programs and institutions. The bluefin fishery is, therefore, an important element of the region's economic base which we must protect, a fact which this Commission should recognize, just as it recognizes and attempts to promote the economic interests of other member countries through its research and management programs in other parts of the Atlantic Ocean.

I present these remarks, Mr. Chairman, in order to put into economic perspective our concerns with respect to the conservation of bluefin tuna. Once again this year our scientists have sifted through their data and have analyzed the status of stocks on the basis of two hypotheses; one that there are separate eastern and western stocks and; two that there is one Atlantic-wide stock. Irrespective of the hypothesis you select, it is quite clear that in the western Atlantic we face a problem.

Both the Chairman of the SCRS and the delegate of the U.S. showed us some graphs that illustrated a general decline in the number of bluefin in the Atlantic, a decline that is temporarily reversed by the progress of the 1973 and 1974 year-classes through the population. Despite these two strong year-classes, however, and some subsequent year-classes of average strength, particularly in the east, the SCRS has concluded that the adult stock could decline considerably by 1985 at current catch levels.

The recruitment from the western spawning area does not appear to have been as strong as in the east, so that in considering a western spawning stock, the conclusions that the SCRS revealed with respect to a possible total Atlantic population became much more significant. Examining the graphs of bluefin numbers we see that, in the west, the age 6-plus group increased significantly in 1979 with the entry of the 1973 year-class, but that there are no substantial numbers of fish to follow. Thus, the numbers of older fish will decline. We know something about year-classes as recent as that of 1979, a year-class which will not enter the larger fish component until 1985. By this time, the numbers of large fish appear likely to have reached a level similar to that which existed in recent years. This level caused us very grave concern about possible recruitment failure. Our concern was, however, tempered by our awareness of that one strong year-class, which had been spawned some years earlier. We might consider ourselves saved by that year-class, but it would be irresponsible for us to continue to rely on the occasional chance strong year-classes to maintain bluefin tuna in the western Atlantic.

I would like to illustrate the significance of the present decline in the giant fish population. In 1975, our small vessels were averaging three fish for each 10 days on the fishing grounds. In 1979, this had dropped to only slightly more than one fish for each 10 days on the fishing ground.

Mr. Chairman, I think that these points highlight our concern. We believe that the time has come for the Commission to act to protect the stocks of bluefin in the western Atlantic. We have reached this conclusion after an examination of our own domestic regulations as well as the domestic regulations taken by Japan and the U.S.A. under the auspices of the current ICCAT regulation. I should like to repeat our conviction that further regulatory action should be taken by our Commission. In doing so, we believe that we must be cognizant of the interests of all Parties whose fishermen exploit the stocks in the west, including the fishermen of Brazil, Japan, the United States and Canada. We are not seeking a regulatory system that would unduly penalize anybody, but at the same time, we are convinced that if nobody is prepared to act, we will all be penalized in the end.



## **JAPANESE STATEMENT REGARDING THE CONSERVATION OF BLUEFIN TUNA IN THE ATLANTIC OCEAN**

(Attached to Report of Panel 2)

On this occasion, I would like to present Japan's basic attitude on the conservation of bluefin tuna in the Atlantic Ocean.

1. Needless to say, Japan considers that management of highly migratory species such as tunas, including bluefin tuna of course, should be carried out by international organizations. It is also important that examination of management measures be fully based upon scientific evidence. Concerning bluefin tuna, Japan highly evaluates the results of the SCRS findings on the stock condition and the Committee's recommendation, which were presented by the SCRS Chairman. Their appraisal of and recommendation for the stocks were the result of very intensive studies and improvement of statistics done by our scientists in the past and every effort made by our qualified scientists during the past week.

2. Japan is among the few countries that have been most strictly observing the bluefin regulations which have been implemented for this stock since 1975. In this connection, we would like to emphasize that unless and until such regulations are fully implemented by all the Contracting Parties concerned, the conservation of the stocks cannot be achieved. The Japanese bluefin tuna catch has been limited to a quota of up to 4,500 MT in the Atlantic, and as a matter of fact, the Japanese catch has not increased at all; the catch in 1978-80 even decreased by 30 percent compared to previous years.

3. Japan has been paying keen attention to the protection of the spawning stock. As a matter of fact, I would like to stress two points:

a) Since 1975, Japan has been imposing additional, voluntary domestic measures on our fishermen which have not even been recommended by ICCAT. These include the closure of bluefin fishing in the Mediterranean Sea during the spawning season (May 21-June 30), where adult bluefin occur in abundance.

b) In the western Atlantic and the Gulf of Mexico, Japan has been limiting fishing effort. In addition, Japan limited the annual catch of adult bluefin tuna in the Gulf of Mexico to 8,000 fish for this fishing season. This figure will be further reduced in 1981 to 7,000 fish.

As stated above, Japan would like to strongly reiterate its concern for the protection of the spawning stock.

**REPORT OF THE STANDING COMMITTEE ON  
FINANCE AND ADMINISTRATION (STACFAD)**

Madrid, November 1980

Item 1. OPENING OF THE MEETING

1.1 In absence of the Committee Chairman (Mr. C. J. Blondin, U.S.A.), Dr. L. Koffi (Ivory Coast), Chairman of the Commission, opened the session. The Chairman proposed that Mr. A. Felando (U.S.A.) substitute Mr. Blondin in chairing the first session of the Standing Committee on Finance and Administration. Mr. Felando thanked the Committee for its confidence in him and stated that Mr. Blondin would arrive later in the day and would be present for the second session.

Item 2. ADOPTION OF AGENDA

2.1 After reviewing the Commission Agenda Items referred to the STACFAD, the Tentative Agenda previously prepared by the Secretariat, was slightly modified and adopted (Appendix I).

Item 3. ELECTION OF RAPPORTEUR

3.1 The Secretariat was designated rapporteur.

Item 4. PANELS

4.1 *Reconsideration of species distribution among the Panels*

To begin the discussion of this Item, the Executive Secretary presented document COM/80/25. This document shows different theoretical assumptions designed to show the financial repercussions of moving bigeye to Panel 1.

The SCRS Chairman presented COM/80/25 Annex 1, which deals with questions asked of the SCRS on this matter. In nature, the problem of the management of bigeye is closely related to the management of skipjack and yellowfin; therefore, it can be moved to Panel 1 or can be discussed as in the past in a joint meeting of Panels 3 and 4. After discussion of the subject, it was agreed to retain bigeye in Panel 4 and to hold a joint meeting of Panels 1 and 4 on a regular basis.

#### 4.2 *Review of Panel membership*

The Panel membership presented in COM/80/20 was reviewed. According to the Rules of Procedure, it was confirmed that as this is a Special Meeting of the Commission, member countries which wish to join a new Panel must make this request to the Chairman and that withdrawal of any country from a Panel cannot be effected until a regular meeting is held.

The Committee noted that Gabon became a new member of Panel 1. A table of Panel membership is attached as Appendix 2 to Annex 7.

### Item 5. ADMINISTRATIVE REPORT

5.1 The Administrative Report (COM/80/9) was presented and fully explained by the Executive Secretary. He outlined all the activities of the Secretariat and the Commission, including various ICCAT inter-sessional meetings; meetings at which the Commission was represented; cooperation with other organizations; the ICCAT data processing work; ICCAT publications; progress made by the Skipjack Year Program; and trips made by the ICCAT Secretariat staff. Special mention was made of the trips by the Executive Secretary to African countries and of the strong interest shown in ICCAT activities by their governments.

5.2 The Executive Secretary also stated that interest was expressed by the WECAFC countries to become ICCAT members as a block. They were advised that, according to the text of the Convention, they can join country by country.

5.3 The problem of inadequate office space has been solved thanks to the host Spanish Government's having taken action to expand the office space.

5.4 France congratulated the Commission for excellent progress made by both the Commission and the Secretariat.

5.5 The Administrative Report (COM/80/9) was reviewed and adopted by the Committee and it was recommended that the Commission approve the Report.

### Item 6. RELATIONS WITH OTHER ORGANIZATIONS

6.1 The Committee studied the relationships the Commission has maintained with various international organizations (COM/80/9) and found them to be satisfactory. In response to an inquiry about the Commission's relationship with the Indo-Pacific Fisheries Council (IPFC) and the Indian Ocean Fisheries Commission (IOFC), the Committee was informed that ICCAT cooperates closely with both the IOFC and the IPFC in tuna research and in establishing tuna statistical systems in the Indian and west Pacific Oceans.

### Item 7. COMMISSION PUBLICATIONS

7.1 The Committee studied the sections of the Administrative Report pertaining to Commission publications (COM/80/9) and recommended that the present publication

policy be maintained in the future. The Committee noted, in particular, that the number of publications issued by the Secretariat has increased this year due to the increase in work.

#### Item 8. AUDITOR'S REPORT, 1979

8.1 It was noted that the Auditor's Report (original in Spanish) with summary translations in English and French was circulated to the head of each delegation in early 1980. The Report was adopted by the Committee and then was recommended to the Commission for adoption.

#### Item 9. FINANCIAL STATUS OF THE REGULAR BUDGET 1980

9.1 The Financial Report (COM/80/10) was presented and fully explained by the Executive Secretary. He explained that in 1980 the exchange rate between U.S. dollars (in which the budget is planned) and Spanish pesetas (in which many of the expenditures are incurred) had shifted in favor of the U.S. dollar. As a result, the financial situation of the Commission had improved and a positive balance of \$103,820 is expected at the end of this fiscal year. He suggested that this balance be transferred to the Working Capital Fund. The Committee agreed and recommended that the Commission accept this proposal.

9.2 The Executive Secretary also presented the status of the country contributions and stated that the Secretariat experienced great difficulty in carrying out its duties in 1980 due to a shortage of funds caused by the delayed payments of the contributions by member countries. Even as of November, 23 percent of the Regular Budget was still unpaid.

9.3 Several delegations commented on the delay of payments of contributions and urged that all delegates do everything possible to have their governments pay the contributions on time. It was noted that according to Rule 9-9 of the Rules of Procedure: "*The voting rights of any member country of the Commission may be suspended by the Commission if the arrears of contributions of that country equal or exceed the amount due for the two preceding years.*" Several governments stated that their contributions, held up because of bureaucratic procedures, would be paid very soon.

#### Item 10. WORKING CAPITAL FUND

10.1 The Committee reviewed Statement 10 of the Financial Report (COM/80/10) and found it to be satisfactory. It recommended that all the unbudgeted income and unused balance of the 1980 budget go into the Working Capital Fund.

Item 11. REVIEW OF SECOND HALF OF BIENNIAL BUDGET (1981)

11.1 The Executive Secretary presented the Financial Report (COM/80/10) and referred to the budget for the biennial period 1980-81, adopted at the 1979 meeting (Appendix 3 to the 1979 STACFAD Report). He proposed that no changes be made on the budget for the second half of the biennial period (1981), on the basis that there were no new elements to change in the budget which had not already been foreseen at the time the budget was adopted in 1979.

11.2 The Committee agreed with this proposal and recommended to the Commission that no changes be made for the second half of the 1980-81 budget.

Item 12. FINANCIAL STATUS OF THE SKIPJACK PROGRAM

12.1 The financial status of the Skipjack Program, which is estimated to the end of 1980, is reported in COM/80/10. It was noted that a positive balance of approximately \$69,000 at the end of the year is expected. It was explained that this positive balance was planned on when the four-year budget was initially estimated in order to finance the major Skipjack Year activities scheduled in early 1981 before the new contributions are received. The Executive Secretary proposed a special "Skipjack Working Capital Fund", in which this positive balance can be placed so that it will be carried over to 1981 to be used for the Skipjack Program as the case arises. The Committee recommended that this proposal be adopted.

12.2 The Committee noted, however, that this positive balance is still theoretical as many of the contributions (54 percent) have not yet been paid. At this point, the 1980 expenditures of the Skipjack Program have exceeded the amount actually received, and the situation creates grave problems for the development of the Skipjack Program.

12.3 All member countries were reminded of the importance of this Program and were encouraged to have their governments pay the contributions on time.

Item 13. REVIEW OF THE SPECIAL SKIPJACK BUDGET (1981-82)

13.1 The Executive Secretary referred to the Skipjack Year Program Budget adopted in 1978 for a four-year period, 1979-1982 and revised in 1979 for the period 1980-82 (Appendix 5 to Annex 6 of the 1979 Proceedings). He explained that the budget was accepted in 1978 and revised in 1979 with the understanding that the yearly budgets be reviewed on an annual basis.

13.2 The SCRS Chairman commented that the revised budget proposed in 1979 is still quite valid and covers the necessities of the Program.

13.3 The Committee approved the revised Skipjack Year Program Budget for 1981 and recommended that the Commission adopt it without change.

Item 14. REVIEW OF THE MEMBER COUNTRY CONTRIBUTIONS --  
SPECIAL SKIPJACK BUDGET (1981-1982)

14.1 The country contributions for the 1981 Skipjack Year Program, as revised in

1979, were reviewed (Appendix 5 to the 1979 STACFAD Report). Cape Verde's contribution is not included in this table as that country did not become a member of the Commission until after the budget and contributions were adopted.

14.2 The Committee agreed on the 1981 country contributions as revised in 1979.

#### Item 15. DATE AND PLACE OF NEXT REGULAR MEETING OF THE COMMISSION

15.1 Upon the suggestion of Cape Verde, which was seconded by a majority of the delegations, it was decided to change the location of the next ICCAT meeting (1981). Several locations were mentioned, including Málaga and the Canary Islands. The delegates from Spain stated that they would be pleased to host the meeting again next year at either of the above-mentioned locations.

15.2 In response to a question asked by Portugal, as to whether changing the place of the meeting would cause any financial difficulties to the Commission, the Executive Secretary noted that it would increase the cost of the meeting. The unused portion of the 1980 budget which was moved to the Working Capital Fund could be used, with the Commission's authorization, in case of emergency.

15.3 The Committee decided that all the financial conditions and all other factors should be studied carefully by the Secretariat. At the suggestion of the delegate of Canada, each member country was asked to indicate his preference between the Canary Islands and Málaga as the place to hold next year's meeting, in order to help the Secretariat in choosing the place, with the conditions for holding the meeting in the two places being very similar. The majority of the countries (Brazil, Canada, Cuba, France, Gabon, Ghana, Japan, Korea, Senegal, U.S.A., and U.S.S.R.) preferred the Canary Islands, while six countries (Angola, Cape Verde, Ivory Coast, Morocco, Portugal and South Africa) preferred Málaga.

15.4 The Committee recommended that the Secretariat, in consultation with the Spanish Government, make the decision on the exact location for the next meeting, taking into consideration the above preferences shown by the delegates. The Committee also recommended that the dates for the next Commission meeting be November 11-17, 1981.

#### Item 16. OTHER MATTERS

16.1 France proposed to study the repercussions on the Commission budget if the Commission provides travel funds for the Chairmen of the Commission, STACFAD, and SCRS to attend its meetings. A majority of the Committee members agreed that the Executive Secretary be asked (1) to study the financial implications if such a new ruling is adopted; (2) to study the alternative guidelines for such procedure; and (3) to review the procedures taken by other international organizations similar to ICCAT. The results should be reported at the next Commission meeting, possibly with a recommendation on the matter.

16.2 The delegate of Gabon expressed his hope that the ICCAT could hold a training program for tuna fishing and research, particularly for developing countries. This idea was supported by Ivory Coast. The Committee entrusted the matter to the Executive Secretary to study the financial implications and methods of such a program to be effected. The results should be submitted at the next meeting of the Commission.

16.3 The Committee considered the matter of salaries and benefits of the Secretariat staff. A proposal was made by Brazil to create a panel of experts from at least three member governments and FAO to study the salaries and benefits of the Secretariat staff, as the ICCAT salary scheme was established eleven years ago following the FAO system and has not exactly kept pace with recent FAO improvements. The majority of the delegates showed great interest in this matter and it was decided that a letter should be circulated to all delegations and FAO, inviting their participation on the panel. A report of their findings should be presented at the next session of the Commission meeting.

Item 17. ADOPTION OF REPORT

17.1 The Report was adopted.

Item 18. ADJOURNMENT

18.1 The meeting was adjourned.

**Agenda for the Standing Committee on  
Finance and Administration (STACFAD)**

1. Opening of the meeting
2. Adoption of Agenda
3. Election of rapporteur
4. Panels
  - 4.1 Reconsideration of species distribution among the Panels
  - 4.2 Review of Panel membership
5. Administrative Report
6. Relations with other organizations
7. Commission publications
8. Auditor's Report 1979
9. Financial status of the Regular Budget 1980
10. Working Capital Fund
11. Review of the second half of the biennial budget (1981)
12. Financial status of the Skipjack Program
13. Review of the Special Skipjack Budget (1981-82)
14. Review of member country contributions - Special Skipjack Budget (1981-82)
15. Date and place of the next regular meeting of the Commission
16. Other matters
17. Adoption of Report
18. Adjournment



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**PANEL MEMBERSHIP**


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<i>Country</i>	<i>Panel 1</i>	<i>Panel 2</i>	<i>Panel 3</i>	<i>Panel 4</i>	<i>Total</i>
Angola	X	—	—	X	2
Benin	—	—	—	—	0
Brazil	X	—	X	—	2
Canada	—	X	—	X	2
Cape Verde	X	—	—	—	1
Cuba	X	—	—	X	2
France	X	X	—	—	2
Gabon <sup>1</sup>	X	—	—	—	1
Ghana	X*	—	—	—	1
Ivory Coast	X	—	—	—	1
Japan	X	X	X*	X	4
Korea	X	X	X	X	4
Morocco	X	X*	—	—	2
Portugal	X	X	—	X	3
Senegal	X	—	—	—	1
South Africa	—	—	X	—	1
Spain	X	X	—	X*	3
United States	X	X	X	X	4
U.S.S.R.	X	—	—	X	2
Total	16	8	5	9	38

<sup>1</sup> Gabon became a member of Panel 1 during the Panel session.

\* Panel Chairman.

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**REPORT OF THE STANDING COMMITTEE  
ON RESEARCH AND STATISTICS (SCRS)**

Madrid, November 6 -11, 1980

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4 – Report of the Sub-Committee on Statistics

5 – Report of the Working Group on SCRS Organization

6 – Table of SCRS Assignments

7 – ICCAT Inter-sessional Meeting on Billfishes

**Item 1. Opening of the Meeting**

The Chairman, Mr. A. Fonteneau (France), opened the Eleventh Regular Meeting of the Standing Committee on Research and Statistics (SCRS).

Mr. Fonteneau welcomed all the attendants. Recognizing that the Commission has entered its second decade, he commended the excellent progress made in tuna research by the scientists and the Secretariat. He stressed the importance of developing a new approach in analysis of all the results that have come out of a decade of studies (for example, production model studies, etc.). He also pointed out the complexity of the coordination of research with increased Commission membership and asked for close cooperation from all the scientists.

The Executive Secretary of the Commission welcomed all the attendants. He mentioned the changes that have occurred in the Secretariat staff since the 1979 meeting (by saying that the staff members who left the Secretariat did so for personal reasons) and introduced the new members. He stated his concern for the lack of Commission funds due to the delay in payment of contributions by member countries. He commented on his visits to Gabon, Benin and Ivory Coast and later to Morocco to attend the CEEAF meeting. He further noted that he had attended the GFCM meeting and that cooperation with ICCAT had been mentioned in the GFCM Report. In addition, he pointed out the Secretariat's difficulties in the collection of data and the receipt of important correspondence due to the tremendous delays in mail delivery.

Each member country delegation introduced its members (the List of Participants is attached as Annex 2 to the Proceedings of the Commission Meeting).

## Item 2. Adoption of Agenda and arrangements for the Meeting

The Tentative Agenda, circulated in advance of the meeting, was adopted (attached as Appendix 1).

The following scientists were appointed rapporteurs for Item 6 of the SCRS Report, "Review of condition of stocks."

6-A Tropical Tunas (AYF - Yellowfin) (ABE - Bigeye) (ASJ - Skipjack)	G. Sakagawa*, F. X. Bard, S. Kume, W. Parks, R. Evans, G. Sharp
6-B Albacore	L. Antoine*, N. Bartoo, A. González-Garcés
6-C Bluefin	M. L. Parrack*, H. Farrugio, J. L. Cort
6-D Billfishes (DBL - Billfish) (DSW - Swordfish) (DSB - Southern Bluefin)	M. Farber*, J. C. Rey, S. Goto, P. C. F. Hurley
6-E Small Tunas	W. Richards*, P. M. Miyake
6-F Multi-Species Aspects --Tropical Species --Temperate Species	

Dr. P. M. Miyake (Secretariat) was nominated rapporteur for all the other Agenda items, and Dr. G. Sharp (FAO) was asked to coordinate the reports of Agenda Item 6.

## Item 3. Admission of Observers

All the observers (found in the List of Participants) were introduced, admitted and welcomed to the SCRS session.

## Item 4. Admission of Scientific Papers

It was noted that all the documents submitted to the SCRS had arrived within the deadline set by the Committee and were therefore duly accepted. Some national reports

\*Head Rapporteur.

were submitted after the deadline but were accepted since these reports are exempt from complying with the deadline. The List of Documents is attached as Appendix 2.

## Item 5. Review of national fisheries and research programs

### 5.1 ANGOLA

No report was submitted.

### 5.2 BENIN

No report was submitted.

### 5.3 BRAZIL

The tuna fleet of Brazil has been expanding since 1976. The expansion has not been as rapid as expected but it may be considered satisfactory, particularly since 1979. At present there are two longline fleets in operation off the Brazilian coast, one consisting of five national small boats and another comprising five Japanese Brazil-based boats. There are also about 30 live-bait boats.

The longline fleets have already been discussed in previous reports. The baitboat fleet started fishing in 1979 and is rapidly expanding. The majority of the boats are converted from other fisheries, with lengths varying from 12 to 25 meters.

Tuna and related species are also caught by the artisanal fleet operating in the northeast of Brazil using troll lines and gill nets.

The catches have been increasing. While in 1976 the total catch was about 3,300 MT, in 1979 it was about 8,000 MT. The increase was mainly due to the development of the live-bait fishery.

Collection of statistics and biological data as well as oceanographic studies are being carried out. Exploratory fishing has been reinitiated and tagging is being carried out in Rio Grande do Norte and Rio de Janeiro by live-bait boats. The majority of the activities are related to the International Skipjack Year Program.

### 5.4 CANADA

Tuna catches in 1979 amounted to 245 MT, consisting entirely of large bluefin taken in Canadian waters. Trap fishing catches were 86 percent below those in 1978, while catches in the rod and reel fishery remained about the same despite changes in regulations allowing an increase in effort. There was no Canadian purse seine effort in the Atlantic in 1979. Preliminary data indicate the 1980 catch amounted to about 340 MT of large bluefin. Catches in the rod and reel fishery improved although the trap fishery experienced another poor year. There was no purse seine fishery for tuna in 1980. Swordfish catches amounted to 2,970 MT in 1979 in response to a change in mercury content regulations in that year. Preliminary data indicate 1980 swordfish catches amounted to approximately 3,000 MT.

Sampling of large bluefin for length and otoliths continued and their analysis led to an estimate of growth parameters. Collection of fishing logs from the rod and reel fishery was continued and analysis indicates a good relationship between adjusted CPUE and recent stock abundance estimates. Collection of swordfish logs was also continued and analysis suggests only a partial recovery of the exploited stock. An intense 50-day swordfish research survey was conducted to collect basic biological data. Tagging efforts were continued with 13 bluefin and 65 swordfish tagged and released and 4 bluefin recaptured.

### 5.5 CAPE VERDE

The fishing industry is oriented towards the fishing of tuna, a seasonal activity practiced from May to November. The principal species, caught by pole and line using live bait, are skipjack, yellowfin and bigeye in descending order in terms of weight.

Roughly, 70 percent of the catch is exported frozen and 30 percent is canned by the small semi-artisanal canneries. A negligible amount of tuna caught by the artisanal fishery is exported once the domestic demand is satisfied.

<i>Years</i>	<i>Catches</i>	<i>Frozen</i>	<i>Material for Canning</i>	<i>Canned (Net)</i>
1979	1,702 MT	1,207 MT	495 MT	165 MT
1980 (up to September)	1,223 MT	768 MT	455 MT	143 MT

### 5.6 CUBA

The Cuban tuna catches for 1979 reached 9,500 MT; the major part (6,100 MT) is caught by longliners. There was only one purse seiner in operation and it contributed 800 MT to the total catch. The short-ranged baitboat fisheries caught 2,000 MT of skipjack. Small longliners and trollers caught approximately 600 MT of swordfish and spotted Spanish mackerel in Cuban waters.

Length composition samples, surveys of new fishing grounds, fishery control and experiments on keeping bait alive were included in the skipjack research.

### 5.7 FRANCE

In 1979, France caught 66,800 MT of tunas, of which 57,000 MT were tropical species.

Two survey cruises were made to study the migration of albacore in the North Atlantic and to carry out sampling and tagging operations.

Several samplings were also effected at landing ports on all species. These samplings gave interesting results on the biology and dynamics of different stocks.

## 5.8 GABON

No report was submitted.

## 5.9 GHANA

Due to various economic reasons, some of the Oriental vessels operating from Tema left the fishing area. The number of vessels in 1979 was, therefore, reduced to around 35. In 1980, two purse seiners joined the fleet. The reduction of the number of vessels generally caused a decrease in landings of tuna.

Routine biological sampling continued through the efforts of the Fishery Research Unit at Tema. During 1979, 4,280 yellowfin, 2,900 bigeye and 5,930 skipjack were measured. The length-frequency distribution continued to reveal the predominance of under-sized tunas landed in Ghana.

On-board sampling for species composition, gonad and stomach contents was also undertaken. Unfortunately, the boats continued to disregard the forms given to them to assess the level of discards.

For the future, research will be focused on the Skipjack Year Program with emphasis on: a) Sampling for maturity and fecundity, b) Port and intensive sampling, c) Collection of otoliths and dorsal spines, and all other activities that will contribute to the successful implementation of the Program.

## 5.10 IVORY COAST

In 1979, the Ivorian fleet, made up of eight purse seiners, landed 13,018 MT of tuna of which 70 percent were yellowfin and 29 percent skipjack.

The production of canned tuna amounted to 6,310 MT in net weight, representing 47 or 48 percent of the catches.

The landings at the port of Abidjan in 1979 (54,029 MT) were sampled with a 98 percent coverage rate for Tasks I and II and with a 30 percent coverage rate for biological data. The CRO also made a special effort to sample the skipjack landed at Abidjan within the scope of the Skipjack Program.

## 5.11 JAPAN

In 1979, Japan caught about 45,000 MT of tunas and tuna-like species in the Atlantic. The longline fishery (249 vessels) harvested 28,000 MT, 80 percent of which were comprised of bigeye, southern bluefin and bluefin tuna. The Tema-based baitboat fleet (15 vessels) caught 17,000 MT of tropical tunas. More than 87 percent of the catch was skipjack. Both fleets have been under the ICCAT regulations for yellowfin and bluefin tunas.

Collection and compilation of Atlantic tuna fisheries data (Task I, Task II and biological sampling) have been continued routinely and submitted to the ICCAT Secretariat as requested by the SCRS. Research on fisheries biology and stock assessment analysis for Atlantic tuna resources have been carried out and documented to the SCRS. For the International Skipjack Year Program, tagging cruises were conducted successfully by a chartered

baitboat during the summer of 1980 in the Gulf of Guinea, resulting in the release of 5,983 skipjack, 1,042 yellowfin and 947 bigeye tuna.

#### 5.12 KOREA

The Korean commercial catch of tunas and related species decreased to 38,000 MT in 1979 from 39,500 MT in 1978 and 45,000 MT in 1977.

A total of 66 longliners participated in the Atlantic tuna fishing operation in 1979 and caught 20,700 MT, 28.6 percent less than the 1978 catch and 46.6 percent lower than in 1977. A total of 18 Korean baitboats operated for tropical tunas in the East Atlantic and caught 17,000 MT, 65.8 percent more than the catches of the previous years.

The collection and analysis of catch and effort data from Korean tuna fishing vessels were performed continuously.

In connection with the International Skipjack Year Program, dart tags to be used in the eastern tropical Atlantic have been prepared and sent to 18 Korean baitboats for tagging experiments.

#### 5.13 MOROCCO

No report was submitted.

#### 5.14 PORTUGAL

In 1979 the Portuguese baitboat catch was 6,566 MT, of which 1,038 MT were from Madeira and 5,428 MT from the Azores. By species, 3,393 MT of bigeye, 2,950 MT of skipjack, 188 MT of albacore and 26 MT of bluefin were caught, not including the tropical purse seine catch.

The 1980 quick estimates for Madeira were 136 MT, which show a 90 percent decrease.

During 1980, biological sampling was done for skipjack and bigeye (in the Azores), and the collection of baitboat catch and effort data was accomplished as well. In Madeira measurements of tuna landed are also carried out. At present, the collection of historical catch and effort data is being done.

#### 5.15 SENEGAL

In 1979 there was an overall drop in catches of the fleet of 28 baitboats (-24 percent) as well as of the fleet of three purse seiners (-80 percent); the total catch was 8,241 MT (yellowfin + skipjack + bigeye). About 3,000 MT of small tunas and 105 MT of swordfish and sailfish must be added to this total catch. The 1980 quick estimates indicate that the total catch will undoubtedly be less than that in 1979 due to the cessation of the purse seiners and the decrease in baitboat effort.

The research carried out this year was particularly important (seven SCRS documents) due to Senegal's participation in several activities of the International Skipjack Year Program (reproduction, ageing, tagging...). In three tagging cruises, 229 skipjack, 98 yellowfin and 240 bigeye were tagged. Senegal also handles the compilation and proces-

sing of the data for the entire French-Ivorian-Moroccan fleet.

#### 5.16 SOUTH AFRICA

No report was submitted.

#### 5.17 SPAIN

In 1979, the total catch of tunas and tuna-like fishes reached 99,304 MT. This amount represents a decrease of about 7,000 MT with respect to the 1978 catch. The tropical purse seine fleet slightly increased its catch of yellowfin while the skipjack catches decreased sharply. The Canarian local fleet also slightly decreased its catches. Due to successful albacore fishing, the catches of the peninsular fleets increased.

Effort was directed towards increasing the coverage of Task II, biological samplings from the tropical fleet, as well as towards the preparations for the International Skipjack Year. Tagging, parameter estimates and status of stock evaluations were carried out by the rest of the fisheries.

#### 5.18 UNITED STATES

United States catches of tunas and tuna-like fishes in the Atlantic Ocean in 1979 decreased 40 percent from 29,572 MT in 1978 to 17,864 MT in 1979. Tropical tuna catches decreased 65 percent from 18,487 MT to 6,496 MT. Bluefin tuna catches increased 19 percent from 1,852 MT to 2,297 MT. Catches of swordfish increased 11 percent from 3,039 MT to 3,405 MT.

Both the United States tropical tuna and bluefin tuna fleets operated under regulations. The tropical tuna fleet was subject to ICCAT's 3.2 kg yellowfin minimum size limit. The bluefin tuna fleet was subject to a strict minimum size limit, quota and season regulation.

Research activities during 1979-1980 included stock assessment, age and growth and stock identification studies. The relationships between environmental variables and tuna occurrence were studied. A technique to assess the economic value of the eastern Atlantic tropical tuna fisheries was reviewed.

The U.S. conducted a 74-day research cruise to tag skipjack tuna in the Caribbean and western Atlantic in 1980. This effort, part of ICCAT's International Skipjack Year Program, resulted in the tagging of 1,612 fish (1,412 skipjack).

Collection of fishery and biological data from commercial and recreational United States fisheries for tuna and tuna-like fishes continued in 1978-1979. United States imported tuna continued to be sampled for biological data at Puerto Rico.

#### 5.19 U.S.S.R.

In 1979, fishing for tunas and related species was carried out in the east Atlantic which yielded 10,533 MT, i.e. considerably below the 1977 (19,915 MT) and 1978 (19,356 MT) levels. The reduction of catches can be attributed to the fishery's operation exclusively outside the 200-mile economic zones introduced in 1979. The catch of tunas



in 1979 (6,889 MT) was almost half the 1978 catch. The bulk of the 1979 catch was comprised of skipjack, bigeye and yellowfin tunas, which were caught with longlines and purse seines. The catch of swordfish also decreased and amounted to only 80 MT in 1979.

In 1979 and 1980, U.S.S.R. research of Atlantic tunas and related species was directed mainly to the study of the conditions of formation of commercial tuna aggregations (fished with longlines) relating to the oceanographic regime in the west and east tropical Atlantic. The data are available on the species compositions and behavior of tuna (skipjack, yellowfin, little tunny, frigate tuna - objects of the purse seine fishery) schools in the Gulf of Guinea by season. The processing of long-term ichthyological samples has yielded data on the spawning period and areas of bigeye, yellowfin, skipjack, little tunny and frigate tuna in different areas of the tropical Atlantic.

Four research cruises were conducted, two with longliners and two with purse seiners.

## 5.20 EQUATORIAL GUINEA

Equatorial Guinea thanks ICCAT for its invitation to the 1980 meeting. It is extremely interested in the scientific work that is carried out by ICCAT.

## 5.21 ITALY

In 1979, Italy caught over 13,000 MT of tuna and tuna-like species in the Mediterranean. The 1980 trap catch was very minor but purse seine catches of spawning bluefin in 1980 were better than those of 1979, even though bad weather allowed for only a few days' fishing.

Italian bluefin catch statistics were reviewed and discussed at the Palermo meeting (SCRS/80/28). The important bluefin fisheries were monitored by scientists. Biological studies on bluefin were continued. Joint research with Spanish scientists to evaluate spawner biomass using larval survey data clarified egg-larvae mortality.

A survey of albacore and frigate tuna spawning grounds was continued and albacore growth rates were studied.

## 5.22 TAIWAN

In 1979, the number of longliners which operated in the Atlantic was 194, a total of 44 million hooks were used and the total landings made in the Atlantic were 33,500 MT. In 1978, 227 boats used 66 million hooks and landed 33,800 MT.

The 1979 albacore landings amounted to 27,300 MT, of which 7,000 MT were from the North Atlantic and 20,300 MT from the south Atlantic. The 1979 landings of bigeye and yellowfin amounted to 2,200 MT and 920 MT, respectively.

As for the catch and effort statistics, the coverage rate of logbooks for 1979 was 48.1 percent; it was 20 percent and 30 percent for 1977 and 1978, respectively.

Nine thousand albacore, 850 bigeye and 430 yellowfin were measured on-board in 1979.

The quick estimate of landings in the Atlantic for 1980, up to September, is 25,900 MT, of which 21,000 MT are albacore.

**Item 6. Review of conditions of stocks, with brief presentation of major papers on this subject**

**6-A TROPICAL TUNAS**

**AYF-YELLOWFIN**

**AYF-1 Description of fisheries**

Yellowfin tuna are caught throughout the tropical waters of the Atlantic Ocean and adjacent waters by surface (primarily baitboat and purse seine) and longline fisheries.

Trends in catch by area, gear and nation are listed in Table 1. The total Atlantic catch of yellowfin was 130,000 MT in 1979 (Fig. 2). The 1980 catch is estimated to be 111,000 MT.

After reaching a maximum of about 56,000 MT in 1960, longline catches steadily decreased to 16,000 MT in 1979; the 1980 estimate is 13,000 MT.

The eastern Atlantic surface fishery developed rapidly from late 1960, first as a baitboat fishery, and since 1970 as mainly a purse seine fishery. Catches increased to a maximum of 110,000 MT in 1979 and are estimated to be 95,000 MT in 1980.

As noted in Table 1, 1979 catches include 8,900 MT taken by South Africa. This catch is either from the Indian Ocean stock or the Atlantic stock. For purposes of analyses presented in this Report, the Committee examined alternative conditions; the entire catch assumed from the Indian Ocean stock, and the entire catch from the Atlantic stock. Either assumption is not very important to overall trends in surface catches, but would affect the trends in recent years. For example, if 1979 South African catches are from the Atlantic stock, the decline in catch from 1979 to 1980 is more notable (Fig. 2).

Catches in the western Atlantic have remained constant at about 12,000 MT since 1966.

The fishing intensity of the longline fishery has been variable with an increasing trend over the period 1956-1978 (Fig. 3). Effort in the surface fishery, as indicated by the total carrying capacity of the combined purse seine and baitboat fleets, has steadily increased from 1968 to 1980 (Fig. 4).

**AYF-2 State of stocks**

The state of stocks of yellowfin tuna in the Atlantic was assessed for two hypothesized stock structures: an Atlantic-wide stock, and separate eastern and western stocks (see Fig. 1 for east-west division). This format follows that of previous years and is based on the uncertainty about the true stock structure for Atlantic yellowfin.

**i) Atlantic-wide stock**

CPUE for the FISM fleet of medium and large purse seiners in the coastal eastern Atlantic index area was reviewed (Fig. 5). Abundance has declined steadily over the period, 1969-1979 (Fig. 6). This decline in CPUE is to be expected in this surface fishery

in which catch and effort have steadily increased over time, and may not realistically reflect the changes in overall abundance of the Atlantic-wide stock, as it reflects mostly effort in the eastern Atlantic.

The Committee noted that the assumption that the coastal CPUE is a reliable index of Atlantic-wide yellowfin abundance has not been proven.

Results of production model analysis using the FISM CPUE index suggest that average maximum sustainable yield (MSY) is in the range of 119,000 MT to 144,000 MT (Fig. 7). This range of estimates is somewhat narrower than that presented in 1979 (113,000 MT to 175,000 MT). This difference is probably due to the addition of data points representing higher levels of effort which better define the declining high effort part of the relation and to the fact that 1979 analyses used different CPUE series as indices of abundance.

Current (1979) catch is within the range of estimated MSY. Current effort levels are 20 percent to 25 percent greater than levels corresponding to MSY for  $m = 1$  and 2 models. Effort is infinite for the  $m = 0$  model and increases in effort would result in modest increases in yield.

The above evidence suggests the stock is heavily exploited at levels close to MSY. If the  $m = 1$  or 2 model best represents the fishery then further increases in effort, while perhaps resulting in temporary increases in yield, will eventually result in a decrease in sustainable yield. If the  $m = 0$  model best represents the fishery, increases in effort would theoretically result in a small increase in yield.

South African catches in 1979 may be from an Indian Ocean stock. The omission of these catches results in a new 1979 point below the  $m = 0$  curve. This point combined with the 1980 point, the first since 1973 below all three curves, may indicate that catches may have reached a maximum and that any expansion of effort should be monitored closely.

As noted above, the use of coastal CPUE as an index of Atlantic-wide abundance may not be appropriate. Trends of CPUE and of the results of production model analysis therefore apply only to the present combination of gear and areas in the fishery.

In particular, if the recent expansion of the eastern Atlantic fishery into new areas continues, and if the fishery is able to exploit previously lightly exploited fish, yields could be greater than suggested by these results. Such an increase in catches (and in estimated MSY) occurred in the eastern tropical Pacific surface fishery for yellowfin tuna.

Results of yield-per-recruit analyses presented in previous years suggest that there has been a modest increase in yield-per-recruit for the fishery as a whole since 1973. The effect for the individual gears was mixed. Yield-per-recruit in the longline and baitboat fisheries declined while yield-per-recruit in the purse seine fishery increased.

## ii) Separate eastern and western Atlantic stocks

### a) *Eastern Atlantic stock*

Production model analyses were performed for two data sets reflecting alternative eastern Atlantic stock structure hypotheses. The first analysis assumed that yellowfin tuna taken by eastern Atlantic surface and longline gears belong to the same stock. The second assumed that yellowfin taken by these two gears are separate stocks and analyzed

surface fishery data only.

Abundance indices presented for the coastal eastern Atlantic stock were assumed to accurately index eastern Atlantic abundance. Trends indicate abundance has declined.

MSY is estimated to be in the range of 108,000 MT to 133,000 MT (Fig. 8). As for the Atlantic case, and probably for the same reasons, this range is narrower than in 1979 (92,000 MT to 162,000 MT). Current catch is within this range; effort is 14 percent to 24 percent greater than effort corresponding to MSY for the  $m = 1$  or 2 cases.

As in the Atlantic case the position of the 1979 point (omitting the South African catch) and the 1980 point suggest that the  $m = 0$  form of the model is less likely. The above suggests that the stock is being exploited near MSY and that any expansion of effort should be monitored closely. Uncertainty surrounding the use of coastal CPUE as an index of eastern Atlantic abundance and the lack of additional information suggests that these results apply only to the fishery as currently constituted. Changes in the pattern of fishing as indicated for the Atlantic stock may result in greater yield.

Analysis of the eastern Atlantic stock exploited by surface fisheries only resulted in MSY estimates between 94,000 MT and 127,000 MT (Fig. 9). Again this range is narrower than the range of estimates for 1979 (97,000 MT to 161,000 MT). Current catch is in the range of MSY; effort is 13 percent to 24 percent greater than optimum for  $m = 1$  and 2 forms of the model.

As for the other hypothesized stocks the positions of 1979 and 1980 points suggest that  $m = 1$  or 2 form may be more appropriate. Results of these forms suggest the fishery is operating near MSY. The reservations about the use of coastal CPUE as an index of abundance expressed earlier apply as well for this hypothesized stock and results apply only to the fishery as it is currently structured.

#### *b) Western Atlantic stock*

No new production model analysis of the hypothesized western Atlantic stock was presented. The Committee discussed analyses presented in last year's report. MSY ranged between 16,000 MT and 22,000 MT (Fig. 10). Current catches are 31 percent to 50 percent less than MSY. Current (1977) effort is about twice the optimum level.

The Committee noted that the western Atlantic stock is primarily exploited by longline fisheries and that MSY based on production model analyses of this fishery probably do not reflect sustainable yields should a surface fishery develop. Based on this, the Committee was unable to offer advice on the effects of changing effort in the fisheries on the stock.

#### **AYF-3 Effects of current regulations**

In 1972, ICCAT adopted a minimum size regulation of 3.2 kg (or 55 cm) with a 15 percent tolerance in number of fish per landing for yellowfin tuna. The regulation entered into effect on July 1, 1973. The regulation was intended to improve the yield-per-recruit of Atlantic yellowfin tuna to the fishery and recent analyses indicate that a slight increase has occurred. Despite the regulation, however, a large number of undersized fish continue to be taken by eastern Atlantic surface fisheries. During the period 1976-1979, 27 percent

to 60 percent (mean 43 percent) of yellowfin tuna in the baitboat catch and 28 percent to 38 percent (mean 35 percent) of yellowfin in purse seine catches were less than 55 cm in fork length (Table 2).

The regulation has led to mislabeling undersized yellowfin tuna as bigeye and to discarding of undersized yellowfin dead at sea. Mislabeling of yellowfin as bigeye should diminish as ICCAT's minimum size regulation of 3.2 kg for bigeye tuna recommended in 1979 becomes effective. The practice of discarding dead undersized fish at sea, however, will continue to be a problem.

These effects of yellowfin regulations on catches of bigeye are one aspect of the complications encountered in management of the multi-species Atlantic tropical tuna fishery. Other aspects are explored in detail in the tropical tuna multi-species section.

#### **AYF-4 Recommendations**

##### *AYF-4.a Statistics*

The Committee recommended the following actions to be taken to improve the yellowfin tuna statistics:

i) Collect statistics on the amount and species composition of fish caught and discarded at sea by baitboats and purse seiners. Data can be collected through a combination of encouraging fishermen to record such information in logbooks and by placing trained technicians aboard fishing vessels to collect such data.

ii) Monitor the catches of yellowfin and bigeye tunas landed at major ports more closely for statistics on species composition and sizes of fish landed. Fleets that need to be monitored more closely are the Spanish purse seine fleet and the Tema-based baitboat fleet. Sampling of transshipments in ports such as Puerto Rico should continue.

iii) Collect more representative catch and effort statistics (Task II) from the Korean baitboat fleet and Spanish purse seine fleet. The action required is to increase logbook coverage to at least 50 percent and hopefully more of the fleet.

iv) Collect statistics on catches not passing through normal market channels. This requires, as an initial step, a survey to assess the magnitude of the problem. The Secretariat might be best to execute such a survey.

##### *AYF-4.b Research*

The Committee recommended that the following research topics receive support and high priority in 1980-1981:

i) Collect data and analyze information on growth of juveniles. This investigation should consider the use of new techniques, such as modal progression of juvenile yellowfin tuna recovered in predator stomachs.

ii) Compile and analyze data for estimating recruitment strength and monitoring the spawning stock. This research should include investigations on use of size-specific

catch-per-unit-effort data and recruitment information from cohort analysis.

iii) Investigate the relationship between the longline fishery and surface fishery. One approach should be to use size-specific catch-per-unit-effort data.

iv) Investigate the stock structure of yellowfin taken in South African fisheries.

v) Refine and extend analyses of alternative management schemes for reducing the catch of small yellowfin tuna. Guidelines for conducting this research is contained in the report of the Working Group on Juvenile Tropical Tunas.

#### *AYF-4.c Management*

The Committee noted that there continue to be large numbers of undersized fish being caught in the surface fishery. As in the past, the Committee noted that this is being caused by the activities of several purse seine and baitboat fisheries which have experienced practical difficulties in implementing the 3.2 kg size limit.

Investigations of alternative management schemes were conducted by the Committee in 1980. Results are detailed in the multi-species tropical tuna section. The Committee does not have specific recommendations on additional measures at this time.

## ABE-BIGEYE

### ABE-1 Description of fisheries

Bigeye tuna, distributed throughout the Atlantic Ocean, have been harvested by both the longline and surface fisheries. The longline fishery is distributed over almost the entire Atlantic (Fig. 11). The main surface fisheries taking bigeye tuna are baitboat fisheries operating in local areas off Madeira, the Azores, the Canary Islands, Dakar and in the Gulf of Guinea. Also, purse seine fleets catch bigeye in the eastern Atlantic tropical waters. The historical catches by gear and country are shown in Table 3. The longline catch has been dominant throughout the past few decades as shown in Fig. 12. Catches in the entire Atlantic Ocean were about 42,000 MT in 1979 and are estimated to be about 35,000 MT in 1980.

Stock structure is not well defined. However, the Committee assessed the state of stock under two hypotheses: (1) a single Atlantic-wide stock, and (2) two independent stocks separated at about 5°N into northern and southern stocks (e.g. sub-populations) as shown in Fig. 1.

### ABE-2 State of stocks

Since the longline catch is comprised entirely of adults, the CPUE indices should indicate relative status of the spawning stock(s) (Figs. 13 and 14). These CPUE's appear to have been affected particularly by the development of the equatorial surface fisheries which caught a great number of small fish. Adult abundance levels of slightly more than

one-half of the initial adult stock are presently indicated from relevant analyses. In the surface fisheries, particularly in equatorial waters, large numbers of small fish are captured.

Current appraisals can be summarized as follows:

i) Atlantic-wide stock

The total Atlantic stock appraisal made at this time by production model analyses is almost the same as that of 1979, suggesting that the stock is currently exploited at a high level (Fig. 15). The present fishing effort is most likely below the level corresponding to estimated MSY. Further increases in fishing effort with current fishing patterns would probably result in marginal increases in yield.

Results of the available yield-per-recruit analysis indicate that increasing age-at-first-capture would increase equilibrium yield-per-recruit. Identified increases are tentative. Decreases in yield-per-recruit would be expected from continued increases of small bigeye tuna in the catch (Fig. 16).

ii) Two-stock hypothesis

Considering the two-stock hypothesis, it is appropriate to consider the stocks separately. For the North Atlantic stock, essentially the same conclusion on the current stock status was reached by production model as at the 1979 SCRS (Fig. 17). The current fishery is believed to be operating at a level slightly below that giving MSY. Increased effort with the same fishery pattern would probably result in some increase in sustainable yield. However, the actual yield will depend on the sizes of fish caught. If there is an increase in the number of small fish taken, the yield can be expected to be less than it would be if catches are predominately of large fish.

For the south Atlantic stock, the present analyses do not alter previous conclusions on the appraisal of this stock. Results of production model analyses indicate that recent levels of fishing have been high, within the range of the MSY level (Fig. 18). Consequently, increasing fishing effort would probably not result in notable increases in yield with the current fishery pattern. Furthermore, increased catches of small bigeye tuna by the surface fishery could have an adverse impact on future catches.

#### ABE-2 Effects of current regulations

The Committee recommended a 3.2 kg size limit, which only came into effect as of September, 1980. The interest of this regulation is two-fold: (1) to have a regulation parallel to that for yellowfin which would help resolve the species misreporting problem, and (2) to generally increase the age-at-first-capture of bigeye in order to increase yield-per-recruit over the bigeye fishery in the equatorial Atlantic. However, the following express the Committee's concern about the evaluation of the effects of the present regulations:

i) The multi-species nature of the catches of small bigeye requires that any evaluation of fishery operations and most biological problems which may arise be considered together with those of the other interacting species.

ii) The yield-per-recruit of both yellowfin and bigeye, in principle, could be improved by delaying the time of entry (age and size) of both species into fisheries, but this may be difficult to achieve for bigeye, in practice, due to technical limitations with regard to the effectiveness of available fishing gear and the aforementioned multi-species interactions.

iii) The size limit regulation now in effect may well provide the first steps towards the noted objectives of both appropriate identification of catches and decreasing mortalities on very small bigeye. However, our ability to evaluate the effects of the regulation may be several years away, and will require at-sea sampling by trained technical staff in a broad survey of the fishery operations in the tropical waters.

#### **ABE-4 Recommendations**

##### *ABE-4.a Statistics*

Misreporting of juvenile tropical tunas in catch statistics (Task I), while somewhat alleviated, continues to be a problem. The Committee recognized the need to improve catch, effort and size frequency data, and recommended that countries whose statistics have not been presented adequately be encouraged to collect and submit these data and to investigate the possibility of estimating previously unavailable historical data. The Committee recommended that further effort be made to ensure accurate species breakdown of catches. Also, (1) sampling should be emphasized at landing ports used by fleets catching significant numbers of juvenile tunas, such as the FISM, Spanish and Tema-based tropical surface fleets. (2) Sampling at transshipment ports such as Puerto Rico should be continued. (3) Spanish landing statistics do not distinguish between yellowfin and bigeye and this is necessary in order to properly represent the catches. (4) The historical data for catches in the Portuguese fisheries are not yet available and need to be made available.

##### *ABE-4.b Research*

The Committee emphasized that the following research items need to be conducted:

i) Population parameters such as length-weight relationship, growth rate (particularly for small fish) and mortality rates should be re-estimated from the complete available data.

ii) Extensive tagging should be conducted to elucidate the stock structure and to facilitate estimation of population parameters. Tag-releases of small bigeye tuna should be encouraged during tagging operations of the International Skipjack Year Program.

iii) Intensive collection of detailed species and size composition data by school or set for surface fisheries taking mixed catches of the three tropical tuna species should be continued.



iv) Examination of underlying reasons (biological or other) which might have contributed to the recently increased catch of small bigeye tuna in the Gulf of Guinea needs to be made.

v) Further research on fishery specific (multi-gear) yield-per-recruit potentials should be continued to help evaluate the effect of the recent size limit regulation.

vi) Analysis of available tagging data is needed to stock structure analyses.

vii) Stock structure studies should be encouraged.

#### *ABE-4.c Management*

The Committee has no specific recommendations at this time. In the 1979 management recommendations, the Committee expressed their views on the practicalities of implementing the size limit on bigeye. The problems of effective enforcement and necessary research into alternative management strategies were also highlighted. The meetings of the Working Group on Juvenile Tropical Tunas in Abidjan (SCRS/80/23) and Brest (SCRS/80/17) gave full attention to the latter problem. Their conclusions are available in these documents and are further discussed in the section on "multi-species interactions". The Committee concurred with the recommendations of the Working Group and wished to note that the success of the regulation depends on enforcement which is the responsibility of the individual fishing nations.

### ASJ-SKIPJACK

#### ASJ-1 Review of fisheries data

Skipjack tuna fisheries occur in the eastern and western Atlantic. Fishing effort in the eastern Atlantic is principally by the FISM, Spanish and American purse seine fleets and by the Tema-based (Japanese, Korean, Ghanaian and Panamanian), Angolan and FISM baitboat fleets. Catches for these fleets are given in Table 4. The east-west breakdown of catch statistics were made for the purpose of monitoring the stock. These breakdowns can be seen in Fig. 1. Total catch for the eastern Atlantic was 80,000 MT in 1979 and is estimated at 97,000 MT for 1980. Western Atlantic catches are made primarily by Brazilian, Venezuelan, American and Cuban purse seiners and baitboats. Estimated skipjack catch for the western Atlantic was 5,400 MT in 1979 and is estimated to be 9,000 MT for 1980. Catches for the entire Atlantic have risen steadily since 1960 but have fluctuated markedly since 1974 (Fig. 19).

#### ASJ-2 State of stocks

No good index of skipjack tuna abundance is available. The Committee examined

two time series of surface fishery CPUE's as possible indices of skipjack abundance. One was the CPUE for FISM purse seiners for the coastal eastern Atlantic index area (Fig. 20). This CPUE shows wide fluctuations which are attributed to variation in availability of yellowfin tuna rather than skipjack abundance because the FISM purse seiners direct their fishing effort at skipjack tuna only when yellowfin tuna are not available.

The second was the CPUE for the Japanese baitboat fleet (Fig. 20). This CPUE shows fluctuation but an upward trend since 1973. It, too, is suspected to be a poor index of skipjack abundance because it is based on successful fishing days only rather than on total fishing and searching days.

In the absence of a reliable estimate of skipjack abundance, it is not possible to obtain usable information from the relation between surplus yield and fishing effort, if such a relation exists for the skipjack fishery. Fig 21 shows a plot of catch against total estimated fishing effort based on the FISM CPUE and illustrates the difficulty of obtaining usable information from the relation based on data presently available.

A yield-per-recruit analysis for skipjack in the entire Atlantic (Fig. 22) was developed by the second Working Group on Juvenile Tropical Tunas (SCRS/80/17). Despite present doubts regarding the parameters used, there does not seem to be any benefit to be expected from an increase in size at first capture under the current fishing patterns. This is because young skipjack, after spending some time in the area of the fishery, escape to offshore areas where they are no longer fished. The possible development of offshore fisheries directed towards large skipjack tuna may necessitate review of this analysis.

The Committee's assessment of the condition of the stock(s) is the same as that of last year. Apparently, skipjack tuna in the eastern Atlantic are currently fished at a high level and in the western Atlantic at a low level. The true potential yield from the stock(s) is unknown, but available information suggests that the potential is larger than current catch levels.

### ASJ-3 Effects of current regulations

There is no regulation of skipjack at this time. However, since skipjack tuna are often found in mixed schools, together with young yellowfin and bigeye tunas, current regulations for the latter two species might affect skipjack yield.

Other measures envisaged for the protection of young yellowfin and bigeye tunas, such as the closure of fishing areas in the Gulf of Guinea, may have notable effects on the skipjack fishery. This was studied by the second Working Group on Juvenile Tropical Tunas; the Group's conclusions are given in the section on problems of multi-species fisheries of tropical tunas.

### ASJ-4 Recommendations

#### *ASJ-4.a Statistics*

The Committee noted that specific needs for improvement of skipjack tuna statis-

ties had been identified by the Sub-Committee on Skipjack and had been incorporated into planned activities of the International Skipjack Year Program. Details of the specific needs are contained in the Sub-Committee's Report.

In this regard, the Committee took special note of the importance of collecting fishery and biological data from fisheries that are developing in new areas such as off Brazil and Ascension Island.

The Committee recommended that the Commission continue to support the Program so that improved skipjack fishery statistics can be made available for more accurate assessments of the condition of the stocks and for developing management advice. In this respect, it may be useful to repeat some specific recommendations made last year as follows:

- i) Catch statistics are relatively good. However, an attempt should be made to improve those from certain small fleets, since their data are not precise.
- ii) While recognizing that data collection improved in recent years, the Committee recommended that further improvements in the collection of Task II data for Spanish purse seiners and Korean baitboats are needed. This will permit the Committee to improve its evaluations in the future.
- iii) Finally, effort statistics from Japanese baitboats should include search time in order to make them compatible with those of other fleets.

#### *ASJ-4.b Research*

A comprehensive three-year research plan for skipjack tuna is currently being executed as the ICCAT International Skipjack Year Program. The Committee recommended that the Commission continue to support this Program, in particular, those parts that require contributions from national scientists.

#### *ASJ-4.c Management*

As in past years, the Committee noted that scientific information available on skipjack tuna is insufficient for developing informed management recommendations. The International Skipjack Year Program was, therefore, developed specifically to improve the body of scientific information on skipjack and the results of this Program are just now beginning to be realized. As a result, the Committee has no management recommendations to offer at this time.

## 6-B ALBACORE

### B-1 Review of fisheries data

The Atlantic albacore population is assumed to primarily comprise northern and southern stocks (see Fig. 1 for boarder line). These stocks are felt to be relatively independent and separate statistics are kept for each stock.

Total catches of Atlantic albacore (Table 5 and Fig. 23) increased steadily since the 1920's until the mid-1960's when the increase in catch stopped. Catches from the north stock (surface and longline fisheries) have been relatively constant at about 50,000 MT since 1971. The 1979 catch was 48,400 MT. Catches from the south stock (by longline only) have been decreasing since the early 1970's; the 1979 catch was 22,000 MT.

Longline fishing effort on the north stock has increased erratically from near zero to 117 million effective hooks fished over the 1957 to 1977 period. In 1978, effort decreased about 20 percent (Fig. 24). Surface fishing effort has decreased by about 30 percent since 1957. Most of the decrease has been due to the decreased troll fishery effort (Fig. 25).

Fishing effort on the south stock by longline (Fig. 26) has increased steadily from 1956 through 1972. Since 1972, effort declined by about one-third through 1975 and then increased to within 10 percent of the 1972 peak value.

### B-2 State of stocks

#### i) Northern stock

The catch-per-effort (CPUE) for the longline fishery has shown a continuous slow decline since 1958 (Fig. 27). Currently the longline CPUE is about 25 percent of the 1958 value. Both the baitboat and troll fisheries show no apparent decline in CPUE (based on weight) since 1957 although year-to-year fluctuations are noted (Figs. 28 and 29).

The production model analysis shows an MSY ranging from 60,000 MT to 65,000 MT depending on the form of the model used (Fig. 30). Effort associated with MSY is 40 percent greater than the estimated present levels. The current production model differs from those shown in 1977 and 1978 in that the cluster of data points is now on the left-hand portion of the curve whereas the cluster was previously near the top or further to the right. The change in results is due primarily to differing methods of effort standardization as well as the addition of new data. It must be mentioned that there are difficult practical and theoretical problems (such as effort standardization) encountered in applying the production model to a complex multi-gear fishery like the northern Atlantic albacore fishery.

From available information there are indications that the yield-per-recruit may be increasing due to a shift towards larger fish in the catch. The average estimated yield-per-recruit has changed from 3.29 kg in the period 1969-73 to 4.07 kg in recent years (1974-78). Further analysis is required.

As indicated by the CPUE of age 2 ("Bonites") fish in the French troll fishery (Fig. 31), recruitment has no trend over time but high variability is noted.

Calculated recruitment from cohort analyses (Fig. 31) shows recruitment to be variable with a slight decreasing trend. Concerning the latter case, recruitment would be variable but have no trend if we take only the more recent data into account. The more recent data are considered to be more reliable than the earlier data. The spawner-recruit relationship for the stock is shown in Fig. 32. The parent stock index is equal to 15-20 percent of the maximum level. Additional analyses show that the probability of a cohort weaker than that observed in 1974 (the lowest on record) is about 8-20 percent.

Analyses presented this year indicate that the north Atlantic albacore stock is relatively heavily exploited. Present evidence and analysis results in a production model which suggests some increase is possible with additional fishing effort. This is different from past conclusions and should be considered provisional until verified. Yield-per-recruit analyses indicate the stock is heavily exploited but as the total fishing effort shifts, as it appears to have been doing towards larger fish, the yield-per-recruit should increase. Analyses indicate that albacore recruitment is variable and the probability of a recruitment below any observed to date by the surface fisheries seems to be between 8 and 20 percent. As noted before, the current parent stock index is about one-seventh of that noted in 1957. Nevertheless, the north stock seems to be relatively healthy.

## ii) Southern stock

Catch-per-effort for the south Atlantic albacore longline fishery (Fig. 33) shows a sharp decline from 1959 to 1962 and a slow continuous decline since.

No new production model was presented for the south stock. The analysis discussed last year was considered (Fig. 34). The conclusion previously reached that MSY is about 30,000 MT, given the current pattern of fishing, appears valid. Catches (Table 5) in 1976, 1977, 1978 and 1979 are all below the estimated MSY. However, the inclusion of these data in future analyses should change the MSY estimate somewhat.

The conclusions from yield-per-recruit analysis are still valid (1978 SCRS Report, page 137). The fishery is currently realizing a yield-per-recruit of about 7.65 kg and it appears that little yield-per-recruit increase can be expected from an increase in size at first capture. This is because the longline fishery takes predominately large albacore. If a surface fishery should develop, these conclusions would change.

No recruitment indices or stock-recruitment relations have been developed for the south stock.

Based on previous analyses, the south Atlantic stock appears to be fished at effort and catch levels below those needed for MSY. Yield-per-recruit is relatively high. It is not possible to assess the current recruitment levels. In general, the stock appears to be in no danger of over-exploitation and some increases in catch may be possible.

## B-3 Effects of current regulations

There are no regulations currently in effect for either the north or south stocks.

## **B-4 Recommendations**

### *B-4.a Statistics*

#### i) Surface fishery

– Catch, effort and size data should be collected from the Portuguese fishery in the Azores and Madeira areas. This fishery has not fished albacore to any great degree in the past, but is developing.

– Surface catches of south Atlantic albacore should be monitored to determine if they become a significant percentage of the total catch.

#### ii) Longline fishery

The problem concerning distribution of historic Taiwanese longline catches appears to be resolved. It is necessary to insure that adequate sampling is done in the future to maintain the quality of the data.

### *B-4.b Research*

i) A production model analysis of the south stock should be done using revised catch statistics.

ii) Recommendations made in 1979 as to size-dependent sex ratio measures of catches are still valid. These measures should be systematically established for several adult albacore fisheries. This could allow for an understanding of male and female ecology and eventually for an explanation of a sex-related degree of availability in the longline fishery.

iii) For the north stock it is necessary to monitor the stock-recruit and yield-per-recruit situation.

iv) A comparison of the adult indices used for the north stock should be done.

v) Different methods for standardizing effort for the north stock should be examined.

vi) An index of recruitment is needed for the southern stock presently fished by longline.

### *B-4.c Management*

The concerns expressed by the SCRS in past years as to the status of the North Atlantic stock have been eased somewhat; the trend toward decreasing recruitment has ceased and the yield-per-recruit may be increasing. Nevertheless, there is still some possibility of weak recruitment and it is recognized that recruitment is variable. There is no special recommendation concerning management.

The southern stock does not appear to require any specific management efforts at present as the stock appears from available data to be relatively free from over-exploitation.

## 6-C BLUEFIN

### C-1 Description of bluefin fishery

Bluefin tuna are exploited by numerous national gear-specific fisheries that are not only geographically and temporally distinct but also are specific as to the size of fish caught. Catches (below) (as of Nov. 1980) have decreased 20 percent since the high level of 1976 due to declines of small fish catches from the Mediterranean (Table 6 and Fig. 35).

	<i>Hundreds of metric tons</i>									
	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
E. Atl.*	57	43	57	46	58	99	58	70	83	64
Small fish	26	22	34	27	22	43	13	23	23	16
Large fish	31	21	23	19	36	56	45	47	60	48
Med.	49	66	53	57	124	111	161	119	78	98
Small fish	18	37	29	34	57	45	99	59	52	63
Large fish	31	29	24	23	67	66	62	60	26	35
W. Atl.*	58	71	40	38	33	52	56	66	56	60
Small fish	38	37	20	16	12	23	14	14	12	12
Large fish	20	34	20	22	21	29	42	52	44	48
Total	164	180	150	141	215	262	275	255	217	222
Small fish	82	96	83	77	91	111	126	96	87	91
Large fish	82	84	67	64	124	151	149	159	130	131

\*East-west division of catch made at 30°W.

### C-2 State of stocks

The geographical distribution of longline catches and mark-recapture data show some interchange of fish between eastern and western areas occurs. However, the existence of two temporally and spatially separate spawning areas is certain. Although the magnitude or frequency of interchange is not yet known, the present evidence (which is still somewhat weak) is towards the hypothesis of separate eastern and western stocks, with a small and variable interchange. However, the evidence is not sufficient to reject the hypothesis of a single Atlantic-wide stock. The state of stocks, therefore, was analyzed according to both assumptions: that of two separate stocks (one in the east and one in the west) and of a single stock. Abundance trends and exploitation rates were derived from virtual population (cohort) analysis. For the purposes of monitoring, the division lines shown in Fig. 1 were used in the analysis (except for catch data in metric tons).

a) Separate stocks assumption

i) East Atlantic (including Mediterranean)

Calculations give a fluctuation of stock size (age 1 to 12) ranging from 1.8 to 3.6 million fish. General fishing mortality rates decreased slowly after 1975 and in 1977 reached the same level as in 1966. Juvenile stock size as indexed by the numbers of age 1-3 fish increased during 1971-1975, then decreased slightly in 1976 (Fig. 36). Juvenile abundance remained relatively stable in 1976-1978. Adult stock size as indexed by the estimated abundance of age 4-12 fish decreased 50 percent during 1970-1976. Adult stock abundance increased slightly in 1977 and again in 1978 with the entry of the strong 1974 year-class.

The apparent recruitment (age 1 stock size) has steadily improved from an unusually low level in 1971; recruitment has been average or above average since 1973. The 1974 cohort (age 1 in 1975) is the most abundant in the data; that cohort was apparently about twice the average cohort size of the 1967 to 1978 period. Recruitment was average in 1976, well above average in 1977 and average in 1978.

ii) West Atlantic

Adult stock abundance of age 6 and older fish decreased four-fold from the early 1960's to 1978 (Fig. 37) then increased with recruitment of the abundant 1973 year-class to the adult stock in 1979. Juvenile stock sizes (ages 1-5 fish) decreased four-fold, 1960 to 1973. The strong 1973 cohort supported high juvenile abundance levels from 1974 until it recruited into the adult stock. High recruitment levels occurred during 1960-1966 and rather low levels from 1967-1973 (Fig. 36). The 1974 level (1973 year-class) was four to five times the average of other years and the 1975 and 1976 levels may have been average or slightly above average. Apparently the 1977, 1978 and 1979 levels were below average; however, current methods do not allow reliable tracking of recruitment strength. The exploitation rate on juvenile fish decreased seven-fold from the period 1970-1975 to the period 1976-1979; the drop is a direct result of decreased purse seine catches through regulations.

b) Total Atlantic stock assumption

Juvenile abundance (age 1-5) decreased two-fold from 1960-1964 to 1968-1972, then peaked in 1975 with recruitment of the abundant 1973 and 1974 cohorts. Juvenile stock size apparently decreased since 1975 (Fig. 38). Adult stock abundance decreased from 1960-1976 and has increased slightly since. The abundance of very large fish (200 cm and larger, age 10 and over) has decreased since 1972. The abundance of these fish will continue to decrease until the abundant 1973 and 1974 cohorts enter that size category in 1983. Recruitment increased during 1971-1975. Both the 1973 and 1974 year-classes were very abundant, so recruitment was high in 1974 and 1975. The 1976 and 1977 levels were average or slightly above average. The recruitment levels in 1978 may have been below average.

The yield-per-recruit in the small fish fisheries is currently near maximum, however, the yield-per-recruit of the large fish fisheries will increase markedly with decrease in the fishing mortality rate on small fish.



### C-3 Effects of current regulations

#### a) Separate stocks assumption

##### i) East Atlantic (including Mediterranean)

The adult stock is increasing slowly with the entry of the strong 1974 cohort into the adult category. Juvenile stock abundance is stable. Recruitment was average 1976-78.

Due to the ICCAT regulation limiting fishing mortality, exploitation rates evidently have not increased since 1976 on juveniles, adults or the stock as a whole. The average annual catch of age 0 and 1 fish before the regulation of the 6.4 kg size limit was 383,000 fish, as compared to 236,000 after regulation, a decrease of 38 percent.

##### ii) West Atlantic

The adult stock abundance increased in 1979 due to entry of the strong 1973 cohort into the age category. 1979 juvenile abundance is slightly below average. Recruitment has been below average, 1977-79.

Due to the ICCAT regulation limiting fishing mortality, exploitation rates evidently have not increased since 1976 on juveniles, adults or the stock as a whole. The average annual catch of age 0 and 1 fish before the regulation of the 6.4 kg size limit was 43,000 as compared to 4,000 after regulations, a decrease of 90 percent.

#### b) Total stock assumption

Juvenile stock abundance has been decreasing since 1975. Adult stock abundance (age 6 and over) has increased due to the strong 1973 and 1974 cohorts. If the current catch level, either in weight or numbers, is maintained, the adult stock (age 6 and over) could decline considerably by 1985; if the current fishing mortality rate is maintained the decline will not be as severe. The accuracy of this projection depends upon the estimate of the current abundance of young fish but the methods used do not yield reliable estimates of that abundance. The abundance of very large fish (200 cm and larger, age 10 and over) is low and will continue to decrease. Available data indicate fish of that size are a major reproductive component of the stock. Since the strong 1973 and 1974 cohorts offer the only apparent chance of replenishment, controls should be maintained to prevent over-exploitation of these year-classes.

Due to the ICCAT regulation limiting fishing mortality, exploitation rates evidently have not increased since 1976 on juveniles, adults or the stock as a whole. The average annual catch of age 0 and 1 fish before the regulation of the 6.4 kg size limit was 411,000 fish as compared to 236,000 after regulation, a 50 percent decline.

### C-4 Recommendations

#### C-4.a Statistics

i) Last year's recommendation concerning the informal exchange of data between national experts resulted in significant progress and this cooperation should be continued.

ii) In order to complete the bluefin data base, the SCRS recommended to continue the collection of all data that can improve the knowledge of total landings and age structure of the catches. This recommendation applied for all countries, but particularly to ICCAT non-member countries.

iii) It was also recommended that the analysis of future trends in the spawning stock that was carried out in 1980 under the assumption of a single Atlantic-wide stock be extended to the assumption of separate east and west Atlantic stocks.

#### *C-4.b Research*

Two critical areas need to be addressed in the future so that present research progress will continue. The amount and periodicity of interchange of bluefin between eastern and western waters is of prime concern. Studies of natural tags (i.e. microspectrometry and parasitology) offer potential as well as mark-recapture experiments. The migration of small fish from the Mediterranean needs confirmation. Some age 0 trap-caught fish in southern Spain near Gibraltar were tagged in 1980 and these should be continued and extended into the Mediterranean Sea.

The tagging of small fish in the eastern and western Atlantic was very successful in 1978, 1979 and 1980. Pre-season tagging is still required to confirm the accuracy of recruitment, current juvenile stock size and fishing mortality estimates. Current information suggests that at least 1,000 fish of each cohort of interest should be tagged to obtain reliable estimates. Aspects of the reproductive biology of 130-200 cm fish, including time, location and reproductive success, are not described and emphasis should be placed on such investigations.

#### *C-4.c Management*

Last year's comments remain valid as explained in the 1979 SCRS Report (paragraph c-vii.3) as well as management recommendations to continue the minimum size and fishing mortality regulations.

## **6-D BILLFISHES**

### **DBL-BILLFISH**

#### **DBL-1 Description of fisheries**

Blue marlin, white marlin and sailfish/spearfish are caught by many fisheries both directed and incidental throughout their ranges in the Atlantic Ocean. One of the major catches is the incidental catch resulting from the tuna longline fishery of several countries. The second major fisheries are the directed sport fish fisheries of the U.S. and Senegal, among others. Third are the developing industrial and artisanal fisheries, especially in Ghana, and tropical tuna purse seine incidental catches. The catch statistics of these

fisheries are given in Tables 7 and 8. These tables represent the best estimates of catch of the Committee which spent some time apportioning the unclassified catches which are reported by many countries. This procedure is very difficult to do in particular for the longline fleets because those of Japan, which were used as a basis for apportioning the other countries, have redirected their efforts to different species of tunas, particularly tunas found in temperate waters.

#### DBL-2 State of stocks

In considering the catches, the Committee drew attention to the decline of catch over the past ten years (Table 8). CPUE trends were plotted for the blue and white marlin and these also reflect a declining trend (Fig. 39, 40, 41 and 42). In interpreting CPUE data, the Committee used two stock hypotheses for analysis. These two hypotheses are first, an Atlantic-wide stock hypothesis and second, based on very limited biological and fishery evidence, a two separate stocks hypothesis. These are separate north and south Atlantic stocks for blue and white marlin and separate east and west Atlantic stocks for the sailfish (see Fig. 1). These hypotheses have been used by the Committee in past years; therefore, because of this historical precedent of stock hypotheses, our figures present aspects based on these geographical limits. Also, historically some higher order analyses, particularly the use of production models, have been used to analyze these fisheries. These production models are not used in this year's recommendation for a number of reasons. The possibility that some aspects of the methodology, if not accurately represented, may have cascading error effects on the results of the model. Some catch statistics are unreliable due to unclassified catches, lack of reports, and species composition uncertainties. Also, another important aspect is the changing nature of the Japanese longline fishery which has been discussed earlier. The Japanese incidental billfish catch has been steadily decreasing as a percentage of total billfish landings. This involves significant changes in nominal effort from the inception of the Japanese longline fishery, within the ICCAT billfish area, as noted in last year's Report. That Report recognized that great care must be exercised in using longline statistics to index billfish abundance. However, incidental catches are useful for monitoring stocks. This year we do not believe that the methodology adequately accounts for temporal and spatial changes in fishing patterns, differences in deploying gear and types of bait.

#### *Blue marlin*

CPUE and catch have shown continued downward trends in recent years. Comparison of CPUE for both Japanese and Taiwanese fisheries reveals the same downward trends (Figs. 39 and 40). Total effective fishing intensity and landings also show these trends (Fig. 44). The Committee is unsure of the exact status of blue marlin but with the trend of very low CPUE levels of recent years, concern is expressed about any increase of effort on the stocks. It was recommended that fisheries taking blue marlin, both directed and undirected, be closely monitored and if further analysis confirms this apparent low level of abundance, consideration be given to methods of reducing effort on this species.

*White marlin*

CPUE and catch have shown continuing downward trends in recent years. Comparisons of CPUE for both Japanese and Taiwanese fisheries reveal the same downward trends as noted in last year's Report (Figs. 41 and 42). Total effective fishing intensity and landings also demonstrate these trends (Fig. 45). The Committee is unsure of the exact status of white marlin but with the trend of very low CPUE levels of recent years, concern is expressed about any increase of effort on the stocks. There is a more basic problem which needs to be addressed. There are presently two species of white marlins and perhaps three. This needs better resolution before catches and stocks can be appropriately resolved. It is recommended that fisheries taking white marlin, both directed and undirected, be closely monitored and if further analysis confirms this apparent low level of abundance, consideration be given to methods of reducing effort on this species.

*Sailfish*

CPUE from the Senegalese sport fishery was compared with the Japanese longline CPUE of the eastern Atlantic (Fig. 43). The trend line does not show the trends noted in the other species but the same close monitoring is recommended because of the development of other sport, artisanal and industrial fisheries along coastal West Africa. Also shown is the total effective fishing intensity and landings (Fig. 46).

**DBL-3 Effects of current regulations**

No regulations are in force for billfishes.

**DBL-4 Recommendations***DBL-4.a Statistics*

In general, the major problem areas are inadequate or inaccurate reporting of total catch, inadequate effort data, the practice of lumping or combining all or certain species of billfishes in reporting catch statistics and species and stock identification problems. Specifically, the Committee recommended that:

i) Catch and effort statistics from all countries be reported by 5° area and by month for each of these billfish species. If this proves impractical in the near future, then statistics for each species should at least be reported by ICCAT billfish area and by month. These data should include catch-by-number as well as in weight by species.

ii) Catch statistics for sailfish and spearfish, in particular, be reported separately by all countries in order to facilitate stock assessment work on both of the species.

iii) Length frequency data by sex for all species be collected on a regular basis for all fisheries.

iv) The Secretariat review carefully the catch reports of blue, white and black marlins to verify translations of common names and thus avoid incorrect reporting of catch.

v) Species identification be carefully taken into consideration because species differentiation problems exist within what is currently termed white marlin.

#### *DBL-4.b Research*

The lack of basic data on growth, mortality rates, species identification and stock structure severely hampers many of the standard analyses used in population dynamics. To correct these deficiencies and to provide a better theoretical base for future analyses, the Committee recommended that:

i) Studies be continued on age and growth of billfishes to provide accurate data and population parameters for yield-per-recruit studies and cohort analyses and that preliminary findings be reported.

ii) Further work be done on both the commercial and recreational fisheries for billfishes to determine indices of abundance which take into account changes in target species of the longline fleets and the incidental catch problems, as well as investigations into possible alternatives to using Japanese longline catch for standardization.

iii) The available tagging data be thoroughly analyzed to evaluate important information on exploitation rates and to determine whether or not tagging data can reasonably be utilized in stock assessment work.

iv) There be close monitoring of the sailfish stocks off Senegal and Ghana due to development of a commercial fishery on this species during the apparent spawning season.

v) That both species and stock identification studies be initiated to resolve the white marlin problem and stock problems for all species.

vi) This Committee has pointed out in past years, and reaffirms this year, that the significant problems with many aspects of billfish biology and catch data upon which assessment analyses are made must be examined by the scientific experts. These significant problems are listed elsewhere in the report. To address these problems, it was strongly recommended that an inter-sessional workshop be held in 1981. It is recommended that scientists from Brazil, Canada, Cuba, Ghana, Japan, Korea, Senegal, Spain, Taiwan, U.S.A. and other interested countries meet no later than July, 1981. The U.S.A. offered to host the meeting at the Southeast Fisheries Center in Miami, Florida, which is easily accessible and where computer facilities are available. It was further recommended that Dr. W. J. Richards (U.S.A.) serve as chairman of this meeting.

#### *DBL-4.c Management*

No management recommendations are made at this time except to stress the need to closely monitor the billfish fisheries, especially the CPUE and catch which have shown sharp downward trends in recent years. Should the downward trends in catches continue in billfishes, it might be necessary that some or all stocks have effort regulation of some form as noted last year.

**DSW-SWORDFISH****DSW-1 Review of fishery**

Swordfish are taken primarily in directed fisheries using longline, harpoon and sport gear and as incidental catches on longline gear directed towards other tuna species. However, catches have been reported for almost all types of fishing gear. Total Atlantic catches declined 35 percent in 1971 when fishing was reduced as a result of imposition of mercury content restrictions by some countries. Catches rose only slightly between 1971 and 1977 but then increased 30 percent in 1978 when several countries relaxed these restrictions. Catches decreased slightly in 1979 to 17,600 MT (Table 9 and Fig. 47). Much of the catch comes from the Mediterranean Sea, which raises a question as to the relation between fish in the Atlantic and in the Mediterranean.

**DSW-2 State of stocks**

No information was presented which enabled the Committee to advance any hypothesis of stock structure of swordfish in the Atlantic and Mediterranean Sea.

Estimates from the Canadian longline fishery (which was resumed in 1979) indicate only a minor increase in catch rates from the stock exploited by this fishery when compared to the 1962-70 data (Fig. 48). An indication of a slight increase in adjusted CPUE (Fig. 49) was observed in the Japanese longline fishery although this fishery has not targeted swordfish, except during 1969-73. It is uncertain from these analyses what the real status of the stock(s) of swordfish in the entire Atlantic Ocean may be at this time.

From a yield-per-recruit analysis of the relatively new, rapidly developing Straits of Florida longline fishery, it can be tentatively concluded that rate of exploitation may be below the level that would maximize yield-per-recruit in this fishery. However, it is necessary to have validation of ageing techniques and analysis of the assumption before the Committee can draw firm conclusions on the yield-per-recruit for the fishery.

The lack of data available precludes any firm conclusions regarding status of the stock(s) or stock structure. However, preliminary analyses indicate that these fisheries need close monitoring in view of recent increases in fishing effort, particularly in the western Atlantic. An in-depth review of available information is also needed for this species.

**DSW-3 Effects of current regulations**

No ICCAT regulations are currently in effect for swordfish.

**DSW-4 Recommendations***DSW-4.a Statistics*

The major deficiencies are the lack of detailed catch, effort and sampling data re-

ported in adequate time and area units. The Committee recommended:

- i) Catch and effort statistics should be reported by 5° area and by month for swordfish. If this proves impractical in the near future, then statistics should at least be reported by ICCAT billfish area by month. These data should include catch in numbers, as well as in weight.
- ii) Length frequency data by sex should be collected for swordfish on a regular basis.
- iii) Attempts should be made to improve historical swordfish catch statistics.
- iv) Catch and effort data for the Straits of Florida fishery should be made available.

#### *DSW-4.b Research*

The lack of basic data on growth, mortality rates and stock structure severely hampers many of the standard analyses used in population dynamics. To correct these deficiencies, the Committee recommended:

- i) Studies be continued on the age and growth of swordfish and detailed results be made available for review.
- ii) Studies be initiated to examine the stock structure of swordfish in the Atlantic.
- iii) Studies be initiated to determine if some effort indicator other than that from the Japanese longline fishery can be used to produce more reliable abundance indices.
- iv) As recommended in the billfish report, it was also recommended that a joint inter-sessional meeting be held to address the problem of insufficient data from the billfish and swordfish fisheries.

#### *DSW-4.c Management*

No management measures were recommended. However, it was recommended that all swordfish fisheries be monitored closely, particularly in the western Atlantic where effort has increased in the last few years. A review of available information is needed before any firm conclusions could be drawn and management recommendations made.

### DSB-SOUTHERN BLUEFIN TUNA

The southern bluefin tuna comprises primarily only two fisheries: an Australian surface fishery, which is presently dominated by purse seine and baitboat effort and the Japanese longline fleet which fishes in the southern ocean (in virtually all oceans with effort varying from year to year in any particular ocean area). Australia and Japan have jointly made efforts to assess the stock status, and in their studies have presented evidence that there is a single stock which, as adults, is widely distributed throughout the

southern oceans. The major reproduction areas appear to be in the eastern Indian Ocean.

Hook rates in the longline fishery have been relatively stable in the entire southern ocean (90-110 million hooks per year) from 1970 to 1978. As previously described, effort distributions change from year to year. Recently there has been a tendency for increased effort in the southern Atlantic. This is described in Table 10 in the form of catches. The effort patterns in the Atlantic compared to the total effort will be provided next year so as to clarify these points in regard to changes in effort patterns.

No appraisal of stock status was made by the Committee because the major fishing interests' governments have evoked regulatory controls on their respective fleets. Recent results of assessments were discussed at the Stock Assessment Workshop on Tunas and Billfishes in the Pacific and Indian Oceans (Shimizu, Japan, June 1979).

There were no specific management recommendations made by the SCRS. However, a study of the possible effects of Atlantic catches on the entire southern bluefin stock should be encouraged considering the broad geographic distribution of this resource.

## 6-E SMALL TUNAS

### E-1 State of stocks

No quantitative assessments have been made as to the level of abundance of stock size of any of the species due to lack of adequate data although recent catch trends were examined for Senegalese waters for *Euthynnus alletteratus*, *Sarda sarda* and *Scomberomorus tritor*. Definitive conclusions were not reached because of the lack of adequate time series, effort data and the small geographic limits of the study. From the table on catch (Table 11) it is clear that these data are unreliable because of unreported landings, misidentifications and lack of identifications. No regulations are in force for small tuna species. The lack of adequate data precludes the appraisals of any species.

### E-2 Recommendations

#### E-2.a Statistics

As was emphasized in the 1979 SCRS Report and is being emphasized again here, the major problem is the inaccurate and incomplete reporting of statistics. It is, therefore, recommended that:

i) Attempts be made to more accurately identify the catches of individual species, especially those currently listed in the "others" category.

ii) Wherever possible, catch, effort and length frequency data be collected and reported especially since many of these species are important to artisanal fishermen in tropical waters. For example, it is noted that significant catches of these species by tropical purse seiners do not appear in national reports of those countries involved in tropical purse seining operations.



*F-2.b Research*

It is recommended that studies be continued on the basic biology, especially population parameters of the taxa of this section.

*E-2.c Management*

No management measures were recommended.

## **6-F MULTI-SPECIES ASPECTS — TROPICAL SPECIES**

### **F-1 Description of fisheries**

The surface fishery exploiting tropical tunas is composed of purse seiners and baitboats. These two gears simultaneously exploit the three principal species of tropical tunas: yellowfin, skipjack and bigeye. There are two baitboat fleets currently in operation, one based in Dakar and the other based in Tema. The Tema-based baitboat fleet, which operates in the Gulf of Guinea where catches on the average comprise a large proportion of skipjack (70 percent of the total weight), mixed with small yellowfin and bigeye which are taken as an incidental catch. In general, the purse seine catch comprises principally yellowfin tuna, of which a significant part is small-sized fish (see yellowfin section), mixed with skipjack and bigeye.

The three species, yellowfin, skipjack and bigeye, often seem to be found in mixed schools, which does not leave the fishermen a choice of species to fish.

### **F-2 Size limits for yellowfin and bigeye**

The SCRS recommendation for a minimum size limit of 3.2 kg for yellowfin tuna was adopted by the Commission in 1972 as a mechanism for increasing the yield-per-recruit to the fisheries. Despite the adoption of this regulation, the catch of undersized fish remained high, and the practice of misreporting undersized yellowfin tuna as bigeye tuna or vice versa appeared to have increased and affected the reliability of the catch statistics. The SCRS, therefore, recommended and the Commission adopted in 1979 a common 3.2 kg size limit for yellowfin and bigeye tuna. At the same time, the SCRS recommended that because some fisheries were having difficulty in implementing the regulation, alternative measures that would limit or reduce the catches of undersized fish should be investigated.

The problem is that the Atlantic fisheries for tropical tunas are multi-species fisheries in which yellowfin, bigeye and skipjack tunas are caught in various combinations. Optimizing yield-per-recruit for one species through a minimum size limit consequently could have an effect, both biological and economic, on yield of the other

species. This situation was identified and reported in 1979 by the SCRS's Working Group on Juvenile Tropical Tunas. That Group also investigated the question concerning use of economic data for evaluating the impact of the minimum size regulation, and concluded that development of a bioeconomic model of the fisheries was needed and the individual involved nations should use their own economic data to assess the impacts.

### F-3 Past activities of the Working Group on Juvenile Tropical Tunas, 1979-1980

#### a) Closed areas concept

The goal of management is still to reduce fishing mortality on juvenile yellowfin and bigeye in order to increase the yield-per-recruit of the fishery and maintain spawner stock at a reasonable level. This closed strata (time-area) technique can be used to select strata where the highest concentrations of juvenile yellowfin/bigeye are exploited by present fisheries. This closed strata is supposed to produce a selective decrease of the fishing effort exerted towards juvenile tunas.

#### b) Caveats upon present analysis

Present analysis of the Working Group depends on data and methods used.

-- Only the available data have been used; they are not really adequate due to insufficient Task II statistics, errors in species identification, poor sampling of size distributions for some major fleets, and non-reporting of dumping of dead undersized yellowfin.

--- The method presently used (for technical reasons) was to consider the number of undersized yellowfin/bigeye (less than 3.2 kg) in each stratum. A more realistic study should work on the catch by all sizes of yellowfin and bigeye fished in these strata or protected by its closure.

#### c) Which strata should be closed to protect juvenile yellowfin and bigeye?

Independently of these limitations, the present analysis clearly shows the area and time strata where significant amounts of yellowfin/bigeye are usually caught by baitboats and purse seiners. These strata appear on Fig. 50 and in Table 12 (shaded area).

#### d) What may happen under an area closure management scheme?

A significant amount of skipjack is taken within the areas which are critical for juvenile yellowfin/bigeye. Consequently, although a closed fishing season would probably produce increased yield-per-recruit for yellowfin and bigeye for the fishery as a whole, it will have unknown results on skipjack yields, depending on skipjack stock structure and age specific availability: if skipjack, which will not be fished in the closed strata, can still be fished (in other areas during the closure or after the closure period in the same area), there may not be any less skipjack caught.

If this assumption is not valid, all the skipjack catch in the strata, or a significant

part of it, could be lost. In more detail, the consequences would be different for each gear. At this time, it appears that the immediate losses of skipjack, estimated by the Working Group, would be higher than the maximum benefit from increased yield-per-recruit for yellowfin and bigeye combined.

However, at this time the Working Group cannot reach any conclusion on the possible benefits or losses evolving from closed strata.

#### F-4 Future work

The Committee agreed that the Working Group had reached useful conclusions despite the absence of entirely appropriate data in most cases.

Among the many items requiring study which might help the Committee in its search for appropriate management strategies and methods for evaluation of present regulations, highest priorities should be given to at-sea sampling of size and species composition for different fishing fleets operating in representative fashions in the various areas. Without these data there can be no direct resolution of these two important problems.

Major problems have arisen in these studies due to ignorance regarding skipjack stock structure and the age-specific availability of this species to existing gears. Further studies should employ modern biological oceanographic methods in conjunction with traditional fishery methods; they also should consider the ecological interaction between species. Economic considerations will certainly pose complexities in our assessments of effects of regulations. The economic impacts of any proposed management alternatives will differ among fleets and countries. There are both positive and negative effects to evaluate. If economic evaluations are required, then data need to be collected soon. Because of the differences between national economies and economic policies, individual countries must collect and evaluate data from their own fisheries. Until this is done on a broad scale, no realistic evaluations of regulations can be made. This matter is discussed thoroughly in last year's report and in SCRS/80/23.

In view of the preceding remarks or any other political or socio-economic considerations, the SCRS is ready to study any other management schemes requested by the Commission.

#### F-5 Recommendations

##### *F-5.a Statistics*

i) Estimation of the correct species composition of the catches must be achieved in both purse seine and baitboat fisheries, the solution may include development of a logbook reporting system. The Skipjack Program may contribute to this solution.

ii) Evaluation of the amount of non-routine marketed fish landings.

iii) Substitution principles should be reviewed in depth based on the actual data available, and standard methods need to be established.

iv) Monthly catch by size by surface fleet in selected areas D, E, and F calculated during the session should be researched and accurately documented.

- v) Estimation of discards must be made for all the fleets.
- vi) Tagging of yellowfin and bigeye in relation with the International Skipjack Year Program should be encouraged.

#### *F-5.b Research*

i) The evaluation of the mixing of species and sizes in schools must be improved. The Skipjack Program may provide useful information here, but all fleets should be evaluated.

ii) Changes of yield-per-recruit due to the changes in fishery exploitation pattern should be examined.

iii) Evaluation of environmental parameters vs. change in tuna availability and vulnerability needs study.

The Group agreed that it had completed the tasks as well as it could with available knowledge of fish biology and with the best available data base. The improvements of studies can be done by correspondence as the data base is being updated and improved, but it would not warrant another meeting next year. Therefore, the Group recommended that its next meeting be scheduled in 1982 after the results of the Skipjack Year Program become available.

The Committee concurs with the Working Group and strongly recommends that these various tasks be undertaken by the various responsible groups. Further clarification of the bases for these recommendations can be found in SCRS/80/17 and SCRS/80/23.

### — TEMPERATE SPECIES

Although not specifically emphasized, multi-species interactions between temperate tunas, billfishes and other pelagic species fisheries exist. The general cause of multi-species catches can be attributed to the inability of fishing gears to be species selective. This problem manifests itself when the distributions of the various species and any two or more species are simultaneously available to the gear.

Examples of common or anomalous multi-species catches of various fishing gears include:

- purse seine catches of bluefin, albacore and swordfish (in the Mediterranean)
- gill net catches of billfishes, albacore, bluefin and sharks
- troll catches of bluefin, skipjack and albacore
- longline catches of billfish with temperate tunas

#### *Recommendations - Research*

Studies on temperate multi-species interactions are needed to provide quantitative information for developing advice on managing the complex temperate fisheries. Delineation of species habitat overlap in time and space, including size specific, species distribu-

tion and environmental requirements needs careful study and evaluation.

**Item 7. Review of the Report of the SCRS Officers Meeting**

The Report (SCRS/80/26) was presented to the Committee by its rapporteur, Dr. P. M. Miyake (Secretariat). The Officers Meeting was held on May 31, 1980, at Brest, France, together with the meetings of the Sub-Committee on Skipjack and the Working Group on Juvenile Tropical Tunas. The officers reviewed the progress made by the SCRS scientists since the 1979 SCRS meeting. The officers concentrated their discussion on the new organization of the 1980 meeting, based on recommendations made by the Working Group on SCRS Organization. They also reviewed the ICCAT Document Policy. The SCRS Chairman, after discussion, decided to dissolve the Working Group on Data Management, as the work of that Group had been completed.

The Committee recognized that the meeting was very productive and that such an inter-sessional meeting is very helpful in carrying out the work of the SCRS.

**Item 8. Review of the Report of the Working Group on Juvenile Tropical Tunas**

The Report of the meeting of the Working Group on Juvenile Tropical Tunas, held on May 28-June 7, 1980 at Brest, France (SCRS/80/17), was presented by its Convener, Mr. Kothias Amon (Ivory Coast). He focused his presentation on the multi-species complexity which the Group studied and the hypothetical effects of any possible (areal and/or temporal) closure to protect juvenile tropical tunas in the present fishery on other tuna species for which no protection is needed.

The Committee congratulated the Working Group, its Convener and the members for the excellent work accomplished by the Group. The Report (SCRS/80/17) was adopted by the Committee without any changes (Collective Volume, Vol. XIII).

The Report was used as a basis for discussion on "Multi-species aspects-tropical tunas."

**Item 9. Review of the Report of the Sub-Committee on Skipjack**

The Convener of the Sub-Committee on Skipjack, Dr. G. Sakagawa (U.S.A.) presented the report of the Sub-Committee's inter-sessional meeting held in Brest, France, June 2-4, 1980 (COM-SCRS/80/16) as well as the report of the meeting held during this Session (Appendix 3). Both reports were adopted and the Convener, the members of the Sub-Committee and the Skipjack Coordinator, Dr. P. E. K. Symons, were highly commended for the excellent achievements made up to the present.

**Item 10. Report of the Sub-Committee on Statistics and review of Atlantic tuna statistics and data management system**

The Convener of the Sub-Committee on Statistics, Mr. S. Kume (Japan), presented

the report (Appendix 4). The Committee adopted the report, and concurred with all its recommendations. The Convener, the members of the Sub-Committee and the Secretariat statistical staff were commended for their contribution to the improvement of statistics.

#### Item 11. Review of SCRS research programs and consideration of future plans

A proposal was made at the 1980 inter-sessional SCRS Officers Meeting to set one day aside during the SCRS meeting for consideration and discussion by the scientists of one specific basic study topic which is common for all tuna biology but not for any one particular species. The Chairman suggested various possible subjects for discussion, such as problems related to population models, population parameters, environment, ecology, interaction between tuna and non-tuna species, etc. Since at least one year's preparation is necessary before such a session can be held, the Committee agreed to decide on the topic and its leader at this time. In a preliminary discussion, "Interaction of tunas and the bait species" and "Evaluation of abundance indices in relation to the effect of environmental elements on the ecology of tunas" were suggested as possible topics. The Chairman asked the SCRS scientists to give serious consideration to this matter and to resume their discussion at a later session of the SCRS.

At a later plenary session, the SCRS discussed further the special subject to be discussed at the 1981 one-day symposium. Evaluation of abundance indices in relation to environmental parameters was recognized as the most important subject, and one which has been a common problem for all species of tunas. However, the Skipjack Year Program, currently in progress, might provide considerable new information to assist in such an evaluation. For this reason, the Committee decided that this subject should be discussed at the 1982 symposium.

Dr. G. Sharp (FAO) presented "The definition of tuna and billfish habitats and effects of environmental variations on apparent abundance and vulnerability to fisheries" as the topic for discussion on this one-day symposium in 1981.

The proposed day of presentations would focus on studies and reviews of available information about species distribution; evaluation of the effects of these properties on "apparent" abundance variations considering both availability and vulnerability variations; properties of tuna and billfish behavior which create puzzling problems in interpretation of generally applied assessment tools (e.g. changes in catch rates in longline gear with different depth of hooks, studies of aggregation dynamics relating to various physical-climatic phenomena or by natural or artificial means).

The results of these presentations and ensuing discussions should help define necessary research and changes in assessment procedures to be implemented and evaluated in the future.

The Committee felt that the subject proposed by Dr. Sharp is most appropriate and would serve as a very good introductory discussion leading to the 1982 topic (evaluation of abundance index).

The Committee decided that this topic would be discussed at the 1981 meeting. Dr. Sharp was nominated coordinator for this symposium and was asked to draw up a procedural plan to organize the symposium. Dr. Sharp stressed the importance of the participa-

tion of academic scientists who have not been working in the ICCAT scheme up to now since they do not represent governments in this inter-governmental organization.

The Committee, in agreeing on the importance of participation of such non-government academic scientists, discussed the possibility of financing their participation but came to the conclusion that, based on the Commission's policies and financial condition, it could not assume their trip expenses.

The Committee recommended that various scientists who have not been working in the ICCAT traditional scheme but who have made new achievements in the field covered by this topic be invited to participate in the symposium and that each national office try to find a way of financing such non-traditional scientists. The Committee considered that the proposed topic is general enough for all the scientists working in the present ICCAT scheme to contribute to this subject, as well as outside scientists. The need to review the topic in an overall, ocean-wide scale rather than as a very localized, specialized standpoint was confirmed. The Committee also felt that such a topic requires a very comprehensive, basic and complex discussion, and that one day would be insufficient for a thorough study on this topic. However, with careful planning and preparation the symposium will give eye-opening stimulation for the scientists working within the ICCAT scheme.

The Committee recognized that three inter-sessional meetings have been proposed, and recommended that all the three meetings be organized.

i) Billfish Workshop. The Tentative Agenda has been proposed and is attached as Appendix 7. The Agenda is still flexible and Dr. W. Richards (U.S.A.), who was nominated General Chairman, was asked to organize the workshop, together with the planning team whose members are listed in the Appendix 7. The Committee stressed the importance of the advance preparations as regards the gathering and updating of all the available statistics.

ii) Inter-sessional meeting of the Sub-Committee on Skipjack.

iii) SCRS Officers Meeting.

The above two inter-sessional meetings were proposed. The Committee approved these two meetings, to be held at a time and place which will be agreed upon at a later date by correspondence.

#### Item 12. Cooperation with other organizations

The Executive Secretary reported on the relationship which ICCAT has maintained in the past with FAO and its affiliated bodies (CECAF, WECAFC, OPFC, IPFC, GFCM), the Inter-American Tropical Tuna Commission (IATTC), the South Pacific Commission (SPC), the International Council for the Exploration of the Sea (ICES), the International Commission for the Southeast Atlantic Fisheries (ICSEAF), the Inter-governmental Oceanographic Council (IOC), the North Atlantic Fisheries Organization (NAFO), etc. The Committee thanked FAO for the assistance given by various FAO attendants at ICCAT meetings and expressed hope that cooperation with these international agencies will continue.

Special appreciation was expressed to CECAF for their collaboration with ICCAT,

particularly in assuming the travel expenses of scientists of CECAF member countries who attended the Working Group on Juvenile Tropical Tunas in 1980.

The Committee recommended that the Commission should maintain even closer cooperation and collaboration with CECAF in the future.

**Item 13. Report of the Working Group on Publication Policy and review of scientific publications**

All the scientific publications which the Commission issues were reviewed. The Committee expressed their satisfaction with the quality, format and characteristics of these publications and recommended that the present publication policy be maintained.

**Item 14. Identification of questions asked of the SCRS, recommendations and priorities**

The recommendations which resulted from the species groups' discussions are listed in Appendix 6.

**Item 15. Date and place of next meeting**

The Committee decided that the 1981 SCRS meeting would be held at the same place as the Commission Meeting and starting on the Monday of the week preceding the 1981 Commission meeting.

**Item 16. Other matters**

*a) Communication between the Commission and the SCRS*

i) Questions raised by the Commission as to whether bigeye tuna should be considered as a tropical or as a temperate species.

The SCRS Chairman stated that during the 1979 Commission meeting, the Commission asked the SCRS if bigeye should biologically be considered as a tropical species or as a temperate species, in reference to questions as to which panel this species should be placed. Since most of the SCRS scientists had left Madrid by that time, the Chairman gave a tentative answer to the Commission at the time. The matter was further elaborated and was presented to the Commission as COM/80/25.

The Committee concurred with the Chairman's view and recommended that the Commission take note of this document when it considers this matter.

ii) Questions asked of the SCRS by the Commission

Last year, the SCRS asked the Commission to be very explicit when phrasing questions or instructions to the SCRS. The SCRS again made the same request to the Commission.



iii) New format of the SCRS Report

A new format was adopted this year for the SCRS Report, as had been requested at the 1979 Commission meeting. The SCRS requested the Commission to evaluate this new format as to whether such a format is acceptable by the Commission.

iv) Economic studies of the tropical tuna fishery

The SCRS briefly reviewed the situation of the "terms of reference" given to the Committee in the Convention and Rules of Procedure and these seem to exclude any economic aspects. On the other hand, the SCRS was asked by the Commission to include some economic aspects in its studies of the juvenile tropical tuna problem. In past years, the SCRS had requested the Commission to clarify the situation, particularly as to what extent the SCRS was expected to be involved in such economic studies. The Commission has not yet given a clear answer to this question and the Committee requested clear instructions on this subject.

*b) Review of the new SCRS organization adopted this year*

Dr. N. Bartoo (U.S.A.), the Convener of the Working Group on SCRS Meeting Organization, presented the Group's latest report which included evaluations of the new meeting procedures adopted this year. His Group recommended that the format of SCRS Reports A and B be tried again next year, but with some modifications.

The Committee adopted the report (attached as Appendix 5) and concurred with all the recommendations and suggestions. For this year, however, the formats for Reports A and B should be followed. However, it was suggested that very clear detailed instructions on the format be given to the rapporteurs prior to the 1981 meeting.

*c) Other matters*

The Committee and a temporary working group spent considerable time identifying and developing abundance indices which can be used in monitoring adult stocks and recruitment for each stock of tuna over a long period basis. This matter has been pending since 1979, but the Committee felt that it was still premature to set up any definitive abundance indices for all the species at this time. The Committee decided that discussion on this matter should be continued during the inter-sessional period, and that the results should be presented at the 1981 session of the SCRS. Mr. R. H. Pianet (France) was nominated coordinator for the discussions. It was also recommended that all scientists using abundance indices provide a short note explaining the calculation procedures and basic data used in estimating indices, for the benefit of this group.

**Item 17. Adoption of Report**

The Report was adopted.

**Item 18. Adjournment**

The Chairman highly commended the excellent work done by the scientists and the tremendous effort made by the Secretariat staff during the past ten days. He also thanked the interpreters for their very high quality work. The U.S. scientists congratulated the SCRS Chairman for an excellent job done. The meeting was adjourned.

Table 1. Atlantic yellowfin catch (1,000 MT)

	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980 <sup>1</sup>
<i>TOTAL</i> . . . . .	60.1	82.9	93.7	75.1	73.0	93.7	94.3	107.6	124.4	125.9	127.9	134.7	130.0	111.2
<b>East Atlantic</b> . . . . .	53.2	74.4	82.1	61.2	58.0	79.0	84.9	96.3	109.5	114.4	114.6	119.7	116.4	100.1
– Surface . . . . .	38.5	53.8	62.6	45.5	44.4	60.6	60.5	76.5	94.6	99.3	99.1	108.4	109.3	94.5
Baitboat . . . . .	16.8	22.1	15.9	9.4	10.4	12.8	14.3	19.8	9.4	13.1	11.1	9.6	15.1	5.1
Angola . . . . .	.9	1.1	.4	.3	.5	.6	.6	.8	.1	1.0	1.9	2.0	.8	0.
FIS . . . . .	14.4	18.7	14.3	7.5	7.6	7.5	5.5	6.3	2.9	3.7	3.4	2.8	2.1	2.3
Ghana <sup>2</sup> . . . . .	0.	0.	0.	0.	0.	.0	.1	.3	.7	.8	.6	.3	.3	.3
Japan <sup>2</sup> . . . . .	1.3	2.2	1.0	.8	2.0	3.5	6.5	7.1	1.1	4.9	2.6	1.4	.6	.8
Korea-Panama <sup>2</sup> . . . . .	0.	0.	0.	0.	0.	.4	.8	2.8	3.5	2.0	2.1	1.7	2.9	1.1
Spain <sup>3</sup> . . . . .	.2	.2	.3	.7	.4	.7	.8	2.0	1.0	.2	.3	.2	.1	.2
Others . . . . .	0.	0.	0.	0.	0.	0.	0.	.5	.1	.4	.3	1.1	8.2	.4
Purse seine . . . . .	18.7	29.7	45.1	33.9	32.6	47.8	44.9	53.4	83.4	86.2	87.6	97.6	92.9	89.4
FISMP <sup>4</sup> . . . . .	9.0	12.7	15.2	17.2	19.2	24.6	26.7	32.9	45.1	50.5	47.9	53.7	48.9	46.0
Japan <sup>2</sup> . . . . .	5.2	7.5	4.7	1.1	2.0	2.5	1.2	.8	.1	0.	0.	0.	0.	0.
Spain <sup>3</sup> . . . . .	2.9	3.1	5.5	6.4	7.2	8.6	13.2	13.7	23.8	33.1	33.2	35.1	40.2	35.5
U.S.A. . . . .	.9	5.8	18.8	9.0	3.8	12.0	3.0	5.6	14.0	1.7	6.4	8.1	2.9	4.8
Others . . . . .	.7	.7	.9	.2	.4	.2	.8	.4	.4	.8	.2	.6	1.0	1.0
Other gears . . . . .	3.0	1.9	1.6	2.1	1.4	.0	1.2	3.3	1.9	.0	.4	1.2	1.2	2.1
– Longline . . . . .	14.7	20.6	19.5	15.7	13.6	18.3	24.4	19.8	14.9	15.1	15.5	11.3	7.1	5.6
China (Taiwan) . . . . .	1.9	6.6	7.0	3.9	3.4	3.5	1.5	1.0	1.3	.6	.2	.2	.2	.1
Cuba . . . . .	0.	0.	0.	0.	1.7	3.6	4.5	3.4	1.7	1.8	2.9	1.9	2.8	2.8
Japan . . . . .	10.1	9.8	6.4	2.5	1.6	2.3	1.3	.7	1.7	.3	.1	.3	.3	.2
Korea-Panama . . . . .	0.	1.6	4.2	9.3	6.9	7.8	17.1	14.7	10.2	10.9	10.6	8.4	3.1	1.7
Others . . . . .	2.7	2.7	1.9	0.	0.	1.1	.0	0.	0.	1.6	1.8	.5	.7	.7

West Atlantic . . . . .	6.9	8.5	11.6	14.0	15.0	14.7	9.4	11.3	14.9	11.4	13.3	15.0	13.6	11.1
– Surface . . . . .	.2	.1	0.	0.	0.	3.4	2.3	1.6	2.0	.6	1.1	4.7	3.9	3.9
– Longline . . . . .	3.5	6.2	9.3	11.5	13.5	11.2	7.2	9.7	12.8	10.2	11.3	9.4	8.7	7.2
China (Taiwan) . .	.8	1.3	3.8	3.2	1.0	1.2	1.2	1.3	1.1	1.1	.1	.2	.8	.5
Cuba . . . . .	0.	0.	0.	0.	0.	0.	0.	0.	.6	1.2	.9	.7	0.	.7
Japan . . . . .	2.7	4.2	3.6	4.3	9.1	4.2	2.5	2.8	2.4	3.1	1.4	1.6	1.7	1.7
Korea-Panama . .	0.	.7	1.8	4.0	3.0	3.3	1.3	4.0	7.6	3.5	7.2	5.0	4.4	2.5
Others . . . . .	0.	.1	.1	0.	.4	2.6	2.2	1.5	1.1	1.3	1.7	2.0	1.8	1.8
– Unclassified gears . . .	3.2	2.2	2.3	2.4	1.5	0.	0.	0.	.1	.7	.8	.9	1.0	.2
Unclassified region. . . .	0.	0.	0.	0.	0.	.1	0.	0.	0.	0.	0.	0.	0.	0.
– Surface. . . . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
– Longline. . . . .	0.	0.	0.	0.	0.	.1	0.	0.	0.	0.	0.	0.	0.	0.
– Unclassified gears . . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

1. Catch for 1980 is provisional.
  2. Adjusted by the percent of bigeye in the yellowfin and bigeye catch from the Tema-based fleet sampled in Puerto Rico; 1969-1974 - 21 percent bigeye; 1975 - 11 percent bigeye; 1976 - 15 percent bigeye; 1977-78 - 28 percent bigeye (SCRS/79/26).
  3. Spanish eastern tropical fleet catch adjusted by the percentage of bigeye in the yellowfin and bigeye catch of the FIS purse seine and baitboat fleets, 1969-78 (SCRS/79/26).
  4. France-Ivory Coast-Senegal-Morocco-Portugal.
  5. Catch by South Africa in 1979 noted under "others" includes 200 MT longline, 7,700 MT baitboat, 300 MT purse seine and 650 MT others. Fish in these catches may be from either Atlantic or Indian Ocean stocks.
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Table 2. Catches in number ( $10^6$  fish) and weight ( $10^3$ MT) of yellowfin, all sizes and undersized (less than 3.2 kg) in the eastern Atlantic fishery. The percentage of undersized catches are given in terms of weight and number, as well as the mean weights for 1976-79.

	Year	<i>Baitboat</i>			<i>Purse seine</i>			<i>Eastern surface</i>			<i>Eastern longline</i>			<i>Eastern Atlantic</i>		
		No.	Weight	$\bar{w}$	No.	Weight	$\bar{w}$	No.	Weight	$\bar{w}$	No.	Weight	$\bar{w}$	No.	Weight	$\bar{w}$
Total number and catches	1976	3.2	13.0	4.1	4.7	86.2	18.3	7.9	99.2	12.6	.3	15.1	50.3	8.2	114.3	13.9
	1977	1.5	11.0	7.3	5.1	87.5	17.2	6.6	98.8	15.0	.3	15.5	51.2	6.9	114.3	16.6
	1978	1.2	9.4	7.8	6.6	97.4	14.7	7.8	108.0	13.8	.3	11.3	37.8	8.1	119.3	14.7
	1979	1.4	6.9	4.9	4.2	90.6	21.6	5.6	99.7	17.8	NA	6.8	NA	NA	106.5	NA
Number and catches of undersized fish	1976	1.9	4.3	2.3	1.8	NA	NA	3.7	NA	NA				3.7	NA	NA
	1977	.4	1.0	2.5	1.9	NA	NA	2.3	NA	NA				2.3	NA	NA
	1978	.5	1.4	2.8	1.9	3.6	2.0	2.4	5.0	2.1				2.4	5.0	2.1
	1979	.6	NA	NA	1.5	3.2	2.2	2.1	NA	NA				2.1	NA	NA
Percentage of undersized fish	1976	59	33		38	NA		47	NA					45	NA	
	1977	27	9		37	NA		35	NA					33	NA	
	1978	42	15		28	4		31	5					30	4	
	1979	43	NA		36	4		38	NA					NA	NA	

NA = not available.

Table 3. Atlantic bigeye catch (1000 MT)

	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980 <sup>1</sup>
<i>TOTAL</i> . . . . .	16.8	21.4	28.0	34.1	49.1	38.9	48.1	58.0	54.6	37.6	45.1	42.9	41.4	35.0
<b>North Atlantic</b> . . . . .	5.5	7.9	9.8	19.6	26.1	18.1	24.1	38.4	36.8	21.3	26.9	24.5	21.1	21.4
– Surface . . . . .	1.3	1.4	3.0	4.5	7.5	3.3	5.0	12.9	12.2	7.8	11.5	11.2	10.0	9.9
Baitboat . . . . .	1.3	1.4	2.9	4.3	7.3	3.2	4.9	12.0	11.6	7.0	8.7	10.5	8.5	8.8
FIS . . . . .	0.	0.	1.4	.7	.3	.1	.5	.5	1.2	1.2	2.5	3.6	1.9	2.2
Portugal . . . . .	0.	0.	0.	0.	0.	0.	0.	8.4	4.7	1.6	2.6	2.9	3.2	3.6
Spain . . . . .	1.3	1.4	1.5	3.6	7.0	3.1	4.4	3.2	5.7	4.2	3.6	3.9	3.0	3.0
Others . . . . .	0.	0.	0.	0.	0.	0.	0.	0.	.0	.0	.1	.2	.4	0.
Purse seine . . . . .	0.	0.	.0	.3	.2	.1	.1	.1	.4	.3	1.5	.7	1.2	1.1
FISMP . . . . .	0.	0.	.0	.2	.1	.1	.1	.1	.3	.1	.9	.4	.7	0.6
Spain <sup>2</sup> . . . . .	0.	0.	0.	.0	.1	.0	.0	.0	.1	.1	.6	.2	.5	0.5
Others . . . . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0	0.	0.	.0	0.
Other gears . . . . .	0.	0.	0.	0.	0.	0.	0.	.7	.2	.5	1.4	0.	.3	.2
– Longline . . . . .	4.0	5.6	5.8	11.0	18.6	14.8	19.1	25.6	23.1	12.1	15.3	13.4	11.0	10.8
China (Taiwan). . . . .	.3	1.5	3.0	5.1	2.4	.8	1.3	1.1	1.5	.4	.3	.6	.3	.3
Cuba . . . . .	0.	0.	0.	0.	1.2	.8	1.0	.9	.7	.8	1.4	.5	.8	0.9
Japan . . . . .	3.4	4.0	2.4	4.7	13.1	11.8	11.1	17.6	12.4	5.9	5.3	5.8	5.1	5.5
Korea-Panama . . . . .	.2	.1	.5	1.2	1.8	1.4	5.7	5.9	8.5	5.0	6.6	6.3	4.2	5.3
U.S.S.R. . . . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.2	.2
Others . . . . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0	1.8	.2	.3	.3
– Unclassified gears. . . . .	.3	.9	1.0	4.1	0.	0.	0.	0.	1.5	1.5	0.	0.	0.	.5
<b>South Atlantic</b> . . . . .	9.5	13.3	18.2	14.5	23.0	20.7	24.0	19.6	17.7	16.2	18.3	18.4	20.3	13.6
– Surface . . . . .	.5	1.1	2.0	1.5	2.6	3.0	5.1	6.0	1.5	2.4	4.5	3.5	4.1	2.4
Baitboat . . . . .	.4	.6	.5	.5	.8	1.5	2.4	2.8	.7	1.4	2.1	1.4	2.6	1.0

Table 3. (continued)

	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980 <sup>1</sup>
FIS . . . . .	0.	0.	.3	.2	.3	.4	.4	.1	0.	0.	0.	0.	0.	0.
Ghana . . . . .	0.	0.	0.	0.	0.	0.	.0	.1	.1	.1	.2	.1	.1	-
Japan . . . . .	.4	.6	.3	.2	.5	.9	1.7	1.9	.1	.9	1.0	.6	.6	0.3
Korea-Panama .	0.	0.	0.	0.	0.	.1	.2	.7	.4	.4	.8	.7	1.9	0.6
Others . . . . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0	0.1
Purse seine . . . . .	.1	.4	1.5	1.1	1.7	1.5	2.7	3.2	.9	1.1	2.5	2.1	1.5	1.4
FISMP . . . . .	0.	0.	.1	.5	.5	.5	1.8	1.5	.6	.6	1.3	1.1	.7	0.6
Japan . . . . .	.1	.4	1.3	.3	.5	.7	.3	.2	.0	0.	0.	0.	0.	0.
Spain <sup>2</sup> . . . . .	0.	0.	0.	.1	.2	.2	.4	.7	.2	.4	.8	.6	.6	.6
U.S.A. . . . .	0.	.0	.1	.2	.5	.2	.1	.9	.1	.0	.3	.2	.2	0.2
Others . . . . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0	0.	.1	0.	0.
Other gears . . . . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.1	.0	0.
- Longline . . . . .	9.1	12.2	16.2	13.0	20.4	17.7	18.8	13.5	16.2	13.8	13.7	14.9	16.1	11.2
China (Taiwan).	1.9	3.8	4.5	2.4	3.1	4.2	2.5	2.0	2.5	2.9	2.7	2.0	1.9	1.9
Cuba . . . . .	0.	0.	0.	0.	2.0	1.2	1.6	1.5	1.2	.5	.5	1.8	1.5	1.4
Japan . . . . .	5.2	6.2	7.9	4.3	7.1	6.3	8.8	3.2	5.0	1.4	3.8	3.5	6.8	6.5
Korea-Panama .	.1	.2	1.4	3.5	5.5	4.3	2.8	3.3	3.6	3.7	2.2	4.9	3.6	4.5
Others . . . . .	1.9	2.0	2.4	2.7	2.7	1.6	3.1	3.6	3.9	5.3	4.6	2.6	2.3	0.2
- Unclassified gears.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.1	.2
Unclassified region. .	1.7	.2	0.	0.	0.	0.	.0	0.	0.	0.	0.	0.	0.	-
- Surface . . . . .	1.7	.2	0.	0.	0.	0.	.0	0.	0.	0.	0.	0.	0.	-
- Longline . . . . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	-
- Unclassified gears.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	-

1. Provisional

2. North-south breakdown of Spanish tropical catch is based on north-south breakdown of FIS purse seine catches.

**Table 4. Atlantic skipjack catch (1000 MT)**

	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980 <sup>1</sup>
<i>TOTAL</i> . . . . .	21.8	47.2	28.2	49.5	75.1	72.6	76.0	117.2	61.4	77.0	118.2	107.2	90.4	109.2
– Surface – E. Atlantic . . . . .	19.0	44.6	26.3	46.9	72.4	71.0	72.8	113.2	57.3	73.2	114.6	100.2	84.0	97.2
Purse seine . . . . .	7.9	24.2	14.8	31.1	50.0	50.6	51.3	76.5	37.6	35.2	63.9	59.3	38.6	64.6
FISM . . . . .	1.6	5.1	2.8	8.8	14.2	14.8	8.4	24.0	11.5	16.3	30.9	24.8	17.8	27.1
Japan . . . . .	2.2	6.3	.7	3.5	6.2	3.4	1.5	.9	.1	0.	0.	0.	0.	0.
Spain . . . . .	3.1	8.7	6.4	6.5	12.2	20.2	18.7	31.6	18.1	16.8	27.0	24.9	18.5	32.0
U.S.A. . . . .	.5	3.2	4.7	11.8	16.2	12.2	21.2	20.0	7.4	1.8	5.9	6.8	2.1	3.5
Others . . . . .	.6	.9	.1	.6	1.2	.1	1.3	.1	.5	.3	.1	2.7	.2	2.0
Baitboat . . . . .	11.1	20.4	11.4	15.8	22.3	20.2	21.5	36.5	15.2	27.8	41.2	39.0	44.3	31.5
Angola . . . . .	2.0	4.2	1.8	.9	1.9	1.5	1.3	3.4	.6	1.5	3.8	3.2	3.6	5.1
FIS . . . . .	3.7	7.3	3.7	4.4	5.8	3.8	3.3	4.5	1.8	2.2	2.7	3.3	3.3	2.9
Ghana . . . . .	0.	0.	0.	0.	0.	0.	.1	.7	1.3	2.1	3.5	2.6	3.9	-
Japan . . . . .	3.7	7.3	4.9	7.5	11.7	10.1	13.0	18.7	3.7	15.0	16.8	14.6	14.7	20.0
Korea-Panama . . . . .	0.	0.	0.	0.	0.	.7	1.1	3.1	6.3	4.4	7.6	11.1	13.8	
Spain . . . . .	.7	.8	.8	1.8	2.7	4.1	2.6	5.4	.8	.6	.7	.6	1.3	1.5
Others . . . . .	.9	.8	.1	1.1	.1	.0	.1	.7	.7	1.9	6.1	3.5	3.7	2.0
Other gears. . . . .	0.	.0	.1	0.	.1	.1	.0	.1	4.5	10.2	9.4	1.9	1.1	1.1
– Surface – W. Atlantic . . . . .	.0	.1	.1	0.	1.6	1.3	2.5	3.1	3.2	3.5	3.0	6.3	5.4	9.0
Brazil . . . . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.4	7.0
Others . . . . .	.0	.1	.1	0.	1.6	1.3	2.5	3.1	3.2	3.5	3.0	6.3	4.0	-
– Surface – Uncl. region . . . . .	0.	0.	0.	0.	.2	0.	0.	0.	0.	0.	0.	0.	0.	0.
– Uncl. gears . . . . .	2.7	2.5	1.8	2.6	.8	.3	.7	.9	.8	.3	.6	.7	1.0	3.0

1. Provisional.



**Table 5. Atlantic albacore catch (1,000 MT)**

	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
<i>TOTAL</i> . . . . .	74.2	71.4	76.1	70.7	83.5	83.7	73.7	72.1	61.8	77.0	75.0	72.3	72.0
North Atlantic . . . . .	53.8	42.3	39.8	39.7	50.6	40.4	50.8	51.9	39.9	56.9	52.2	48.2	49.8
– Surface . . . . .	48.3	37.8	32.0	30.3	40.0	34.9	26.7	37.2	31.0	34.0	32.1	34.4	38.1
Baitboat . . . . .	17.6	13.8	14.1	14.5	15.5	8.4	8.7	15.6	21.1	20.3	15.6	11.7	15.9
France . . . . .	3.9	2.2	1.7	2.0	1.6	1.1	1.0	.5	.7	1.1	.6	.4	.2
Spain . . . . .	13.7	11.6	12.4	12.5	13.9	7.3	7.7	13.8	19.4	18.8	14.9	11.3	15.6
Others . . . . .	0.	0.	0.	0.	0.	0.	0.	1.2	1.0	.4	.1	.1	.1
Troll . . . . .	30.7	24.0	17.9	15.9	24.5	26.5	18.0	21.6	9.9	13.7	16.5	22.6	22.1
France . . . . .	11.6	11.0	7.7	4.6	8.2	8.7	5.1	8.5	5.4	5.6	6.2	8.4	7.8
Spain . . . . .	19.0	13.0	10.2	11.3	16.3	17.8	12.9	13.1	4.5	8.1	10.3	14.1	14.2
Others . . . . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Other gears . . . . .	0.	0.	0.	0.	0.	0.	0.	0.	.0	.1	.0	.1	.1
– Longline . . . . .	5.5	4.5	7.8	9.4	10.6	5.5	24.1	14.7	8.9	22.8	20.1	13.7	11.7
China (Taiwan)	.1	1.1	1.5	2.2	2.7	4.1	10.0	8.2	5.4	14.8	13.7	9.3	7.0
Japan . . . . .	4.8	3.3	4.7	5.9	6.5	1.3	1.5	2.1	1.3	1.3	.8	.5	1.2
Korea-Panama	.6	.1	1.6	1.3	1.5	.1	12.7	4.4	2.0	6.6	5.6	3.8	3.5
Others . . . . .	0.	0.	0.	0.	0.	0.	0.	0.	.1	.1	0.	.1	.0



Table 6. Atlantic bluefin catch (1,000 MT)

	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
<i>TOTAL</i> . . . . .	24.9	15.4	16.7	16.5	18.5	15.3	14.7	21.9	26.3	27.7	25.7	22.6	21.7
West Atlantic . . . . .	2.8	1.2	2.6	5.7	7.3	4.1	4.1	3.4	5.1	5.8	6.7	5.8	6.3
Small fish. . . . .	2.3	.8	1.2	3.7	3.7	2.0	1.6	1.2	2.2	1.4	1.4	1.2	1.1
—Purse seine . . . . .	2.3	.8	1.1	3.7	3.6	1.9	1.6	.9	2.1	1.4	1.4	1.2	1.0
Canada . . . . .	0.	0.	0.	1.2	.9	.3	.6	.1	.3	.3	.3	.2	0.
U.S.A. . . . .	2.3	.8	1.1	2.5	2.7	1.6	1.0	.8	1.8	1.1	1.1	.9	1.0
—Rod & Reel . . . . .	0.	0.	.1	.1	.1	.1	.0	.3	.1	.0	.1	.1	.1
U.S.A. . . . .	0.	0.	.1	.1	.1	.1	.0	.3	.1	.0	.1	.1	.1
Large fish. . . . .	.5	.4	1.4	1.9	3.5	2.0	2.3	2.0	2.8	4.2	5.2	4.5	5.0
—Purse seine . . . . .	0.	0.	0.	.8	.5	.5	.2	.1	.3	.2	.2	.1	.4
U.S.A. . . . .	0.	0.	0.	.8	.5	.5	.2	.1	.3	.2	.2	.1	.4
—Rod & Reel . . . . .	.1	.2	.9	.5	1.0	1.0	.5	.6	.2	.6	.6	.4	.4
Canada . . . . .	.1	.2	.2	.2	.1	.2	.2	.4	.2	.3	.3	.2	.2
U.S.A. . . . .	0.	0.	.7	.4	.8	.8	.2	.1	0.	.2	.3	.2	.2
—Longline . . . . .	.1	0.	.0	.1	1.6	0.	1.1	.9	1.5	2.9	3.7	3.2	3.6
Japan . . . . .	0.	0.	0.	.1	1.5	0.	1.1	.9	1.5	2.9	3.7	3.1	3.6
Others . . . . .	.1	0.	.0	0.	.1	0.	.0	.0	0.	0.	.0	.0	.0
—Other gears . . . . .	.3	.3	.5	.5	.4	.5	.5	.5	.8	.6	.8	.8	.7
Canada . . . . .	.3	.3	.4	.3	.1	0.	.1	.3	.1	.2	.4	.2	.0
U.S.A. . . . .	0.	0.	.1	.2	.3	.5	.4	.3	.7	.4	.4	.6	.6
—Uncl. gears . . . . .	0.	0.	0.	.1	.1	.1	.2	.2	.1	.2	.1	.1	.2
East Atlantic . . . . .	12.6	5.8	5.8	5.7	4.4	5.8	4.7	5.8	10.0	5.7	7.0	8.4	4.7
Small fish. . . . .	3.6	1.7	2.2	2.6	2.2	3.4	2.7	2.2	4.3	1.3	2.3	2.3	1.6
—Baitboat . . . . .	1.6	1.2	1.5	2.2	2.2	2.9	2.2	1.6	1.7	.9	1.6	2.3	1.4
France . . . . .	.9	.4	.5	.7	.7	.7	.5	.5	.7	.3	.6	.7	.3
Spain . . . . .	.7	.8	1.0	1.5	1.5	2.1	1.7	1.1	1.0	.7	1.0	1.6	1.1



Table 6. (continued)

	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
—Other gears . . . .	0.	.6	.4	.6	.6	.6	.8	.7	.6	.6	.5	.1	0.
Italy . . . . .	0.	0.	0.	.5	.5	.5	.5	.5	.5	.5	.5	.1	0.
Spain. . . . .	0.	.6	.4	.1	.1	.1	.3	.2	.1	.1	0.	0.	0.
Large fish. . . . .	6.5	4.3	4.7	3.1	2.9	2.4	2.3	6.7	6.6	6.2	6.0	3.2	4.3
—Purse seine . . . .	.8	.4	.7	1.2	.8	1.0	1.2	3.1	4.2	4.1	4.2	2.1	2.9
Italy . . . . .	.8	.4	.7	1.2	.8	1.0	1.2	3.1	4.2	4.1	4.2	2.1	2.9
—Trap. . . . .	3.4	2.9	3.4	1.7	1.9	1.2	.8	1.4	1.1	1.0	1.1	.8	1.0
Italy . . . . .	1.9	1.7	1.3	1.0	1.0	.8	.4	.7	.7	.7	.7	.2	.2
Libya . . . . .	.8	1.0	2.0	.5	.6	.3	.4	.5	.3	.3	.3	.6	.6
Morocco . . . .	.0	.0	0.	0.	.0	.0	.0	.0	0.	0.	0.	0.	0.
Spain. . . . .	.3	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Tunisia . . . . .	.3	.2	.1	.2	.2	.1	.1	.1	.1	.1	.1	0.	.1
—Longline . . . . .	0.	0.	0.	0.	0.	.1	.2	2.2	1.3	1.0	.6	.1	.2
Spain. . . . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.1	.1	.1
Japan . . . . .	0.	0.	0.	0.	0.	.1	.2	2.2	1.3	1.0	.5	.1	.1
Others. . . . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
—Other gears . . . .	2.3	1.0	.6	.2	.1	.0	0.	.1	.1	.1	.1	.1	.2

Table 7. Atlantic and Mediterranean billfish catches

		<i>Sailfish</i>	<i>Black marlin</i>	<i>Blue marlin</i>	<i>White marlin</i>	<i>Total</i>
<b>1977</b>						
Senegal	Sport	93				93
"	Uncl.	72				72
Argentina	LL				2	2
Brazil	LLHB	80			10	90
China (Taiwan)	LLFB	230		765	459	1,454
Cuba	LL	95		316	189	600
Grenada	Uncl.	50		165	99	314
Japan	LLHB	47		135	106	288
"	LLFB			113	76	189
Korea	LLFB	151		503	302	956
Panama	LLFB	43		143	86	272
U.S.A.	Sport	308		295	109	712
U.S.S.R.	Uncl.	13		13		26
Venezuela	LL			241		241
<i>Sub-totals</i>						
	LL	646		2,216	1,230	
	Sport	401		295	109	
	Uncl.	135		178	99	
<b>TOTAL</b>		<b>1,182</b>		<b>2,689</b>	<b>1,438</b>	<b>5,309</b>
<b>1978</b>						
Senegal	Sport	79				79
"	Uncl.	71				71
Brazil	LLHB	154	159	93	54	460
China (Taiwan)	LLFB	182		42	282	506

Table 7. (continued)

		<i>Sailfish</i>	<i>Black marlin</i>	<i>Blue marlin</i>	<i>White marlin</i>	<i>Total</i>
Cuba	LLFB	75		265	160	500
Grenada	Uncl.	44		271	42	357
Japan	LLHB	21 (?)*		73 (140)*	43 (95)*	137
Korea	LLFB	49		300	46	395
Panama	LLFB	11		68	11	90
U.S.A.	Sport	308		295	109	712
U.S.S.R.	Uncl.	5		7		12
Venezuela	LL	35		216	33	284
	LL	527	159	1,057	629	
<i>Sub-totals</i>	Sport	387		295	109	
	Uncl.	120		278	42	
TOTAL		1,034 (?)*	159	1,630 (1,697)*	780 (832)*	3,603

\*Highest estimate of catch including mortality of species returned to sea within U.S. Fishery Conservation Zone.

Table 8. Atlantic billfish catch (1,000 MT)

	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979 <sup>1</sup>
<i>TOTAL</i> . . . . .	5.0	7.0	6.9	6.8	7.0	4.9	4.7	6.1	4.8	5.0	6.6	5.7	5.5
Argentina . . . . .	0.	0.	0.	0.	0.	0.	.1	0.	0.	.0	.0	0.	0.
Barbados . . . . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	.4	.3	.3	.3
Brazil . . . . .	0.	.1	.1	.1	.1	.2	.1	.1	.1	.2	.5	.4	.3
China (Taiwan) . .	.9	2.2	3.4	3.2	2.8	2.4	1.8	1.3	.9	1.2	1.5	.5	.4
Cuba . . . . .	1.7	1.3	.6	.6	.5	.3	1.0	2.3	1.4	.7	.6	.5	.8
Ghana . . . . .	0.	0.	0.	0.	0.	0.	.0	.0	.0	.0	.8	1.9	2.7
Grenada . . . . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.3	.4	.0
Japan . . . . .	2.4	3.0	2.3	2.3	2.8	1.1	.8	.8	1.2	.9	.3	.1(.2) <sup>1</sup>	.2
Korea . . . . .	0.	0.	0.	0.	0.	0.	0.	0.	.9	1.0	1.0	.4	.2
Panama . . . . .	0.	0.	0.	0.	0.	0.	.7	0.	0.	.0	.3	.1	0.
Senegal . . . . .	0.	0.	.1	.1	.1	.1	.1	.1	.1	.2	.2	.2	.1
U.S.A. . . . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.7	.7	0.
U.S.S.R. . . . .	0.	0.	0.	0.	0.	.1	.1	1.3	.0	.0	.0	.0	0.
Venezuela . . . . .	0.	.4	.5	.5	.6	.6	0.	.1	.1	.2	.2	.3	.4
<i>Breakdown by species</i> <sup>2</sup>													
Blue marlin . . . . .	1.1	.9	1.0	1.0	1.4	.4	.4	.3	1.0	.5	2.7	1.6(1.7) <sup>1</sup>	.4
Black marlin . . . . .	0.	0.	0.	0.	.0	.0	0.	0.	0.	0.	0.	0.	.1
White marlin . . . . .	.7	1.1	.8	.7	1.0	.6	.4	.4	.4	.6	1.4	.9	.4
Sailfish . . . . .	.7	1.0	.5	.7	.6	.5	.3	.4	.9	.5	2.1	3.0	3.0
Uncl. billfish . . . . .	2.6	4.0	4.5	4.4	4.0	3.4	3.6	4.9	2.5	3.4	.4	.3	1.6
1. Estimate of catch including mortality of billfish returned to sea dead within U.S. Fishery Conservation Zone (Collective Volume, Vol. XIV).													
2. Provisional.													



Table 9. Atlantic and Mediterranean swordfish catch (1,000 MT)

	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979 <sup>1</sup>
<i>TOTAL</i> .....	13.0	13.1	14.2	15.7	10.2	12.2	11.7	12.6	12.9	12.7	13.5	17.9	17.9
<b>-Atlantic &amp; Uncl. areas.</b> . .	10.0	10.2	12.1	12.8	5.9	6.9	7.3	8.2	9.0	8.6	8.7	12.6	2.7
Argentina.....	.1	.3	.5	.4	.1	.1	.0	.0	.0	.1	.1	.0	0.
Brazil.....	.1	.1	.2	.1	0.	.1	.1	.3	.3	.3	.3	.2	.3
Bulgaria.....	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0	0.	0.
Canada.....	4.8	4.4	4.3	4.8	0.	0.	0.	0.	.0	.0	.1	2.3	3.0
China (Taiwan)	0.	0.	0.	0.	0.	.8	1.1	.8	.9	.9	.9	0.	1.3
Cuba.....	.2	0.	0.	0.	0.	0.	0.	0.	0.	.6	.7	.6	.4
Ireland.....	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0	0.	0.	0.
Italy.....	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0	0.
Japan.....	.8	1.1	2.3	3.2	1.6	1.8	1.0	1.4	1.5	.8	.8	.9(1.0) <sup>2</sup>	1.0(1.0) <sup>2</sup>
Korea.....	0.	0.	0.	0.	0.	0.	0.	0.	.5	1.1	1.2	1.3	.6
Mexico.....	0.	0.	0.	0.	0.	.0	.0	.0	0.	0.	0.	.0	0.
Morocco.....	.2	.2	.3	.2	.4	.3	.0	.2	.0	.2	.0	.2	.0
Norway.....	.3	.2	.6	.4	.2	0.	0.	0.	0.	0.	0.	0.	0.
Panama.....	0.	0.	0.	0.	0.	.2	.4	0.	0.	.0	.1	.2	0.
Poland.....	0.	0.	0.	0.	0.	0.	.1	0.	0.	0.	0.	.0	0.
Portugal.....	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0
Rumania.....	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0	0.
South Africa... .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0
Spain.....	2.7	3.6	3.5	3.2	3.4	3.2	3.8	2.9	3.7	2.8	3.3	3.6	2.6
U.S.A.....	.5	.3	.2	.3	.0	.2	.4	1.1	1.7	1.4	.9	3.0	3.4
U.S.S.R.....	0.	0.	.1	.2	.2	.2	.2	1.4	.3	.2	.1	.2	.1
Venezuela.....	.4	0.	.1	0.	0.	0.	0.	0.	.1	.0	.0	.0	.1

<b>—Mediterranean</b>	3.0	2.9	2.1	2.9	4.4	5.3	4.4	4.4	3.9	4.0	4.8	5.3	5.1
Algeria . . . . .	0.	0.	0.	0.	0.	.0	.1	.2	.5	.4	.4	.3	.5
Cyprus . . . . .	0.	0.	0.	0.	0.	0.	0.	0.	.0	.1	.1	.1	.1
Italy . . . . .	1.9	1.4	2.0	1.8	2.9	3.7	2.8	3.3	3.0	3.3	3.3	4.0	3.4
Japan . . . . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0	0.	.0	.0
Libya . . . . .	.3	.5	0.	0.	.1	0.	0.	0.	0.	0.	0.	0.	0.
Malta . . . . .	0.	0.	0.	.1	.2	.2	.2	.2	.2	.2	.2	.1	.1
Morocco . . . . .	.0	.0	0.	0.	.0	.0	.2	.0	.1	0.	.1	.0	.2
Spain . . . . .	.7	1.0	0.	.9	1.1	1.3	1.1	.7	.1	.1	.7	.7	.8
Tunisia . . . . .	0.	0.	0.	0.	0.	0.	0.	.0	0.	.0	0.	0.	0.
Turkey . . . . .	.1	0.	.1	.1	.1	.1	0.	.0	0.	0.	0.	0.	0.

1. Provisional.

2. Estimate of catch including mortality of swordfish returned to sea dead within U.S. Fishery Conservation Zone (SCRS/80/70).



**Table 11. Atlantic small tuna catch (1,000 MT)**

	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
<i>TOTAL</i> . . . . .	110.2	86.6	126.3	102.1	81.7	90.0	81.3	75.9	60.4	56.2	81.6	69.6	63.4
Blackfin tuna (BLF) <i>(T. atlanticus)</i> . . . . .	.1	.2	.2	.2	.2	.4	.5	.3	.2	.1	.3	.3	.6
Atlantic little tuna (LTA) <i>(E. alletteratus)</i> . . . . .	8.9	8.1	9.0	13.6	10.9	8.0	7.4	7.8	2.3	2.4	4.8	15.1	10.8
Atlantic bonito (BON) <i>(S. sarda)</i> . . . . .	49.1	31.9	61.5	28.9	21.6	16.3	12.4	17.7	13.1	10.7	16.4	11.6	11.7
Frigate tuna (FRI) <i>(A. thazard)</i> . . . . .	9.3	9.3	11.0	12.6	10.9	13.5	9.7	11.9	9.1	7.3	17.5	4.8	7.7
King mackerel (KGM) <i>(S. cavalla)</i> . . . . .	12.4	12.4	12.6	12.0	12.5	15.1	18.1	21.2	8.5	10.8	11.5	14.0	11.3
Spotted Spanish mackerel (SSM) <i>(S. maculatus)</i> . . . . .	6.4	7.9	9.0	10.7	6.0	11.3	14.0	6.6	15.0	14.6	15.4	14.9	13.5
Others. . . . .	24.1	16.7	23.0	24.0	19.7	25.5	19.2	10.5	12.2	10.2	15.6	8.8	7.6

Table 12. Area-month strata (shaded area) where a large quantity of small yellowfin and bigeye (less than 3.2 kg) were taken by baitboats and purse seiners, 1976-78.

Area	Year	Jan.		Feb.		Mar.		Apr.		May		Jun.		Jul.		Aug.		Sept.		Oct.		Nov.		Dec.	
		BB	PS	BB	PS	BB	PS	BB	PS	BB	PS	BB	PS	BB	PS	BB	PS	BB	PS	BB	PS	BB	PS	B.S	PS
A	76																								
	77													x		x									
	78																								
B	76																								
	77									x	xx		x												
	78																								
C	76																								
	77																								
	78							xx		xx															
D	76		x	x	xx	x	xx									xx	xx	xx	xx	xx	xx	xx		x	
	77	xx		x		x		x								x		xx	xx	xx	xx	xx		x	
	78							xx					x				xx	xx	xx	xx	xx	xx		x	
E	76	x		xx						x		x		xx	x	xx	xx	xx	x	xx	xx	x	xx		x
	77	x	xx		xx							x	xx	x	xx	xx	xx	xx	xx	xx	xx	xx		x	
	78	x	x	x		x				xx	x			xx	xx	xx	xx	x		x		x		x	
F	76		x													xx		xx		xx		xx		x	
	77												x	xx		xx		xx		xx		xx		x	xx
	78		xx									xx		xx											

x = 50-100 MT/area/month. xx = 100 MT and above/area/month. (From SCRS/80/17)

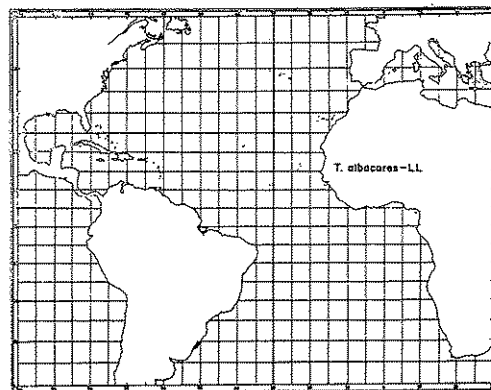
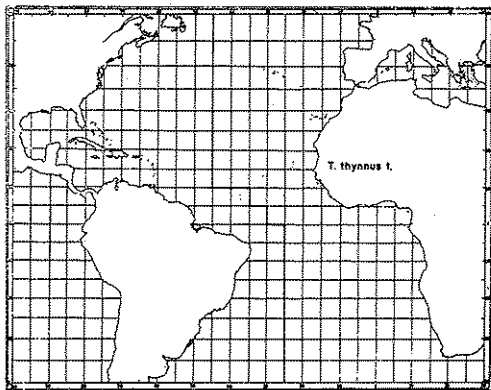
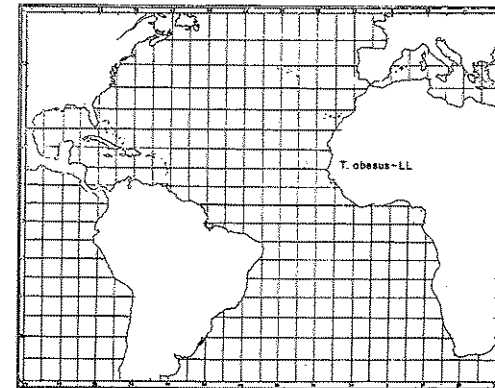
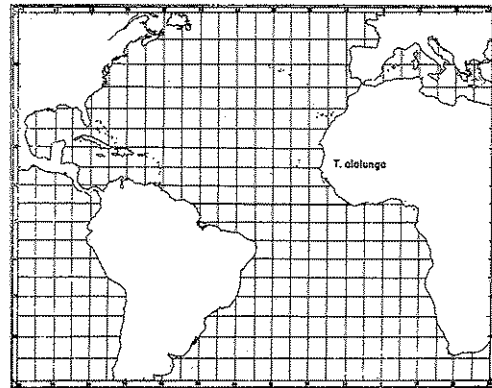
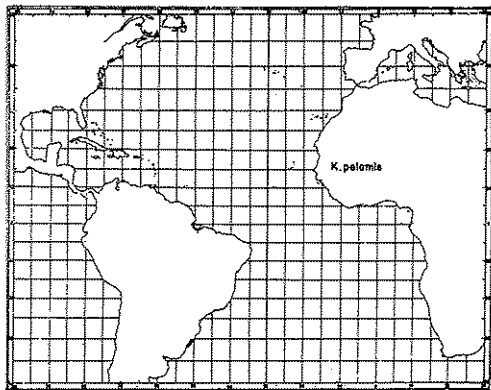


Fig. 1. Areal divisions used for monitoring stock abundance in this Report.

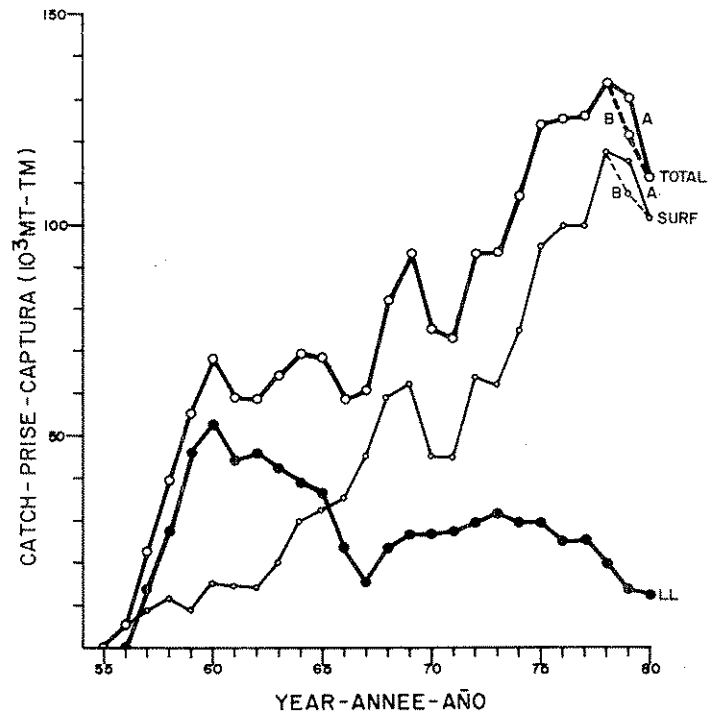


Fig. 2. Catch of yellowfin tuna in the Atlantic Ocean by surface, longline and all gears combined, 1955-80. Trends for 1978-80 are shown (a) including South Atlantic catches and (B) not including these catches.

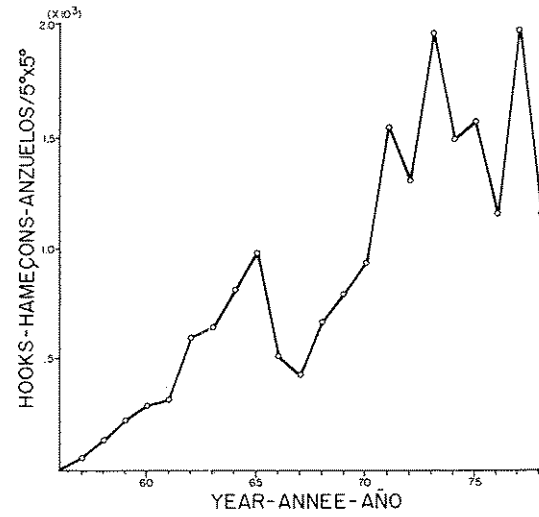


Fig. 3. Trend in annual yellowfin longline effort intensity (hooks per 5° square) in the Atlantic (SCRS/80/66).

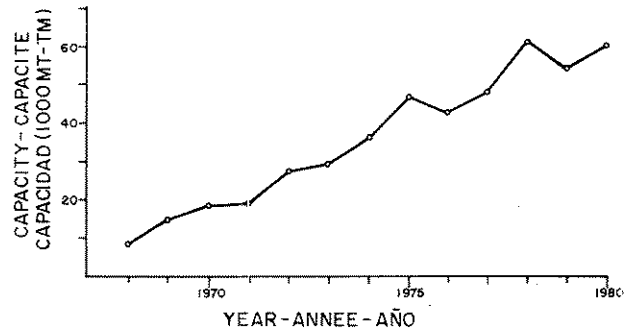


Fig. 4. Carrying capacity of the tropical baitboat-purse seine fleet in the eastern Atlantic, 1968-80.

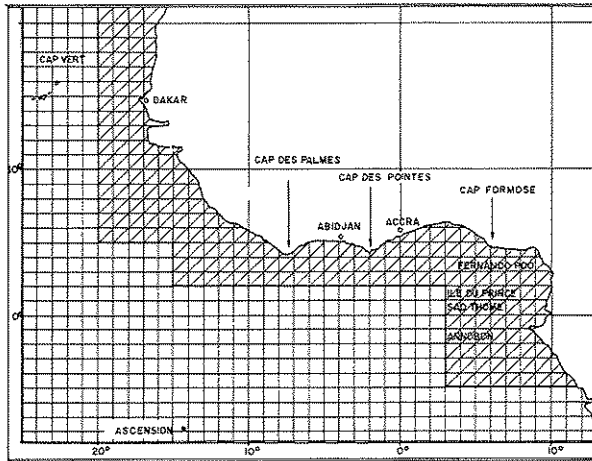


Fig. 5. "Coastal eastern Atlantic index area" used in calculating the CPUE index to estimate yellowfin abundance.

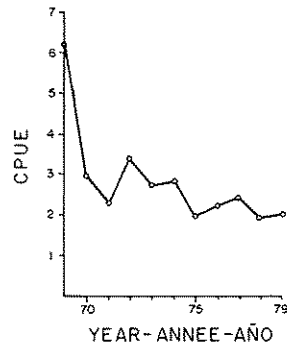


Fig. 6. Average yellowfin CPUE for the coastal eastern Atlantic index area by 1 x 1 and 15 days for FISM medium purse seiners; large purse seiners combined CPUE is represented in MT per 12 fishing hours.

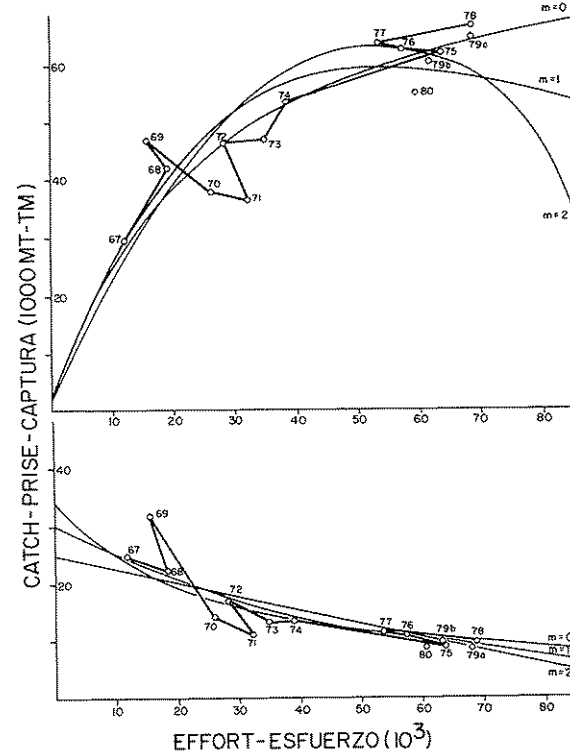


Fig. 7. Yellowfin production model under the hypothesis of a single Atlantic stock which is exploited by surface and and longline fisheries ( $k = 3$ ,  $m = 0, 1, 2$ ). Point 79-a includes South African catch; 79-b excludes South African catch.



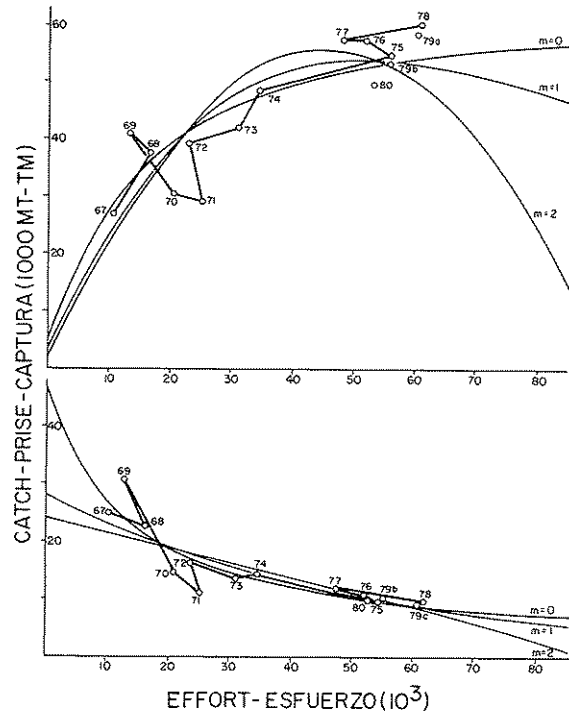


Fig. 8. Yellowfin production model under the hypothesis of an eastern Atlantic stock exploited by surface and longline fisheries. The balanced production curves are calculated with  $k = 3$  (3 significant age-classes) and are indicated for  $m = 0, 1, 2$ . Point 79-a includes South African catch; 79-b excludes South African catch. (Effort calculated from FISM CPUE/1<sup>o</sup> square-15 days fishing time, coastal area).

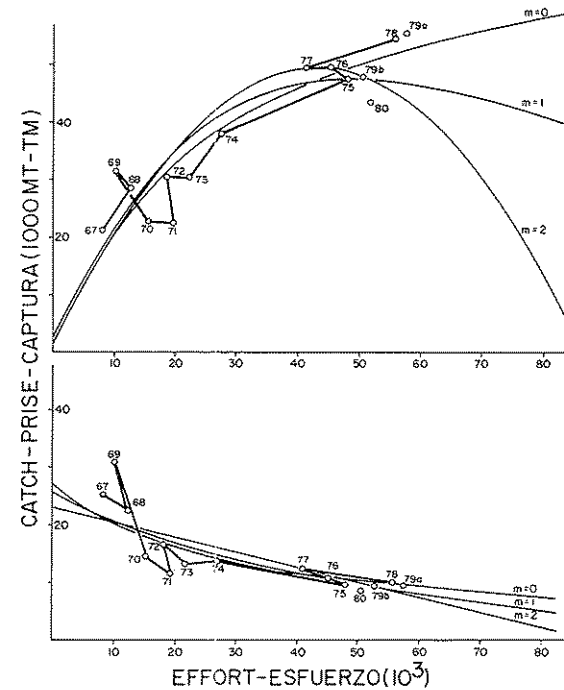


Fig. 9. Yellowfin production model under the hypothesis of an eastern Atlantic stock which is exclusively exploited by surface fisheries ( $k = 3, m = 0, 1, 2$ ). Point 79-a includes South African catch; 79-b excludes South African catch. (Effort calculated from FISM CPUE/1<sup>o</sup> square-15 days fishing time, coastal area).

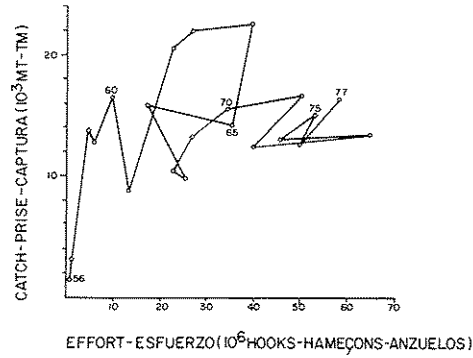


Fig. 10. Yellowfin tuna catch ( $10^3$  MT) and effort ( $10^6$  hooks) in the western Atlantic. Catches in this figure were compiled by the author and may not be the same as those in Table 1.

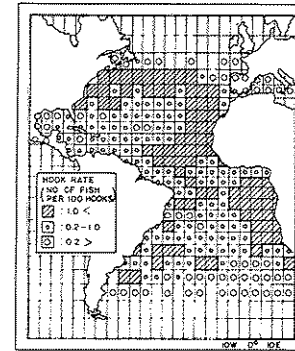


Fig. 11 Annual distribution of bigeye tuna caught by the longline fishery in the Atlantic, prepared by taking the highest monthly hook rates from Kume and Morita, 1977.

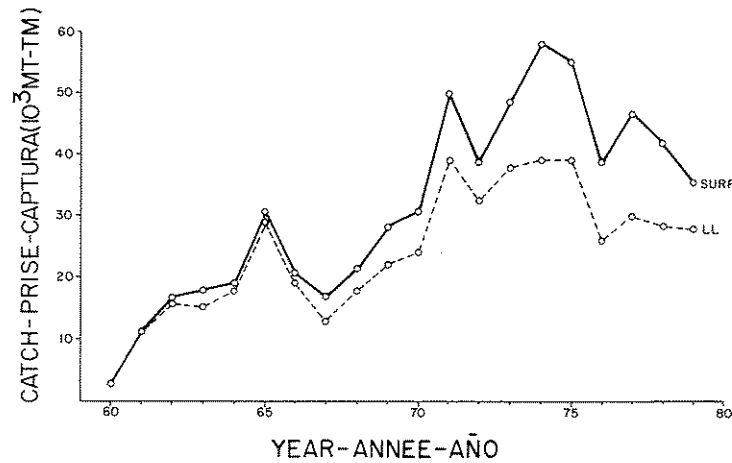


Fig. 12. Annual catch of bigeye tuna in the Atlantic Ocean by longline and surface fisheries, 1960-79.

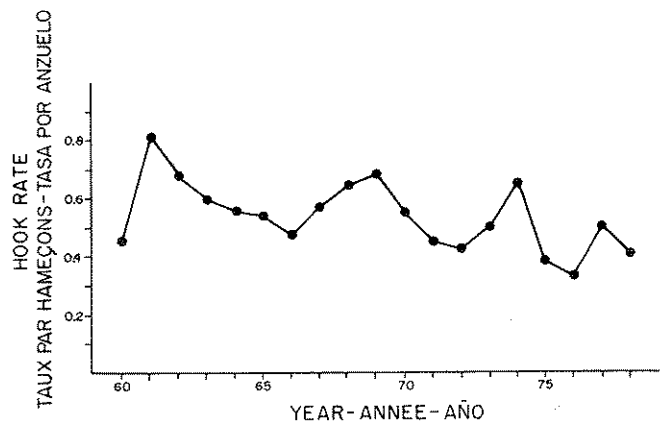


Fig. 13. Annual hook rate of bigeye tuna in the whole Atlantic, 1960-78.

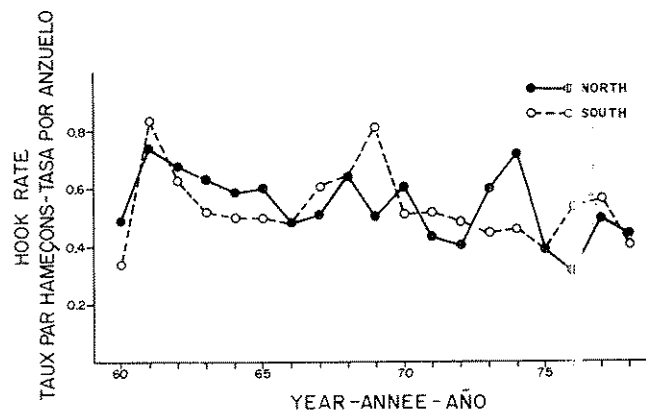


Fig. 14. Annual hook rate of bigeye tuna in the north and south Atlantic, 1960-78.

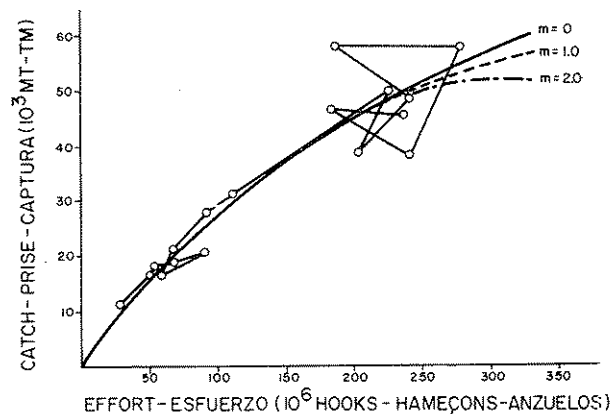


Fig. 15. Yield curves obtained from the production model analysis for bigeye tuna in the whole Atlantic, 1961-78.

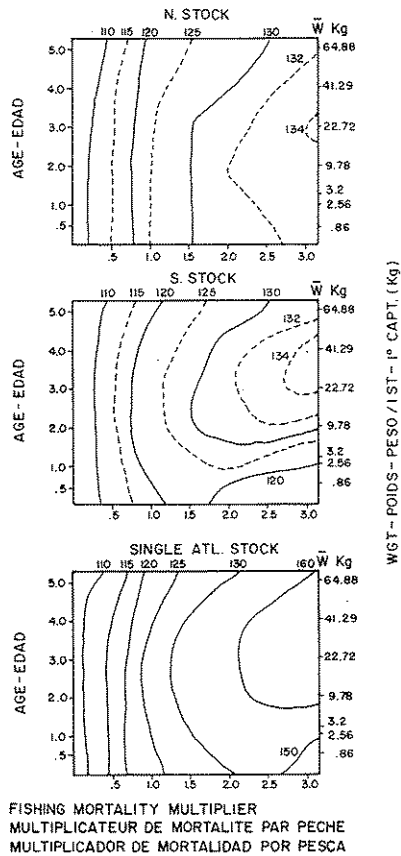


Fig. 16. Equilibrium yield-per-recruit for Atlantic bigeye for combination of fishing mortality multiplier and age (weight) at first capture (A) north stock, (B) south stock and (C) entire Atlantic stock.

WGT - POIDS - PESO / 1<sup>er</sup> CAPT. ( Kg )

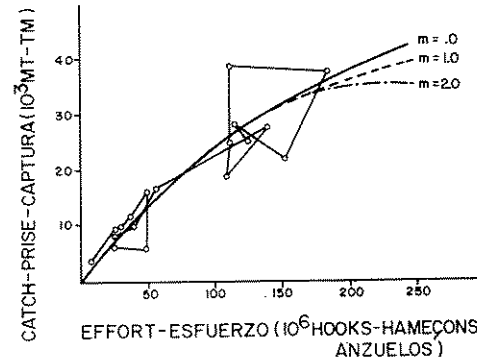


Fig. 17. Yield curves obtained from the production model analysis for bigeye tuna in the North Atlantic, 1961-78.

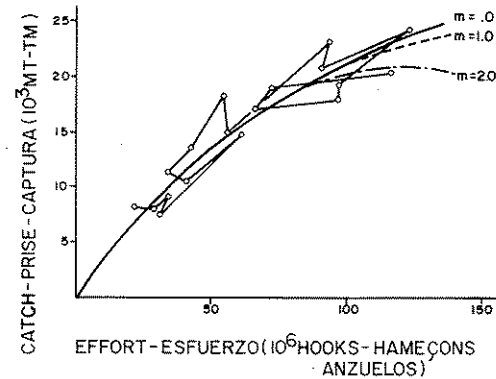


Fig. 18. Yield curves obtained from the production model analysis for bigeye tuna in the South Atlantic, 1961-78.

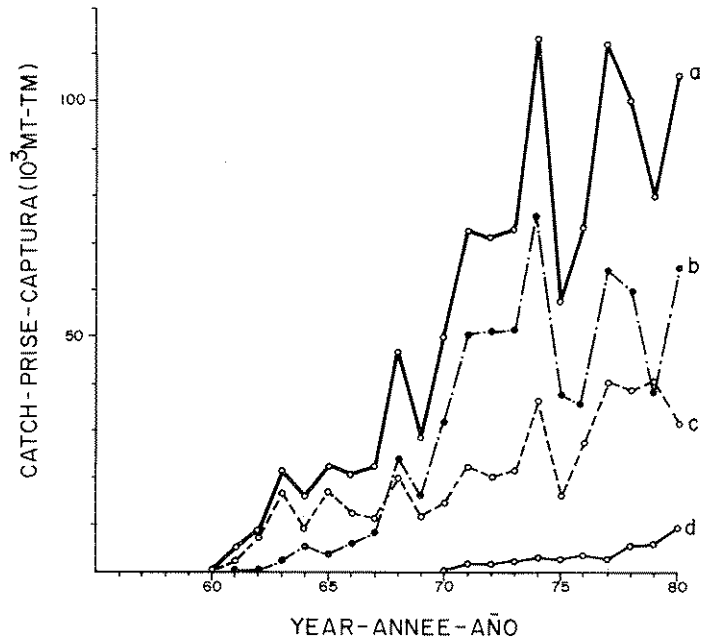


Fig. 19. History of skipjack catches in the Atlantic (MT). 1980 values are preliminary estimates. (a = total Atlantic; b = eastern Atlantic purse seiners and includes the fleets of FISM, Spain, U.S., Japan, Congo and the U.S.S.R.; c = eastern Atlantic baitboats and includes the fleets of FISM, Japan and Korea (Tema-based), Angola, Portugal and Spain; d = western Atlantic purse seiners and includes the fleets of Brazil, U.S. and Cuba).

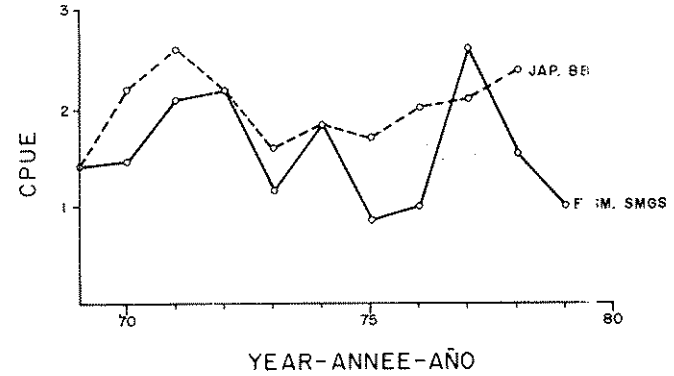


Fig. 20. Standardized CPUE index for traditional eastern Atlantic area used as indices of abundance of skipjack. (FISM index is from SCRS/80/57; Japanese baitboat index is from SCRS/79/118).

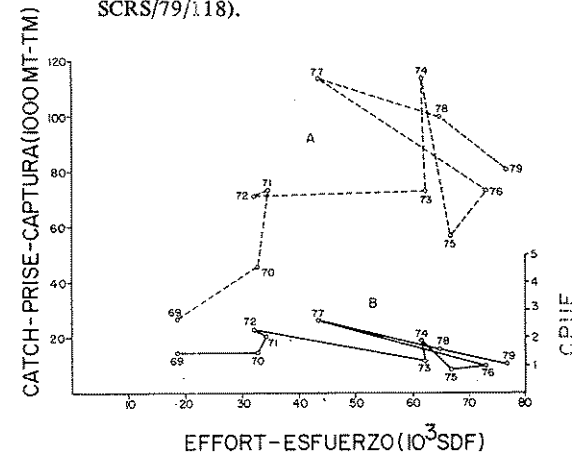


Fig. 21. Relation between skipjack catch (MT) and effort (standard days fishing) (A) and CPUE (MT/SDF) and effort (B) for 1969-79. (Source: SCRS/80/57).

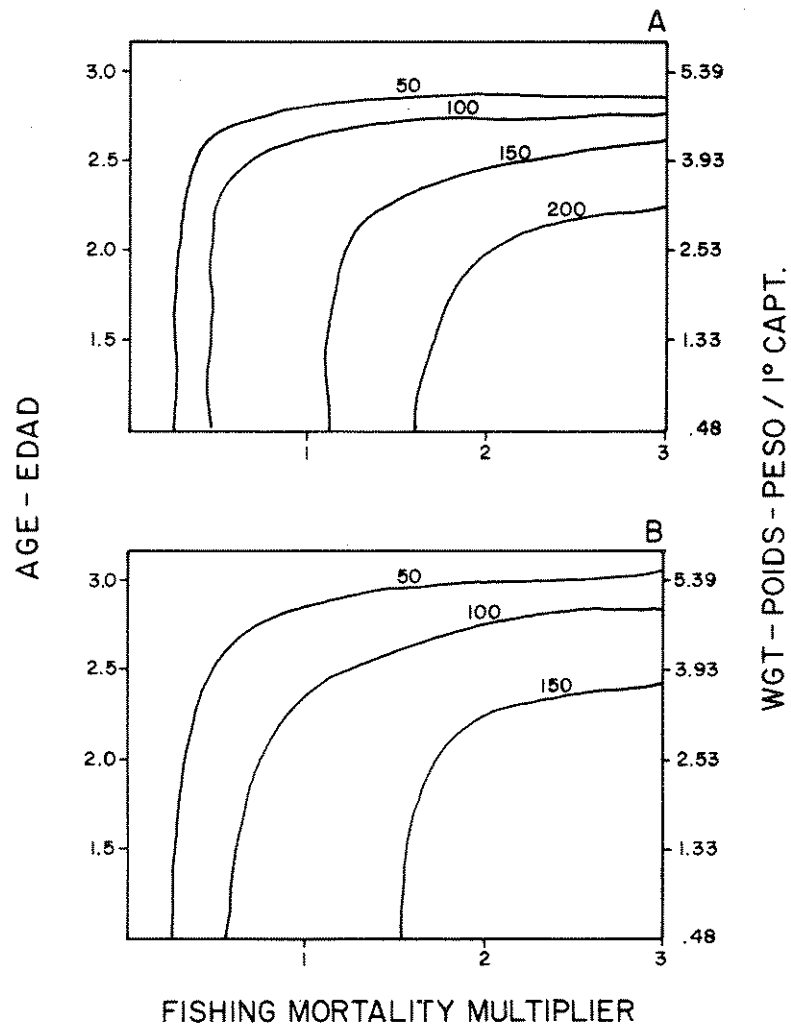


Fig. 22. Equilibrium yield-per-recruit for Atlantic skipjack for two hypothetical recruitment levels (A-high recruitment of  $356 \times 10^6$  fish; B-low recruitment of  $143 \times 10^6$  fish) for combination of fishing multiplier and age (weight at first capture). X = present situation. (SCRS/80/17).

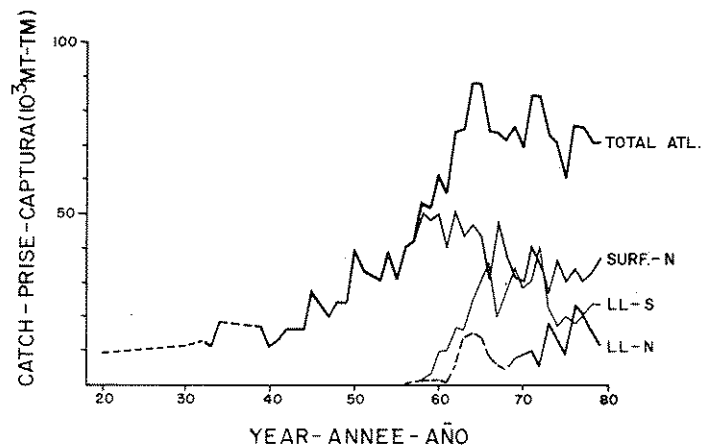


Fig. 23. Catch of Atlantic albacore by stock and principal fisheries.

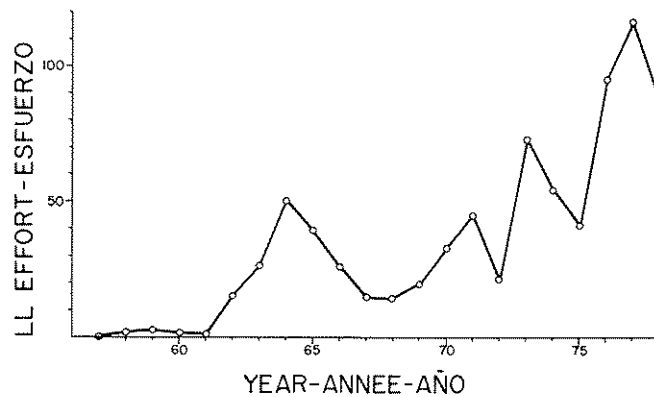


Fig. 24. Albacore north stock effective longline effort (millions of hooks) (Source: SCRS/80/62).

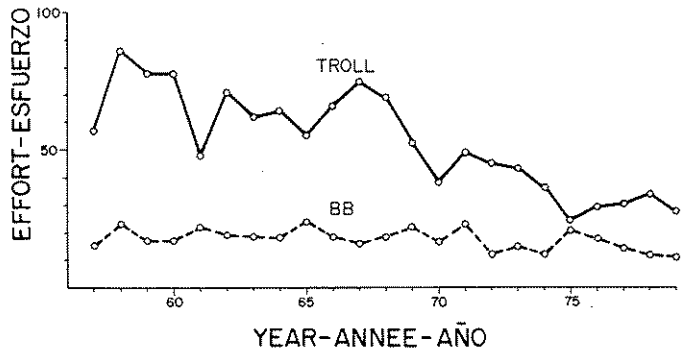


Fig. 25. Albacore north stock nominal baitboat and troll effort (in 1000 fishing days) (Source: SCRS/80/62 and SCRS/80/84).

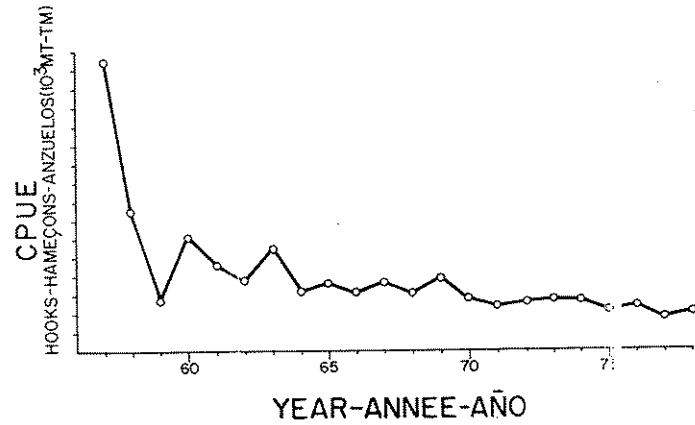


Fig. 27. CPUE by longline fishery of north Atlantic albacore, 1957-78.

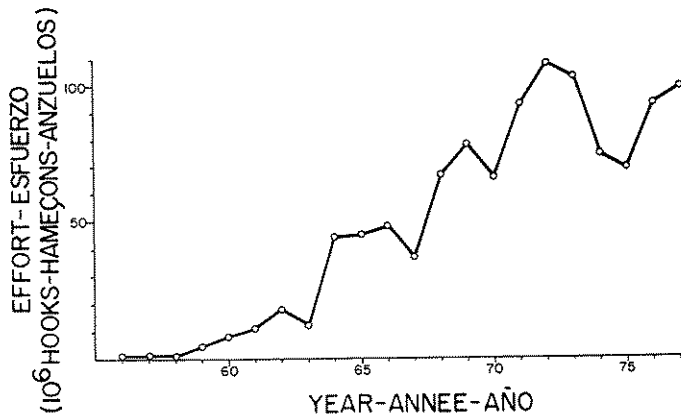


Fig. 26. Albacore south stock effective longline effort (millions of hooks) (Source: SCRS/79/53).

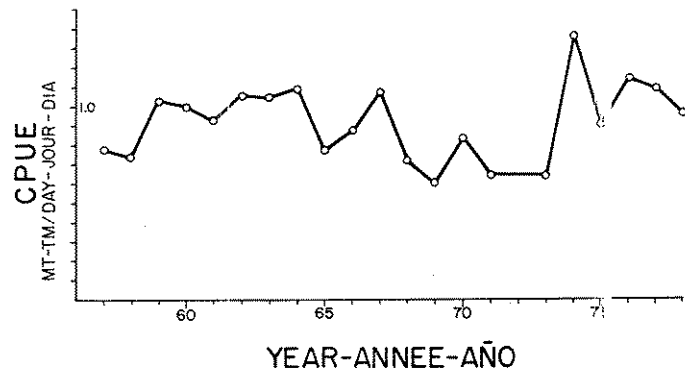


Fig. 28. CPUE by baitboat fishery of north Atlantic albacore, 1957-78.

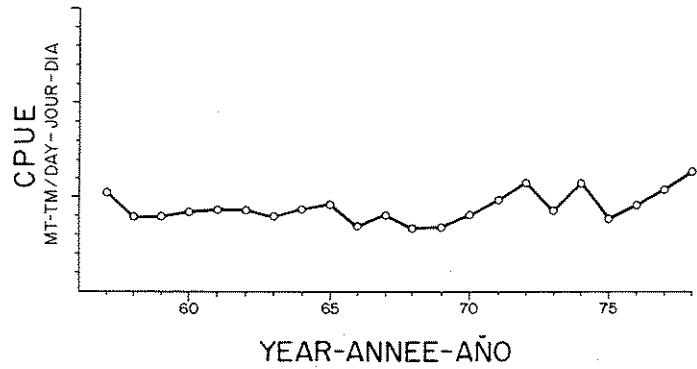


Fig. 29. CPUE by troll fishery of North Atlantic albacore, 1957-78.

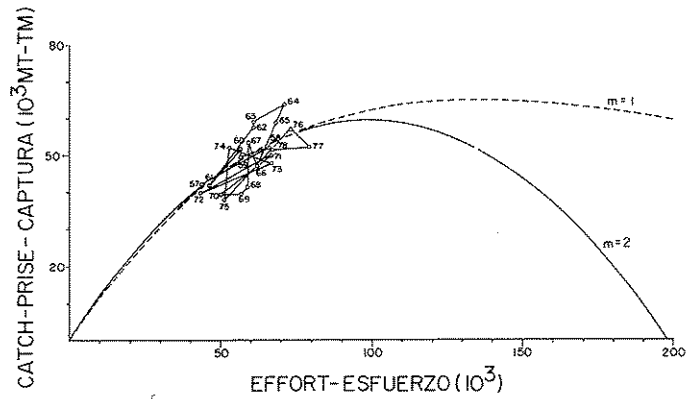


Fig. 30. Fitting of production model to catch and effort data of the north Atlantic albacore fishery, 1957-78.

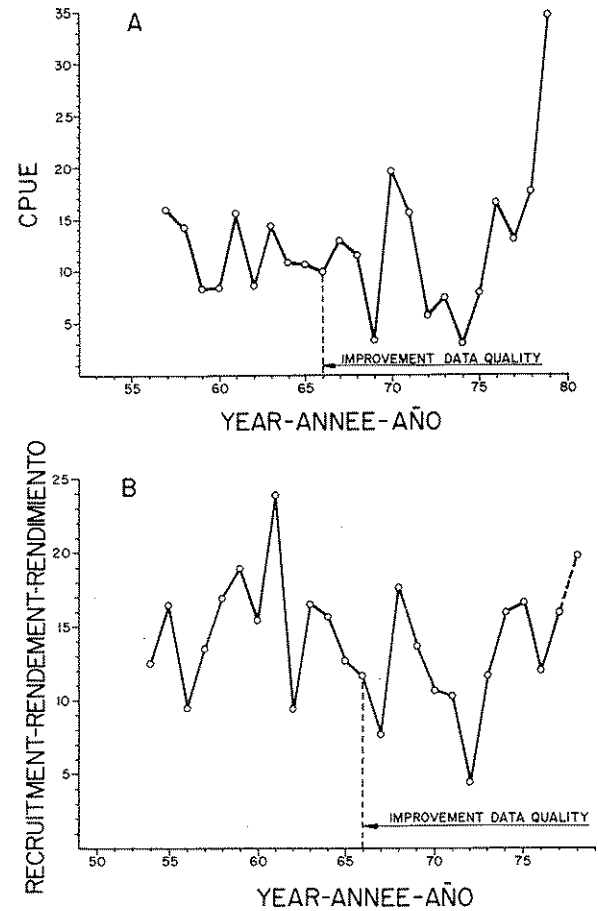


Fig. 31. (A) CPUE of the French troll fishery for "bonites". (B) estimates of recruitment of "bonites" (millions of fish) from cohort analysis.



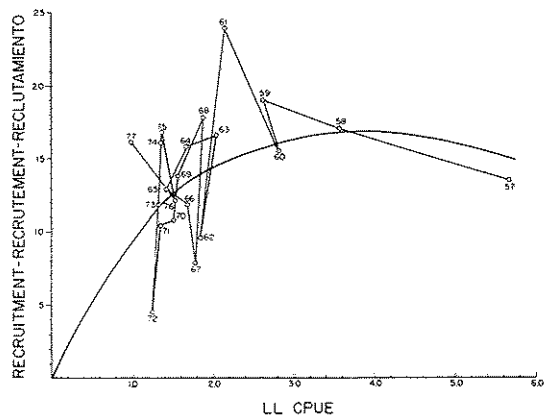


Fig. 32. Stock recruitment relation, north Atlantic albacore stock.

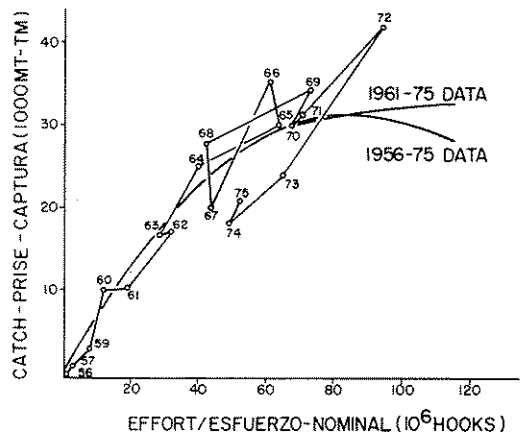


Fig. 34. Production model fitted to South Atlantic albacore catch and effort data for two time series (SCRS/78/77).

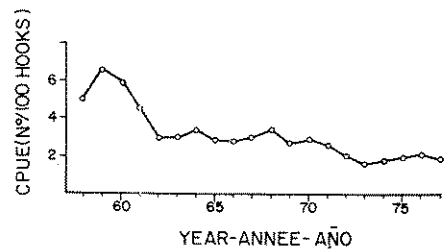


Fig. 33. Catch-per-unit-effort for the South Atlantic albacore longline fishery.

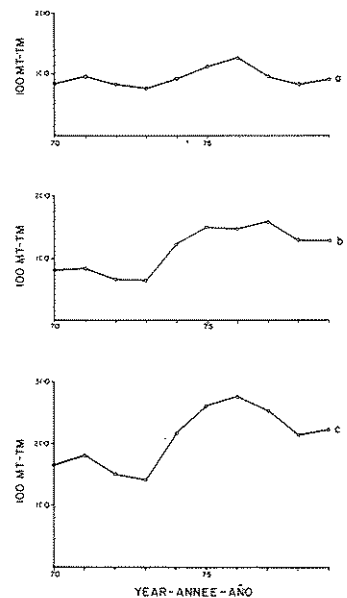


Fig. 35. Catches of bluefin tuna from the Atlantic Ocean and Mediterranean Sea. a = small fish; b = large fish; c = total catch.

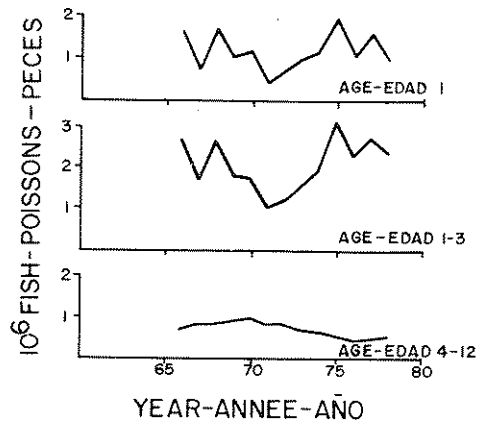


Fig. 36. Estimates of stock size of the eastern Atlantic bluefin stock by age category.

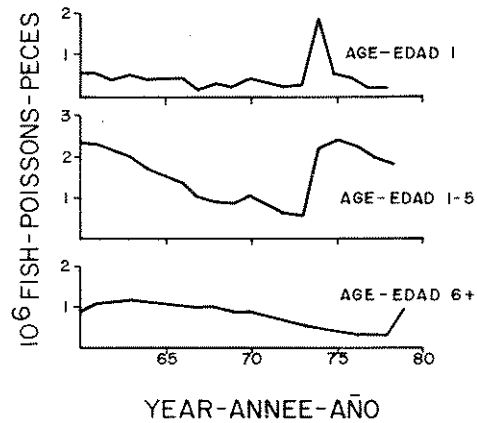


Fig. 37. Estimates of stock size of the western Atlantic bluefin stock by age category.

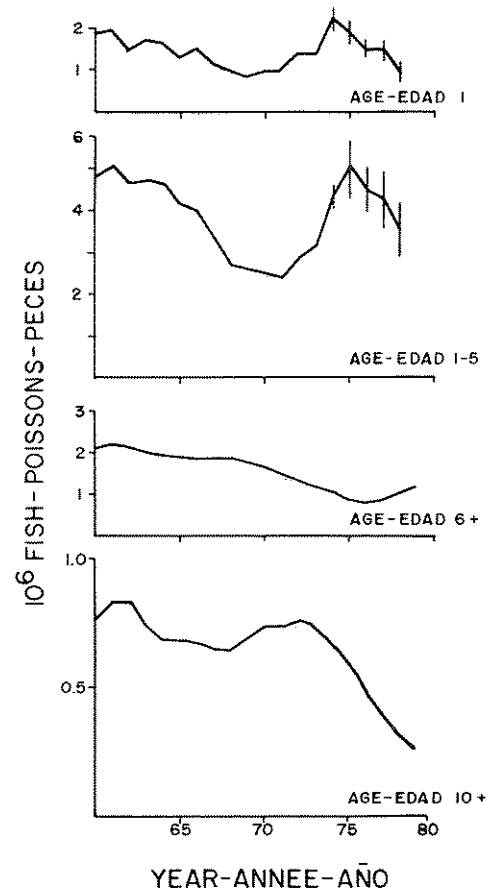


Fig. 38. Estimates of stock size of the total Atlantic bluefin stock by age category.

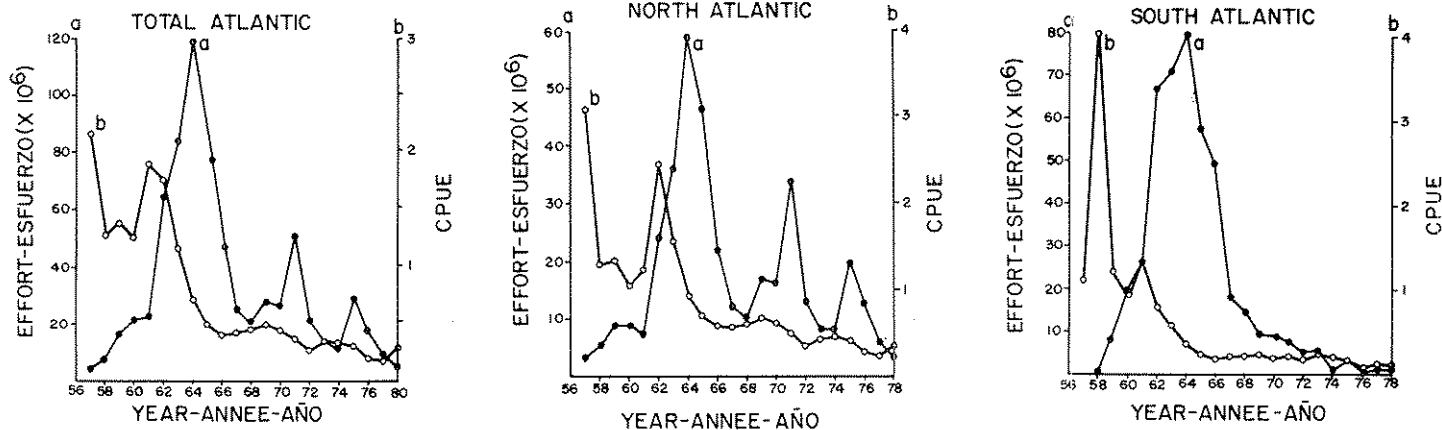


Fig. 39. Effective effort (no. of hooks) and catch-per-unit-effort (fish per 1000 hooks) for blue marlin in the Atlantic Ocean, 1957-78. All data are from the Japanese longline fishery. (See Collective Volume, Vol. XIV.)

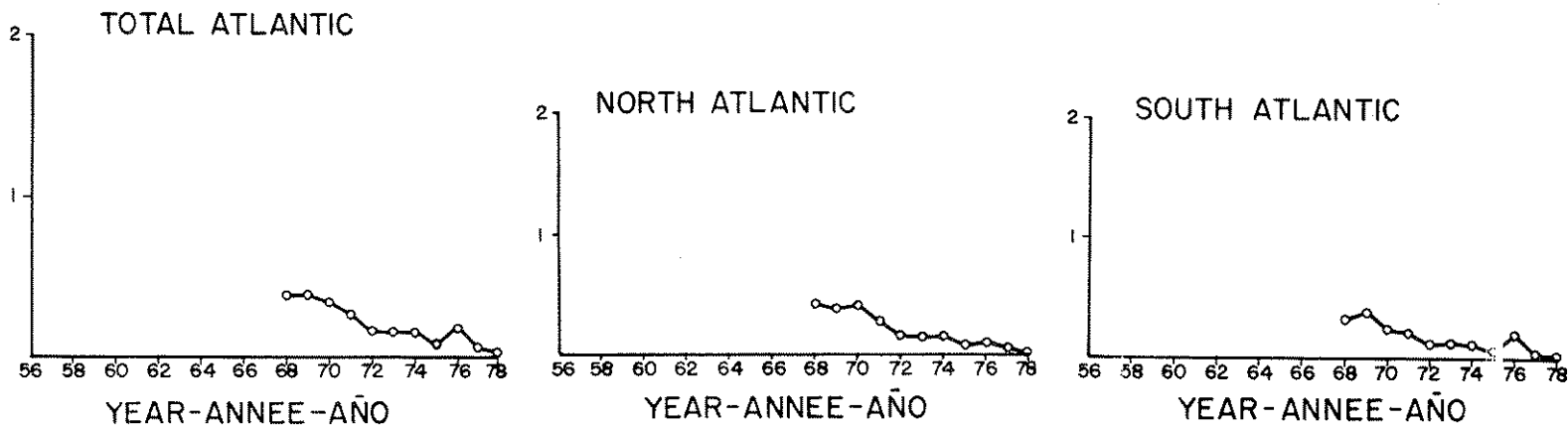


Fig. 40. Catch-per-unit-effort (fish per 1000 hooks) for blue marlin in the Atlantic Ocean using data from the Taiwanese longline fishery. (See Collective Volume, Vol. XIV.)

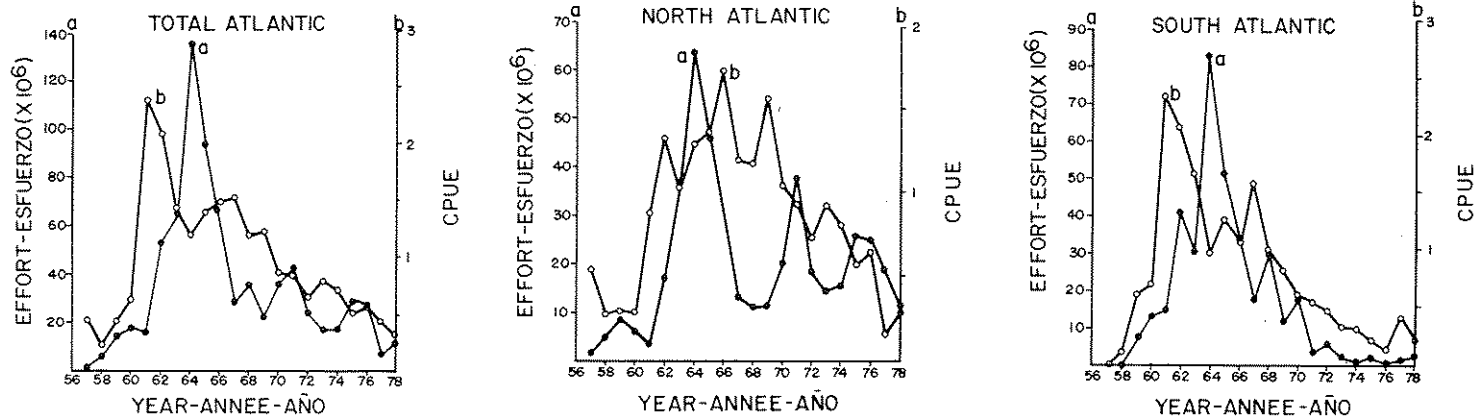


Fig. 41. Effective effort (no. of hooks) and catch-per-unit-effort (fish per 1000 hooks) for white marlin in the Atlantic Ocean, 1957-78. All data are from the Japanese longline fishery. (See Collective Volume, Vol. XIV.)

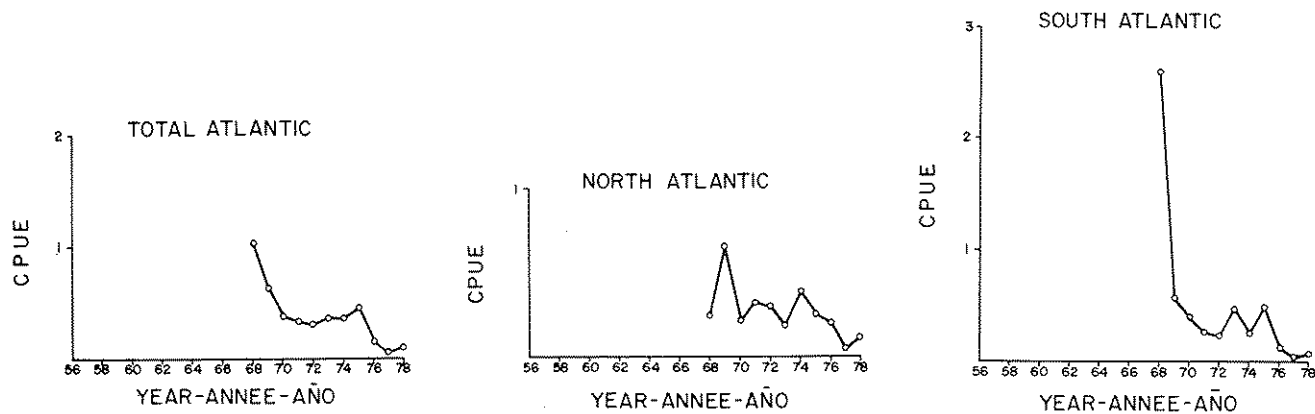


Fig. 42. Catch-per-unit-effort (fish per 1000 hooks) for white marlin in the Atlantic Ocean using data from the Taiwanese longline fishery. (See Collective Volume, Vol. XIV.)

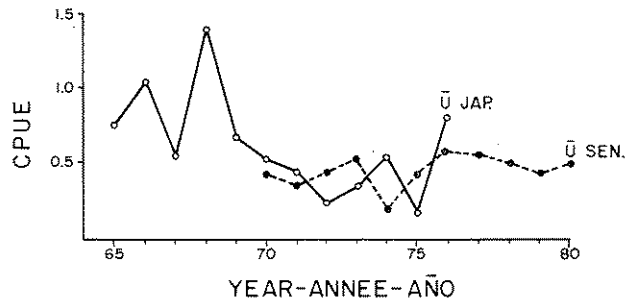


Fig. 43. Catch-per-unit-effort ( $\bar{U}$  = thousands of hooks per 50 square) of Japanese longliners ( $\bar{U}$  JAP) and the Senegalese sport fishery ( $\bar{U}$  SEN). (SCRS/80/55)

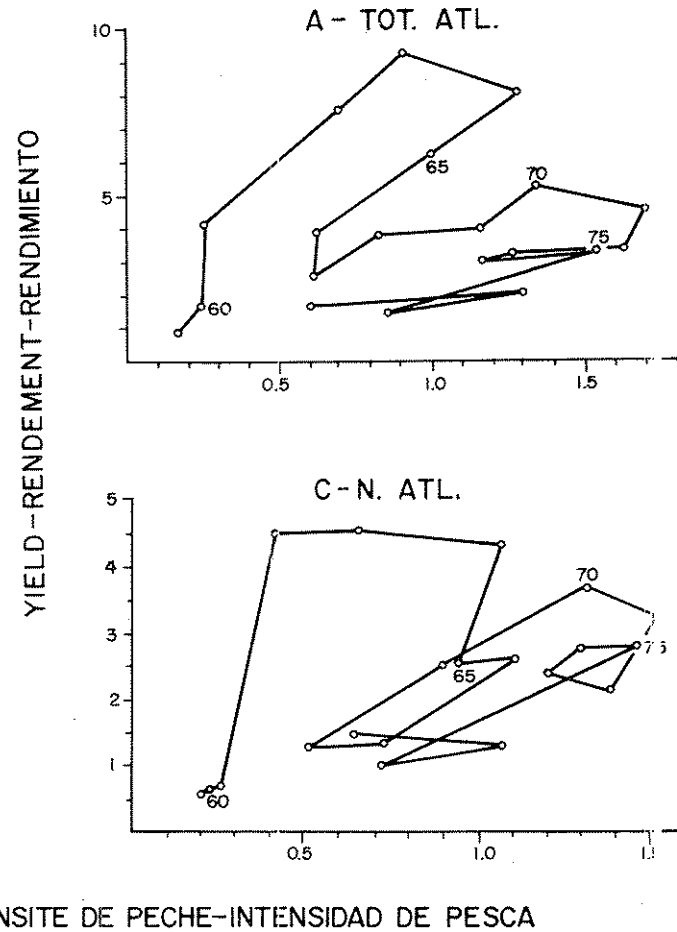


Fig. 44. Total effective fishing intensity (1000 hooks per 50 area) and landings for blue marlin in the Atlantic Ocean under two stock structure hypotheses. (See Collective Volume, Vol. XIV for details.)

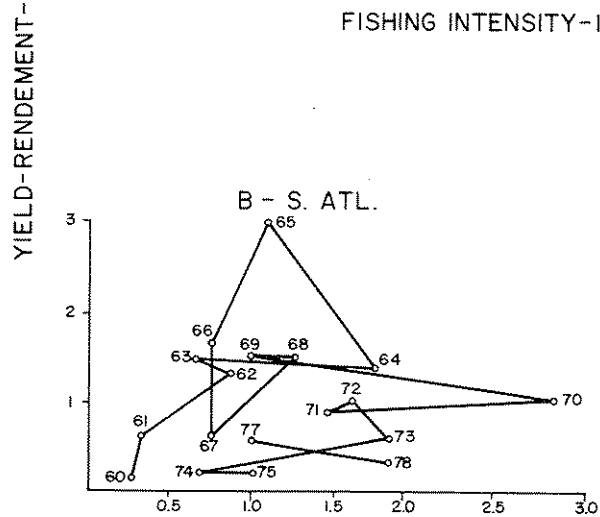
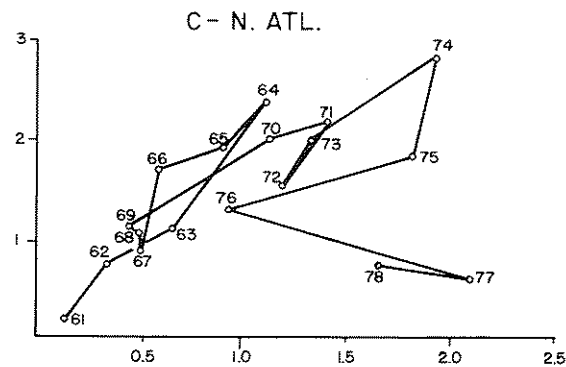
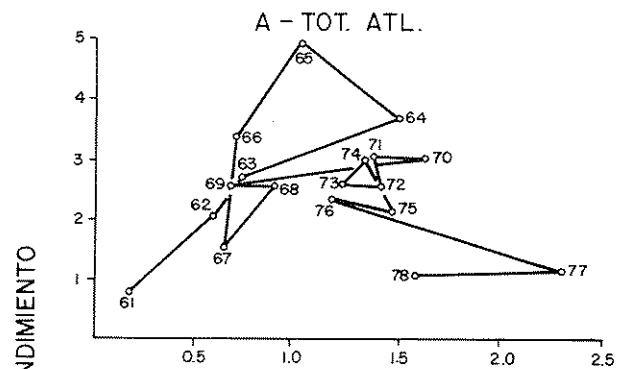


Fig. 45. Total effective fishing intensity (1000 hooks per 50 area) and landings for white marlin in the Atlantic Ocean under two stock structure hypotheses. (See Collective Vol. XIV for details.)

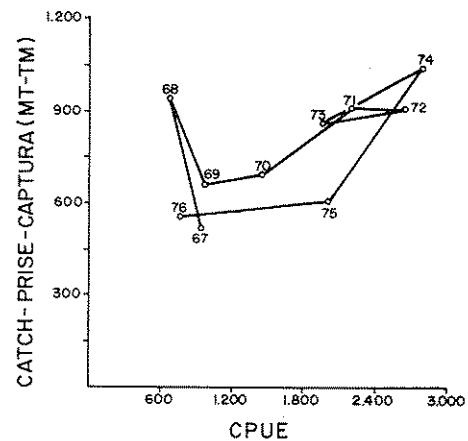


Fig. 46. Total effective fishing intensity (1000 hooks per 50 area) and landings for sailfish from the east Atlantic and the results observed for the period, 1967-76. (SCRS/80/55)

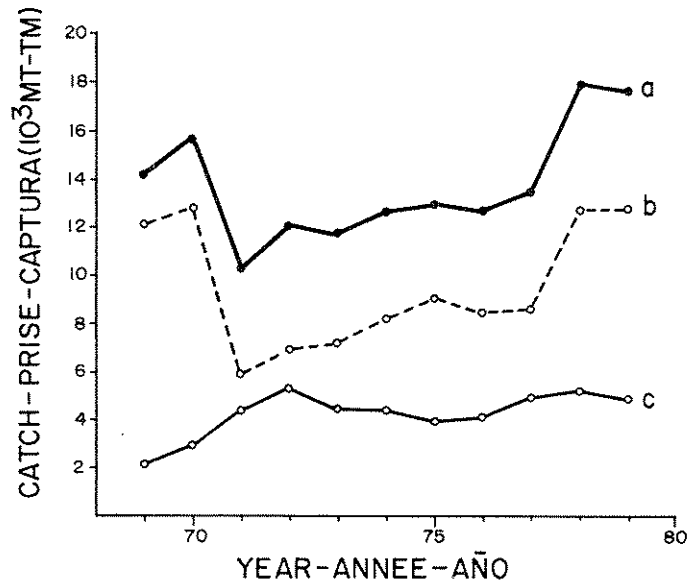


Fig. 47. Atlantic and Mediterranean swordfish catch (1000 MT).  
a = Atlantic and Mediterranean; b = Atlantic; c = Mediterranean.

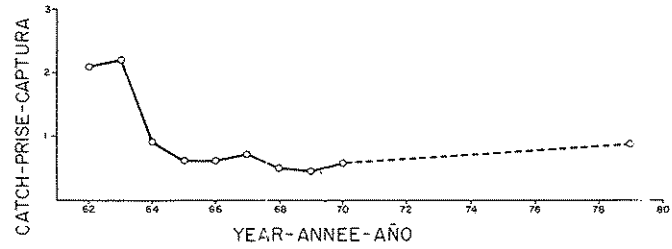


Fig. 48. CPUE data (MT-dressed weight per 1000 hooks) from the Canadian longline swordfish fishery. (Source: SCRS/80/4.).

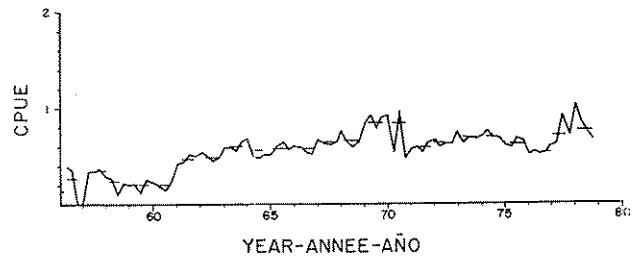


Fig. 49. Annual change in CPUE (fish/1000 effective hooks) of swordfish in the whole Atlantic Ocean, 1956-78 (SCRS/80/70).

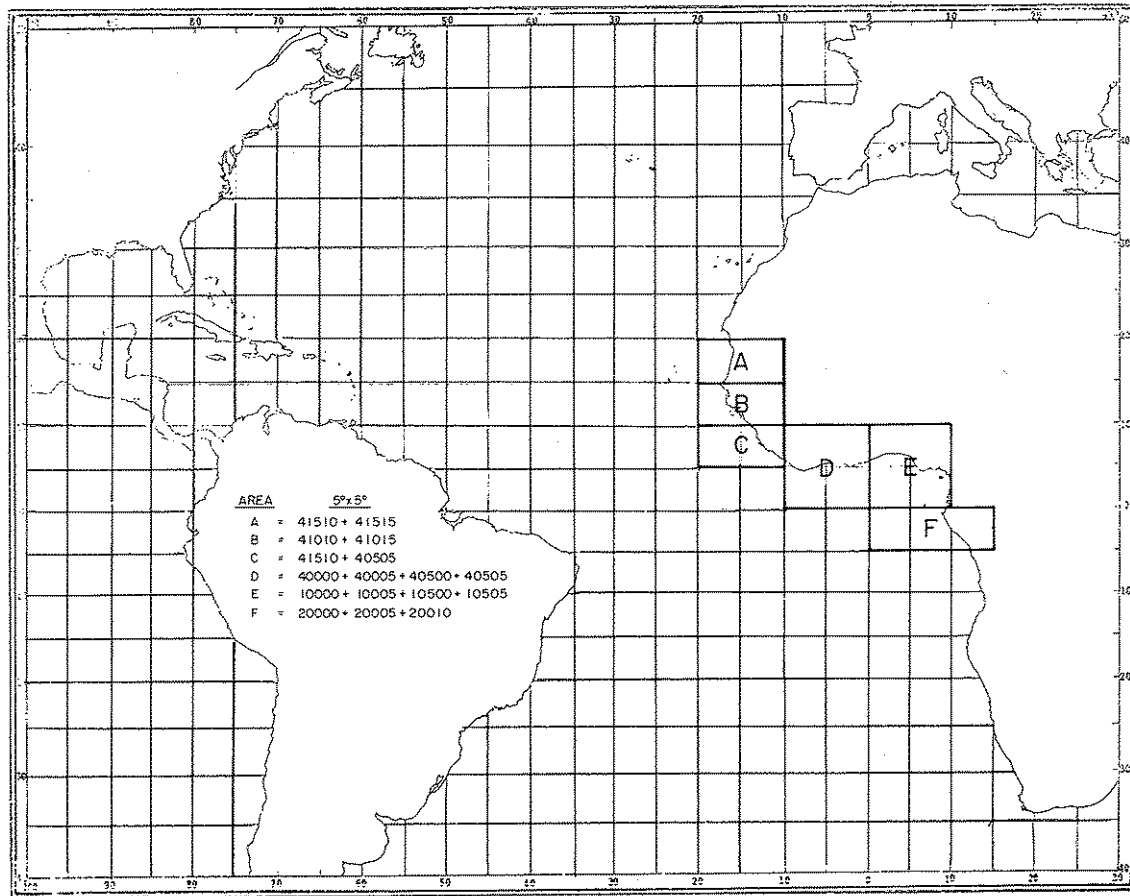


Fig. 50. Areas chosen for detailed study of undersized fish (Source: SCRS/80/17).



**AGENDA FOR THE STANDING COMMITTEE ON  
RESEARCH AND STATISTICS (SCRS)**

1. Opening of the meeting
2. Adoption of Agenda and arrangements for the meeting
3. Admission of observers
4. Admission of scientific papers
5. Review of national fisheries and research programs
6. Review of conditions of stocks, with brief presentation of major papers on this subject:
  - A) Tropical Tunas  
(AYF-Yellowfin)  
(ABE-Bigeye)  
(ASJ-Skipjack)
  - B) Albacore
  - C) Bluefin
  - D) Billfishes  
(DBL-Billfish)  
(DSW-Swordfish)  
(DSB-Southern Bluefin)
  - E) Small Tunas
  - F) Multi-Species Aspects  
--Tropical Species  
--Temperate Species
7. Review of the Report of the SCRS Officers Meeting
8. Review of the Report of the Working Group on Juvenile Tropical Tunas
9. Review of the Report of the Sub-Committee on Skipjack
10. Report of the Sub-Committee on Statistics and review of Atlantic tuna statistics and data management system
11. Review of SCRS research programs and consideration of future plans
12. Cooperation with other organizations
13. Report of the Working Group on Publication Policy and review of scientific publications
14. Identification of questions asked of the SCRS, recommendations and priorities
15. Date and place of next meeting
16. Other matters
17. Adoption of Report
18. Adjournment

**LIST OF DOCUMENTS**

- SCRS/80/1 Tentative agenda of the SCRS
- 2 Annotated Tentative Agenda of the SCRS
  - 3 Tentative Time Schedule of the SCRS
  - 4 Tentative Agenda of the Sub-Committee on Statistics
  - 5 Organization of the 1980 SCRS Meeting
  - 6 Document Policy
  - 7 Data Record, Vol. 15
  - 8 Data Record, Vol. 16
  - 9 Statistical Series-9
  - 10 Statistical Bulletin, Historical Series-1 (Draft)
  - 11 Report of the 1979 SCRS Meeting
  - 12 1980 SCRS Report "A" (Working Document)
  - 13 1980 SCRS Report "B" (Summary presented to the Commission)
  - 14 Statistical Bulletin, Vol. 10
  - 15 Secretariat Report of Statistics and Coordination of Research
  - 16 Report of the Sub-Committee on Skipjack (Brest, June 2-4, 1980)
  - 17 Report of the Working Group on Juvenile Tropical Tunas (Brest, May 28-June 7, 1980)
  - 18 Skipjack Program - Vessel and Aircraft Clearance
  - 19 Skipjack Program - Progress Report
  - 20 Collective Volume, Vol. IX (1) (Tropical Species)
  - 21 Collective Volume, Vol. IX (2) (Temperate Species)
  - 22 Collective Volume, Vol. IX (3) (Billfishes and others)
  - 23 Collective Volume, Vol. X
  - 24 Collective Volume, Vol. XI
  - 25 Collective Volume, Vol. XII
  - 26 Report of 1980 Inter-sessional SCRS Officers Meeting (Brest, May 31, 1980)
  - 27 Report of the Tenth Session of the Coordinating Working Party on Atlantic Fishery Statistics (Madrid, July 22-29, 1980)
  - 28 Report of the Informal Meeting on Mediterranean Bluefin Data (Palermo, July 7-8, 1980)

- 29 Tunisian Bluefin Statistics, H. Farrugio's trip (June, 1980)
- 30 The procedures adopted in revising Task I catch statistics for yellowfin and bigeye, up to 1978 (as of April, 1980)
- 31 Review of United States fisheries and research activities on tunas and tuna-like fishes of the Atlantic Ocean for 1979-80 – SEFC-SWFC
- 32 Japanese tuna fishery and research in the Atlantic 1979-80 – S. Kume
- 33 Korean fisheries and research activities for tuna and tuna-like fishes in the Atlantic Ocean in 1979
- 34 Ghana national report - Tuna fishery, 1979
- 35 Evolution des populations de germon (*Thunnus alalunga*) dans le nord-est atlantique – F. Delaporte
- 36 Norwegian bluefin tuna (*Thunnus thynnus* L.) catches in 1979 – S. Myklevoll
- 37 Migración de bonitos (*Sarda sarda*) y bacoreta (*Euthynnus alletteratus*) entre el Mediterráneo y el Atlántico – J. C. Rey, J. L. Cort
- 38 Areas de puesta del atún, melva y bonito en las costas de España y Marruecos – J. Rodríguez-Roda, A. Dicenta
- 39 An assessment of the status of stocks of blue marlin (*Makaira nigricans*) and white marlin (*Tetrapturus albidus*) in the Atlantic Ocean – M. I. Farber, R. J. Conser
- 40 Swordfish (*Xiphias gladius*) dynamics in the Straits of Florida – S. A. Berkeley, E. D. Houde
- 41 Ageing western Atlantic bluefin (*Thunnus thynnus*) using tagging data, caudal vertebrae and otoliths – M. I. Farber, D. W. Lee
- 42 Abundance of bluefin tuna larvae and estimates of spawning stock sizes in the Gulf of Mexico in 1977 and 1978 – W. J. Richards, T. Potthoff, E. D. Houde
- 43 An assessment of the Atlantic bluefin tuna resource – M. L. Parrack
- 44 Recent yield-per-recruit trends of Atlantic bluefin tuna – S. Nichols
- 45 Analysis of catch/effort trends in bluefin tuna – S. Brunenmeister
- 46 Canadian national report, 1979-80 – T. D. Iles, P. C. F. Hurley, C. D. Burnett
- 47 Analysis of catch and effort data from the Canadian bluefin tuna rod and reel fishery – P. C. F. Hurley, G. A. P. Black, T. D. Iles
- 48 A review of the Canadian swordfish fishery – P. C. F. Hurley, T. D. Iles
- 49 Age and growth of bluefin tuna taken in Canadian waters in recent years – P. C. F. Hurley, T. D. Iles, C. A. Dickson
- 50 Mercado de atunes en el Golfo de Vizcaya durante el verano de 1980 – J. L. Cort, J. C. Rey, A. Lavin

- 51 South African national report, 1979 — C. S. de V. Neppen
- 52 Premières données relatives à l'exploitation et à la biologie de quelques "petits thonidés et espèces voisines": *Euthynnus*, *Sarda*, *Scomberomorus*, au Sénégal — T. Diouf
- 53 Croissance de la thonine (*Euthynnus alletteratus* Rafinesque 1810), établie à partir de coupes transversales du premier rayon de la nageoire dorsale — P. Cayré, T. Diouf
- 54 Maturité sexuelle, fécondité et sex ratio du listao (*Katsuwonus pelamis*) des côtes d'Afrique de l'ouest (20°N-0°N), étudiés à partir des débarquements thoniers (1977 à 1979) au port de Dakar (Sénégal) — P. Cayré
- 55 Pêche et aspects de la biologie du voilier de l'Atlantique (*Istiophorus platypterus*) sur les côtes sénégalaises - C. Limouzy, P. Cayré
- 56 Note sur le mode de calcul de la P.U.E. des senneurs FISM — A. Fonteneau
- 57 Analyse de l'état des stocks d'albacore (*Thunnus albacares*) et de listao (*Katsuwonus pelamis*) de l'Atlantique, au 30 septembre 1980 — A. Fonteneau, P. Cayré
- 58 Relationships of *Katsuwonus pelamis*, Linnaeus 1758, caught in the south and southeast of Brazil: length-weight and gilled/gutted weight-weight — A. F. de Amorim, S. A. Antunes, C. A. Arfelli
- 59 Resultados preliminares del marcaje de listado (*K. pelamis*) en aguas de Canarias — Al. Santos G., S. Torres N.
- 60 Résultats de la pêche du thon rouge en Méditerranée française en 1979 — H. Farrugio
- 61 Etude de l'évolution du stock de thons rouges de 1 à 12 ans en Est Atlantique et Méditerranée de 1966 à 1978, par analyse des cohortes — H. Farrugio
- 62 A production model analysis of North Atlantic albacore (*Thunnus alalunga*), 1957-1978 - A. González-Garcés
- 63 Relationship between effort and fishing mortality in the Atlantic albacore surface fishery — A. González-Garcés, J. A. Pereiro
- 64 Informe sobre la pesca e investigación española de túnidos en 1979 y 1980 — A. González-Garcés
- 65 A preliminary analysis on mixing of species within schools fished by the Tema-based Japanese baitboat fleet during 1979 and 1980 — Z. Suzuki
- 66 Overall fishing intensity, catch, catch by size of yellowfin tuna in the Atlantic tuna longline fishery, 1956-1978 — M. Honma
- 67 Estimation on north-south breakdown of the albacore catch by the Taiwanese longline fleet in the Atlantic, 1976-78 — S. Kume, R. T. Yang
- 68 Progress report on Japanese activity for the International Skipjack Year Program in 1980 — S. Kume

- 69 An approach to evaluate the stock status of Atlantic bigeye tuna by production model — S. Kume
- 70 Overall fishing effort and catch with a comment on the status of stock for the swordfish (*Xiphias gladius*) in the Atlantic Ocean — S. Kikawa, M. Honma
- 71 Analysis on the Atlantic bluefin tuna stock caught by longline fishery — C. Shingu, K. Hisada
- 72 Report on research and fisheries of tunas and relative species in Brazil during the period 1978-79 — J. A. Negreiros Aragao
- 73 Madurez gonadal del rabil (*Thunnus albacares*) en el sudeste y sur del Brasil (20°S-32°S) — L. A. Zavala-Camin, R. W. von Seckendorff
- 74 Statistiques de la pêche thonière PISM durant la période 1969-1979 — A. Fonteneau, M. Slepoukha
- 75 An updated stochastic spawner/recruit relationship for North Atlantic albacore — N. W. Bartoo
- 76 Length and age composition of yellowfin tuna catches in the eastern Atlantic Ocean, 1966-1977 — A. L. Coan, E. Weber
- 77 Review of the catch compositions by species caught by Korean baitboat fishery based in Tema for 1977-1979 — Y. Gong, J. U. Lee, W. S. Yang
- 78 Comments on the use of water temperature to delimit tropical tuna distributions — R. Evans
- 79 A baseline economic analysis of surface tuna fishing activities in the eastern tropical Atlantic — S. Herrick
- 80 Rapport national de la Côte d'Ivoire — L. Koffi, F. X. Bard, J. B. Kothias Amon
- 81 Preliminary results of a 1980 skipjack tuna tagging cruise in the western Atlantic and Caribbean Sea — R. Rinaldo, R. Evans, P. Vergne
- 82 Report on the scientific research on tunas conducted by the U.S.S.R. in 1979-80
- 83 Rapport de recherches 1979 pour la France — D. Guérault
- 84 Commentaires sur l'état du stock de germon (*Thunnus alalunga*) nord-atlantique en 1980 — L. Antoine, A. González-Garcés
- 85 Rapport sur la pêche et la recherche thonière au Sénégal en 1979-80 — P. Cayré
- 86 Informe de la pesquerías cubanas de túnidos en aguas del océano Atlántico correspondientes a 1979, así como actividades de investigación efectuadas en dicho año

## Appendix 3 to Annex 8

## REPORT OF THE SUB-COMMITTEE ON SKIPJACK

The Sub-Committee on Skipjack met on November 6, 1980, at the Hotel Castellana, Madrid, under the convenership of Dr. G. T. Sakagawa (U.S.A.). Dr. P. E. K. Symons (Secretariat) was appointed rapporteur.

The Convener drew attention to documents COM-SCRS/80/16 (Report of the Sub-Committee on Skipjack, Brest), COM-SCRS/80/18 (Vessel and aircraft clearance), and COM-SCRS/80/19 (Skipjack Program Progress Report). On the matter of vessel clearance, the Sub-Committee once again urged member countries to give whatever assistance possible, since failure to obtain authorization has already prevented tagging of skipjack in several important areas in both the west and east Atlantic.

The Convener requested the Sub-Committee to review document COM-SCRS/80/16, which records progress since June, and confirms or revises the plans for 1981.

*Tagging - Dart*

A total of 10,735 fish were tagged with yellow and 257 with red tags in 1980, as of the time of the meeting. The details and revised plans for 1981 are given below.

Participating country	Scientist in charge	No. fish tagged		No. fish to be tagged	
		1980		1981	
		yellow	red	yellow	red
Cuba	S. Valle	--	--	5,500	--
France/I. Coast	F. X. Bard	476	12	16,000	1,800
Japan	S. Kume	7,971	--	6,000	--
Korea	?	?	--	3,000	--
Portugal	J. A. Pereira	--	--	1,000	--
Senegal	P. Cayré	495	36	13,000	?
Spain	Al. Santos	435	5	1,500	?
U.S.A.	W. Parks	1,352	204	--	--
U.S.S.R.	Y. Vialov	?	?	5,000	?

While the majority of fish tagged by most countries were skipjack, some yellowfin, bigeye, blackfin and other tunas were also tagged. Cruises dedicated to tagging in 1980 are listed in Table 1.

The Sub-Committee reviewed tag reward procedures and confirmed that T-shirts should be given only as rewards and should not be used by ship's crews or scientists, nor should they be given as gifts or sold. The Sub-Committee also noted that the choice of

whether a T-shirt or a cash reward is given is to be determined by the personnel distributing rewards and by the request of the tag-finder. T-shirts may be given as rewards for tags on Atlantic-caught tunas other than skipjack. The cost of rewards distributed from the ICCAT will be charged to the countries whose tags were recovered (and for which rewards were paid) at appropriate intervals. A revised list of tag recovery stations is as follows:

<i>Participating country</i>	<i>Location of stations</i>	<i>Scientist in charge</i>
Angola	Lobito, Angola	M. Pina Fernandes
Brazil	Rio de Janeiro, Brazil	J. Negreiros Aragao
Cape Verde	--	(Coordinator to investigate)
Cuba	Havana, Cuba	S. Valle
France/Ivory Coast	Abidjan, Ivory Coast	F. X. Bard
France	Pointe Noire, Congo Martinique	R. H. Pianet
Ghana	Tema, Ghana	M. A. Mensah
Japan	Shimizu, Japan	S. Kume
Korea	Tema, Ghana	K. B. Hwang
Portugal	--	(Coordinator to investigate)
Senegal	Dakar, Senegal	P. Cayré
Spain	Santander, Spain Tenerife, Spain	J. M. García-Mamolar Al. Santos
U.S.A.	La Jolla, Calif., U.S.A. Puerto Rico	W. Parks
U.S.S.R.	Kaliningrad, U.S.S.R.	Y. Vialov

*Tagging - Sonic*

The following plans for sonic tagging experiments were reviewed once again.

*Experiment 1*

Area/time: Annobon (SJ-73), July 15-31, 1981

Tracking vessel: R/V *Nizery* (France)

Oceanographic vessel: R/V *Capricorne* (France)

Scientist in charge: R. H. Pianet (France)

Remarks: The U.S.S.R. is considering the possibility of conducting an oceanographic cruise in the Annobon area during the period of Experiment 1. Supplemental oceanographic data would be collected in areas adjacent to the tracking area.

*Experiment 2*

Area/time: Canary Islands (SJ-75), September, 1981  
 Tracking vessel: ?  
 Oceanographic vessel: ?  
 Scientist in charge: ?

Remarks: The Sub-Committee recommended that an experiment be organized by a Spanish scientist. The Coordinator was requested to continue investigating the possibility of Spain's participation.

The U.S.A. confirmed that an experienced tagging/tracking team is available with sonic tags and hydrophone equipment from the U.S.A. if a tracking vessel and funds for travel, per diem expenses and installation of equipment can be provided. Some limited funds may be available from the ICCAT for travel costs for a team of two persons.

*Port Sampling*

Table 2 gives a revised checklist of data coverage from port sampling. Korea and Spain reported that they currently have no vessels unloading or transshipping in Venezuela. The Sub-Committee noted with satisfaction the new plans for increased coverage in 1981 by Spain and Portugal.

*Intensive Sampling*

In 1980 trial intensive sampling cruises were conducted by France, Japan and Spain. The observers planned to be placed aboard vessels in 1981, given below, will all be aboard purse seiners, except for observers aboard Japanese baitboats. Inadequacies noted earlier remain unrectified except for an increase in number of observers planned by Spain.

<i>Country</i>	<i>Number of boats with observers</i>			
	<i>1980</i>		<i>1981</i>	
	<i>Needed</i>	<i>Accomplished</i>	<i>Needed</i>	<i>Expected</i>
<b>ANNOBON (June-August 1981)</b>				
France	1-2	1	10	8-10
Ghana	1	0	2	2
Ivory Coast	1	0	2	2
Japan	1	1	3	1
Korea	1	0	5	0
Spain	1	2	6	5
U.S.A.	1	0	5	0
U.S.S.R.	1	0	?	?
<b>CAPE VERDE (August-October 1981)</b>				
France	0	0	10	0
Ivory Coast	0	0	2	0
Morocco	1	0	1	0
Senegal	1	0	1	0
Spain	1	0	5	0



*Exploratory Fishing*

The following recommendations and plans remain unchanged apart from reactivated plans on the part of Brazil (information to be contributed by Brazilian delegate).

<i>Area for Exploration</i>	<i>Recommended Activity</i>	<i>Remarks/Expectations</i>
<b>W. Atlantic</b>		
Caribbean (SJ-81,82, 83)	Aerial survey	Flights being planned by Cuba over Cuban waters
Venezuela (SJ-83)	Aerial survey	No plans
NE Brazil (SI-80)	Vessel cruises~90 days	
<b>E. Atlantic</b>		
Angola inshore (SJ-74)	Vessel cruises~80 days	U.S.S.R. cruise Sept.-Oct.
Ascension Island (SJ-78)	Aircraft or vessel cruise	No plans
Annobon Island (SJ-73)	Aerial survey	1 1/2 months, July, August, France

*Fishery Oceanography*

Slight revision to the plans provided earlier by France and Spain are given below together with plans confirmed by other countries.

**Fishery Oceanography - Collection of Subsurface Data, 1981**

<i>Country</i>	<i>Research vessel</i>	<i>Commercial vessel</i>	<i>Satellite</i>	<i>Buoys</i>	<i>Remarks</i>
Brazil	yes	no	yes	no	
Cuba	4 cruises	no	no	no	
France	July-August, 3 cruises	yes	yes	Three drifting or fixed	10 purse seiners and 3 merchant vessels
<b>Spain</b>					
Can. Is.	yes	no	no	no	
Tropical	no	no	no	no	
U.S.A.	1 cruise	yes	yes	no	3 purse seiners
U.S.S.R.	1 cruise, 6 months	no	no	no	

*Maturity-Fecundity*

Plans for collection of gonads have now been added by Japan and Portugal, and revised by Spain. The revised table below does not indicate the number of samples to be collected because this is to be determined by the scientists in charge within each participating country.

<i>Country</i>	<i>Scientist in charge</i>	<i>Level of analysis*</i>	<i>Remarks</i>
<b>West Atlantic</b>			
Brazil	J. Negreiros Aragao	To be determined	--
Cuba	S. Valle	1	--
U.S.A.	W. Parks	2	Collection in Puerto Rico
<b>East Atlantic</b>			
Ghana	M. A. Mensah	1	Level 2 analysis, probably in Dakar
Ivory Coast	F. X. Bard	2	--
Japan	S. Kume	--	Collection only, near Tema
Portugal	J. A. Pereira	2	Collection in Madeira and Azores
Senegal	P. Cayré	2	--
<b>Spain</b>			
Santander	A. M. Fernández	1	Level 2 analysis
Canary Is.	Al. Santos	1	in Dakar
U.S.A.	W. Parks	2	Collection diffi- cult but analy- sis possible if samples sent
U.S.S.R.	Y. Vialov	2	--

\*Level 1 analysis requires weighing the fish and the gonads and visually assessing maturity, all of which may be completed aboard the vessel; level 2 analysis can only be done in a laboratory since it requires collecting a sub-sample of 100-200 mg from the gonads and measuring the diameter of ova in this sub-sample with a microscope.

Sampling in Cape Verde is still a problem, but this should soon be resolved now that Miss H. Santa Rita Vieira has been assigned to tuna fisheries work in this country.

A small working group chaired by P. Cayré was appointed to work with the Coordinator in developing details for the coordination of the collection of samples by area and season. This group agreed that field workers should record the samples collected each month on a map of ICCAT skipjack zones divided by 1°x1° squares. When received by the Coordinator, those maps would reveal the coverage of sampling in the different fishing areas.

#### *Ageing*

During the presentation of the report of the Sub-Committee on Skipjack at Brest (SCRS/ 80/16), certain modifications to the details of plans for sampling and analyzing hard parts became apparent. Current plans are summarized below.

<i>Collecting country</i>	<i>Parts sampled</i>	<i>Parts analyzed</i>	<i>Location of analysis</i>
Portugal	S + O	S	Azores
Ivory Coast	S + O	--	--
Senegal	S + O	S	CRODT, Dakar
U.S.A.	S + O	O	NMFS, La Jolla
U.S.S.R.	S	S	U.S.S.R.
Spain	S	S	IEO, Santander
France	--	S + O	CNEXO, Brest

S = spines, O = otoliths

Discussion has revealed that difficulties exist in reading spine sections and a working meeting is necessary. Interested persons agreed to meet in December, 1980, at Brest. With respect to otoliths, this meeting has already been held (A. Wild and L. Antoine, La Jolla).

Once a method for reading has been decided upon, it will be described. Otolith samples should be circulated between the U.S.A. and France, spines between Spain, Senegal, U.S.S.R., Portugal and France. The collection and origin of samples should be reported every three months to the Coordinator, beginning in January, 1981, and he will redistribute this information.

#### *Predator Stomach Analysis*

Current plans for collecting and processing stomach samples are as follows:

<i>Collecting/processing countries</i>	<i>Scientist in charge</i>	<i>Number of samples</i>
Brazil*	L. A. Zavala	?
Japan	S. Kume	400
U.S.S.R.	Y. Vialov	500

\*A report on plans is to be submitted by Brazil.

#### *Biochemical Stock Identification*

The Coordinator was requested to continue the pursuit of any suggestions the Sub-Committee might have for finding a laboratory capable of analyzing blood samples.

#### *Larval Survey*

Collection and processing of larval samples were reviewed. In addition to the processing countries shown in the following table, Dr. C. Piccinetti (Italy) confirmed a willingness to process some samples, if required. Brazil offered to process a limited amount of the U.S. samples. The number of samples likely to be collected is yet to be specified.

<i>Sampling</i>		<i>Processing</i>	
<i>Country</i>	<i>Scientist in charge</i>	<i>Country</i>	<i>Scientist in charge</i>
Brazil	Y. Matsuura	Brazil	Y. Matsuura
Cuba	M. Juarez	Cuba	M. Juarez
Ivory Coast	F. X. Bard	France	R. H. Pianet, confirmation required
U.S.A.	W. Parks	U.S.A.	W. Parks
	W. Parks	Brazil	Y. Matsuura
U.S.S.R.	Y. Vialov	U.S.S.R.	Y. Vialov

#### **Manuals and data forms**

After an initial draft by the Secretariat, the U.S.A. is continuing to produce near-final drafts of these important materials. Latest drafts were reviewed in Madrid by interested members of the Sub-Committee.

#### **Documentary film**

The Coordinator reported that preliminary estimates of costs of a 15- to 20-minute film ranged from \$50,000 to \$75,000. Two courses of action were suggested, both of

which should be pursued:

a) Film could be taken by scientists and technicians at low cost to provide a record which could be useful in interviews or for assembly into a documentary.

b) Independent financing for a professional film could be solicited from industry and other agencies who might have an interest in such a venture.

#### **Budget**

The Executive Secretary reported that the budgetary surplus planned by the Sub-Committee for the end of 1980 to support work early in the Skipjack Year before contributions arrive had been achieved. The Convener congratulated the Sub-Committee on its planning and suggested no adjustments were necessary at this time.

#### **Inter-sessional meeting for 1981**

The Sub-Committee agreed that a meeting should be held coincidental with the SCRS Officer's meeting in mid-year, 1981.

#### **Adoption of Report**

The Report was adopted.

#### **Adjournment**

The meeting was adjourned.

**Table 1. International Skipjack Year Program – List of cruises accomplished as of November, 1980**

<i>Country</i>	<i>Dates</i>	<i>Area</i>	<i>Objective</i>	<i>Vessel Name</i>	<i>Responsible</i>
Senegal	1 to 15 May	Cape Verde offshore	Tagging	Laurent Amaro	P. Cayré
	August	Cape Verde inshore	Tagging	Laurent Amaro	P. Cayré
	Early October	Cape Verde inshore	Tagging	Laurent Amaro	P. Cayré
Ivory Coast – France	14 July to 13 August	Annobon NW	Tagging	Nizery	F. X. Bard
	22 Sept. to 4 October	Annobon NW	Tagging	Nizery	F. X. Bard
	13 to 26 October	Annobon SW	Tagging	Nizery	F. X. Bard
Spain	3 June to 11 July	Annobon	Intensive sampling	Itxas Norte	A. M. Fernández
	30 July to 3 Sept.	Cape Verde	Intensive sampling	Txori Eder	J. M. García Mamolar
	15 June to 15 July	Canary Is.	Tagging	San Eduardo	Al. Santos
	November	Canary Is.	Tagging	San Eduardo	Al. Santos
Japan	28 July to 28 Sept.	Annobon	Tagging & Intensive sampling	Katsushio-Marui	S. Kume
U.S.S.R.	June to July	Cape Verde	Fish. Ocean. & Ageing	Altair	Y. Vialov
	Nov. to Dec.	Angola	Tagging	Nekton	Y. Vialov
U.S.A.	2 Feb. to 26 April	Caribbean to Fr. Guyana	Tagging	Rhonda Sue	W. Parks

Table 2. Port Sampling – Updated (November, 1980) checklist of current data coverage

Port/location	Flag/gear*	Data coverage**		Remarks
		Logbook	Size sampling	
Abidjan, Ivory Coast	FISM/PS	S	S	
	Spain/PS	S	S	
Benguela, Angola	Angola/BB	NI	NI	(Delegate absent).
Canary Islands, Spain	Spain/BB	S	S	
	Spain/Trop. PS	NI	NI	Increased coverage planned for 1981.
Cape Verde	CV/BB	NI	NI	No plans yet for 1981 - Should Spain/BB fishery develop, coverage required.
Congo	Congo/PS	NI	NI	No plans yet for coverage in 1981.
Cumana, Venezuela	Venez./PS	NI	NI	Prospects for improved coverage are poor.
	Venez./BB	NI	NI	
Dakar, Senegal	FISM/BB	S	S	
	FISM/PS	S	S	
	Spain/PS	S	S	
East Atlantic	USSR/Motherboat	NI	S	Steps are being taken to obtain full coverage in 1981.
Madeira, Azores, Portugal	Port/BB or Handline	NI	NI	Increased coverage planned for 1981.
Morocco	Morocco/PS	NI	NI	No plans yet for coverage in 1981. (Delegate absent).
Puerto Rico	US/PS	S	NI	Efforts to improve size sampling are under way.
Rio de Janeiro & northern Brazil, Brazil	Brazil/BB	?	?	New fishery statistics currently being gathered.
	Brazil/PS	?	?	Should the fishery develop by 1981, coverage required.
Tema, Ghana	Japan/BB	S	S	No plans yet for improving logbook coverage by 1981; quality of size sampling needs improving.
	Korea/BB	NI	S	
	Ghana/BB	NI	S	
	Panama	NI	S	

\*BB = baitboat, PS = purse seine.

\*\*S = satisfactory; NI = needs improvement.

## REPORT OF THE SUB-COMMITTEE ON STATISTICS

### 1. Opening of the meeting

The meeting was opened on November 10, 1980, by the Convener, Mr. S. Kume (Japan). He noted that considerable progress has been made by the scientists and the Secretariat in collecting adequate and correct statistics for Atlantic tuna fisheries. He then stated that as the population studies progress, more detailed, refined statistics are being required.

### 2. Adoption of Agenda and arrangements for the meeting

The Agenda (Addendum 1) was adopted without change and Dr. P. M. Miyake (Secretariat) was appointed rapporteur.

### 3. Examination of progress made by national offices

Each country's progress in reporting statistics through 1979 and 1980 was reviewed by the Sub-Committee. The Secretariat Report on Statistics and Coordination of Research (COM-SCRS/80/15 - hereafter referred to as the Secretariat Statistics Report), together with its attached table, was also reviewed with respect to the progress made. The table showing the progress made was updated and is attached herewith as Table 1. The Sub-Committee was satisfied to note that this table is now by species and fisheries rather than by countries, following the recommendation made at the 1979 meeting.

It was also noted that the table contains coverage rates of Task II catch and effort data reported and the number of fish measured vs. the catch of the particular species, if known, for each fishery. These new elements added to the table seem very helpful for the Sub-Committee in evaluating the quality of statistics and it recommended that the Secretariat complete these columns in the table as much as possible.

It was noted that under the coverage rates in the table for Task II catch and effort data, two types of rates can be found: one is the original sample coverage and the other is the coverage of data which the Secretariat received. The Sub-Committee recommended that only the original sample coverage should be reported here while two more columns be added to show if the data submitted are raised, unraised or both.

Other suggestions were:

i) that countries which have no catch be distinguished in the table from the countries which have catches but from whom no information has been received. Both of these cases were blank in the 1980 table.



ii) that countries which have minor catches not reported to the Secretariat and thus not included in this table be listed with a footnote to that effect.

The Assistant Executive Secretary reported that the present system of receiving all national scientific statistics through one statistical correspondent solved many problems with most of the countries, but did not work well with those countries where many scientists and organizations who are far removed from each other work on different species of tunas. He suggested that more than one scientist be nominated for such countries, if a need is recognized, for each species. This system is in practice in France. The Sub-Committee reiterated its suggestion. It reviewed and updated all scientific statistical correspondents for member countries (see Table 2).

The Sub-Committee also reviewed pertinent recommendations made at the 1979 meeting and reviewed all the progress made along with many of these recommendations. The important progress and further steps to be taken are reported in the next section (Item 4) of this Report.

#### 4. Examination of the problems of the quality of statistics and promptness of reporting

The Sub-Committee reviewed Table 1 of this Report. It also reviewed Appendix 6 of the 1980 SCRS Report, which summarized all the recommendations formed during the analyses on stock conditions earlier in this SCRS meeting. This appendix also includes all the recommendations made in 1979 which still have not been fulfilled.

The Sub-Committee discussed the ways to solve major problems related to statistics.

##### *a) Billfish statistics*

The Sub-Committee recognized a serious deficiency in the quality of statistics, in particular a lack of biological information, abundance indices, accurate catches by species, and geographical and temporal distributions of catches and effort.

The Sub-Committee reiterated the proposal to hold an inter-sessional billfish meeting in 1981 to solve these problems, and it recommended that the scientists and the Secretariat spend considerable effort in solving these problems in preparation for this meeting.

##### *b) Juvenile tropical tuna statistics*

The problems involve: i) the improvement of the statistics of discards, ii) the report of catches by a correct species breakdown, iii) the evaluation of the amount of fish that goes through a non-routine marketing system, iv) the improvement of biological sampling, and v) the collection of mixed-species school information.

The Sub-Committee stressed that these problems are important, requiring serious attention by the countries concerned, and that only a lot of research effort by those countries (probably for many years to come) will offer any solutions for these problems. In particular, problems i) and v) mentioned above require field activities by experts aboard vessels.

On the other hand, it was noted that surveys on problems ii), iii) and iv) can be

started at ports. The Sub-Committee felt that the majority of the problems depend on the national scientists for their solution. Improvement in statistical systems for these problems might be initiated by sending an expert representing ICCAT to these areas.

The Sub-Committee noted that in 1980 the Secretariat planned to send a statistical expert to the problem areas but the program was postponed since it was felt that there was no clear authorization or instructions by the SCRS for the Secretariat to undertake such a task.

The Sub-Committee Convener asked a small group (R. Pianet, W. Parks, F. X. Bard and E. A. Kwei, together with A. Fonteneau and S. Kume as *ex officio*) to review the necessity of such a mission and if the necessity was identified, to state clear mandates given to this expert, qualification of an expert, places and period of visit, etc. The Sub-Committee, at a later session, received and adopted the report of this group, and concurred with all the recommendations. This report is attached as Addendum 2 to Appendix 4 to Annex 8.

#### *c) Mediterranean bluefin statistics*

The Assistant Executive Secretary reported that Mr. H. Farrugio (France) represented ICCAT on a trip to Tunisia to collect statistics from the Tunisian trap fisheries (SCRS/80/29). The Secretariat also organized an informal meeting of pertinent scientists at Palermo. The Palermo report is presented as document SCRS/80/28.

As a result of these efforts, many catches not reported previously became available in 1980. The Italian bluefin catch has been separated by large and small fish and by the Tyrrhenian and Adriatic Seas. However, the problem of a lack of biological samplings from the Italian catches has not been solved. The Sub-Committee noted that during the informal meeting held at Palermo by bluefin scientists, this problem was thoroughly discussed and procedures are being taken to make such samplings possible.

The bluefin data bases were also completed by M. Parrack (biological data) and the Secretariat (catch and effort) as recommended by the Bluefin Workshop held in Santander (1979).

It was stated that the Japanese longliners were the only longliners reported operating in the Mediterranean Sea in 1980 during their domestic open season and that their catches were also reported.

#### *d) Longline catch of albacore by north-south Atlantic*

The Sub-Committee noted that the 1976, 1977 and 1978 Taiwanese albacore catches were divided into north-south Atlantic using landing statistics of all the transshipment ports, through a joint effort by the scientists of Taiwan University, Japanese scientists and the Secretariat (SCRS/80/67). Their efforts were commended and it was recommended that such a high-quality breakdown be continued for future years.

#### *e) ICCAT port sampling program*

The Sub-Committee was informed that expansion of the port sampling program to Cumaná (Venezuela) and Montevideo (Uruguay) had been carried out. This is in addi-

tion to the ports already covered (Cape Town, Las Palmas, Tenerife and St. Maarten). However, there are still some problems to be solved. It was strongly recommended that this expansion be continued throughout 1981.

*f) New statistics contained in the scientific papers should be reported separately to the ICCAT Secretariat*

The Secretariat reported that this practice is not well observed and therefore there were some difficulties in updating statistics. The Sub-Committee recommended that scientists report to the Secretariat any new statistics used in their scientific papers.

## 5. Examination of progress made by the Secretariat

### 5.1 BIOSTATISTICAL ASSIGNMENTS

The Assistant Executive Secretary referred to the "Secretariat Report on Statistics and Sampling" (SCRS/80/15) and explained that Dr. Max Laurent, the biostatistician, left the Commission at the end of 1979. The Secretariat did not hire a new biostatistician in 1980, but instead carried out programs on a contract basis, as was suggested by the SCRS at the 1979 meeting. The major tasks accomplished include the following:

- a) North-south separation of albacore catches (see section 4-d of this Report)
- b) Mediterranean bluefin statistics (see Section 4-c of this Report)
- c) Review of sampling of tropical surface-caught tunas (see Section 4-b of this Report).
- d) Work on data base (see Section 5.2 of this Report).

The Sub-Committee also noted the ever-increasing statistical workload of the Secretariat and reconfirmed the need for a permanent biostatistician at the Secretariat. It recommended that, in principle, the vacant position of a biostatistician be filled by a qualified person. The terms given to such a biostatistician should include all those terms initially proposed when the position of a biostatistician was established with the Secretariat in an earlier year, such as the overall re-evaluation of the Atlantic-wide sampling system. If such a qualified person is hired, he will be the best person to be sent on the mission mentioned in section 4-b).

On the other hand, the Sub-Committee recommended that the Committee authorize the Secretariat to use the part of the funds budgeted for a biostatistician to contract a temporary biostatistician(s) to solve various problems, in case this part of the funds remains unused due to a delay in the recruitment of a biostatistician.

### 5.2 DATA BASE

The Assistant Executive Secretary reviewed all the updating of the ICCAT central data base and the work achieved using the data base (SCRS/80/15).

*a) Updating*

Following the decision made by the 1979 SCRS, the Task I data base has been updated so that it now contains, with very few exceptions, only the best estimates of nominal catches made by the scientists working on each species, rather than the official statistics. The Secretariat used the catch tables prepared for each species at the 1979 ICCAT meeting and further improved them by eliminating all the errors, adding new information, separating bigeye catches by north-south (rather than by east-west), and improving albacore north-south separation and yellowfin east-west separation based on Task II catch and effort statistics. As a result, the catch tables prepared by the Secretariat for each species group were used by the scientists with very few changes. The only exception was billfish.

The Sub-Committee reconfirmed that the Task I data base should contain the best scientific estimates rather than the official statistics and recommended that the Secretariat prepare species catch tables for next year based on this data base.

The Sub-Committee recommended that errors contained in any former statistical publications be corrected in the data base and errata be circulated.

*b) Statistical Bulletin – Historical Series*

The Secretariat prepared a set of print-outs early in 1980 which were reviewed by the corresponding national scientists. At the inter-sessional SCRS Officers Meeting, it was recommended that a "Draft" with all the suggested corrections be prepared and distributed by the time of the 1980 SCRS meeting. The Sub-Committee noted that this task had been accomplished.

The procedure to further correct and update the historical statistics and to finalize the Bulletin before formal publication was discussed at length. It was agreed that a scientist be nominated as a collaborator for each species to cooperate with the Secretariat in collecting further statistics. The following collaborators were nominated:

Skipjack	-	R. H. Pianet
Yellowfin	-	G. T. Sakagawa
Bigeye	-	S. Kume
Albacore	-	F. X. Bard
Bluefin	-	M. L. Parrack and H. Farrugio
Small tunas	-	Secretariat
So. Bluefin	-	S. Kume

It was hoped that the proposed Billfish Workshop to be held in 1981 would solve this problem for billfishes and swordfish.

The assistance of various scientists working on each species is greatly encouraged. The deadline for completing these assignments was set as August 31, 1981. The species collaborators should make final judgements by the deadline as to whether any further improvements are needed or the statistics can be formally published. Depending on the decisions by these collaborators, the Secretariat will either publish an official Historical Bulletin or another provisional issue before the next SCRS meeting.

*c) Preparation of data files for the meeting of the Working Group on Juvenile Tropical Tunas*

The Sub-Committee recognized that all the data, with the exception of FIS data, used at the Working Group meeting had been prepared by the Secretariat using its central data base. It also noted that the "Centre Océanologique de Bretagne" provided the use of its computer facilities (free of charge) to ICCAT during this meeting and that much of the data processing was carried out on the spot.

### 5.3 PUBLICATION AND DISSEMINATION OF DATA

The Sub-Committee reviewed all the statistical publications, such as the Statistical Bulletin, Statistical Series and Data Record. The Sub-Committee felt that they were all satisfactory and that present policies should be maintained.

It was also noted that the scientists often exchange data on magnetic tape and that the Secretariat functions as the exchange center of the data files. The continuation of this practice was highly recommended.

### 6. Future plans to improve the statistics and recommendations to the SCRS

There were many recommendations made by the Sub-Committee under each specific Agenda Item. Besides, many recommendations made by the SCRS and which are summarized in Appendix 6 of the SCRS Report refer to the Sub-Committee.

### 7. Other matters

The ICCAT and the International Commission for the Southeast Atlantic Fisheries (ICSEAF) jointly hosted the Tenth Session of the Coordinating Working Party on Atlantic Fishery Statistics (CWP) on July 22-29, 1980, in Madrid. ICCAT was represented by the systems analyst; the report is presented as SCRS/80/27.

### 8. Adoption of Report

The Report was adopted.

### 9. Adjournment

The meeting was adjourned.

Table 1. Progress in the Collection of 1979 Task I and Task II Data (as of November 11, 1980)

Species, Gear and Country	TASK I				TASK II CATCH & EFFORT							BIOLOGICAL (SIZE)						Remarks		
	Date Rec'd		Effort	By big areas	Date Rec'd		Area	Time	Cov. rate %	Effort	Weight	No. of fish	Date Rec'd		Area	Time	Raised		Not raised	No. of fish sampled/ Total catch (MT)
	1980	1979			1980	1979							1980	1979						
<b>Tropical Surface Fleet</b>																				
<i>BB</i>																				
Angola	May 12*	May 25	x	x	Oct 10	Aug 30	5x5	mo	100	x	x		Sep 3	Aug 30	5x5	mo	x		14908/547	
Brazil	Jul 31*	Mar 20		x																
Cuba	May 2	Apr 30	x	x									Jul 4	Apr 30	ICCAT	qtr	x		7913/787	
FISM	Jul	Aug 28	x	x	Jul		1x1	mo	100	x	x									
Ghana	Feb 13	Jun 1	x	x	Sep 17	Jun 1	1x1	mo		x	x		Sep 17	Jun 1	5x10	qtr	x			
	Sep 17		x	x											10x20					
Japan	Apr 16	Jul 20	x		Oct 27	Jul 20	1x1	mo		x	x		May	Jul 20	5x5	mo	x			
	Jul 23*			x											5x10					
Korea	Apr 18*	Nov	x	x	Aug 19	Aug 27	1x1	mo	52	x	x		Aug 19	Aug 27	5x10	mo	x	x		
Panama			x	x																
Portugal					Jun 17	Oct	5x5	mo			x									
					Oct 1		5x5	mo	100		x									
					Nov 3		5x5	mo		x	x									
South Africa	Jul 23	Mar 16	x	x	Jul 23		1x1	mo		x	x		Jun 16		1x1	mo	x		100/93	
Spain(Can.Is.)	Aug 20	Jun 4	x	x									Nov 9		5x5	mo	x			
<i>PS</i>																				
Cuba	May 2	Apr 30	x	x										Apr 30						
FISM	Jul	Aug 28	x	x	Jul		1x1	mo	100	x	x									
Morocco	Aug 11		x	x	Aug 11	May 14	1x1	mo			x									
South Africa	Jul 23	Mar 16	x	x	Jul 23	Mar 16	1x1	mo		x	x		Jun 16	Mar 16	1x1	mo	x		130/22	
Spain	Aug 20	Oct	x	x	May	Oct	1x1	mo		x	x		May	Oct	1x1	mo	x			
															ICCAT					
U.S.A.	Jul 28	Jul 16	x	x	Aug	Jul 16	1x1	mo		x	x		Aug	Jul 16	1x1	mo	x		1752/6189	
	Sep 2		x												ICCAT					
U.S.S.R.	Aug 11	Jul 14		x	Jun 23	Aug 9	FAO	mo			x									

Task II: includes  
Ghana-based fleets.  
Size data for  
1976, 77, 78.

Source: ICCAT.  
Madeira only, data  
for 1977, 79.  
Madeira only 1980.  
Azores only.

Data for 1979,80.

Task II data  
for 1978.



**Bluefin Surface Fleet**

*BB*

France(Biscay)  
Portugal

Sep 1

x x

Jun 17 Oct

5x5 mo

x

Nov 3

5x5 mo

x x

Spain (Can.Is.)  
Spain(Pen.)

Aug 20  
Aug 20

Jun 4  
Oct

x x  
x x

Nov 9

5x5 mo

x

Madeira only, data  
for 1977, 79.  
Azores only.  
Data for 1979,80.  
Med. catch not  
included.

*PS*

Canada

Mar 2

Mar 2

Feb 15

France(Med.)  
Italy(Med.)

May 19  
Jul 7

Mar 12  
May 16

x x  
x x

May 19 Mar 12

5x5 mo

65 x x

May 19 Mar 12

5x5 mo

x

No fishery in 1979,  
so no data reported  
in 1980.

Morocco  
Norway  
U.S.A.

Aug 11  
Mar 18  
Jul 28  
Sep 2

x x  
x x  
x x  
x

Mar 18  
Jul 28 Jul 16

5x5 mo  
1x1 mo  
5x5

99.37  
100 x x x

Mar 18  
Jul 28 Jul 16

5x5 mo  
1x1 mo  
5x5

x x  
x x

161/60  
1298/1425

Adriatic Sea catch  
not included.

*Trap*

Canada  
Italy  
Spain  
Tunisia

Aug 25  
Jul 7

Mar 2  
May 16  
Oct

x x  
x

Aug 25 May 9  
Jun 19

1x1 mo  
5x5 mo

100 x x  
x x x

Jun 19

5x5 mo

x

552/82

Data for 1979,80.  
C/E for 1976-79.

*Uncl. and Others*

Canada  
France(Med.)  
Mexico  
Morocco  
Portugal  
U.S.A.

Aug 25  
May 19  
Sep 22  
Sep 22  
Jul 28

Mar 2  
Mar 12  
x  
Oct  
Jul 16

x x  
x x  
x  
x  
x

Aug 25 Mar 2  
Mar 12  
Aug 11 May 14  
Oct  
Jul 28

1x1 mo  
100  
1x1 mo  
5x10 yr  
10x20

100 x x  
x

Jul 28 Jul 16

5x5 mo

x x

4119/872

Source: FAO.  
Source: FAO.



Table 1. (cont.)

Species, Gear and Country	TASK I				TASK II CATCH & EFFORT							BIOLOGICAL (SIZE)						Remarks		
	Date Rec'd		Effort	By big areas	Date Rec'd		Area	Time	Cov. rate o/o	Effort	Weight	No. of fish	Date Rec'd		Area	Time	Raised		Not raised	No. of fish sampled/ Total catch (MT)
	1980	1979			1980	1979							1980	1979						
<b>Longline Fleet (All species)</b>																				
Brazil	Jul 31*	Mar 20	x	x	Sep 22	5x5	mo		x	x										C/E for 1978-80.
	Sep 22		x																	
Canada	Aug 25	Mar 2	x	x	Aug 25	5x5	mo	18	x	x										
China(Taiwan)	May*	Apr 2	x	x		5x5	mo	60	x	x				ICCAT	mo	x	x	13215/9194		Task II: ICCAT Port Sampling. Nat'l Taiwan University.
		Oct 17			Oct 21	Oct	5x5	mo	100	x	x	x	Oct 16	5x5 ICCAT	qtr		x			
Cuba	May 2	Apr 30	x	x	Sep 29	Apr 30	5x5	mo	100	x		x								
Japan	Apr 16	Jul 20	x		Sep 11								May	Apr 30 Jul 20	5x10 10x20	mo		x		Size data for 1971, 77,7 % Data for Jan-June, 1980.
	Jul 23*			x																
Japan-based Brazil					Oct*	5x5	mo	100	x	x										
Korea	Apr 18*	Nov	x	x	Aug 19	Aug 27	5x5	mo	38	x	x		Aug 19	Aug 27	10x20	qtr	x	x		
Panama			x	x			5x5	mo	50	x	x				ICCAT	mo	x	x		ICCAT Port Samp.
South Africa	Jul 23	Mar 16	x	x	Jul 23		5x5	mo		x	x									
Spain	Aug 20	Oct	x	x		Oct														Med catch not incl.
U.S.A.	Jul 28	Jul 16	x																	
U.S.S.R.	Aug 11	Jul 14		x	Jun 23	Aug 9	FAO	mo		x	x			Aug 9						
Venezuela	Mar 31*			x																

\*Preliminary.

**Table 2. ICCAT Scientific Statistical Correspondents (as of the time of the November Meeting)**

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Angola	F. Jardim
Benin	Adéyemi L. Fagbohomi
Brazil	J. Negreiros Aragao
Canada	P. Hurley
Cape Verde	H. Santa Rita Vieira
Cuba	B. Garcia Moreno
France	L. Antoine (ALB), H. Farrugio (BFT), A. Fonteneau (Trop.)
Gabon	J. Rogombe
Ghana	M. A. Mensah
Ivory Coast	F. X. Bard
Japan	S. Kume
Korea	J. U. Lee
Morocco	R. Biaz
Portugal	M. L. Portugal
Senegal	P. Cayré
South Africa	C. S. de V. Nepgen
Spain	A. González-Garcés
U.S.A.	G. T. Sakagawa
U.S.S.R.	Y. Vialov

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*Addendum 1 to Appendix 4 to Annex 8*

**Agenda for the Sub-Committee on Statistics**

1. Opening of the meeting
2. Adoption of the Agenda and arrangements for the meeting
3. Examination of progress made by national offices
4. Examination of the problems of the quality of statistics and promptness of reporting
5. Examination of progress made by the Secretariat
  - 5.1 Biostatistical assignments
  - 5.2 Data base
  - 5.3 Publication and dissemination of data
  - 5.4 Other matters
6. Future plans to improve the statistics, and recommendations to the SCRS
7. Other matters
8. Adoption of Report
9. Adjournment

*Addendum 2 to Appendix 4 to Annex 8***REPORT OF THE WORKING GROUP ON JUVENILE TROPICAL TUNAS —  
Statistical Problems**

Up to now, the sampling of multi-species young tropical tunas in the Gulf of Guinea has presented several difficult problems. Consequently, present estimates of catches and size frequencies of small yellowfin, bigeye and skipjack are inadequate. This is a major limitation for SCRS stock assessment, especially in the field of protecting juvenile tunas.

The Group, therefore, recommended that the ICCAT biostatistician or, in the case that such a biostatistician cannot be recruited in time, a contracted expert in sampling techniques be sent to Africa to the ports where juvenile tunas (yellowfin and bigeye) are landed along with skipjack. The biostatistician or expert, who must be a highly qualified person in this field, will review the overall sampling scheme and will help national scientists to develop a more efficient sampling scheme for this complex problem and will train technicians in charge of tuna sampling to apply this scheme. He should also help national scientists to estimate non-routine marketing systems and dumping of undersized fish.

A more specific guideline to this work would be:

1. Help national scientists obtain an efficient species identification scheme.
2. Help national scientists improve the size sampling of multi-species landings.
3. Help make a survey of non-routine marketing systems.
4. Help design an interview scheme of dumping whereby results could be compared to the observations made during the Skipjack Year Program.

Some of these problems are found at different levels in Abidjan (purse seiners) and Tema (baitboats). Most of the landings take place from July to November. The ICCAT expert should spend a total of about 30 days in Abidjan and Tema and possibly in Madrid and Las Palmas; a report of his activities should be submitted to ICCAT.

*Appendix 5 to Annex 8***REPORT OF THE WORKING GROUP ON SCRS ORGANIZATION**

The Working Group on SCRS Organization met and discussed the meeting organization and report formats used during the 1980 meeting. Following the discussion, the Group recommended that the report formats and procedures used this year be used again at the 1981 SCRS meeting. Several specifics were suggested to streamline the meeting and preparation of reports.

**SCRS Report A**

1. Report A should be written in 1981 with an effort to minimize the number of

rough drafts produced.

2. Drafts of reports should have revision numbers.

3. Species working groups should meet concurrently (as much as possible) to produce the A reports dealing primarily with stock abundance variations. Discussions of juvenile and multi-species problems should be done at a separate meeting.

4. A new "species" working group entitled "multi-species" should be formed to deal with problems common to several species. This group should convene shortly after the single species groups have completed their primary discussions.

#### SCRS Report B

5. Report B should retain its narrative style with emphasis on a succinct, concise presentation. The present five-page limit appears adequate.

6. Report B, presented to the Commissioners, should be assembled as follows:

1. Cover sheet with species name
2. Catch Table(s)
3. Graph of Catch vs. Time
4. Text
  - a. Description of fisheries
  - b. Status of stocks
  - c. Effects of current regulations
  - d. Recommendations
5. Other figures

For publication, the Secretariat may rearrange the pages.

#### Meeting Organization

7. The allocation of meeting time, three days for species meetings and the remainder in plenary sessions, seems adequate and should be maintained.

8. The initial meeting of rapporteurs with the SCRS Chairman on Monday morning should be expanded to include all scientists present. The Chairman should again outline the schedule and describe the expected format of reports A and B.

9. To streamline the work of the Committee meetings, working groups as defined by the Sub-Committee conveners and comprised of interested people, should be held on Thursday evening. These meetings should be used to update tables and gather needed information prior to the Sub-Committee meetings.

TABLE OF ASSIGNMENTS

	STATISTICS	RESEARCH
<i>Yellowfin</i>	<p>Amount and species compositions of discards by surface fleets (has coverage of at least 50 percent).</p> <p>Species composition and sizes of fish landed particularly for Spanish and Tema-based.</p> <p>Logbook coverage from Korean BB. Spanish PS to be improved (<math>\geq 50</math>percent).</p> <p>Statistics on catches not passing through normal channels to be studied.</p> <p>Sampling in Puerto Rico to be continued and reported by U.S.</p>	<p>Growth of juveniles to be studied.</p> <p>Recruitment strength and spawning stock to be monitored.</p> <p>Longline vs. surface interaction to be studied.</p> <p>Alternative management scheme for reducing small YF catch to be further analyzed.</p>
<i>Skipjack</i>	<p>Fishery and biological data to be collected from developing fisheries (Brazil &amp; Ascension Island).</p> <p>Support ISYP which improves all statistical problems identified.</p> <p>a) Improve statistics from certain small fleets which may be imprecise.</p> <p>b) Collection of Task II data from Spanish PS and Korean BB.</p> <p>c) Effort statistics from Japanese BB should include search time.</p>	<p>Support ISYP.</p>
<i>Bigeye</i>	<p>Accurate species breakdown of young BE</p> <p>Port sampling for FISM, Spanish and Tema-based fleets where juvenile tuna are landed.</p> <p>Catch, effort, size data to be improved (separation of YF, BE in historical Spanish catches).</p>	<p>Population parameters (length-weight, growth particularly for small-fish mortality) to be re-evaluated.</p> <p>Extensive tagging. (Tagging small fish encouraged in ISYP).</p> <p>Detailed mixed species and size data by school (set) to be collected.</p>

	STATISTICS	RESEARCH
<i>Bigeye (cont.)</i>	<p>Historical catch data for Madeira, Azores, Canary Islands.</p> <p>Sampling at Puerto Rico.</p>	<p>Reasons of recent increase of small bigeye in Gulf of Guinea to be examined.</p> <p>Fishery specific (multi-gear yield-per-recruit studies).</p> <p>Analyses of available tagging data for stock structure.</p>
<i>Albacore</i>	<p>Catch, effort, size data to be collected from developing fishery (Azores and Madeira).</p> <p>Adequate sampling to be continued to ensure accurate S-N breakdown of Taiwanese LL catches.</p> <p>Surface catches of S. Atl. albacore to determine if they become a significant proportion of the catch.</p>	<p>Production model analyses of state of stocks to be done with revised statistics.</p> <p>Size dependent sex ratio measures of catches to be established for several adult fisheries.</p> <p>Stock-recruit to be monitored for north stock.</p> <p>Stock recruitment indices to be established for south stock.</p> <p>North adult indices to be compared.</p> <p>Methods of standardizing effort to be compared.</p>
<i>Bluefin</i>	<p>Informal exchange of data between national experts to be maintained including non-member countries.</p> <p>ICCAT representative should obtain data from Mediterranean and eastern Atlantic non-member countries.</p>	<p>Parasites and natural tag studies.</p> <p>Tagging of Age 0 trap-caught fish in southern Spain continued and extended into Med.</p> <p>Pre-season small fish tagging in the east and west Atlantic.</p> <p>Biology of 130-200 cm fish to be investigated.</p>
<i>Billfishes</i>	<p>LL catch and effort be reported by month and by species 5° sq. (or minimum by ICCAT Stat. area by month).</p> <p>Catch and effort to be in number of fish and weight.</p>	<p>Age and growth studies to be continued.</p> <p>Sailfish stock off Senegal to be monitored.</p> <p>Develop some effort indicator (other than Japan LL) to standardize total Atl. effort.</p>

STATISTICS		RESEARCH
<i>Billfishes (cont.)</i>	<p>Sailfish and spearfish to be separated.</p> <p>Length frequency by sex on a regular basis, all fisheries.</p> <p>Verify translation of species common names.</p> <p>Careful species identification be made, esp. for white marlin.</p>	<p>Inter-sessional meeting to be held on data basis.</p> <p>Available tagging data to be analyzed.</p>
<i>Swordfish</i>	<p>Catch and effort to be reported by 5°x5° and month, or at least by billfish sampling area by month.</p> <p>Catch and effort statistics to be in number as well as weight.</p> <p>Length frequency to be by sex on a regular basis.</p> <p>Amount of unclassified reporting of catches during mercury content regulation period to be estimated.</p>	<p>Age and growth studies to be continued.</p> <p>Stock structure to be studied.</p> <p>Develop some effort indicator (other than Japan LL) to standardize total Atlantic effort.</p> <p>Inter-sessional meeting to be held on data basis.</p>
<i>Small tunas and S. bluefin</i>	<p>ST: Accurate species identification of catches particularly "others."</p> <p>ST: Catch and effort and length data to be collected wherever possible, especially species important to artisanal fishery.</p> <p>SBF: None.</p>	<p>ST: Basic biology, population parameters to be studied.</p> <p>SBF: Possible effects of Atlantic catches on the entire southern bluesfin stock to be studied.</p>
<i>Multi-species (trop.)</i>	<p>Size specific distribution of tropical tunas.</p> <p>Substitution principles to be studied.</p> <p>Improved statistics for Spanish tropical fleet, Korean, Panamanian and Ghanaian BB.</p> <p>Set log data (U.S. PS, Spanish tropical).</p>	<p>Calculated catch by size-surface fleets to be rechecked and documented, especially FIS fleet.</p> <p>FIS 1977-78 data species breakdown of small fish to be re-examined.</p> <p>Discard survey (Ghana-based fleet).</p> <p>Yellowfin growth curve to be improved.</p>



STATISTICS		RESEARCH
<i>Multi-species (trop.) (cont.)</i>	Tagging of yellowfin and bigeye. Task II statistics to be improved.	Analyses of Ghana catch and size data. Tuna availability vs. environmental parameters. Gonad index for Ghana. Mixing of species in cohorts and size. Sensitivity study of yield-per-recruit to parameters. M estimates as error source. Length-weight relationship. Yellowfin growth. Yield-per-recruit vs. changes of fishery. Bigeye true cohort analyses.
<i>Multi-species (temp.)</i>	None.	None.

**ICCAT INTER-SESSIONAL MEETING ON BILLFISH**  
(including swordfish)

**DATE:** To be determined (prior to July 31, 1981)  
**PLACE:** Southeast Fisheries Center, Miami, Florida  
**GENERAL CHAIRMAN:** Dr. W. J. Richards (U.S.A.)  
**PLANNING TEAM:** J. Negreiros Aragao (Brazil), P. Hurley (Canada), B. Garcia Moreno (Cuba), M. Mensah (Ghana), S. Kume (Japan), J. Lee (Korea), P. Cayré (Senegal), J. C. Rey (Spain), R. Yang (Taiwan), M. Farber (U.S.A.) and the ICCAT Secretariat.

**PROVISIONAL AGENDA**

- Day 1* Introduction of participants  
Definition of goals of the meeting  
Adoption of agenda  
Review of current research and submitted documents
- Day 2* Species problems  
Review of white marlin species complex  
Review of stock structure by species
- Day 3* Review of population parameters by species  
Age, growth, movements, mortality, reproductive biology, life history
- Day 4* Review of available fisheries data  
Available data bases by species  
Applicability of catches by species  
Catch and effort data and trends by species and stock of each species
- Day 5* Continuation of Day 4 items
- Day 6* Population dynamics and stock assessments  
Discussion of direction to take
- a) Appropriate methodologies
  - b) Approaches to take different than current
  - c) Multi-species problems
- Discussion of research needs
- a) Problems in fisheries data bases
  - b) Problems in population parameters

ICCAT REPORT 1980-81 (I)

- Day 7*      Summary and draft report  
                  Conclusions  
                  Definition of problems  
                  Future directions  
                  Recommendations to SCRS

(Participants should plan on one extra day should the agenda prove to be too optimistic.)

**Invited Species**

Blue marlin	<i>Makaira nigricans</i>
White marlin	<i>Tetrapturus albidus</i>
Big-scale marlin	<i>Tetrapturus georgei</i>
Hatchet marlin	<i>Tetrapturus ?</i>
Spearfish	<i>Tetrapturus pfluegeri</i>
Mediterranean spearfish	<i>Tetrapturus helone</i>
Sailfish	<i>Istiophorus platypterus</i>
Black marlin	<i>Makaira indica</i>
Swordfish	<i>Xiphias gladius</i>

Date of meeting will be determined by host country and ICCAT Secretariat by January 1, 1981.

# CHAPTER III

## National Reports

### REPORT ON RESEARCH AND FISHERIES OF TUNAS AND RELATED SPECIES IN BRAZIL DURING THE PERIOD 1978-79

by

JOSE AUGUSTO NEGREIROS ARAGAO

#### 1. State of the fisheries

##### *1.1 Development of the fleet*

The tuna fleet of Brazil has been expanding since 1976. The expansion has not been as rapid as expected but may be considered satisfactory, particularly since 1979.

At present two longline fleets are in operation on the Brazilian coast: one comprised of five national small modern boats (24 m) based in Santos, State of Sao Paulo, and the other comprised of five leased Japanese boats based in Rio Grande, State of Rio Grande do Sul. There is also a fleet of thirty-three live-bait boats fishing off the coast of the State of Rio de Janeiro.

The longline fleets have been operating for some time and have been considered already in previous reports. The live-bait fleet initiated its activities in 1979 and its rapid expansion has been due to the good catches obtained. The majority of the boats are converted from other fisheries, with lengths varying from 12 to 25 meters.

Tuna and related species are also caught by the artisanal fleet operating in the northeast with troll lines and gill nets mainly in the States of Ceará and Rio Grande do Norte.

##### *1.2 Main fishing areas*

The longline fleets operated in the southeast-south region, fishing mainly in the area between south of the State of Bahia ( $15^{\circ}$  S) and the limit of the Brazilian and Uruguayan waters ( $33^{\circ}48'$  S). The leased boats concentrate their effort in waters of the State of Rio Grande do Sul while the national boats fish between Cabo Frio ( $23^{\circ}00'$  S) and Cabo of

Original report in English.

Santa Marta (28°36' S). The longlines are always set in the area of the continental slope (Figs. 1, 2 and 3).

The operation of the recently formed live-bait fleet is limited to the coastal waters of the State of Rio de Janeiro and fishes mainly in the proximities of the oil drilling platforms existent there (Fig. 4).

In the northeast region, the artisanal fleet operates along the whole coast and the main fishing areas are in the waters of the State of Rio Grande do Norte and Ceará.

### *1.3 Tendencies of catch and effort during the period 1976-79*

The catches have been increasing according to the enlargement of the fleet. The total catch in 1979 was 7,964.4 MT while in 1976 it was 3,329.3 MT. This increase was due to the operation of the leased longliners and to the rapid development of the live-bait fisheries. Of the 1979 total catch, 1,336 MT were caught by the leased longliners, 1,229 MT by the national longliners and 2,345.4 MT by the live-bait boats. The catch of the artisanal fleet in the northeast was about 3,050 MT.

It is expected that in 1980 the longline catches will remain at the same level as 1979. However, there should be a substantial increase by the live-bait fishery since the fleet continues to expand. It is estimated that the catches will be between eight and ten thousand tons.

The performance of each fleet has been as follows:

#### a) Longline fleets

The fishing effort of the fleet based in Rio Grande was only 273,825 hooks during the first year of operation (1977); the catch was 417.3 MT and the catch rate was 152.3 kg/100 hooks/day. Billfishes made up almost 50 percent of the total catch. The fleet operated only from September to December, concentrating its activities in the southeast, between 15° S and 20° S, which explains in a way the large catch of billfishes (Table 1).

In 1978, the effort was 1,733,413 hooks of which a small amount (less than 20 percent) was applied in the northeast region at the beginning of the year. The balance was applied in the southeast-south region between 20° S and 30° S. The total catch was 1,718.1 MT. The catch rate was 99.1 kg/100 hooks/day. Although there was a decrease in the catch rate, there was an increase in catches of yellowfin, albacore and bigeye consisting of around 70 percent of the total weight because the area between 15° S and 20° S where billfishes are abundant was avoided. The data resulting from the operation of two boats based in Sao Sebastiao are also included in this period. The catches were very small in view of a series of operational problems which resulted in a low catch rate.

In 1979, the effort was 1,176,277 hooks, the total catch was 1,336.0 MT and the catch rate was 113.6 kg/100 hooks/day. The greatest concentration of effort was in the south region in the waters of the State of Rio Grande do Sul and the yield was better than the previous year. The high catch rate of yellowfin, albacore and bigeye was maintained. Another species which significantly contributed to the catches was the broadbill swordfish constituting about 11 percent of the total weight.

The reduction in effort was due to the improvement in yields and to the interruption of the operations of the two boats based in Sao Sebastiao which reinitiated their operation only in October in Rio Grande.

During the whole period of the fleet's operation there was a total effort of 3,183,515 hooks, a total catch of 3,471.4 MT and a catch rate of 109.1 kg/100 hooks/day. The species composition, not including the data of 1977, was the following: 25.6 percent big-eye tuna, 24.0 percent yellowfin tuna, 19 percent albacore, 0.8 percent bluefin tuna, 9.0 percent broadbill swordfish, 7.0 percent Atlantic white marlin, 1.0 percent Atlantic blue marlin, 1.8 percent Atlantic sailfish, 11.8 percent other species.

The statistics on fishing effort of the Korean boats operating during 1976 are not available. During this year information was collected only on the total catch, 496.5 MT (Table 1).

In 1977, the effort recorded was 1,273,062 hooks, with a significant amount of this total, about 61 percent, being concentrated in the fishing area located between the latitudes of  $05^{\circ}$  S and  $10^{\circ}$  S. The total catch recorded was 883.4 MT, corresponding to a catch rate of 69.4 kg/100 hooks/day. Although this yield was lower than that registered for the fleet in operation in the southeast-south region, there was a greater quantity of yellowfin, albacore and bigeye representing about 83 percent of the total weight. It is estimated for this fleet that there was a total effort of 1,739,966 hooks for a catch of 1,207.2 MT during 1977.

According to Table 1, the effort and catches of the national fleet based in Santos were stable during the period 1976-79, the average number of hooks was 1,227,821, corresponding to an average catch of 1,265 MT, except in 1978, when there was a significant decrease in the catches which were 40 percent below the average of the other years. The average catch rate, not including 1978, was 103 kg/100 hooks/day. In that year, the catch rate was only 60.7 kg/100 hooks/day.

The largest catches were those of yellowfin tuna which represented about 32.4 percent of the total weight, the catches of broadbill swordfish represented 19.2 percent, albacore 11.6 percent, bigeye tuna 9.8 percent, other billfishes 8.3 percent and other species 18.7 percent.

#### b) Live-bait fleet

In view of the rapid growth of the fleet, precise information on the trends of effort and catches during 1979 is not available. According to the records maintained by the Fisheries Research and Development Program in Rio de Janeiro, the initial fleet of two boats had increased to 23 by the end of 1979. In 1980, there are already 33 boats operating.

Based on data collected during the first quarter of 1980, the yield of the fisheries has been estimated at 8.2 MT/day, which includes only the three main species caught.

The total catch in 1979 was 2,345 MT and in the first quarter of 1980 it was 3,213.5 MT. The largest concentration of effort has been observed in the southern part of the area. The species composition of the catch has been as follows: skipjack, about 80 percent; blackfin tuna, about 6 percent; yellowfin tuna, 2 percent. The frigate tuna should be noted among the other species caught (Tables 2, 3 and 4).

#### c) Artisanal fisheries in the northeast

The data available on effort and catches of the northeast fisheries are insufficient for a detailed analysis. Only data on landings are available, except for the effective recording system of the blackfin tuna fisheries in the Formosa Bay area, Rio Grande do Norte

and of the king mackerel and spotted Spanish mackerel fisheries in the State of Ceará. Table 1 shows that in the period 1978-79 the artisanal catches in the northeast were about 3,200 MT. The species composition was blackfin tuna, king mackerel and spotted Spanish mackerel, Atlantic sailfish, Atlantic bonito and yellowfin tuna. Other species were caught in negligible quantities.

In Formosa Bay, the average catch of blackfin tuna during 1977-79 was 72.5 MT, made by an average of 71 boats fishing during 2,104 trips/year, corresponding to a catch rate of 34.5 kg/one-day trip. This is a seasonal fishery which takes place during the first and fourth quarters of the year, probably because the species is found closer to the coast during those periods (Table 5).

The catch rates of king mackerel and spotted Spanish mackerel in Ceará are not very high which could be attributable to the scarcity of the species or to the ineffectiveness of the gear used, in particular, the troll line. The second hypothesis could be more realistic. There was a decrease in the catch-per-unit-of-effort of those species during 1965-1975 followed by an increase from 1976 to 1978 (Table 6), probably caused by a change in the type of boat used.

## 2. Research programs

Various research programs are being carried out, among which the following should be noted: collection of statistics, collection of biological data and oceanographic studies. Exploratory fishing has been reinitiated and includes some tagging in Rio Grande do Norte. In Rio de Janeiro, some tagging should be done from live-bait boats.

The majority of the activities are related to the International Skipjack Year Program. Results have been obtained according to some documents presented to the SCRS and others in preparation.

The research institutions concerned with the above-mentioned research activities are as follows:

- Oceanographic Institute of the University of Sao Paulo (IO-USP)
- Fisheries Institute of the State of Sao Paulo (Inst. de Pesca SP)
- State Enterprise for Agriculture and Cattle Research of the State of Rio de Janeiro (PESAGRO-RJ)
- Sciences of the Sea Laboratory of the Federal University of Ceará (LABOMAR-UFC)
- National Institute for Space Research (INPE)
- Superintendency for the Development of Fisheries (SUDEPE)

**Table 1. Annual catches of tuna and related species off the coast of Brazil, by gear and fishing areas, 1976-79**

Yrs	Area	Gear	Effort (No./hooks)	Total catch	BFT	YFT	ALB	BET	BLF	Catches by species (MT)								Others
										SWO	WHM	BUM	SAI	SJT	KGM	WAH	SSM	
76	SE-S <sup>1</sup>	LL	1,085,005	1,276.1	--	375.5	156.8	99.9	0.4	309.8	25.8	--	94.8	--	--	--	--	213.1
	NE	LL		496.5	--	221.6	123.6	69.9	--	22.3	26.4*	--	--	--	--	--	--	32.7
	NE	Troll		1,556.7	--	(485)	--	--	56.4	0.3	25.2	10.9	61.9	83.2	546.0	4.8	283.0	--
	Total			3,329.3	--	1,082.1	280.4	169.8	56.8	332.4	77.4	10.9	156.7	83.2	546.0	4.8	283.0	245.8
77	SE-S <sup>1</sup>	LL	1,250,335	1,290.5	--	326.2	157.0	133.3	--	275.2	9.7	--	79.8	--	--	--	--	309.3
	SE-S <sup>2</sup>	LL	273,825	417.3	0.2	40.4	55.3	57.8	--	8.5	188.9*	--	--	--	--	--	--	66.2
	NE	LL	1,739,966	1,207.2	--	455.5	329.8	219.6	--	41.2	18.8	29.4	34.5	--	--	--	--	78.4
	NE	Troll		2,980.0	--	(485)	--	--	272.5	12.3	3.1	51.9	119.1	187.5	790.2	72.9	985.5	--
	Total			5,895.0	0.2	1,307.1	542.1	410.7	272.5	337.2	220.5	81.3	233.4	187.5	790.2	72.9	985.5	453.9
78	SE-S <sup>1</sup>	LL	1,281,380	777.4	--	292.6	64.8	66.6	--	115.0	17.0	9.8	82.0	--	--	--	--	129.6
	SE-S <sup>2</sup>	LL	1,733,413	1,718.1	11.9	398.3	374.2	426.1	--	128.9	119.5	24.0	34.1	--	--	--	--	201.1
	NE	Troll		3,466.1	--	(485)	--	--	189.6	4.9	1.9	1.7	89.5	279.9	844.6	46.6	1,522.4	--
	Total			5,961.6	11.9	1,175.9	439.0	492.7	189.6	248.8	138.4	35.5	205.6	279.9	844.6	46.6	1,522.4	330.7
79	SE-S <sup>1</sup>	LL	1,294,565	1,229.0	--	488.8	150.7	148.1	--	177.7	13.7	10.1	35.1	--	--	--	--	204.8
	SE-S <sup>2</sup>	LL	1,176,277	1,336.0	8.7	335.1	215.6	355.3	--	144.0	92.5	3.2	21.6	--	--	--	--	160.0
	SE-S	BB		2,345.4	--	586.4	--	--	351.8	--	--	--	--	1,407.2	--	--	--	--
	NE	Troll		3,054.2	--	429.3	--	--	172.6	1.2	3.9	12.7	83.9	246.4	847.6	65.9	1,190.7	--
	Total			7,964.4	8.7	1,839.6	366.3	503.4	524.4	322.8	110.1	26.0	140.6	1,653.6	847.6	65.9	1,190.7	364.7

Obs: The catches by troll line of the northeast region refer to the artisanal fishery.

\*Total of billfishes.

1 - Fleet of national longliners.

2 - Fleet of leased longliners.

( ) - Estimate.

Source: System of landings control and system of logbooks - DARP/PDP/SUDEPE  
Fishery Institute - Santos (SP).



Table 2. Monthly catches of tunas and related species by the live-bait fisheries in the State of Rio de Janeiro during 1979.\*

<i>Month</i>	<i>Landing Points</i>		<i>Total</i>
	<i>Industries</i>	<i>Terminal Rio de Janeiro</i>	
January	50,737	7,807	58,544
February	218,746	7,652	226,398
March	48,698	13,504	62,202
April	16,010	39,934	55,954
May	120,078	34,524	154,602
June	188,272	1,910	190,182
July	104,183	1,347	105,530
August	329,163	4,600	333,763
September	350,654	1,386	352,040
October	219,140	3,872	223,012
November	170,627	13,323	183,950
December	138,276	20,165	158,441
Total	2,195,367	150,024	2,345,391

\*Source: Logbook systems SUDEPE/PDP - Base of Rio de Janeiro.

Table 3. Monthly catches of tunas and related species by the live bait fisheries in the state of Rio de Janeiro during the first quarter of 1980\*

Month	Landing Points		Total
	Industries	Terminal Rio de Janeiro	
January	26,289	35,545	61,834
February	75,310	48,749	124,059
March	183,155	42,536	224,691
April	909,931	15,295	747,955
May	808,925	7,220	816,145
June	1,052,167	8,428	1,060,595
Total	3,055,777	157,773	3,213,550

\*Source: Logbook Systems SUDEPE/PDP - Base of Rio de Janeiro.

Table 4. Total catches by species by the live-bait fisheries in the state of Rio de Janeiro during the first quarter of 1980\*

Species	Catches (kg)	Percentage of Composition by Weight
Yellowfin tuna ( <i>Thunnus albacares</i> )	55,160	1.72
Blackfin tuna ( <i>Thunnus atlanticus</i> )	151,068	4.70
Bigeye tuna ( <i>Thunnus obesus</i> )	1,986	0.06
Frigate tuna ( <i>Auxis thazard</i> )	4,262	0.13
Skipjack ( <i>Katsuwonus pelamis</i> )	3,001,074	93.39
Total	3,213,550	100.00

\*Source: Logbook Systems - SUDEPE/PDP - Base of Rio de Janeiro.

**Table 5. Catches, fishing effort (no. of trips) and CPUE (catch/trip) of blackfin tuna by the fisheries in Formosa Bay (State of Rio Grande do Norte), during the last quarter of 1977, 1978 and 1979\***

<i>Years</i>	<i>Months</i>	<i>No. of boats</i>	<i>No. of trips</i>	<i>Average trips/boat</i>	<i>Catches (kg)</i>	<i>Catch/trip (kg)</i>
1977	October	70	917	13.10	22,184	24.19
	November	69	780	11.30	42,807	54.88
	December	65	518	7.97	23,464	45.30
	Total	--	2,215	10.86	88,455	39.94
1978	October	64	488	7.60	4,198	8.60
	November	82	950	11.60	38,877	36.70
	December	74	458	6.20	14,762	32.20
	Total	---	1,896	8.60	53,837	28.40
1979	October	75	716	9.55	16,888	23.60
	November	74	747	10.09	30,698	41.40
	December	70	737	10.53	24,564	33.30
	Total	--	2,200	10.05	72,150	32.80

\*Source: System of control of landings SUDEPE/PDP - Base of Rio Grande do Norte.

Obs: Round trips (departure and arrival on the same day).

**Table 6. Data on catch and effort of the fisheries of king mackerel, *Scomberomorus cavalla*, and spotted Spanish mackerel, *Scomberomorus brasiliensis*, off the state of Ceará during 1979\***

Months	Recorded catch (No. of individuals)			Effort of recorded fisheries			Index of abundance (No. fish/100 hooks/day)		
	KGM	SSM	Total	No. of fishing days	No. of fishermen/ day	No. of hooks/day	KGM	SSM	Total
January	557	358	915	72	198	337	165.3	106.2	271.5
February	302	138	440	36	103	275	109.8	50.2	160.0
March	488	137	625	76	171	378	129.1	36.2	165.3
April	301	80	381	43	94	230	130.9	34.8	165.7
May	330	90	420	49	77	228	144.7	39.5	184.2
June	153	90	243	24	39	116	131.9	77.8	209.5
July	50	68	118	14	31	78	64.1	87.2	151.3
August	263	238	501	45	86	212	124.1	112.3	236.3
September	278	316	594	52	87	222	125.2	142.3	267.6
October	322	231	553	57	98	236	136.4	97.9	234.3
November	499	289	788	77	121	318	156.9	90.9	247.8
December	511	279	790	64	93	260	196.5	107.3	303.8

\*Source: Sciences of the Sea Laboratory - Federal University of Ceará.

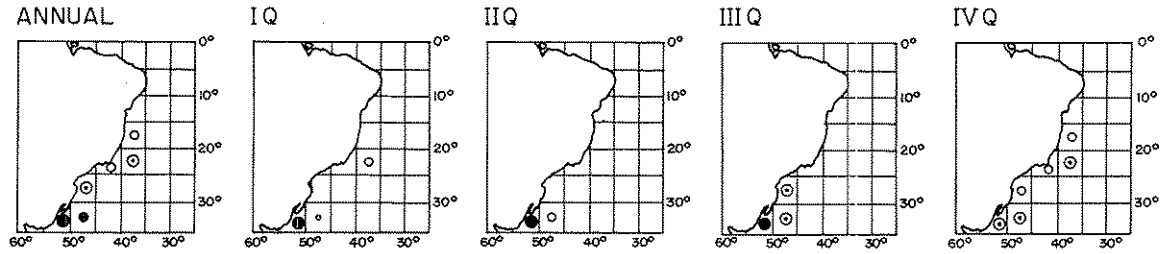


Fig. 1 Annual and quarterly distribution of fishing effort (hundred hooks) by  $5^\circ$  squares, in the fisheries of the Japanese leased fleet during 1979.

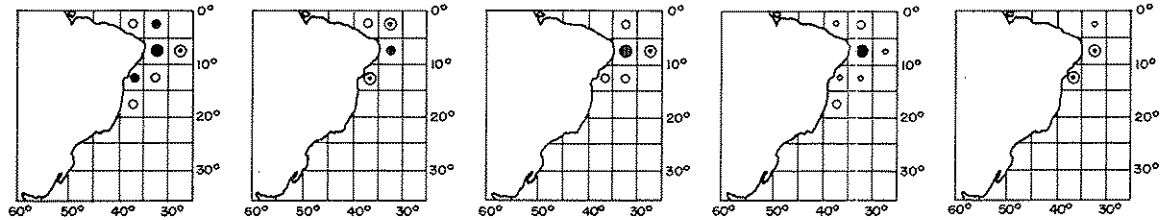


Fig. 2 Annual and quarterly distribution of fishing effort (hundred hooks) by  $5^\circ$  squares, in the fisheries of the Korean leased fleet during 1977.

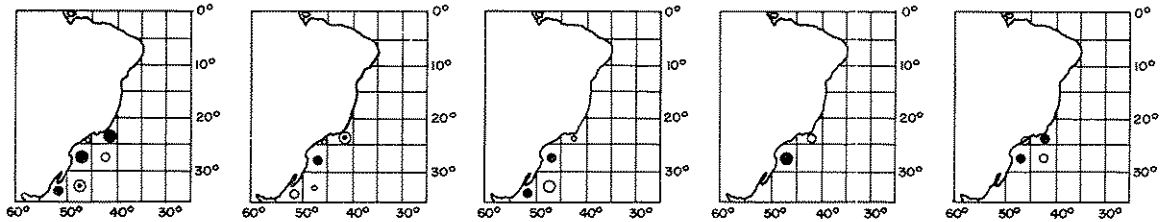
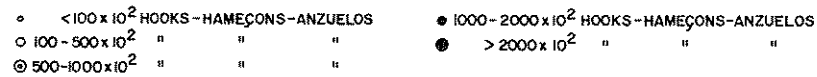


Fig. 3 Annual and quarterly distribution of fishing effort (hundred hooks) by  $5^\circ$  squares, in the fisheries of the national fleet during 1979.



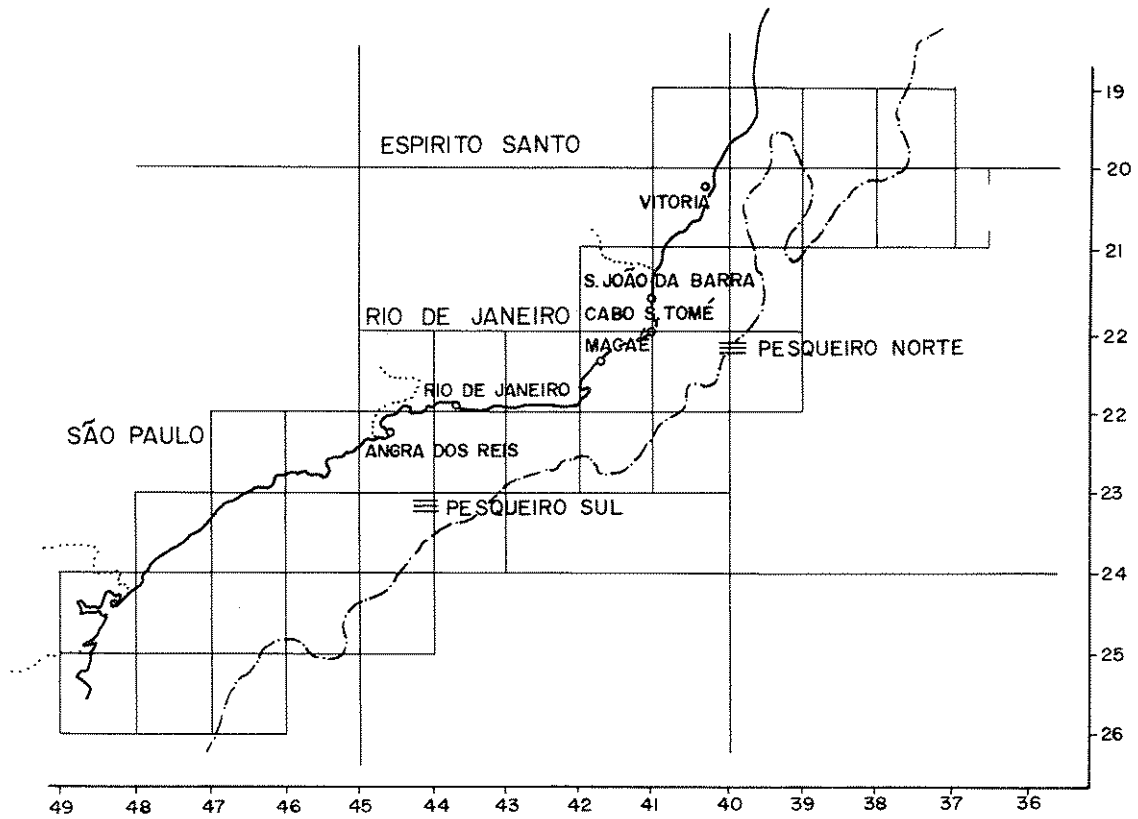


Fig. 4 Area of operation of the live-bait fleet.

## CANADIAN NATIONAL REPORT, 1979-80

by

T. D. ILES, P. C. F. HURLEY, and C. D. BURNETT

### 1. Status of the fisheries

#### 1.1 *Swordfish*

The nominal catch of swordfish in Canada in 1979 amounted to 2,970 MT. Most of this was transshipped at sea to American vessels and landed at American ports. Licensing and a 3,000 MT quota were introduced into this fishery this year.

#### 1.2 *Tunas*

Canadian landings of bluefin tuna in 1979 amounted to 245 MT, a 64 percent decrease from the previous year. The mackerel trap fishery in St. Margaret's Bay accounted for only 31 MT of giant bluefin while 214 MT of giant bluefin were taken by the rod and reel fishery.

There was no Canadian purse seine effort in the Atlantic in 1979.

Both length of season and number of licenses issued were increased in 1979 in the bluefin rod and reel fishery. A quota of 2,200 bluefin tuna was established for the bluefin tuna fisheries in Canadian waters. Regulations remained unchanged otherwise.

### 2. Special research studies

#### 2.1 *Swordfish*

To assess changes in this fishery during the past nine years, observers were placed on board several commercial vessels to examine fishing techniques and to conduct biological sampling. In addition, detailed fishing logs were collected to cover approximately 22 percent of the catch. Preliminary analysis of catch and effort data suggests only a partial recovery of the stock exploited by this fishery.

One tagged swordfish was recaptured in 1979. This swordfish was tagged by harpoon in 1968 off Nova Scotia and was recaptured by longline off the east coast of Florida after 3,995 days at large. This time-at-large record produced growth data suggesting a very slow growth rate in swordfish.

Original report in English.

## 2.2 Tunas

Weights were recorded for 501 giant bluefin caught in Canadian waters in 1979, approximately 90 percent of the total catch, while fishing logs covering approximately 75 percent of the effort were collected. There was once again a slight increase, 3.6 percent, in the mean weight of fish taken in the rod and reel fishery in the Gulf of St. Lawrence. Individual weights ranged from 250-601 kg with a mean of 424 kg. Despite an increase of almost 25 percent in rod and reel effort in the Gulf of St. Lawrence, the catch in this area showed no increase. The catch off Prince Edward Island decreased from 437 fish in 1978 to 317 in 1979, while the catch in Chaleur Bay increased slightly to 75 fish. However, there was an increase in the catch in the St. George's Bay off Nova Scotia from 17 to 111 fish as a result of new licenses issued and a sharp increase in effort in this area.

The trap fishery in St. Margaret's Bay decreased dramatically again in 1979. From 948 fish in 1977 to 530 in 1978, the catch dropped to 72 fish in 1979. The low catch is likely a result of a combination of low water temperatures and reduced abundance of forage species in the area.

Bluefin tuna sampling was continued at various locations in 1979. Detailed morphometric data were collected from 125 giant bluefin, and otoliths were obtained from 105 of these.

No bluefin were tagged and released in Canadian waters in 1979. Three tagged bluefin were recaptured; two had been released from rod and reel in Chaleur Bay in 1975 and 1977 and were recaptured in the same area; and one, which had been released from rod and reel off the Atlantic coast of Nova Scotia in 1977, was recaptured by rod and reel south of Puerto Rico in April 1979.

## 3. Preliminary information for 1980

Canadian swordfish regulations established in 1979 were adopted in 1980 with only slight modifications. The quota was increased to 3,500 MT and the licensing of vessels was closed in mid-season. Preliminary reports indicate that a good season was experienced.

A 50-day Canadian swordfish research survey covering an area from Cape Hatteras to the Grand Banks was conducted in 1980. Materials were collected for examination of stock determination, migration, ageing, growth, feeding, reproduction, parasites and mercury and other environmental contamination, and are being analyzed at present. In addition, 48 swordfish, one bluefin tuna, one bigeye tuna, 183 pelagic sharks and five other pelagic fishes were tagged and released from longline capture. A further 17 swordfish were harpoon tagged.

Canadian bluefin tuna regulations introduced during the 1979 season remained in effect with only slight modifications. Preliminary catch figures for the giant bluefin fisheries in Canadian waters indicate there has been only a slight improvement in catches in 1980. The rod and reel fishery in Prince Edward Island has taken approximately 407 fish while the fishery in Chaleur Bay has taken approximately 234 fish. The fishery in St. George's Bay has taken approximately 30 fish, but does not finish until mid-November. The trap fishery in St. Margaret's Bay has taken approximately 112 fish.

There was no Canadian purse seine fishery for tuna in the Atlantic in 1980.

During a seven-day period immediately prior to the opening of the 1980 rod and



reel season in the Gulf of St. Lawrence. 13 bluefin tuna were tagged and released by rod and reel in Chaleur Bay. On the opening day of the season, five days after their release, two of these fish were recaptured in the same area. None of the remaining fish were recaptured during the remainder of the season.

Two additional bluefin recaptures were reported. One fish, tagged and released from rod and reel in Chaleur Bay in 1974, was recaptured by a Japanese longliner in the Gulf of Mexico in late February 1980. The other, also tagged and released from rod and reel in Chaleur Bay in 1975, was recaptured in the same area this season.

#### 4. Publications

BURNETT, C. D., P. C. F. HURLEY and T. D. ILES

1980 MS Report to the ICES Bluefin Tuna Working Group - Canadian Report 1979, 5 p.

HURLEY, P. C. F. and T. D. ILES

1980 A review of the Canadian swordfish fishery.

HURLEY, P. C. F., G. A. P. Black and T. D. ILES

1980 Analysis of catch and effort data from the Canadian bluefin tuna rod and reel fishery.

HURLEY, P. C. F., T. D. ILES and C. A. DICKSON

1980 Age and growth of giant bluefin tuna taken in Canadian waters in recent years.

## SUMMARY OF THE STATE OF THE TUNA FISHERIES — REPUBLIC OF CAPE VERDE

by

M. H. SANTA RITA VIEIRA

The "Direction Générale des Pêches," the organization in charge of defining a development strategy in the Cape Verde area, has only been in existence for four years. The lack of qualified personnel as well as budgetary limitations have not permitted the establishment of an adequate administrative scheme compatible with the importance of tuna fishing in the country's economy.

The commercial fishery is fundamentally dedicated to the fishing of tunas, a seasonal activity carried out from May to November. The main species, in order of weight, are *Katsuwonus pelamis*, *Thunnus albacares*, and *Thunnus obesus*, caught by pole-and-line and live bait.

Approximately 70 percent of the catch is exported frozen and 30 percent is canned in small semi-artisanal canning factories (see table).

<i>Years</i>	<i>Catch</i>	<i>Frozen</i>	<i>Fish to be canned</i>	<i>Canned fish</i>
1979	1,702 MT	1,207 MT	495 MT	165 MT
1980 (up to Sept.)	1,233 MT	768 MT	455 MT	143 MT

In 1979, a government agency, INTERBASE, was created to encourage the development of commercial fishing. This agency is in charge of the freezing, canning and exportation of tuna, as well as the sale of cold-storage facilities and other services to the fleets operating in the area.

The artisanal fishery only supplies fresh fish to the local population and this fishery is especially interested in the demersal species.

A government organization, SCAPA, handles the commercialization of the catches.

A small amount of tuna caught by the artisanal fishery is exported after the local demand is satisfied.

In 1981-82, the fishery agency will have at its disposal a research and statistics group which will permit greater participation in ICCAT activities.

Original report in French.

## CUBAN TUNA FISHERIES IN THE ATLANTIC OCEAN AND RESEARCH ACTIVITIES CARRIED OUT IN 1979

### 1. The tuna fishing fleet

The Cuban longline fleet that operated in the Atlantic Ocean was comprised of 24 vessels. The fleet carried out its fishing operations in the Caribbean Sea and eastern Atlantic, mainly in the central-eastern Atlantic. The total catches of this fleet reached 6,100 MT.

The only purse seiner in operation carried out its fishing activities in the eastern Atlantic. This vessel's catch reached 800 MT and was basically made up of yellowfin and skipjack.

The Cuban flat fleet that operated in the waters near the Cuban coast was comprised of about 60 small baitboats and caught 2,000 MT of skipjack during 1979. Small longliners and trollers operating in Cuban waters caught approximately 600 MT of swordfish and spotted Spanish mackerel.

### 2. The tuna catches

Cuban tuna catches for 1979 reached 9,500 MT, and were made up as follows: 3,400 MT yellowfin, 2,300 MT bigeye, 2,100 MT skipjack, 800 MT billfish, and 400 MT each of swordfish and spotted Spanish mackerel.

Cuban tuna catches in the Atlantic Ocean from 1975-1979 were as follows:

<i>Species</i>	<i>1975</i>	<i>1976</i>	<i>1977</i>	<i>1978</i>	<i>1979</i>
Yellowfin	2.6	3.6	3.9	3.0	3.4
Albacore	0.1	0.1	0.1	0.1	---
Bigeye	1.9	1.3	1.8	2.3	2.3
Skipjack	2.6	3.0	2.5	2.0	2.1
Billfish	1.4	0.7	0.6	0.5	0.8
Swordfish	---	0.6	0.7	0.6	0.4
Spotted Spanish mackerel	0.6	0.5	0.4	0.6	0.4
Other species	1.0	0.4	0.1	0.1	0.1
TOTAL (in 1,000 MT)	10.2	10.2	10.1	9.2	9.5

Original report in Spanish.

### 3. Research

Research activities have been centered on skipjack which inhabit Cuban waters and adjacent areas.

During 1979, monthly sampling for length/weight composition of the catch was conducted in the major landing ports. Also several research and monitoring cruises were carried out. A series of experiments aimed at lowering the mortality of the bait used in fishing operations was carried out.

Regarding Cuban participation in the International Skipjack Year Program, the necessary preparations in research matters that Cuba has promised to carry out are continuing.

## REPORT OF 1979 FRENCH RESEARCH

by

D. GUERULT\*

### 1. Status of fishing in France

It is estimated that a total of 66,800 MT of tunas were caught in 1979 off the coasts of France and on the high seas. This figure represents a decrease of about 7,000 MT from 1978's report.

### 2. Development of the catches from 1973 to 1979

	1973	1974	1975	1976	1977	1978	1979
Albacore	6.1	9.0	6.1	6.7	6.8	8.4	8.0
Yellowfin	32.3	31.5	38.0	48.0	37.9	41.6	38.7
Skipjack	12.7	24.5	11.4	18.4	24.8	19.9	15.2
Bigeye	2.5	0.5	0.04	1.0	3.0	2.2	3.1
Bluefin	1.5	2.3	2.3	3.8	3.7	2.3	1.8
Total (in 1,000 MT)	55.1	67.8	57.8	77.9	76.2	74.4	66.8

#### 2.1 *Albacore*

The excellent yields of the French tuna fleet (about 170 vessels) made up for a decrease of about 20 percent in fishing effort in 1979 as compared to 1978. This decrease is essentially due to the fleet's delay in starting fishing.

#### 2.2 *Bluefin*

In 1979, bluefin catches reached 1,850 MT of which 1,578 MT were from the Mediterranean and 272 MT were from the Atlantic.

A sampling of the Mediterranean catches showed that 42,826 bluefin tuna weighing 1,002,556 tons made up 65 percent of the total landings. The 24 purse seiners that operated in 1979 made a total of 68 successful trips.

\*"Institut Scientifique et Technique des Pêches Maritimes," B.P. 1049, 44037 Nantes Cédex, France. Original report in French.

### 2.3 *Tropical tunas: yellowfin, skipjack, bigeye*

The total catches were about 57,000 MT as compared to 64,000 MT in 1978. This decrease in catch is attributed to an almost equal decrease in yellowfin and skipjack catches.

### 3. Research carried out

Three organizations participated in tuna research: ISTPM ("Institut Scientifique et Technique des Pêches Maritimes"), COB ("Centre Océanologique de Bretagne") and ORSTOM ("Office de la Recherche Scientifique et Technique Outre-Mer").

#### 3.1 *ISTPM*

##### a) Albacore

Two albacore research cruises were conducted by the ISTPM in 1979.

The first cruise took place from July 12 to August 11. It was carried out by the oceanographic vessel, *Cyros*, and surveyed, in the northwest Atlantic, a vast area between north of the Azores Islands and south of the Great Bank of Newfoundland. The presence of large albacore (up to 18 kg), fishable from the surface by troll lines northwest of the Azores Islands, was noted. Of a total of 104 albacore caught, 81 were returned to sea with one or two tags attached. It should also be pointed out that 38 skipjack were caught in the area to the south of the Great Bank of Newfoundland.

The research cruise conducted by the oceanographic vessel *La Pélagia* took place August 2 - 29 along the coasts of France. Adverse weather conditions greatly hampered this cruise and only 153 albacore were caught (56 of which were tagged).

##### b) Bluefin

The work carried out in the Mediterranean was essentially dedicated to the quantitative analysis of the landings which showed that the major part of the catches made in 1979 was comprised of two- and three-year old fish (85 percent of the total number and 80 percent of the total annual weight). The growth study of Mediterranean bluefin was completed. The work concerning the validity of the CPUE in the Mediterranean was carried out in collaboration with Italy.

#### 3.2 *ORSTOM*

The studies center on tropical tunas and are coordinated within the scope of national research programs. They are explained in the national reports of Senegal and the Ivory Coast. The overall processing of statistics of the FISM fleet is carried out by the ORSTOM branch located at the COB (Brest), and was used for many studies on the status of stocks.

### 3.3 COB (CNEXO)

#### a) Albacore

As in 1978, the catch and effort statistics were collected, in collaboration with scientists from the "Instituto Español de Oceanografía." A study of the state of stocks in 1979 was made according to these data, as well as the data from the longline fishery, provided by ICCAT member countries and ICCAT Statistical Bulletins.

A growth study, from the dorsal fin ray sections, made possible the forming of a set of growth curves distinguishing the males from the females, permitting the development of a new synthetic age composition table. Different hypotheses have been made regarding albacore biology which can have repercussions regarding the evaluation of mortality parameters on one hand, and fecundity on the other. However, more information on the sex ratio of the catches will be needed to verify the merit of such hypotheses.

#### b) Bluefin

The French/Spanish fishery off the Bay of Biscay has been monitored, in collaboration with the Spanish scientists. A growth curve derived from the study of dorsal fin ray sections has been proposed. Finally, an evaluation of apparent recruitment in the area to the west of Gibraltar (east Atlantic) has been proposed.

#### c) General studies

A new method of multi-cohort analysis was proposed, taking into account two successive age-classes. Application of this method has been made in evaluating the fishing mortality and recruitment of albacore.

### 4. Skipjack Program

France continues emphasizing the importance of the activities of the Skipjack Program. The three organizations (CNEXO, ISTPM and ORSTOM) are participating in the Program and their activities are coordinated at the national level. 1979 was essentially dedicated to setting up the Program, whose field activities were begun in 1980 by tagging, updating a new statistical system, putting an observer on board tuna vessels and collecting hard parts for growth studies.

### 5. Documents presented at the 1980 SCRS meeting

ANTOINE, L. and A. GONZALES-GARCES

Commentaires sur l'état du stock de germon (*Thunnus alalunga*) nord-Atlantique, 1980.

DELAPORTE, F.

Evolution des populations de germon (*Thunnus alalunga*) dans le nord-est Atlantique.

FARRUGIO, H.

- a) Etude de l'évolution du stock de thons rouges de 1 à 12 ans en Est Atlantique et Méditerranée, de 1966 à 1978 par analyse des cohortes.
- b) Résultats de la pêche du thon rouge en Méditerranée française en 1979.

FONTENEAU, A.

Note sur le mode de calcul de la PUE des senneurs FISM.

FONTENEAU, A. and P. CAYRE

Analyse de l'état des stocks d'albacore (*Thunnus albacares*) et de listao (*Katsuwonus pelamis*) de l'Atlantique, au 30 septembre 1980.

FONTENEAU, A. and M. SLEPOUKHA

Statistiques de la pêcherie thonière FISM durant la période 1969-1979.

GUERALT, D.

Rapport de recherches 1979 pour la France.



## GHANA NATIONAL REPORT – TUNA FISHERY, 1979

### 1. Tuna fleet

In 1979, fifty-two tuna vessels were registered, of which forty-seven operated. These comprised thirty-nine foreign and eight Ghanaian vessels.

The Ghanaian fleet that operated consisted of the following:

<i>Vessel</i>	<i>Gear</i>	<i>GT</i>
Mary Radine	Baitboat	283.88
No Catch No Pay	"	284.73
Fernanda Marisa	"	282.94
Nick "T"	"	282.99
Joy	"	253.88
Afko 301	"	254.46
Afko 302	"	253.94
Azuma Maru 2	"	284.76

The foreign fleet consisted of the following:

<i>Flag</i>	<i>Gear</i>	<i>Number</i>	<i>Range in GT</i>
Japan	Baitboat	19	253.94 – 379.59
Panama	"	9	252.18 – 454.71
Korea	"	8	188.84 – 416.95
Honduras	"	2	456.77 – 457.11
Netherlands	"	1	245

The Ghanaian artisanal fleet also continued to catch tunas and related species in 1979.

### 2. Landings

During 1979, the following landings in metric tons were made by foreign and Ghanaian flag vessels.

Original report in English.

<i>Species</i>	<i>Foreign Flag</i>	<i>Ghanaian Industrial</i>	<i>Ghanaian Artisanal</i>	<i>Total</i>
Yellowfin	2475.018	288.130	239.600	3002.748
Bigeye	3451.729	115.416	55.300	3622.445
Skipjack	31695.561	3905.144	292.144	35893.005
Black skipjack	129.248	131.237	---	260.485
Frigate tuna	---	---	4286.400	4286.400
Others	1410.427	1136.908	8106.600	10653.935
Total	39161.983	5576.835	12980.200	57719.018

The total quarterly landings of the industrial fleet, in metric tons, are as follows:

<i>Species</i>	<i>1st Qtr.</i>	<i>2nd Qtr.</i>	<i>3rd Qtr.</i>	<i>4th Qtr.</i>	<i>Total</i>
Yellowfin	572.186	593.138	771.797	826.027	2763.148
Bigeye	752.054	628.094	1109.018	1077.979	3567.145
Skipjack	9828.392	7911.754	11051.435	6809.124	35600.705
Black skipjack	103.337	95.117	36.811	25.220	260.485
Others	131.200	203.285	790.466	1422.384	2547.335
Total	11387.169	9431.388	13759.527	10160.734	44738.818

### 3. Research

During the year, research into the biology and population dynamics of tunas continued.

#### 3.1 Biological sampling

i) Sampling was continued for studies into the length frequency distributions, maturity and feeding of the tropical tunas. The species studied were yellowfin, bigeye and skipjack. A total of 4,280 yellowfin, 2,900 bigeye and 5,930 skipjack were measured during the year.

The length frequency distributions continued to demonstrate the predominance of young tunas off Ghana.

ii) Another study that was continued was that of the biology of young tunas involving the gonado-somatic indices and stomach contents of juvenile tunas landed by the Ghanaian flag fleet which are used for feeding the local cannery.

iii) In addition to port sampling, at-sea sampling of tunas was carried out with the cooperation of Star-Kist, Int. Ghanaian scientists on-board tuna boats fishing for Star-Kist, Int. obtained valuable information, including data on species composition of tuna

schools, magnitudes of discards of juvenile tunas at sea and weights of bait caught. Five such cruises were undertaken during the year.

### *3.2 Discards*

The problem of discards of under-sized yellowfin at sea continued to engage the attention of the Fishery Research Unit. Discard forms were distributed to the tuna fleet to complete with data concerning the magnitude and the rate at which juvenile yellowfin were discarded at sea. The cooperation of the tuna fleet in this exercise was not encouraging. A total of only thirty-six discard forms were completed throughout 1979. Based on these data, it is estimated that a total of 3,259 MT of juvenile yellowfin were discarded by the Tema-based foreign flag baitboats in 1979.

## **4. Research programs for 1980-81**

*4.1 The Research Unit will participate fully in the International Skipjack Year Program, especially in:*

- a) Sampling for Maturity and Fecundity
- b) Port and Intensive Sampling
- c) Collection of otoliths and dorsal spines
- d) Collection of stomachs
- e) Providing technicians for dart tagging

*4.2 Other research work involves the following:*

- a) Gonado-somatic indices and the feeding of the juvenile tunas
- b) Improvement in Task II statistics and size sampling
- c) Improvement in logbook coverage.

# NATIONAL REPORT OF THE IVORY COAST

by

L. KOFFI, F. X. BARD, J. B. AMON KOTHIAS.

## 1. Development of the Ivorian fleet and catches

From two vessels in 1970—a medium-sized purse seiner (MS) and a large purse seiner (GS), the Ivorian fleet increased to four vessels in 1975, to seven vessels in 1977 (2 MS and 5 GS) and to eight vessels in 1979.

The catches, which totaled 19,530 MT in 1976 and which reached 16,354 MT in 1977, decreased to 13,018 MT in 1979. A breakdown by species is as follows:

Yellowfin	8,981 MT
Skipjack	3,804 MT
Bigeye	207 MT
Albacore	26 MT

In 1980, the preliminary estimates for the period January to October are 12,574 MT.

## 2. Canning

Canned fish represented 6,310 MT, which is 48.47 percent of the catch.

## 3. Statistics

The Ivorian tuna statistics for Task I, Task II and biological data are combined with those of the French, Senegalese and Moroccan (FISM) fleets which are reported elsewhere.

Otherwise, the statistics collected in Abidjan also refer to the Moroccan and French tuna vessels based at that port. The landings thus effected in Abidjan in 1979 amounted to 54,029 MT. A decrease of about 26 percent is noted from 1975 (72,800 MT) and from 1976 (73,118 MT). This is due to the fact that Asiatic tuna vessels no longer call at Abidjan and by some boats being out of operation due to difficult economic circumstances, associated with higher fuel costs, a primary item in the operating costs of tuna vessels.

There was a 98 percent coverage rate for Task I and Task II data of the 1979 landings (54,029 MT) and a 30 percent coverage rate for biological data. The number of fish actually measured represents 2 percent of the total landings.

Original report in French.

#### 4. Research

The C.R.O. of Abidjan actively participated in the Skipjack Program and have recruited a technician for the duration of the Program to support their special effort to sample the skipjack landed in Abidjan.

In 1979, the C.R.O. collected biological parts on skipjack handled in canneries. This operation was continued in 1980.

The C.R.O. scientists participated actively in the work of the ICCAT inter-sessional meetings that took place in Brest (France) from May 27 to June 2, 1980. Mr. Aron Kothias presided over the meeting of the Working Group on Juvenile Tropical Tunas held in Brest.

#### 5. Scientific documents

BARD, F. X.

Etude de la composition spécifique des bancs de thonidés pêchés par la flottille FISM en 1978 et 1979. (WJJ/80/10).

LEVENEZ, J. J., A. FONTENEAU, R. REGALADO

- (a) Evolution numérique et pondérale des calées de la flottille de senneurs FISM ayant débarqué à Abidjan de janvier, 1976 à juillet, 1979. (SCRS/79/52).
- (b) Résultats d'une enquête sur l'importance des dauphins dans la pêche FISM. (SCRS/79/105).

# JAPANESE TUNA FISHERY AND RESEARCH IN THE ATLANTIC, 1979-80

by

SUSUMU KUME  
FAR SEAS FISHERIES RESEARCH LABORATORY (FSFRL)

## 1. Fishing activities

In 1979, Japanese tuna production in the Atlantic amounted to 44,480 MT of tunas and tuna-like species caught by the longline and pole-and-line fisheries, an increase of 14.4 percent over the preceding year. The increase was attributed to the longline catch (about 27 percent increase), whereas the pole-and-line catch remained the same and contributed 38 percent to the total catch. The 1979 catch was the highest recorded for the last five years (Table 1 and Fig. 1).

During the first quarter of 1980, Japanese tuna fishing activities by the two major fishing gears followed approximately the same pattern as that of 1979.

### 1.1 Longline fishery

Longline gear simultaneously captures a variety of tunas and billfishes, and consequently the species composition of the catch is versatile, depending on the fishing season and area of targeted species. The activity of the Japanese longline fleet in recent years has been completely different from that of the mid-1960's, when the longline fishery experienced its peak years with albacore and yellowfin tuna constituting more than 60 percent of the total longline catch. The 1979 longline catch resulted in 27,613 MT, most of which was shared by three main species: bigeye tuna (11,957 MT), southern bluefin (6,192 MT) and bluefin tuna (4,350 MT), definitely indicating a shift of the fishing grounds of targeted species (Table 3). These three species predominated in the total longline catch by more than 80 percent. The number of longline vessels, all Japan-based, which operated in the Atlantic was 249 in 1979, an increase of 15 percent over the 1978 figure (Table 2), and two-thirds of these vessels concentrated in the southern bluefin fishing grounds off the southern tip of Africa, especially during the first half of the year.

Original report in English.

In the first half of 1980, the monthly number of longliners operating in the Atlantic ranged from 70 to 160, about the same level during the same period of 1979, and most of the boats were concentrated again in the southern bluefin fishing grounds.

Since the inception of the ICCAT bluefin regulations in 1975, Japanese fishermen have been subjected to pertinent governmental regulatory measures to observe them. A patrol boat was dispatched again to monitor the Atlantic longline fleet for bluefin fishing in May and June of 1980. The 1979 Atlantic bluefin tuna catch was 4,350 MT, and shows a slight increase compared to 1978, but it is less than the recent five-year average of 5,000 MT.

### *1.2 Pole-and-line fishery*

Japanese pole-and-line boats based at Tema, Ghana, numbered fifteen in 1979 and harvested 16,867 MT, with skipjack comprising 87 percent of the catch (Tables 2 and 4). Only 7 percent of the pole-and-line catch was comprised of yellowfin and bigeye tunas (in equal amounts). The amount of reported discards due to the size limit regulation for yellowfin tuna was 776 MT in 1979.

In the first quarter of 1980, Japanese Tema-based pole-and-line boats decreased to twelve in number and unloaded about 7,000 MT, of which 86 percent was skipjack.

## **2. Research activities**

Research work on Atlantic tunas and billfishes has continued during the period 1979 to 1980. In May-June, 1980, Japanese scientists participated in meetings of the International Skipjack Year Program, the Working Group on Juvenile Tropical Tunas, and the SCRS Officers Meeting, all of which were held in Brest, France.

### *2.1 Fishery statistics*

Annual catch statistics (Task I) were reported to ICCAT up to the final 1979 figures for the pole-and-line fishery and the preliminary statistics for 1979 for the longline fishery. In addition, the estimated catch by species in the first half of 1980 was made available as of September, 1980.

Catch and effort statistics (Task II) were also routinely submitted to ICCAT. Final 1979 pole-and-line and 1978 longline data are now available.

Size frequency statistics (biological sampling) have been remarkably improved due to continuous efforts made in size measurement on-board vessels by the tuna fleet in the Atlantic. Length data for 1978 were compiled for tunas and billfishes and have already been reported to ICCAT.

Since April, 1979, a new data collection system was established to obtain detailed information on a school basis for the pole-and-line fishery. The data are now being processed for analysis.

## 2.2 Skipjack tagging cruise

Two skipjack tagging cruises for the ICCAT Skipjack Year Program were conducted by Japanese baitboats during August-September, 1980, in the Gulf of Guinea. The cruises successfully released 5,976 skipjack, 1,042 yellowfin and 947 bigeye tunas. At the same time, detailed information on a school basis was collected, and intensified biological sampling was carried out.

## 2.3 Tuna biology and stock assessment

Two Japanese scientists attended the Brest meeting for the International Skipjack Year Program and the Working Group on Juvenile Tropical Tunas. A study on the analysis of fishing effort for the Japanese pole-and-line fishery was presented to the Working Group on Juvenile Tropical Tunas.

Regarding the standardization of effort, the FSFRL continued to estimate effective effort and overall fishing intensity for the longline fishery for the years up to 1978. The estimation of the north-south breakdown of the albacore catch by the Taiwanese longline fleet in the Atlantic, 1976-78, was conducted in cooperation with Taiwanese scientists, according to a recommendation made at the 1979 SCRS meeting.

Results of studies on biology and population dynamics of Atlantic tuna and billfish resources were presented at the 1980 SCRS meeting. A list of documents is included below.

## 3. References

### 3.1 Document presented at the Working Group on Juvenile Tropical Tunas

KUME, S.

Estimation on fishing effort of the Japanese baitboat fishery based at Tema.

### 3.2 Documents presented at the 1980 SCRS Meeting

HONMA, M.

Overall fishing intensity, catch, catch by size of yellowfin tuna in the Atlantic tuna longline fishery, 1956-1978.

KIKAWA, S. and M. HONMA

Overall fishery effort and catch with a comment on the status of stock for the swordfish (*Xiphias gladius*) in the Atlantic Ocean.

KUME, S.

- a) Progress report on Japanese activity for the International Skipjack Year Program in 1980.



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- b) An approach to evaluate the stock status of Atlantic bigeye tuna by production model.

KUME, S. and R. T. YANG

Estimation on north-south breakdown of albacore catch by Taiwanese long-line fleet in the Atlantic, 1976-78.

SHINGU, C. and K. HISADA

Analysis of the Atlantic bluefin tuna stock caught by the longline fishery.

SUZUKI, Z.

A preliminary analysis on mixing of species within schools fished by the Tema-based Japanese baitboat fleet during 1979 and 1980.

Table 1. Japanese catch (MT) of tunas and tuna-like fishes by types of fisheries,  
Atlantic Ocean and Mediterranean Sea, 1975-79

Type of fishery	1975	1976	1977	1978	1979
Total . . . . .	38,610	42,288	42,842	38,882	44,480
<i>Longline</i>					
Subtotal . . . . .	32,429	20,678	21,855	21,690	27,613
Deckloaded motherboat . . . . .	259	--	--	--	--
Homeland-based boat . . . . .	32,170	20,678	21,855	21,690	27,613
<i>Purse seine</i>					
(Single-boat type) . . . . .	291	--	--	--	--
<i>Pole-and-line</i> . . . . .	5,890	21,610	20,987	17,192	16,867

Table 2. Number of Japanese tuna boats which operated in the Atlantic Ocean and Medi-  
terranean Sea, 1975-79.

Type of fishery	Size class	1975	1976	1977	1978	1979
<i>Longline</i>						
Deckloaded motherboat . . . . .	201 - 500	1	--	--	--	--
Homeland-based boat . . . . .	201 - 500	228	146	179	216	249
<i>Purse seine</i>						
(Single-boat type) . . . . .	201 - 400	1	--	--	--	--
	401 -	--	--	--	--	--
<i>Pole-and-line</i> . . . . .	151 -	24	15	18	19	15

Table 3. Catch (MT) of tunas and tuna-like fishes taken by the Japanese Atlantic long-line fishery, 1975-79.

<i>Year</i>	<i>1975</i>	<i>1976</i>	<i>1977</i>	<i>1978</i>	<i>1979</i>
TOTAL	32,429	20,678	21,855	21,690	27,613
ATLANTIC					
Subtotal	31,169	19,707	21,335	21,627	27,511
Albacore	1,637	1,418	930	666	1,324
Bigeye	17,391	7,297	9,137	9,301	11,957
Bluefin	4,413	4,875	5,252	3,721	4,251
Southern bluefin	636	692	3,168	4,651	6,192
Yellowfin	4,192	3,366	1,467	1,923	1,986
Skipjack	1	0	0	0	0
Swordfish	1,500	808	792	853	968
Blue marlin	608	264	135	69	134
White marlin	418	543	106	41	57
Sailfish	150	137	47	20	39
Others	223	307	301	382	603
MEDITERRANEAN					
Subtotal	1,260	971	520	63	102
Albacore	0	1	0	0	0
Bluefin	1,260	968	520	61	99
Bigeye	0	1	0	0	0
Swordfish	0	1	0	2	3

Table 4. Catch (MT) of tunas and tuna-like fishes taken by the Japanese Atlantic pole-and-line fishery, 1975-79.

Year	1975	1976	1977	1978	1979
TOTAL	5,890	21,610	20,987	17,192	16,867
Albacore	0	0	2	0	0
Bigeye	328	2,599	1,144	1,201	582
Yellowfin	1,270	2,225	2,451	807	573
Skipjack	4,100	15,042	16,845	14,614	14,686
Frigate tuna	17	14	89	--	--
Others	175	741	456	570	1,026

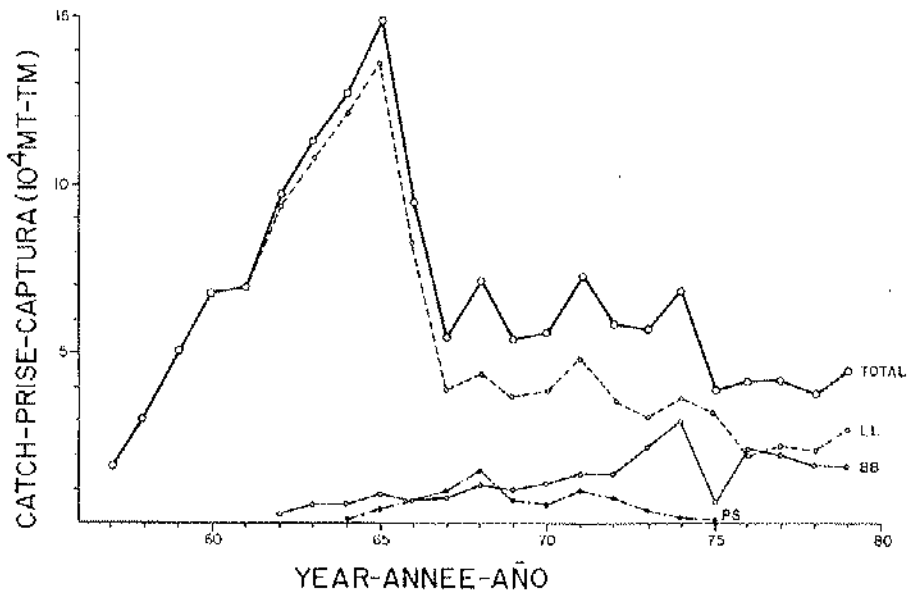


Fig. 1 Annual yield of the Japanese tuna fisheries in the Atlantic Ocean, 1957-79.

## KOREAN FISHERIES AND RESEARCH ACTIVITIES FOR TUNA AND TUNA-LIKE FISHES IN THE ATLANTIC OCEAN IN 1979

### 1. Fishing activities

In 1979, the Korean commercial catch of tuna and tuna-like fishes in the Atlantic Ocean registered 37,957 MT, a decrease from 39,458 MT in 1978 and 45,051 MT in 1977 (Table 1).

A breakdown of the total catch by type of gear is as follows:

- 66 longliners recorded 20,767 MT showing a decrease of 28.6 percent over the previous year.
- 18 baitboats registered 17,188 MT showing an increase of 65.8 percent over the previous year.

#### 1.1 Longline fishery

Korean longliners suffered a sharp decrease of their catches in 1979 over the previous two years.

The catch by species breakdown is as follows:

- 6,997 MT yellowfin (33.7 percent of the total)
- 3,875 MT albacore (18.6 percent)
- 17,305 MT bigeye (35.2 percent)
- 606 MT swordfish (2.9 percent)

The catch of the above species showed a downward tendency from 1977, due to the decrease in the number of fishing boats from 120 in 1977 to 66 in 1979; it was also due to the decreased catch of the main target species such as yellowfin and bigeye. (Table 2 and Fig. 1).

#### 1.2 Pole and line fishery

In 1979, a total of 18 Korean baitboats operated for tropical tuna fishing in the east Atlantic. The fleets caught 17,188 MT, which was 65.8 percent more than that of the previous year and the highest catch during the period of 1973-1979 (Table 1 and Fig. 2).

The catch by species (Table 3) was 2,871 MT yellowfin (16.7 percent), 1,712 MT bigeye (10.0 percent) and 12,017 MT skipjack (69.9 percent). This was due to the increased catch-per-unit-effort and the effective coverage of the fishing ground.

Original report in English.

## 2. Research activities

The analysis of catch and effort data collected from Korean tuna fishing vessels continued and 1979 data have already been submitted to ICCAT in the form of Task I and II. The research activities will be continued with a view to improving Korean fishery statistics in the Atlantic.

In connection with the ICCAT International Skipjack Program, 3,000 tags and some posters for dart tagging experiments in the eastern tropical Atlantic were sent to the 18 Korean baitboats for their experiments in 1979.

Table 1. Korean catch in MT and number of boats for tuna and tuna-like fishes in the Atlantic Ocean, 1964-1979

Year	Number of boats			Catch (MT)		
	Longline	Baitboat	Total	Longline	Baitboat	Total
1964	1	-	1	167	-	167
1965	9	-	9	520	-	520
1966	54	-	54	7,114	-	7,114
1967	56	-	56	12,836	-	12,836
1968	49	-	49	12,624	-	12,624
1969	57	-	57	12,594	-	12,594
1970	105	-	105	34,865	-	34,865
1971	117	-	117	36,737	-	36,737
1972	105	2	107	35,736	-	35,736
1973	106	3	109	32,051	1,822	33,873
1974	124	8	132	33,568	4,412	37,980
1975	118	8	126	38,819	7,653	46,472
1976	121	6	127	31,575	3,339	34,914
1977	120	15	135	38,849	6,202	45,051
1978	97	20	117	29,094	10,364	39,458
1979	66	18	84	20,767	17,188	37,955

**Table 2. Catch in MT by species and percentage (*italics*) of tunas and tuna-like fishes taken by Korean longliners in the Atlantic, 1971-1979**

Year	Bluefin	Yellowfin	Albacore	Bigeye	Skipjack	Swordfish	Unclassified & others	Total
1971	3,039	9,901	11,539	7,353	47		4,858	36,737
	<i>8.3</i>	<i>27.0</i>	<i>31.4</i>	<i>20.0</i>	<i>0.1</i>		<i>13.2</i>	
1972	30	11,078	13,577	5,730	45		5,276	35,736
	<i>0.1</i>	<i>31.0</i>	<i>38.0</i>	<i>16.0</i>	<i>0.1</i>		<i>14.8</i>	
1973	66	12,844	8,525	5,829	-		4,787	32,051
	<i>0.2</i>	<i>40.1</i>	<i>26.6</i>	<i>18.2</i>	-		<i>14.9</i>	
1974	56	15,518	5,216	7,376	116		5,286	33,568
	<i>0.2</i>	<i>46.2</i>	<i>15.5</i>	<i>22.0</i>	<i>0.3</i>		<i>15.7</i>	
1975	23	15,344	6,073	10,162	196	451	6,570	38,819
	<i>0.1</i>	<i>39.5</i>	<i>15.6</i>	<i>26.2</i>	<i>0.5</i>	<i>1.1</i>	<i>16.9</i>	
1976	10	11,211	8,755	6,747	26	1,147	3,679	31,575
	<i>0.0</i>	<i>35.5</i>	<i>27.7</i>	<i>21.4</i>	<i>0.1</i>	<i>3.6</i>	<i>11.7</i>	
1977	3	16,347	9,345	7,610	9	1,240	4,295	38,849
	<i>0.0</i>	<i>42.1</i>	<i>24.1</i>	<i>19.6</i>	<i>0.0</i>	<i>3.2</i>	<i>11.1</i>	
1978	-	11,512	4,418	9,182	42	1,333	2,607	29,094
	-	<i>39.6</i>	<i>15.2</i>	<i>31.6</i>	<i>0.1</i>	<i>4.6</i>	<i>9.0</i>	
1979	2	6,997	3,875	7,305	2	606	1,982	20,769
	<i>0.0</i>	<i>33.7</i>	<i>18.6</i>	<i>35.2</i>	<i>0.0</i>	<i>2.9</i>	<i>9.5</i>	

**Table 3. Catch in MT by species and percentage (*italics*) of tunas and tuna-like fishes taken by Korean baitboats in the Atlantic Ocean, 1973-1979**

Year	Yellowfin	Bigeye	Skipjack	Unclassified and others	Total
1973	900	-	922	-	1,822
	<i>49.4</i>	-	<i>50.6</i>	-	
1974	2,169	-	2,123	120	4,412
	<i>49.2</i>	-	<i>48.1</i>	<i>2.7</i>	
1975	1,259	1,750	4,469	175	7,653
	<i>16.5</i>	<i>22.9</i>	<i>58.4</i>	<i>2.3</i>	
1976	365	810	1,948	216	3,339
	<i>10.9</i>	<i>24.3</i>	<i>58.3</i>	<i>6.5</i>	
1977	1,075	640	3,600	887	6,202
	<i>17.3</i>	<i>10.3</i>	<i>58.0</i>	<i>14.3</i>	
1978	941	965	8,132	326	10,364
	<i>9.1</i>	<i>9.3</i>	<i>78.5</i>	<i>3.1</i>	
1979	2,871	1,712	12,017	588	17,188
	<i>16.7</i>	<i>10.0</i>	<i>69.9</i>	<i>3.4</i>	

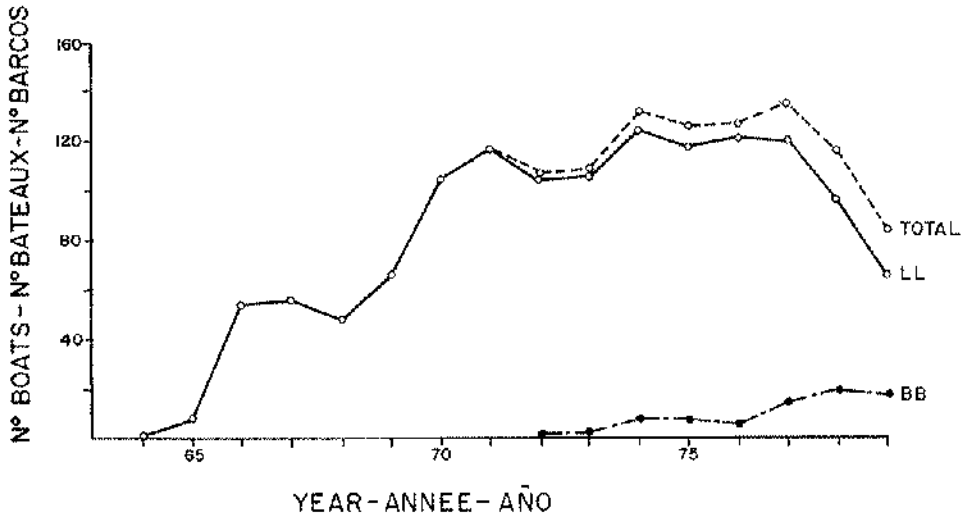


Fig. 1 Annual number of boats of the Korean tuna fishery in the Atlantic Ocean, 1964-1979.

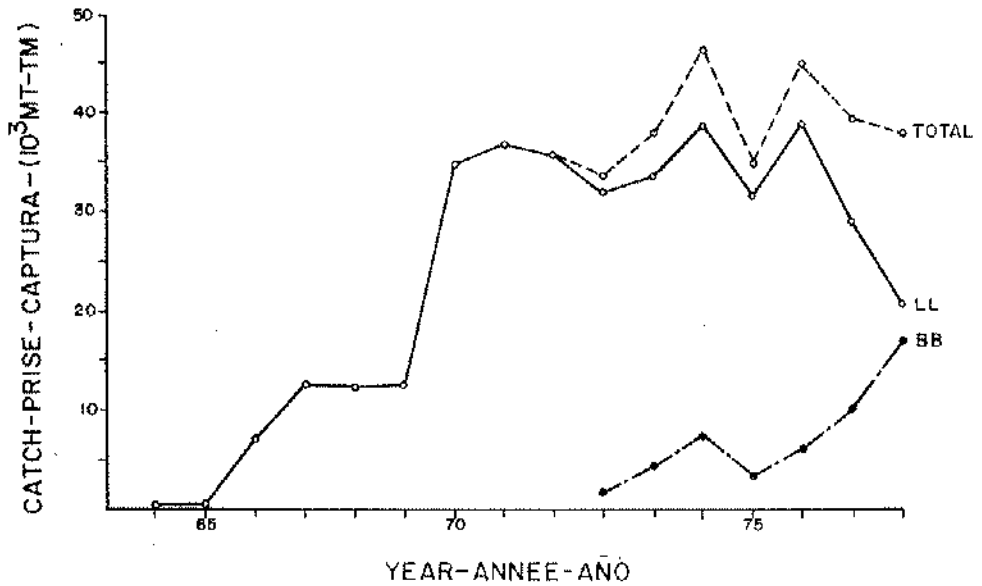


Fig. 2 Annual yield of the Korean tuna fishery in the Atlantic Ocean, 1964-1979.



## REPORT ON TUNA FISHING AND RESEARCH IN SENEGAL IN 1979-80

by

P. CAYRE

### 1. Tuna fishing

#### 1.1 *Yellowfin, skipjack and bigeye*

Tuna landings and transshipments at Dakar in 1979 and 1980 are shown in Table 1. In 1979, the Dakar-based tuna fleet was comprised of 30 baitboats and three purse seiners. The number of baitboats is similar to that of 1978 (29 baitboats), but their overall effort is slightly higher (+19 percent). On the other hand, the number of purse seiners in 1979 is lower (three instead of six in 1978) and consequently their effort decreased (-64 percent). The overall tendency is for the catch to decrease (baitboat: -24 percent, purse seine: -80 percent), due to the significant decrease in purse seine effort and to the decrease observed in yellowfin (-32 percent) and bigeye (-24 percent) baitboat catches.

The transshipments of the FIS fleet in Dakar were slightly less in 1979 (10,589 MT) than those of 1978 (12,000 MT).

The landings of the three species in 1980 should not be very different from those presented in Table 1, although these figures are only as of September 30, due to the cessation of activities of a number of baitboats since August-September.

The total baitboat catch (28 vessels) in 1980 (7,348 MT) is slightly lower than that of 1979, but the effort of these vessels is also lower (-28 percent). It should be noted that a decrease in the skipjack catches was compensated by an increase in bigeye catches. The overall catch in 1980 will be, without a doubt, less than that of 1979 because of the complete cessation of purse seine activity and the decrease in baitboat effort.

A decrease (-27 percent) is also noted in the transshipments of the FIS fleet in Dakar in 1980 (7,726 MT). For the moment it is impossible to give the exact tonnage of tuna transshipments from Spanish vessels; a rough estimate indicates that it will be around 15,000 MT.

#### 1.2 *Other species*

The landings of small tunas (three species) for 1978 and 1979 are shown in Table 2

Original report in French.

for both the commercial fishery (600 MT) and the artisanal fishery (2,368 MT). This amount (3,000 MT in 1979) is significant in that until now it has not been reported to ICCAT. Sailfish landings in 1979 and 1980 (up to September 30) are given in Table 3. The large increase in artisanal fishery catches in 1980 is due to the creation of an economic outlet (factory for "smoked" process) for this species, which until now has not been targeted by this fishery.

## 2. Research

Sampling and data collection activities were continued as well as studies regarding stock dynamics. Sampling of Spanish tuna vessels transshipping or landing their catches in Dakar was carried out according to the terms of the agreement made with the "Instituto Español de Oceanografía" in 1976. Particular interest has been shown this year in the fishing and biology of small tunas (SCRS/80/52 and 53). Also, for the first time, a statistical inventory of billfish catches in Senegal was made (SCRS/80/55).

Particular emphasis was placed on skipjack research activities since 1980 was the first year of the international research program on this species. Within the scope of this program, three tagging cruises were made by the oceanographic vessel "Laurent Amaro" along the coasts of Senegal. 229 skipjack (of which 36 were injected with tetracycline), 98 yellowfin and 240 bigeye were tagged. The slightly deceiving results of the three cruises are due on one hand to the problems linked to the capture and preservation of live bait on board and, on the other hand, to the fact that authorization for the vessel to operate in foreign waters did not arrive in time.

Four hundred samples of dorsal fins for skipjack growth studies were collected. For reproduction studies on this species, some 900 skipjack gonads were collected and processed at Level 2 analysis, as described in the Skipjack Program Plans. The data collected since 1977 were presented in document SCRS/80/54 and represent the first publication on the subject. This document can serve to direct the research program activities on this matter, given the results and hypotheses presented.

The tuna statistics of the entire FISM fleet were, as last year, compiled and processed in Dakar, and were the subject of several documents (SCRS/80/56, 57 and 74).

## 3. Documents presented by CRODT to the 1980 SCRS Meeting

CAYRE, P.

Maturité sexuelle, fécondité et sex ratio du listao (*Katsuwonus pelamis*) des côtes d'Afrique de l'ouest (20°N-00°N), étudiés à partir des débarquements thoniers (1977 à 1979) au port de Dakar (Sénégal).

CAYRE, P. and T. DIOUF

Croissance de la thonine (*Euthynnus alletteratus*, Rafinesque 1810) établie à partir de coupes transversales du premier rayon de la nageoire dorsale.

DIOUF, T.

Premières données relatives à l'exploitation et à la biologie de quelques "petits thonidés et espèces voisines": *Euthynnus*, *Sarda*, *Scomberomorus*, au Sénégal.

FONTENEAU, A.

Note sur le mode de calcul de la P.U.E. des senneurs FISM.

FONTENEAU, A. and P. CAYRE

Analyse de l'état des stocks d'albacore (*Thunnus albacares*) et de listao (*Katsuwonus pelamis*) de l'Atlantique, au 30 septembre 1980.

FONTENEAU, A. and M. SLEPOUKHA

Statistiques de la pêcherie thonière FISM durant la période 1969-1979.

LIMOUZY, C. and P. CAYRE

Pêche et aspects de la biologie du voilier de l'Atlantique (*Istiophorus platypterus*) sur les côtes sénégalaises.

Table 1. The tuna fishery in Dakar, 1979-80

Fishery	No. of boats	1979					1980 <sup>1</sup>					
		Effort	YF	SJ	BE	Total	No. of boats	Effort	YF	SJ	BE	Total
Dakar-based												
— Baitboats	30	3495	2067	3339	1972	7378	28	2529	2265	2923	2160	7348
— Purse seiners <sup>2</sup>	3	323	285	510	68	863	0	---	---	---	---	0
Total	33	3818	2352	3849	2040	8241	28	2529	2265	2923	2160	7348
Foreign vessels (Transshipments)												
— FIS	30	1272	8506	1687	396	10589	21	977	4742	2763	221	7726
Total <sup>3</sup>	30	1272	8506	1687	396	10589	21	977	4742	2763	221	7726
Grand Total	63	5090	10858	5536	2436	18830	49	3506	7007	5686	2381	15074

1. Provisional data, up to September 30, 1980.

2. Dakar-based purse seiners: 2 ex-SOSAP and Vendôme.

3. The Spanish transshipments (about 15,000 MT) are not included.

**Table 2. Landings (MT) of small tunas in Senegal, 1978-79**

<i>Species</i>	1978			1979		
	<i>Artisanal fishery</i>	<i>Commercial fishery</i>	<i>Total</i>	<i>Artisanal fishery</i>	<i>Commercial fishery</i>	<i>Total</i>
Atlantic little tuna ( <i>E. alletteratus</i> )	1036	410	1446	1097	600	1697
W. African Spanish mackerel ( <i>Scomberomorus tritor</i> )	1054	0	1054	1112	0	1112
Atlantic bonito ( <i>Sarda sarda</i> )	523	0	523	159	0	159
<b>TOTAL</b>	<b>2613</b>	<b>410</b>	<b>3023</b>	<b>2368</b>	<b>600</b>	<b>2968</b>

**Table 3. Landings (MT) of Atlantic sailfish (*Istiophorus americanus*) in Senegal, 1979-80**

<i>Artisanal fishery</i>	1979		<i>Artisanal fishery</i>	1980*	
	<i>Sport fishery</i>	<i>Total</i>		<i>Sport fishery</i>	<i>Total</i>
28.4	76.8	105.2	177.6	50.6	228.2

\* Data up to September 30.

## SOUTH AFRICAN NATIONAL REPORT, 1979

### 1. The fishery

The discovery at the beginning of 1979 of large shoals of yellowfin tuna south of Cape Agulhas gave rise to a substantial increase in the tuna catch as well as fishing effort. A number of boats were withdrawn from their normal fishing activities and employed in the catching of tuna with poles. A total of 9,352 MT of tuna was caught, consisting of 8,910 MT yellowfin, 382 MT albacore, 19 MT bigeye, 12 MT skipjack and 29 MT swordfish.

Of the total amount of tuna caught, 83.4 percent were caught by pole fishing, 5.4 percent by sport fishing, 5.1 percent by line fishing, 3.3 percent by purse seine, 2.5 percent by longline and 0.3 percent in trawl nets.

### 2. Biological sampling

Measurements of 230 yellowfin landed by South African boats were taken. Samples of albacore were measured from 110 foreign boats transshipping tuna in Table Bay harbour.

### 3. The environment

Studies were conducted during five months in the Cape Peninsula upwelling region making extensive use of airborne radiation thermometry. Ocean colour determinations were also done during these studies.

During November a cruise was undertaken in the Cape Point area to collect eggs and larvae of pelagic fish as well as hydrological data.

# REPORT OF SPANISH TUNA FISHING AND RESEARCH, 1979-1980

by

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## 1. Catches

Spanish tuna catches in 1979 amounted to 99,304 MT, which indicate a decrease of 7,000 MT with respect to the previous year. This decrease is basically due to skipjack catches, which went from 29,000 MT to 19,800 MT, and which represent a decrease of 31 percent with respect to the previous two years.

The total catches in metric tons, broken down by species, during the last three years were as follows:

<i>Year</i>	<i>YF</i>	<i>SJ</i>	<i>BE</i>	<i>BF</i>	<i>ALB</i>	<i>SWO</i>	<i>Others</i>	<i>Total</i>
1977	37,549	29,795	3,561	2,207	25,155	4,616	2,664	105,547
1978	39,946	28,932	3,850	3,661	25,404	4,320	1,625	107,738
1979	41,458	19,836	2,975	1,843	29,810	3,382	---	99,304

In general, a decrease was observed in the catches of all species, except for yellowfin and albacore.

Spain catches tunas in three quite different areas: Gulf of Guinea, the Canary Islands and around the Iberian Peninsula.

### 1.1 Gulf of Guinea

The fleet operating in the Gulf of Guinea is comprised of 42 purse seiners (34 of which are of 400 to 1,000 GRT). These purse seiners basically catch yellowfin and skipjack. In 1979, yellowfin catches rose slightly in this area, reaching 41,313 MT, while skipjack catches decreased drastically to 18,506 MT, which indicates a decrease of 36 percent in the catches with respect to 1978. Preliminary estimates show that in 1980 the catch has normalized and a catch similar to that of 1978 is expected.

Original report in Spanish.

### 1.2 Canary Islands

The fleet which operated in this zone was comprised of small baitboats, most of which were less than 20 GRT. The fleet has 265 vessels of less than 20 GRT, 36 between 20 and 50 GRT, and 24 vessels between 51 and 150 GRT.

The 1979 catches decreased slightly with respect to previous years, reaching a total of 5,812 MT, broken down as follows:

Species	YF	SJ	BE	BF	ALB
MT	145	1,330	2,975	758	604

### 1.3 Iberian Peninsula

In this area, four types of fishing gear are used: baitboat, trolling, longline and traps. In 1979, 253 baitboats, 273 trollers, 140 longliners and 4 traps were in operation.

The catches increased with respect to previous years, mainly because of the increase in albacore catches. The total catch reached 33,673 MT, broken down as follows:

Species	BF	ALB	SWO
MT	1,085	29,206	3,382

The increase in albacore catches was due to the successful fishing of the baitboats which increased their catch 5,000 MT over the previous year, without significantly increasing their effort (10,023 days fishing in 1978 and 10,175 days fishing in 1979).

The baitboats mainly fished for albacore although a small part of the fleet was dedicated to bluefin fishing. The trollers only fished for albacore, while the longliners were exclusively dedicated to swordfish fishing. The traps caught bluefin and small tunas.

## 2. Research

During 1979-1980, research in the Gulf of Guinea area was centered on the increase of the compilation of ICCAT Task II statistics, reaching a coverage rate of approximately 60 percent. We hope to increase this percentage in 1980. The level of sampling also increased and two scientists were sent to this area to participate in the "ISYP's" Intensive Sampling activity on-board commercial vessels. During 1979, 7,300 yellowfin, 6,400 skipjack, 625 bigeye and 1,000 other tuna species, mainly Atlantic little tuna and frigate tuna, were sampled.

As in other years, routine research was continued in the Canary Islands and the Iberian Peninsula. In the area of biological research, 6,000 albacore, 3,000 bluefin, 1,500 swordfish and 1,000 bigeye were sampled. Various tagging cruises were conducted and 300 bluefin, 400 albacore, 514 skipjack, 870 Atlantic bonito (*S. sarda*) and 100 Atlantic little tuna (*E. alletteratus*) were tagged.

In general, for population dynamics studies, analyses of the state of the yellowfin, skipjack, bigeye, albacore and bluefin stocks were carried out and were presented at the 1980 SCRS meeting.



**3. Documents presented to the 1980 SCRS Meeting**

ANTOINE, L. and A. GONZALEZ-GARCES

Comentaires sur l'etat du stock de germon (*Thunnus alalunga*) nord-atlantique en 1980.

CORT, J. L., J. C. REY and A. LAVIN

Marcado de atunes en el Golfo de Vizcaya durante el verano de 1980.

GONZALEZ-GARCES, A.

- a) A production model analysis of North Atlantic albacore (*Thunnus alalunga*), 1957-1978.
- b) Informe sobre la pesca e investigación española de túnidos entre 1979 y 1980.

GONZALEZ-GARCES, A. and J. A. PEREIRO

Relationship between effort and fishing mortality in the Atlantic albacore surface fishery.

REY, J. C. and J. L. CORT

Migración de bonitos (*Sarda sarda*) y bacoretas (*Euthynnus alletteratus*) entre el Mediterráneo y el Atlántico.

RODRIGUEZ-RODA, J. and A. DICENTA

Areas de puesta del atún, melva y bonito en las costas de España y Marruecos.

SANTOS G., Al. and S. TORRES N.

Resultados preliminares del marcaje de listado (*K. pelamis*) en aguas de Canarias.

REVIEW OF UNITED STATES FISHERIES AND RESEARCH  
ACTIVITIES ON TUNAS AND TUNA-LIKE FISHES  
OF THE ATLANTIC OCEAN FOR 1979-1980

by

NATIONAL MARINE FISHERIES SERVICE\*

1. The fisheries

United States commercial catches of Atlantic tunas and tuna-like fishes in 1979 decreased approximately 40 percent compared to 1978 catches. (Table 1). Catches of bluefin tuna increased 19 percent; catches of yellowfin, bigeye and skipjack tuna decreased by 67 percent, 14 percent and 63 percent, respectively. Catches of swordfish increased by 11 percent.

The U.S. fishery for bluefin tuna operated under size, catch and season limitations. The U.S. fishery for tropical tunas operated under a minimum size regulation of 3.2 kg for yellowfin tuna with a 3 percent by weight incidental catch allowance of undersized fish per boat landing.

1.1 Tropical tunas

Most fishing by U.S. vessels was concentrated in the eastern tropical Atlantic in 1979. Seven purse seiners fished in these waters, a decrease of 15 from the number fishing in 1978 (Table 2). These vessels expended approximately 720 days of fishing. Catches were mainly yellowfin tuna (2,884 MT) and skipjack tuna (2,073 MT). Catches included minor amounts of bigeye tuna, albacore and little tunny.

Catch rates were 3.9 MT of yellowfin tuna and 2.2 MT of skipjack tuna per day's fishing. These rates are about the same as those experienced by the fleet in 1978 (Table 2).

The catch of undersized yellowfin tuna by the U.S. fleet in 1979 was approximately 0.2 percent of the fleet's total yellowfin catch.

In 1980, U.S. participation in the Atlantic tropical tuna fishery was estimated to be ten seiners. The total 1980 catch of Atlantic tropical tunas is projected to be approxi-

\*Prepared by staff members of the Southwest Fisheries Center, La Jolla, California, and the Southeast Fisheries Center, Miami, Florida.

Original report in English.

imately 8 500 MT, a 21 percent increase from the 1979 catch.

### *1.2 Temperate tunas*

U.S. fisheries in the northwestern Atlantic caught 2,297 MT of bluefin tuna in 1979. The purse seine fishery took the majority of the catch (1,425 MT) while hand gear, sport and harpoon gears took 450 MT, 250 MT and 141 MT, respectively. Unclassified gears took 31 MT.

Regulations similar to those in effect in 1979 were in effect for the 1980 fishery. The preliminary estimate of the 1980 total catch is 2,040 MT.

### *1.3 Miscellaneous tuna-like species*

The U.S. commercial fishery for Spanish mackerel and king mackerel is centered off Florida. Landings in 1979 decreased from those in 1978. The trend in landings has been essentially stable for the past 12 years.

## **2. Research activities**

United States research for Atlantic tunas and tuna-like fishes is conducted at the Miami Laboratory of the Southeast Fisheries Center and at the La Jolla Laboratory of the Southwest Fisheries Center. Studies in 1979-1980 included stock assessment, fishery evaluation and fishery/environment studies in support of fishery management requirements and in response to recommendations of the ICCAT SCRS.

Research on Atlantic bluefin tuna and billfishes was conducted at Miami and research on tropical tunas and albacore was conducted in La Jolla.

### *2.1 Tropical tunas*

Research during 1979-1980 continued on stock assessment and fishery evaluation of Atlantic tropical tunas. U.S. fisheries were monitored and biological and fishery data were collected. Imported Atlantic-caught tunas were sampled (8,984 fish sampled in 1979) for biological information in Puerto Rico. Atlantic tuna catch, effort and biological data bases were updated.

Analyses of tropical tuna fishery biological and environmental data were performed. Changes in age composition of yellowfin tuna in eastern Atlantic catches using the most recent data were reviewed. The partitioning of multi-species effort using water temperature criteria was reviewed. Available baseline data needed for the economic evaluation of eastern Atlantic tropical tuna fisheries were reviewed.

The U.S. conducted a 74-day research cruise to tag skipjack tuna in the Caribbean and western Atlantic in 1980. This effort, part of ICCAT's International Skipjack Year Program, resulted in the tagging of 1,612 fish (1,412 skipjack).

## 2.2 *Temperate tunas*

Research on bluefin tuna continued at a high level during 1979-1980. Stock assessment analyses were updated, age and growth studies were continued with the addition of data from medium-sized fish. X-ray crystallography continued to be studied as a tool for stock identification. Larval abundance estimates for the Gulf of Mexico were examined, and about 3,041 young bluefin tuna were tagged and released in experiments to estimate population parameters, particularly exploitation rates in the U.S. fishery. Data on catch, effort and size frequency of fish landed were collected for use in research.

Research on Atlantic albacore continued. Using new and revised data, major emphasis was placed on verifying the probability of recruitment failure of the north Atlantic stock based on spawner/recruit relations.

## 2.3 *Billfishes*

U.S. research on billfishes was primarily devoted to updating analyses for assessing the condition of the Atlantic stocks and to collecting fishery data from the U.S. recreational fishery and foreign longline fishery.

## 3. Documents submitted to the 1980 SCRS Meeting

BARTOO, N.

An updated stochastic spawner/recruit relationship for North Atlantic albacore.

BERKELEY, S. A. and E. D. HOUDE

Swordfish (*Xiphias gladius*) dynamics in the Straits of Florida.

BRUNENMEISTER, S.

Analysis of catch/effort trends in bluefin tuna.

COAN, A. L. and E. WEBER

Length and age composition of yellowfin tuna catches in the eastern Atlantic Ocean, 1966-1977.

EVANS, R.

Comments on the use of water temperature to delimit tropical tuna distributions.

FARBER, M. I. and R. J. CONSER

An assessment of the status of stocks of blue marlin (*Makaira nigricans*) and white marlin (*Tetrapturus albidus*) in the Atlantic Ocean.

FARRER, M. I. and D. W. LEE

Ageing western Atlantic bluefin tuna (*Thunnus thynnus*) using tagging data, caudal vertebrae and otoliths.

HERRICK, S.

A baseline economic analysis of surface tuna fishery activities in the eastern tropical Atlantic.

NICHOLS, S.

Recent yield-per-recruit trends of Atlantic bluefin tuna.

PARRACK, M. L.

An assessment of the Atlantic bluefin tuna resource.

RICHARDS, W. J., T. POTTHOFF and E. D. HOUDE

Abundance of bluefin tuna larvae and estimates of spawning stock sizes in the Gulf of Mexico in 1977 and 1978.

RINALDO, R., R. EVANS and P. VERGNE

Preliminary results of a 1980 skipjack tuna tagging cruise in the western Atlantic and Caribbean Sea.

Table 1. Catch and landing (MT) of Atlantic tunas and tuna-like fishes by American fishermen, 1967-79<sup>1</sup>

Year	Blue-fin	Yellow-fin <sup>2,3</sup>	Albacore	Big-eye <sup>2</sup>	Little tunny	Skip-jack <sup>2</sup>	Bonito	Sword-fish	Spanish mackerel	King mackerel	Unclassified	Total
1967	2,320	1,136	0	0	7	493	22	474	3,577	2,767	10	10,806
1968	807	5,941	0	18	6	3,314	43	274	5,342	2,813	2	18,560
1969	1,226	18,791	0	148	7	4,849	98	171	4,952	2,814	1	33,057
1970	3,327	9,029	0	195	158	11,752	83	287	5,506	3,050	--	33,387
1971	3,169	3,764	0	544	5	16,224	90	35	4,713	2,571	50	31,165
1972	2,138	12,342	10	212	212	12,290	24	246	4,863	2,213	--	34,550
1973	1,294	3,590	0	113	20	21,246	261	406	4,437	2,710	--	34,077
1974	1,857	5,621	13	865	51	19,973	92	1,125	4,990	4,747	1	39,335
1975	2,823	14,335	1	67	67	7,567	117	1,700	5,288	3,095	19	35,079
1976	1,931	2,252	0	28	5	2,285	23	1,429	6,385	4,053	30	18,421
1977	1,956	7,208	2	331	53	6,179	268	912	5,453	3,837	71	26,270
1978 <sup>4</sup>	1,852	9,747	9	248	113	8,492	224	3,039	3,310	2,507	31	29,572
1979 <sup>4</sup>	2,297	3,182	11	212	12	3,102	502	3,405	2,926	2,204	11	17,864

1 Estimated catch is for bluefin tuna, yellowfin tuna, albacore, bigeye tuna, skipjack tuna and little tunny. Landing is for all other species.

Sport catches are not included, except for bluefin tuna.

2 Includes catches of purse seiners flying the flags of Bermuda, Netherlands Antilles, Nicaragua and Panama.

3 Includes small quantities of bigeye tuna prior to 1975.

4 Preliminary, except for the bluefin tuna catch.

Table 2. Summary of logbook estimates of catch and catch rate of yellowfin and skipjack tunas caught by American seiners<sup>1</sup> in the eastern tropical Atlantic

Year	Number of seiners	Yellowfin		Skipjack	
		Catch (MT)	Catch rate (metric tons/ days fishing)	Catch (MT)	Catch rate (metric tons/ days fishing)
1967	3	1,000	7.8	500	3.8
1968	8	6,200	23.3	3,200	12.0
1969	25	19,800	10.9	4,400	2.4
1970	24	9,100	4.0	11,400	5.1
1971	22	4,400	2.7	16,100	10.0
1972	35	10,900	3.3	12,200	3.7
1973	21	2,600	2.2	20,400	17.0
1974	26	5,600	2.8	20,000	8.7
1975	32	14,000	5.6	7,400	2.7
1976	7	1,706	5.2	1,766	5.1
1977	12	6,400	4.4	5,859	3.8
1978	22	8,131	3.2	6,797	2.4
1979	7	2,884	3.9	2,073	2.2

<sup>1</sup> Purse seiners flying the flags of Bermuda, Netherlands Antilles, Panama and U.S.A. are included. Data were collected by the Inter-American Tropical Tuna Commission through contract.

# REPORT ON THE SCIENTIFIC RESEARCH OF TUNAS CONDUCTED BY THE U.S.S.R. IN 1979-1980

by

ATLANTNIRO

## 1. The catches

In the period under review, U.S.S.R. scientists collected and processed biostatistical data on bigeye and yellowfin tunas. Catch statistics by length class and month are available for the 1965-1978 period (yellowfin tuna from ICCAT areas 14 and 15, and bigeye tuna from ICCAT areas 44 and 45).

The 1979 catch statistics for the eastern tropical Atlantic have been analysed. The total catch of tunas and related species was 10,533 MT, of which 4,304 MT were taken by longline and 4,020 MT by purse seine. The catch included 2,229 MT of bigeye tuna, 1,161 MT of skipjack, 806 MT of yellowfin tuna, 59 MT of albacore and 80 MT of swordfish. The by-catch was represented by little tunny, frigate tuna and bonito.

## 2. Commercial species of the longline fishery

The data obtained in two scientific research cruises conducted by the AtlantNIRO in the tropical Atlantic (September 1979 to May 1980) indicate that in December-January biologically productive areas were located in the vicinity of frontal zones and coastal upwelling zones off Angola, and in January-February near the open Gulf of Guinea in the periphery of the equatorial countercurrent. A powerful hydrological front was observed in the area north of San Paolo Island (western tropical Atlantic), which created favourable conditions for high biological productivity in the area of interaction of the northern tradewind equatorial current and northern equatorial countercurrent. Bigeye and yellowfin tunas, feeding intensively in these areas, had maturing gonads and formed stable commercial aggregations. The length of bigeye tunas ranged between 90 and 190 cm (143 cm on the average) and yellowfin tuna lengths ranged between 105 and 165 cm (147 cm on the average).

## 3. Commercial species of the purse seine fishery

From the data obtained in two scientific research cruises in the open part of the Gulf of Guinea, it has been determined that the formation of a frontal zone is related to the upwelling recorded along the southern border of the Lomonosov Current. The schools

Original report in English.



of skipjack from 36 to 73 cm in length (57 cm), young yellowfin tuna of 36 to 52 cm (43.2 cm) and bigeye tuna of 38 to 45 cm (41.1 cm) were observed there on the surface in August-January.

Tuna aggregations were associated with the upwelling zones, keeping to the thermocline depth. The water heating (to 25-26° C) that takes place in the Gulf of Guinea from September to November results in the southward migration of tunas.

The study of the distribution of tuna schools in the eastern part of the ocean made it possible to reveal the following areas for perspective skipjack research and fishing: the Sierra Leone height (February-March), central Gulf of Guinea (June-September) and Angola (October-December).

The analysis of the specific structure of tuna schools fished on the surface in (1) the coastal part of the Gulf of Guinea (April-May), (2) the open Gulf of Guinea (September-November) and (3) the open waters of Sierra Leone, showed that in the first area the schools consisted of 30.0 percent skipjack, 25.0 percent yellowfin, 30 percent little tunny and 15.0 percent frigate tuna. In the second area the catch was represented by 78.0 percent skipjack, 13.0 percent yellowfin, 6.0 percent bigeye and 3.0 percent frigate tuna. As compared to the second area, the specific structure of tuna schools in the third area was 93.5 percent skipjack, 4.2 percent yellowfin, 0.2 percent bigeye and 2.1 percent frigate tuna. Thus, little tunny in certain periods of time stay mainly in coastal waters while skipjack prefer oceanic waters.

In December-January, in the southern Gulf of Guinea, mixed schools (skipjack and yellowfin tunas) predominated. Mature and juvenile yellowfin tuna occurred together. The schools were accompanied by numerous flocks of birds; the fish jumped out of the water. In the open waters (5° N) schools of two types predominated, and were mainly represented by skipjack. The first type can be described as small scattered schools with fish splashing and a small number (50-100) of sea-gulls above; the second type are mobile dense schools (to about 300 MT) producing ripples on the surface.

The processing of long-term data on tuna reproduction yielded the following information.

i) Bigeye tuna spawn in the northern near-equatorial waters in July-September. In the southern near-equatorial waters the spawning takes place in the entry area, mainly between 0-10° S and 0-15° W in January-March and, perhaps, in the open Angolan waters.

ii) Yellowfin tuna spawn in both coastal and open waters throughout the year, except July-September. Judging by the larvae occurrence, spawning intensity in coastal waters is considerably higher.

iii) Skipjack-the most intensive spawning takes place in the Gulf of Guinea and adjacent waters in January-March.

The spawning of small tunas (little tunny and frigate tuna) occurs in the Freetown area (January-March), Gulf of Guinea (April-June) and Pointe Noire (April-June).

In the period under review, four scientific research cruises were conducted (two with longline and two with purse seine).