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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, 1984-85  
PART I (1984)  
English version**

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MADRID, SPAIN

1985

# INTERNATIONAL COMMISSION FOR THE CONSERVATION OF ATLANTIC TUNAS

## *Contracting Parties (as of April 1, 1985)*

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

## *Chairman of Commission*

Mr. C. J. BLONDIN, U.S.A.  
(from November 15, 1983)

## *First Vice-Chairman of Commission*

Mr. S. MAKIADI, Angola  
(from November 15, 1983)

## *Second Vice-Chairman of Commission*

Mr. J. G. BOAVIDA, Portugal  
(from November 15, 1983)

## *Panel Membership (as of April 1, 1985)*

<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.	Ivory Coast
2	Canada, France, Japan, Korea, Morocco, Portugal, Spain, U.S.A.	Morocco
3	Brazil, Japan, South Africa, U.S.A.	Japan
4	Angola, Canada, Cuba, Japan, Korea, Portugal, Spain, U.S.A., U.S.S.R.	U.S.S.R.

## *Council*

No election was conducted for the 1984-85 biennial period.

## *Standing Committees*

### **Standing Committees:**

Committee on Finance and Administration (STACFAD)

### **Chairman**

Mr. J. J. CHAO, Spain  
(from November 15, 1983)

Committee on Research and Statistics (SCRS)

Mr. J. S. BECKETT, Canada  
(from November 17, 1981)

## *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 Contracting Parties to the International Convention for the Conservation of Atlantic Tunas (signed in Rio de Janeiro, May 14, 1966), and to the Delegates and Advisers representing said Contracting Parties, and has the honor to transmit the "**Report for the Biennial Period, 1984-85, Part I (1984)**", describing the activities of the Commission during the first half of said biennial period.

The volume contains reports of the Fourth Special Meeting of the Commission, held in November, 1984, 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 as 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.

*C. J. Blondin*  
*Commission Chairman*

## TABLE OF CONTENTS

### CHAPTER I — Secretariat Reports

Administrative Report 1984 . . . . .	5
Financial Report 1984 . . . . .	11
Secretariat Report on Statistics and Coordination of Research . . . . .	25

### CHAPTER II — Record of Meetings

Proceedings of the Fourth Special Meeting of the Commission . . . . .	32
Commission Agenda/COM Documents. . . . .	40
List of Participants . . . . .	44
Opening Addresses. . . . .	54
Reports of the Meetings of Panels 1 — 4. . . . .	62
— Statement by Canada on Bluefin Tuna . . . . .	79
— Statement by Japan on Bluefin Tuna . . . . .	80
— Proposed Regulations for the Atlantic Bluefin Tuna Catch (1985) . . . . .	81
Statement by Ghana on the Yellowfin-Bigeye Issue . . . . .	83
Report of the Infractions Committee . . . . .	84
— Summary Tables of Regulatory Measures . . . . .	89
Report of the Standing Committee on Finance and Administration (STACFAD) . . . . .	92
— Status of Skipjack Program Funds . . . . .	99
— Report of the Working Group on the Working Capital Fund . . . . .	100
— Regular Budget - 1985. . . . .	102
— Table of Member Country Contributions - 1985 . . . . .	103
Report of the Standing Committee on Research and Statistics (SCRS). . . . .	104
YFT - Yellowfin. . . . .	117
BET - Bigeye . . . . .	121
SKJ - Skipjack . . . . .	124
ALB - Albacore . . . . .	127
BFT - Bluefin . . . . .	131
BIL - Billfishes . . . . .	135
SWO - Swordfish . . . . .	140
SBF - Southern Bluefin. . . . .	142
SMT - Small Tunas . . . . .	144
MLT - Multispecies (Tropical and Temperate) . . . . .	146

SCRS Tables . . . . .	156
SCRS Figures . . . . .	192
List of Documents . . . . .	199
Report of the Sub-Committee on Statistics . . . . .	204
– Table on the Progress in the Collection of 1983	
Task I and Task II data . . . . .	211
– Report of the “Day to Review Statistics” . . . . .	220
– List of Statistical Recommendations . . . . .	227

### CHAPTER III – National Reports

Brazil . . . . .	230
Canada . . . . .	237
Cape Verde . . . . .	239
Cuba . . . . .	241
France . . . . .	244
Ghana . . . . .	246
Ivory Coast . . . . .	250
Japan . . . . .	256
Korea . . . . .	262
Sao Tomé & Príncipe . . . . .	266
Senegal . . . . .	268
South Africa . . . . .	273
Spain . . . . .	274
United States . . . . .	280
U.S.S.R. . . . .	285
Venezuela . . . . .	288
Taiwan . . . . .	289

PRINTED IN SPAIN

Depósito Legal: M. 23693-1985

Artes Gráficas GALA, S. L. - Miguel Yuste, 36 - 28037 Madrid

# CHAPTER I

## Secretariat Reports

### ADMINISTRATIVE REPORT 1984

COM/84/11 (Amended)\*

#### 1. Member countries of the Commission

Since the last meeting (November, 1983) Venezuela deposited with the Food and Agriculture Organization of the United Nations (FAO) an instrument of ratification to the Convention and became a Contracting Party of the International Commission for the Conservation of Atlantic Tunas (ICCAT). The Commission currently comprises twenty-two (22) member countries.

#### 2. Meetings organized by ICCAT

##### *2.1 Data Preparatory Meeting for the Working Group on Juvenile Tropical Tunas*

The Secretariat organized this meeting at the "Centre de Recherches Océanographiques", (CRODT) in Dakar, at the invitation of Senegal, on February 3-9, 1984. The purpose of the meeting was to prepare the data base to be used by the Working Group on Juvenile Tropical Tunas. The invitation to the meeting was sent to all the member countries. Thirteen people from six member countries participated in the meeting. The Group reviewed and studied data preparation procedures. The CRO provided the Group with a conference room and computer facilities.

The Secretariat sent the Assistant Executive Secretary, the biostatistician and the systems analyst to organize and participate in the meeting. The Secretariat invited and assumed expenses for two scientists whose participation was essential to discussions of data base problems. The report of this meeting is appended to the Report of the Working Group on Juvenile Tropical Tunas (SCRS/84/17).

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The Administrative Report presented at the Commission Meeting was revised.

## *2.2 Working Group on Juvenile Tropical Tunas*

The Working Group met at the "Centre Océanographique de Bretagne" (COB), in Brest at the invitation of France on July 12-20, 1984. Twenty-one scientists from 11 member countries participated in the meeting, and 20 scientific papers were presented. The French Government provided the Group with a conference room and computer facilities.

A considerable amount of data processing was carried out during the meeting using the COB computer facilities. The Assistant Executive Secretary, the biostatistician, the systems analyst, the assistant programmer, three secretaries and three professional interpreters participated and assisted at the meeting from the Secretariat.

The Group reviewed the data accumulated over the last decade (including those collected during the International Skipjack Year Program), so as to advise whether or not size limits on tropical tunas would result in an increase in yield under equilibrium conditions and whether there are any other alternative measures to protect juvenile tunas. The report of the Group was approved and was submitted to the Fourth Special Meeting of the Commission (SCRS/84/17).

## *2.3 Working Group on Bluefin Tuna*

The Working Group on Bluefin Tuna met at the Bedford Institute, in Dartmouth, Nova Scotia, from September 27 to October 4, 1984, at the invitation of the Government of Canada. Prior to the meeting, the data base was created and updated at the computer center of the Northwest and Alaska Fishery Center, NMFS, in Seattle, Washington. This data base was directly accessible by the scientists participating in the meeting (see Section 9.2). The Assistant Executive Secretary and one secretary attended the meeting from the Secretariat. The Canadian Government assumed the expenses for a conference room, document reproduction, computer facilities, five professional interpreters, rental of a word processor, and coffee break.

## *2.4 SCRS Officers Meeting*

The SCRS officers attending the Meeting of the Working Group on Juvenile tropical tunas in Brest met on July 20, 1984, at the termination of that Group's sessions. They discussed overall SCRS organization, the 1984 Agenda and rapporteurs for the meeting of the scientific committee. Progress made by the various working groups and the Secretariat's statistical work were also discussed at that time. (SCRS/84/7)

## *2.5 The Working Group on the Working Capital Fund*

Following a decision reached at the last Commission meeting, the Executive Secretary circulated a note inviting participation in this Working Group. The following countries have indicated their intention to participate in the Group: Brazil, Canada, France, Spain and the U.S.A.

A document on the Working Capital Fund (COM/84/14) was prepared and circulated by the Secretariat in May. The Commission and STACFAD Chairmen decided to hold a meeting of this Working Group at the time of the November Commission meeting and prior to the STACFAD meeting.

### 3. Meetings at which ICCAT was represented

#### *3.1 Conference of Plenipotentiaries*

In accordance with a recommendation made at the Eighth Regular Meeting of the Commission (Madrid, November 1983) and at the invitation of the Government of France, a Conference of Plenipotentiaries of the ICCAT member countries was held on July 9 and 10 at the "Centre de Conférences Internationales du Ministère des Relations Extérieures" in Paris, France. The purpose of this Conference was to prepare a Protocol to the ICCAT Convention which would permit the accession of the European Economic Community (EEC) or any similar inter-governmental economic integration organizations.

The French authorities organized the meeting and the ICCAT member countries as well as the Food and Agriculture Organization of the United Nations (FAO), as depository of the Convention, were invited. The EEC and the ICCAT Secretariat were also invited as observers. Twenty ICCAT member countries, a representative from FAO and several representatives of the European Economic Community participated in the meeting. The Report of the Conference and a copy of the Protocol were presented as COM/84/26. The ICCAT Secretariat was represented by the Executive Secretary.

#### *3.2 FAO World Conference on Fisheries, Management and Development*

The Executive Secretary represented the Commission at this Conference held in Rome, Italy, from June 21 to July 6, 1984. At the time of the Conference he also met many delegates and scientists from various ICCAT member and non-member countries (including the Chairmen of the Commission and SCRS) and discussed many Commission matters.

#### *3.3 Coordinating Working Party on Atlantic Fishery Statistics (CWP)*

The CWP, of which ICCAT is an active member organization, held its 12th session at the ICES Headquarters in Copenhagen, Denmark, from July 25 to August 1, 1984. The Commission was represented by the Assistant Executive Secretary. This session focused its attention on the means to eliminate discrepancies in the data bases of the various participating organizations. The report of the CWP Session was presented as document SCRS/84/34.



### *3.4 International Commission for the Southeast Atlantic Fisheries (ICSEAF)*

The Executive and Assistant Executive Secretaries attended the Commission and scientific sessions of ICSEAF, held in Alicante, Spain, in December, 1983.

### *3.5 Meeting for considering tuna research up to the year 2000*

This subject has been discussed through correspondence among world tuna scientists for some time now. Dr. J. Joseph of the Inter-American Tropical Tuna Commission (IATTC), called a meeting in La Jolla, California, U.S.A., on January 16-20, 1984. An informal group of about 20 research scientists and administrators met. Drs. A. Fonteneau, G. T. Sakagawa and P. M. Miyake from ICCAT attended the meeting.

The objectives of tuna research were identified and discussions centered on the types of investigation necessary to reach these objectives. The rate of movement, distribution and heterogeneity of tunas were recognized as key research issues of future importance to management.

### *3.6 Lake Arrowhead Tuna Conference*

Taking advantage of a trip to the U.S. to complete the bluefin data base, the Assistant Executive Secretary attended the Tuna Conference held at Lake Arrowhead, California, on May 21-23, 1984. He presented a paper concerning present and future tuna research in the Atlantic Ocean.

### *3.7 First World Angling Conference*

Mr. J. P. Wise, the ICCAT Biostatistician, attended the First World Angling Conference held by the International Game Fish Association at Cap d'Agde, France, September 12-18, 1984. He presented two papers, one which he authored on "Research and data requirements for conservation and management of fisheries resources", and another on "International management of tuna", by P. M. Miyake.

## **4. Collaboration with other organizations**

As in the past, close working cooperation has been maintained with the Fisheries Department of the Food and Agriculture Organization of the United Nations (FAO). Mutual assistance in collecting statistics and other information continued as in other years.

Close working relationships were also maintained with other FAO organizations,

such as the FAO Fishery Committee for the Eastern Central Atlantic (CECAF), the General Fisheries Council for the Mediterranean (GFCM), the Indo-Pacific Fisheries Council (IPFC), the Indian Ocean Fisheries Commission (IOFC) and the tuna statistical field program in the western Pacific-Indian Ocean region.

The Commission also collaborated with the various international organizations, such as:

- Inter-American Tropical Tuna Commission (IATTC)
- International Commission for the Southeast Atlantic Fisheries (ICSEAF)
- Northwest Atlantic Fisheries Organization (NAFO)
- International Council for the Exploration of the Sea (ICES)
- Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR)

## 5. Coordination of Research

The coordination of research carried out by the Secretariat during 1984 is summarized in the "Secretariat Report on Statistics and Coordination of Research" (SCRS/84/21).

## 6. Publications

The following publications have been issued to date in 1984:

- a) Biennial Report, 1982-1983, Part II (English, French and Spanish)
- b) Statistical Bulletin, Vol. 13 (1982) (Final Edition)
- c) Statistical Bulletin, Vol. 14 (1983) (Provisional Edition)
- d) Data Record, Vol. 23 (Data received from October, 1983 to February, 1984)
- e) Data Record, Vol. 24 (1 & 2) (Data received from February to August, 1984)
- f) Collective Volume of Scientific Papers, Vol. XIX (Report of the Bluefin Workshop)
- g) Collective Volume of Scientific Papers, Vol. XX (1-3) (Report A and 1983 SCRS documents)
- h) Collective Volume of Scientific Papers, Vol. XXI(1 & 2) (Report of the Working Group on Juvenile Tropical Tunas, including documents presented at the meeting)
- i) Statistical Series, Vol. 12 (Port sampling summary for 1983)
- j) Newsletter (3 issues)
- k) Skipjack Conference publication

The Commission contracted the Dobrocky Seatech, Ltd., a Canadian consulting firm, to edit the skipjack publication. Some delay in the publication is anticipated due to slow responses of a few of the authors who were requested by outside referees to make some revisions to their papers. Presently, the most optimistic projection for final publication is the Spring of 1985. A progress report was submitted to the participants at the November meeting (SCRS/84/22).

## 7. Secretariat and Administration

### 7.1 Staff

Ms. V. Nordstrom, ICCAT systems analyst, resigned from the Secretariat. The announcement of the post vacancy was circulated in early September. As of the time of writing, the position has not yet been filled.

### 7.2 Trips

In addition to those trips made by the Secretariat staff to attend meetings mentioned in Sections 4 and 5 of this Report, the only other official trip made by Secretariat staff was that by the Assistant Executive Secretary to the United States in May. He visited the NMFS Southeast Fisheries Center, where, with the assistance by Mr. M. Farrack, the data bases for use at the Working Group on Bluefin Tuna meeting in Canada were created, updated and installed in the computer at the Northwest and Alaska Fisheries Center (Seattle, Washington), accessible from the Bedford Institute where the Working Group met later.

### 7.3 Word processing system

After carrying out a comparative study, the Secretariat purchased "DECmate II" word processors and a "PS-100+" (Rainbow) micro-computer, both products of the Digital Cooperation. The DECmate system is oriented towards word processing but is compatible with the "Rainbow" micro-computer. The whole system includes seven word processors, with two diskette drives each, screens, and keyboards; three daisy-wheel printers and one dot matrix printer were also purchased.

Since the introduction of this system, almost all secretarial work has been done using the DECmates. Improvements have been noted, not only from a time-saving standpoint, but also as concerns overall efficiency in preparing and editing meeting announcements and reports, form letters, tables, mailing lists, etc.

The "Rainbow" unit consists of a 16-bit processor with 128 K memory, a 10 mega-byte hard disc and two diskette drives, a dot matrix printer, screen and keyboard. The software includes a CPM system, FORTRAN and BASIC. It is now being used as a terminal for the INFONET system. Small files of the ICCAT data base can be processed by this unit.

## FINANCIAL REPORT 1984

COM/84/13 (Amended)\*

## REGULAR BUDGET

## I. FISCAL YEAR 1983

## 1. Auditor's Report for Fiscal Year 1983

The Auditor has examined the books and accounts of the Commission up to December 31, 1983. In accordance with Articles 9-3 and 12-7 of the Financial Regulations, and following recommendation of the Council at its Second Regular Meeting, the Secretariat sent a copy of the Auditor's Report to all member country governments in May, 1984. An extract of this Report has been included in the "Report for Biennial Period, 1982-83, Part I", and was presented to the Commission.

## 2. Financial Status at the End of Fiscal Year 1983

*Statement 1* shows the Balance Sheet to the end of Fiscal Year 1983. There was a balance of \$712,973.20. Of this amount, \$100,000 were applied to the 1984 Budget.

There are contributions pending payment totaling \$230,620.83.

## II. FISCAL YEAR 1984

## 1. Regular Budget - 1984

The 1984 Regular Budget was approved by the Commission at its Eighth Regular Meeting (Madrid, November 1983), (see Appendix 2 to Annex 9 of the 1983 STACFAD Report contained in the Biennial Report, 1982-1983, Part II). Because of currency fluctuations (US\$/peseta) the Budget was reduced from \$825,000 in 1983 to \$700,000 in 1984. Besides, by applying the \$100,000 from the positive balance of Fiscal Year 1983, \$600,000 of the total 1984 Budget were covered by the country contributions.

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Updated to the end of Fiscal Year 1984. Modifications agreed upon by the Commission have been included.

## 2. Review of Commission Accounts

*Statement 2* shows the current status of the member country contributions at the end of 1984. Contributions corresponding to 1984 and other years and which amount to \$296,882.57, are pending payment from: Benin, Brazil, Cape Verde, Cuba, Gabon, Ghana, Ivory Coast, Morocco, Senegal, and Uruguay. In addition, there is still an extrabudgetary contribution of \$16,096 pending payment from Venezuela, which became a member of the Commission after the Budget had been approved.

*Statement 3* shows the Budget, Expenditures and Balance to the end of Fiscal Year 1984 and would show a positive balance of \$102,768.44 if all countries had paid their contributions. However, as this was not the case, the funds corresponding to the 1984 Budget are:

a) Country contributions.....	464,598.14	
b) From 1983 balance.....	<u>100,000.00</u>	
		\$ 564,598.14
Since expenses amounted to.....		<u>597,231.56</u>
There is a negative balance of.....		-32,633.42

This difference will be covered by the Working Capital Fund.

## 3. General comments on the Regular Budget

### Chapter 1 - SALARIES

The effect of currency fluctuation, as mentioned before, has resulted in a substantial positive balance (\$47,184.52) in this Budget chapter, since there were no increases in staff salaries. On the contrary, there were actually slight decreases in salaries in dollar amounts.

### Chapter 2 - TRAVEL

Trips made by the Secretariat staff are outlined in the Administrative Report (COM/84/11).

Included in this Budget chapter are trips made by the Executive Secretary to Las Palmas (to organize the annual meeting), Azores (to attend the "Week of Fisheries"), Paris (to attend the Conference of Plenipotentiaries), Rome (to attend the FAO World Conference on Fisheries) and Málaga (to attend the ICSEAF Meeting).

Also included are trips by the Assistant Executive Secretary to Dakar, Senegal (Data Preparatory Meeting on Juvenile Tropical Tunas), the United States and Canada (Working Group on Bluefin Tuna) and Málaga (ICSEAF).

This Budget chapter ended with a positive balance of \$1,025.43.

## Chapter 3 - ANNUAL MEETING

An estimated budget of \$72,000 was adopted, based on holding the annual Commission Meeting in Madrid. Since the meeting was held in Las Palmas, Canary Islands, actual expenses amounted to \$75,551.16, a 4 percent increase over the amount budgeted for Madrid.

We should like to point out that due to the high level of efficiency of the Secretariat staff, we have been able to reduce the number of staff contracted for the meetings. On the other hand, the excellent conditions offered by the Hotel Reina Isabel helped to reduce costs considerably.

The expenses charged to this Budget chapter were as follows:

i) ICCAT Secretariat staff (travel, per diem, overtime, transport of equipment and material).....	\$30,853.20
ii) Simultaneous interpreters (travel, salary, per diem).....	15,060.96
iii) Extra staff (3 multi-lingual translators, 1 receptionist, and 1 copy machine operator).....	9,603.61
iv) Hotel conference rooms, working rooms, coffee break and miscellaneous .....	6,804.40
v) Electronic equipment for simultaneous translation .....	5,157.35
vi) 3 copy machines .....	5,938.95
vii) Extra local staff.....	<u>2,132.69</u>
TOTAL .....	\$75,551.16

## Chapter 4 - PUBLICATIONS

The Commission publications outlined in the Administrative Report (COM/84/11) have been charged to this chapter. There is a positive balance of \$1,804.93.

## Chapter 5 - OFFICE EQUIPMENT

Expenditures charged to this chapter include the purchase of office furniture and monthly installments on two leased photocopy machines. This chapter shows a positive balance of \$2,424.93.

## Chapter 6 - OPERATING EXPENSES

The expenses incurred in this Budget chapter are broken down as follows:

i) Office material.....	\$ 7,516.89
ii) Reproduction of documents.....	6,237.10
iii) Mailing expenses.....	14,425.05
iv) Telephone.....	4,884.01
v) Telegrams and telex.....	3,564.51
vi) Equipment maintenance.....	9,340.32
vii) Auditor's fees.....	1,500.00
viii) Security bond.....	759.95
ix) Electricity.....	4,097.74
x) Office cleaning.....	2,410.44
xi) Miscellaneous.....	<u>1,696.55</u>
TOTAL.....	\$56,432.56

This chapter shows a negative balance of \$1,432.56, due to the notable increase in mailing and equipment maintenance expenses.

#### Chapter 7 - MISCELLANEOUS

This chapter was charged with minor expenses, such as repairs (plumbing, furniture, etc.) office insurance (fire, theft, liability), local transportation for office business, and in general, other miscellaneous expenses which are not applicable to other Budget chapters.

#### Chapter 8 - COORDINATION OF RESEARCH

##### *a) Staff*

This chapter includes the salaries of the biostatistician, the systems analyst (up to the month of June), two statistical assistants and a statistical clerk. It also includes the expenses (\$11,000) of the port samplers in Tenerife, Las Palmas, St. Maarten, Cape Town, Cumaná, and Montevideo. This sub-chapter shows a positive balance of 452,543.33, due in part to the vacancy in the systems analyst position for 7 months and a 3-month vacancy in a statistical assistant position.

##### *b) Travel*

Trip expenditures included in this sub-chapter are those of the biostatistician and systems analyst to Dakar, Senegal (Data Preparatory Meeting on Juvenile Tropical Tunas), the Assistant Executive Secretary to Copenhagen, Denmark (CWP Meeting), "home leave" of the biostatistician and his family, and the biostatistician's trip to France (First World

Angling Conference). There is a positive balance of \$3,401.98 in this sub-chapter.

*c) Office Equipment*

These expenses correspond to office material and equipment acquired for the statistical department. The purchase of 30,000 tags and 3,000 needles at a cost of over \$14,000, as well as auxiliary computer equipment, were also charged to this sub-chapter.

The Secretariat provides the scientists with tags and needles to use in national tagging programs. For this reason this sub-chapter shows a negative balance of \$11,605.82.

*d) Data Processing*

Data processing expenditures have remained well within the amount budgeted, in spite of increased processing work. There is a positive balance of \$16,600.95.

*e) Meetings during the year*

Expenditures for several meetings held during the year were charged to this sub-chapter. Consequently, expenses have exceeded considerably the amount budgeted and there is a negative balance of \$10,013.76 corresponding to this Budget sub-chapter. A breakdown of these meeting expenses is as follows:

i) Working Group on Juvenile Tropical Tunas	
- Dakar, Senegal .....	\$3,500.00
- Brest, France* .....	\$24,948.76
ii) Working Group on Bluefin Tuna	
- Dartmouth, Canada.....	\$ 2,463.00
iii) Training Course on Statistics & Sampling	
- For Korea (in Japan).....	<u>\$ 1,102.00</u>
TOTAL.....	\$32,013.76

\*Several members of the Secretariat staff were sent to Brest to assist at the meeting and the services of professional interpreters were utilized.



*f) Miscellaneous*

Included in this sub-chapter are expenditures to ship tagging materials from the United States to Spain, repair of the Texas Instruments terminal, tag recovery rewards (tagging lottery), and sampling of bluefin and shipping of bluefin samples from Italy to the United States. This sub-chapter shows a positive balance of \$789.81.

4. Income and Disbursements of the Regular Budget

*Statement 4* shows the Income and Disbursements for Fiscal Year 1984.

5. Breakdown of the Working Capital Fund

*Statement 5* shows the Breakdown of the Working Capital Fund. After making deductions authorized by the Commission, the Fund shows a balance of \$552,016.82 at the end of Fiscal Year 1984.

However, all pending country contributions corresponding to 1984 and other years (\$296,882.57), as well as the extrabudgetary contribution of Venezuela (\$16,096.00) will automatically go to the Working Capital Fund as they are received.

6. Balance Sheet of the Regular Budget

*Statement 6* shows Assets and Liabilities at the end of Fiscal Year 1984. There are \$727,016.82 in Cash and Bank and \$296,882.57 corresponding to pending country contributions.

## SKIPJACK BUDGET

1. At the end of Fiscal Year 1983 there was a balance of \$73,445.97. However, there are contributions pending payment totaling \$12,610.70. (See Statement 10 of the 1983 Financial Report contained in the Biennial Report, 1982-83, Part II.)

The skipjack funds available are used to meet the expenses of the contract with the Dobrocky Seatech, Ltd., a Canadian consulting firm where the former Skipjack Coordinator is employed, to edit the skipjack publication. Once this volume has been published, Program activities and any financial applications will have ended.

The status of skipjack accounts at the end of Fiscal Year 1984 is as follows:

Funds available at end of 1983 .....	\$73,445.97
Expenditures during 1984.....	<u>38,473.29</u>
Balance.....	\$34,972.68

This balance will be used to meet the expenses of the skipjack publication.

2. We note the agreements reached by the Commission concerning skipjack funds.

- i) Once all Program activities have been completed, and should there be a positive balance of skipjack funds, this balance will be deposited to the Working Capital Fund of the Regular Budget.
- ii) If, on the other hand, expenses exceed available funds, the difference will be paid from the Working Capital Fund.
- iii) The Skipjack Budget contributions still pending payment at the end of Program activities will be solicited again and those still unpaid will be added to the appropriate country's contribution to the Regular Budget.

## REGULAR AND SKIPJACK BUDGETS

### 1. Balance Sheet at Close of Fiscal Year 1894

*Statement 7* shows the Assets and Liabilities corresponding to both Commission Budgets.

**STATEMENT 1**

**Balance Sheet – Regular Budget 1983 (USA\$)**

<i>ASSETS</i>		<i>LIABILITIES</i>	
Cash and Bank . . . . .	712,973.20	Available in Working Capital Fund . . . . .	612,973.20
Contributions pending payment . . . . .	230,620.83	Applied to the 1984 Budget . . . . .	100,000.00
	<hr/>	Contributions pending payment . . . . .	<hr/> 230,620.83
<b>TOTAL</b> . . . . .	<b>943,594.03</b>	<b>TOTAL</b> . . . . .	<b>943,594.03</b>

## Status of Member Country Contributions in 1984 - Regular Budget (USA\$)

<i>Country</i>	<i>1983 Balance</i>	<i>Contributions for 1984, approved by the Commission</i>	<i>Contributions paid towards the 1984 Budget</i>	<i>Other Contributions*</i>	<i>Balance</i>
Angola . . . . .	--	16,827	16,827.00	--	--
Benin . . . . .	20,227.00	4,117	4,117.00	--	20,227.00
Brazil . . . . .	25,871.00	26,089	--	--	51,960.00
Canada . . . . .	--	15,353	15,353.00	--	--
Cape Verde . . . . .	--	10,261	--	--	10,261.00
Cuba . . . . .	13,306.32	19,490	14,536.14	13,306.32	4,953.86
France . . . . .	--	72,249	72,249.00	--	--
Gabon . . . . .	16,764.41	8,230	--	--	24,994.41
Ghana . . . . .	51,522.27	24,209	--	--	75,731.27
Ivory Coast . . . . .	19,610.05	24,535	--	16,588.90	27,556.15
Japan . . . . .	--	56,625	56,625.00	--	--
Korea . . . . .	--	38,124	38,124.00	--	--
Morocco . . . . .	38,068.00	21,000	--	--	-59,068.00
Portugal . . . . .	--	24,246	24,246.00	--	--
Sao Tomé & Príncipe . . . . .	--	4,115	4,115.00	--	--
Senegal . . . . .	45,251.78	11,784	--	39,244.90	17,790.88
South Africa . . . . .	--	10,275	10,275.00	--	--
Spain . . . . .	--	131,311	131,311.00	--	--
Uruguay . . . . .	--	4,340	--	--	4,340.00
United States . . . . .	--	54,677	54,677.00	--	--
U.S.S.R. . . . .	--	22,143	22,143.00	--	--
<b>TOTAL . . . . .</b>	<b>230,620.83</b>	<b>600,000</b>	<b>464,598.14</b>	<b>69,140.12</b>	<b>296,882.57</b>

\*Late payments: to the Working Capital Fund.

## STATEMENT 3

## Budget, Expenditures and Balance of the Regular Budget for Fiscal Year 1984 (USA\$)

<i>Chapter</i>	<i>I Amount Budgeted</i>	<i>II Actual Expense</i>	<i>III Difference</i>
1. Salaries . . . . .	280,000.00	232,815.48	+ 47,184.52
2. Travel . . . . .	14,000.00	12,974.57	+ 1,025.43
3. Annual Meeting . . . . .	72,000.00	75,551.16	- 3,551.16
4. Publications . . . . .	30,000.00	28,195.07	+ 1,804.93
5. Office Equipment . . . . .	10,000.00	7,575.07	+ 2,424.93
6. Operating Expenses . . . . .	55,000.00	56,432.56	- 1,432.56
7. Miscellaneous . . . . .	9,000.00	5,404.14	+ 3,595.86
<i>Sub-total</i> . . . . .	470,000.00	418,948.05	+ 51,051.95
8. Coordination of Research			
a) Staff . . . . .	150,000.00	97,456.67	+ 52,543.33
b) Travel . . . . .	12,000.00	8,598.02	+ 3,401.98
c) Office Equipment . . . . .	5,000.00	16,605.82	- 11,605.82
d) Data Processing . . . . .	36,000.00	19,399.05	+ 16,600.95
e) Meetings during the year (Sub-Committees, Working Groups, Training Courses, etc.) . . . . .	22,000.00	32,013.76	- 10,013.76
f) Miscellaneous . . . . .	5,000.00	4,210.19	- 789.81
<i>Sub-total</i> . . . . .	230,000.00	178,283.51	+ 51,716.49
9. Contingencies . . . . .	0	0	0
<b>TOTAL</b> . . . . .	700,000.00	597,231.56	+ 102,768.44
<b>From Working Capital Fund</b> . . . . .	100,000.00		
<b>From Member Country Contributions</b> . . . . .	600,000.00		

## STATEMENT 4

## Income and Disbursements of the Regular Budget 1984 (USA\$)

<i>INCOME</i>		<i>DISBURSEMENTS</i>	
Cash and Bank (at the end of Fiscal Year 1983) . . . . .	712,973.20	From the 1984 Budget . . . . .	597,231.56
Contributions paid towards the 1984 Budget . . . . .	464,598.14	Balance in Cash and Bank . . . . .	727,016.82
Other contributions (pending from other years) . . . . .	69,140.12*		
Bank interest 1984 . . . . .	77,519.14*		
Sale of ICCAT publications . . . . .	<u>17.78</u>		
<b>TOTAL . . . . .</b>	<b>1,324,248.38</b>	<b>TOTAL . . . . .</b>	<b>1,324,248.38</b>

\*To the Working Capital Fund.

## STATEMENT 5

Breakdown of the Working Capital Fund (USA\$)

At the end of Fiscal Year 1983 . . . . .	612,973.20	
Bank Interest – 1984 . . . . .	77,519.14	
Sale of ICCAT publications . . . . .	17.78	
Delayed contributions . . . . .	<u>69,140.12</u>	759,650.24
Deductions:		
-- To cover negative balance of 1984 . . . . .	32,633.42	
-- Applied to the 1985 Budget . . . . .	100,000.00	
-- Applied to the 1985 Budget from Bank Interest . . . . .	75,000.00	<u>207,633.42</u>
Available in the Working Capital Fund . . . . .		552,016.82

**STATEMENT 6**

**Balance Sheet of the Regular Budget 1984 (USA\$)**

<i>ASSETS</i>		<i>LIABILITIES</i>	
Cash and Bank . . . . .	727,016.82	Available in Working Capital Fund . . . . .	552,016.82
Contributions pending payment . . . . .	296,882.57	Applied to the 1985 Budget . . . . .	175,000.00
		Contributions pending payment . . . . .	<u>296,882.57</u>
<b>TOTAL . . . . .</b>	<b>1,023,899.39</b>	<b>TOTAL . . . . .</b>	<b>1,023,899.39</b>



## STATEMENT 7

## Balance Sheet at Close of Fiscal Year 1984 — Regular Budget and Skipjack Budget (USA\$)

<i>A S S E T S</i>		<i>L I A B I L I T I E S</i>	
<i>Available:</i> (Banco Exterior de España) (1US\$ - 171 Pts.)		<i>Acquired holdings</i>	208,237.85
Acct. 84-31279-Z (time deposit)	691,091.80	<i>Available in the Working Capital Fund</i>	552,016.82
Acct. 82-31279-Q (US\$)	40,745.56	<i>Applied to the 1985 Regular Budget</i>	175,000.00
Acct. 30-17632-A (Pts.)	5,293,005.00	<i>Skipjack Program Funds</i>	34,972.68
Acct. 30-17329-F (Convert. Pts.)	3,205.69	<i>Contributions pending payment:</i>	
Cash on hand (Pts.)	33,425.00	Regular Budget	296,882.57
	<u>5,329,635.69</u>	Skipjack Budget	12,610.70
	31,167.45	Extra-budgetary	16,096.00
<i>Receivables:</i>		<i>Difference in currency exchange</i>	1,015.31
From Regular Budget:			
BENIN	20,227.00		
BRAZIL	51,960.00		
CAPE VERDE	10,261.00		
CUBA	4,953.86		
GABON	24,994.41		
GHANA	75,731.27		
IVORY COAST	27,556.15		
MOROCCO	59,068.00		
SENEGAL	17,790.88		
URUGUAY	4,340.00		
	<u>296,882.57</u>		
Extra-budgetary contribution:			
VENEZUELA	16,096.00		
From Skipjack Budget:			
BENIN	3,044.70		
GABON	860.00		
GHANA	4,800.00		
MOROCCO	3,906.00		
	<u>12,610.70</u>		
<i>Equipment:</i>			
Acquired before 1983	136,646.96		
Acquired during 1983: i) 64,759.97			
ii) <u>1,781.75</u>	66,541.72		
Acquired during 1984	4,779.97		
	<u>207,968.65</u>		
<i>Bonds</i>			
	<u>269.20</u>		
<b>TOTAL ASSETS</b>	<b>1,296,831.93</b>	<b>TOTAL LIABILITIES</b>	<b>1,296,831.93</b>
Furniture ceded by Undersecretariat of Merchant Marine of Spain	3,365.38	Furniture ceded by Undersecretariat of Merchant Marine of Spain	3,365.38
The Executive Secretary:		Certified by the Auditor:	
<i>O. Rodríguez-Martín</i>		<i>B. Tahoces Acebo</i>	

## SECRETARIAT REPORT ON STATISTICS AND COORDINATION OF RESEARCH

SCRS/84/21

### I. Data collection and sampling

#### 1. Collection of 1983 statistics through national offices

The same routine procedure was adopted as in previous years. Various requests and reminders were forwarded by letter, telephone, telex and telegram to those countries which did not provide the Commission with statistics on time. The progress made by national offices and by the Secretariat is shown in Table 1 to Appendix 3 to Annex 10.

Because the scientists have had to prepare data for various intersessional meetings, the data for many fisheries have been received much earlier than usual this year. As of September 30, 1984, provisional 1983 Task I data were almost complete, except for minor countries or minor species; 1983 Task II catch and effort data as well as size data have been received for almost all of the major fisheries except for the Japanese longline fishery.

#### 2. Difficulties in updating statistics

The Secretariat still has some major problems in updating Task I catch statistics:

##### *a) Species breakdown*

For many surface fisheries, the Working Group on Juvenile Tropical Tunas estimated new catch figures for yellowfin, bigeye and skipjack which are quite different from what had been previously reported (Task I). Even though it is assumed that the new figures are better than the old ones, the Secretariat has not yet changed the data base. As soon as the SCRS approves the new estimates, or the national statistical correspondents formally inform the Secretariat that the new estimates should replace the old figures, the Secretariat will update the data base accordingly.

The Secretariat prepared two species tables for the 1984 SCRS meeting for the rapporteurs, one based on official data and another based on the new estimates.

Another species problem continues with billfishes. Some countries do not identify billfish catches by species. In such cases, the Secretariat waits until the SCRS reviews the data. If the SCRS does not estimate the species composition of these combined billfish catches, the Secretariat estimates the species breakdown according to the method approved at the 1981 Miami Billfish Workshop.

*b) Area breakdown*

Many countries do not report catches by major ocean areas. The Secretariat generally estimates the areal breakdown based on Task I and Task II catch and effort data, but only after the Task II data are updated and processed, i.e., some time after the "Provisional" Statistical Bulletin is issued but before the "Final" edition is published.

This year, there is an additional problem with the areal breakdown of sailfish. In 1983, the SCRS recommended that the catches of sailfish, which had been reported for the whole Atlantic up to 1982, should be reported by east and west Atlantic. The request for statistics specified this new change but many countries did not follow these instructions in reporting sailfish catches. Also all catches reported for past years are for the total Atlantic. The Secretariat has assigned catches by the coastal fleets (e.g., Senegalese, Brazilian, etc.) to the appropriate side of the ocean but longline catches could not be separated.

*c) Country breakdown*

The basic rule used in reporting statistics has been that catches be reported according to the flag of the fishing vessels. However, the situation becomes more and more complicated as the number of boats flying flags of convenience increases, and as joint fishing ventures become more common. The Secretariat still observes this rule but sometimes we have to give first priority to the criterion that all catches must be reported, but only once. In other words, sometimes the catches are not reported strictly by flag (e.g., Panama, FIS, Venezuela).

### 3. Port sampling by the Secretariat

Document SCRS/84/24 discusses in detail the present situation and considers future programs.

## II. Secretariat data processing

### 1. Facilities

The INFONET system was contracted again in 1984 for ICCAT data processing. A Digital PC-100+ which was purchased at the beginning of 1984 added some support to the Secretariat data management scheme. Since this micro-computer has a 10 megabyte hard disk, it can be used both as a terminal to INFONET and to process relatively small data files transferred from INFONET to its disc memory.

## 2. Staff

There have been some changes in the Secretariat staff (see COM/84/11). The systems analyst has resigned and as of the time of writing this report, the position has not yet been filled. It is hoped that in the future the Secretariat statistical staff will consist of a systems analyst, an assistant computer programmer, a statistical clerk (secretary) and a key puncher (data entry).

## 3. Data processing

An unusually large amount of data processing was done by the Secretariat in 1984 because of the two major inter-sessional working group meetings held during the year. Both meetings required considerable data processing by the Secretariat before, during and after each meeting. (See Section III.) In addition, the shortage of personnel caused some delay in low priority routine work (e.g., providing copies of a part of the data base to national offices).

Computer facilities during the meeting of the Working Group on Juvenile Tropical Tunas were provided by the CNEXO-COB of Brest, France and those for the meeting of the Working Group on Bluefin Tuna were provided by the NMFS of the U.S.A. and the Bedford Oceanographic Institute of Canada free of charge. These offers reduced to a great extent the total data processing cost which would have been borne by the Secretariat.

The following data processing work was carried out by the Secretariat in 1984:

### ROUTINE PROCESSING

- a) Updating all data bases (Task I, Task II, etc.).
- b) Data entry and processing of port sampling statistics.
- c) Separation of Task I catch data into major areas (and sometimes into species) using Task II catch and effort and size data.
- d) Output of Statistical Bulletin tables.
- e) Output of Task II data received recently (Data Record, Vols. 23 and 24).
- f) Preparation of species catch tables for the SCRS meetings and SCRS Reports (1983 and 1984).
- g) Updating tagging files and output of yearly recovery summary.
- h) Creation and distribution of tapes, upon request, for member countries.

### SPECIAL PROCESSING (See Section III)

- i) Processing of bluefin data for the Working Group on Bluefin Tuna (done with the assistance of the NMFS, Southeast Fisheries Center, Miami, on the U.S. computer).

- j) Processing of juvenile tropical tuna data in preparation for the meeting of the Working Group on Juvenile Tropical Tunas.
- k) Processing of data during the meeting of the Working Group on Juvenile Tropical Tunas (using the computer at the COB-Brest).
- l) Entering and processing of field data from Ghanaian fleets in order to provide Task II catch and effort data and biological data (1982 and 1983).

### III. Special assignments given to the Secretariat

#### 1. Updating and processing for the Bluefin Workshop

Following a recommendation made by the SCRS, the Secretariat intended to recreate the catch-by-size data base for bluefin (up to and including 1982) by month, rather than by year as was prepared in 1983. This assignment was completed with the assistance of Mr. M. Parrack of the NMFS Southeast Fisheries Center. At the same time the data base was updated to include all the new data received by the Secretariat (mostly those for 1983) since it was created in 1983 (SCRS/84/26).

This new data base was forwarded to bluefin scientists either in hard copy form or on magnetic tape. Also, the data base was established at the Northeast and Alaska Fishery Center, NMFS, and was accessed from the Bedford Oceanographic Institute by scientists attending the meeting of the Working Group on Bluefin Tuna.

#### 2. Computer work for the Working Group on Juvenile Tropical Tunas

In order to prepare the data base for use by the Working Group, the Secretariat held a "Data Preparatory Meeting" in February at the CRO-Dakar, at the invitation of Senegal. According to the agreements reached at this meeting, the Secretariat created the juvenile tropical tuna data base for all fleets, except for the FISM and Spanish fleets. The base was distributed well in advance of the meeting to all interested scientists.

The Secretariat was also responsible for combining all the data bases, including FISM and Spanish, and for installing and processing the data at the computer of the COB-Brest where the meeting of the Working Group was held. The results were distributed to interested scientists.

#### 3. Biostatistical work

The biostatistician participated in the data analysis in advance of as well as during the Data Preparatory Meeting for the Working Group on Juvenile Tropical Tunas held in Senegal in February, and the Working Group on Juvenile Tropical Tunas in France in July,

where he presented papers on the variability of catches of Atlantic yellowfin and bigeye tunas (JTT/84/5) and on estimates of catches of small or undersized yellowfin and bigeye tunas (JTT/84/6).

He presented an invited paper on research and data requirements for conservation and management of fisheries resources at the First World Angling Conference in France in September. He was author of a chapter on the future of food from the sea in "The Resourceful Earth", published by Basil Blackwell Publisher in mid-1984.

Specialized studies of the ICCAT data base continued, with an analysis of size sampling in the Task II base (SCRS/84/27). An indexed bibliography of the first twenty volumes of the "Collective Volume of Scientific Papers" was completed.

#### 4. Training courses

In 1983 the Commission conducted training courses for scientists and technicians of developing member countries working in the field on collecting statistics. Unfortunately, Korea could not participate in the courses held by ICCAT due to the distance between that country and the locations chosen to hold the courses.

In 1984, Japan offered to accept one Korean trainee. The Secretariat arranged the schedule and one scientist spent about ten days in Japan to receive training at fisheries research centers in Japan. Trip expenses for the trainee were paid by the Commission.

### IV. Future program on the data base

As already mentioned, due to the heavy work schedule in data processing and other statistical work in 1984, many important long-term assignments have not been completed. These include:

#### 1. Reorganization of Task II catch and effort and size data bases

The ICCAT data bases have developed very rapidly and the growth in volume has been much more than was expected when they were first established. The data received by the Secretariat varies both in quality and format. The data base was designed to be quite flexible so that almost any quality of data (e.g., even if the time strata are missing), any type of data (e.g., fork length,  $LD_1$ , age or weight) or any format (e.g., field records, summarized data, or raised and substituted data) can be entered. However, acceptance of such data has resulted in nonuniform data bases.

Another problem is that countries submit corrections to the data, supplemental data and/or different sets of data at a later date. Most of these data have been merged with the

original files or replace old figures, but some are kept as separate files (e.g., supplemental size data for the Japanese longline fishery).

The Secretariat needs to do some "house cleaning" of the data bases, but up to the present time the work load has not allowed us to complete this task. When the systems analyst position is filled in the near future, high priority will be given to this task.

## 2. Reorganization of tagging record data base

Since a decision was made by the SCRS to create a tagging file at the Secretariat, the Secretariat entering all the data available on tag releases and recoveries in the base. Many countries cooperated by sending us their files on magnetic tape. Those are now kept in various files, and are available for users. However, the situation is very similar to the Task II bases, i.e., reorganization of all the files is needed to make them more convenient for users. The Secretariat will be undertake this work as soon as time permits and personnel are available.

## 3. Improvement of data verifying program in the data base

The present updating programs for the ICCAT data base have only limited data verification capability. We hope to expand this mechanism to include more strict data quality control. This project has also been left for the future.

## V. Publications and dissemination of information

<u>Publication</u>	<u>Published in</u>	<u>Contents</u>
a) Quick estimates:	Jun. 1984 Oct. 1984	Estimates for all 1983 catches Estimates for first half of 1984
b) Statistical Bulletin		
Vol. 13 (Final)	Feb. 1984	1982 Final catches
Vol. 14 (Prov.)	Oct. 1984	1983 Provisional catches

- |   |           |  |   |
|---|-----------|--|---|
| c) Data Record                            |           |  |   |
| Vol. 23                                   | Mar. 1984 |  | Data received in Oct. 1983 Feb. 1984  |
| Vol. 24                                   | Oct. 1984 |  | Data received in Mar.-Aug. 1984   |
| d) Collective Volume of Scientific Papers |           |  |   |
| Vol. XIX                                  | Jan. 1984 |  | Report of the Bluefin Workshop  |
| Vol. XX(1-3)                              | Apr. 1984 |  | 1983 SCRS Report "A" and papers presented at the meeting  |
| Vol. XXI(1 & 2)                           | Oct. 1984 |  | Report of the Working Group on Juvenile Tropical Tunas, including papers submitted at the meeting |
| e) Statistical Series                     |           |  |   |
| Vol. 12                                   | Aug. 1984 |  | Port sampling summary for 1983  |



## CHAPTER II

### Record of Meetings

#### PROCEEDINGS OF THE FOURTH SPECIAL MEETING OF THE COMMISSION

Las Palmas, Canary Islands, Spain

November 7 - 13, 1984

#### TABLE OF CONTENTS

##### Plenary Sessions of the Commission

- Annex 1 - Commission Agenda
- Annex 2 - List of Participants
- Annex 3 - Opening Address by the Secretary General of Maritime Fisheries of Spain
- Annex 4 - Opening Address by Commission Chairman
- Annex 5 - Statement by Dr. F. Castro y Castro, Head of Mexican Observer Delegation
- Annex 6 - Reports of the Meetings of Panels 1 - 4
- Annex 7 - Statement by Ghana on the Yellowfin-Bigeye Issue
- Annex 8 - Report of the Meeting of the Infractions Committee
- Annex 9 - Report of the Standing Committee on Finance and Administration (STACFAD)
- Annex 10 - Report of the Standing Committee on Research and Statistics (SCRS)

## Opening Plenary Session November 7, 1984

### Item 1. OPENING OF THE MEETING

1.1 The Commission held its Fourth Special Meeting at the Hotel Reina Isabel, Las Palmas, Canary Islands, under the chairmanship of Mr. C. J. Blondin (U.S.A.). The Chairman expressed the Commission's appreciation to the Government of Spain for hosting this meeting in Las Palmas. The Chairman introduced Mr. M. Oliver, Secretary General of Maritime Fisheries of Spain.

1.2 Mr. Oliver extended a warm welcome to all the delegates and observers. He commented briefly on the history of the Commission since its beginning in 1969. He stressed the importance of international cooperation in tuna research, which benefits all the member countries. He expressed his confidence in the Commission's ability to find solutions to the difficult problems encountered in the study of maritime resources. (Mr. Oliver's Opening Address is attached as Annex 3.)

1.3 After a brief recess, the Chairman formally opened the meeting. He welcomed all the delegates and observers, particularly Venezuela, the newest member of ICCAT. The Chairman noted that the Commission has grown in size to 22 member countries, which is evidence of the importance the world community places on this Commission.

1.4 Mr. Blondin noted that the effectiveness of the scientific committees work was clearly shown by the success of the five-year International Skipjack Year Program. The Program was an example of international cooperation in studying highly migratory tunas which range far beyond national jurisdictions.

1.5 Mr. Blondin commented on the ICCAT regulations designed to protect the stocks of yellowfin, bigeye and bluefin tunas. He noted ICCAT's willingness to address the sensitive and difficult problems of effective enforcement of regulations.

1.6 The Chairman stressed that, although much progress has been made, the Commission must continue to expand its knowledge of tunas and tuna-like species to improve its ability to make accurate stock assessments. (Mr. Blondin's Opening Address is attached as Annex 4.)

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

2.1 The delegations from the member countries were introduced. (The List of Participants is attached as Annex 2.)

2.2 The Commission reviewed the Tentative Agenda previously circulated and adopted the Agenda without changes (attached as Annex 1).

2.3 It was decided that Agenda Items 4-13, 18, 25 and 26 would be referred to the Standing Committee on Finance and Administration (STACFAD). Item 24 was referred to the Infractions Committee.

### Item 3. ADMISSION OF OBSERVERS

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

3.2 The observer from Mexico, Dr. Fernando Castro y Castro, addressed the Commission and recognized its aim to attain rational exploitation of Atlantic tuna resources. He described his country's participation in the FAO World Conference, meetings of the South Pacific Commission and the Inter-American Tropical Tuna Commission and the importance of the New Law of the Sea. Mr. Castro y Castro stressed the necessity of international support as provided by the large number of experts working within ICCAT. Finally, he expressed his wish for a very successful meeting in which not only resources, catches and their management would be discussed, but also economic solutions that would equitably provide benefits for different countries. His statement is attached as Annex 5.

## Second Plenary Session

November 8, 1984

### Item 15. REPORT OF THE STANDING COMMITTEE ON RESEARCH AND STATISTICS (SCRS)

15.1 Mr. J. S. Beckett (Canada), Chairman of the Standing Committee on Research and Statistics (SCRS), presented the Report of his Committee and summarized its scientific findings.

15.2 He described first the standard techniques used by the scientists in stock analyses and general data problems. There were two major working group meetings held by the SCRS in 1984, the Working Group on Juvenile Tropical Tunas (Brest, France, July), and the Working Group on Bluefin Tuna (Dartmouth, Canada, September-October). In March, a Data Preparatory Meeting for Juvenile Tropical Tunas was held (Dakar, Senegal).

15.3 The Working Group on Juvenile Tropical Tunas, convened by Dr. J. B. Amon Kothias (Ivory Coast), found that the areas in which schools of small fish of mixed species are more widespread than previously observed and include almost all the surface fishing grounds of the eastern tropical Atlantic. Results are more fully described in the appropriate sections of the SCRS Report.

15.4 The Bluefin Working Group held a stock assessment meeting at Dartmouth, Canada, under the convenership of Dr. J. J. Maguire (Canada). Direct access to the computer rapidly solved many analytical problems. The results are summarized in the bluefin section of the SCRS Report.

15.5 The SCRS Chairman presented the results of scientific research on current fishing patterns, stock structure, and stock assessments made by the Committee and its eval-

uation of the effect of current regulations (where applicable) for each major species. These are summarized under Agenda Item 9 of the SCRS Report.

15.6 Special mention was made of the bigeye size regulation and bluefin regulations. More details are found in Sections BET-4.c and BFT-4.c. The specific questions asked by the Commission of the Working Group on Juvenile Tropical Tunas are also answered in the SCRS Report and the Report of the Working Group on Juvenile Tropical Tunas (SCRS/84/17). Multi-species problems in relation to the possibility of time-area closures for protection of juvenile yellowfin and bigeye are analyzed and reported in the multi-species sections of Item 9 of the SCRS Report.

15.7 The Chairman referred to other SCRS discussions, such as how can the quality of papers included in ICCAT publications be improved; the "Day to Review Statistics" dedicated to the examination of statistical and sampling systems; how to proceed with port sampling in order to cover problem areas; advice on the length of bluefin equivalent to 6.4 kg; the possibility of continuing micro-element studies; the development of a plan to monitor the eastern tropical Atlantic stocks since a sharp reduction in fishing effort is taking place there; the proposal for another meeting of the Bluefin Working Group to carry out stock assessments; how to streamline SCRS Report and drafting procedures; the probable dissolution of the Working Group on Juvenile Tropical Tunas; and changes in the future organization of the SCRS, introducing more analytical elements.

15.8 The Commission was advised that, if adopted, the micro-element studies and the monitoring of the eastern tropical stocks will require substantial extra funding by the Commission.

15.9 Clarification of a few points was requested. The Commission congratulated the SCRS Chairman and the scientists for successfully carrying out scientific assignments. The Commission adopted the Report, which is attached as Annex 10.

## Item 19. REPORT OF THE CONFERENCE OF PLENIPOTENTIARIES

19.1 Mr. B. Labrousse (France) presented the conclusions of the Conference of Plenipotentiaries, which was hosted by France in Paris, July, 1984. The Conference was chaired by France. The results are presented in COM/84/26, including the Final Act of the Conference and the Protocol to the Convention which are appended to it.

19.2 The delegate from France informed the Commission that the Final Act had been signed by all Plenipotentiaries present (Gabon and Cape Verde were absent but may sign at any time). The Protocol itself, deposited together with the Final Act with the Director General of FAO, must be signed and ratified or approved by all ICCAT member countries. Only a few countries have complied with this requirement. France seriously requested that all the member countries rapidly fulfill this formality and asked the Executive Secretary to transmit this request to the member countries.

19.3 The EEC observer thanked the participants of the Paris Conference and expressed the hope that the EEC would very soon become a Contracting Party to the Commission as is the case in five other international fishery organizations. The EEC also

thanked those countries which signed the Protocol to the Convention prior to the closing date of September 10, 1984, namely, Brazil, Canada, the U.S.A. and France, as well as those countries which expressed regret at not having signed the Protocol in due time. The EEC also seeks swift ratification of the Protocol by all member countries and an indication of the state of progress of the necessary procedures by the member countries.

## Final Plenary Session

November 13, 1984

### Item 16. REPORTS OF PANELS 1 - 4

16.1 It was decided that Panels 1 and 4 would hold a joint meeting to discuss the possible extension of the bigeye size regulation, as a part of the overall juvenile tropical tuna problem. The joint panel considered only yellowfin, skipjack and bigeye; the other species considered by Panel 4 were left for that Panel's separate discussions. The Report of the Joint Meeting of Panels 1 and 4 was presented by its Chairman, Dr. J. B. Amon Kothias (Ivory Coast), and is included in Annex 6. Ghana presented a statement which was read by the Commission Chairman at the Final Plenary Session in the absence of the Delegate from Ghana. The statement expressed doubt on the recommendation made by the Joint Panels to extend the bigeye size regulation for an indefinite period. The statement is attached as Annex 7.

16.2 The Commission Chairman drew attention to the juvenile tropical tuna problem, while indicating his impartiality to the continuation or discontinuation of the minimum size regulation. He asked that the commissioners pay serious attention to the scientific reports presented by the Working Group on Juvenile Tropical Tunas and the SCRS. These reports raised two major issues: whether the regulations can be enforced and if any benefit can be derived by enforcing the regulations. He noted that even if the regulation were not enforceable there would be some conservation benefits in having regulations. However, at the same time, it would be an injustice to apply the regulation in one fishery but not in another. Any consequences which the continuation or discontinuation of the regulations may have on the integrity and reliability of scientific data should not be overlooked.

16.3 The Commission noted that the Joint Meeting of Panels 1-4 recommended extension of the current size limit of 3.2 kg on bigeye for an indefinite period. The Commission adopted the Report of the Joint Meeting of Panels 1-4 and agreed with the recommendation to extend the bigeye regulation.

16.4 The Report of Panel 2 was presented by the Panel Chairman, Mr. V. Bermejo (Spain). The Commission noted that regulatory measures similar to those in effect for 1984 were proposed for the west Atlantic bluefin stock for 1985 (Appendix 4 to Annex 6). The Commission adopted the Report and reiterated the recommendation for the regulations. The Report is included in Annex 6.

16.5 The Reports of Panel 3 and Panel 4 were presented by the Panel chairmen, Mr. K. Shima (Japan) and Mr. Yu. Vialov (U.S.S.R.). Both Reports were adopted and are included in Annex 6.

#### Item 17. REPORT OF THE INFRACTIONS COMMITTEE

17.1 Mr. B. Garcia Moreno (Cuba), Chairman of the Infractions Committee, presented the Report of the Committee to the Commission. The Report was adopted together with all the recommendations contained therein, and is attached as Annex 8.

#### Item 14. REPORT OF THE STANDING COMMITTEE ON FINANCE AND ADMINISTRATION (STACFAD)

14.1 The Chairman of the Standing Committee on Finance and Administration (STACFAD), Mr. J. J. Chao (Spain), presented his Committee's Report. The Commission noted that the Report of the Working Group on the Working Capital Fund, which met prior to the Commission meeting, was attached as Appendix 3 to the STACFAD Report. The Commission reviewed and adopted the Report and all the recommendations contained therein (Annex 9).

14.2 While adopting the STACFAD Report, serious concern was expressed about the problem of the accumulating pending contributions to the Commission's Budget by some of the member countries. The Chairman of the Commission emphasized that this problem could jeopardize future Commission activities. He stated that he may travel, using funds from his own organization, to some of those countries which owe a significant amount in pending contributions in order to urge fulfillment of financial obligations to the Commission.

14.3 The Commission noted that the following Agenda items had been covered by the Committee:

- Item 4. Panel membership*
- Item 5. Administrative Report*
- Item 6. Relations with other organizations*
- Item 7. Commission publications*
- Item 8. Basic Texts of the Commission*
- Item 9. Auditor's Report - 1983*
- Item 10. Financial status of the Skipjack Program*
- Item 11. Financial status of Regular Budget - 1984*
- Item 12. Review of the second half of the biennial budget - 1985*
- Item 13. Review of Working Capital Fund*
- Item 18. Report of the Working Group on the Working Capital Fund*

Item 20. REPORTS OF SUBSIDIARY BODIES APPOINTED BY THE COMMISSION FOR THE MEETING

20.1 Since no subsidiary bodies were appointed during this session, there were no reports presented.

Item 21. STATUS OF THE REGULATIONS ADOPTED BY THE COMMISSION REGARDING YELLOWFIN, BLUEFIN AND BIGEYE

21.1 The Commission noted that this subject was covered adequately by the Infractions Committee.

Item 22. GENERAL REVIEW OF THE BIGEYE REGULATION (MINIMUM SIZE) FOR THE PURPOSE OF POSSIBLE EXTENSION

22.1 The Commission noted that this subject was covered by the Joint Meeting of Panels 1 and 4, and that the Commission had discussed this matter under Agenda Item 16.

Item 23. OTHER POSSIBLE REGULATORY MEASURES TO BE CONSIDERED

23.1 No other regulatory measures were discussed.

Item 24. STATUS OF THE PORT INSPECTION SCHEME

24.1 The Commission noted that this subject was adequately covered by the Infractions Committee.

Item 26. DATE AND PLACE OF NEXT REGULAR MEETING OF THE COMMISSION

26.1 The Delegate from Angola proposed that the Commission hold its next regular meeting in Palma de Mallorca, Spain. The proposal was seconded by France. At the same time the Delegate from France stated that invitations from member countries to host the ICCAT Commission meeting should be encouraged.

26.2 The proposal by Angola was supported by Ivory Coast, Portugal, Cuba, and the U.S.S.R. The Delegate from Spain indicated that the Spanish Administration will be happy to have the next Commission meeting in Palma de Mallorca. The Executive Secretary was

asked to review the financial aspects of holding the meeting in Palma and if it is found feasible, he should proceed to organize the 1985 Commission meeting there.

26.3 It was agreed that the next Commission meeting should start on Wednesday, November 13, 1985, and extend for one week. The scientific meetings will start the week preceding the Commission meeting.

#### Item 27. OTHER MATTERS

27.1 No other matters were discussed.

#### Item 28. ADOPTION OF REPORT

28.1 The Proceedings of the Opening and Second Plenary Sessions were adopted with minor changes. The Commission decided to approve the Proceedings of the Final Plenary Session by mail as soon as practicable after the meeting.

#### Item 29. ADJOURNMENT

29.1 In closing the Fourth Special Meeting of the Commission, the Chairman noted that the 1984 meeting was successful in that many goals were met and action taken on serious issues. He stated that the Commission should be proud of the progress it has made in the area of scientific cooperation. He pointed out the vigorous research programs for next year and expressed his support for inter-sessional meetings as a means to avoid unnecessary pressure on our scientists. He noted the role of the scientists in bringing to the Commission's attention the data and their interpretation of those data for a better understanding of the true status of the stocks. He added that scientists should not try to pre-judge management options, but to leave that work to the Commission.

29.2 Mr. Blondin thanked the observer countries and observer organizations, especially the EEC, for their interest in ICCAT. He encouraged the member countries to complete the ratification process for the accession of the EEC to ICCAT.

29.3 The Commission Chairman expressed his gratitude to the Secretariat staff, the interpreters, receptionists and copy machine operators for their excellent work throughout the meeting. He gave a special note of thanks to the Executive Secretary for his distinguished work and sound guidance to the Commission.

29.4 The Fourth Special Meeting of the Commission was adjourned.



## AGENDA OF THE COMMISSION

### *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. Panel membership
5. Administrative Report
6. Relations with other organizations
7. Commission publications
8. Basic Texts of the Commission

### *Finance*

9. Auditor's Report - 1983
10. Financial status of the Skipjack Program
11. Financial status of Regular Budget - 1984
12. Review of the second half of the biennial budget - 1985
13. Review of Working Capital Fund

### *Reports to the Commission*

14. Report of the Standing Committee on Finance and Administration (STACFAD)
15. Report of the Standing Committee on Research and Statistics (SCRS)
16. Reports of Panels 1 - 4
17. Report of the Infractions Committee
18. Report of the Working Group on the Working Capital Fund
19. Report of the Conference of Plenipotentiaries
20. Reports of subsidiary bodies appointed by the Commission for the meeting

*Measures for the conservation of stocks*

21. Status of the regulations adopted by the Commission regarding yellowfin, bluefin, and bigeye
22. General review of the bigeye regulation (minimum size) for the purpose of possible extension
23. Other possible regulatory measures to be considered
24. Status of the Port Inspection Scheme

*Research*

25. Other activities in research and statistics

*Other matters*

26. Date and place of next Regular Meeting of the Commission
27. Other matters
28. Adoption of Report

*Adjournment*

29. Adjournment

## List of Commission Documents

COM/84/

- 1 Tentative agenda
- 2 Annotated tentative agenda
- 3 Tentative schedule
- 4 Tentative agenda of the Standing Committee on Finance and Administration (STACFAD)
- 5 Tentative agenda of Panel 1
- 6 Tentative agenda of Panel 2
- 7 Tentative agenda of Panel 3
- 8 Tentative agenda of Panel 4
- 9 Tentative agenda of the Infractions Committee
- 10 Panels
- 11 Administrative Report
- 12 Basic Texts of the Commission
- 13 Financial Report
- 14 Working Capital Fund
- 15 Report for Biennial Period, 1982-83 (Part II, 1983)
- 16 Report of the Bluefin Workshop, (Dartmouth, Canada, September-October, 1984)
- 17 Report of the Working Group on Juvenile Tropical Tunas, (Brest, France, July 1984)
- 18 1984 SCRS Report "A" (working document)
- 19 1984 SCRS Report "B" (summary presented to the Commission)
- 20 Statistical Bulletin, Vol. 14 (Provisional)
- 21 Secretariat report on research and statistics
- 22 Publication status of the proceedings of the ICCAT Conference on the International Skipjack Year Program

- 23 Considerations for tuna research to the Year 2000
- 24 Status of the proposals adopted by the Commission  
for the conservation of yellowfin, bluefin and bigeye stocks
- 25 Port Inspection
- 26 Conference of Plenipotentiaries of the ICCAT Member Countries, Paris,  
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## OPENING ADDRESS BY THE SECRETARY GENERAL OF MARITIME FISHERIES OF SPAIN

It is with great pleasure that I welcome all the participants to the Fourth Special Meeting of the International Commission for the Conservation of Atlantic Tunas. I would especially like to welcome Venezuela, which is present for the first time as a member country of the Commission.

I would also like to express my gratitude to the Canarian authorities who have honored us with their presence at this opening session, an expression of the special interest and dedication that these Islands have for all fishery matters. I am sure that they will follow our work closely and will aid in putting into practice the conclusions reached at this meeting.

In December, 1969, the Commission held its First Regular Meeting in Rome, which I, as an biological oceanographer, attended as part of the Spanish delegation. I recall that Mr. Fernando Marcitllach, the then Head Commissioner of the Spanish delegation, and Mr. Jean Touya, then Head Commissioner of the French delegation, also attended.

Mr. Marcitllach was elected Chairman of the Commission and had the responsibility of putting all the activities of the Commission into motion in 1970-1971. Mr. Touya succeeded him as Chairman in 1972-1973. I have specifically mentioned these two ex-chairmen because they are here with us today at this inaugural session. I know that they carried out their missions with enthusiasm and efficiency and I would like to give them both a very cordial greeting.

Fifteen years have passed since that first meeting in Rome, and during all this time the Commission has had to face diverse and complex problems, first in obtaining a better knowledge of the Atlantic tuna resources, and then in trying to regulate the fisheries in order to obtain the maximum sustainable yield from catches.

I think this Commission has understood very well its purpose and that it is carrying out its mission with responsibility and efficiency that cannot pass unnoticed in the field of fisheries.

Evidence of the fact that this Commission presents a very good image is that new countries continue to join. The Commission is presently comprised of a total of twenty-two countries, which I will name in order of their incorporation: United States, Japan, South Africa, Ghana, Canada, France, Spain, Brazil, Portugal, Morocco, Korea, Senegal, Ivory Coast, Cuba, Angola, U.S.S.R., Gabon, Benin, Cape Verde, Uruguay, Saõ Tomé and Príncipe, and Venezuela.

These countries have very different characteristics in terms of geography, race, language, economic development and history, but all have in common and are strongly united in their interest for the conservation of tuna resources to benefit their economies and to provide food for their people.

It should also be noted that a Conference of Plenipotentiaries of the member countries of the International Convention for the Conservation of Atlantic Tunas was held this year in Paris, as all of you know. This Conference adopted a Protocol to the Convention in which specifies that the Convention is open to signature or adhesion by any inter-governmental economic integration organization made up of states that have transferred to it matters dealt with by the Convention. This is the case, for example, of the European Economic Community.

This year the FAO World Conference on Fisheries Management and Development was held in Rome. At this Conference, the Director General of the Food and Agriculture Organization of the United Nations, Mr. E. Saouma, pointed out that never before had so many national delegations met to examine jointly fishery problems. He also stated that rational management, on the national level, must be accompanied by a high level of international cooperation.

It is obvious that at the present time national fishery policies cannot be carried out in isolation. No country could, by itself, carry out the research necessary to know the state of the stocks and follow their dynamics. Moreover, any catch limit on the national level would be ineffective if fishing vessels from other countries were not subject to the limitation. Common interests mean shared obligations. These principles are doubly important when dealing with migratory species such as tunas. For these reasons, regional organizations must be established to which all countries interested in the rational exploitation of the fishery belong. We must, however, bear in mind that organizations, such as the International Commission for the Conservation of Atlantic Tunas, and others must be self-supporting without external aid. The annual budget must be covered by contributions from member countries, in larger or smaller proportions, according to the degree of exploitation by each country.

In conclusion, if we are all in agreement—of which there seems to be no doubt—that these organizations are absolutely necessary, then we must accept the financial responsibility that corresponds to us. I know very well that this Commission has always operated in an economical fashion, achieving the objectives of the Convention and considerably increasing its activities each year without increasing the staff of the Secretariat. However, a very serious situation is hanging over the Commission which is disturbing and could become grave in a very short time. I am referring to the late payment of contributions. I know that the Commission is aware of this problem and that close attention will be paid as we try to find a solution.

The fact that I have brought up this rather unpleasant subject should not be interpreted as my not being aware of the serious economic difficulties that several member countries are faced with. I cannot ignore these difficulties, since my own country is also suffering from a severe economic crisis.

These difficulties are also reflected in the fishery sector which, however, with the full support of our national administration, is making great efforts to adapt to the complex po-



litical and economic framework in which fishing activities are developing, in national waters as well as in the Exclusive Economic Zones of other countries and on the high seas. Therefore, during the past year the Spanish fisheries administration, as well as, I imagine, all other ICCAT member countries, has had as its objective the management of fisheries affairs, reconversion and modernization of the fleet, development of aquaculture, regulation of fishery products markets and development of international cooperation.

I have learned that the scientists of the Standing Committee on Research and Statistics have been working very hard here since October 29 to prepare the technical reports on the different species that will be presented to the Commission. Special attention has been placed on juvenile tropical tunas and on bluefin tuna, which are of great interest to the Commission.

In addition, I would like, as Secretary General of Fisheries and as a biologist, to express my desire that the Skipjack Program publication be available as soon as possible. Its contents I am sure will fulfill our hopes and will justify the effort made.

Ladies and Gentlemen, Las Palmas de Gran Canaria is a beautiful and prosperous city with a port that has the highest volume of traffic in gross tonnage in Spain. Many vessels of the fishing fleets of various countries visit this port and I am confident that the delegations may go on board the tuna vessels of their countries and converse with the fishermen in their own languages.

I am going to end with the words of His Majesty, the King of Spain, presented at the FAO World Fisheries Conference on June 27 in Rome; I think they are very appropriate for this occasion. The King, referring to fishing, said:

“We must do everything in our power to safeguard what constitutes one of our main sources, not just of wealth, but of life itself. Unless we act promptly, the present negative trends may become irreversible.

“It is therefore essential to seek suitable formulas for international cooperation to make the best possible use of the living resources of the sea for the benefit of all countries in the world and, in particular, of the most deprived populations.”

Referring to the men who spend most of their lives at sea on board fishing vessels, who after all are the ones who catch the fish and who also collaborate with the scientists in the recovery of tags, the King said,

“Rarely is adequate tribute paid to [the fishermen]. I therefore think that this is a suitable occasion for all countries to give public recognition of the hard and self-sacrificing toil of these men who, frequently away from their homes, skillfully battle with the unpredictable perils of the sea, and provide us through their work with a very important contribution to our food supplies.”

On my own behalf, I would only like to add that we have placed our confidence in the group of scientists that work in the Standing Committee on Research and Statistics, as well as in the delegates that form part of the Standing Committee on Finance and Administration. Consequently, we are sure that the Commission will find the best solutions for the difficult problems it faces.

I hope that you enjoy this marvellous city of Las Palmas, its climate, its beaches and the cordiality of its people.

Thank you.

## OPENING ADDRESS BY THE CHAIRMAN OF THE COMMISSION, MR. C. J. BLONDIN

Distinguished delegates, Ladies and Gentlemen:

It is a great pleasure for me to welcome you to Las Palmas and to open this Fourth Special Meeting of the International Commission for the Conservation of Atlantic Tunas. I am very honored to chair this Commission, and I hope to uphold the fine example of leadership and dedication which Dr. Koffi and his predecessors have exhibited in this position over the past years. I have been personally associated with the Commission for a decade now, and have been greatly impressed by the achievements and progress which this Commission has been able to make in a relatively short time. As we approach the midpoint of the second decade of ICCAT's existence, we can take great pride in the record of success which our organization has established, a record which is all the more remarkable given ICCAT's relative youth compared with other international fisheries organizations. Given our past accomplishments, we can look to the future optimistically, anticipating that we can solve the problems which will face us through continued cooperation, goodwill, and most importantly with a thorough understanding of all the views that are brought to our deliberations.

I would like to express on behalf of all the national delegations our appreciation to the Government of Spain for hosting this meeting. Las Palmas is an ideal setting for holding thoughtful and productive discussions in a cordial atmosphere. I would also like to note the fine work of the Executive Secretary, Dr. Olegario Rodriguez-Martin, and the staff of the Secretariat, who have done so much to make this organization effective and with whom it is such a pleasure to work.

On behalf of the ICCAT delegations I extend a warm welcome to the representative from Venezuela, our newest member. The Commission has now grown in size to 22 member countries, a sign of the prestige and importance which the world community attaches to this body. Interest in the Commission continues, as is evidenced by the large number of observers present. I welcome our observers and invite them to take part in the process during our discussions.

In looking at the past history of ICCAT, it is evident that we can take a justified pride in our work. In reviewing our accomplishments, we must first look at the excellent work of the Standing Committee on Research and Statistics which forms the fundamental basis for the Commission's work. The SCRS has worked tirelessly to extend our knowledge of the tuna and billfish resources in the Atlantic Ocean and has produced a formidable

scientific record which can be found in the growing number of scientific papers, statistical bulletins, and data records published by ICCAT.

To further the scientific and statistical resources available to the Commission, the SCRS has established a computer data base and word processing system in the Secretariat which has enhanced scientific projects and Commission activities. The SCRS's ability to obtain accurate data has likewise been enhanced through the scheduling of training sessions on techniques for collecting fisheries statistics which have been held on various occasions with the co-sponsorship of other international organizations. The annual tag recovery lottery, which is designed to encourage the participation of fishermen in research effort, is another example of the innovative ways in which the SCRS has increased its data base on tuna resources. As a result of these efforts, we now have a much greater volume of data available on national fisheries and on more species and stocks.

The effectiveness of the SCRS's work is perhaps best epitomized by the five-year Skipjack Program. A decade ago, we knew very little about skipjack stocks in the Atlantic and faced a difficult task in learning more about this species because of its complex characteristics. The usual scientific techniques used to assess tuna stocks would not have been effective in analyzing the skipjack resource. Thus, our scientists embarked on an ambitious five-year effort, which led to answers for virtually all the major questions which the project addressed. This program is an example of the value of an international organization to the study of highly migratory tunas which range far beyond national jurisdictions and the goals which can be achieved through mutual efforts and cooperation.

The Commission has acted effectively and responsibly in using the data gathered by the SCRS to take regulatory actions. Such actions are most appropriately addressed by an international body which concerns itself with the stocks of tuna throughout their range. The measures adopted on yellowfin, bluefin and bigeye have been based on objective and reasonable interpretations of the scientific data available. The bluefin regulations in particular are an example of the ability of the Commission to act responsibly when faced with an extremely difficult and complex situation. The Atlantic bluefin tuna, which exhibited declining trends in the early 1970's, may now be responding to the restrictive measures developed by the Commission. Other programs such as the port inspection scheme point to the Commission's willingness to address the sensitive and difficult problems of effective enforcement.

However, we cannot allow past successes to make us complacent to the problems which remain. For instance, although we have made much progress in regard to bluefin tuna, we must expand our knowledge of this species in order to be able to make optimal decisions in the future. This issue will be of great importance at this meeting, since the bluefin tuna management regime in the western Atlantic expires at the end of 1984, and we are faced with the need to make new decisions on bluefin regulations.

The size regulation on bigeye likewise expires this year, and we shall need to consider the proper course of action to take for this species. We must also be concerned with the deficiencies which remain in our knowledge of billfish and swordfish stocks and which limit our ability to make accurate stock assessments. Finally, there is the continuing problem of insuring that the regulations we adopt are effectively implemented.

Nonetheless, given the past record of success of this Commission, I am confident that we will move to resolve these and other problems which face us. It gives me great pleasure now to open officially the Fourth Special Meeting of the International Commission for the Conservation of Atlantic Tunas.

**STATEMENT BY DR. FERNANDO CASTRO Y CASTRO,  
HEAD OF THE MEXICAN OBSERVER DELEGATION**

Distinguished Chairman, Honorable Delegates:

The Mexican Government decided to authorize a delegation to attend this important forum as observers in order to recognize an organization as prestigious as the International Commission for the Conservation of Atlantic Tunas, as well as its Executive Secretary, Dr. O. Rodríguez-Martín, for its bold efforts to assure that the Atlantic tuna fisheries exploit the fishery resources in a rational manner and set the maximum sustainable yield on a scientific basis. The Commission was, without doubt, a forerunner of the New Law of the Sea, and Mexico wishes to emphasize this.

Mexico was present and participated in the FAO World Conference on Fisheries Management and Development, held in June and July, 1984, in Rome, and had the honor of having its Secretary of Fisheries, Dr. P. Ojeda Paullada, preside over this Conference. My government is concerned with peaceful, just and equitable solutions in the world order. The Chairman of the Conference pointed out that it was essential that the Conference face the practical realities of fisheries management based on the new United Nations Convention on the Law of the Sea, to which Mexico has subscribed and which it has ratified. "We are confident", he stated, "of our capacity to bring all of our efforts to bear to facilitate the optimum exercise of the rights of sovereignty of each country over the living resources in its Exclusive Economic Zone". "The resources", he said, "of civilization and culture are in operation .... Science and technology provide us with knowledge and the instruments to achieve our objectives... Without isolating ourselves from world cooperation we unite to increase the possibility of carrying out well-defined acts of international cooperation...."

For these reasons we attended and participated in the meetings held in 1984 by the South Pacific Commission in Noumea, New Caledonia, by the Inter-American Tropical Tuna Commission (IATTC) in La Jolla, California, and now by this Commission in the beautiful Canary Islands which serve as a natural backdrop for its work.

Mexico has also taken part in the Atlantic tuna fisheries through joint ventures with another country and therefore needs information as well as being responsible for providing it. But Mexico also requires international cooperation, since it is engaged in designing a genuinely regional convention on highly migratory species that pass through our region for the Latin American area.

Recently, in February, 1984, during the meeting of the Action Committee on Maritime and Fresh Water Products of the Latin American Economic System (CAPMADSELA), an agreement was reached on essential points that should be honored in the development of a regional Convention on tunas. A copy of this document will be given to the Executive Secretary.

I have the honor and the duty to announce the formation of the Latin American Organization for Fisheries Development (OLDEPESCA), which was inaugurated in Managua, Nicaragua, on November 2, 1984, and whose chairman is Dr. P. Ojeda Paullada, Secretary of Fisheries in Mexico. The new organization is set up as an ideal framework through which cooperative fishery efforts in the area can be channeled.

The ministers and highest fisheries authorities in Latin America indicated in the eleventh item of their declaration their intention to, and I quote, "Invite other States and international organizations to the Ministers Conference of the Latin American Organization for Fisheries Development (OLDEPESCA) so that together with the Permanent South Pacific Commission (CPPS) we can develop mechanisms necessary to develop a regional convention on tuna and highly migratory species in the eastern Pacific, taking into consideration the consensus reached at the First Special Working Group Meeting for Regional Coordination and the agreements that will be reached at the next meeting, to be held in Guayaquil, Ecuador." In the twelfth item of the document, it is stated that, "The imposition of any type of sanctions with the intent of limiting the coastal states in exercising their rights of sovereignty according to the New Law of the Sea should be avoided. In addition, the elimination of measures which mean the application of commercial sanctions to those countries that adopt measures exercising such rights should be promoted".

International support provided by the technical people and scientists of the member countries of this Commission is essential for the previously stated reasons, as well as for those contained in the text of the document, which I will also give to the Executive Secretary for distribution.

We aspire, Mr. Chairman and Commissioners, in accordance with the world strategy resulting from the [FAO] Conference, to create a genuinely regional Convention that not only considers allotment of resources, catches and administration but also economic solutions that benefit our peoples and that equitably considers urgent social solutions based on a more just world order.

Ladies and Gentlemen, I wish you success in your discussions and in the solutions you will surely reach, led by an experienced Chairman, member of the United States delegation, who will conduct the meeting with experience and integrity.

Thank you.

## REPORTS OF THE MEETINGS OF PANELS 1-4

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

Las Palmas, Canary Islands, Spain, November, 1984

#### 1. OPENING

France proposed that Ivory Coast, chairman of Panel 1, chair the joint meeting of Panel 1 and 4. This proposal was unanimously approved by the members of Panels 1 and 4. Mr. J. B. Amon Kothias, (Ivory Coast), opened the meeting.

#### 2. ADOPTION OF AGENDA

The Agenda of Panel 1 was adopted after incorporating bigeye tuna in the agenda and is attached as Appendix 1.

#### 3. ELECTION OF RAPPORTEUR

Dr. A. Fonteneau (France) was appointed rapporteur.

#### 4. REVIEW OF PANEL MEMBERSHIP

There was no change in membership of Panel 1. Angola, Brazil, Cuba, France, Ghana, Ivory Coast, Japan, Korea, Portugal, Senegal, Spain, U.S.A. and U.S.S.R. were present.

There was no change in membership of Panel 4, and all members were present (Angola, Canada, Cuba, Japan, Korea, Portugal, Spain, U.S.A. and U.S.S.R.).

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

The Chairman of the SCRS, Mr. J. S. Beckett (Canada) summarized the Committee's conclusions concerning yellowfin, bigeye and skipjack.

### 5.a) Yellowfin

As regards yellowfin, Mr. Beckett reported that the stock had been subjected to intensive exploitation in the Atlantic and the catches observed in 1981 and 1982 were superior to the current estimates of maximum equilibrium catch. Since 1983, there has been a marked reduction in fishing effort and in catches in the east Atlantic due to the departure of an important part of the France-Ivory Coast-Senegal-Morocco (FISM) and Spanish purse seine fleets for the Indian Ocean. This reduction in effort is more pronounced in 1984, for which a catch of only 60,000 MT is forecast for the east Atlantic, corresponding to fishing effort much lower than the effort producing the maximum equilibrium catch. If the fishing effort remains at a level similar to that observed in 1984, the stock biomass should rapidly increase and allow an increase in catch near the equilibrium level, in five or six years, when the catches would only be slightly lower than the recently observed level.

The size limit of 3.2 kg enacted on yellowfin since 1973 is ineffective because it is not implemented, as can be seen by the various indices calculated by the SCRS. The most recent yield-per-recruit calculations made by the Committee confirm that a strict implementation of the regulation would have notably improved the yield-per-recruit calculations of the stock during periods of high fishing effort, particularly in 1980 to 1982. With the sharply reduced fishing effort observed in 1984, the potential gains are quite low.

On the other hand, in the west Atlantic, yellowfin is subjected to an increasing fishing effort, especially in the area around Venezuela, which is shown by increased catches. It is still impossible to estimate the stock potential due to the fact that the development of the fisheries is very recent and to the poor fishery statistics available. Also, the yellowfin stock structure in the Atlantic is still not well known, and it is impossible to decide between a two-stock (east and west) and a single Atlantic-wide stock hypotheses.

### 5.b) Bigeye

Mr. Beckett reported on the results concerning bigeye tuna obtained by the Working Group on Juvenile Tropical Tunas. First of all, he noted the significant changes in the data base which led to an increase in the estimates of the bigeye catch for the surface fleet, in particular, the purse seine fleet. The analyses carried out on this revised data base led, however, to conclusions that are almost the same as those previously reached. The Committee used the hypothesis that there is a single bigeye stock in the Atlantic. This stock appears to be subjected to quite a high exploitation rate. Recent fishing effort is, however, lower than that giving maximum equilibrium catch of the stock. Furthermore, it is noted that



longline effort underwent a sharp decrease in 1983 and that the departure of the purse seiners will decrease the catch of small bigeye.

The 3.2 kg size limit in effect for bigeye is not implemented any better than it is for yellowfin, as shown through size sampling. The most recent yield-per-recruit analyses indicate that the implementation of the size limit for the fisheries in 1980-1982 would have produced a slight increase in the yield per recruit, lower than the 10 percent gain previously estimated by the SCRS. The main benefit produced by the size limit on bigeye tuna is, it seems, a reduction in or suppression of the misreporting of catches of yellowfin less than 3.2 kg as bigeye, a problem observed until the bigeye size limit was put into effect.

#### *5.c) Skipjack*

Mr. Beckett pointed out that the present conclusions of the SCRS on the state of the skipjack stock are basically the same as those reached at the close of the International Skipjack Year Program. The problem of whether there are one or two stocks remains unsolved. However, skipjack in the Atlantic still seem to be generally underexploited. Furthermore, it is clear that any size limits that could be introduced for skipjack would not provide any potential gains. Finally, the Committee notes that the departure of the FISM and Spanish purse seiners for the Indian Ocean will reduce the catch potential of this species which, contrary to yellowfin, remains underexploited.

#### *5.d) Multi-species*

The information provided by the Working Group on Juvenile Tropical Tunas has been further examined. The consequences of various time and area closures to reduce catches of small bigeye and yellowfin were estimated by means of a simulation model. With the hypotheses given, the potential gains calculated for yellowfin and bigeye are offset by similar or greater losses of skipjack. Consequently, it does not seem that closing certain areas or seasons would be a viable alternative to the 3.2 kg size limit in effect for yellowfin and bigeye.

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

Mr. Arnon Kothias submitted these measures for discussion by Panels 1 and 4. In particular, he noted that the Commission should reach a decision on the continuation of the bigeye size limit of 3.2 kg that expires at the end of 1984.

Ivory Coast proposed an extension of the regulation on bigeye because it resolves statistical problems and should result in improved yield per recruit. Senegal agreed with this proposal. France also supported this proposal and felt that since the coastal countries want to protect this resource, France is ready to adopt this measure indefinitely. This proposal

was supported by Portugal, Cuba, Spain, Angola, U.S.A., U.S.S.R., Korea, Brazil and Canada.

The delegate from Portugal further noted the effective implementation of the bigeye size limit by his country.

The delegate from Ghana expressed concern on the effectiveness of having size regulations for tropical tunas. His doubts are based on scientific observations which show that very frequently sizes and species are mixed in the schools from which the fishermen are unable to select only the fish larger than the size limit set by ICCAT. It follows that in reality all the fisheries in the Gulf of Guinea, purse seiners as well as baitboats, continue catching large quantities of small yellowfin and bigeye. In these circumstances, Ghana feels that since time-area closures cannot be implemented either, regulations on both yellowfin and bigeye should be struck off. Meanwhile we should take advantage of the reduction in effort caused by the departure of the FISM fleet for the Indian Ocean by undertaking further studies like those envisaged by the SCRS in order to develop a more realistic regulation that can be enforced.

Japan also expressed concern on the yellowfin and bigeye size limits. The implementation of the yellowfin 3.2 kg size limit in 1973 has considerably hampered the activities of the Japanese baitboats based at Tema. Although Japan no longer has any baitboats in this fleet, Japan considers that the implementation of the size limit is not an adequate means to resolve the problem of catching juveniles which faces all the baitboat and purse seine fleets in the Gulf of Guinea. Japan feels that the Commission should make a regulation that the fishermen will be able to abide by. Japan expressed its wish that the member countries be able to implement the size limit now being extended.

Canada, supporting Ivory Coast's proposal, noted its concern about the fact that the size limits adopted by ICCAT have never been implemented.

After discussion, the joint meeting of Panels 1 and 4 recommended extending the bigeye 3.2 kg size limit for an indefinite period.

## 7. RESEARCH NEEDED TO BE CARRIED OUT

The Chairman of the SCRS presented the main recommendations concerning the species of Panels 1 and 4. He noted the rapid development of fisheries in the west Atlantic, especially the yellowfin fishery based in Venezuela. A statistical mechanism is needed following ICCAT requirements to effectively monitor these stocks.

In the east Atlantic, the important decrease in fishing effort observed in 1984, if prolonged, provides a unique opportunity for the SCRS to test the efficiency of stock evaluation models. Consequently, the SCRS proposes planning by its next meeting in 1985 an intensive research program for two or three years, to measure precisely how the fisheries and the stocks, especially the yellowfin stocks, react to the reduction in purse seine effort. Such a program would be based, among other activities, on intensive tagging cruises and studies of micro-elements of hard parts. This project would, if the Commission agrees, be financed by part of the surplus funds in the Working Capital Fund.

## 8. DATE AND PLACE OF NEXT PANEL MEETING

The next meeting of Panel 1 will be 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 of Panels 1-4 was adjourned.

## Report of the Meeting of Panel 2

Las Palmas, Canary Islands, Spain, November, 1984

### 1. OPENING

The meeting of Panel 2 was opened by the Commission Chairman, Mr. C. J. Blondin in absence of the Panel Chairman (Morocco). Spain was elected to chair this session of the Panel and Mr. V. Bermejo served as Chairman.

### 2. ADOPTION OF AGENDA

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

### 3. ELECTION OF RAPPORTEUR

Dr. P. M. Miyake (Secretariat) was appointed rapporteur.

#### 4. REVIEW OF PANEL MEMBERSHIP

There have been no changes in panel membership. Canada, France, Japan, Korea, Portugal, Spain and the U.S.A. were present.

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

##### 5.a) *Bluefin*

The SCRS Chairman, Mr. J. S. Beckett, presented the results of the SCRS studies on bluefin. He stated that evidence indicates that there are two distinct stocks in the east and west Atlantic with some interchange. The rate of interchange is variable between years but is less than 10 percent.

The Bluefin Working Group made very good progress in analyzing the data and stock condition for the west Atlantic stock. If the 1970 fishing pattern with higher catches of small tunas is used, the yield per recruit analysis gives an equilibrium yield estimate (at the recent average recruitment level) of about 2,700 MT. If more recent fishing patterns (lower catch of small fish) are used, the equilibrium yield would be in the vicinity of 6,000 MT. These estimates are made under the assumption of a natural mortality rate ( $M$ ) of 0.18. If a lower  $M$  is assumed, the equilibrium yield attained over a long period would be more than 6,000 MT. The present stock condition is not very well known, but it is somewhere close to the point producing a yield of 2,700 MT, since the change of the fishing pattern to that which reduces the catch of small fish occurred relatively recently.

The SCRS noted that for the west Atlantic the present catch levels are likely to halt the decline of the stock as well as allow for stock increases in the long term (30 years). Catches lower than present levels would most likely result in an increased speed of recovery while slightly higher catches would slow down the rebuilding of the stock. The SCRS also noted that following confirmation of the response of the stock to the present management regime, it would be possible to increase the allowable catch gradually in proportion to the recovery rather than hold a constant catch level until the stock has stabilized.

For the eastern stock, the Chairman noted that not much analysis was done due to the lack of accuracy in the data base. He commented that fish less than 6.4 kg made up 40 to 86 percent of the total catch (in number) in the eastern Atlantic and 12 to 67 percent in the Mediterranean in the last few years. A high rate (67 percent) of undersized fish observed in the Mediterranean in 1982 may be associated with the recruitment of a strong year-class.

The Japanese delegate noted that if the 1970 fishing pattern used in estimating yield per recruit is that for July, the fish are lean after spawning. Had the September pattern been used, the equilibrium catch estimate would have been more than 2,700 MT. The SCRS Chairman answered that the large fish formed only 40 percent of the catch and the effect of the condition factor would be minor.

Following the comments by the Japanese delegate, some discussion ensued on the strength of the 1973 year-class in the west Atlantic. It was noted that this year class was observed only in the purse seine catch of small fish, which indicated a relatively strong year-class. Tagging experiments carried out on this year-class support this view. However, with the present fishing pattern, the strength of the cohort has not been substantiated in any other fishery (longline fishery or Gulf of Mexico fishery).

The Japanese delegate also focused questions on the estimated exchange rates between the east and west stocks. It was clarified by the SCRS Chairman that the highest rate (10 percent) among all estimates was based on a pilot study by micro-element analysis and may represent a cumulative life-time exchange rate rather than an annual exchange rate, and the conclusion of the SCRS concerning the stock structure (mentioned above) was confirmed.

The EEC indicated that it had noted the Committee's recommendation concerning the transmission of statistics for the Mediterranean and expressed its intention to assist in their compilation.

#### *5.b) Albacore, north*

The Chairman of SCRS reported that there has been a slight change in advice since the last session, due to recent improvements in the data base through the addition of the Taiwanese longline CPUE data. The catches decreased in 1980-1981 but recovered in the last three years. The stock has been exploited near the MSY level. The MSY is now estimated at about 60,000-70,000 MT, which is slightly higher than the estimate made last year. The recruitment level in the last three to four year-classes seems less abundant but this could be caused by the environment. No adult-recruit relation was observed.

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

### *6.a) Bluefin*

Past and current management measures were reviewed briefly by the Panel Chairman.

The Canadian delegate noted significant progress made by the scientists, and commented that the numerous uncertainties which the Commission had when the current regulatory measures for the west Atlantic were adopted in 1983 have been partly clarified. He recognized that there are still some uncertainties remaining, but the most recent scientific findings seem to confirm the wisdom of the management measures recently adopted by IC-CAT. Recognizing that some time is needed before we can increase the allowable catches on the western stock, and expressing the hope that better knowledge will become available next year on the stock status, the Canadian delegate proposed continuing the current year regulatory measures next year, which may require some modifications in the text of the recommendations. His statement is attached as Appendix 2.

The Japanese delegate again stated his country's doubt that if September weight-age data are used for the 1970 fishing pattern instead of those for July, the equilibrium yield estimate would have been larger than 2,741 MT. At any rate, he expressed his satisfaction in noting that the bluefin stock condition is not as bad as it was reported to be in the past. Japan expressed the view that the catch in the western Atlantic could be increased for 1985, but that Japan will wait one more year for the results of the Working Group. In the meantime, the 1984 regulatory measures should be continued in 1985, since the SCRS could not recommend a value for the allowable catch. However, if no clear advice on allowable catch is made next year by the SCRS, the Commission should very seriously review the necessity of the present regulation. The Japanese delegates' statement is attached as Appendix 3.

The United States delegate concurred with the view expressed by Canada. He reminded the Panel of the decline of the stock associated with the substantial catches in the early 1970's and of the conservation measures taken by ICCAT to achieve recovery of the stock. In light of these past problems, a cautious approach would appear to be appropriate. He commented that the fishermen who were unhappy when the drastic regulations were introduced now have a better understanding of the ICCAT regulations and their positive effect on the bluefin tuna stocks. Recognizing that it will take some time before sufficient scientific data will be available to produce precise advice on the stock status, the U.S. delegate proposed that the current regulatory measures be extended for a period of at least three years with the provision that they be reviewed every year for revision in light of any new scientific findings.

The delegate of France expressed grave concern about the shift in fishing effort from the west Atlantic towards the east Atlantic following the drastic bluefin regulations in the west Atlantic. This concern has been expressed in preceding years and led to the inclusion of a fourth recommendation on this subject in the bluefin regulation. In comparing the statistics of the last few years, it seems that certain countries that fished in the past in the west Atlantic have greatly increased by an equivalent amount their fishing in the east Atlantic. The French fishermen, especially those in the Mediterranean, are very unhappy and ask that measures be taken by the countries concerned to put an end to this situation that is illegal according to the ICCAT regulation.

The Portuguese delegate reiterated the concern expressed by the French delegate and asked that the countries concerned provide information on the measures taken.

The Japanese delegate responded that his country, following the Fourth recommendation, issued domestic regulations in 1982 that a catch of only 200 MT is allowed in the directed bluefin fishery in the eastern Atlantic for the period between July 20 and the end of the year. The Fourth recommendation, prohibiting the shift in effort, came into effect on July 20, 1982. By taking the average catch made by the Japanese longline fleet during the period 1975-1980 in the eastern Atlantic (1,950 MT per year) and considering that most of the catch was made prior to July 20, they arrived at the 200 MT figure for 1982. For 1983 and 1984, a catch of only 1,600 MT was allowed in the directed fishery in the eastern Atlantic. After this domestic quota was filled, only the indirect fishery was permitted.

The U.S. delegate stated that he felt at least a three-year extension of the current regulation would be more realistic, but that his delegation would go along with the Canadian proposal if the majority of the Panel members were in favor of a one-year extension. The delegate of Canada indicated that Canada, too, could support a three-year extension but

had put forward a one-year extension in light of the various views expressed by the members of the Panel.

The delegate from Japan stated that the Canadian proposal is acceptable for next year. The French delegate also agreed with the Canadian proposal with a slight modification to include the obligation of reporting any regulation made in view of the limits of the shift of fishing effort from the west to the east Atlantic according to the proposal by Portugal.

The Panel chairman recognized unanimity in accepting the Canadian proposal to extend this year's regulation for another year and formed a drafting group to modify the recommendation made in 1983 to the present situation. The drafting group was made up of Canada (Convener, France, Japan, Portugal and the U.S.A. Cuba was also allowed to participate as an observer. In doing so, Cuba was encouraged to consider seriously joining Panel 2, if Cuba continues to be interested in bluefin regulations.

The draft recommendations for the 1985 regulatory measures were later presented to the Panel by the Convener (Canada) of the drafting group. While doing so he called attention to the fact that Cuba (observer) objected to the order of the recommendations. The Convener reported, however, that all the Panel members agreed to the draft as presented.

The delegate from Cuba, participating in the Panel as an observer, indicated that his country feels that it is appropriate to carry out a research program in the Gulf of Mexico, in order to understand better the bluefin stock condition, since there is still much uncertainty on the current situation. Research cruises could include tagging, oceanographic observations, CPUE studies and biological sampling.

The delegate from Cuba asked that the 1983 recommendations for bluefin regulations be rearranged so that the Fifth recommendation (which excludes Cuba and Brazil from the regulation) would come at the end of the recommendations, because if the original order is kept, the recommendation will have an implicit contradiction in the objectives concerning the developing fisheries of Cuba and Brazil, countries which are not subject to any limits.

Finally, the delegate expressed his reservations concerning the drafting of the Sixth recommendation, since it affects the development of the fisheries of both countries by expressly prohibiting bluefin fishing in the Gulf of Mexico area.

The U.S. noted its concern over any change in the resolution which would imply an expansion of artisanal fisheries beyond the developing stage. Historical fisheries for bluefin tuna in the western Atlantic, including the Gulf of Mexico, are operating under severe restrictions. While developing fisheries such, as those of Brazil and Cuba, should not be exposed to the same regulatory burdens as the more developed fisheries. Nevertheless, there is an obligation to bring to the attention of other ICCAT members any plans for significant increases in fishing effort so that such increases may be considered by the Commission in the context of its overall conservation program.

The draft recommendations were adopted by the Panel and are attached as Appendix 4.

*6.b) Albacore, north*

The Panel found no evidence requiring adoption of any conservation measures for this stock at this time.

**7. RESEARCH NEEDED TO BE CARRIED OUT**

The SCRS Chairman asked the Panel to refer to the recommendations on research that appear in the SCRS Report. He drew the Panel's attention, in particular, to the recommendation that the Bluefin Working Group meet again next year at a place which has direct access to a powerful computer.

The French delegate suggested that France, pending final clarification of his government, would be willing to host this meeting at Brest, France, where computer facilities are available.

The United States delegate indicated that his government would be willing to accept the French proposal but would also be willing to invite the Working Group to meet at one of the U.S. laboratories where there are adequate computer facilities available.

The Secretariat was asked to look further into the matter, and through correspondence with France and the U.S., as well as with the SCRS Chairman, decide upon the place and dates of the meeting. The Executive Secretary asked that when the formal invitation is presented to the Commission to host this meeting, the financial as well as technical conditions should be well defined, so that the decision of where to hold the meeting would be easier.

**8. DATA AND PLACE OF NEXT PANEL MEETING**

The Panel will 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 meeting was adjourned.

## Report of the Meeting of Panel 3

Las Palmas, Canary Islands, Spain, November, 1984

### 1. OPENING

The meeting was called to order by the Chairman, Mr. K. Shima (Japan).

### 2. ADOPTION OF AGENDA

The Agenda was adopted without changes (Appendix 1).

### 3. ELECTION OF RAPPORTEUR

Mr. D. S. Crestin (U.S.A.) was designated rapporteur.

### 4. REVIEW OF PANEL MEMBERSHIP

All Panel members were present (Brazil, Japan, South Africa, and the U.S.A.).

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

Mr. J. S. Beckett, SCRS Chairman, reviewed in summary the SCRS findings regarding southern bluefin and albacore, the two species of interest to Panel 3, in the south Atlantic.

### 5.a) *Southern bluefin*

The SCRS Chairman reminded the Panel members that southern bluefin is a species common to all oceans of the southern hemisphere, and that the primary harvest of the species occurs in oceans other than the Atlantic, where only 643 MT were reported to have been taken in 1982.

Mr. Beckett did, however, stress the concern of the SCRS with respect to the status of the stock, which appears to have been overfished. A working group that convened in Japan in 1983 determined that the spawning stock currently consists of only one third of the biomass of the original stock. Management actions in place include avoidance by Japanese longline vessels of areas yielding large catches of small fish and a decision by Australia to reduce its harvest of small fish in order to prevent further decrease of spawning biomass and yield per recruit.

### 5.b) *Albacore, south*

Mr. Beckett advised that catch rates for this stock have been relatively stable from 1975 through 1980, then slightly decreased, but recovered during 1982 to an average annual harvest of about 25,000 MT. He noted further that there was a substantial reduction in fishing effort during 1983, with preliminary statistics indicating the catch to have been approximately half the average annual catch of previous years.

Mr. Beckett referred to the MSY model used by the SCRS, which indicates that a sustained yield of between 24,000 MT and 26,000 MT is possible on an annual basis. Review of the MSY model using updated catch data indicates that the model accurately reflects the dynamics of the stock and that the model now fits the data better than in previous years. He indicated that recent annual harvest levels were close to the MSY except in 1983.

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

### 6.a) *Southern bluefin*

The SCRS Chairman noted that the SCRS does not believe ICCAT is the proper forum for considering conservation measures for this species due to the extremely low harvest in the Atlantic Ocean. He did, however, stress that the SCRS wishes to be kept informed of developments in this fishery, and that the SCRS wishes to cooperate closely with other organizations and to exchange data.

### 6.b) *Albacore, south*

Mr. Beckett expressed caution on behalf of the SCRS regarding the surface fishery for this species in the eastern south Atlantic. He emphasized that increased catches would adversely affect MSY, as indicated in the production model.

## 7. RESEARCH NEEDED TO BE CARRIED OUT

### 7.a) *Southern bluefin*

No new research was recommended.

### 7.b) *Albacore, south*

Research was recommended on recruitment indices.

## 8. DATE AND PLACE OF NEXT PANEL MEETING

It was agreed that the next meeting of Panel 3 would be in conjunction with the next regular meeting of the Commission.

## 9. OTHER MATTERS

No other matters were brought to the attention of the Panel.

## 10. ADOPTION OF REPORT

The Report was adopted.

## 11. ADJOURNMENT

The meeting of Panel 3 was adjourned.

## **Report of the Meeting of Panel 4**

Las Palmas, Canary Islands, Spain, November, 1984

### 1. OPENING

The meeting of Panel 4 was opened by the Chairman, Mr. Y. Vialov (U.S.S.R.).

## 2. ADOPTION OF AGENDA

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

## 3. ELECTION OF RAPPORTEUR

Mr. R. Steinbock (Canada) was appointed rapporteur.

## 4. REVIEW OF PANEL MEMBERSHIP

All Panel members were present at the meeting.

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

### 5.a) Bigeye

Bigeye tuna was not covered here as it was discussed in the Joint Meeting of Panels 1 and 4.

### 5.b) Atlantic bonito

Reported landings of small tunas have varied from about 65,000 MT to over 120,000 MT since 1969. Atlantic bonito is the principal species in the catch of small tunas. In recent years (1980-82), catches of Atlantic bonito have ranged from 30,000 to 50,000 MT per year. While statistics indicate catches of this species of 4,500 MT in 1983, these are considered incomplete, in particular with respect to the Turkish catches. The reasons for the high variability in catches of small tunas are not known.

Detailed studies on Atlantic bonito and other small tuna species are needed in such areas as biological parameters, stock structure, distribution of species and the amount of mixing of small tunas in the catches of purse seiners fishing in tropical areas.

### 5.c) Billfishes

Major catches of billfish are incidental to the tuna longline fisheries of several countries. Secondary fisheries are the directed recreational fisheries of the United States and Senegal. There are also developing industrial and artisanal fisheries for sailfish as well as

incidental catches in the tropical tuna purse seine fisheries. Total billfish catches in the last three years (1981-83) have been about 5,000 MT.

The state of the stocks is not considered entirely satisfactory. More statistical data and research are necessary to determine the status of the stocks. The U.S. delegation stated that more emphasis should be given to improving catch and effort data for these species as well as providing historical catch statistics for swordfish where these exist.

#### 5.c.i) Blue marlin

Total Atlantic landings of blue marlin show a continual decline over the period 1975 to 1979. While landings increased through 1982, preliminary estimates of the 1983 landings show a substantial decline from the 1982 level.

While uncertainty remains on the status of blue marlin, concern was expressed about any increase of effort on the stock. Both the sport and commercial fisheries should be monitored, and consideration should be given to methods of reducing fishing mortality if analysis confirms the apparent low level of abundance.

#### 5.c.ii) White marlin

Landings from the total Atlantic show a negative trend over the period 1973-79. The trend since 1979 has been upward with some fluctuation. Production models do not appear to fit the white marlin data and, therefore, little useful information can be derived from this method.

Concern is expressed about increased levels of effort on the stock. Fisheries taking white marlin should be closely monitored and consideration should be given to methods of reducing effort on the species if analysis confirms the apparent low level of abundance.

#### 5.c.iii) Sailfish

Sailfish landings during the 1975-1982 period fluctuated but showed no apparent trends. The western Atlantic stock appears to be only moderately exploited, given the age composition of recent samples from the U.S. recreational fishery and from the Japanese longline fishery. However, other indications suggest that fishing is at the maximum sustainable yield and therefore further analysis of catch and effort is needed for a more definitive assessment of the stocks.

With respect to the east Atlantic stock, the CPUE of sailfish/spearfish has fluctuated without apparent trend. Catch and effort statistics and stock structure information should be improved with respect to the longline fishery.

#### 5.c.iv) Swordfish

Swordfish is caught mainly with longline gear, in both directed fisheries and as bycatch to tuna fisheries, and secondarily with harpoon and sport fishing gear.

The total reported Atlantic and Mediterranean catch was 17,600 MT in 1983, but this figure is lower than the actual catch as a result of incomplete data.

No firm conclusions can be reached on the status of the stocks or on stock structure at this time because of inadequate data. Studies are necessary to obtain basic biological data on swordfish, including age and growth, size composition structure and mortality rates.

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

No new stock conservation measures were considered. The current bigeye regulation obtained support for continuation from a majority of the member countries during the joint meeting of Panels 1 and 4.

### 7. RESEARCH NEEDED TO BE CARRIED OUT

Details are given on the principal activities to be carried out in the sections of this report corresponding to each particular species.

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

Panel 4 decided to hold its next meeting at the same place and at the same time 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 of Panel 4 was adjourned.

**Agendas for Joint Panels 1 - 4 (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 Report of the Standing Committee on Research and Statistics (SCRS)
6. Review of possible measures for the conservation of stocks:

<u>PANELS 1-4</u>	<u>PANEL 2</u>	<u>PANEL 3</u>	<u>PANEL 4</u>
a) Yellowfin	a) Bluefin	a) Southern bluefin	a) Bigeye
b) Skipjack	b) Albacore	b) Albacore	b) Atlantic bonito
c) Bigeye			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

## Statement by Canada on Bluefin Tuna

(Attached to Report of Panel 2)

We in the Canadian delegation note with considerable interest the results of the deliberations of the Working Group on Bluefin Tuna and the SCRS advice resulting therefrom. Canada has been concerned for several years about the state of the bluefin tuna stock in the western North Atlantic and was an active participant in recent years in seeking stringent conservation measures to arrest the decline in the western Atlantic stock and begin a process of rebuilding. We strongly supported the conservation measures adopted by the Commission for this purpose.

During the past couple of years, the Commission was faced with considerable uncertainty in the scientific advice on western Atlantic bluefin, which made the task of the Commission particularly difficult. Because of the uncertainties at that time, Canada supported a cautious and prudent approach to the management regime for this stock. As a result of the continuing scientific uncertainties, it became clear last year that a special effort was required to resolve the various conflicting views about the status of the stock.

To facilitate this, Canada invited the Working Group on Bluefin Tuna to meet in Canada this fall. We are pleased that the work of this Working Group has proven beneficial in resolving some of the uncertainties. While there is still some uncertainty as the Chairman of the SCRS explained yesterday and while additional work is still required, it is now clear that this stock was being overfished in the early 1970's. The recent management measures adopted by the Commission appear to have reduced considerably the fishing mortality in the west Atlantic. We are encouraged by the SCRS advice that "present catch levels are likely to stop the decline of the stock as well as allow stock increases in the long term (30 years)". We also note with interest the SCRS observation that "catches lower than present levels would most likely result in an increased speed of recovery while slightly higher catches would slow down the rebuilding of the stock". This SCRS advice seems to confirm the wisdom of the management measures recently adopted by ICCAT and, in the view of the Canadian delegation, support a continuation of the current management approach for the short- to medium-term. There is, of course, some optimism in the SCRS Report that, in the future, we could look forward to some gradual increase in the allowable catch as the stock recovers. However, this stock recovery process will probably take a considerable period of time.

The response of the stock to current management measures requires confirmation over time before any increase should be contemplated. It would be premature to plan on that basis at this time.

In summary, the Canadian delegation is encouraged that some progress has been made in resolving the scientific uncertainties we faced in previous years. Obviously, fur-



ther progress is desirable. Based on SCRS advice, we feel that the most reasonable approach at the present time would be to maintain the current management measures and await confirmation of stock recovery in response to these measures. Therefore, we would propose that the management measures adopted for bluefin tuna in 1984 be maintained in 1985.

*Appendix 3 to Annex 6*

## Japanese Statement on Bluefin Tuna

(Attached to Report of Panel 2)

Japan would like to express its thanks to all the scientists who have worked so diligently on bluefin tuna both at the Bluefin Working Group meeting in Canada and at this meeting.

We would like to make some comments on the substance of the SCRS Report on bluefin tuna. We would like to refer you to Table 11 of the 1984 SCRS Report and Table 10 (west Atlantic bluefin tuna weights at age) of the Report of the Meeting of the Working Group on Bluefin Tuna (Dartmouth, Nova Scotia, Canada, September 27-October 4, 1984) used for yield per recruit calculations. During the Second Plenary Session (November 8) it was implied that the current catch level appears to coincide with the absolute value of equilibrium yield of 2,741 MT for the 1970 fishing pattern as shown in Table 11. It should be noted bluefin tuna lose weight in July just after spawning. If we use the weights at age in September, the yield must increase markedly. We are not going to discuss the absolute value of the said yields, but wish to indicate the danger of possible misleading. The essential point of Table 11 is to express that estimates of equilibrium yields have significance just in showing how the regulation of small fish is useful to increase possible yields.

The SCRS should continue to study the problem of intermixing of the east and west stocks.

Anyway, Japan is happy to see that the SCRS has agreed that the bluefin tuna stocks in the western Atlantic have not been as poor as some scientists erroneously inferred in the past. We now recognize that, if the recent fishing pattern continues, we will be able to gradually increase the equilibrium yield to the level of 6,300 MT annually in the future. The SCRS's conclusion suggests that, if there is a continuation of such current extreme catch limits in the future, this will lead to under-exploitation of the stock. Japan is happy that the SCRS was able to provide the Commissioners with this information.

Since 1976, there has been a restriction on the taking of small bluefin tunas in the western Atlantic. In addition, since 1982, fishing mortality has been drastically reduced. Because of these two factors, the allowable catch should be able to be increased this year.

However, since the SCRS has not been able this year to recommend allowable catch, Japan is willing to wait one more year to see the results of the Working Group on Bluefin Tuna and the SCRS in 1985.

To prevent future problems with bluefin analysis, Japan proposes that the 1985 Working Group and the SCRS be instructed that their first priority be to improve a scientific monitoring plan including an evaluation of the current management scheme from a solely technical viewpoint.

It is the position of Japan that if there is again no clear advice on allowable catch from the SCRS next year, ICCAT should seriously review the necessity of the present regulatory measures with a view towards flexibility and experimentation.

*Appendix 4 to Annex 6*

### Proposed Regulations for the Atlantic Bluefin Tuna Catch (1985)

(Attached to Report of Panel 2)

Taking into account that the SCRS has found that present catch levels are likely to stop the decline of the western Atlantic bluefin stock as well as permit gradual increases in the long term, proportional to stock recovery,

The Commission recommends that during 1985:

*FIRST:* In order to maintain and improve the data necessary to index the abundance of the stock of bluefin tuna in the western Atlantic

- a) the Contracting Parties whose nationals have been actively fishing for bluefin tuna in the western Atlantic take measures to limit the catch for scientific monitoring in 1985 to 2,660 metric tons (MT);
- b) the catch of 2,660 MT be taken by these Contracting Parties in the same proportions as previously agreed for 1984, and
- c) further scientific investigations, including the work of the Working Group on Bluefin Tuna that is to meet prior to the next SCRS meeting, be carried out in order that the Ninth Regular Meeting in November, 1985, has additional information upon which to base bluefin tuna management measures.

*SECOND:* That the adoption of the above measures concerning the western Atlantic must not imply any modification in the ICCAT recommendation adopted in 1975 con-

cerning a minimum weight of 6.4 kg adopted for the entire Atlantic and fishing mortality limited to recent levels in the eastern Atlantic; this latter measure being extended until a new decision is made by ICCAT.

*THIRD:* That in recognition of the possible lower level of abundance of small bluefin in recent years, no more than 15 percent in weight of the catch in the western Atlantic may consist of bluefin smaller than 120 cm fork length.

*FOURTH:* That the Contracting Parties take measures to prohibit any transfer of fishing effort from the western Atlantic to the eastern Atlantic in order to avoid increasing fishing mortality of bluefin tuna in the eastern Atlantic. Such measures shall be reported in due time to the Commission for possible review at its next meeting.

*FIFTH:* That the developing bluefin tuna fisheries in the western Atlantic of Brazil and Cuba shall not be subject to the limitation addressed herein.

*SIXTH:* That there will be no directed fishery on the bluefin tuna spawning stocks in the western Atlantic in spawning areas such as the Gulf of Mexico.

*SEVENTH:* That, notwithstanding the provisions of Article VIII, paragraph 2 of the Convention, with respect to paragraphs a and b of the First recommendation, the Contracting Parties whose nationals have been actively fishing for bluefin tuna in the western Atlantic take steps to implement this recommendation as soon as possible in accordance with the regulatory procedures of each country.

*EIGHTH:* That in the event that the SCRS is not able to provide new scientific advice on the status of the stock of bluefin tuna in the western Atlantic, the Commission will consider, at the Ninth Regular Meeting, appropriate management measures, including the continuation of the current management measures, throughout 1986.

*Annex 7*

**STATEMENT BY THE DELEGATE OF GHANA  
ON THE YELLOWFIN-BIGEYE ISSUE**

Mr. Chairman, Honorable Commissioners:

On this issue, I made a lengthy statement at the Panel level, but please permit me to give this short address.

On the various species, your scientific advice is as follows:

- Yellowfin: Regulation is ineffective because it is not implemented. As things stand now, it will not be implemented and cannot be implemented unless the strategy is radically changed.
- BigeYE: Implementation of the size regulation at the highest effort level will increase the yield by no more than 10 percent. Right now, the effort has been reduced, so there would be no increase in yield even if the regulation were implemented.
- Skipjack: Implementation of the regulation on the other two species will drastically affect yield. And yet this species forms 76 percent of the tropical tuna catch. The scientists go further to say that skipjack is under-exploited.

In consideration of the above, what moral justification is there to have the regulation?

Honorable Commissioners, in 1980 when the regulation on bigeye was being discussed, you directed three questions to the scientists, to enable you to arrive at a decision. Answers to all three questions are negative.

So upon what would you base your regulations? Even the bluefin regulations, the application of which is showing positive results, are revised from year to year after a review of the results of new scientific knowledge; is it not unfair that the institution of the regulation on yellowfin and bigeye tunas is for an indefinite period, while this regulation poses problems and causes doubts in the results?

We should not forget that we are making decisions which will affect generations in the coastal countries yet unborn.

I leave the decision with you. Posterity will judge our wisdom.

## REPORT OF THE MEETING OF THE INFRACTIONS COMMITTEE

### 1. OPENING OF THE MEETING

The Chairman, Mr. B. García Moreno (Cuba), opened the meeting and noted that the member countries represented were Angola, Brazil, Canada, Cuba, France, Ivory Coast, Ghana, Japan, Korea, Spain, Portugal, U.S.A. and the U.S.S.R.

### 2. ADOPTION OF AGENDA AND ORGANIZATION OF THE MEETING

Mr. García Moreno briefly reviewed the Tentative Agenda (Appendix 1), which was adopted without change.

### 3. ELECTION OF RAPPORTEUR

The Chair proposed that Mr. J. P. Wise (Secretariat) serve as rapporteur for the meeting.

### 4. NATIONAL REGULATIONS ON SPECIES

The Chair called attention to COM/84/24 and asked the Executive Secretary to review it. The Executive Secretary pointed out that the document contained the information currently available on the dates of adoption of national orders, laws, regulations, etc., designed to implement the ICCAT recommendations for the conservation of Atlantic tunas, and requested that delegates provide him with any information they had concerning corrections, amendments, etc. The tables of regulations are attached as Appendix 2. He asked that each member country send to the Secretariat for its files copies of relevant national documents so that they would be available if other members wished to compare them.

## 5. NATIONAL LEGISLATION OF PORT INSPECTION

Mr. García Moreno referred the delegates to COM/84/25. The Executive Secretary asked for the floor to explain the document. He briefly reviewed the history of the ICCAT Port Inspection Scheme, called the delegates' attention to Article 1 and pointed out that not much information had been received by the Secretariat to date about national regulations on inspection.

The delegate of France said that in his country the implementation of the ICCAT recommendations did not require any new law or decree, that he had been waiting to confirm whether the ICCAT recommendations on bigeye tuna would be extended, and that a circular would be issued indicating the texts of the regulations currently in force. A copy will be sent to the Secretariat. The delegate of Spain explained that procedures in his country were somewhat different, but that Spain was in principle doing the same thing.

The delegate from the U.S.S.R. noted that his country implements the ICCAT recommendations and sends copies of its national regulations to the Secretariat. In the opinion of the U.S.S.R. delegation, inspections, both national and international, should be done on the high seas, since this is the most effective and convenient way, and does not affect the quality of the fish. With regard to the Port Inspection Scheme, the U.S.S.R. drew the attention of the Committee to the Executive Secretary's letter of February 16, 1983, which noted in particular that the Scheme had entered into force for some Contracting Parties. Considering this fact, the U.S.S.R. delegation said that its opinion was that the Port Inspection Form (Attachment III to COM/84/25) should show, perhaps as a note, the list of Contracting Parties to which the Scheme applies.

## 6. REPORT OF PORT INSPECTIONS CARRIED OUT IN 1984

In response to the Chair's request that members report on inspections carried out, the delegate from the U.S.A. reported that her country had been conducting inspections before the Infractions Committee was formed. While no foreign-flag vessels had been inspected in 1983, over 700 man-hours were spent on inspection of domestic tuna vessels.

The delegate from Portugal called the Committee's attention to Article 9 of the ICCAT Port Inspection Scheme, which requires that members report only on those inspections in which a violation was noted.

The Executive Secretary remarked that the Commission was still learning how these reports should be handled. He suggested as a possibility that countries would want to report the results of inspections periodically to the Secretariat, possibly using copies of the Port Inspection Form (Attachment III to COM/84/25) or a summary.

## 7. ADOPTION OF AN IDENTITY CARD FOR INSPECTORS

The Executive Secretary briefly reviewed the development of the identity card that may be used by inspectors and indicated that an example and blank cards had been distributed to all member countries. The Secretariat maintains a stock of these cards, which will be used as long as the Committee finds them appropriate.

## 8. ADOPTION OF AN INSPECTION FORM AND QUESTIONNAIRE

The Chair called the attention of the Committee to the present version of the ICCAT Port Inspection Form (Attachment III to COM/84/25). There was considerable discussion of the form, particularly with regard to the indicated length equivalents for the weights specified in the ICCAT recommendations for conservation of bluefin, yellowfin and bigeye tunas. It was pointed out by the delegates of France and Portugal that these equivalencies as stated could cause serious problems with national enforcement, since national laws and regulations were based on the ICCAT recommendations with respect to weight as stated in the official reports of the meetings. The delegate of Spain indicated that perhaps the problem was the use of the "=" sign, indicating a mathematical equivalency that in fact did not exist.

With respect to the different limits used for bluefin tuna, that is the fork length of 120 centimeters in the western Atlantic and the 6.4 kg for the whole Atlantic, the delegate of Ivory Coast noted that the Standing Committee on Research and Statistics (SCRS) had been asked to recommend a length equivalency for the 6.4 kilogram bluefin, and had recommended in Item 15 of its Report an equivalency for inspection purposes of 70 centimeters.

The Executive Secretary suggested that the problem of indicating approximate length equivalencies for purposes of inspection of those fish where ICCAT recommendations and national regulations were in terms of weight could be best handled by a footnote on the inspection form rather than including them in the headings. This footnote would give the indications not shown in the recommendations, such as sizes, which are useful for inspectors. The delegate of France said that he agreed in principle with the Executive Secretary's suggestion, but that the problem was perhaps not that simple, especially from a legal point of view. The delegate from Portugal said that he agreed with the point made by France, and that official alternative methods of measurement would doubtless be necessary. He suggested that the SCRS be asked in addition to furnish guidelines for the methods used in sampling catches for purposes of inspection.

The delegate of Ivory Coast remarked that the Executive Secretary's suggestion was very clear, but that a second stage was needed, that is to have length-weight equivalencies established officially by the Commission. The delegate of Japan noted that in his opinion equivalencies could be established with some range, since living animals change their length while keeping the same weight, and vice versa.

Mr. García Moreno called on the Chairman of the SCRS to help clarify the situation. The SCRS Chairman agreed with the previous speakers, and observed that any given length will encompass a range of weights. The use of both for inspection purposes would generate confusion, and it might not be practical to cite alternatives. He suggested that the matter was one for serious study and that delegates should come to the next meeting prepared to discuss the problem in depth. The delegate of the U.S.S.R. pointed out the problems that could be generated by having two criteria for a single species. The Chair said that further study seemed to be the only practical way out and reiterated the idea that delegates should bring their ideas to the next meeting.

## 9. PLAN FOR THE APPLICATION OF THE INSPECTION SCHEME

The delegate from Angola asked the Committee to note that the "Departamento Nacional de Inspeção e Fiscalização do Ministério das Pescas" would be the responsible organization for his country, and made some changes to the list of inspectors. The Executive Secretary said that these changes would appear on the next list of authorized inspectors circulated by the Secretariat.

The Cuban delegate said that this country considered inspection an important matter. Cubas fishing vessels are mostly longliners that, because of the size of the fish caught, do not violate size limits. Nonetheless a Cuban purse seiner had made landings from time to time in Las Palmas, and in accordance with Article 11 of the Port Inspection Scheme, the Cuban Government had requested that Spain authorize a Cuban inspector to check these landings, either alone or with Spanish inspectors accredited by ICCAT.

The Executive Secretary noted that it would be convenient for the member countries participating in the Port Inspection Scheme to nominate national correspondents to whom inquiries could be addressed concerning the details of national application and regulations. This arrangement had worked well with other ICCAT matters, for example for statistics. The Chair asked for comments, and when there were none, suggested that the Secretariat request the names of national correspondents directly from the participating countries.

## 10. DATE AND PLACE OF NEXT COMMITTEE MEETING

The Chair suggested that the Committee meet at the same time and place as the Commission next year, and this suggestion was accepted without comment.

## 11. OTHER MATTERS

No other matters were brought before the Committee.

## 12. ADOPTION OF REPORT

The report was adopted.

## 13. ADJOURNMENT

The meeting was adjourned.



### **Agenda of the Infractions Committee**

1. Opening of the Meeting
2. Adoption of Agenda and organization of the meeting
3. Election of Rapporteur
4. National regulations on species
5. National legislation on port inspection
6. Report of port inspections carried out in 1984
7. Adoption of an identity card for inspectors
8. Adoption of an inspection form and questionnaire
9. Plan for the application of the inspection scheme
  - a) National correspondents
  - b) Nomination of inspectors
  - c) Application dates
10. Date and place of next Committee meeting
11. Other matters
12. Adoption of Report
13. Adjournment

**Status of adoption of regulatory measures on size limits by the member countries for  
YELLOWFIN, BIGEYE and BLUEFIN TUNAS (as of December 31, 1984)**

Species	YELLOWFIN	BIGEYE	BLUEFIN
Commission recommendation	3.2 kg limit	3.2 kg limit	6.4 kg limit
Area of application	Entire Atlantic	Entire Atlantic	Entire Atlantic
Date of entry into effect	July 1, 1973	September 7, 1980	August 10, 1975
Date of expiration	Indefinite period	Indefinite period	Indefinite period
Angola . . . . .	Jun. 17, 1979		No fishing
Benin . . . . .			
Brazil . . . . .	Feb. 23, 1973	Nov. 17, 1980*	Aug. 18, 1977
Canada . . . . .	Sep. 4, 1973	No fishing	Feb. 17, 1973
Cape Verde . . . . .			
Cuba . . . . .	Jul. 1, 1973	Sep. 7, 1980	No fishing
France . . . . .	Jun. 29, 1973	Mar. 3, 1981	Aug. 8, 1975
Gabon . . . . .	No fishing or landings	Measures being considered	No fishing or landings
Ghana . . . . .	Jun. 19, 1976		
Ivory Coast . . . . .	Mar. 2, 1970	Mar. 2, 1970	
Japan . . . . .	Jun. 14, 1973	Sep. 7, 1980	Apr. 16, 1975
Korea . . . . .	Jan. 21, 1973	Sep. 15, 1980	Dec. 17, 1975
Morocco . . . . .	No fishing		
Portugal . . . . .	Nov. 26, 1973	Jul. 17, 1981	Nov. 27, 1976
Sao Tomé & Principe . . . . .			
Senegal . . . . .	Jul. 2, 1976	Jul. 2, 1976	
South Africa . . . . .	May, 1973	Dec. 5, 1980	Jun. 27, 1975
Spain . . . . .	May 29, 1974		Mar. 3, 1975
Uruguay . . . . .			
U.S.A. . . . .	Nov. 5, 1975	Mar. 30, 1981	Aug. 13, 1975
U.S.S.R. . . . .	Sep. 28, 1978	Sep. 28, 1978	Sep. 28, 1978
Venezuela . . . . .			

\*Awaiting written confirmation.

NOTE: For more details, please request information from the national administrations.

**Status of adoption of regulatory measures on BLUEFIN TUNA fishing mortality  
by the member countries (as of December 31, 1984)**

Commission recommendation	Limiting fishing mortality to recent levels				
		1 <sup>st</sup> Extension	2 <sup>nd</sup> Extension	3 <sup>rd</sup> Extension	4 <sup>th</sup> Extension
Area of application	Entire Atlantic	Entire Atlantic	Entire Atlantic	Entire Atlantic	E. Atlantic only
Date of entry into effect	Aug. 10, 1975	Aug. 10, 1976	Oct. 10, 1978	Sep. 4, 1980	Jul. 21, 1982
Date of expiration	Aug. 10, 1976	Aug. 10, 1978	Aug. 10, 1980	Aug. 10, 1982	Indefinite
Angola . . . . .	No fishing				
Benin . . . . .					
Brazil . . . . .	Aug. 10, 1977	Aug. 18, 1977	Mar. 2, 1979	Nov. 17, 1980*	
Canada . . . . .	Feb. 17, 1976	Feb. 17, 1976	Feb. 15, 1979	Feb. 15, 1979	
Cape Verde . . . . .					
Cuba . . . . .	Zero catches in 1976-78				
France . . . . .		Dec. 27, 1974	Dec. 27, 1974	Dec. 27, 1974	
Gabon . . . . .	No fishing				
Ghana . . . . .					
Ivory Coast . . . . .					
Japan . . . . .	Apr. 16, 1975	Apr. 16, 1975	Apr. 16, 1975	Apr. 16, 1975	Mar. 3, 1982
Korea . . . . .	Dec. 17, 1975	Dec. 17, 1975	Oct. 14, 1978	Sep. 15, 1980	
Morocco . . . . .					
Portugal . . . . .		Nov. 27, 1976	**	**	**
Sao Tomé and Principe . . . . .					
Senegal . . . . .					Mar. 11, 1982
South Africa . . . . .	Jun. 27, 1975	Oct. 19, 1976	Feb. 9, 1979	Jan. 11, 1980	
Spain . . . . .	Feb. 19, 1976	Feb. 19, 1976	Feb. 19, 1976	Jan. 24, 1980	
Uruguay . . . . .					
U.S.A. . . . .	Aug. 13, 1975	May 18, 1976	Jun. 15, 1979	Jun. 13, 1980	
U.S.S.R. . . . .					
Venezuela . . . . .					

\*In process.

\*\*Objections presented and ratified on November 16, 1978, March 19, 1980, and July 21, 1982.

NOTE: For more details, please request information from the national administrations.

Status of adoption of regulatory measures on West Atlantic BLUEFIN TUNA catches  
by the member countries (as of December 31, 1984)\*

Commission recommendation	Catch prohibited, except for monitoring purposes				
	Date of entry into effect	Feb. 15, 1982	Jan. 1983	Jan. 1984	Jan. 1985
Date of expiration	Feb. 14, 1984	Jan. 1984	Jan. 1985	Jan. 1986	
Angola . . . . .	----- No fishing -----				
Benin . . . . .					
Brazil . . . . .					
Canada . . . . .	Jun. 14, 1982	Jun. 21, 1983			
Cape Verde . . . . .					
Cuba . . . . .					
France . . . . .					
Gabon . . . . .	----- No fishing or landings -----				
Ghana . . . . .					
Ivory Coast . . . . .					
Japan . . . . .	Mar. 3, 1982	Mar. 7, 1983			
Korea . . . . .					
Morocco . . . . .					
Portugal . . . . .					
Sao Tomé and Principe . . . . .					
Senegal . . . . .					
South Africa . . . . .					
Spain . . . . .					
Uruguay . . . . .					
U.S.A. . . . .	Jun. 11, 1982	Jun. 17, 1983	Jul. 24, 1984		
U.S.S.R. . . . .			Feb. 15, 1984		
Venezuela . . . . .					Feb. 15, 1984

\*Details on the ICCAT recommendations are given in the Biennial Reports of the Commission, starting with the "Report for Biennial Period, 1982-83, Part I".

NOTE: For more details, please request information from the national administrations.

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

### Item 1. OPENING OF THE MEETING

1.1 The 1984 meeting of the Standing Committee on Finance and Administration (STACFAD) was opened by the Chairman, Mr. J. J. Chao (Spain). All members, except the following, were present: Benin, Gabon, Morocco, São Tomé and Príncipe, South Africa, Uruguay and Venezuela.

### Item 2. ADOPTION OF AGENDA

2.1 After reviewing the Commission Agenda items referred to the Committee, the Tentative Agenda, circulated in advance of the meeting, was adopted (Appendix 1).

### Item 3. ELECTION OF RAPPORTEUR

3.1 The Secretariat served as rapporteur.

### Item 4. PANEL MEMBERSHIP

4.1 Panel membership, referred to in Document COM/84/10, was reviewed. It was noted that there were no changes in panel membership during the past year or during this Commission session.

### Item 5. ADMINISTRATIVE REPORT

5.1 The Executive Secretary presented the Administrative Report (COM/84/11) and outlined the overall Secretariat and Commission activities. These included ICCAT meetings, meetings at which the Commission was represented, cooperation with other organi-

zations, ICCAT data processing work, a training course for scientists, ICCAT publications, progress on the Skipjack Conference publication, the purchase of word processors for the Secretariat and trips made by the Secretariat staff.

5.2 He made special note of the numerous ICCAT-organized intersessional meetings held in 1984, specifically the Data Preparatory Meeting (Dakar, Senegal), the Working Group on Juvenile Tropical Tunas (Brest, France) and the Working Group on Bluefin Tuna (Dartmouth, Canada). He noted that these meetings had considerable financial repercussions.

5.3 The Committee reviewed and adopted the Administrative Report (COM/84/11) and recommended it to the Commission for approval.

#### Item 6. RELATIONS WITH OTHER ORGANIZATIONS

6.1 The Executive Secretary referred the Committee to the pertinent section of the Administrative Report which reviews the relationships the Commission maintains with various international organizations. The Committee found these to be satisfactory.

#### Item 7. COMMISSION PUBLICATIONS

7.1 The Committee reviewed the pertinent sections of the Administrative Report (COM/84/11) concerning ICCAT publications and recommended that the current publication policy be maintained.

#### Item 8. BASIC TEXTS OF THE COMMISSION

8.1 The official texts of the Convention, Rules of Procedure and Financial Regulations are reviewed in Document COM/84/12 for consistency in the three language versions. Some discrepancies in the original text of the Convention, adopted by the Conference of Plenipotentiaries in Rio de Janeiro in 1966 and which are equally authoritative, were pointed out at the ICCAT Meeting of Legal Experts (Paris, May 1982). The Committee noted that a "procès-verbal" of rectification to harmonize the text of the Convention in the three authoritative languages and to bring the original text into line with certified true copies of the Convention was transmitted to the Commission by the Food and Agriculture Organization of the United Nations (FAO), the depository of the Convention.

8.2 Since the Commission intends to publish a revised version of the "Basic Texts" in 1985, the discrepancies found in the "Rules of Procedure" and the "Financial Regulations" were reviewed by the Secretariat and some linguistic modifications are suggested in Document COM/84/12. The U.S. and France approved all the corrections suggested by the Secretariat for the English and French versions, respectively. Spain and Cuba agreed to re-

view the Spanish text and present any additional modifications to the Secretariat.

8.3 The Committee recommended that the Secretariat publish the revised version of the "Basic Texts" including all the suggested changes in the text.

#### Item 9. AUDITOR'S REPORT 1983

9.1 In discussing this Agenda item, the Executive Secretary remarked that the 1983 Auditor's Report had been distributed by the Secretariat earlier in the year. He pointed out that an abstract of the Report was included in the 1983 Financial Report (Report for Biennial Period, 1982-83, Part II). He noted that limited copies of the original Report were available for consultation by the delegates.

#### Item 10. FINANCIAL STATUS OF THE SKIPJACK PROGRAM

10.1 The Committee was referred to Document COM/84/13-A which presents the current status of the Skipjack Budget. The Executive Secretary also reviewed the overall progress of the Skipjack Conference publication and in doing so reminded the Committee that there were still contributions pending payment to that Budget. A summary of the current status of the skipjack accounts was presented and is attached herewith as Appendix 2.

10.2 In discussing this matter, the Executive Secretary requested authorization to deposit the positive balance, if any, of the Skipjack Program to the Working Capital Fund of the Regular Commission Budget. The Executive Secretary clarified that pending skipjack contributions would be debited to the appropriate country's contribution to the Regular Commission Budget.

10.3 He also asked the Committee's authorization to use money from the Working Capital Fund to meet expenditures pertaining to the publication and distribution of the Conference Report, until pending skipjack contributions are received. These proposals were agreed to by the Committee and referred to the Commission.

#### Item 11. FINANCIAL STATUS OF THE REGULAR BUDGET - 1984

11.1 The Financial Report (COM/84/13) was presented by the Executive Secretary. He noted that the favorable U.S. dollar/peseta exchange rate had a positive effect on Commission accounts. In general, the financial status of the Commission is good, and a positive balance of approximately US \$75,000 is forecast.

11.2 The Executive Secretary pointed out that several 1984 member country contributions to the Regular Commission Budget (approximately \$135,000) and past contributions to the Skipjack Budget (approximately \$12,600) are still pending payment. He noted that fortunately, because of the Working Capital Fund, no Commission activities had to be curtailed in 1984.

**Item 12. REVIEW OF THE SECOND HALF OF THE BIENNIAL BUDGET - 1985**

12.1 The Committee studied the second half of the Commission's Budget for the biennial period 1984-1985. It was confirmed that this biennial budget was adopted at the Eighth Regular Meeting of the Commission (Madrid, November 1983). However, the second half (1985) of the budget was adopted pending revision at the 1984 session.

12.2 The delegate from Spain observed that a positive balance of approximately \$75,000 was forecast for the end of Fiscal Year 1984 and that about \$75,000 in unbudgeted income (bank interest) was also anticipated. He also indicated that, according to a recommendation made by the Working Group on the Working Capital Fund, \$100,000 of the Working Capital Fund should be transferred to the 1985 budget. He further noted that the total budget projected for 1985, as estimated at present, would be somewhat less than that estimated a year ago due to changes in exchange rates between the U.S. dollar and the peseta. Taking these fluctuations into consideration, the proportion of the budget spent in dollars and that spent in pesetas, the inflation rate, etc., the Spanish delegate proposed a total budget of about \$687,500, which he agreed could be rounded up to \$700,000. Of this total budget, \$250,000 should come from the 1984 positive balance, bank interest and the Working Capital Fund and \$450,000 from the member country contributions.

12.3 The delegate from the United States proposed an alternative plan which included some of the views expressed by Spain. The U.S. proposal establishes the 1985 total budget at \$770,000. It reduces contributions by \$100,000, as agreed, from the Working Capital Fund and by \$70,000 from bank interest earned during Fiscal Year 1984. If interest earned is less than \$70,000, the difference will be taken from the Working Capital Fund. If interest earned is more, any amount over \$70,000 will be deposited to the Working Capital Fund. Considering some expansion of SCRS research activities, additional meeting costs, and some contingency plans for an unexpected reversal of favorable exchange rates, the delegate from the United States expressed his opinion that the Executive Secretary's total budget estimate should be maintained.

12.4 The Spanish delegate suggested a revision to the original Spanish proposal in that the total budget should be \$700,000, based on a study by his delegation on exchange rates, etc. and further suggested reducing contributions to \$525,000 by applying \$100,000 from the Working Capital Fund and \$75,000 from bank interest.

12.5 The delegates from Portugal and Ivory Coast expressed support for the revised Spanish proposal.

12.6 In response to an inquiry from the delegate from France, the Executive Secretary explained some of the problems involved in estimating the Commission budget. He cited, in particular, changes in Secretariat personnel due to the resignation of the systems analyst in 1984, but noted that additional funds will be required in 1985 once this position is filled. He emphasized the many uncertainties which still exist concerning future currency fluctuation, increased meeting costs, etc., and felt that the total budget should be maintained at \$770,000. He noted that the U.S. proposal would maintain the 1985 country contributions at the same level as 1984.

12.7 The delegate from the U.S. commented that the Spanish proposal considers essentially only the short term and depends heavily on the Working Capital Fund. He fur-



ther noted that such a procedure is risky and added that if the budget is reduced once, any future increases would be difficult for all concerned. On the other hand, the U.S. proposal takes a long-term view of the Commission's work and needs and will avoid any risks.

12.8 After a short recess, a compromise solution was presented by the Chairman, whereby the total Commission budget for 1985 would be \$750,000. Of this amount, \$100,000 will be allocated from the Working Capital Fund, and \$75,000 will come from expected earned interest. If interest earned in 1984 is less than \$75,000, the difference should be paid from the Working Capital Fund. Thus, the base for the member country contributions will be \$575,000. This proposal was accepted by the majority of the member countries and recommended to the Commission for adoption. The new budget is attached as Appendix 4.

12.9 The member country contributions, calculated based on the new budget scheme outlined above, were agreed upon and recommended to the Commission by the STACFAD (Appendix 5).

### Item 13. REVIEW OF WORKING CAPITAL FUND

13.1 The Committee reviewed the document on the Working Capital Fund (COM/84/14) as well as the Report of the Working Group on the Working Capital Fund (Appendix 3) as introduced during the session. It was confirmed that the positive balance from the 1984 budget, if any, should be deposited to the Working Capital Fund. It was also confirmed that if bank interest earned during 1984 should be less than \$75,000, the difference should be deducted from the Working Capital Fund and applied to the 1985 budget, as agreed under Agenda Item 12.

13.2 The U.S. delegate proposed the adoption of a policy of automatically reducing the following year's country contributions by applying the preceding year's positive balance, if any, to the budget, starting from the 1986 budget. This policy would be followed each year, with a determination made each year regarding any additional reductions that might be made possible in the contributions through the use of the Working Capital Fund until such time as the Working Capital Fund reaches a level of 15 percent of the annual budget. However, the U.S. delegate expressed some reservation as regards the adequacy of the level of 15 percent of the annual budget of the Working Capital Fund and asked that determination of the application of the Fund be based on information available at the time regarding exchange rates, contribution delays, etc.

13.3 This proposal was accepted, in principle, pending further review at the STACFAD meeting in 1985, when the budget for the 1986-87 biennial period will be under consideration.

### Item 14. REPORT OF THE WORKING GROUP ON THE WORKING CAPITAL FUND

14.1 The Report of the Working Group, presented in an earlier session of the Committee and reviewed under various sections of the Agenda, was formally adopted and is attached as Appendix 3.

**Item 15. OTHER ACTIVITIES IN RESEARCH AND STATISTICS**

15.1 Mr. J. S. Beckett, the Chairman of Standing Committee on Research and Statistics (SCRS) noted that he had presented some of long-term plans of the SCRS which may require substantial funding at the Meeting of the Working Group on the Working Capital Fund. For 1985, the SCRS has proposed holding interim meetings: the Working Group on Bluefin Tuna to assess bluefin stock using computer facilities, and a small planning session involving a few scientists to organize a program to monitor and evaluate the stock conditions of eastern tropical Atlantic tunas. This program became necessary as a result of the substantial reduction of surface fishing effort in this area.

15.2 Mr. Beckett informed the Committee that two programs which the SCRS is now considering for the immediate future will require substantial funding by the Commission in addition to the normal Commission Budget, i.e., coordination of the program to monitor and assess stocks in the eastern tropical Atlantic and the micro-element analyses of tuna hard parts. These programs will be discussed at the next SCRS meeting and detailed plans will be submitted to the Commission for consideration.

15.3 The SCRS Chairman commented further that in the foreseeable future, the SCRS meeting may require considerable reorganization in order to carry out more quantitative assessment rather than qualitative assessment as is done at present. This plan may involve numerous small working groups or an extended SCRS session, including computer facilities. In either case, more funding will be needed. Another program which will require some financial involvement by ICCAT is the proposed "World Tuna Conference", which is being organized for 1986 or 1987. If this Conference materializes, the ICCAT would have to be involved since it is one of the world's foremost tuna research organizations. When the scope, responsibility and overall organization is more clearly defined, the Commission will be informed of the developments.

**Item 16. DATE AND PLACE OF NEXT REGULAR MEETING OF THE COMMISSION**

16.1 This subject was referred back to the Commission.

**Item 17. OTHER MATTERS**

17.1 No other matters were discussed.

**Item 18. ADOPTION OF REPORT**

18.1 The Report was adopted together with its attached appendices.

**Item 19. ADJOURNMENT**

19.1 The meeting was adjourned.

## STACFAD Agenda

1. Opening of the meeting
2. Adoption of Agenda
3. Election of Rapporteur
4. Panel membership
5. Administrative Report
6. Relations with other organizations
7. Commission publications
8. Basic Texts of the Commission
9. Auditor's Report - 1983
10. Financial status of the Skipjack Program
11. Financial status of the Regular Budget - 1984
12. Review of the second half of the biennial budget - 1985
13. Review of Working Capital Fund
14. Report of the Working Group on the Working Capital Fund
15. Other activities in research and statistics
16. Date and place of next Regular Meeting of the Commission
17. Other matters
18. Adoption of Report
19. Adjournment

## Status of Skipjack Program Funds

<i>ASSETS</i>		<i>LIABILITIES</i>	
Cash (Jan. 1, 1984) . . . . .	73,445	Expenses (Jan.-Aug., 1984) . . . . .	21,820
		Estimated Expenses:	
		a) Dobrocky Seatech . . . . .	32,800
		b) Printing & distribution . . . . .	25,000
TOTAL . . . . .	73,445 (-\$6,175)	TOTAL . . . . .	79,620
PENDING . . . . .	12,610		
	86,055 (+\$6,435)		

## **Report of the Meeting of the Working Group on the Working Capital Fund**

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

The Working Group on the Working Capital Fund met on Tuesday, November 6, 1984, at the Hotel Reina Isabel in Las Palmas de Gran Canaria, Spain. The meeting was opened by the Chairman of the Commission, Mr. C. J. Blondin (U.S.A.).

### **2. ELECTION OF CHAIRMAN**

Mr. Blondin nominated Mr. J. J. Chao (Spain), Chairman of the Standing Committee on Finance and Administration (STACFAD) to serve as Chairman of the Working Group. The following eleven member countries were present: Angola, Brazil, Canada, Cuba, France, Ghana, Ivory Coast, Japan, Spain, the United States and the U.S.S.R. The European Economic Community (EEC) and the International Commission for the Southeast Atlantic Fisheries (ICSEAF) attended the meeting as observers.

### **3. BACKGROUND**

The Chairman gave a brief overview on the formation of the Working Group and the purpose of the Group's meeting. He referred the Group to Document COM/84/14, prepared by the Secretariat and distributed to the member countries in May, regarding the status of the Fund and alternatives for its use.

The Executive Secretary reviewed the aforementioned document. He referred the Group to Article X, paragraph 9, of the Convention, which establishes the Working Capital Fund as a means to finance Commission activities until the annual contributions are received and for such other purposes as determined by the Commission. He noted that several articles of the Financial Regulations also refer to the Fund. The Executive Secretary reiterated the three proposed alternatives contained in the document regarding application of the balance of the Working Capital Fund.

Several delegations questioned whether the level of the Working Capital Fund should be 15 percent of the annual budget, or 15 percent of the biennial budget. The Executive Secretary clarified that at its Second Regular Meeting (Madrid, 1971), the Commission fixed the level of the Working Capital Fund at 15 percent of the annual budget.

Spain noted that any adjustment in this respect was not within the terms of reference of the Working Group and would have to go through normal Commission procedures.

It was suggested that some funds from the Working Capital Fund might be reserved for special SCRS programs. The SCRS Chairman informed the Working Group that there were two future research programs that would require increased financing. He noted that the fisheries off west Africa have had a dramatic shift in effort, and this situation afforded the scientific community an excellent opportunity to measure tuna populations and test present SCRS conclusions. Another future SCRS research program involves the study of micro-elements of hard parts of several tuna species. He clarified, however, that the scientific committee would proceed as it did for the Skipjack Program and submit detailed program plans, costing, etc. to the Commission for approval.

Several alternatives for application of the balance in the Fund were presented by various delegations. The delegate from Ivory Coast proposed an alternative whereby \$100,000 of the balance in the Working Capital Fund would be applied to the 1985 Commission Budget, \$100,000 would be applied to the 1986 Commission Budget and the rest would remain in the Working Capital Fund.

The U.S., France, Canada, Cuba, Angola and Japan expressed support for this proposal.

Spain also supported the proposal of Ivory Coast, but expressed the reservation that this would only be a short-term solution and would not adequately deal with the real problem facing the Working Group, which is the continual increase in the number of countries which delay payment of their annual contributions. The delegate from Spain noted that the proposal made by Ivory Coast represents a pragmatic solution to a very serious concern which seriously jeopardizes the Commission's activities.

Other delegations reiterated Spain's concern about the delay in payments, and it was suggested that the Secretariat further investigate the reasons for these delays and inform the STACFAD of his findings, so that the Commission could seek solutions to the problem.

It was decided to present the Ivory Coast proposal to STACFAD and recommend its adoption.

#### 4. ADOPTION OF REPORT

The Report was adopted.

#### 5. ADJOURNMENT

The meeting was adjourned.

## Regular Budget - 1985 (USA\$)

	<i>1985 Budget (750,000)</i>
1. Salaries . . . . .	300,000
2. Travel . . . . .	15,000
3. Annual Meeting . . . . .	77,200
4. Publications . . . . .	32,000
5. Office Equipment . . . . .	10,700
6. General Operating Expenses . . . . .	59,500
7. Miscellaneous Expenses . . . . .	<u>9,600</u>
<i>Sub-total</i> . . . . .	504,000
8. Coordination of Research	
a) Salaries . . . . .	160,000
b) Travel . . . . .	12,900
c) Equipment . . . . .	5,400
d) Data Processing . . . . .	38,600
e) Meetings during the year (working groups, etc.) . . . . .	24,000
f) Miscellaneous Expenses . . . . .	<u>5,100</u>
<i>Sub-total</i> . . . . .	246,000
9. Contingencies . . . . .	<u>0</u>
<b>TOTAL</b> . . . . .	<b>750,000</b>
<b>From Working Capital Fund</b> . . . . .	<b>100,000</b>
<b>From Bank Interest in 1984</b> . . . . .	<b>75,000</b>
<b>From Country Contributions</b> . . . . .	<b>575,000</b>

Table of Member Country Contributions to the 1985 Regular Commission Budget

Country	A No.	B	C ..... (1,000 MT) .....	D	E	F	G \$	H \$	I \$	J \$	K \$
Angola	2	5.17	5.209	1.377	6.586	1.24	1,000	2,000	8,914	4,275	16,189
Benin	0	1.72	.003	0	.003	0.00	1,000	0	2,971	2	3,973
Brazil	2	5.17	20.197	0	20.197	3.80	1,000	2,000	8,914	13,111	25,024
Canada	2	5.17	1.166	3.254	4.420	0.83	1,000	2,000	8,914	2,869	14,783
Cape Verde	1	3.45	2.735	.250	2.985	0.56	1,000	1,000	5,943	1,938	9,880
Cuba	2	5.17	9.700	.799	10.499	1.98	1,000	2,000	8,914	6,815	18,729
France	2	5.17	62.826	25.200	88.026	16.58	1,000	2,000	8,914	57,141	69,054
Gabon	1	3.45	0	0	0	0.00	1,000	1,000	5,943	0	7,943
Ghana	1	3.45	20.184	3.297	23.481	4.42	1,000	1,000	5,943	15,242	23,185
Ivory Coast	1	3.45	17.560	6.400	23.960	4.51	1,000	1,000	5,943	15,553	23,496
Japan	4	8.62	52.975	0	52.975	9.98	1,000	4,000	14,856	34,388	54,244
Korea	3	6.90	31.835	0	31.835	6.00	1,000	3,000	11,885	20,665	36,550
Morocco	2	5.17	11.795	.924	12.719	2.40	1,000	2,000	8,914	8,256	20,170
Portugal	3	6.90	6.848	4.593	11.441	2.15	1,000	3,000	11,885	7,427	23,312
Sao Tomé & Principe	0	1.72	0	0	0	0.00	1,000	0	2,971	0	3,971
Senegal	1	3.45	2.323	2.900	5.223	0.98	1,000	1,000	5,943	3,390	11,333
South Africa	1	3.45	2.466	.539	3.005	0.57	1,000	1,000	5,943	1,951	9,893
Spain	3	6.90	135.569	33.200	168.769	31.79	1,000	3,000	11,885	109,554	125,440
Uruguay	0	1.72	.328	.002	.330	0.06	1,000	0	2,971	214	4,185
U.S.A.	4	8.62	17.795	32.317	50.112	9.44	1,000	4,000	14,856	32,529	52,386
U.S.S.R.	2	5.17	13.834	.564	14.398	2.71	1,000	2,000	8,914	9,346	21,260
<b>TOTAL</b>	<b>37</b>	<b>100.00</b>	<b>415.348</b>	<b>115.616</b>	<b>530.964</b>	<b>100.00</b>	<b>21,000</b>	<b>37,000</b>	<b>172,333</b>	<b>344,667</b>	<b>575,000</b>

A - Panel membership.

B - Percentage of payments for annual membership and panel membership (G + H).

C - 1981 catch (live weight).

D - 1981 canned production (net product weight).

E - Total (C+ D).

F - Percentage distribution of E.

G - Payment of \$1,000 annual membership contribution.

H - Payment of \$1,000 for each panel membership.

I - 1/3 of \$517,000 = (\$575,000 - \$58,000 (G + H)) distributed percentage-wise according to column B.

J - 2/3 of \$517,000 = (\$575,000 - \$58,000 (G + H)) distributed percentage-wise according to column F.

K - Total (G+ H+ I+J).



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

Las Palmas, Spain, November 1-6, 1984

**Table of Contents**

Text of Report

Tables and Figures

Appendix 1 – Agenda

2 – List of Documents

3 – Report of the Sub-Committee on Statistics

**Item 1. OPENING OF THE MEETING**

The Standing Committee on Research and Statistics (SCRS) met in Las Palmas, Canary Islands (Spain), at the Hotel Reina Isabel from November 1 to 6, 1984, under the chairmanship of Mr. J. S. Beckett (Canada). Groups of scientists met during the preceding three days to help rapporteurs draft the species sections of the SCRS Report.

The SCRS Chairman opened the Fifteenth Regular Meeting of the Committee and welcomed all the scientific delegations. He commented on achievements made by the scientists during the past year in tuna research, and referred specifically to the two important intersessional meetings held during 1984: the meeting of the Working Group on Juvenile Tropical Tunas held in Brest, France, on July 12-21; and the meeting of the Working Group on Bluefin Tuna held in Dartmouth, Canada, from September 27 to October 4. He expressed his appreciation of the excellent work demonstrated by the conveners, scientists and the Secretariat staff.

**Item 2. ADOPTION OF AGENDA AND ARRANGEMENTS FOR THE MEETING**

The Tentative Agenda which was circulated prior to the meeting was adopted (attached as Appendix 1). The scientists nominated as rapporteurs and coordinators of the Report are:

## Agenda Item 9:

Tropical Tunas (General)	A. Fonteneau
YFT-Yellowfin	F.X. Bard
BET-Bigeye	S. Kume
SKJ-Skipjack	N. Bartoo
ALB-Albacore	A. González-Garcés
BFT-Bluefin tuna	J. J. Maguire
BIL-Billfish	R. Conser
SWO-Swordfish	J. C. Rey
SBF-Southern Bluefin	S. Kume
SMT-Small Tunas	J. P. Wise
MLT-Multi-Species (Temperate and Tropical)	G. T. Sakagawa
Other Agenda Items	P. M. Miyake

## Item 3. INTRODUCTION OF DELEGATIONS

Each member country introduced its respective scientific delegation. (The list of participants is attached as Annex 2 to the Commission's Proceedings).

## Item 4. ADMISSION OF OBSERVERS

The observers were introduced, admitted and welcomed to the 1984 SCRS Meeting (included in the List of Participants in Annex 2). Recognizing that many international organizations were also represented at the meeting as observers, the SCRS Chairman emphasized the importance of collaboration between the organizations.

## Item 5. ADMISSION OF SCIENTIFIC PAPERS

The SCRS was informed that this year all documents, with the exception of three, were submitted before the deadline, and were accompanied by 80 copies as requested, even though a month-earlier deadline was adopted for bluefin documents. One late document was for bluefin and was withdrawn by the author.

The other two documents were submitted for the "Day to Review Statistics" and are written descriptions of what was presented at the meeting. Since the contents of these two documents did not refer to stock assessments, the Committee decided to accept them.

It was pointed out that the rapporteurs had difficulty this year in carrying out their duties, as many authors of scientific papers did not present summaries of their reports early enough so that they could be forwarded to the rapporteurs beforehand. It was urged that the previous practice of early circulation of documents or summaries to the rapporteurs should again be followed.

## Item 6. REVIEW OF NATIONAL FISHERIES AND RESEARCH PROGRAMS

### 6.1 ANGOLA

The Angolan tuna fleet is comprised of 41 small vessels fishing with live bait. All the vessels have similar characteristics and operate mainly on the continental shelf in national waters.

The catches of tunas and tuna-like species in 1983 amounted to 3,074 MT and are broken down as follows: 25.6 percent yellowfin, 10.3 percent skipjack, 4.1 percent Atlantic bonito, 53.1 percent Atlantic little tuna, and 6.9 percent frigate tuna.

The difference between the 1982 and 1983 catch levels was due to some older fishing vessels going out of operation. These vessels will be replaced by new, larger vessels in the near future.

Effort is being made to proceed with improvement of the quality and coverage of national statistics as well as carrying out sampling of the abundant species at the landing points of the national vessels. In 1983, ninety-nine samples were taken.

### 6.2 BENIN

No report was submitted.

### 6.3 BRAZIL

The 1983 Brazilian tuna fleet was comprised of 11 longliners and 57 baitboats. The foreign-leased tuna fleet consisted of 4 longliners, 3 baitboats and 3 purse seiners. There is no accurate information on the artisanal fleet, but it is supposed that the number of boats was the same as in previous years.

The number of boats in the national baitboat fleet decreased in relation to 1982. On the other hand, the average GRT of this fleet has evolved yearly. The operation of the leased baitboat fleet has resulted in an expansion of the fishing area, mainly towards the south.

In 1983, the total landings of the national and leased longline fleet were less than in 1982. The national baitboat fleet landings, that were increasing until 1982, showed a 20 percent decrease in comparison to 1982. For the leased baitboat fleet the total catches were about 110 percent higher than those in 1982. The landings of the leased purse seine fleet amounted to about 498.9 MT. As regards the artisanal fleet, available data show a decrease in catches. We suppose that the catches reported may be below the actual amount taken by this fleet, due to deficiencies in the system of data collection.

Fishing effort increased for the national longline fleet and the leased baitboat fleet and showed a decrease for the national baitboat fleet and the leased longline fleet. As regards catch rates, there was a decrease in this parameter for the national longline fleet and

for the leased baitboat fleet, compared with 1982. For the leased longline fleet and the national baitboat fleet, catch rates showed a slight increase from 1982 to 1983.

An effort was made to increase statistical coverage of the baitboat fisheries, as well as to improve port sampling activities on the most important species.

Research conducted by Brazilian institutions included attempting the use of fish aggregating devices on the increasing skipjack catches and experimenting with the purse seine method for catching skipjack and other species of small tunas.

Scientific papers were presented to the Skipjack Conference and to the 1984 SCRS Meeting.

#### 6.4 CANADA

The 432.7 MT bluefin tuna landings in 1983 were the highest in recent years. This occurred despite the near complete failure of the trapnet fishery which in the past has contributed over 50 percent of the catch. The bluefin fishery was conducted by approximately 700 licensed in-shore vessels (i.e., fishing within 20 km of shore) and a variable number of fixed trapnets. Both of these major gear categories are extremely sensitive to the yearly changes in bluefin distribution believed to be caused by environmental fluctuations.

Swordfish landings totaled 1,088 MT in 1983, which were divided between two gear categories: longlines (960 MT) and harpoon (128 MT).

On-going bluefin tuna research is conducted in conjunction with the annual catch sampling program. This research includes studies on feeding, aging and age validation, seasonal condition factors (through tissue analysis and length-weight relationships) and catch and effort (through analysis of log records and environmental parameters).

Swordfish research was limited to the completion of an age and growth study using fin spine sections.

#### 6.5 CAPE VERDE

The Cape Verde tuna fleet in 1984 is comprised of 2 freezer baitboats and 25 baitboats without freezer facilities.

Catches of tunas and tuna-like species (up to the end of September) reached 1,586 MT. Yellowfin is the most important species and makes up 62 percent of the catch, followed by skipjack which makes up 30 percent.

Research is still in the developing stage. In spite of the difficulties, size sampling was done on yellowfin, skipjack and bigeye, and samples were also taken of gonads and stomach contents of these three species.

## 6.6 CUBA

In 1983, Cuban tuna catches reached 8,984 MT, and yellowfin was the most important species with a total catch of 2,709 MT.

The tuna fleet was comprised of 18 large longliners, 9 medium longliners, 59 pole-and-line vessels, and approximately 50 small vessels that use troll lines or nets.

Size sampling continued on skipjack and blackfin tuna, and sampling of sailfish and white marlin as well as blue marlin began in Cuban ports.

At the present time, studies on the abiotic parameters (linked to skipjack and blackfin tuna abundance), larvae, and other biological aspects of these species are being carried out.

## 6.7 FRANCE

In 1983 French catches amounted to 65,500 MT (31,900 MT yellowfin, 20,500 MT skipjack, 6,000 MT bigeye, 4,100 bluefin and 3,000 MT albacore).

Research conducted by ORSTOM and IFREMER included surveys in the areas of albacore concentrations in relation to environmental conditions, collection of catch, effort and biometric statistics, continuation of tests of partial freezing. The size composition of albacore catches and CPUE were also studied.

Studies were made on bluefin tuna and their size composition in the Mediterranean.

For tropical tunas, studies were conducted on the detailed collection of catch, effort and size data. Processing of these data has led to the preparation of new models used during the meeting of the Working Group on Juvenile Tropical Tunas. Two tagging cruises were conducted in cooperation with Ivory Coast.

## 6.8 GABON

No report was submitted.

## 6.9 GHANA

Forty-three vessels operated off Ghana in 1983. Of these, ten were foreign flag vessels. Five of the Ghanaian-flag vessels were purse seiners.

By the middle of August, 1984, three of the foreign-flag vessels left the shores of Ghana and the rest changed to Ghanaian flag, either through joint venture or through purchase by Ghanaian-registered companies. A total of 45,370 MT of tuna was landed in 1983.

Collection of catch statistics (Task I and II) continued during the year. Studies on length-frequency distribution, size structure, maturity and feeding of the three principal tuna species were continued. A total of 4,824 yellowfin, 5,848 skipjack and 380 bigeye were

measured during the year. The results of these measurements revealed the continued predominance of young yellowfin and bigeye in the Tema landings.

Active participation in the tagging program led to the return of 12 recovered tags.

#### 6.10 IVORY COAST

There have been many important changes in tuna fishing in Ivory Coast in 1984. The FISM fleet which was based in the port of Abidjan has gradually moved to new fishing grounds in the Indian Ocean. At the end of 1984 there will be no tuna vessels from this fleet based at Abidjan.

On the other hand, the activities of the large Spanish purse seiners have remained constant. The baitboats usually based at Tema have moved towards Abidjan and currently about 30 baitboats under Ghanaian and Japanese flags land their tuna catches at Abidjan. Four Ghanaian and one Japanese purse seiners also regularly land their catches at this port.

These circumstances have caused confusion and restrictions for the "Centre de Recherches Océanographiques" (CRO), which is responsible for collecting Task I and II statistics and biological data. However, with collaboration from France, Ivory Coast has continued with the tagging programs which were recommended as a complement to the Skipjack Program, and with research on aggregating devices. The CRO scientists actively participated in the activities of the Working Group on Juvenile Tropical Tunas.

#### 6.11 JAPAN

In 1983, the Japanese tuna fishery in the Atlantic produced a little over 30,000 MT, which represents a decrease to about half the 1982 catch due to a marked decrease in longline effort. The longline catch accounted for 75 percent of the total catch, of which more than half was bigeye tuna. The rest of the catch was made by the baitboat and purse seine fleets operating in the Gulf of Guinea. In April, 1984, Japanese baitboats based at Tema discontinued their operations in the Gulf of Guinea.

All the fleets have been under national measures to comply with ICCAT regulations on yellowfin, bigeye and bluefin tunas.

Japan has been reporting its fishery data (Task I, II and biological sampling) to the ICCAT. An improvement made in April, 1984, was the establishment of a quick reporting system of the longline fishery logbooks. The time needed to compile the Task I and II statistics will be much shorter than before. On-board size sampling for the longline fishery catch has continued.

Scientists of the Far Seas Fisheries Research Laboratory (FSFRL) participated in two ICCAT intersessional meetings: the Working Group on Juvenile Tropical Tunas (July, 1984-Brest, France) and the meeting of the Working Group on Bluefin Tuna (September-October, 1984-Dartmouth, Canada).

Continued research on stock assessment was focused on bigeye and bluefin tuna and presented to the SCRS in ten working documents.

## 6.12 KOREA

The total catch of tunas and tuna-like species in the Atlantic Ocean in 1983 was recorded at about 18,000 MT, showing a decrease of 27 percent compared to the 1982 figure.

The longline catch was about 16,200 MT, which revealed a 23 percent decrease from the 1982 catch. Since 1979, bigeye has made up the largest portion of the total catch. However, the 1983 bigeye catch decreased by approximately 12 percent over the previous year. The catch by Tema-based baitboats during the period of January to May, 1983, amounted to about 1,700 MT indicating a 52 percent decrease over the 1982 catch. After June, 1983, Korea had no baitboats based at Tema because of a shift to other flag nations.

The National Fisheries Research and Development Agency has collected catch and effort data as well as the length frequency data on tunas and related species from the commercial fishing vessels as in past years. Task I, II and size data were sent to ICCAT and, in particular, length frequency data on sailfish and blue marlin were submitted this year for the first time.

## 6.13 MOROCCO

No report was submitted.

## 6.14 PORTUGAL

No report was submitted.

## 6.15 SAO TOME AND PRINCIPE

No report was submitted.

## 6.16 SENEGAL

In 1983 the tuna fleet based at Dakar (23 baitboats and 5 purse seiners) landed 9,700 MT of tuna, of which 43 percent was skipjack. These landings were lower than in 1981 due to a decrease in skipjack catches. Landings and transshipments amounted to 26,000 MT in 1983. The decrease in the overall level of activity (-15 percent) is due to the significant decrease in landings and transshipments by the French-Ivorian fleet. In 1983 a number of purse seiners of this fleet left the Atlantic to fish in the Indian Ocean.

Landings of small tunas in 1983 (7,100 MT) increased (+50 percent) because of the significant catches made by the artisanal fleet. The cause of the decrease observed in the sailfish landings (-28 percent) in 1983 is still unknown. In 1983, two Spanish longliners caught around 370 MT of swordfish in Senegalese waters.

Research in 1983-1984 was centered on the preparation of statistics for the Working Group on Juvenile Tropical Tunas; namely, estimates of species composition of tuna catches made by the surface gears (Task I and II), state of the stocks for the three species, yel-

lowfin, skipjack and bigeye, etc. Before the meeting of the Working Group, an ICCAT-organized Data Preparatory Meeting was held in Senegal and important data processing was carried out on the data base. The number of documents prepared and the importance of the studies carried out in Senegal and then presented either to the Working Group on Juvenile Tropical Tunas or to the SCRS reflects the significant contribution made by Senegal to ICCAT.

#### 6.17 SOUTH AFRICA

No report was submitted.

#### 6.18 SPAIN

The catch of tunas and tuna-like species in 1983 reached 142,701 MT, a slight decrease with respect to 1982.

Tropical purse seine catch decreased significantly, going from 98,492 MT in 1982 to 88,055 MT in 1983. In the Canary Islands fishery, the catches were low, approximately 5,370 MT. In the northeast Atlantic the catches increased around 7,000 MT, reaching 41,080 MT. In the Mediterranean the catches remained at a level similar to the previous year, 6,030 MT.

The most important species were: yellowfin (54,627 MT), skipjack (33,349 MT), albacore (30,387 MT), swordfish (8,422 MT), bluefin tuna (5,257 MT) and bigeye (4,192 MT); the catch of the rest of the species reached 6,467 MT.

Research in the tropical zones is based on detailed analyses of the activities of the Spanish tuna fleet, studying the duration of the sets, behavior of the schools, effects of the moon on yields, etc.

In the Canary Islands, two tagging cruises were carried out, while in the northeast Atlantic four cruises were made in 1983-1984. Research in these areas was centered on the general aspects of population dynamics of bluefin tuna, albacore and swordfish, their migrations and effects of variations in effort on the future yields of the fisheries.

In the Mediterranean two tagging cruises were conducted and research centered on the biology and population dynamics of bluefin, swordfish, Atlantic bonito and frigate tuna. We should especially note the ichthyoplankton fishing cruise dedicated to tunas and carried out in the summer of 1984.

#### 6.19 URUGUAY

No report was submitted.



## 6.20 U.S.A.

In 1983, the United States catch of Atlantic tunas and tuna-like species totaled approximately 11,000 MT. This total is approximately 27 percent lower than the 1982 catch of 15,000 MT.

In 1983, tropical tuna catches totaled approximately 1,000 MT, down sharply from 2,000 MT in 1982. Bluefin tuna catches approached 1,400 MT in 1982, approximately double the 1981 catch. Catches of swordfish dropped in 1983 to 2,100 MT from 3,100 MT in 1982.

Both the United States tropical tuna and bluefin tuna fleets operated under regulations in 1982. The tropical tuna fleet was subjected to a minimum size limits for yellowfin and bigeye tunas. The bluefin tuna fishery was subjected to a minimum size limit and catch limitations.

In addition to fishery data and statistics collection, research was conducted on problems associated with stocks of yellowfin, skipjack, and bluefin tunas and stocks of swordfish and billfishes. Results of research and statistics collected were reported.

## 6.21 U.S.S.R.

In 1983, the U.S.S.R. catch totaled 13,461 MT, including 6,528 MT little tuna, 2,375 MT bonito, 1,655 MT frigate and bullet tunas, 1,223 MT skipjack, 1,282 MT yellowfin tuna, 352 MT bigeye tuna and 46 MT swordfish. Compared with 1982, the catch of most of the species, except yellowfin and little tuna, decreased.

Scientific research concerned the specific characteristics of the biology and fishing for skipjack, yellowfin, bigeye, little tunas, frigate tunas and bullet tunas. Three scientific research expeditions were carried out. Five observers were on board fishing vessels. There were 12,588 tunas measured and 4,178 biological analyses made. Also, 2,478 age samples, 50 samples for feeding studies, 40 samples for fecundity studies and 2,390 samples for genetic-biochemical analysis were collected. In addition, 98 tunas were tagged.

## 6.22 VENEZUELA

No report was submitted.

## 6.23 CHINA (TAIWAN)

The number of Taiwanese longiners in the Atlantic decreased from 220 vessels in 1982 to 99 at the end of 1983. The total landings also decreased from 38,800 MT in 1982 to 27,780 MT in 1983. Albacore was still the target species in 1983 and represented 88.5 percent of the total landings (23,756 MT). Of the albacore landings, 14,254 MT were from the North Atlantic and 9,502 MT were from the South Atlantic. The significant shift in the fishing grounds of Taiwanese fleets in 1983, seemed to be due to the greater demand and

higher fish prices in Puerto Rico and to the rather low fish prices and relatively high fuel costs in Cape Town. As a result part of the fleet shifted from the South to the North Atlantic and to the Indian Ocean.

As of August, 1984, the number of vessels fishing in the Atlantic was 109. Based on landing statistics for the first 6 months, this year's total landing will be around 29,900 MT.

Standardization of the total longline effort on albacore and evaluation of the south Atlantic albacore stock were both updated to 1983. Results of research and statistics compiled (Task I and II, and size data) were presented to the SCRS.

#### Item 7. REVIEW OF THE REPORT OF THE WORKING GROUP ON JUVENILE TROPICAL TUNAS

Dr. J. B. Amon Kothias (Ivory Coast), Convener of the Working Group on Juvenile Tropical Tunas, presented the results of the findings by his group which met July 12 -21, 1984, at Brest.

Before the Working Group meeting, it was found necessary to make a detailed revision of basic data for the following reasons:

Juvenile yellowfin and bigeye are reported mixed with skipjack or large yellowfin and bigeye as those are target catches.

Records of catches by species in logbooks take into account only commercial criteria (selling price) which are often quite different from biological criteria (actual species caught).

Due to the importance of the problem and to the quantity of work involved, a preparatory meeting was held in Dakar (Senegal) on February 3-9, 1984. This meeting enabled the scientists to prepare the necessary data for the Brest meeting.

The report of the Working Group meeting is presented in SCRS/84/17--Collective Volume of Scientific Papers, Volume XXI (1 and 2).

The following is a summary of the most notable results contained in this report.

##### *a) Species mixing and time-area distribution of juvenile yellowfin and bigeye*

Studies on schools of fish in terms of species composition, size of fish and time/area distribution led to the following conclusions:

- Single-species schools are relatively rare, particularly those of juvenile tuna (yellowfin and bigeye) which are the subject of regulations in question. There is frequent mixing of these small tunas with skipjack and with large yellowfin and bigeye (whose catch is desirable).
- Time-area distribution of mixed schools so formed is widespread and it seems impossible to isolate areas where pure schools of yellowfin can be protected.

-When considering the total catches of juvenile yellowfin and bigeye for all the fleets operating in the east Atlantic from 1975 to 1982, it is evident that the distribution of high catches has changed. Before it was seasonal and localized in one particular section well inside the Gulf of Guinea. In recent years (e.g., 1982), there has been a more complex distribution of catches, and catches have taken place throughout the year and in open sea areas. Such a development impedes a system of protection of juvenile tunas by closing well-defined time/area zones of a nursery ground.

*b) Yield per recruit with multiple gears*

The results of yield per recruit analyses made for each of the three species are as follows:

- Yellowfin: The only way to increase yield per recruit would be to increase size at first capture and to increase simultaneously fishing mortality.
- Skipjack: Only an increase in fishing mortality would permit an increase in yield per recruit.
- Bigeye: A minimum increase in yield per recruit can only be obtained by an increase in size at first capture coupled with an increase in fishing mortality.

*c) Fishery models*

The Working Group was asked in short to try to optimize the yield per recruit of the three species, yellowfin, skipjack and bigeye, under various management strategies. These strategies should allow a considerable decrease in fishing mortality of juvenile yellowfin and bigeye without decreasing the yield of skipjack.

The important characteristics resulting from the different management strategies tested can be summarized as follows:

- Losses of skipjack are, only under the most favorable conditions, only just compensated by gains in yellowfin and bigeye.
- Gains for yellowfin are generally modest (if there are any) and rarely more than 6,000 MT.
- The amount of bigeye caught is hardly affected by any of the management schemes tested.

*d) Efficiency of current measures*

The purpose of the regulations is primarily to reduce the exploitation of juvenile yellowfin and bigeye so that the performance of the fisheries can be improved by increasing yield per recruit.

The percentage of undersized yellowfin in the catch has not decreased since the size regulation was instituted, but has increased steadily and has been more than 60 percent of the catch since 1980. The short time which has elapsed since the bigeye regulations went into effect does not allow us to observe the long-term results directly but we do not expect results fundamentally different from those for yellowfin.

The second aim of the regulation was to reduce deliberate misreporting of undersized yellowfin as bigeye, which occurred when only the yellowfin size limit was in force. In this regard, the bigeye regulation seems to be effective. However, it is obvious that the size regulation for yellowfin is not reducing fishing exploitation on undersized yellowfin and it is hardly probable that the bigeye regulation should function any better in this respect.

*e) Evaluation of alternative fishing strategies*

The overall conclusion from simulations carried out is that there is little compelling evidence to support a closure scheme at present. The fact that fishing effort is currently decreasing significantly as the FISM and part of the Spanish fleets are moving towards the Indian Ocean means that there is less pressure at present for stock conservation measures. This decrease in effort also provides us with a "natural" experiment which could allow us to reduce the uncertainty in many of the parameters used in the simulation projections. It is, therefore, recommended that the residual fishery be monitored closely so that we can take advantage of this "natural" experiment and we will be prepared if considerable fishing effort again develops in this region.

*f) Summary of results and discussion on questions asked of the Working Group*

Results and discussion on the questions asked of the Working Group were reviewed by the SCRS under Agenda Item 9 and they are incorporated in the appropriate tropical tunas species sections.

The SCRS congratulated the Group for successfully concluding, after continuous effort for several years, the assignments given it by the SCRS. The excellent leadership of the Convener and the Secretariat's assistance were also highly commended.

**Item 8. REVIEW OF THE REPORT OF THE WORKING GROUP ON BLUEFIN TUNA**

Mr. J. J. Maguire (Canada), Convener of the Working Group on Bluefin Tuna, reported on the results of the Group's meeting held in Dartmouth from September 27 to October 4, 1984 (SCRS/84/31).

The Working Group reviewed current research, drafted Report A and made an assessment of stock status of the western Atlantic bluefin tuna stock. A revised catch at length

based on monthly calculations was accepted and used to estimate catch at age using a growth equation (with variable yearly  $t_{\phi}$ ) obtained by analyzing mark-recapture data. Several CPUE indices were considered and the Canadian rod and reel CPUE and a standardized CPUE from 1<sup>0</sup> square Japanese longline data in the Gulf of Mexico were used as indicative of the 16+ and 10+ stock sizes, respectively, to calibrate virtual population analysis (VPA). Population number estimates on younger ages were derived from tagging data. The results of VPA were not considered to be reliable enough to allow short-term surplus production calculations. The VPA results were used to obtain fishing patterns at age and geometric mean recruitment which in turn were employed in yield per recruit calculations. These results were included in Agenda Item 9.

The SCRS expressed its appreciation to the members of the Working Group and the Group's Convener for successfully carrying out the SCRS mandate.

## Item 9. REVIEW OF CONDITIONS OF STOCKS, WITH BRIEF PRESENTATION OF MAJOR PAPERS ON THESE SUBJECTS

### OVERVIEW

The tuna fishery of the Atlantic Ocean is undergoing marked changes which are being shaped by events in the Atlantic as well as in other parts of the world. During the past three to five years economic forces, such as the slowing of demand for canned tuna, the rise in fuel prices, the increase in the costs of capital investment and greater competition among vessels, together with the discovery of new productive fishing areas, such as in the western Pacific and Indian Oceans, have contributed to altering the world tuna fisheries. The effects of these events on the Atlantic fisheries have heretofore been subtle. This year, however, the effect is quite obvious so the Committee has taken special note of the situation.

The most significant for tropical tunas is the relocation of virtually the entire FIS and part of the Spanish purse seine fleets from the eastern tropical Atlantic to the Indian Ocean to participate in a more profitable fishery there; flag changes to Ghanaian flag in the Tema-based baitboat fleet and the exploitation of large-sized fish for economic reasons; and the changes in the pattern of unloading of catches at different ports as vessels adjust to changing market conditions. The impact of all of these events on the stocks in the eastern tropical Atlantic in general will be beneficial as they will allow the stocks an opportunity to rebuild. But, with the reduced fishing and perhaps also with changes in fishing patterns of the remaining vessels, the amount and type of data obtained from the fisheries may not be sufficient for stock assessment purposes or may not be comparable to data collected in previous years.

With respect to temperate tunas, a large part of the longline fleet that fished in the south Atlantic moved to the North Atlantic and Indian Oceans in 1983, in search of better returns. This shift in effort caused the exploitation of the south Atlantic albacore to decline sharply, which will certainly benefit this population. These impacts and concerns are discussed more fully in the following species sections. Changes in the pattern of market de-

mand are also effecting bluefin fisheries as medium and large fish are being sought more actively in some areas, in preference to the smaller fish that have been taken habitually.

## **YFT-YELLOWFIN**

### **YFT-1. Description of fisheries**

Yellowfin is caught in all the tropical Atlantic by surface gears (purse seine and bait-boat) and by longlines. Surface gears gradually became predominant until 1983 and their operations are mainly limited to the east Atlantic. However, in 1984, the number of purse seiners dropped abruptly as many left for the Indian Ocean. Catches in the east Atlantic using surface gears have therefore nearly halved. Details are shown in Figure 1 and Table 1.

In this table, it should be noted that past figures for yellowfin catches have been corrected following the conclusions of the Working Group on Juvenile Tropical Tunas, which met in 1984. These corrections only affect the figures for the east Atlantic fisheries and show a slight decrease in the level previously estimated for yellowfin catches.

However, this procedure hardly changes the historical development of the catches which have increased steadily up to a record catch of 156,400 MT in 1982 and decreased rapidly in 1983 and especially in 1984. The departure of the purse seiners and the continued presence of the baitboats and longliners thus change considerably the situation of the fisheries for 1984. This affects above all the fishing effort in the east Atlantic, and the indices for the nominal (carrying capacity) and effective fishing effort (Figure 2) show the extent of this drop which should be reflected in the fishing mortality. Therefore, substantial changes in the state of the stock can be expected, particularly in the east Atlantic. Table 2 gives details of the development of nominal fishing effort in the eastern Atlantic. The rapid development of the purse seine fishery based in Venezuela is an important new aspect of the western Atlantic fisheries.

### **YFT-2. State of the stocks**

As before, no new information is available which would make it possible to select between the classic alternative hypotheses on the yellowfin stock structure, which are: two stocks separated at 30°W and one single Atlantic stock. However, we should point out that because of the magnitude of yellowfin catches in the east Atlantic until 1983, and the lack of information for the west Atlantic, most of the analyses and conclusions presented in the report refer to the eastern stock.

*YFT-2.1 East Atlantic stock*

The change in abundance of this stock can be represented by an abundance index taken from the CPUE of the FISM fleet. This has been the only one available for a long time. On the other hand, the biomasses for these same years can be calculated directly by cohort analysis using certain assumptions on the degree of real stock exploitation. These two indices are shown in Figure 3. They show a steady, moderate decline in the average abundance of this stock from 1969 to 1983.

The production model shows that in spite of the notable increase in fishing effort during 1976-1982, the catches have increased only marginally. The previous analysis shows that the level of exploitation of stock is about that producing the maximum sustainable yield (MSY). However, as fishing effort has decreased since 1983, the stock has been much less exploited (Figure 4). The production model was fit to the series of catch and effort data for 1969-1984 for various values of  $m$  (parameter controlling the form of the curve) and  $k$  (number of age-classes present in significant numbers in the catches). The resulting estimates for the MSY and the corresponding optimal effort are shown in Table 3.

The most reasonable value of  $m$  is approximately 2 (1.92 for  $k = 5$ , 1.72 for  $k = 3$ ), and therefore the choice of  $m = 2$  and  $k = 3$  seems preferable. This means that the best MSY estimate is 115,000 MT with an optimal effort of 69,000 days fishing. Figure 4 shows the curve with this set of parameters ( $m = 2$ ,  $k = 3$ ) and, for comparison, that with  $m = 1$  and  $k = 3$ .

The current trend in fishing effort results in an unstable situation which explains why the 1984 point is well below the fitted curve. The current fishing effort on this stock (about 40,000 fishing days) is, therefore, well under the estimated optimal fishing effort level which ranges between 63,000 to 82,000 fishing days for  $m = 1$  and 2.

A complete yield-per-recruit study was made during the meeting of the Working Group on Juvenile Tropical Tunas. This study, based on certain assumptions, reaches a unique solution for the yellowfin cohort analyses. Due to this, it has been possible to calculate fishing mortality from 1972 to 1981 and also the corresponding state of yield per recruit.

According to that analysis, which was done when fishing effort was at a peak (in 1981-1982), fishing mortality was high and the corresponding state of yield per recruit is shown in Figure 5. We can note that there were substantial gains to be expected from raising the age at first capture.

This is no longer so in 1984 as the fishing pattern and fishing effort are changing greatly. Figure 5 gives a rough estimate of the changes in fishing effort from 1981 to 1984. It can be seen that little increase in yield per recruit can be expected by raising the age at first capture under present conditions.

Finally, based on the same cohort analysis, we can evaluate the 1968-1980 recruitment level. In addition, two indices of recruitment based on the CPUE at age 1 and 2 are also available for the same period, 1968-1982. These three indices are shown in Figure 6.

The agreement among the three indices is slight. This is probably due to the biases inherent in each method and to the probable errors in the basic size composition table.

However, the variability of the three indices is comparable and there is no trend in any of the three indices. This, together with the fact that the decrease of estimated biomass is moderate between 1969 and 1983, means that the Committee does not expect a collapse of recruitment at the moment.

Moreover, the considerable decrease in fishing effort of the purse seiners leads to a decrease in the level of fishing mortality and several factors indicate that if effort remains low, the stock of the eastern Atlantic yellowfin should show a rapid increase in abundance. This will also affect the catches and catch rates.

At first the production model indicates that the production curve and equilibrium yields of the stock should be reached in three to five years, according to the parameter  $k$  (number of significant year-classes) used. The increase in abundance should be most rapid in the first half of this period.

Such an increase has recently been observed in the eastern Pacific yellowfin fisheries. Following an abrupt reduction in purse seine effort, the stock seemed to recuperate rapidly. The simulation model forecasts a rapid increase in stock comparable to that which can be expected for the production model.

#### *YFT-2.2 West Atlantic stock*

As in the past, it is difficult to draw conclusions about the state of the west stock, owing to a lack of data to analyze, but the rapid increase of catches recorded there proves the availability of stock in this area.

#### *YFT-2.3 Total Atlantic stock*

No new analyses have been made available since last year; thus, the conclusions made in the 1983 SCRS Report are maintained. However, ~~these analyses do not take into account the statistical revisions made as indicated in Section YFT-1.~~ Interpretation is difficult because the CPUE used comes mainly from the east Atlantic fisheries and this can bias the analysis if the CPUE in the east Atlantic is not a good measure of abundance for the total Atlantic.

#### **YFT-3. Effects of current regulations**

Juvenile yellowfin of less than 3.2 kg are caught in large numbers in the eastern tropical Atlantic, often in schools mixed with skipjack and small bigeye. In 1972 ICCAT introduced a regulation to reduce the catch of juvenile yellowfin in order to increase the yield per recruit of the stock. This regulation seems to have had only a minor effect on the fish-



eries, as has been stated in previous SCRS Reports, and is ineffective in reducing the mortality of juvenile yellowfin.

Because this regulation is not properly followed, a large number of undersized yellowfin are still caught (71 percent in number of fish for the total 1982 yellowfin catch) and fishing mortality of juvenile fish rose until 1983.

#### YFT-4. Recommendations

##### *YFT-4.a Statistics*

The current level of statistics on yellowfin is adequate for the eastern Atlantic. It must be noted that the recommendations made last year have been followed and that the estimation of the actual quantities of juvenile yellowfin was carried out successfully at the meeting of the Working Group on Juvenile Tropical Tunas. This was also done in the document on the baitboats based at Tema, prepared by the Secretariat and examined by the Working Group.

However, it is still possible to improve the correction procedures of the mixed species for FISM and Spanish purse seine Task II data. Special effort must be made to collect high resolution statistics, if we want to monitor the rebuilding of stocks closely.

The level of statistics for the western Atlantic is far from adequate. Task I data are complete but imprecise, and Task II data are incomplete. Due to the lack of data, it has never been possible to analyze a possible western Atlantic stock. This is becoming urgent considering the obvious increase in catches in this area.

##### *YFT-4.b Research*

Knowledge of the exact structure of the stocks is no longer progressing. Advances in this area could be expected if studies using size frequency and the composition of microelements were made.

Until these studies are available, the Committee reiterated its recommendation for analysis of the state of a possible western stock.

The departure of the FISM fleet from the Atlantic means that abundance indices based on this fleet are no longer available from the eastern Atlantic from 1984. A calibration study of the Spanish purse seine fleet to the FISM fleet in the Atlantic is essential and urgent.

Presentation of abundance indices and catches by size categories (small, medium and large) would be useful. The statistics to do this are already available.

Research on the natural mortality (M) of yellowfin is desirable.

*YFT-4.c Management*

The Committee is aware of the difficulties in the practical application of the present regulation to reduce mortality of juvenile yellowfin. It is noted that the Working Group which met in Brest found it impossible to propose a practical solution for the multi-species implications of the east Atlantic fisheries. This is explained in Section MLT-2 of the SCRS Report.

Nevertheless, the Committee also notes that the scientific basis on which the current yellowfin regulation is based is still valid. In particular, with the intensive exploitation level that prevailed in the east Atlantic up to 1983, the effective application of such a regulation would bring about notable gains in equilibrium yield per recruit.

The sudden departure of a large part of the purse seine fleet in 1984 has suddenly modified this situation and if this sharply reduced fishing effort continues, there will be few or no gains expected. However, because of the extreme mobility of this fleet, its sudden return to the Atlantic is possible even in the very near future.

**BET-BIGEYE****BET-1. Description of fisheries**

The major bigeye fishery in the Atlantic is the longline fishery. Bigeye tuna are distributed widely in the temperate and tropical waters of the Atlantic Ocean between 40°N and 40°S. Among the surface fisheries, local baitboat fisheries seasonally catch bigeye in waters off the Azores, Madeira, Canary Islands and Dakar. Juvenile bigeye tuna are incidentally caught mixed with yellowfin and skipjack by the baitboat and tropical purse seine fleets in the eastern equatorial Atlantic.

The historical bigeye catches by gear and country are given in Table 4. The longline fishery has been taking the largest portion of the catch in past years (Figure 7). The total Atlantic bigeye tuna catch had increased until 1974 when it recorded 63,500 MT. Thereafter, the total catch has shown a downward trend and reached 45,100 MT in 1979. From 1980 to 1982 catches fluctuated at a level between 62,500 MT and a peak catch of 71,600 MT (1982). The preliminary 1983 catch indicates a noticeable decrease in catches to 54,400 MT. The fluctuations in the total catch were due to fluctuations in longline catch and effort. It is noted that the revision of the species composition made on past tropical purse seine catch data resulted in an increase in the surface catch comprised of small bigeye (Figure 7).

**BET-2. State of the stocks**

The Committee is of the opinion that it is more likely that there is a single, total Atlantic stock rather than two separate stocks in the North and South Atlantic, based on the fact that juvenile bigeye tuna are concentrated only in the eastern tropical Atlantic. Stock

assessments carried out focused the analyses on the total Atlantic bigeye tuna stock. Although past catch data increased due to the revision of tropical purse seine fleet data, the present appraisal does not substantially change the previous results.

The longline CPUE (adjusted on the efficiency of deep longlining), which is indicative of the relative abundance of the adult stock, has leveled off for recent years at about 60 percent of the initial exploitation (Figure 8).

The production model analyses, based on revised effort data, reaffirmed that recent exploitation of the bigeye stock in the Atlantic has been close to or at the MSY level. New estimates show an MSY range of 65,900 MT ( $m = 2$ ) to 146,900 MT ( $m = 0$ ), depending on the parameters ( $m$ ) of the model chosen (Figure 9). The present results gave slightly higher values of MSY compared to the previous ones, but the general form of the yield curves remained unchanged. The catch in the 1980-82 period (which averaged 65,000 MT) was around the lowest estimate of the MSY. The bigeye fishery in 1983 was situated far below the MSY level.

The previous yield-per-recruit analysis on bigeye tuna suggested an overall gain of up to 10 percent by reducing fishing mortality on juvenile bigeye tuna. However, under the present conditions of the bigeye fishery, analyses indicate that only a slight increase in yield per recruit could be obtained by an increase in the size at first capture coupled with an increase in fishing mortality (Figure 10). Analyses also indicated that a reduction in the fishing mortality of small bigeye tuna would benefit the fishery taking large bigeye (Figure 11). The marked decrease in tropical purse seine effort in 1984 would not change the results of present analyses because that fleet is not the major component of the bigeye fishery.

### BET-3. Effects of current regulations

The minimum size regulation of 3.2 kg in effect for bigeye tuna was initiated in September, 1980, and extends until the end of 1984. Evaluation of the effects of the regulation, as well as possible effects of an alternative management strategy, such as a time-area closure scheme, was reviewed thoroughly at the meeting of the Working Group on Juvenile Tropical Tunas (Brest, France, July 1984). The following information is essentially drawn from the results of the meeting.

One of the purposes of the regulation is to reduce fishing intensity on juvenile bigeye so as to increase the yield per recruit. As shown in Table 5, the percentage of undersized bigeye remained far above the allowable limit (15 percent) since the implementation of the regulation, which implies that the regulation has been unable to direct harvest pressure away from juvenile bigeye. As regards the objective to avoid the misreporting of undersized yellowfin as bigeye tuna in the catch, it is noted that the regulation appears to have been effective.

As regards the feasibility study of an alternative management scheme such as time-area closure, reference is made to Section MLT-1.

Three specific questions pertinent to the bigeye regulation were posed by the Commissioners in 1979. The first question was: "Can the fisheries now catching small bigeye

successfully shift this effort to older age groups?" Evidence indicated the difficulty of such a shift in reality. As to the second question: "Would there be any effect on recruitment (of implementing a minimum size limit)?", the Committee pointed out the fact that for the moment the sequences of recruitment for different years for bigeye remain uncertain due to the lack of reliable recruitment indices. The last question was: "Would implementing a size limit result in substantial wastage through dumping?" It is suggested that because juvenile bigeye are encountered in most schools over wide-spread areas and times, it is likely that substantial dumping would occur if the regulation were enforced.

#### **BET-4. Recommendations**

##### *BET-4.a Statistics*

The Committee recommended that:

- i) Size sampling at transshipment sites in Puerto Rico be continued.
- ii) Adjustment of effort for the deep longline fishery be continued.
- iii) Species separation within the mixed catch of juvenile tropical tunas caught by the surface fleets be continued.

##### *BET-4.b Research*

- i) Uncertainty about the stock structure be re-examined based on all available biological information such as maturity and updated tag release-recapture data.
- ii) An index of abundance that incorporates information from the surface bigeye tuna fisheries be developed.
- iii) Age-structure stock analysis, such as cohort and yield-per-recruit analyses, be continued (based on improved catch-at-age tables).

##### *BET-4.c Management*

The Committee noted that the current minimum size limit of 3.2 kg has not improved yield per recruit as it was intended to do. This is due to the lack of enforcement. From a strictly scientific viewpoint, effective implementation of a minimum size limit for bigeye would increase the yield per recruit. The maximum gain would be obtained from a relatively large size at first capture, perhaps as high as 20 kg, based on the latest analysis, and the gain in yield per recruit from a 3.2 kg size limit would be less than had been estimated previously.

The regulation has proven useful in reducing or eliminating misreporting of small yellowfin as bigeye. From this point of view, the regulation will remain effective as long as it coincides with the yellowfin minimum size limit.

For a discussion of the management implications in a multi-species complex, see Section MLT-1 of the SCRS Report.

## ***SKJ-SKIPJACK***

### **SKJ-1. Description of fisheries**

Skipjack is fished almost exclusively by surface gears in both the east and west Atlantic. In recent years the east Atlantic surface fisheries have produced about 75 percent of the Atlantic skipjack catch (Table 6). Catches in the east Atlantic have increased erratically from 28,000 MT in 1969 to a maximum of about 120,000 MT in 1982. In 1983 the catch was 99,000 MT. Recently about two-thirds of the eastern Atlantic catch was taken by purse seiners and one-third by baitboats.

In the western Atlantic, annual catches remained on the order of a few thousand tons from 1969 through 1977. Since 1977 western Atlantic catches increased rapidly to over 30,000 MT in 1982 and 1983. Increases in the last few years are primarily the result of increased effort in the Venezuelan and Brazilian fisheries.

The Committee noted that these catch figures are slightly different from those reported previously, reflecting changes in catch by species made by the Working Group on Juvenile Tropical Tunas.

Accurate effort measures for skipjack in the east and west Atlantic have not been developed. A rough measure of effort in the fishery is carrying capacity. Figure 12 shows that the estimated carrying capacity in the eastern Atlantic increased from 1970 to 1983. In 1984 capacity was reduced by about 25 percent. No useful measure of capacity is available for the western Atlantic.

### **SKJ-2. State of the stocks**

Much of our current knowledge about skipjack in the Atlantic is based on information and assessments done in conjunction with the International Skipjack Year Program (ISYP). Currently the skipjack fisheries appear best assessed as separate east and west stocks. Most information is currently available for the eastern tropical fishery which accounts for over 75 percent of the Atlantic skipjack catches.

Catch per unit of effort (CPUE) in the eastern Atlantic skipjack fishery is a coarse measure of abundance. Table 7 presents nominal CPUE for the FISM fleet since 1969. After initial increases in CPUE in the early 1970's, the CPUE has remained relatively steady

with perhaps some decline in the latest years. This is consistent with previous assessments, including the ISYP results.

Tag studies (ISYP) indicate skipjack have a relatively short residence time in the fishery. Thus the rate of attrition from the population is high. This, combined with low fishing mortality rates, produces a low rate of exploitation for the eastern Atlantic fishery.

Again this year no useful production model results were presented to the Committee, due primarily to uncertainties in the accuracy of estimated effective effort measures for skipjack and the inapplicability of the production model due to the rapid migration of skipjack between fisheries. Previous qualitative analyses (ISYP) indicate that the skipjack fishery in the eastern Atlantic is likely below MSY.

Yield-per-recruit analyses reviewed by the Working Group on Juvenile Tropical Tunas (SCRS/84/17) predict no increases in yield per recruit by increasing size at first capture. Instead, the only way to increase yield per recruit appears to be by increasing fishing effort. This is consistent with the low exploitation rate and general unavailability of larger fish to capture.

As was the case previously, no direct measures of recruitment have been made. Based on ISYP information, skipjack move long distances, spawn year round and recruit year round to the Atlantic fishery at a size of 35 cm. This suggests spawning and recruitment may be partially independent of local conditions. This, coupled with evidence that the recruitment trend was relatively stable but with high variability during the 1968-1980 period when the fishery was rapidly developing and CPUE was relatively stable, suggests that the fishery is not yet having a significant effect on recruitment.

The conclusion reached by the Committee is in concert with previous opinions. The skipjack stocks in the eastern Atlantic appear under-exploited and consequently increased effort will be accompanied by increased yield.

The condition of the skipjack stocks in the western Atlantic is less certain owing to the lack of indicators of abundance. With the developing west Atlantic fisheries it is increasingly important to secure adequate measures of effort and catch from the fisheries.

### SKJ-3. Effects of current regulations

No regulations are in force for skipjack. Based on evaluations by the Working Group on Juvenile Tropical Tunas it does not appear that current regulations on yellowfin and bigeye are having a direct measurable effect on skipjack.

#### SKJ-4. Recommendations

##### *SKJ-4.a Statistics*

- i) Catch statistics should be improved. Examples include landings in Venezuela and Tema.
- ii) Fishing effort data need to be gathered and improved. West Atlantic effort data are poor or non-existent.
- iii) Biological sampling of Caribbean catches should be carried out.
- iv) Observer and port sampling data should be compared to detect biases in sampling.

##### *SKJ-4.b Research*

- i) CPUE indices relating fishing power of various gears and fleets should be developed or improved.
- ii) Additional research on maturity, fecundity and spawning should be developed for expanded areas which have not yet been studied, such as the Caribbean and western Atlantic.
- iii) Growth studies should be done for fish in various regions (e.g., parts of the western Atlantic or off Angola) and time periods both in the east and west Atlantic.
- iv) Studies of predation and distribution of young fish as well as studies of factors affecting survival of recruits should be made.
- v) Investigations on relation of environmental factors to skipjack catch, abundance, availability and recruitment should be continued.
- vi) More tagging experiments are needed to define stock structure. Evaluations of past tagging efforts and the resulting conclusions should be considered when designing new studies.
- vii) Fishing mortality (F) should be estimated using a variety of methods including size structured models.

##### *SKJ-4.c Management*

Based on the conclusions of the Working Group on Juvenile Tropical Tunas, management measures are neither needed nor desirable for Atlantic skipjack. As in the past, the Committee noted that skipjack are under-exploited and catches can be increased. Increasing fishing effort is the only way to increase skipjack yield per recruit.

## ALB-ALBACORE

### ALB-1. Description of fisheries

It is an accepted fact that the Atlantic albacore population is comprised principally of two stocks, a north stock and a south stock, separated conventionally at 5°N. The historical catches by gear and by country are shown in Table 8.

Three main fisheries take the north stock of albacore, two surface fisheries (troll and baitboat) which principally catch young albacore (ages 2 to 5) and the longline fishery which catches adults (over 5 years). The combined catches of the North Atlantic albacore fisheries reached a maximum level in the first half of the 1960's (about 60,000 MT). In 1983 catches reached 50,000 MT.

Longline is the principal gear which catches the south stock of albacore, since the surface fishery in the south area is still in a developing stage. Catches have fluctuated between 20,000 MT and 30,000 MT during the last 15 years. However, in 1983 catches decreased sharply to 14,400 MT due to a sharp decline in effort.

### ALB-2. State of the stocks

#### ALB-2.1 North stock

The CPUE for the entire fishery, if used as an index of entire stock abundance, seems to indicate an increasing trend in stock abundance with some fluctuations from 1968 to 1983 (Figure 13). If surface CPUE is used as an index of abundance of juvenile fish (2 to 5 years) an increase in abundance is observed, with some fluctuations, from 1970 to 1983. If longline CPUE is used as an index of abundance of adult fish (age 5 and over), then the situation seems to have remained relatively stable from 1971 to the present, even though abundance is less than the totals in the 1960's.

The production model was fitted for the period 1967-1982 (Figure 14). This fit is different from what was presented in previous years because the new estimates of longline fishing effort were based on CPUE data from both the Taiwanese and Japanese fleets, rather than from the Japanese fleet alone. Taiwanese CPUE data were used since that country currently takes more than 80 percent of the albacore longline catch. However, if only the historical series of Taiwanese CPUE is used, the model could not be fit to a longer data series since CPUE data of the Taiwanese fleet were only available since 1967.

The method used to standardize effort to baitboat fishing days (of the three main fishing gears, baitboat CPUE is a better index of abundance of the population) was the same as in previous years. The disadvantage of this method is that it standardizes surface and longline CPUE series which do not observe the same trends in the period studied. In addition, these two types of fisheries operate in distinct areas and on distinct age-classes. Another disadvantage as regards the reliability of the model is that the effort range is not very wide for the period studied.

Three different values of  $k$  (the number of significant age-classes in the fishery) were used to fit the model: 3, 4 and 5 for each value of  $m = 0, 1$  and  $2$  ( $m$  defines the form of the curve).



In spite of the changes in the calculation of longline effort using new values of  $k$ , the range of MSY is similar to that of previous years. The highest MSY is obtained with the  $m = 0$  form of the model (range of 100,000 MT to 120,000 MT, depending on the value of  $k$  used). However, this assumption seems unrealistic from a biological viewpoint. The value of  $m$  which best fits the model was 2. However, the degree of fit was not very high in either case.

The use of  $k = 4$  in the fit of the model seems biologically adequate since, if we consider the catch-by-age matrix of the fishery, it can be seen that at least four age-classes contribute significantly to the catch. The result of the fit using  $k = 4$  was 59,800 MT with a corresponding effort of 81,300 baitboat fishing days ( $m = 2$ ) and 70,400 MT with a corresponding effort of 126,900 baitboat fishing days ( $m = 1$ ). The 1983 values which were not used for the fit of the model were 50,000 MT, with a corresponding effort of 45,900 baitboat fishing days.

It should be noted that these results are only applicable to the current fishing pattern and the uncertainties in the standardized effort mentioned above could negatively affect the reliability of the model. The average yield per recruit of the 1959 to 1971 cohorts, calculated based on the cohort analysis for that period, were similar to that obtained in previous years.

The production model and yield-per-recruit analyses seem to indicate that the stock is being moderately exploited.

The CPUE of age 3 fish was used as an index of recruitment since trends of this index coincide with recruitment abundance at age 2 (calculated by cohort analysis) and since the series of data available with this index is longer (Figure 15). This index seems to confirm the variability in recruitment that went from 1 to 4 in recent years (starting from the 1968 cohort). The level of recruitment in the last three years (1978, 1979 and 1980 cohorts) seems very low. However, further research is needed on these variations in CPUE at age 3 to determine if this is still a good index of recruitment (starting from the 1968 cohort) or if it is widely affected by oceanographic conditions which could affect the availability of these fish to the gears or to the fishing areas.

The relation between the spawning stock and recruitment, established using the CPUE of age 3 fish as an index of recruitment and longline CPUE as an index of the spawning stock (longline CPUE takes into account both Taiwanese and Japanese CPUE data, rather than only Japanese CPUE as was the case in other years) still indicates that slight variations in the spawning stock, at least since the 1967 cohort when the quality of the data improved, are associated with wide variations in recruitment. It seems that the low recruitment levels of 1978, 1979 and 1980 cohorts (Figure 16) could be due to variations in environmental conditions, although the cause is not known with exactness.

As previous analysis has shown, it seems that after a period of intense exploitation of albacore in the North Atlantic the species is currently being exploited at a level that increases in effort could be followed by increases in catch, such as occurred in 1982 and 1983.

### ALB-2.2 South stock

The CPUE of the longline fishery decreased from 1967 to 1975 and then remained stable until 1980. In 1981 it decreased slightly and in 1982 and 1983 CPUE levels were slightly higher than those of 1981, but less than those of the 1980 level (Figure 17).

The production model was fit to the 1967 to 1983 catch and effort data; revised data were used for the years 1967 to 1969 and 1982 and an estimate was used for 1983 (which does not include catches by Japan).

Two measures of effort were used: Case 1 using fishing intensity expressed in number of effective hooks, and Case 2 using fishing intensity expressed in number of hooks per 5-degree square. In both cases values of  $k = 3$  and  $4$  and values of  $m = 0, 1$  and  $2$  were used.

Although the estimates of MSY are very similar for the two cases studied, only those obtained with effort expressed in numbers of hooks per 5-degree square (Figure 18) were studied since those data are easier to compare with the results of last year's analyses which also used this effort measure. The degree of fit for each value of  $m$  and  $k$  is somewhat better than in the other case. With this type of fit, the highest range of MSY corresponds to the  $m = 0$  form. However, this assumption does not seem too realistic from a biological standpoint. The range of MSY obtained with the  $m = 1$  and  $m = 2$  models for each value of  $k$  varied from 24,320 MT with a corresponding effort of  $115.54 \times 10^4$  hooks per 5-degree square ( $m = 2, k = 3$ ) to 23,050 MT (with a corresponding effort of  $117.88 \times 10^4$  hooks per 5-degree square). These values are somewhat below those calculated last year, but the degree of fit reached this year is higher and therefore the estimates appear more reliable.

The catch and effort values for 1981 (23,950 MT and  $146.15 \times 10^4$  hooks per 5-degree square) and 1982 (28,970 MT and  $150.90 \times 10^4$  hooks per 5-degree square) were higher than the MSY range, but the estimates for 1983 (13,500 MT and  $74.91 \times 10^4$  hooks per 5-degree square) are clearly below those corresponding to the range of MSY.

Since no new information on yield per recruit was presented, earlier estimates are still valid, i.e., an increase in the size at first capture would only slightly affect yield per recruit. A significant development in the baitboat surface fishery directed at juveniles would produce decreases in yield per recruit.

No new studies were carried out on stock/recruitment relation.

According to current data it seems that south Atlantic albacore is being exploited at MSY levels in recent years, but the sharp decrease in effort in 1983, due to the movement of the major part of the longline fleet to the North Atlantic and Indian Oceans, resulted in an exploitation level considerably below the MSY range.

### ALB-3. Effects of current regulations

There are no management measures currently in force for Atlantic albacore.

#### ALB-4. Recommendations

##### *ALB-4.a Statistics*

The recommendations made last year are still valid.

- i) Catch and effort statistics should be improved for the Mediterranean albacore fisheries.
- ii) Catch and effort statistics for the surface fisheries (baitboat and purse seine) of the south stock should be accurately compiled because of the impact these fisheries could have on this stock, should they continue to develop.
- iii) Total catch data for France for the period 1970-1980 should be verified.

##### *ALB-4.b Research*

- i) Previous recommendations concerning age by sex determination of adult albacore are still valid.
- ii) For the north stock, studies should continue on the relation between spawning potential and recruitment and yield-per-recruit studies should be updated.
- iii) Studies on cohort analysis should be updated for both the north stock and the south stock.
- iv) It is necessary that a recruitment index for the south stock be obtained.
- v) It is essential that production model analysis, for the north stock as well as for the south stock, be reviewed and adapted to the special characteristics of the fisheries taking these stocks; the sensitivity of the results relevant to the assumptions used should be indicated.
- vi) Studies should be carried out to determine the relation between Mediterranean albacore and North Atlantic albacore, and information should be obtained on age, growth, recruitment, etc. for Mediterranean fish.
- vii) Studies should be carried out to determine the relation between variations in oceanographic conditions and albacore abundance and availability to the fishery.

##### *ALB-4.c Management*

The north stock seems to be in good condition although recruitment is variable and for the last three years has been at a relatively low level. The Committee did not present any specific management recommendations but it did note that the fisheries should be closely monitored.

The south stock seems to have been exploited at the MSY level in recent years, depending on the model used. However, the sharp decline in effort last year indicates that the level of exploitation has been moderate for the period. Possible increases in effort in

the future should be closely studied in order to analyze their effects on the stock. The Committee did not present any specific management recommendations concerning the south stock.

## ***BFT-BLUEFIN***

### **BFT-1. Description of fisheries**

There are fisheries for bluefin tuna in the North Atlantic (east and west) and in the Mediterranean. Several distinct fisheries are defined on the basis of their location, season, gear, size of fish caught and countries involved.

Table 9 shows Task I catches in weight for the east and west Atlantic and Mediterranean Sea. The 1983 estimated catch was 22,800 MT: 12,000 MT from the Mediterranean; 8,000 MT from the east Atlantic; and 2,800 MT from the west Atlantic. In the western Atlantic, regulations limited the 1982 and 1983 catches to 1,160 and 2,660 MT, respectively. In the east Atlantic, longline catches were relatively stable (600 to 1,000 MT) during 1978-1981 and increased to 2,700 and 2,600 MT in 1982-1983. Trap catches declined from 2,200 MT in 1969 to 20 MT in 1974, and remained relatively stable between 400 and 900 MT between 1975 and 1981. Trap catches increased to the 1969 level in 1982-1983 (2,300 and 2,000 MT, respectively). Table 10 presents catches in number of fish for 1960 to 1982. Figures 19 (catch in weight) and 20 (catch in numbers) also show these data. Higher demand for medium and large fish in the Mediterranean, starting in 1984, may change the relative proportions of the sizes of the fish caught.

### **BFT-2. State of the stocks**

The exchange of fish between the eastern and western Atlantic has been estimated to be less than 10 percent. Tagging data indicate that such exchanges are variable through time. Two spawning areas, with different spawning seasons, are known to exist: Gulf of Mexico (spring) and the Mediterranean (summer). Recruitment for the east Atlantic appears good in recent years and especially strong in 1982-1983. Stock status for the east Atlantic stock (east Atlantic and Mediterranean) is not presently of concern due to this recent increase in recruitment.

Considerable research efforts have been directed at bluefin tuna in recent years to improve the data bases and decide on appropriate methods of analysis. A major step was made in 1983 at the Bluefin Workshop. After being unable to reach a consensus on stock status and management measures for two years and given the advances made at the Bluefin Workshop, it was decided to hold a meeting of the Working Group on Bluefin Tuna in 1984, prior to the SCRS Meeting, to allow sufficient time for in-depth analyses. The Working Group met on September 27 to October 4 in Dartmouth, Nova Scotia, Canada. The Working Group focused its attention on western Atlantic bluefin tuna as the stock sta-

tus in the east Atlantic and Mediterranean Sea was not of immediate concern due to increased recruitment in recent years.

All analyses made by the Working Group requiring estimates of natural mortality were done with two values ( $M = 0.18$  and  $M = 0.10$ ) for that parameter. The precise level of natural mortality is not known and  $M = 0.18$  is the only published estimate (Rodríguez-Roda, 1974. *Inv. Pesquera*, 41 (2) 263-273) available. A further analysis based on growth and environmental considerations retained the value of  $M = 0.18$  (SCRS/82/66). Consequently, the following discussion is limited to the results obtained with an assumed value of natural mortality of 0.18, recognizing that further studies on the value of that parameter are required.

Estimates of population numbers at age 1 for the 1973 to 1978 year-classes were derived from mark-recapture data. A Sequential Population Analysis (SPA) formula was used with estimated catches at age to derive estimates of fishing mortalities (and population numbers) at age 3 to 8 in 1981. A standardized CPUE from 1-degree square Japanese long-line data for the Gulf of Mexico was calculated. That CPUE series and the Canadian rod and reel CPUE were used to calibrate Virtual Population Analyses (VPA) and to estimate 1981 fishing mortalities for ages 10 and older and 16 and older, respectively. Although estimates were obtained and agreed upon, population estimates from VPA are not considered reliable enough to allow short-term surplus production estimates to be calculated.

Fishing mortality estimates at age from VPA were used to derive fishing patterns at age that were considered to be representative of different periods of the development of the western Atlantic bluefin tuna fishery. These fishing patterns at age were used in Thompson and Bell yield-per-recruit calculations along with geometric mean recruitment of the 1969 to 1977 year-classes. The results are shown in Table 11 and indicate that recent fishing patterns at age give higher yield per recruit than those of the early 1970's. Table 11 also shows that long-term average equilibrium yield at F-max (the fishing mortality level that would keep the stock size stable on average) would be 6,300 MT for the 1982 fishing pattern at age. (Equilibrium yield and equilibrium biomass would be higher with lower  $M$ .) That equilibrium yield would, however, only be achievable, on average, after 30 year-classes have been subjected to recent fishing patterns at age. This is not presently the case and present yield at F-max is impossible to estimate as the stock has been fished above F-max for a number of years.

### BFT-3. Effects of current regulations

The ICCAT regulation limiting fishing mortality for the entire Atlantic stock went into effect in August, 1975. The catches of small fish (Table 9) have consistently decreased in the western Atlantic from 1975 to 1982 and in the eastern Atlantic from 1975 to 1981 but increased in the most recent years. These catches fluctuated considerably in the Mediterranean. The catches of large bluefin tuna increased from 1978 to 1982 in the Mediterranean but declined in 1983. These catches declined steadily from 1977 to 1981 in the eastern Atlantic, but rose in 1982 to the 1977 level before decreasing slightly in 1983. The catches of large fish in the western Atlantic were relatively stable from 1977 to 1981 then decreased substantially in 1982.

A regulation limiting the catches of bluefin less than 6.4 kg for the entire Atlantic stock went into effect in August, 1975. After the regulation, the percentage (Table 12) of individuals less than 6.4 kg was low in the western Atlantic from 1976 to 1981 (2 to 8 percent), but increased in 1982 as a result of lower overall catches. The percentage of undersized fish is still important in the east Atlantic (40 to 86 percent) and in the Mediterranean (12 to 67 percent). The percentage of reported undersized fish declined from 52 to 12 percent from 1977 to 1981 in the Mediterranean but increased to 67 percent in 1982.

A regulation limited the western Atlantic catches in 1982 to 1,160 MT and 2,660 MT for 1983-1984, and forbade fishing directed at the spawning stock in the Gulf of Mexico. This regulation was applied, as can be seen by the considerable decrease in the catches recorded in 1982-83 (Table 9 and Figure 19). Recent management measures reduced considerably the fishing mortality in the west Atlantic.

A regulation limiting the catch of bluefin smaller than 120 cm fork length to no more than 15 percent in weight in the western Atlantic was proposed in November, 1983. The data to assess the impact of that regulation are not yet available.

#### BFT-4. Recommendations

##### *BFT-4.a Statistics*

The Committee recommends:

- i) That all countries submit to ICCAT catch-at-size data by the finest time-area (not less than monthly) resolution available.
- ii) That a set of standards for collection and reporting of statistics to the Secretariat as well as a mechanism to insure that such standards are followed be developed.
- iii) That dependable statistics for the Mediterranean Sea fisheries of non-member countries be collected.
- iv) That bluefin tuna catches made by the Japanese longline fishery in 1957-1966 be reviewed in terms of east-west division to be used in the stock analysis. Until a detailed study is completed, the Committee recommended that all catches from the equatorial and south Atlantic regions during those years be designated from the western stock, for analysis purposes under the two-stock hypothesis.
- v) That statistics for the major fisheries be made available on a more timely basis. The goal for 1985 is to have available at the SCRS Meeting (November, 1985) complete Task I, II and size data for the 1984 season and partial data for the 1985 season.
- vi) That catch and effort data be submitted on the basis of the finest time-area scale possible.
- vii) That catch numbers at length instead of catch numbers at weight be reported.

- viii) That sampling intensity of the catch in the western Atlantic be increased for the fisheries where it is required. As a guideline, 300 to 500 fish measurements for each ICCAT sampling area, for each quarterly period and each country-gear category should be the objective.
- ix) That for countries other than France and Spain, reporting of catches of small fish (essentially ages 0 and 1) in the east Atlantic and Mediterranean and catches of large fish in the Mediterranean be improved.

*BFT-4.b Research*

The Committee recommends:

- i) That an analysis of the usefulness of larval survey data as an index of spawning stock abundance be presented at the next SCRS Meeting.
- ii) That a mark-recapture data file for the western Atlantic be prepared and maintained by the Secretariat. The U.S.A. should prepare the initial file as soon as possible.
- iii) That the following criteria be followed in future VPA:
  - Develop techniques to estimate age from length that account for different growth rates among individuals and among cohorts of different abundances.
  - Study and report the reliability of calibration methods via simulation. Assumptions such as zero intercept may not be forced to hold but rather be used in the tuning process to choose between different fishing mortality vectors. Further, calibration should be based on catch and effort samples, not on the estimates of totals after prorating. Such calibration should be on the basis of a fine resolution of time and space.
  - Using a "plus" group in VPA may give unrealistic results (like spontaneous generation of fish). These are not likely to affect VPA results substantially, and a technique avoiding such discrepancies should be used. Otherwise, the full catch-at-age matrix should be used.
- iv) That sampling programs for hard parts for age determination be instituted, that age determination from such structure be validated as to the annual nature of the deposition of the rings and that an analysis of the accuracy of reading these ages be made.
- v) That a study be made to estimate the value of natural mortality for bluefin tuna and that the results be reported. Until then,  $M = 0.18$  should be used and sensitivity analysis using values in the range 0.12-0.24 should be calculated.
- vi) That a Working Group meeting to assess the stock size of western Atlantic bluefin tuna be held in 1985 and that attempts be made during that meeting to assess the stock size of the east Atlantic stock. Such a meeting should be held well in advance of the SCRS meeting to allow in-depth analysis. For the same reason, computer facilities should be available. A draft report of that meeting should be available to meeting participants on the last day of the meeting.

- vii) That an evaluation of the usefulness of the technique of X-ray analysis of micro-elements in hard parts as a method to determine the amount of annual exchange of fish from the east to the west Atlantic (and vice-versa) be made and that consideration be given to incorporating the technique into an international cooperative program of investigation of the timing and frequency of such exchange. If these investigations produce estimates of exchange rates, the impact of these rates should be evaluated by simulation.
- viii) That, as directed fisheries on the spawning stock in the Gulf of Mexico were interrupted in 1982 by regulation, efforts be made to collect and report biological samples from current fisheries. If samples are not sufficient, it is recommended that an annual research survey be conducted in the Gulf of Mexico, during spawning, to collect such information.

#### *BFT-4.c Management*

Based on the estimates of exchange rates between the east and west Atlantic (and vice versa) and for the practical purposes of management, the two stocks are considered to be separate stocks.

#### West Atlantic stock

Present catch levels are likely to stop the decline of the stock as well as allow stock increases in the long term (30 years). Catches lower than present levels would most likely result in an increased speed of recovery while slightly higher catches would slow down the rebuilding of the stock. The SCRS notes that, following confirmation of the response of the stock to the present management regime, it would be possible to increase the allowable catch gradually in proportion to the recovery rather than hold a constant catch level until the stock has stabilized.

#### East Atlantic stock

The Committee has no advice for changes in existing management measures.

## ***BIL-BILLFISHES***

### **BIL-1. Description of fisheries**

Billfishes are distributed over the tropical and temperate waters of the Atlantic Ocean. Blue marlin, white marlin, sailfish and longbill spearfish are caught by many fisheries, both directed and incidental, throughout their ranges. Black marlin are also present in



the Atlantic Ocean, but they are rare and negligible in the landings. Major catches of billfishes are incidental to the tuna longline fisheries of several countries. Secondary fisheries are the directed recreational fisheries of the U.S.A. and Senegal. Also, there are developing industrial and artisanal fisheries for sailfish, especially in Ghana and Senegal, as well as incidental catches in the tropical tuna purse seine fisheries. Of these billfishes, the most important in terms of landings in recent years are sailfish/spearfish, followed by blue marlin and white marlin. Sailfish and spearfish are often treated as a species group, since the longline statistics for these species are mixed. The catch statistics of blue marlin and white marlin, by countries, are given in Tables 13 and 14, respectively. Catch statistics for sailfish/spearfish are provided in Table 15. These tables represent the best estimates of catch based on the revisions adopted by the Inter-sessional Billfish Workshop in 1981.

## **BIL-2. State of the stocks**

Although considerable effort was expended in revising and compiling the catch data base during 1981 by the ICCAT Secretariat and member country scientists, stock assessment work on billfishes is still plagued with deficiencies in the basic data and biological parameters that are needed for definitive stock assessment analysis (Tables 16-19). A major consideration, especially in marlin assessment work, is that the Japanese longline catches represent a decreasing percentage of the total catch in recent years; hence analyses have been based on increasingly greater extrapolations. However, because of the broad time-area distribution and the historical continuity of the Japanese longline data, they are still the best available data for effort standardization. The Committee recognizes that estimates of effective CPUE that use this standardized effort will be imprecise for recent years and that caution must be exercised in using these statistics to index billfish abundance. For this reason, the surplus production model results are not overly stressed in the recommendations.

### *BIL-2.1 Blue marlin*

Total Atlantic landings of blue marlin (Table 13) show a continual decline over the period 1975 to 1979. Landings then increased through 1982, mostly due to increases in the Japanese catch. Preliminary estimates of the 1983 landings show a substantial decline (-44 percent) from the 1982 level. Because significant portions of the catches are not being reported by geographical region (Table 13), it is not possible to discuss recent landing trends in the North or South Atlantic.

Japanese effective effort estimates and CPUE indices are available through 1980. There was a decline in Japanese effective fishing effort from 1975-1978 followed by an increase for 1979-1980. CPUE increased slightly during 1977-80, but only to a level still below the 1965-75 average. Production model results indicate that some over-exploitation may have occurred during the early to mid-1970's, but fishing effort in more recent years (1978-80) appears to be below the level associated with maximum sustainable yield. The Committee remains unsure of the exact status of blue marlin, but given the low CPUE levels of recent years (through 1980) and the production model results, concern is expressed

about any increase in effort on the stock. The Committee believes that fisheries taking blue marlin, either directed or undirected, i.e., sport or commercial fisheries, should be closely monitored and if further analysis confirms this apparent low level of abundance, consideration be given to methods of reducing fishing mortality on this species.

### *BIL-2.2 White marlin*

Landings from the total Atlantic (Table 14) show a negative trend over the period 1973-79. The trend since 1979 has been upward, with some fluctuation. There has been a continuing decline in Japanese effective effort over the period 1971-79, with an increase occurring in 1980. CPUE in the total Atlantic decreased sharply from the high in 1961 through 1964, increased through 1967 and fluctuated with a basically decreasing trend to 1980. Production models do not appear to fit the white marlin data adequately and little useful management information can be derived from the method. As concluded in last year's Report, the Committee remains unsure of the exact status of white marlin but with the declining trend and low CPUE levels of recent years, concern is expressed about increased levels of effort on the stock. The Committee believes that fisheries taking white marlin, either directed or undirected, i.e., sport or commercial fisheries, should be closely monitored and if further analysis confirms this low level of abundance, consideration be given to methods of reducing effort on this species.

### *BIL-2.3 Sailfish*

Landings from the total Atlantic (Table 15) increased over the period 1975-79, then decreased through 1983. Preliminary 1983 landings (1,657 MT) were below the previous 10-year average (1,986 MT).

#### *BIL-2.3.a Western Atlantic stock*

In the western Atlantic areas, hook rates from the Japanese longline fishery appear to fluctuate without apparent trend. Age composition of samples from the U.S. recreational fishery indicates that average age (and size) has declined since the 1950's but the age composition appears to be quite stable over the past ten years or so. Age composition for the Japanese longline fishery, available only for 1971-76, is also stable. Yield-per-recruit analysis indicates that recent fishing mortality levels are about 40 percent below  $F_{0.1}$  (the point where the slope of the curve is one-tenth the slope at the origin). Considering these data collectively, sailfish appear to be only moderately exploited. However, the fishing mortality and natural mortality rate estimates are nearly equal ( $\hat{F} = \hat{M} = 0.34$ ), a condition often assumed to occur at the point of maximum sustainable yield, and the Committee cautioned that further analysis of catch and effort data (e.g., VPA and/or production model analysis), in conjunction with yield-per-recruit analysis, would be needed before a more definitive assessment of the status of stocks could be made.

### BIL-2.3.b Eastern Atlantic stock

Japanese CPUE of sailfish/spearfish declined from the mid-1960's to the early 1970's, then fluctuated without trend. Senegalese CPUE of sailfish, 1970-80, has also fluctuated without apparent trend. There are no other means to evaluate the eastern Atlantic stock at this time. Continued efforts to report catch, effort, and size data are recommended because of the uncertainty of the status of the stock and the reported growth of the sport, artisanal, and industrial fisheries along west Africa.

### BIL-3. Effects of current regulations

No ICCAT regulations are currently in force for billfishes.

### BIL-4. Recommendations

#### *BIL-4.a Statistics*

- i) Catch and effort statistics from all longline countries should be reported by 5-degree area and by month. The catch of each of the billfish species should be reported separately. While the Committee noted that some progress has been made in this area, further improvement is still necessary (Table 16). Size frequency data should also be reported by month for each species. The Committee noted the need for progress in this area as well (Tables 16-19).
- ii) At the 1983 SCRS Meeting, several longlining nations first reported that some of their fishing operations were deploying longline gear in non-traditional ways, e.g., deep longlining for bigeye tuna (Japan) and shallow longlining for sailfish (Cuba). Such differences in the deployment of longline gear may affect the catchability of billfishes (and other species). It is requested that each longline nation prepare a description of its current and past longline operations in order to evaluate the need to stratify further the Task II catch and effort statistics by depth of fishing.
- iii) Length frequency data by sex for all species should be collected on a regular basis for all fisheries.
- iv) Catch statistics for sailfish and spearfish, in particular, should be reported separately by all countries in order to facilitate stock assessment work on both species. Sailfish statistics (separated from spearfish statistics) should be reported for the east/west Atlantic. Historical statistics should also be segmented in this manner. ICCAT billfish areas should also be adjusted to accommodate the east/west stock structure hypothesis.
- v) Comprehensive data collection for the sailfish fishery off Senegal has been established in response to the Committee's recommendations in previous years. Improved data collection in Ghana is still needed and should be carried out due to the development of commercial fisheries on this species during apparent spawning aggregations.

- vi) Efforts to estimate the discarded sailfish in the purse seine fisheries off west Africa should be undertaken. Because the historical reported landings in this area have been relatively small (generally less than 1,000 MT), the effect of these discards may be important for future stock assessment studies.

#### *BIL-4.b Research*

The lack of basic data on growth, mortality rates and stock structure severely hampers many of the conventional population dynamics analyses. 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 marlins and sailfish to provide accurate information for study of population parameters for cohort analyses and yield-per-recruit analyses; and that preliminary findings be reported.
- ii) Further data collection and analyses be done from 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. Particularly, investigations into possible alternatives to using Japanese longline catch rate data for standardization should also be begun, e.g., standardization of effort from the Taiwanese longline fleet.
- iii) Stock assessment work on sailfish should continue. Improvements in the data base and better estimates of population parameters should enable more progress to be made in this area.
- iv) Production model analysis of blue marlin and white marlin should be updated to provide a more current assessment of the status of the stocks.

#### *BIL-4.c Management*

No management recommendations are made at this time, except to stress the need to monitor closely the billfish fisheries, particularly the CPUE and catch for blue marlin and white marlin, which have shown sharp downward trends in recent years, but with fluctuations. Should the downward trends in catch rates continue with the present or increased level of effort, it may be necessary to impose some form of regulation in the future.

## *SWO-SWORDFISH*

### SWO-1. Description of fisheries

Swordfish are distributed in the temperate and tropical zones of the entire Atlantic and Mediterranean. They are caught mainly with longline gear, in both swordfish directed fisheries and in tuna longline fisheries, and secondarily with harpoon and sport fishing gear.

Table 20 shows the catch of swordfish by country. The 1983 Atlantic catch reached 16,800 MT, which was approximately the same level as in 1982. The 1983 catch was the highest catch in the 1950-1983 series.

In the Mediterranean, the 1983 catch was 5,200 MT, which is at about the same level as the 1982 catch.

The total Atlantic and Mediterranean catch was 22,000 MT (Table 20 and Figure 22).

### SWO-2. State of the stocks

No new information was presented which would allow a choice of a particular hypothesis on swordfish stock structure. Historically, it has been treated as a single stock in the Atlantic and Mediterranean.

Nominal CPUE of the Brazilian longline fishery does not show a clear trend and has fluctuations from one year to the other for the period 1971-82 (Figure 23).

Effective CPUE (calculated based on the Honma method) of the Japanese longline fishery for the total Atlantic remained relatively stable during the last decade (Figure 24). However, in the northwest Atlantic area (north of 5°N and west of 40°N), the CPUE has shown a continual decline in recent years (1977-80) (Figure 25). Though this may indicate a decrease in swordfish abundance in the northwest Atlantic, it should be noted that since the fishery was not directed at swordfish and since the proportion of the total Atlantic swordfish catch taken by Japan (the proportion corresponding to the northwest area is unknown) has been low throughout the historical series of the fishery, it is possible that this declining trend may not reflect a real change in the stock size.

The CPUE of the Spanish longline fishery directed at swordfish in the area of the northeast Atlantic did not show any clear tendency during the period 1973-82 but remained at the level of previous years (Figure 26).

New information presented on cohort analysis by size data of the northeast Atlantic (based on the Spanish longline fishery directed at swordfish) indicated that effort in 1978-82 and size-specific mortality are at a level whereby an increase or decrease in effort would not bring about sharp increases or decreases in yield within a hypothetical stock in the northeast Atlantic (ICCAT sampling area BILL-94). (This result is not inconsistent with the trend in CPUE of the Japanese fleet for the total Atlantic (Figure 24) or with Brazilian CPUE data (Figure 23).)

This analysis assumes an equilibrium stock and one that has been stable since the 1960's. The analysis also assumes that the size distribution of the Spanish longline catch was representative of the overall fishery and that migration between the northeast Atlantic, the Mediterranean and the rest of the Atlantic, was negligible.

This type of analysis was also applied to the Mediterranean (ICCAT sampling area BILL-95) under the assumptions described in the previous paragraph. If this analysis is, in general, a step forward toward a better knowledge of the state of the stocks, the results relative to the Mediterranean are much less reliable than those obtained for the northeast Atlantic. However, the results in both cases should be considered preliminary. In addition, the preliminary results for the Mediterranean would be more disputable since sampling was not extensive and the data coverage is much lower than for the northeast Atlantic (especially since Spanish catches represent 20 percent of the total Mediterranean catches).

We cannot reach firm conclusions on the status of the stocks or on stock structure at this time due to the lack of adequate data.

### SWO-3. Effects of current regulations

There are currently no ICCAT regulations in effect for swordfish.

### SWO-4. Recommendations

Collection of basic swordfish data is of great importance for scientific studies on this species. This is evident from detailed Task I data (Table 20) and also from the growing effort by national scientists to obtain representative samples from the major swordfish fisheries (Table 21).

#### *SWO-4.a Statistics*

The recommendations presented in the 1983 SCRS Report seem to have had an effect, as information on catch, effort and sampling has improved for some countries. However, important Task I and II statistics are still missing from some areas of the Mediterranean and western Atlantic. Therefore, it is recommended that:

- i) Swordfish catch and effort statistics be presented by 5-degree squares and by month. If this is not possible, then they should be presented by ICCAT billfish sampling areas.
- ii) Due to the areal variation in the sex ratio and the different growth rates by sex, any stock evaluation model considers the sexes separately and by fishing areas. Therefore, size frequencies by sex and fishing area should be collected.
- iii) In spite of the increase observed in the number of swordfish sampled by some countries, countries catching swordfish (whether or not as a target species) carry out adequate levels of size sampling.

- iv) Due to the known under-reporting of swordfish catches by Canada and the U.S. since the imposition of mercury content restrictions in 1971, attempts be made to estimate the magnitude of the catches that were unrecorded and may not yet be recorded under existing conditions in spite of the fact that the U.S. has considerably improved catch data since 1979.
- v) Adequate steps be taken to obtain catch, effort and size distribution information of the new swordfish fisheries that may develop in the future.

#### *SWO-4.b Research*

The lack of basic data on growth, mortality rates and stock structure is still serious; therefore, it is recommended that:

- i) Studies continue on the growth and age of swordfish, as well as on size composition structure, providing detailed results for review.
- ii) Joint studies be carried out by concerned scientists, to evaluate the stock structure (biometrics, parasites, etc.). Also, tagging programs should include swordfish, in the Atlantic and the Mediterranean.
- iii) Those countries whose fleets catch swordfish when targeting other species (e.g., long-line fisheries for tunas) and which do not exert effort on swordfish carry out studies to determine their effective effort on this species.

#### *SWO-4.c Management*

No recommendations are presented on management.

### ***SBF-SOUTHERN BLUEFIN***

#### **SBF-1. Description of fisheries**

Southern bluefin tuna comprise a single stock unit in the temperate waters of the southern hemisphere. The only known spawning ground is located in the area of the Indian Ocean off northwestern Australia. Size composition of catches and tagging results reveal that the fish at younger ages are distributed in coastal waters of Australia, and as the fish grow larger, they migrate circumpolarly in the offshore waters of the Pacific, Indian and Atlantic Oceans.

The stock has been substantially exploited by Australian and Japanese fishermen since the 1950's. The amount of catch by the Japanese longline fishery increased in earlier

years, but began showing a decreasing trend in recent years. The Australian surface fishery, capturing small-sized fish, grew rapidly in later years. Presently, New Zealand fishermen also indicate interest in exploiting the large-sized fish by handline. The total catches by Japan, Australia and New Zealand in 1982 were about 18,200, 23,000 and 300 MT, respectively. In the Atlantic, southern bluefin are caught by the longline fishery in the area off the southern tip of Africa, and the catch has varied widely between 500 and 6,200 MT during 1972-1983 (Table 22), reflecting the shift in effort between oceans.

#### **SBF-2. State of the stocks**

According to the cohort and yield-per-recruit analyses made at the scientific meeting on southern bluefin tuna which was held in Shimizu, Japan (April, 1983), it was pointed out that the spawning biomass has recently been lowered to one-third that at the virgin stock level. Although recent recruitment had not been reduced, judging from the increasing trend of small-fish catches by coastal surface fisheries, it was noted that a further decrease in spawning biomass might result in a reduction in the level of recruitment. It was also recognized that a further increase in the catch of young fish would result in a marked decrease in yield per recruit and spawning biomass.

At the trilateral fish-talks among Japan, Australia and New Zealand held in May, 1984, in Canberra, biologists from the three countries jointly examined the latest analyses on updated catch and size statistics. Results presented at this meeting confirmed, in general, the conclusion of the Shimizu meeting, and emphasized the importance of maintaining the spawning biomass at a satisfactory level, i.e., about 210,000 MT.

#### **SBF-3. Effects of current regulations**

In 1971, Japanese longline fishermen voluntarily restricted fishing in areas where young fish are abundant. This measure has prevented a further decline in the age at first capture by the longline fishery. Australia implemented a new management program from October 1, 1984. The major elements of the program are Australia's national quota of 14,500 MT and area/seasonal closures off western Australia. These regulatory measures were introduced to prevent a further decline in the spawning biomass by protecting the young fish.

#### **SBF-4. Recommendations**

The Committee made no recommendation for management of southern bluefin tuna in the Atlantic Ocean.



## ***SMT-SMALL TUNAS***

### **SMT-1. Description of fisheries**

Reported landings of small tunas have varied from about 65,000 MT to slightly over 120,000 MT since 1969, with the lowest catches occurring in the mid-1970s. In recent years (1980-82) catches have been dominated by Atlantic bonito (30,000-50,000 MT), king and Spanish mackerels (23,000-28,000 MT), little tuna (13,000-17,500 MT) and frigate tuna (10,000-15,000 MT). The reasons for the high variability in catches are not known. The principal landings of Atlantic bonito have been made by Turkey, whose annual take has reached as much as 30,000 MT. It is probable that there are unreported artisanal landings, and that there are also catches and discards by industrial fleets that are not reported. Thus, the true catches and landings may be substantially higher than reported statistics indicate.

Table 23 shows the best available current data on catches of small tunas. The data for 1983 are obviously very incomplete.

### **SMT-2. State of the stocks**

It is not possible to arrive at any conclusions on the status of the stocks on the basis of the available data.

### **SMT-3. Effects of current regulations**

There are currently no ICCAT recommendations in effect on small tunas, and the Commission is not aware of any national regulations. It is possible that the minimum size regulations now in effect for yellowfin and bigeye tunas could have some effects on small tuna catches, since several species occur in mixed schools with yellowfin and bigeye.

### **SMT-4. Recommendations**

#### ***SMT-4.a Statistics***

The data on small tunas in the ICCAT data base continue to be far from adequate. As mentioned in the description of fisheries given above, there are indications that landing and catch statistics are not complete. There are no fishing effort data nor sampling of the sizes in the catch for most species. The principal gap in statistics other than those of landings is for the Turkish catches of Atlantic bonito. Substantial catches of little tuna and frigate mackerel by Ghana are not sampled, nor are some catches of several species by the U.S.S.R. Sampling of little tunas and blackfin tuna for size by the U.S.A. has been irregular, and there has been no sampling by the U.S.A. of considerable catches of other small tunas. It now appears that Senegal, which was thought not to have sampled small tunas for some years, has in fact done so, and will be submitting the information to the ICCAT data base in the near future. The Committee notes with pleasure that some of its previous rec-

ommendations have been followed; for example, Spain has recently initiated sampling for frigate tuna and Atlantic bonito. Considering that the catches of small tunas are approximately 20 percent of the total Atlantic tuna catches, the Committee recommends that:

- i) Member countries make special efforts to see that they report their catches of small tunas, and that the Secretariat do all possible to insure that catches of non-member countries are included in catch statistics.
- ii) Member countries collect fishing effort and size data and submit them to the ICCAT data base.
- iii) The Secretariat make the necessary efforts to secure the required data from non-member countries.
- iv) Appropriate emphasis be directed to collecting data from artisanal fisheries and from discards from industrial fisheries fishing primarily for other species.

#### *SMT-4.b Research*

The Committee recommends that:

- i) Collection of information on spawning through larval surveys be continued, especially in areas where there are important small tuna fisheries.
- ii) Studies aimed at distinguishing among different stocks, such as biochemical work and tagging, be continued.
- iii) Studies on biological parameters be carried out.
- iv) Studies of distribution of species and of ecological relations through means such as the examination of predator stomachs be continued.
- v) Studies of the amount of mixing of small tunas (which are frequently discarded) in the catches of purse seiners fishing in tropical areas be initiated.

#### *SMT-4.c Management*

The Committee has no recommendations for management of fisheries for small tunas at this time.

## *MLT-MULTISPECIES*

### MLT-1. Tropical Species

In the 1983 SCRS Report it was pointed out that two categories of multispecies concerns are of interest to the Committee: (1) biological interactions among species, and (2) exploitation of mixed species by fishing gears. Research organized by the Committee this year concentrated on evaluating time-area fishing closures on yields of yellowfin, skipjack and bigeye tunas in the eastern tropical Atlantic. The objective was to identify closure schemes that could simultaneously reduce the catch of young fish and improve the combined yield from the three species. A detailed description of the Committee's findings is contained in the Report of the Working Group on Juvenile Tropical Tunas and the findings are discussed under Item 7 and in the next section (MLT-2) of this Report.

During the course of the Committee's investigation, the need for more accurate procedures to partition mixed-species catches into bigeye and yellowfin catches was identified. Part of the problem is attributed to confusion concerning what data need to be corrected and how they should be corrected. This problem was referred to the Sub-Committee on Statistics.

### MLT-2. Juvenile tropical tunas

There are 3.2 kg minimum size regulatory measures currently in effect for bigeye and yellowfin and there is a tolerance for undersized fish amounting to 15 percent by number of the catch of each species per landing. The yellowfin regulation was instituted in 1973 for an indefinite period, whereas the bigeye regulation was instituted in 1980 and extends until the end of 1984.

The purpose of the regulations is primarily to reduce fishing pressure on young yellowfin and bigeye and increase the yield per recruit. The effectiveness of the regulation in achieving the desired result can be shown with three indicators: one indicator measures changes in the size distribution of the catch; another measures changes in the size-specific fishing mortality; and the third measures the degree to which the actual yield approaches the desired yield. The indicators are plotted for yellowfin in Figure 27. All three indicators have been increasing, but if the yellowfin regulation had been working, all three should have decreased. The Committee believes this is evidence that the regulation has been ineffective, probably owing to ineffective enforcement.

The short time elapsed since the institution of the bigeye regulation does not allow us to prepare a similar plot for bigeye tuna, but we do not expect the results to be fundamentally different from those for yellowfin.

Because of the poor effectiveness of the yellowfin and bigeye size regulations, an alternative management strategy was investigated. This strategy would simply be to prohibit fishing by certain fleets in those time-area strata where the catch of undersized yellowfin and bigeye is high. Such a strategy means sacrificing the catch of some amount of legal-sized yellowfin and bigeye, and of skipjack in the closed strata for long-term gains in yield from the open strata. A "multispecies" simulation model was constructed for evaluating the effects of closure schemes under equilibrium conditions, i.e., after eight years. The

"null-hypothesis" scenario is a scenario of no regulations whatsoever against which the closure schemes were weighed. The various fleets, areas and seasons involved in 12 hypothetical closure schemes are shown in Table 24. The areas used in the analysis are inserted in Table 24.

The results indicate no gain in terms of total yield by instituting any of the closure schemes. The expected changes in combined yields of the three species are all negative or zero. Results for individual species indicate small gains in yield to be had for bigeye or yellowfin with some schemes but at the expense of yield, principally of skipjack tuna. Projected CPUE and yield by gear show substantially the same picture.

The Committee points out that these results are from a simulation model that requires eight years to attain a steady state. Projections of gains and losses are, therefore, for the steady state or equilibrium conditions, and losses are substantially greater during intervening years before the steady state is attained.

The Committee notes that substantially more and better information has been accumulated and fishing patterns have changed since 1973 when ICCAT adopted the minimum size regulation for yellowfin tuna. Fishing by the surface fisheries is currently conducted over a wider geographic region and mixed catches of both large and small fish and of the three species combined are more frequently made over a wide region than in the past. Consequently, the closure schemes investigated resulted in no gain, but in fact losses in some cases, in the combined yield of skipjack, yellowfin and bigeye tunas, although substantial numbers of young fish are protected. The losses occur principally in yield of skipjack but also in yield of large yellowfin and bigeye, which the closure schemes also protect by preventing fishing in areas where they are available.

Losses of skipjack yield can also occur from the enforcement of the minimum size limits on yellowfin and bigeye. This is due to the high degree of mixing of small fish and the likelihood that fishermen will have to forego skipjack catches to avoid undersized yellowfin and bigeye.

In 1984, there has been substantial movement of purse seiners from the eastern tropical Atlantic to the Indian Ocean resulting in further changes in the fishing pattern for tropical tunas in the eastern Atlantic. The net result is an overall reduction of fishing intensity in the eastern tropical Atlantic, which should contribute to reduced catches of small yellowfin and bigeye.

### MLT-3. Temperate species

The SCRS has been monitoring multispecies interactions primarily as they relate to exploitation of mixed species by tuna fishing gears. So far results show that virtually all tuna fishing gears are capable of catching a variety of species depending on how, where and when the gears are deployed.

An example of this aspect of the tuna fisheries was presented in a document (SCRS/84/75) reviewed by the Committee. The longline gear has been employed in fishing for tunas, billfishes and swordfish in the Atlantic Ocean since the 1950's. This gear is known

to take a variety of species, although fishermen deploy it in ways to catch certain "target" species. In 1978, 1979 and 1980 detailed data on fishing operations of Japanese longliners that operated in the Fishery Conservation Zone (200-mile limit) of the United States were collected by trained observers. The data show that a much wider variety of species is being caught by the gear than are regularly reported in the fishery data. Tunas constituted the largest percentage of the catch; yellowfin and bigeye were the principal species caught, but also bluefin tuna in the Gulf of Mexico and albacore in the northwest Atlantic. Sharks, primarily the blue shark (*Prionace glauca*), were caught about as frequently as were some of the tunas, occurring in 84 percent of the sets made in the Gulf of Mexico and 99 percent of the sets in the northwest Atlantic. Relatively few billfishes were caught; white marlin and swordfish were the principal species.

The data also showed a number of interesting multispecies associations, such as yellowfin tuna, were often found in significant association with various billfish species, but not with swordfish or other tunas, whereas bluefin tuna were found in significant association with most tunas and billfishes in the Gulf of Mexico. In the northwest Atlantic, there was a significant association between yellowfin and bigeye but not between albacore and bigeye.

Another example was presented in document SCRS/84/43. The Spanish baitboat fleet in the Bay of Biscay reported substantial numbers of small bluefin tuna (age 1) being caught in 1983 while fishing for the more preferred species, albacore. This unusual catch is believed to be related in part to the unusually high abundance of a bluefin tuna year-class and may represent a means for monitoring year-class strength.

The search for acceptable procedures and models for incorporating data from multispecies fisheries for stock assessment purposes and for exploring optimum harvesting strategies is continuing. As noted in previous SCRS Reports, current stock-assessment analytical techniques used by the SCRS are for single species and do not use all of the information from multispecies fisheries.

Thus, the effects of species associations and catches of non-target species by fisheries, such as longliners and baitboats, can seriously affect estimates of abundance for individual species when obtained from multispecies fishery statistics and without proper adjustments. The Committee continues to encourage development of better techniques and to pursue ways of employing methods developed for other multispecies situations, such as the multispecies simulation model developed for tropical tunas, in studying temperate multispecies problems.

#### Item 10. REVIEW OF THE PROGRESS OF THE SKIPJACK PUBLICATION

A progress report on the status of the publication of the Skipjack Conference papers was presented by one of the co-editors, Dr. G. T. Sakagawa (SCRS/84/22). Preparations for the publication have been set back somewhat due to slow response by some of the referees and authors and to mail delays. Barring unforeseen delays, the Proceedings should be ready for printing in Spain in early 1985.

Some scientists expressed the view that the authors who withdrew their papers on the grounds that there was insufficient time for revision, on the premise that the publication would be complete by the fall of 1984, should be given a chance to reconsider revising their papers using this extra time caused by the delay. Though most of the authors were given at least 6 months for revision, it is understood that this extra time can indeed be utilized by authors who wish to revise their papers. However, this should not cause further delays in publication.

The editorial policy concerning withdrawn papers is that their abstracts will be included in the publication, and the texts of such papers will be included in the Collective Volume of Scientific Papers (Red Book series).

#### Item 11. REVIEW OF EDITORIAL AND PUBLICATION POLICY

The publication policy was discussed in two parts: the immediate future and the long-term.

For the immediate future, it was agreed that the Report of the Working Group on Bluefin Tuna would comprise one volume of the Collective Volume of Scientific Papers, together with the papers submitted at the Working Group meeting. Those papers should be cross-referenced with the Volume which contains all the 1984 SCRS papers (since the bluefin papers will not be included there again). The papers submitted for the "Day to Review Statistics" should be treated just the same as the other SCRS papers, i.e., included in the same volume and authorization for inclusion should be requested of the authors.

For the long-term publication policy, the SCRS Chairman reviewed the changes in publication policies which the SCRS and the Commission have adopted since the beginning of the Commission. Presently, the Collective Volume of Scientific Papers is a citable document, and there is no screening process for the inclusion of papers. It was pointed out that even a paper which was not judged suitable to be referenced in drafting the SCRS report can be included in the series and, therefore, can be cited. A suggestion was made that the species groups give an endorsement to papers for inclusion in the Collective Volume or suggest exclusion of some of the papers from the publication. This opinion was supported by a few scientists.

Publication policies adopted by other international organizations (e.g., NAFO, ICES) was compared with ICCAT's system. These organizations do not publish scientific contribution papers, except for a few selected ones. There are pros and cons but it was pointed out that one advantage of the ICCAT system is that it is a very open forum and many young scientists from developing countries have the opportunity to make contributions. In addition, many past papers are readily available for reference.

In general, it was recognized that a mechanism is lacking to feed back the SCRS's evaluation of papers to the authors. Recognizing the difficulties in establishing a feed-back mechanism and screening process of the papers, the Commission agreed that the scientists should give some careful thought to the problem and be ready to discuss the publication policy in depth at the next SCRS session.

It was pointed out that some figures and tables included in the Collective Volume are not well prepared nor clear to understand. The scientists were urged to observe the guidelines given to them for submitting documents which are attached to the Document Policy circulated well ahead of the SCRS Meeting.

**Item 12. CONSIDERATION OF RECOMMENDATIONS CONCERNING  
JUVENILE TROPICAL TUNA PROBLEMS**

The conclusions reached by the Working Group on Juvenile Tropical Tunas are reported under Agenda Item 7, and discussed thoroughly under Agenda Item 9. The recommendations made in the yellowfin, skipjack, bigeye and multispecies sections should be referred to.

**Item 13. REPORT OF THE GROUP TO STUDY PROCEDURES OF REPORTING  
STATISTICS**

The report of the Group was presented to the Sub-Committee on Statistics and attached as Addendum 2 to Appendix 3.

**Item 14. REPORT OF THE SUB-COMMITTEE ON STATISTICS AND REVIEW  
OF ATLANTIC TUNA STATISTICS AND DATA MANAGEMENT  
SYSTEM**

The Report of the Sub-Committee on Statistics was presented by the Convener, Dr. N. Bartoo. He highlighted the topics discussed during the Sub-Committee meeting, namely, improvement of sampling programs, proposal for research on sampling design, and the "Day to Review Statistics".

After a short review, the Committee reiterated all the recommendations made by the Sub-Committee and approved the Report (Appendix 3) with addenda which include the Report on the "Day to Review Statistics".

**Item 15. BLUEFIN TUNA LENGTH CORRESPONDING TO 6.4 KG (MINIMUM  
LEGAL SIZE)**

The present ICCAT size regulation for bluefin tuna sets the minimum legal size at 6.4 kg. Studies of bluefin length-weight relationships indicate that, on an average, a 6.4 kg bluefin measures about 67 cms in the western Atlantic and 69 cms in the east Atlantic and Mediterranean. For practical reasons, the Commission is advised that 70 cm may be used as the length equivalent of 6.4 kg for all Atlantic bluefin tuna fisheries for the purpose of implementing the minimum size regulation.

## Item 16. REVIEW OF SCRS RESEARCH PROGRAMS AND CONSIDERATION OF WORKING PROCEDURES

### 16.1. Major research items proposed during this SCRS session

The following were mentioned as major research items not specific to fisheries:

- Monitoring stocks after a large-scale relocation of surface tropical fishing effort from the eastern Atlantic to the Indian Ocean. This includes a proposal for a large-scale tagging program of yellowfin.
- Analyses of micro-elements in hard parts to estimate the mixing rate of various stocks and for verification of ages.
- Standardization of measures of fishing effort (particularly of longline).
- More accurate estimates of natural mortality.
- Various proposals for improvement of general statistics and sampling schemes.

The Chairman drew the scientists' attention to the report "Consideration for tuna research to the year 2000" (SCRS/84/23) which was written by a group of world tuna scientists that met early in 1984. He pointed out that many of the items proposed at the SCRS sessions coincide with those identified in this report as important future research items.

The program to monitor stocks in the eastern tropical Atlantic is discussed in detail in Section 16.2. It was pointed out that this program would require substantial funding from the Commission, should the Commission decide to carry it out.

The group heard that the results of the pilot study on micro-elements carried out by the U.S. will become available at the end of 1984. The SCRS Chairman noted that should the Commission decide to take over this important and promising program, it would also require substantial funding.

The Committee requested that the Commission give very serious consideration to the possibility for finding extra funding for these important future research programs, when they are well formulated and are proposed in the near future.

### 16.2 Study of the effects of decreased fishing effort in the eastern tropical Atlantic tuna fishery

Fishing effort on the stocks of tropical tunas (yellowfin, bigeye and skipjack) in the eastern tropical Atlantic is expected to decrease markedly in 1984 owing to the departure of the French-Ivory Coast purse seine fleet and part of the Spanish purse seine fleet to the Indian Ocean. As a consequence, fishing mortality, particularly for yellowfin tuna, is expected to decrease and the population biomass of yellowfin should increase. Over the next three or four years, this population response should be observable in abundance indices, such as in CPUE statistics. The Committee noted that similar results have been observed



in the eastern Pacific yellowfin population as the result of reduced fishing by purse seiners there in 1982 and 1983.

In order to acquire maximum information on the stocks affected by this marked reduction in fishing effort, the Committee emphasized the need for maintaining a high level of research effort and also proposed that an intensive monitoring effort for the next three to six years be instituted. This would consist of the following activities, many of which involve maintenance and intensification of on-going efforts:

- i) Catch and effort statistics from all fleets fishing in the eastern tropical Atlantic would be collected for estimating abundance indices. For the surface fishery, most critical will be statistics on the Spanish purse seine fleet, the Senegalese purse seine fleet and the Ghanaian baitboat and purse seine fleets. Statistics for the longline fleets, particularly of Korea and Cuba, will be required.
- ii) Size composition data of yellowfin catches would be collected for monitoring year-class strength. Improved statistics are required, particularly for catches made by the Ghanaian fleet, which occasionally uses Abidjan, Ivory Coast, for landing and transshipping large amounts of fish. Size statistics are also needed on the Korean and Cuban longline catches.
- iii) Trained observers would be placed on purse seiners and baitboats to collect detailed fishing data for monitoring trends in school size, frequency of sets, sizes of fish in schools, etc. The format of data to be collected will be the same as developed for the International Skipjack Year Program (ISYP) and emphasis will be on fleets that participated in the ISYP experiment, i.e., Spanish and Senegalese purse seine fleets. Table 25 provides estimates of the number of boats that will be required for this activity.
- iv) Analyses of various types would be performed with existing data and data currently being collected. Specific analyses that will be performed include: (a) detailed analysis of ISYP tag-recapture data to determine local movement of fish and competition among fleets; (b) calibration of CPUE for FIS purse seiners with CPUE for other fleets, particularly with the Spanish purse seine fleet; and (c) investigate ways to simplify baitboat logbooks and development of a better book.
- v) Alternative abundance monitoring techniques would be examined. Specific techniques that the Committee would like to employ include (a) aerial surveys in local areas in the Gulf of Guinea to index stock abundance; (b) use of fish aggregating devices (FAD's) for indexing stock abundance; and (c) intensive tagging of yellowfin to estimate population dynamics parameters. Because this latter tagging technique can be expensive, the Committee plans to develop a more detailed plan and will evaluate the cost-benefit of the plan before recommending that this technique be used.

Considering the importance of the program, and recognizing that much organization is needed to draw up a plan for the program, the SCRS Chairman nominated Dr. A. Fonteneau as coordinator to study the feasibility of the program, to establish goals and to define the scale of the program. Dr. Fonteneau was asked to circulate a discussion paper prior to the next SCRS session.

It was recognized that the special attention being focussed on the information that can be gained on stock dynamics as a result of purse seine effort reduction in the eastern Atlantic might necessitate the creation of a new working group. It was decided, however, that this need would be clearer following further discussions on the nature of the studies to be carried out.

#### *16.3 Intersessional meetings during 1985*

The Committee recognized that a proposal was made and accepted to hold another stock assessment session of the Working Group on Bluefin Tuna in 1985 prior to the SCRS. The meeting as proposed would necessitate high level computer facilities and interpretation services in three languages. Presently no invitation has been issued to host such a meeting. The Committee reiterated its endorsement of the proposal, while leaving the question of meeting site and convener pending, for resolution through correspondence.

The meeting should be held sufficiently in advance of the SCRS Meeting so that the scientists have enough time to digest the meeting report, which should be written and approved by the Working Group by the end of its meeting.

#### *16.4 Organization of 1985 SCRS*

It was noted that the present SCRS Report B is becoming somewhat repetitive, and the process to create the report itself is becoming more complicated and redundant. The objectives of introducing the system of Reports A and B some years ago are becoming lost. It was suggested that more strict guidelines be given to the rapporteurs so that the SCRS Report B would be streamlined.

The Committee congratulated again the Working Group on Juvenile Tropical Tunas for successfully completing the tasks given to the Group. It was decided that the Group will be dissolved unless further specific tasks concerning juvenile tunas are requested by the Commission at the coming meeting.

It was recommended that sensitivity analyses be made for the multispecies models employed in juvenile tuna studies to validate further the results. These analyses should be made by the laboratories which have worked on these models.

Since there are various items of a general nature to be discussed in depth at the next SCRS Meeting, (such as papers on estimating natural mortality, estimating standardized effort, and planning of east Atlantic stock monitoring are invited), the Committee decided that all the time allocated to the Committee would be utilized by the Committee itself, instead of forming special day activities, such as the "Day to Review Statistics".

#### *16.5 Organization of the SCRS in the near future*

The Committee recognized that SCRS assessments are becoming highly sophisticated and that this trend will intensify in the near future, so that the SCRS will require high-level computer facilities for the meeting. Contradictory papers can be reconciled using a

computer, and stock assessment analyses can be updated at the meeting using the most current data base and parameters available; many analytical models can even be developed during the SCRS sessions.

Up to now, only a few species have required such work and it has been carried out during intersessional meetings (e.g., the Working Group on Juvenile Tropical Tunas, the Working Group on Bluefin Tuna). It is, however, foreseen that all stock assessments will require such detailed studies in the near future. The present work scheme of the SCRS may not be able to accommodate such analytical needs of the Committee.

The Committee agreed to discuss this subject in depth at the 1985 SCRS meeting, to study several alternative work formats that would introduce more analytical capability to the Committee's meetings and present these alternatives to the Commission for consideration. These alternatives could include: an extended SCRS session with high-level computer facilities which could take place either immediately prior to the Commission meeting or even separately (before) the Commission meeting; an increased number of working groups on various species which may meet simultaneously or individually during the intersessional period.

#### Item 17. COOPERATION WITH OTHER ORGANIZATIONS

The Committee reviewed cooperation of ICCAT with other organizations as reported in COM/84/11. It was noted that close cooperation has been maintained with IATTC, particularly in estimating the catch of the Venezuelan fleet.

The FAO representative requested continuing cooperation by ICCAT SCRS scientists in the FAO project to prepare a "Synthesis on tuna resources in the east tropical Atlantic".

The observer from the International Commission for the Exploration of the Mediterranean (CIEM) requested that close cooperation between his organization and ICCAT be maintained, particularly with respect to research on Mediterranean bluefin stocks, and invited ICCAT scientists to attend a working group meeting to evaluate the use of egg-larvae survey data as abundance indices. The group is meeting in Italy in 1985 and a more definitive invitation will be sent to ICCAT bluefin scientists through the ICCAT Secretariat.

The Committee noted that organization of an inter-agency working party on tuna statistics on a world-wide basis has been suggested and the idea has been entertained by various tuna scientists ("Considerations for Tuna Research to the Year 2000", SCRS/84/23). It was suggested that the Secretariat keep in contact and cooperate with the people promoting this idea and, as the plan develops, report the progress to the Committee.

**Item 18. RECOMMENDATIONS**

SCRS recommendations concerning statistics, research and management of tuna species are found in Section 4 of the respective species sections and in the section on multi-species of Agenda Item 9. It should be noted that many of these recommendations are based on the results of the Working Group on Juvenile Tropical Tunas and Working Group on Bluefin Tuna and, therefore, the Commission should also give adequate attention to these reports.

**Item 19. OTHER MATTERS**

The World Tuna Conference, proposed in the report of Research to the Year 2000 (SCRS/84/23), was discussed briefly. It was noted that the organization of and responsibility for the conference are being debated at present. ICCAT, as an international organization on tuna management, would like to be recognized as a possible sponsoring organization but found it premature to discuss how contributions can be identified. The Secretariat was requested to keep in contact with pertinent people and organizations and to report the progress to the Commission and SCRS.

**Item 20. ADOPTION OF REPORT**

The Report was adopted.

**Item 21. ADJOURNMENT**

The Chairman thanked all the participants for their cooperation and commended the hard work done. He also thanked the Secretariat staff and interpreters for their invaluable assistance.

The meeting was adjourned.

**Table 1. Atlantic yellowfin tuna catch (1,000 MT)**

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984*
<b>TOTAL</b> . . . . .	72.8	93.1	94.1	106.3	124.2	122.9	128.7	126.3	125.2	124.3	47.3	156.6	131.5	
<b>East Atlantic</b> . . . . .	57.1	77.7	79.2	91.8	107.7	109.1	115.2	111.2	111.6	111.2	130.3	131.1	108.1	58.7
–Surface . . . . .	43.9	59.7	59.9	74.9	94.1	96.4	99.6	100.0	104.8	98.7	122.4	121.1	102.0	52.9
Baitboat . . . . .	10.3	12.7	14.3	19.3	9.3	12.7	11.0	8.7	13.7	7.6	9.8	13.2	11.3	7.3
Angola . . . . .	.5	.6	.6	.8	.1	1.0	1.9	2.0	.8	.5	.7	1.4	.7	.7
FIS . . . . .	7.4	7.4	5.5	6.3	2.9	3.7	3.4	2.8	2.2	2.1	2.9	3.0	2.7	2.7
Ghana . . . . .	0.	.0	.1	.3	.7	.8	.6	.3	1.2	1.7	2.5	5.6	5.0	.9
Japan . . . . .	2.0	3.5	6.5	7.1	1.1	4.9	2.6	1.4	1.0	.5	1.7	1.2	1.0	1.0
Korea-Panama . . . . .	0.	.4	.8	2.8	3.5	2.0	2.1	1.7	4.1	1.4	1.0	.7	.2	.2
Spain . . . . .	.4	.7	.8	2.0	1.0	.2	.3	.2	.1	.1	.1	.4	.7	.7
Others . . . . .	0.	0.	0.	.0	.0	.0	.1	.2	4.4	1.2	.7	.8	1.1	1.1
Purse seine . . . . .	32.2	47.0	44.5	53.1	83.0	83.6	88.3	90.5	89.9	90.7	111.7	107.5	90.1	45.0
FISMP . . . . .	18.6	23.8	26.2	32.2	44.8	47.9	46.5	52.5	46.4	49.2	54.0	45.0	38.0	5.0
Japan . . . . .	2.0	2.5	1.2	.8	.1	0.	0.	0.	0.	0.	0.	.8	1.2	1.1
Spain . . . . .	7.4	8.6	13.3	14.0	23.7	33.2	35.3	29.3	39.9	38.7	51.3	53.8	46.6	36.0
U.S.A. . . . .	3.8	12.0	3.0	5.6	14.0	1.7	6.4	8.1	2.9	1.6	1.5	.6	0.	0.
Others . . . . .	.4	.2	.8	.4	.4	.8	.2	.6	.7	1.2	5.0	7.3	4.3	2.9
Other gears . . . . .	1.4	.0	1.2	2.5	1.9	.0	.3	.8	1.3	.5	.9	.4	.6	.6
–Longline . . . . .	13.2	18.0	19.2	16.9	13.6	12.8	15.6	11.3	6.8	12.5	7.9	9.9	6.1	5.8
China (Taiwan) . . . . .	3.4	3.5	1.5	1.0	1.3	.6	.2	.2	.2	.1	.4	.2	.4	.4
Cuba . . . . .	1.4	3.2	4.5	3.0	1.7	1.8	2.9	1.9	2.6	4.9	2.5	2.1	1.6	2.1
Japan . . . . .	1.6	2.3	1.3	.7	1.7	.3	.1	.3	.3	1.7	1.2	2.8	.9	0.
Korea-Panama . . . . .	6.9	7.8	11.9	12.2	8.8	8.5	10.7	8.4	3.1	5.6	3.6	4.7	3.1	3.1
Others . . . . .	0.	1.1	.0	0.	0.	1.6	1.8	.5	.6	.2	.3	.1	.2	.2

West Atlantic . . . . .	15.7	15.3	14.9	14.5	16.5	13.8	13.4	15.1	13.6	13.1	17.0	25.6	23.4
– Surface. . . . .	0.	3.4	2.3	1.6	2.0	.7	1.4	4.7	3.6	5.6	4.8	15.1	17.2
– Longline. . . . .	13.9	11.6	12.4	12.6	14.2	12.6	11.4	9.5	9.0	6.6	11.3	9.8	5.8
China (Taiwan). . . . .	1.0	1.2	1.2	1.3	1.1	1.1	.1	.2	.8	.5	.4	.4	.1
Cuba . . . . .	.3	.4	0.	.4	.6	1.2	.9	.7	.2	.7	2.0	1.5	.8
Japan . . . . .	9.1	4.2	2.5	2.8	2.4	3.1	1.4	1.6	1.7	1.1	3.0	3.3	1.2
Korea-Panama . . . . .	3.0	3.3	6.5	6.5	8.9	5.9	7.1	5.0	4.4	2.7	3.6	2.9	2.0
Others . . . . .	.5	2.6	2.2	1.5	1.1	1.4	1.8	2.1	1.9	1.5	2.4	1.8	1.7
– Uncl. gears . . . . .	1.8	.3	.3	.3	.4	.5	.6	.8	1.0	.9	.9	.6	.5
<b>Uncl. region . . . . .</b>	<b>0.</b>	<b>.1</b>	<b>0.</b>	<b>0.</b>	<b>0.</b>	<b>0.</b>	<b>0.</b>	<b>0.</b>	<b>0.</b>	<b>0.</b>	<b>0.</b>	<b>0.</b>	<b>0.</b>
– Surface. . . . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
– Longline. . . . .	0.	.1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
– Uncl. gears . . . . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

\*Provisional.

**Table 2. Estimated carrying capacity (thousands of MT) of yellowfin and skipjack surface fisheries in the eastern Atlantic Ocean**

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984*
<b>— Baitboat</b>															
FISM . . . . .	3.4	2.8	2.7	2.1	2.0	1.8	1.5	1.3	1.3	1.4	1.3	1.3	1.3	1.2	1.2
Tema-based . . . . .	1.2	1.6	3.2	4.0	8.7	9.2	7.3	11.0	12.8	11.6	9.7	8.7	8.1	8.0	7.2
Canary Islands . . . . .	.3	.4	.6	1.0	1.9	1.6	.6	.6	.6	.6	.6	.6	.6	.6	.6
Angola . . . . .			.3					.5	.5	.5	.4	.5	.4	.4	.4
Cape Verde . . . . .											.2	.2	1.0	1.0	1.0
Portugal. . . . .	.5	.5	.5	.5	.4	.6	.3	.3	.3	.6	.6	.5	.3	.3	.3
Total baitboat. . . . .	5.4	5.3	7.3	7.6	13.0	13.2	9.7	13.7	15.5	14.7	12.8	11.8	11.7	11.5	10.7
<b>— Purse Seine</b>															
FISM . . . . .	5.8	7.2	9.2	12.4	14.5	17.2	17.5	14.6	17.6	16.5	17.2	16.8	16.3	16.8	4.8
Spain . . . . .	2.7	3.6	5.6	7.5	9.1	14.0	17.2	20.4	24.3	25.2	27.9	27.6	31.5	36.8	34.0
U.S.A. . . . .	5.4	3.8	11.9	2.9	5.5	10.4	1.7	4.2	10.5	3.2	2.2	1.6	1.3	0.	0.
Japan . . . . .	1.5	2.0	1.9	1.9	.6	.2							.4	.4	.4
U.S.S.R. . . . .	.1	.1	.1	.1	.1	.1	.1	.1	.2	1.0	3.0	3.9	4.9	4.9	4.9
Others** . . . . .	.2	.2	.9	.2	.2	.4	.2	.2	.2	.7	2.9	4.9	10.8	10.2	6.4
Total purse seine . . . . .	15.7	16.9	29.6	25.	30.	42.3	36.7	39.5	52.8	46.6	53.2	54.8	65.2	69.1	40.5
Total baitboat and purse seine . . . . .	21.1	22.2	36.9	32.6	43.	45.5	46.4	53.2	68.3	61.3	66.	66.6	78.9	80.6	61.2

\*Preliminary.

\*\*Ghana, Mexico, Congo, Gran Cayman, Portugal, Venezuela.

Source: SCRS/83/27 (1984 added)

Table 3. Estimates of MSY and corresponding optimum effort using various values of m and k for the 1969-84 data series for east Atlantic yellowfin

<i>m</i> \ <i>k</i>	0	1	2	Variable
3	179.7 inf	116.1 82.4	114.9 68.4	114.4 70.0 m 1.72
5	151.3 inf	107.4 71.1	108.0 62.6	107.8 62.8 m 1.92

Upper figure = MSY x 10<sup>3</sup> MT.

Lower figure = F-opt x 10<sup>3</sup> days fishing.





**Table 5. Catches ( $10^6$  fish) of bigeye tuna (less than 55 cm FL) and the efficiency of the minimum size regulation**

<i>Year</i>	<i>Small</i>	<i>Catch</i>	<i>Total</i>	<i>o/o of small fish</i>	<i>F*</i>
1974.....					
1975.....	.3		1.2	25.0	.09
1976.....	1.6		3.0	53.3	.50
1977.....	1.8		3.0	60.0	.53
1978.....	.9		2.1	42.8	.40
1979.....	1.1		2.1	52.4	.44
1980.....	2.1		2.9	72.4	.61
1981**.....	2.3		3.5	65.7	.65
1982.....	2.1		3.3	63.6	.34

\*Average F for fish less than 55 cm/total F.

\*\*Bigeye size limit was initiated.

**Table 6. Atlantic skipjack catch (1,000 MT)**

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
<b>TOTAL</b> .....	77.9	74.7	77.1	116.3	59.7	74.5	110.2	109.7	88.5	108.4	129.4	153.7	131.7
<b>- Surface - East Atlantic</b> . . .	75.1	72.8	73.6	111.9	55.2	70.3	106.6	102.4	81.6	95.2	105.9	120.3	98.9
Purse seine	48.6	48.8	49.8	74.2	35.4	32.5	55.9	61.2	35.6	53.3	64.6	73.1	62.1
FIS	13.1	13.6	7.9	22.6	10.5	14.9	28.4	22.5	15.6	21.3	25.3	27.6	24.9
Japan	6.2	3.4	1.5	.9	.1	0.	0.	0.	0.	0.	0.	1.4	1.4
Spain	11.9	19.5	17.8	30.6	16.9	15.6	21.5	29.0	17.4	24.2	31.3	34.7	32.0
U.S.A.	16.2	12.2	21.2	20.0	7.4	1.8	5.9	6.8	2.1	2.6	2.8	.1	0.
Ghana	0.	0.	.2	0.	.2	.1	0.	0.	0.	.3	2.7	3.9	2.8
Portugal	0.	0.	0.	0.	0.	0.	0.	.2	.1	.2	.1	.8	.1
Others	1.4	.2	1.2	.1	.3	.2	.1	2.7	.4	4.7	2.4	4.7	.9
Baitboat	26.3	23.8	23.6	37.6	15.3	28.2	42.7	40.3	44.6	38.1	38.9	44.5	34.7
Angola	1.9	1.5	1.3	3.4	.6	1.5	3.8	3.2	3.6	3.5	2.3	2.2	.3
FIS	5.6	3.7	3.2	4.4	1.8	2.1	2.7	3.3	3.3	3.1	2.6	4.4	2.6
Ghana	0.	0.	.1	.7	1.3	2.1	3.5	2.6	4.0	4.7	4.9	14.3	20.5
Japan	11.7	10.1	13.0	18.7	3.7	15.0	16.8	14.6	14.7	12.3	12.9	8.5	4.6
Korea-Panama	0.	.7	1.1	3.1	6.3	4.4	7.6	11.1	13.6	8.5	7.7	5.4	3.2
Spain	2.7	4.1	2.6	5.4	.8	.6	.7	.6	1.3	2.2	4.2	3.4	1.3
Portugal	4.2	3.7	2.2	1.9	.6	2.1	4.4	4.4	3.0	1.7	2.7	4.8	1.0
Cape Verde	0.	0.	0.	0.	0.	.3	.9	.5	1.0	2.1	1.6	1.6	1.2
Others	.1	.0	.1	.1	.3	.0	2.2	0.	0.	.0	.1	.0	.0
Other gears	.1	.2	.1	.1	4.5	9.6	8.1	.9	1.4	3.8	2.4	2.7	2.0

— Surface - West Atlantic . . .	2.2	1.4	2.7	3.3	3.4	3.7	3.2	6.6	6.2	12.8	22.8	31.8	31.4
Purse seine. . . . .	0.	1.2	.3	.1	.4	.7	.6	3.5	1.5	3.1	4.7	9.7	12.2
U.S.A. . . . .	0.	.1	0.	0.	.2	.5	.3	1.6	.7	1.0	2.6	.0	.6
Others. . . . .	0.	1.0	.3	.1	.2	.2	.3	1.8	.8	2.1	2.1	9.7	11.6
Baitboat . . . . .	1.6	0.	1.9	3.0	2.8	2.8	2.4	2.8	4.4	9.4	18.1	22.0	19.1
Brazil . . . . .	0.	0.	0.	0.	0.	0.	0.	0.	1.8	6.1	13.9	16.0	11.7
Cuba. . . . .	1.6	0.	1.5	1.8	2.3	2.8	2.4	1.8	2.0	2.3	1.1	1.1	1.7
Others. . . . .	0.	0.	.4	1.2	.5	0.	0.	1.0	.5	1.0	3.1	4.9	5.7
Other gears . . . . .	.6	.2	.5	.3	.2	.2	.2	.3	.3	.3	.1	.1	.1
— Surface - Uncl. region . . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
LL - Trawl - All Atl. .	.1	.1	.1	.2	.2	.0	.1	.1	.0	.0	.1	.0	.6
— Unclassified gears . . . . .	.5	.5	.7	.9	1.0	.4	.2	.6	.6	.5	.7	1.6	.9

Table 7. Skipjack nominal CPUE (annual catch/annual days fishing) for the FISM fleet, 1969-1983

<i>Year</i>	<i>Baitboats</i>	<i>Medium purse seiners</i>	<i>Large purse seiners</i>
1969	.40	.84	.35
1970	.60	1.31	1.98
1971	.93	1.73	2.51
1972	.73	1.73	2.95
1973	.71	.92	1.34
1974	1.00	1.95	3.22
1975	.56	1.07	1.02
1976	.76	.83	1.65
1977	.99	2.32	3.41
1978	1.20	2.03	2.34
1979	1.32	1.84	1.56
1980	1.40	2.61	1.88
1981	1.08	3.40	2.00
1982	1.73	2.73	2.24
1983	.99	2.39	1.91

**Table 8. Atlantic albacore catch (1,000 MT)**

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
<i>TOTAL</i> . . . . .	83.1	83.4	75.7	72.5	59.4	77.2	75.0	72.1	72.5	60.8	59.2	72.3	65.9
<b>North Atlantic</b> . . . . .	57.6	49.4	47.0	52.3	41.4	57.3	52.9	48.5	49.7	38.2	34.1	42.0	50.3
— Surface . . . . .	39.7	34.7	28.8	37.6	28.7	34.3	32.0	34.3	38.1	28.7	24.3	28.8	34.0
Baitboat . . . . .	15.7	8.2	10.1	16.7	19.2	20.4	15.6	11.7	15.9	16.2	13.4	15.9	21.0
France . . . . .	1.5	.5	1.1	.6	.7	1.1	.6	.4	.2	.4	.4	.2	.2
Spain . . . . .	13.9	7.3	8.2	14.9	17.6	18.7	14.9	11.3	15.6	15.7	12.6	15.3	19.0
Others . . . . .	.3	.4	.9	1.2	.9	.6	.1	.1	.1	.1	.4	.4	1.9
Trolling . . . . .	24.0	26.5	18.7	21.0	9.5	13.9	16.5	22.6	22.1	12.6	10.8	12.8	12.8
France . . . . .	7.7	8.7	5.8	7.9	5.0	5.7	6.2	8.4	7.8	3.1	2.5	2.7	2.2
Spain . . . . .	16.3	17.8	12.9	13.1	4.5	8.2	10.3	14.1	14.2	9.5	8.3	10.1	10.6
Others . . . . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Other gears . . . . .	0.	0.	0.	0.	0.	0.	0.	0.	.1	.0	.1	.1	.2
— Longline . . . . .	17.9	14.7	18.1	14.6	12.7	23.0	20.9	14.2	11.6	9.5	9.8	13.2	16.3
China (Taiwan) . . . . .	2.9	4.4	9.5	9.5	8.1	14.8	13.7	9.3	7.0	7.1	6.6	10.5	14.3
Japan . . . . .	6.5	1.3	1.5	2.1	1.3	1.3	.8	.5	1.2	1.0	1.7	.8	1.2
Korea-Panama . . . . .	7.7	8.2	7.2	3.0	3.1	6.6	6.1	3.8	3.4	1.0	1.1	1.8	.8
Others . . . . .	.8	.8	0.	0.	.2	.2	.2	.5	.0	.4	.4	.1	.1

Table 8. (cont.)

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
<b>South Atlantic</b> . . . . .	25.0	33.3	28.2	19.7	17.5	19.2	21.3	23.0	22.3	22.1	23.6	29.0	14.3
– Surface . . . . .	0.	.1	.1	.1	.2	.0	.3	.2	.5	1.5	3.2	3.7	2.5
– Longline . . . . .	25.0	33.2	28.1	19.6	17.4	19.2	21.0	22.8	21.8	20.6	20.3	25.3	11.8
China (Taiwan) . . .	17.5	25.0	22.2	16.7	13.4	14.6	16.1	20.5	20.3	18.7	18.2	22.8	9.5
Japan . . . . .	3.2	2.1	.3	.1	.3	.1	.1	.1	.1	.3	.6	.6	.2
Korea-Panama . . . .	3.8	5.8	5.6	2.6	3.5	4.1	4.1	1.7	1.0	.9	.8	.8	.6
Others . . . . .	.5	.3	.1	.2	.2	.3	.6	.5	.4	.7	.8	1.1	1.6
<b>Mediterranean</b> . . . . .	.5	.7	.5	.5	.5	.6	.6	.6	.5	.5	1.5	1.3	1.2
<b>Unclassified region</b> . . . .	0.	0.	.0	0.	.0	.1	.2	.1	.0	.0	.0	.0	0.
– Surface . . . . .	0.	0.	.0	0.	.0	0.	.0	.1	.0	.0	.0	.0	0.
– Longline . . . . .	0.	0.	0.	0.	0.	.1	.2	.0	0.	0.	0.	0.	0.
– Unclassified gears . . . .	0.	.0	0.	.0	0.	0.	0.	.0	0.	.0	0.	.0	.1

**Table 9. Atlantic bluefin tuna catches (1,000 MT)**

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
<b>TOTAL</b> . . . . .	17.7	15.4	14.7	21.7	26.3	28.3	25.6	20.5	18.5	18.9	19.2	22.7	22.8
<b>West Atlantic</b> . . . . .	6.9	4.1	4.1	3.5	5.2	6.0	6.8	5.9	6.5	5.9	5.9	1.5	2.8
Small fish. . . . .	3.4	1.7	1.5	1.2	2.2	1.4	1.4	1.2	1.1	.8	.9	.2	.4
–Purse seine. . . . .	3.3	1.6	1.5	.9	2.1	1.4	1.4	1.2	1.0	.8	.9	.2	.4
Canada . . . . .	.9	.3	.6	.1	.3	.3	.3	.2	0.	0.	.1	0.	0.
U.S.A. . . . .	2.4	1.3	.8	.8	1.8	1.1	1.1	.9	1.0	.8	.8	.2	.4
–Rod & Reel . . . . .	.1	.1	.0	.3	.1	.0	.1	.1	.1	0.	0.	0.	0.
U.S.A. . . . .	.1	.1	.0	.3	.1	.0	.1	.1	.1	0.	0.	0.	0.
Large fish. . . . .	3.3	2.2	2.3	2.1	2.6	4.4	5.3	4.5	5.1	5.0	4.8	1.1	2.2
–Purse seine. . . . .	.5	.4	.2	.1	.3	.2	.2	.1	.4	0.	0.	0.	0.
U.S.A. . . . .	.5	.4	.2	.1	.3	.2	.2	.1	.4	0.	0.	0.	0.
–Rod & Reel . . . . .	1.0	1.0	.5	.6	.2	.6	.6	.4	.4	.5	.5	.2	.5
Canada . . . . .	.1	.2	.2	.4	.2	.3	.3	.2	.2	.3	.3	0.	.1
U.S.A. . . . .	.8	.8	.2	.1	0.	.2	.3	.2	.2	.3	.2	.2	.4
–Longline . . . . .	1.5	.3	1.1	.9	1.5	3.1	3.8	3.2	3.7	4.0	3.9	.4	.8
Japan . . . . .	1.4	.3	1.1	.9	1.5	2.9	3.7	3.1	3.6	3.9	3.8	.3	.7
Others. . . . .	.1	.0	.0	.0	.0	.2	.1	.1	.1	.0	.1	.1	.1
–Other gears . . . . .	.4	.5	.5	.5	.8	.6	.8	.8	.7	.5	.4	.5	.9
Canada . . . . .	.1	0.	.1	.3	.1	.2	.4	.2	.0	.1	.0	.3	.4
U.S.A. . . . .	.3	.5	.4	.3	.7	.4	.4	.6	.6	.5	.4	.2	.5
–Uncl. gears. . . . .	.1	.1	.2	.2	.2	.2	.1	.2	.2	.1	.2	.3	.3



Table 9. (cont.)

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
<b>East Atlantic</b> . . . . .	4.6	5.5	4.7	6.1	10.0	5.2	7.0	5.8	4.8	4.1	3.4	6.7	8.0
Small fish. . . . .	2.2	3.4	2.7	2.2	4.3	1.3	2.3	2.3	1.6	1.6	1.1	1.5	3.0
–Baitboat . . . . .	2.2	2.9	2.2	1.6	1.7	.9	1.6	2.3	1.4	1.5	1.0	.9	2.7
France. . . . .	.7	.7	.5	.5	.7	.3	.6	.7	.3	.3	.2	.2	.4
Spain . . . . .	1.5	2.1	1.7	1.1	1.0	.7	1.0	1.6	1.1	1.2	.9	.7	2.3
–Purse seine . . . . .	.0	.5	.5	.6	2.6	.3	.7	.0	.2	.2	.1	.6	.3
Morocco . . . . .	.0	.5	.5	.6	2.6	.3	.7	.0	.2	.2	.1	.6	.3
–Uncl. gears . . . . .	.1	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Large fish. . . . .	2.3	2.0	1.9	3.9	5.6	3.9	4.7	3.5	3.2	2.5	2.3	5.2	5.0
–Purse seine . . . . .	.6	.4	.4	.9	1.0	.5	.8	.2	.1	.3	.2	.1	.0
Norway . . . . .	.6	.4	.4	.9	1.0	.5	.8	.2	.1	.3	.2	.1	.0
–Baitboat . . . . .	.8	.9	.9	.7	1.3	.9	1.3	1.6	.8	.4	.5	.1	.4
Portugal. . . . .	0.	0.	0.	.2	.3	.0	.0	.1	.0	.0	.0	.0	.1
Spain . . . . .	.8	.9	.9	.5	1.0	.8	1.3	1.5	.8	.4	.5	.0	.3
–Trap . . . . .	.7	.4	.5	.0	.4	.5	.6	.5	.6	.7	.9	2.3	2.0
Morocco . . . . .	.1	.1	.0	.0	0.	0.	.2	0.	0.	.0	.1	.4	.1
Spain . . . . .	.6	.3	.5	.0	.4	.5	.3	.5	.6	.7	.8	1.9	1.9
–Longline . . . . .	.3	.3	.1	2.2	2.9	2.0	1.8	.7	.7	1.0	.6	2.7	2.6
Spain . . . . .	0.	0.	0.	0.	.0	0.	0.	0.	.1	0.	.0	.1	.0
Japan . . . . .	.2	.2	.0	2.2	2.9	2.0	1.6	.6	.6	.9	.5	2.6	2.6
Others. . . . .	.1	.0	.0	.0	.0	.1	.2	.2	.0	.1	.1	.0	.0
–Other gears . . . . .	0.	0.	.0	0.	0.	0.	.3	.5	1.0	.0	.1	.0	.0

Uncl. region . . . . .	.0	0.	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.
China (Taiwan) . . . . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Korea . . . . .	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Panama . . . . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Cuba . . . . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Others . . . . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
<b>Mediterranean . . . . .</b>	<b>6.2</b>	<b>5.8</b>	<b>6.0</b>	<b>12.1</b>	<b>11.1</b>	<b>17.1</b>	<b>11.8</b>	<b>8.8</b>	<b>7.3</b>	<b>8.9</b>	<b>9.9</b>	<b>14.5</b>	<b>12.0</b>
Small fish . . . . .	3.2	3.2	3.2	5.1	4.0	10.0	5.6	5.4	3.3	4.0	5.9	8.7	7.4
—Purse seine . . . . .	3.1	3.1	3.1	5.0	3.9	9.9	5.4	5.2	3.1	4.0	5.7	8.6	6.8
France . . . . .	2.2	1.1	1.4	1.8	1.6	3.8	3.2	1.6	1.5	1.7	2.3	4.8	3.6
Italy . . . . .	.5	1.8	1.5	2.9	2.1	5.5	1.3	2.6	.8	1.8	3.0	3.3	2.0
Morocco . . . . .	.0	.0	0.	.0	.0	.0	.0	0.	.0	0.	.0	0.	.0
Yugoslavia . . . . .	.3	.2	.2	.3	.2	.6	.9	1.0	.7	.5	.4	.5	1.2
—Other gears . . . . .	.1	.1	.1	.1	.1	.1	.2	.2	.1	.0	.2	.2	.5
Italy . . . . .	.1	.1	.1	.1	.1	.1	.1	.1	.1	0.	.1	.1	0.
Spain . . . . .	0.	0.	0.	0.	.0	0.	.1	.1	.0	.0	.1	.1	.5
Large fish . . . . .	3.1	2.6	2.8	7.0	7.1	7.1	6.2	3.5	4.1	4.9	4.0	5.8	4.7
—Purse seine . . . . .	.8	1.0	1.2	3.1	4.2	4.1	4.2	2.1	2.9	3.4	1.7	2.2	2.6
Italy . . . . .	.8	1.0	1.2	3.1	4.2	4.1	4.2	2.1	2.9	3.4	1.7	2.2	2.6

Table 9. (cont.)

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
—Trap . . . . .	2.0	1.3	1.0	1.4	1.5	1.5	1.2	1.0	.7	.7	.6	.6	.4
Italy . . . . .	1.0	.8	.4	.7	.7	.7	.7	.2	.2	.2	.2	.2	0.
Libya . . . . .	.6	.3	.4	.5	.6	.8	.3	.7	.4	.4	.3	.3	.3
Morocco . . . . .	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.
Spain . . . . . <sup>1</sup>	.1	.1	.0	.0	.0	.0	.0	0.	0.	.0	.1	.0	
Tunisia . . . . .	.2	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
—Longline . . . . .	.1	.2	.5	2.4	1.4	1.2	.6	.2	.2	.2	.3	1.5	.9
Spain . . . . .	.1	.1	.3	.2	.1	.3	.1	.1	.1	.1	.2	.5	.2
Japan . . . . .	0.	.1	.2	2.2	1.3	1.0	.5	.1	.1	.1	.1	1.0	.7
Others . . . . .	0.	0.	0.	0.	.0	0.	.0	0.	0.	0.	0.	0.	0.
—Other gears . . . . .	.1	.1	.1	.1	.1	.3	.3	.2	.3	.6	1.4	1.5	.8

**Table 10. Bluefin catches in numbers (in 1,000 fish)**

<i>YEAR</i>	<i>EAST ATLANTIC TOTAL</i>	<i>MEDITERRANEAN TOTAL</i>	<i>NOS. &lt; 120 CM</i>	<i>WEST ATLANTIC NOS. ≥ 120 CM</i>	<i>TOTAL</i>
1960	903	51	2	14	16
1961	1132	80	6	18	24
1962	703	261	65	112	177
1963	806	1188	137	158	295
1964	752	119	97	138	235
1965	408	66	194	95	289
1966	777	556	251	41	292
1967	780	793	148	29	177
1968	232	835	60	14	74
1969	366	160	70	13	83
1970	254	99	292	27	319
1971	120	288	282	29	311
1972	244	219	176	15	191
1973	231	210	108	20	128
1974	272	374	99	25	124
1975	832	458	201	21	222
1976	172	606	98	21	119
1977	318	606	45	44	89
1978	254	500	39	32	71
1979	149	215	31	37	68
1980	172	323	35	33	68
1981	183	473	36	33	69
1982	267	1757	9	3	12

**Table 11. Results of yield-per-recruit calculations (Thompson and Bell) for western Atlantic bluefin tuna under three assumptions of fishing pattern at age and  $m = 0.18$ .**

<i>Fishing pattern</i>	<i>Weights at age</i>	<i>Y/R at F-max (kg)</i>	<i>Equilibrium<sup>1</sup> yield at F-max (MT)</i>	<i>Biomass per recruit at F-max (kg)</i>	<i>Equilibrium<sup>1</sup> biomass at F-max (MT)</i>
1970.....	July	7.831	2,741	71.239	24,850
1981.....	July	17.281	6,048	141.701	49,700
1982.....	Sept.	18.118	6,341	183.102	64,050

<sup>1</sup> Under geometric mean recruitment of 350,000 fish.

**Table 12. Effect of the regulation limiting the catches of bluefin tuna less than 6.4 kg (in 1,000 fish)**

Year	EAST ATLANTIC			MEDITERRANEAN			WEST ATLANTIC		
	Nos. < 6.4 kg	Total No.	o/o < 6.4 kg	Nos. < 6.4 kg	Total No.	o/o < 6.4 kg	Nos. < 6.4 kg	Total No.	o/o < 6.4 kg
1971.....	8	120	6.7	193	288	67.0	77	311	24.8
1972.....	107	244	43.9	39	220	17.7	47	191	24.6
1973.....	140	231	60.6	97	210	46.2	6	128	4.7
1974.....	139	272	51.1	183	374	48.9	56	124	45.2
1975.....	625	831	75.2	211	458	46.1	44	222	19.8
				Size regulation started					
1976.....	79	171	46.2	107	606	17.7	5	119	4.2
1977.....	163	318	51.3	313	606	51.7	1	89	1.1
1978.....	129	254	50.8	195	500	39.0	5	71	7.0
1979.....	59	148	39.9	55	215	25.6	3	68	4.4
1980.....	98	172	57.0	67	323	20.7	3	68	4.4
1981.....	115	133	86.5	55	473	11.6	5	69	7.2
1982.....	229	267	85.8	1169	1757	66.5	4	12	33.3

**Table 13. Blue marlin catches and/or landings (MT)**

<i>Country</i>	<i>Gear</i>	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
<b>North Atlantic total</b>		1615	1731	1924	1243	1171	848	782	928	1090	1458	952
Benin	SURF	0	0	0	0	0	0	0	0	6	8	0
China (Taiwan)	LLFB	155	183	105	169	64	81	51	160	98	100	106
Cuba	LL	223	516	594	250	220	97	156	156	187	318	273
Grenada	UNCL	0	0	0	0	**	**	0	0	0	0	0
Japan	LL	229	0	551	0	0	0	0	0	0	0	0
Japan	LLHB	0	267	0	260	118	54	68	193	332	637	192
Korea	LLFB	457	385	304	174	307	185	67	45	70	18	25
Panama	LLFB	208	62	44	47	87	42	6	0	0	0	0
Portugal	BB	0	0	0	0	0	0	0	0	0	1	2
U.S.A.	SPOR	209	234	241	265	295	295	295	295	295	295	187 <sup>1</sup>
U.S.S.R.	LLMB	10	1	3	0	1	1	7	0	0	0	0
Venezuela	LL	124	83	82	78	79	93	132	79	102	81	167
<b>South Atlantic total</b>		1565	1101	1106	948	915	524	536	544	435	832	496
Brazil	LLHB	8	16	12	22	0	12	12	12	0	1	1
Brazil	SURF	0	0	0	11	52	2	13	7	20	20	3
Brazil-Japan	LLFB	0	0	0	0	136	29	4	8	5	15	15
Brazil-Korea	LLFB	0	0	0	12	35	0	0	0	0	0	0
China (Taiwan)	LLFB	537	369	422	240	107	177	139	129	104	150	39
Cuba	LL	75	170	195	159	100	113	180	180	113	118	123
Japan	LL	117	0	57	0	0	0	0	0	0	0	0
Japan	LLHB	0	17	0	4	17	15	66	115	136	495	248
Korea	LLFB	532	449	354	392	356	140	78	92	56	33	67
Panama	LLFB	244	72	51	107	103	32	7	0	0	0	0
South Africa	LLHB	0	0	0	0	0	0	0	1	0	0	0
U.S.S.R.	LLMB	52	8	15	1	9	4	37	0	1	0	0

<b>Unclassified region total</b>		0	0	0	0	0	0	0	0	213	281	145
France	PS	0	0	0	0	0	0	0	0	150 <sup>2</sup>	180 <sup>2</sup>	100 <sup>2</sup>
Spain	PS	0	0	0	0	0	0	0	0	63 <sup>2</sup>	101 <sup>2</sup>	45 <sup>2</sup>
<b>Whole Atlantic total</b>		3180	2832	3030	2191	2086	1372	1318	1472	1738	2571	1593

\*\* - Likely catch of an unspecified amount.

1. As per SCRS/84/87.

2. Estimated as per SCRS/84/67.



**Table 14. White marlin catches and/or landings (MT)**

<i>Country</i>	<i>Gear</i>	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
<b>North Atlantic total</b>		990	1211	1084	1047	499	426	480	503	808	652	1377
China (Taiwan)	LLFB	120	248	84	142	44	79	62	105	174	130	203
Cuba	LL	112	256	294	68	67	43	68	68	219	205	728
Grenada	UNCL	0	0	0	0	**	**	0	0	0	0	0
Japan	LL	328	0	404	0	0	0	0	0	0	0	0
Japan	LLHB	0	381	0	540	80	27	42	99	118	84	27
Korea	LLFB	106	90	71	64	71	33	16	12	48	12	28
Panama	LLFB	48	14	10	17	20	8	1	0	0	0	0
U.S.A.	LL	0	0	0	0	0	0	0	0	0	0	20
U.S.A.	SPOR	104	108	107	109	109	109	109	109	109	109	141
U.S.S.R.	LLMB	2	0	1	0	0	0	1	0	0	0	0
Venezuela	LL	170	114	113	107	108	127	181	110	140	112	230
<b>South Atlantic total</b>		789	536	486	765	478	511	548	443	370	439	295
Argentina	LL	57	++	0	2	2	0	0	0	0	0	0
Brazil	LLHB	10	36	31	31	12	20	17	32	31	23	41
Brazil	SURF	0	0	0	25	3	2	4	3	++	++	++
Brazil-Japan	LLFB	0	0	0	0	91	143	111	26	5	59	25
Brazil-Korea	LLFB	0	0	0	10	23	0	0	0	0	0	0
China (Taiwan)	LLFB	412	279	255	377	119	197	155	145	136	220	87
Cuba	LL	21	48	55	38	57	127	205	205	134	45	112
Japan	LL	27	0	14	0	0	0	0	0	0	0	0
Japan	LLHB	0	9	0	3	26	14	15	7	25	27	17
Korea	LLFB	165	139	109	220	111	5	24	25	37	60	13
Panama	LLFB	75	22	16	59	31	1	2	0	0	0	0
Uruguay	LLHB	0	0	0	0	0	0	0	0	1	5	0
U.S.S.R.	LLMB	22	3	6	0	3	2	15	0	1	0	0
<b>Whole Atlantic total</b>		1779	1474	1570	1812	977	937	1028	946	1178	1091	1672

\*\* - Likely catch of an unspecified amount.

++ - Catch less than 0.5 MT.

Table 15. Sailfish catches and/or landings (MT)\*.

Country	Gear	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
<b>East Atlantic total</b>		160	124	165	193	816	1729	2359	1517	1052	876	2824
Benin	SURF	0	0	0	0	0	0	0	0	36	48	0
Cape Verde	LL	0	0	0	0	0	0	0	0	0	3	0
Cuba	LL	0	0	0	0	0	0	0	0	0	158	200
Ghana	SURF	0	0	0	0	0	0	0	1191	449	16	2161
Ghana	BBF	2	8	22	11	0	0	0	0	0	0	0
Ghana	GILL	0	0	0	0	638	1574	2246	0	0	0	0
Korea	BBF	0	0	0	14	0	0	0	0	0	0	0
Senegal	PS	0	0	0	0	0	0	0	0	0	32	0
Senegal	SURF	74	74	75	91	72	71	28	264	442	540	412
Senegal	SPOR	70	33	61	76	93	79	77	62	88	69	49
Senegal	TRAW	0	0	0	0	0	0	0	0	0	0	2
Spain	LLHB	0	0	0	0	0	0	0	0	0	10	0
U.S.S.R.	LLMB	14	9	7	1	13	5	8	0	37	0	0
<b>West Atlantic total</b>		391	435	426	529	646	652	602	594	530	739	581
Brazil	LLHB	37	82	88	114	96	98	42	81	46	61	42
Brazil	SURF	0	0	0	62	119	90	84	87	55	53	8
Brazil-Japan	LLFB	0	0	0	0	0	41	26	12	++	7	7
Brazil-Korea	LLFB	0	0	0	10	41	0	0	0	0	0	0
Cuba	LL	0	0	0	0	0	0	0	0	0	181	28
Dom. Republic	SURF	0	0	0	0	0	0	0	0	0	22	22
Grenada	UNCL	0	0	0	0	**	**	0	0	0	0	0
Neth. Antilles	UNCL	28	28	28	28	28	51	51	51	51	51	51
U.S.A.	SPOR	240	248	254	261	308	308	308	308	308	308	308
Venezuela	LL	86	77	56	54	54	64	91	55	70	56	115

Table 15. (cont.)

<i>Country</i>	<i>Gear</i>	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
<b>Unclassified region total</b>		1082	775	603	784	409	231	293	318	492	361	184
China (Taiwan)	LLFB	598	248	66	270	64	52	37	49	86	140	108
Cuba	LL	100	229	262	185	156	120	191	191	247	0	0
Japan	LLMB	0	0	4	0	0	0	0	0	0	0	0
Japan	LLFB	1	0	0	0	0	0	0	0	0	0	0
Japan	LLHB	143	137	146	137	47	20	39	55	94	173	69
Korea	LLFB	165	139	109	151	111	32	24	23	65	48	7
Panama	LLFB	75	22	16	41	31	7	2	0	0	0	0
<b>Whole Atlantic total</b>		1633	1334	1194	1506	1871	2612	3254	2429	2074	1976	3589

\*Spearfish landings included for some longline gear.

\*\*Likely catch of an unspecified amount.

+- Catch less than 0.5 MT.



Table 16. (cont.)

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
C) SIZE FREQUENCY											
Brazil . . . . .	5	5	5	5	5	5	5	5	5	5	5
Cuba . . . . .	5	5	5	5	5	5	5	5	5	5	5
Ghana . . . . .	5	5	5	5	5	5	5	5	5	5	5
Japan . . . . .	7	7	7	7	7	7	7	7	7	7	7
Korea . . . . .	5	5	5	6	6	5	5	5	5	5	5
Senegal . . . . .	5	5	5	5	5	5	5	5	5	7	7
Taiwan . . . . .	5	5	5	5	5	5	5	5	7	7	7
U.S.A. . . . .	7	7	7	7	7	7	7	7	7	7	7

- 1 - No report of billfish species caught, or no separation of species.
- 2 - Billfish species reported and separated, but one or more missing.
- 3 - Complete list of billfish species caught, except that sailfish and spearfish are combined.
- 4 - Complete list of all billfish species caught.
- 5 - No size frequencies for any billfish species caught.
- 6 - Size frequencies missing for one or more billfish species taken.
- 7 - Size frequencies available for all billfish species taken.

Table 17. Summary of Atlantic blue marlin catches (upper figure) and number of fish in size sample (lower figure), 1975-1982

	1975	1976	1977	1978	1979	1980	1981	1982
Brazil* . . . . .	12	43	194	38	28	26	24	33
No. fish . . . . .	0	0	0	0	0	0	0	0
China - Taiwan . . . . .	527	409	171	258	190	289	177	220
No. fish . . . . .	0	0	0	0	0	212	223	88
Cuba . . . . .	789	409	320	210	336	336	300	436
No. fish . . . . .	0	0	0	0	0	0	0	0
Japan . . . . .	608	264	135	69	134	306	464	1127
No. fish . . . . .			3	61	71	170	132	0
Korea . . . . .	658	566	663	325	145	137	126	51
No. fish . . . . .	0	0	0	0	0	0	0	0
Panama . . . . .	95	154	190	74	13	0	0	0
No. fish . . . . .	0	0	0	0	0	0	0	0
U.S.A. . . . .	241	265	295	295	295	295	295	295
No. fish . . . . .	**	**	**	**	**	**	569	315
Others . . . . .	100	79	89	98	176	79	110	90
No. fish . . . . .	0	0	0	0	0	0	0	0

\*Includes leased/licensed vessels.

\*\*A series of billfish size data from 1935 has been received but not yet entered in the data base.

**Table 18. Summary of Atlantic white marlin catches (upper figure) and number of fish in size sample (lower figure), 1975-1982**

	1975	1976	1977	1978	1979	1980	1981	1982
Brazil* . . . . .	31	64	110	142	114	57	35	72
No. fish . . . . .	0	0	0	0	0	0	0	0
China - Taiwan . . . . .	339	519	163	276	217	250	310	350
No. fish . . . . .	0	0	0	0	0	548	811	194
Cuba . . . . .	349	106	124	170	273	273	353	250
No. fish . . . . .	0	0	0	0	0	0	0	0
Japan . . . . .	418	543	106	41	57	106	143	111
No. fish . . . . .			25	117	556	880	310	149
Korea . . . . .	180	284	182	38	40	37	85	72
No. fish . . . . .	0	0	0	0	0	0	0	0
U.S.A. . . . .	107	109	109	109	109	109	109	109
No. fish . . . . .	**	**	**	**	**	**	837	0
Venezuela . . . . .	113	107	108	127	181	110	140	112
No. fish . . . . .	0	0	0	0	0	0	0	0
Others . . . . .	33	78	56	11	19	0	2	5
No. fish . . . . .	0	0	0	0	0	0	0	0

\*Includes leased/licensed vessels.

\*\*A series of billfish size data from 1935 has been received but not yet entered in the data base.

**Table 19. Summary of Atlantic sailfish and spearfish catches (upper figure) and number of fish in size sample (lower figure), 1975-1982**

	1975	1976	1977	1978	1979	1980	1981	1982
Brazil* . . . . .	88	184	250	222	148	178	101	120
No. fish . . . . .	0	0	0	0	0	0	0	0
China - Taiwan . . . . .	66	270	64	52	37	49	86	140
No. fish . . . . .	0	0	0	0	0	196	150	17
Cuba . . . . .	262	185	156	120	191	191	247	339
No. fish . . . . .	0	0	0	0	0	0	0	0
Ghana . . . . .	22	11	638	1,574	2,246	1,191	449	16
No. fish . . . . .	0	0	0	0	0	0	0	0
Japan . . . . .	150	137	47	20	39p	55	94	173
No. fish . . . . .				106	35	271	95	29
Senegal . . . . .	136	167	165	150	105	326	530	641
No. fish . . . . .	0	0	0	0	0	0	1,063	951
U.S.A. . . . .	254	261	308	308	308	308	308	308
No. fish . . . . .	**	**	**	**	**	**	305	0
Venezuela . . . . .	56	54	54	64	91	55	71	56
No. fish . . . . .	0	0	0	0	0	0	0	0
Others . . . . .	160	235	183	95	85	74	189	182
No. fish . . . . .	0	0	0	0	0	0	0	0

\*Includes leased/licensed vessels.

\*\*A series of billfish size data from 1935 has been received but not yet entered in the data base.



**Table 20. Atlantic swordfish catch (1,000 MT)**

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
<i>TOTAL</i> .....	11.8	12.6	13.2	13.4	13.6	13.0	13.4	18.6	18.0	20.9	16.1	21.6	22.0
<b>Atlantic</b> .....	7.1	7.1	8.8	8.8	9.7	8.8	8.5	13.1	13.0	15.5	11.2	16.4	16.8
Argentina.....	.1	.1	.0	.0	.0	.1	.1	.0	0.	0.	0.	.0	0.
Benin.....	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0	.0	0.
Brazil.....	.1	.1	.1	.3	.3	.4	.3	.1	.2	1.1	.4	.6	.5
Brazil-Japan.....	0.	0.	0.	0.	0.	0.	.0	.2	.2	.4	.2	.4	.3
Brazil-Korea.....	0.	0.	0.	0.	0.	.0	.0	0.	0.	0.	0.	0.	0.
Bulgaria.....	0.	0.	0.	0.	0.	0.	.0	0.	0.	0.	0.	0.	0.
Canada.....	0.	0.	0.	0.	.0	.0	.1	2.3	3.0	1.9	.6	.6	1.1
China (Taiwan)...	.8	.7	1.1	.8	.9	.9	.7	.6	1.3	.6	.5	.6	.4
Cuba.....	.2	.1	.5	1.1	.5	.6	.7	.6	.4	.6	.4	.7	1.2
France.....	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0	.0	0.	0.
Ghana.....	0.	0.	0.	0.	0.	0.	0.	0.	0.	.1	.0	0.	.0
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.....	1.6	1.8	1.0	1.4	1.5	.8	.8	.9	1.0	2.1	2.2	3.7	1.9
Korea.....	.4	.4	1.0	.7	.5	1.1	1.2	1.3	.6	.7	.4	.7	.5
Liberia.....	0.	0.	0.	0.	0.	0.	0.	0.	0.	.0	.0	.0	.0
Martinique.....	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Mexico.....	0.	.0	.0	.0	0.	0.	0.	.0	0.	0.	0.	0.	0.
Morocco.....	.0	.0	.0	.0	.0	.0	.0	.0	.2	.1	.1	.1	.1
Norway.....	.2	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Panama.....	0.	.0	.4	.1	.1	.3	.1	.2	.1	0.	0.	0.	0.
Poland.....	0.	0.	.1	0.	0.	0.	0.	.0	0.	.0	0.	0.	0.
Portugal.....	.0	.0	.0	.1	.1	.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 .....	3.4	3.2	3.8	2.9	3.7	2.8	3.3	3.6	2.6	3.8	4.0	4.6	7.1
U.S.A. ....	.0	.2	.4	1.1	1.7	1.4	.9	3.0	3.4	3.6	2.1	3.7	2.1
Uruguay .....	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.1	.7	1.5
U.S.S.R. ....	.2	.2	.2	.1	.3	.2	.1	.2	.1	.2	.0	.1	.0
Venezuela .....	.1	.0	.0	.0	.1	.0	.0	.0	.1	.2	.0	.0	.0
<b>Mediterranean...</b>	<b>4.7</b>	<b>5.5</b>	<b>4.4</b>	<b>4.6</b>	<b>3.9</b>	<b>4.2</b>	<b>4.9</b>	<b>5.5</b>	<b>5.0</b>	<b>5.4</b>	<b>4.8</b>	<b>5.1</b>	<b>5.2</b>
Algeria .....	0.	0.	.1	.2	.5	.4	.4	.3	.5	.7	.8	.9	.9
Cyprus .....	0.	0.	0.	0.	.0	.1	.1	.1	.1	.1	.1	.1	.0
Greece .....	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	.1	0.	0.
Italy .....	2.9	3.7	2.8	3.3	3.0	3.3	3.3	4.0	3.4	3.7	2.5	3.0	2.7
Japan .....	0.	0.	0.	0.	0.	.0	0.	.0	.0	.0	.0	.0	.0
Libya .....	.1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Malta .....	.2	.2	.2	.2	.2	.2	.2	.1	.1	.2	.2	.2	.1
Morocco .....	.3	.2	.2	.2	.1	.2	.1	.2	0.	0.	0.	0.	.0
Spain .....	1.1	1.3	1.1	.7	.1	.1	.7	.7	.8	.8	1.1	.9	1.3
Tunisia .....	0.	0.	0.	.0	.0	.0	0.	0.	0.	0.	.0	.0	.0
Turkey .....	.1	.1	.1	.0	.0	.0	.0	.0	.0	.0	.1	.0	.1

**Table 21. Summary of swordfish catches (upper figure) and number of fish in size sample (lower figure), 1975-1982**

	1975	1976	1977	1978	1979	1980	1981	1982
Brazil* . . . . .	318	394	392	272	358	1,421	584	919
No. fish . . . . .	0	0	0	0	0	789	176	0
Canada . . . . .	21	15	113	2,314	2,970	1,885	561	554
No. fish . . . . .	0	0	0	0	0	0	0	0
China - Taiwan . . . . .	928	935	708	607	1,254	643	546	600
No. fish . . . . .	0	0	0	0	0	662	615	523
Italy . . . . .	3,002	3,346	3,345	4,031	3,375	3,699	2,500	3,000
No. fish . . . . .	0	0	0	0	0	0	0	0
Japan . . . . .	1,500	809	792	855	971	2,108	2,233	3,728
No. fish . . . . .			96	1,151	1,059	1,750	1,414	0
Korea . . . . .	451	1,147	1,240	1,333	606	683	447	684
No. fish . . . . .	381	0	0	0	0	0	0	116
Spain . . . . .	3,836	2,905	3,976	4,342	3,382	4,560	5,134	5,454
No. fish . . . . .	1,105	5,098	251	5,115	4,798	7,080	5,000	3,520
U.S.A. . . . .	1,700	1,429	912	3,039	3,405	3,535	2,074	3,746
No. fish . . . . .	0	0	0	0	0	0	20	0
Others. . . . .	1,321	2,060	1,931	1,754	1,672	2,058	1,956	2,863
No. fish . . . . .	0	0	0	0	0	0	0	0

\*Includes leased/licensed vessels.

**Table 22. Atlantic and world southern bluefin catches, by gear, area and country (in MT)**

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983*
<b>Total Atl..</b>	4,348	2,120	4,345	2,687	2,664	637	745	3,168	4,680	6,203	2,151	1,673	643	614
<i>By gear</i>														
LL . . . . .	4,348	2,120	4,345	2,687	2,662	637	745	3,168	4,680	6,203	2,138	1,667	643	594
BB . . . . .	0	0	0	0	1	0	0	0	0	0	13	6	0	0
Sport . . . .	0	0	0	0	1	0	0	0	0	0	0	0	0	0
UNCL. . . . .	0	0	0	0	0	0	0	0	0	0	0	0	0	20
<i>By country</i>														
Chi-Taiw. . .	61	94	75	169	104	1	53	0	29	11	22	0	0	0
Japan . . . .	4,287	2,026	4,270	2,518	2,558	636	692	3,168	4,651	6,192	2,116	1,667	643	594
S.Africa . . .	0	0	0	0	2	0	0	0	0	0	13	6	0	0
Poland. . . .	0	0	0	0	0	0	0	0	0	0	0	0	0	20
<b>World (all oceans)</b>														
LL . . . . .	40,622	38,120	39,604	31,205	33,924	24,118	33,714	29,595	22,974	27,715	29,474	25,600	18,164	19,768
SURF . . . .	6,212	8,451	11,268	8,957	13,206	8,050	7,535	13,906	11,784	10,955	13,647	16,647	23,617	19,323
TOTAL . . . .	46,834	46,571	50,872	40,162	47,130	32,168	41,249	43,501	34,758	38,670	43,121	42,247	41,781	39,091

\*Preliminary.

Source: Report of the Third Tripartite Scientific Meeting on Southern Bluefin Tuna, Canberra, 28 May 1984 and Statistical Bulletin, 1983 (Provisional).

**Table 23. Atlantic small tuna catch (1,000 MT)**

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
<b>Blackfin tuna (<i>T. atlanticus</i>)</b>													
Total . . . . .	1.8	1.8	.8	1.0	.7	.9	1.2	1.2	1.0	1.0	1.8	1.7	1.5
Mediterranean. . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Atlantic. . . . .	1.8	1.8	.8	1.0	.7	.9	1.2	1.2	1.0	1.0	1.8	1.7	1.5
<b>Atlantic little tuna (<i>E. alletteratus</i>)</b>													
Total . . . . .	5.3	2.9	2.3	5.2	4.1	3.9	6.1	16.6	12.0	17.5	13.7	13.0	22.5
Mediterranean. . .	.5	.7	.8	.9	1.0	1.5	1.5	1.5	1.3	1.0	.2	.9	.1
Atlantic. . . . .	4.8	2.2	1.5	4.2	3.1	2.3	4.7	15.1	10.7	16.5	13.5	12.1	22.4
<b>Atlantic bonito (<i>S. sarda</i>)</b>													
Total . . . . .	44.3	24.5	12.1	20.9	15.2	15.8	20.6	17.0	19.6	32.9	42.5	48.7	46.5
Mediterranean. . .	28.7	16.0	6.2	7.7	6.1	6.5	8.7	9.2	13.5	20.7	32.8	36.2	40.1
Atlantic. . . . .	15.6	8.5	6.0	13.2	9.1	9.3	11.9	7.8	6.1	12.2	9.6	12.5	6.4
<b>Frigate tuna (<i>A. thazard</i>)</b>													
Total . . . . .	11.2	13.4	10.1	13.9	10.2	9.4	19.2	7.2	9.8	14.5	9.7	13.7	13.6
Mediterranean. . .	4.1	3.3	3.5	4.3	2.4	2.9	2.6	3.0	3.2	3.5	2.9	3.3	3.7
Atlantic. . . . .	7.1	10.2	6.7	9.6	7.9	6.5	16.6	4.2	6.6	10.9	6.7	10.3	9.9
<b>King mackerel (<i>S. cavalla</i>)</b>													
Total . . . . .	7.7	11.1	14.2	12.2	10.3	10.2	10.8	10.0	10.9	10.5	11.7	14.1	14.1
Mediterranean. . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Atlantic. . . . .	7.7	11.1	14.2	12.2	10.3	10.2	10.8	10.0	10.9	10.5	11.7	14.1	14.1
<b>Spotted Spanish mackerel (<i>S. maculatus</i>)</b>													
Total . . . . .	9.2	11.5	13.4	9.4	10.6	11.2	11.0	9.9	8.8	12.1	9.4	8.8	8.5
Mediterranean. . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Atlantic. . . . .	9.2	11.5	13.4	9.4	10.6	11.2	11.0	9.9	8.8	12.1	9.4	8.8	8.5

Cero (*S. regalis*)

Total . . . . .	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
Mediterranean. . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Atlantic. . . . .	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1

West African Spanish mackerel (*S. tritor*)

Total. . . . .	1.3	2.1	1.6	4.7	.8	1.9	2.6	6.8	4.2	4.9	2.6	4.3	4.0
Mediterranean. . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Atlantic. . . . .	1.3	2.1	1.6	4.7	.8	1.9	2.6	6.8	4.2	4.9	2.6	4.3	4.0

King mackerel unknown (*S. spp*)

Total. . . . .	1.0	.9	1.1	1.0	1.3	1.0	1.0	1.0	.9	.8	.9	.9	.9
Mediterranean. . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Atlantic. . . . .	1.0	.9	1.1	1.0	1.3	1.0	1.0	1.0	.9	.8	.9	.9	.9

Wahoo (*A. solandri*)

Total. . . . .	1.6	1.8	2.4	1.8	1.6	1.8	1.7	2.0	2.7	2.4	3.2	5.0	5.2
Mediterranean. . .	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Atlantic. . . . .	1.6	1.8	2.4	1.8	1.6	1.8	1.7	2.0	2.7	2.4	3.2	5.0	5.2

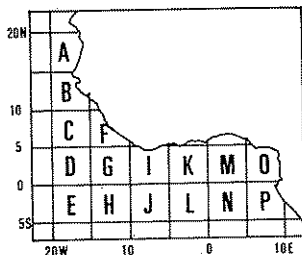
## Others

Total. . . . .	11.1	16.0	7.5	7.7	12.4	10.2	12.2	9.3	8.4	15.5	14.4	12.3	10.1
Mediterranean. . .	.5	.5	.5	.4	.6	.4	.5	.4	.2	.1	1.4	1.5	1.2
Atlantic. . . . .	10.6	15.4	7.0	7.4	11.8	9.8	11.7	8.9	8.2	14.4	13.0	10.9	8.9

TOTAL. . . . .	94.6	86.1	65.6	78.0	67.4	66.2	86.5	81.0	78.4	111.3	110.0	122.6	127.0
Mediterranean. . .	33.8	20.5	10.9	13.3	10.0	11.4	13.3	14.2	18.1	25.3	37.3	41.9	45.1
Atlantic. . . . .	60.8	65.6	54.7	64.7	57.4	54.9	73.2	66.8	60.3	86.0	72.7	80.6	81.9

Table 24. Theoretical gains (+) or losses (-) in yield and CPUE under various time-area closure schemes using non-regulated or current conditions (1982) as the base. Percentages are for equilibrium conditions after eight years and with no reduction in total purse seine (PS) fishing effort

STRATA TO BE CLOSED			PERCENTAGE CHANGE IN CATCH						PERCENTAGE CHANGE IN CPUE		
Quarter of year	Gear	5° x 5° Areas	YFT	SKJ	BET	Overall Total	PS	BB (Tema)	LL	PS	BB (Tema)
3	PS	A, B	-1	-6	+1	-3	-6	+11	+3	-6	+11
2	PS	B, F	+4	-2	0	0	0	0	+2	0	0
2	PS	I, K, M, O, P	0	-3	0	-1	-3	+1	+3	-3	+1
1	PS	I, K, M, O, P	+3	-2	0	0	-1	+1	+2	-1	+1
1,2,3,4	BB Tema	M	+1	-2	0	0	+1	-15	+2	+1	-15
1,2,3,4	PS	I, K, M, O, P	+4	-5	0	-1	-5	+3	+8	-5	+3
1	PS BB Tema	I, K, M, O, P M	+3	-2	0	0	-1	-1	+4	-1	-2
1,2,3,4	BB Tema	A, B, C, F, D, G, I, K, M, P, E, H, L, J, O, N	+5	-17	+1	-5	+9	-100	+7	+9	-100
1,2,3,4	PS & BB Tema	I, K, M, O, P	+5	-7	0	-1	-3	-12	+11	-3	-12
2	PS BB Tema	I, K, M, O, P M	0	-2	-1	-1	-4	+7	+2	-4	+7
1	PS & BB Tema	A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P	-8	-9	+1	-6	-11	-23	+15	+19	+3
3	PS & BB Tema	A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P	+3	-22	0	-7	-25	-22	+21	+17	+2



**Table 25. Estimated number of vessels by flag-country and type fishing in the eastern tropical Atlantic. Recommended number of observers required by the monitoring experiment**

<i>Fleet</i>	<i>1983</i>	<i>1984</i>	<i>Estimate for 1985</i>	<i>Recommended number of observers</i>
<b>Purse seine</b>				
France-Ivory Coast	31	0	0	--
Senegal	5	5	5	--
Spain	51	46	40	10
Ghana	5	5	5	--
Japan	1	1	1	--
Morocco	4	?	?	--
Portugal, Venezuela, Mexico, Ecuador, etc.	6	??		
USSR	5?	5?		
Cuba	1	1		
<b>Baitboat</b>				
Ghana	28	35	35	--
Korea	4	0	0	--
Japan	4	2	0	--
Senegal	23	23	23	--



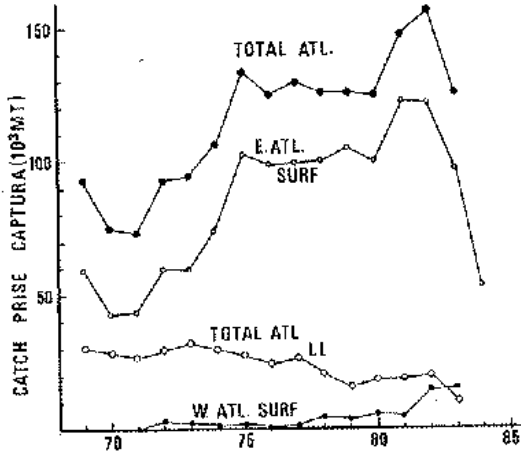


Fig. 1. Yellowfin catch in the total Atlantic, by east and west Atlantic surface and total Atlantic longline gears. (1984 is estimated.)

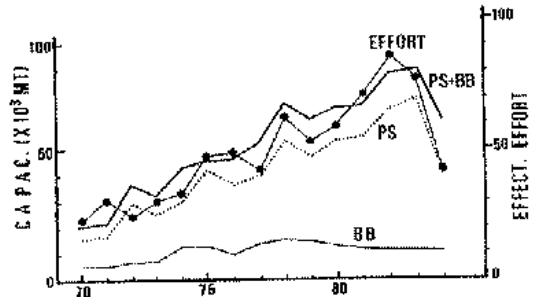


Fig. 2. Comparison of carrying capacity of surface fisheries and effective fishing effort for yellowfin in the east Atlantic.

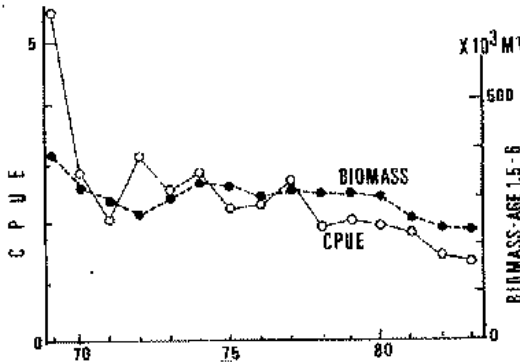


Fig. 3. Development of two abundance indices (CPUE and biomass estimates) of east Atlantic yellowfin. (Source: JTT/84/12, Revised)

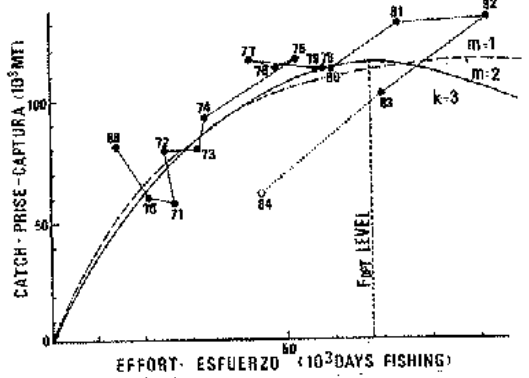


Fig. 4. Production model for east Atlantic yellowfin. The curve fitted to  $m = 2$  is the best estimate. The curve fitted to  $m = 1$  is shown for comparison. (Data for 1984 are provisional estimates.) Catches are in 1,000 MT and effort is in 1,000 fishing days.

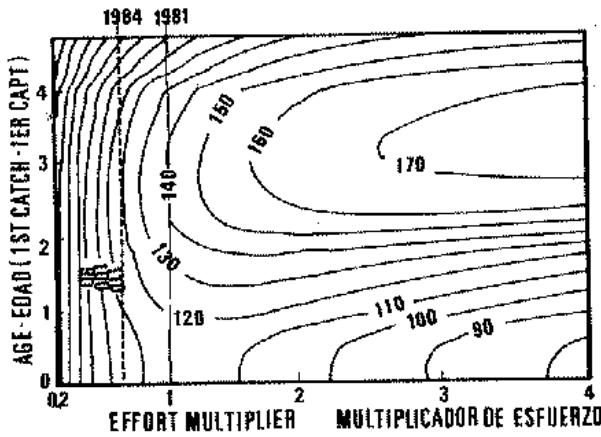


Fig. 5. Production isopleths calculated by using the Ricker model: production estimated for the east Atlantic yellowfin fisheries, under 1981 fishing mortality levels. Rough indication of fishing effort level for 1984 is provided for comparison. (Source: JTT/84/12, Revised)

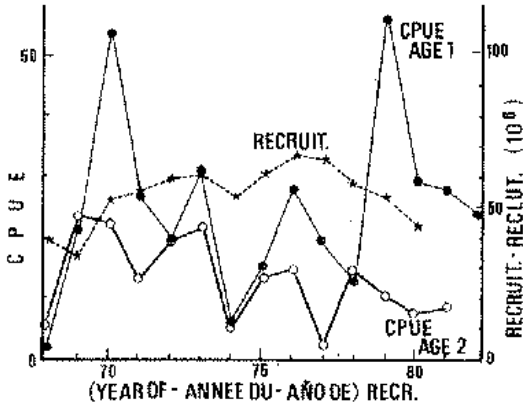


Fig. 6. Three recruitment indices for east Atlantic yellowfin. These indices are: CPUE for age 1, CPUE for age 2 for the FISM fleet, and direct evaluation of recruitment by cohort analysis. (Source: JTT/84/12, Revised.)

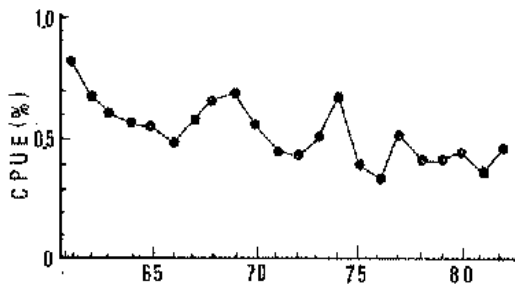


Fig. 8. Annual bigeye CPUE (catch in number per 100 hooks) of the longline fishery in the whole Atlantic.

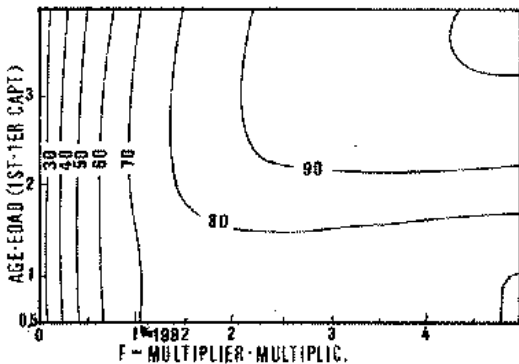


Fig. 10. Yield per recruit of bigeye tuna with 1982 age-specific F.

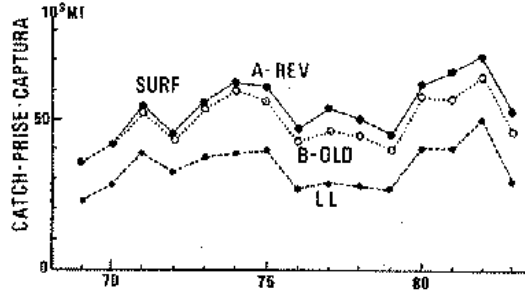


Fig. 7. Accumulative catch of Atlantic bigeye tuna by type of fisheries, 1969-83. (1983 data are still provisional.) Surface (A) and (B) represent catches before and after the data revisions made by the Working Group on Juvenile Tropical Tunas.

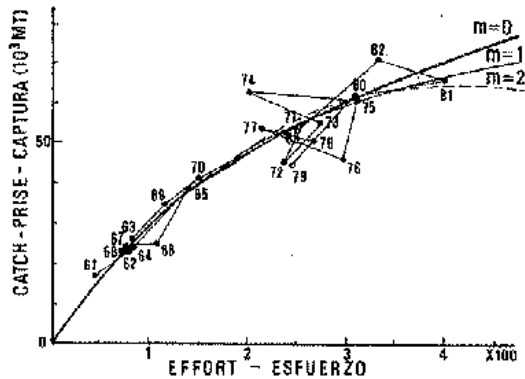


Fig. 9. Yield curves of the production model analysis for total Atlantic bigeye, 1961-83.

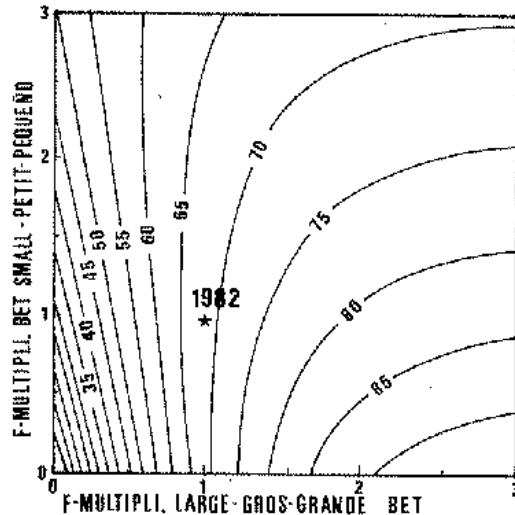


Fig. 11. Multi-gear (for small fish fisheries and large fish fisheries) yield per recruit of bigeye tuna with 1982 fishing patterns.

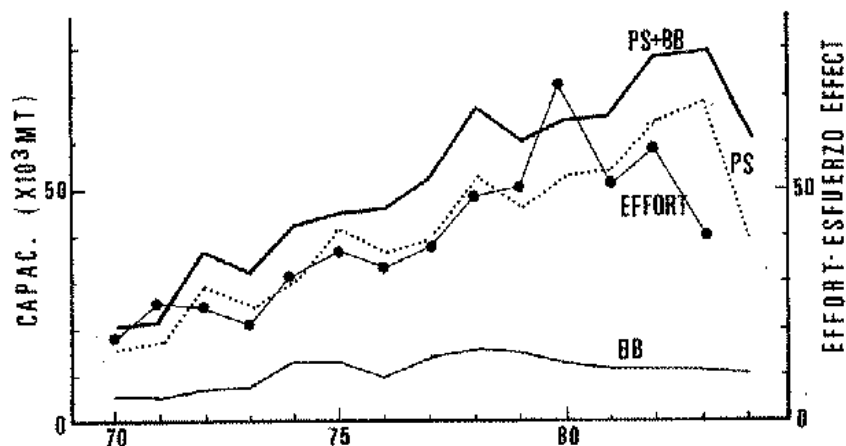


Fig. 12. Carrying capacity of the surface gears in the east Atlantic and estimates of effective effort for skipjack tuna.

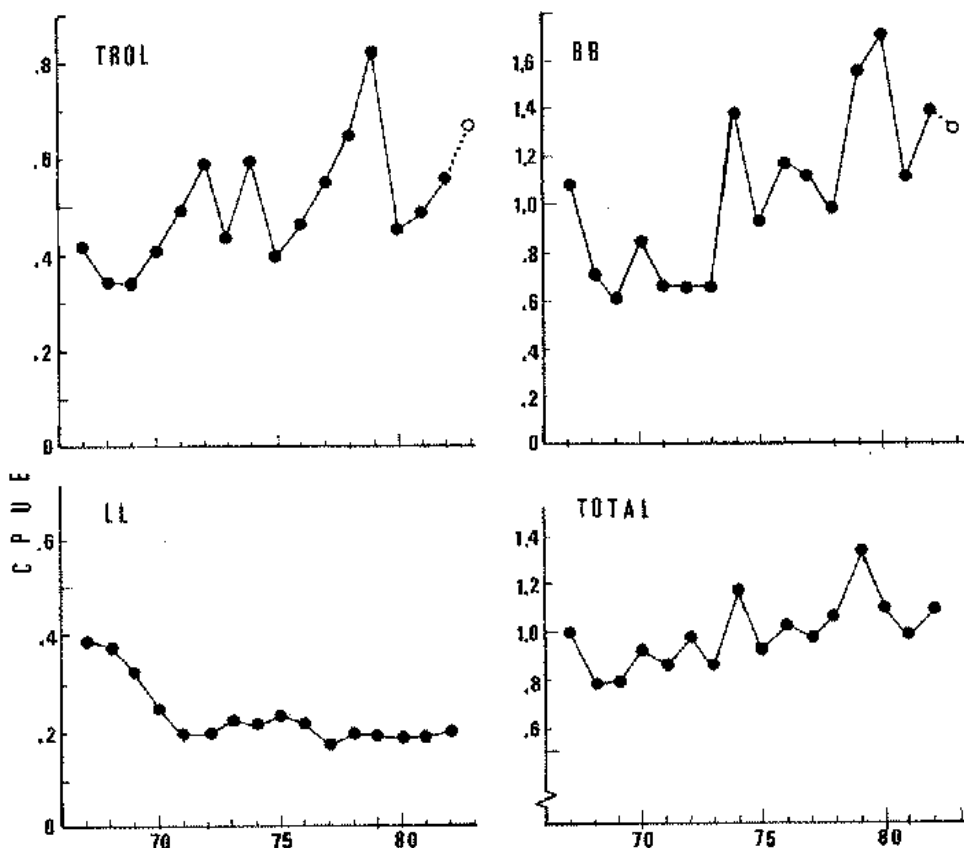


Fig. 13. Albacore catch per unit of effort in weight of the different gears and for the total albacore population in the North Atlantic. Effort for troll, baitboat and longline is not standardized while effort for total is standardized to baitboat days.

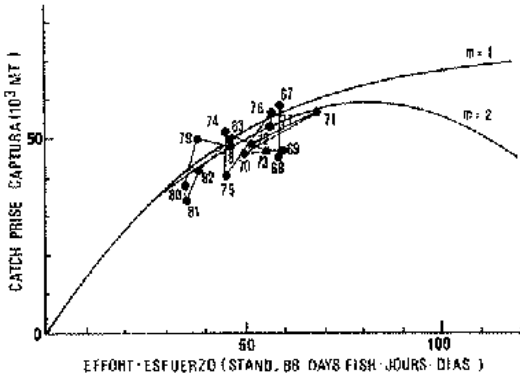


Fig. 14. Results of fitting the production model to the north Atlantic albacore stock. Provisional data for 1983 catch and effort have not been used. Effort standardized for 88 days fishing.

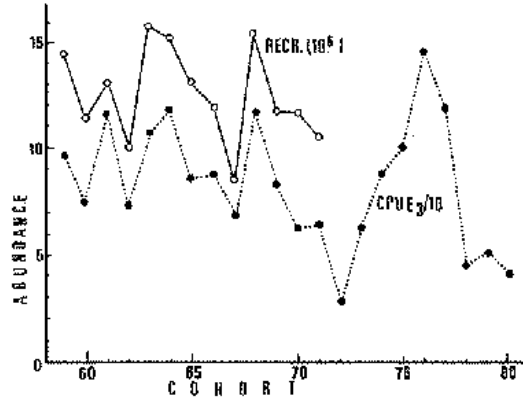


Fig. 15. Recruitment of the north Atlantic albacore stock. Continuous line: recruitment expressed in number of age 2 individuals obtained from cohort analysis (SCRS/84/62). Dotted line: recruitment expressed in CPUE for age 3 (CPUE<sub>3</sub>) (SCRS/84/61). (In order to use the same scale, the recruitment for age 2 fish is expressed in millions of fish and the CPUE<sub>3</sub> is divided by 10.)

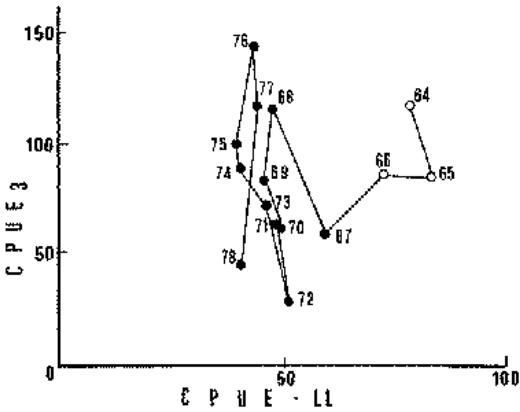


Fig. 16. Relationship between the parental population, expressed in longline catch per unit of effort (CPUE-LL) and the recruitment expressed in catch per unit of effort of age-3 fish (CPUE<sub>3</sub>), for north Atlantic albacore. Data improved since 1967.

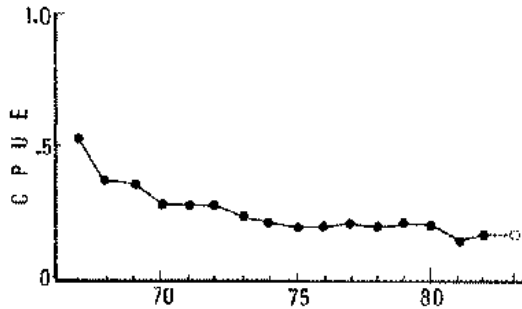


Fig. 17. Longline CPUE of south Atlantic albacore.

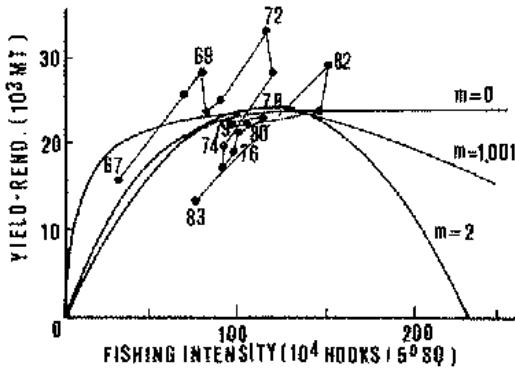


Fig. 18. Results of fitting the production model to the south Atlantic albacore population. Fishing intensity is expressed in 10<sup>4</sup> hooks per 5 degree square.

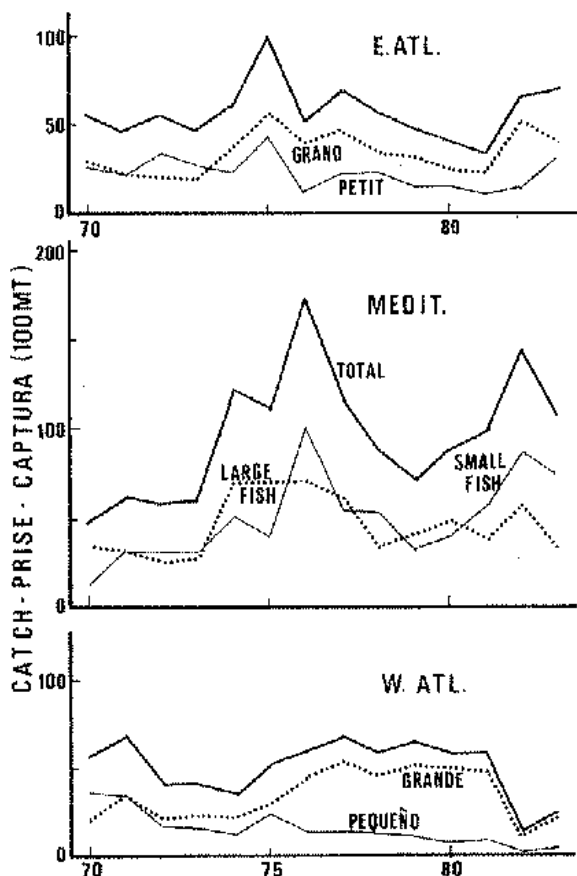


Fig. 19. Catches (in weight) of small and large bluefin tuna for the east Atlantic, west Atlantic and Mediterranean.

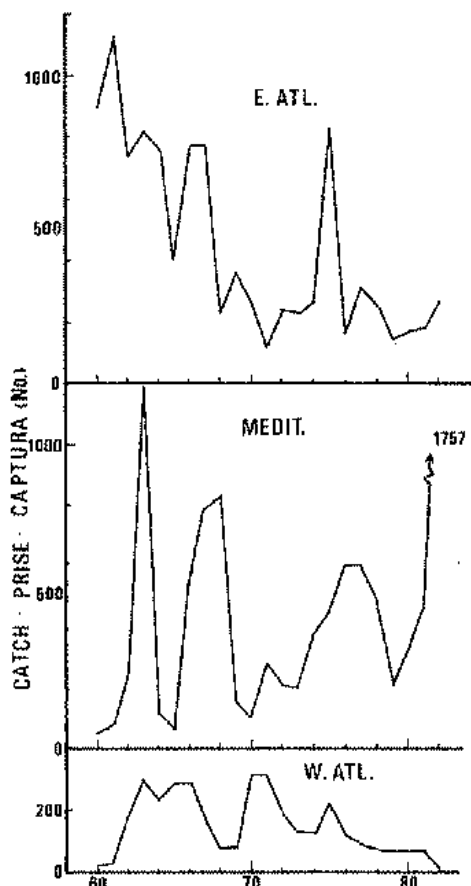


Fig. 20. Bluefin tuna catches in numbers of fish (1,000 fish).

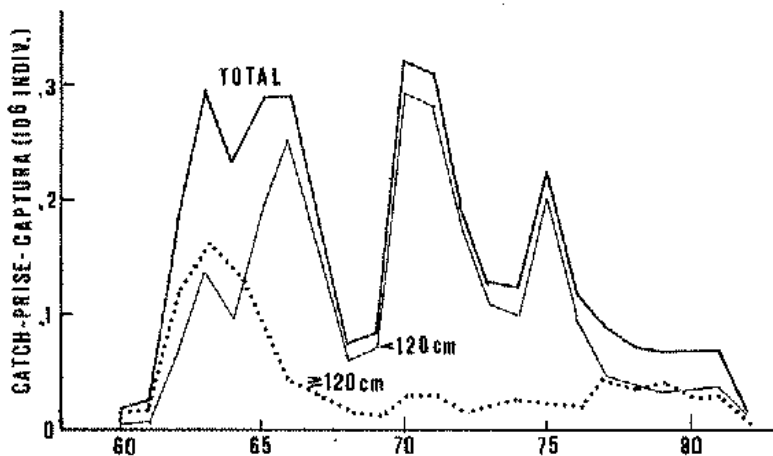


Fig. 21. West Atlantic bluefin tuna catches, total number of fish, numbers less than 120 cm and numbers 120 cm and above.

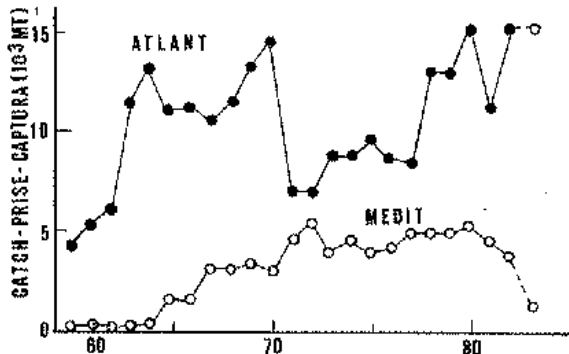


Fig. 22. Development of swordfish catches in the Atlantic and Mediterranean, 1960-1983. (1983 Mediterranean catch refers only to Spanish catches.)

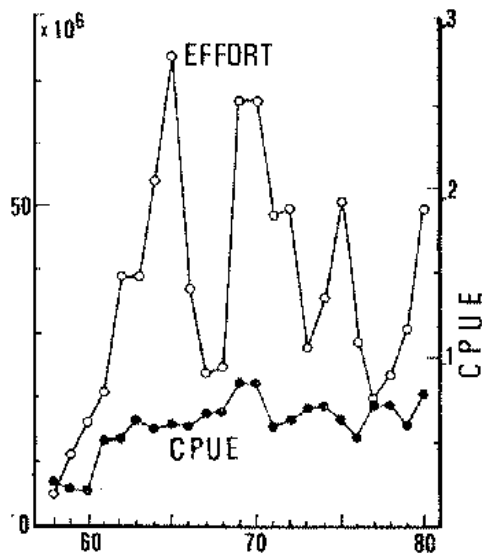


Fig. 24. Swordfish CPUE (no. of fish/100 effective hooks) of the Japanese longline fleet, 1958-1980, for the total Atlantic. (Source: SCRS/82/68).

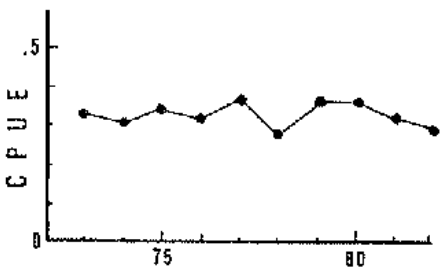


Fig. 26. Changes in swordfish CPUE in the Atlantic, 1982. The CPUE is expressed in MT/10<sup>3</sup> hooks. (Source: SCRS/82/52).

SCRS REPORT

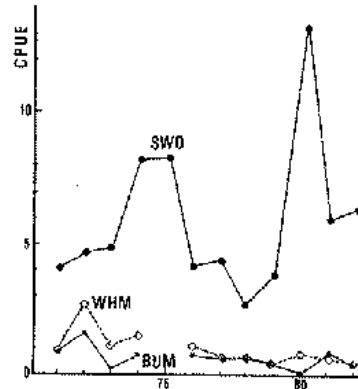


Fig. 23. Development of the swordfish longline nominal CPUE in south and southeast Brazil, 1971-82 (Source: SCRS/84/72).

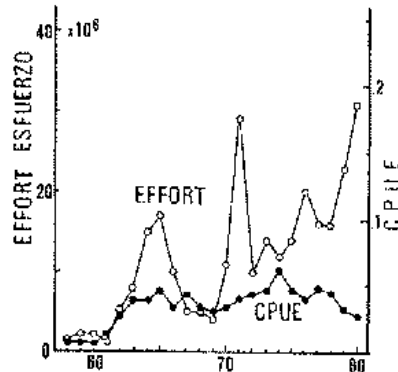


Fig. 25. Swordfish CPUE (no. of fish/100 effective hooks) of the Japanese longline fleet, 1958-1980, for the northeast Atlantic. (Source: SCRS/82/68).

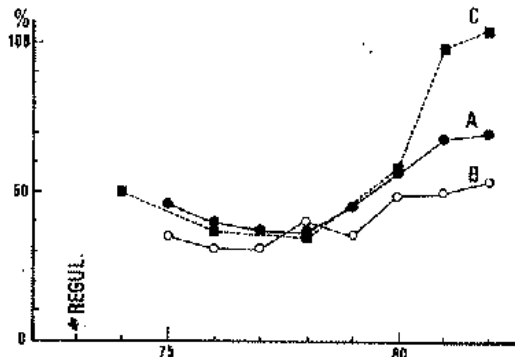


Fig. 27. Three indicators of performance of the YFT minimum size regulations (instituted in 1973). A: Undersized YFT percent (in no.) in total YFT catch; B: Ave. F of undersized YFT/Ave. total F; C: proportional changes in YFT yield between actual yield and theoretical yield with an enforced size regulation.

## 1984 SCRS Agenda

1. Opening of the meeting
2. Adoption of Agenda and arrangements for the meeting
3. Introduction of delegations
4. Admission of observers
5. Admission of scientific papers
6. Review of national fisheries and research programs
7. Review of the Report of the Working Group on Juvenile Tropical Tunas
8. Review of the Report of the Working Group on Bluefin Tuna
9. Review of condition of stock, with brief presentation of major papers on these subjects:
  - Tropical tunas: YFT-Yellowfin, BET-Bigeye, SKJ-Skipjack
  - ALB-Albacore
  - BFT-Bluefin
  - BIL-Billfishes and SWO-Swordfish
  - SBF-Southern Bluefin
  - SMT-Small tunas
  - MLT-Multi-species, Tropical and Temperate
10. Review of the progress of the skipjack publication
11. Review of editorial and publication policy
12. Consideration of recommendations concerning juvenile tropical tuna problems
13. Report of the Group to study procedures of reporting statistics
14. Report of the Sub-Committee on Statistics and review of Atlantic tuna statistics and data management system:
  - a) National statistics and Secretariat reporting
  - b) Nature of Task II data base
  - c) Unconventional fleet statistics
  - d) Biostatistical studies
  - e) Others
15. Bluefin tuna length corresponding to 6.4 kg (minimum legal size)
16. Review of SCRS research programs and consideration of working procedures
17. Cooperation with other organizations
18. Recommendations
19. Other matters
20. Adoption of Report
21. Adjournment

*Appendix 2 to Annex 10***List of Documents**

SCRS/84/

- 1 Tentative agenda
- 2 Annotated tentative agenda
- 3 Tentative schedule
- 4 Tentative agenda for the Sub-Committee on Statistics
- 5 Organization of the 1984 SCRS meeting
- 6 Document policy
- 7 Report of the SCRS Officers Meeting
- 8 Collective Volume of Scientific Papers, Vol. XIX - Bluefin Workshop (Japan, September 1983)
- 9 Collective Volume of Scientific Papers, Vol. XX (1) - Tropical Spp.
- 10 Collective Volume of Scientific Papers, Vol. XX (2) - Temperate Spp. and General Statistics
- 11 Collective Volume of Scientific Papers, Vol. XX (3) - 1983 SCRS Report "A" (Species Reports)
- 12 Data Record, Vol. 2
- 13 Data Record, Vol. 24
- 14 Statistical Series-1
- 15 Report for Biennial Period, 1982-83 (Part II 1983)
- 16 Number not used
- 17 Report of the Working Group on Juvenile Tropical Tunas (France, July 1984 (Coll. Vol. XXI, 1-2))
- 18 1984 SCRS Report "A" (working document)
- 19 1984 SCRS Report "B" (summary presented to the Commission)
- 20 Statistical Bulletin Vol. 14 (provisional)
- 21 Secretariat report on research and statistics
- 22 Status of the publication of the proceedings of the Conference on the International Skipjack Year Program



- 23 Considerations for tuna research to the Year 2000
- 24 Future plans for the ICCAT port sampling – P. M. Miyake
- 25 Procedures adopted by the Secretariat in collecting and processing statistics received at ICCAT headquarters – P. M. Miyake
- 26 Updating and improvements made on bluefin catch-by-size data base – P. M. Miyake
- 27 Analysis of levels of size sampling by species and country in the ICCAT Task II data base, 1975-82 – J. P. Wise
- 28 Invitation to participate in the “Day to Review Statistics” – P. Cayré
- 29 Report on the “Day to Review Statistics”
- 30 Atlantic bluefin tuna sex ratio in the catches obtained by Japanese long-liners – T. Nagai
- 31 Report of the Working Group on Bluefin Tuna
- 32 Rapport sur la pêche et la recherche thonière au Sénégal en 1983-1984 – P. Cayré
- 33 Bilan de la campagne thonière au large des côtes françaises de Méditerranée en 1983 – B. Liorzou
- 34 Report of the Twelfth Session of the Coordinating Working Party on Atlantic Fishery Statistics – FAO Fisheries Report No. 316
- 35 An examination of the Honma method and its applicability in developing indices of abundance for western Atlantic bluefin tuna – R. J. Conser
- 36 Korean tuna fisheries and research activities during 1983-1984
- 37 A preliminary estimation of fishing mortality rates of bluefin tuna in the western Atlantic Ocean, based on tagging experiments in 1975 to 1981 – T. Doi, Y. Kishimoto, Z. Suzuki
- 38 Age and growth study based on modal analysis for the western Atlantic bluefin tuna – T. Nagai
- 39 Stock status on the western Atlantic bluefin tuna assessed with the use of virtual population analysis – T. Nagai, Z. Suzuki
- 40 Variation in mean lengths of modal size groups of bluefin tuna in the western Atlantic – S. Nichols
- 41 A proposal to management of bluefin tuna stock in the western Atlantic Ocean – S. Hayasi, S. Morita
- 42 Collection and processing of Japanese Atlantic tuna fishery data – S. Kume
- 43 Reclutamiento del atún rojo (*Thunnus thynnus*, L.) juvenil (clase de edad 0) en las pesquerías del Atlántico Este – J. C. Rey, J. L. Cort

- 44 Análisis de los datos de marcado del atún rojo (*Thunnus thynnus*, L.) en el Atlántico Este y Mediterraneo. Migración, crecimiento y mortalidad - J. L. Cort, J. C. Rey
- 45 Biological studies on bluefin tuna (*Thunnus thynnus*, L.) in Canadian waters during 1982 and 1983, with a preliminary look at some 1984 statistics - D. Clay, T. Hurlbut, L. Currie
- 46 Age of bluefin tuna (*Thunnus thynnus*, L.) in Canadian waters - T. Hurlbut, D. Clay, L. Currie
- 47 Japanese tuna fishery and research in the Atlantic, 1983-84 - S. Kume
- 48 Catches of bluefin tuna (*Thunnus thynnus*, L.) in Norwegian coastal waters in 1983 - S. Myklevoll
- 49 Méthode suivie au Sénégal pour l'estimation des statistiques des Tâches I et II concernant le voilier (*Istiophorus albicans*) - P. Cayré
- 50 Comparison of two abundance indices based on Japanese catch and effort data by one-degree and five-degree squares for the Atlantic bluefin tuna in the Gulf of Mexico - M. Honma, T. Matsumoto, H. Kono
- 51 Description of statistical procedures for Korean tuna fisheries in the Atlantic Ocean - J. U. Lee, W. S. Yang, J. H. Lee
- 52 Production model analysis of the skipjack tuna from southeastern Brazil, 1979-1983 - S. Jablonski
- 53 Estimate of exploitation rate and population size of skipjack tuna off the southeastern coast of Brazil - S. Jablonski, Y. Matsuura
- 54 Report on data collection in Brazil - Task I and II - J. H. M. de Lima, S. Jablonski
- 55 Análisis de la pesquería de atún por palangre, caña y cerco desembarcado en Cumaná, Edo. Sucre, durante el año 1982 - H. Salazar
- 56 Resultados de las campañas de marcado de túnidos durante 1982 a 1984 en el Golfo de Vizcaya y Mediterráneo - J. C. Rey, J. L. Cort
- 57 Campaña de marcado "Patudo 8404" en Canarias: resultados preliminares - Al. S. Guerra, C. García-Ramos
- 58 Efectos de las fases de la luna sobre los rendimientos de la flota atunera-tropical española - P. Pallarés, J. M. García Mamolar
- 59 Production model approach to evaluate the stock status of Atlantic bigeye tuna - S. Kume
- 60 An analysis on the stock abundance of Atlantic bigeye tuna caught by the Japanese longline fishery - S. Kume
- 61 Ajuste de un modelo de producción a la población de atún blanco (*Thunnus alalunga*) del Atlántico norte, 1967-82 - A. G. Garcés, J. Mejuto

- 62 Yield-per-recruit analysis of North Atlantic albacore (*Thunnus alalunga*) – A. G. Garcés, E. Weber
- 63 Campaña de marcado 4.2 de atún blanco (*Thunnus alalunga*) en el Cantábrico: "Albacora 84" – J. Mejuto
- 64 Relación talla-peso de atún blanco juvenil del Atlántico norte – J. Mejuto, A. G. Garcés
- 65 Efectos de posibles variaciones en el esfuerzo sobre las poblaciones de pez espada (*Xiphias gladius*) de las áreas Bill-94 y Bill-95 – A. G. Garcés, J. Mejuto
- 66 Informe sobre la pesca e investigación española de túnidos en 1983 y 1984 – A. G. Garcés
- 67 Evaluation des débarquements de thonidés mineurs et istiophoridés au port d'Abidjan, 1981-84 – F. X. Bard, J. B. Kothias Amon
- 68 Resumé de la situación de la pêche aux thonidés – M. E. de Costa Moniz
- 69 Rapport national de la Côte d'Ivoire, Session ICCAT 1984 – J. B. Amon, Kothias, F. X. Bard
- 70 Método seguido por España para la valoración de las estadísticas de las Tareas I y II de ICCAT, referentes al atún blanco (*Thunnus alalunga*) – A. G. Garcés
- 71 Método seguido por España para la valoración de las estadísticas de las Tareas I y II de ICCAT, referentes al pez espada (*Xiphias gladius*) capturado por la flota del NW y N de España – J. Mejuto
- 72 Catch per unit effort of *Xiphiidae* and *Istiophoridae* from Brazilian longliners (1971-1982) – A. F. de Amorim, C. A. Arfelli, J. C. Galhardo-Amado
- 73 Método seguido en la región mediterránea y suratlántica española para la valoración de las estadísticas de las Tareas I y II de ICCAT referentes a túnidos menores – J. A. Camiñas, A. Ramos, E. Alot
- 74 Método seguido por España para la realización de las estadísticas de las Tareas I y II de ICCAT en la pesquería de túnidos tropicales – A. M. Fernández
- 75 Species composition in the Japanese longline fishery off the southern and eastern United States – D. W. K. Au
- 76 Methodology and assumptions of multiple cohort analysis technique used by the Working Group on Juvenile Tropical Tunas – P. Kleiber
- 77 Size and species compositions of Atlantic tunas from imports landed in Puerto Rico during 1983 – T. C. Foster, E. P. Holzapfel
- 78 Método seguido por España para la valoración de las estadísticas de las Tareas I y II, en las pesquerías de Canarias – Al. Santos Guerra
- 79 Método seguido en España para la valoración de las estadísticas de las Tareas I y II de ICCAT referentes al pez espada (*Xiphias gladius*) del Atlántico (zona sur, Canarias y costa de Africa y trópico) y Mediterráneo – J. C. Rey

- 80 Método seguido por España para la realización de estadísticas de las Tareas I y II de ICCAT en las pesquerías de atún rojo (*Thunnus thynnus*, L.) - J. C. Rey
- 81 Méthode suivie au Sénégal pour l'estimation des statistiques des tâches 1 et 2 concernant les principales espèces de thonidés (albacore, listao, thon obèse) de l'Atlantique est - T. Diouf
- 82 Prévisions de l'évolution des prises et des rendements des thonidés tropicaux de l'Atlantique est, résultant de la réduction de l'effort des senneurs - A. Fonteneau
- 83 Statistiques de la pêche thonière FISM durant la période 1969 à 1983 - A. Fonteneau, P. Cayré, T. Diouf
- 84 Overall fishing intensity and yield by the Atlantic longline fishery for albacore, 1967-1983 - C. L. Sun, R. T. Yang
- 85 Taiwanese tuna longline fishery in the Atlantic Ocean, 1983-84 - R. T. Yang
- 86 Stock assessment of south Atlantic albacore by production model analysis, 1967-83 - C. L. Sun, R. T. Yang
- 87 Report on United States fisheries monitoring and research activities on tunas and tuna-like species of the Atlantic Ocean during 1983-1984 - NMFS, SWFC
- 88 Collection of Task I, II and biological data for United States Atlantic Ocean fisheries - A. L. Coan, N. Bartoo
- 89 Canadian national report, 1983-1984 - T. Hurlbut, D. Clay, R. Stephenson
- 90 National Report of Brazil - 1983 - J. H. Meneses de Lima
- 91 Analyse de la PUE dans la pêche de patudo en surface aux Açores - J. Pereira
- 92 Procédures suivies aux Açores pour la collecte des statistiques thonières - J. Pereira
- 93 Observations sur le sex ratio du patudo (*Thunnus obesus*) aux Açores - J. Pereira
- 94 Pesquerías cubanas de túnidos en 1983 - B. García Moreno, A. Rodríguez
- 95 Rapport de recherche - France
- \* Metodología seguida por Cuba en la confección de las estadísticas de las Tareas I y II de ICCAT - B. García Moreno
- \* L'estimation des statistiques concernant le germon et le thon rouge en France - B. Liorzou

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\*Arrived late and accepted only for "Day to Review Statistics".

## Report of the Sub-Committee on Statistics

### Item 1. Opening of the meeting

The meeting was held in Las Palmas, Canary Islands (Spain), at the Hotel Reina Isabel, on November 3, 1984. Dr. N. Bartoo (U.S.A.) served as Convener.

### Item 2. Adoption of agenda and arrangements for the meeting

The Tentative Agenda was adopted without change and is attached as Addendum 1. Dr. P. M. Miyake (Secretariat) served as rapporteur.

### Item 3. Report of the progress made by national offices

The Secretariat Report on Statistics and Coordination of Research (SCRS/84/21) was reviewed as to the progress made by the national offices in the collection of data. A summary is given in Table 1.

Since the national statistics collection system was critically reviewed during the "Day to Review Statistics", only major achievements made in 1984 and major problems still to be solved are highlighted here.

Major progress was made by the Working Group on Juvenile Tropical Tunas, i.e., misreported catches in terms of species by various surface fleets fishing tropical tunas in the eastern Atlantic were identified and real species composition was estimated for them.

The remaining problems relate to the lack of fishery and biological data from the newly developing western Atlantic fisheries.

### Item 4. Report of the Group to study procedures of reporting statistics

The Report of the Group was presented by its Convener, Mr. P. Cayré (Senegal). The Group critically reviewed the data collection system and procedures for compiling and processing data by national offices and the Secretariat. The Report is attached as Addendum 2 to this Report.

## Item 5. Examination of ICCAT statistics

### *5.1 National data collection systems*

The Sub-Committee noted that the Group to study procedures of reporting statistics concentrated its effort on reviewing national data collection systems and its Report was reviewed in that respect.

### *5.2 Data processing by national offices*

The Report of the Group to study procedures of reporting statistics was reviewed in this context. It was recognized that there are two distinct procedures practiced by various countries in estimating the total catch by size using fish size samples and catch data. Under one system (e.g., Japanese longliners, U.S. seiners), the raw size data are assembled by appropriate time-area strata and raised to the catch of the strata. Under the other system (e.g., FIS and Spanish seiners), each size sample is raised to the catch from which the sample is taken to estimate the size frequency for each landing. These frequencies (partially raised) are assembled by each time-area strata and then raised again to the total catches of the strata.

### *5.3 Reporting to ICCAT*

The present format and reporting dates requested of each country were reconfirmed. However, it was recognized that the deadlines for reporting various statistics are not really observed. In particular, scientists are urged to correspond on a timely basis to the request for reporting quick estimates of the catches of the current year so that the scientists can use the updated figures during the SCRS and other working group meetings.

There was some discussion as to which country is responsible for reporting catch and other information of joint ventures and the fleet with flags of convenience. It was recognized that the Secretariat assumed a rather flexible attitude on this problem, keeping in mind that it is very important to avoid double reporting and cover all the catches. It was recommended that this flexibility be maintained in the future, while the basic policy is that the flag country is responsible for reporting the catches.

### *5.4 Secretariat data management policy*

Again the Report of the Group to study procedures of reporting statistics was reviewed, since details of the Secretariat data management policy were discussed during that session.

Under this item, the validity of the Spanish purse seine Task II catch and effort data was discussed. Since adjustment was made on the species breakdown of the total tropical

catches, the Task II catch and effort data (nominal) no longer match the new Task I data. It was suggested that the basic nominal Task II data be adjusted accordingly for species composition to comprise a working file.

The Committee noted that there are two types of data files for Task II catch and effort data, just like for biological data: a basic data file (compilation of logbook summaries), and working files (e.g., catch and effort data adjusted for species). The Committee agreed that the present criteria for reporting and maintaining these data in the ICCAT system should not be changed, and while maintaining the files, distinction should be made between the basic files and working files.

In the past, the Secretariat has had to raise size data to the catches to create catch-at-length tables for many fisheries, e. g., in preparing data to be used by working groups. Recognizing that raising is best achieved by the national scientists, it was recommended that each nation be responsible for raising the size to the catches. Such raised files should be submitted together with the actual size and catch and effort files.

### *5.5 Improvements to be made*

The Sub-Committee noted with satisfaction that a better data quality control program is in progress by the Secretariat for the data management system.

## **Item 6. Review of criteria for data requirements by ICCAT**

The present criteria used by the SCRS in requesting data were approved in general. However, it was recommended that the general sampling scheme and strategy adopted by the SCRS and by each nation be analyzed in depth for efficiency and adequacy. This study should be initiated by each nation and by the Secretariat. The Secretariat (biostatistician) should study recognized literature in order to find appropriate sample sizes and stratification procedures for each fishery.

## **Item 7. Examination of progress made by the Secretariat**

### *7.1 Data processing done in 1984*

The pertinent sections of document SCRS/84/24 were reviewed. The Sub-Committee noted that a large amount of work was achieved by the Secretariat this year, using the ICCAT data base, particularly in preparing data bases for two major working groups.

## 7.2 Port sampling program

The Assistant Executive Secretary presented document SCRS/84/25 in which he analyzed the needs for ICCAT port sampling. This study had been requested by the SCRS at its previous meeting.

It was pointed out that the present port sampling system provides a series of reliable data over a long period of time and landing information on fleets with flags of convenience. Even though national governments are now covering logbook information and carrying out sampling, the continuation of the ICCAT program is recommended, with some slight modifications. More emphasis should be given to the collection of landing information and biological sampling while less effort should be spent on abstracting logbooks. Sampling may be extended to the Cuban longliners which are unloading in the Canary Islands.

A lengthy discussion took place concerning sampling from surface fleets unloading and transshipping at ports in countries other than their own (sometimes this could be a joint-venture fleet or a flag of convenience). More specifically, discussion was focused on who would be responsible (financially and physically) for sampling from the Ghanaian surface boats which recently started unloading part of their catches at Abidjan before returning to Tema from the fishing grounds.

A small group, which included the pertinent countries involved and the Secretariat, was formed to find a solution. The group recommended that the Secretariat, in cooperation with scientists of Ivory Coast and Ghana, set up a format for a logbook, which in turn will be distributed by both Ivorian and Ghanaian scientists to the fleet. Ghana will be responsible for collecting all logbooks and presenting summaries to ICCAT, since all the boats will return to Tema at the end of each trip. The Ivorian scientists will cooperate in this, if part of the catch is unloaded at Abidjan. Ghana will also have the responsibility for biological sampling. However, if there is some difficulty in carrying out the biological sampling at Abidjan, as a temporary contingency plan, the Secretariat is authorized to sample the fish in the most efficient and economical way possible, since such partial unloading at Abidjan by Ghanaian boats seems only temporary. It was suggested that the ICCAT biostatistician, if needed, visit Abidjan and Tema in early 1985 in order to coordinate the program.

As catches which are sold on the local market in Ghana will be sampled by Ghanaian scientists, these two sources of data have to be carefully verified to avoid duplication, and raising of biological data to the catch has to be done carefully by the Secretariat, which should be in a position to receive all the data as they become available by this cooperative program. The Committee found this solution satisfactory.

Due to the lack of data from the catches of the recently developing Venezuelan fleet, sampling is needed. The Committee urges that Venezuela, which is now a member of the Commission, build up a statistical system to collect logbooks from the Venezuelan flag and Venezuelan chartered fleet, and sample their catches. The Secretariat is asked to provide Venezuela with technical assistance in establishing a permanent system. However, until such a system is established, the Secretariat is requested to begin an interim sampling system for this fleet, in collaboration with the Venezuelan Government. In this respect,



U.S. scientists offered to send a U.S. biotechnician for a few months to Venezuela to help ICCAT. The Committee welcomed the offer and recommended that the SCRS adopt these programs.

### *7.3 Biostatistical assignments*

The ICCAT biostatistician presented a summary of his work carried out in 1984, referring to the SCRS/84/21. His study of sampling levels of various fisheries (SCRS/84/27) was reviewed during the "Day to Review Statistics".

### *7.4 Publication and data dissemination*

The Sub-Committee found ICCAT statistical publications and publication policy to be satisfactory.

### *7.5 Other matters*

No other matters were discussed.

## **Item 8. Future plans to improve statistics, and recommendations to the SCRS**

Several recommendations included in the previous sections of this Report have not been repeated here; however, attention should be drawn to those recommendations. The scientists who met to evaluate the stock status of each species of tuna (Agenda Item 9 of Annex 10) made various recommendations on statistics. The list of these recommendations is attached herewith as Addendum 3.

The Sub-Committee recognized a few specific areas where major data improvement is requested. These include:

### **Catch**

1. More reliable data should be collected from newly developing fisheries (e.g., Venezuelan). Also, data from joint venture fleets and fleets with flags of convenience must be accurately reported.
2. The Secretariat should continue to do its best to secure reliable bluefin data from non-member Mediterranean countries.

3. Billfish catches should be reported by species and by agreed general areas (particularly for sailfish broken down by east and west Atlantic).
4. Reliable catch data of small tunas by species should be collected and reported.

#### Task II catch and effort

1. Albacore data should be collected from Mediterranean.
2. Data should be collected from the western tropical Atlantic.
3. Mediterranean bluefin data should be collected.

#### Task II size data

1. Sampling should be started immediately from the newly developing western tropical surface catches (including Caribbean Sea).
2. Swordfish size data should be collected from all the fisheries and, if possible, by sex.
3. Billfish size sampling should be further improved from all sectors of the fishery and by sex.

#### Transmission of data

1. Data submission should be made on a more timely basis, particularly for bluefin (all 1984 data should be made available by the 1985 SCRS meeting).
2. Quick estimates of the current year's catch should be made available to the scientists in advance of the meeting.

#### Data format and procedures

1. Basic size frequencies (actual sizes taken by samples) and basic catch and effort (logbook summaries) should be submitted to the Secretariat and they should be kept as basic files.

2. Catch by size should be estimated by each country for its major fisheries and submitted to the Secretariat. These data should be kept as working files in the ICCAT data base.
3. Standardized effort should be reported together with nominal effort. The latter will be in the basic file while the former will be treated as a working file.

**Item 9. Other matters**

No other matters were discussed.

**Item 10. Adoption of Report**

The Report was adopted with some modification.

**Item 11. Adjournment**

The meeting was adjourned.



Table 1. (cont.)

Species, Gear and Country	TASK I				TASK II CATCH & EFFORT							BIOLOGICAL (SIZE)					Remarks		
	Date Rec'd		Effort	By areas	Date Rec'd		Area	Time	Cov. rate %	Raised	Effort	Weight	Date Rec'd		Area	Time		Raised	No. of fish sampled/ total catch (MT)
	1983	1984			1983	1984							1983	1984					
Portugal (Madeira)	Aug 24		X	X	Aug 24		5x5	mo	100	U	X	X							Data Jan-Mar 1983. Data Apr-Sep 1983. Data Oct-Dec 1983. SKJ&BET size 1982.
	Dec 19		X	X	Dec 19		5x5	mo	100	U	X	X							
(Azores)		Mar 14	X	X		Mar 14	5x5	mo	100	U	X	X							
S. Africa	Aug 2	Jun 14	X	X	Aug 2	Jun 14	5x5	mo	91	U	X	X	Jun 14	ICCAT	mo	U	3777/4617		
Spain (Can. Is.)	Apr 6	May 4	X	X	Apr 6	May 4	1x1	mo	100	U	X	X							No sampling in 1983.
(Peninsula)						Mar 9	local	mo	95	U	X	X	Mar 9	local	mo	U	5876/5762	1982 data.	
Venezuela	Jun 14	May 8	X	X		Feb 7	1x1	mo	75	U	X	X	Feb 7	local	mo	U	6195/5370		
	Jun 14	May 8	X	X															
	Jun 30	Jun 11	X	X	Jun 30	Jun 4	local	mo	100	U	X	X							C/E Atl. & Pacific.
<i>PS</i>																			
Brazil-based (leased)																			
Cayman Is.	May 30	Aug 29	X	X															
Spain		Aug 29	X	X		Aug 29	1x1	mo	85	U	X	X	Aug 29	1x1	mo	U	505/319		
Cuba	May 19	Aug 23	X	X															
FISM	Dec 9		X		Dec 12		1x1	mo	100	R	X	X							1982 data.
Ghana	Apr 15	Apr 4		X		May 30	1x1	mo	100	R	X	X	Jul	5x5	mo	U	?/72542	Tape for size 79-83.	
	Dec 16		X	X		Mar 28	1x1	day		U	X	X	Feb	ICCAT	mo	U	?/69540	1982 data.	
		Feb	X	X									Feb	ICCAT	mo	U	291/5767		
Japan		Feb 28	X	X		Feb 28	1x1	mo	100	U	X	X							1982-83 data.
Morocco																			
Portugal (Peninsula)	Jul 28	Jul 16		X															
(Azores)													Jun 14	local	mo	U			

S. Africa	Apr 6	May 4	X	X	Apr 6	May 4	1x1	mo	100	U	X	X	Aug	Jul	5x5	mo	U/R		No sampling in 1983. Tape for size 78-83.
Spain	Jun 14	May 8	X	X	Jul	Jul			100	R	X	X	Jul						
U.S.A.	Jul 8	Jul 16	X	X									Aug						
U.S.S.R.	May 16	Jun 27		X	Jul 1	Jun 27	FAO	mo	100	U	X	X	Aug 3	Aug 16, 24	ICCAT	mo	U	319/1810	YFT & SKJ size only.
Venezuela	Jun 30	Jun 11	X	X	Jun 30	Jun 4	local	mo	100	U	X	X							
<i>Uncl &amp; Others</i>																			
Angola	Apr 15	Mar 26		X															
Argentina																			
Barbados																			
Benin	Jun	Jan 26	X	X		Jan 26	local	mo	40	U	X	X							1979-83 C/E & vessel data. YFT-ALB-BET-BLM mixed.
Brazil	May 30	Aug 29		X															
Cape Verde		Jun 7	X	X		Jun 7	5x5	mo	100	U	X	X							
Ghana																			
Portugal		Jul 16		X															
S. Africa	Apr 6	May 4	X	X	Apr 6	May 4	1x1	mo	100	U	X	X							No sampling in 1983.
Spain																			
(Peninsula)	Jun 14	May 8		X															
U.S.A.	Jul 8	Jul 16		X									Jul		local	mo	U	1069/?	Size; YFT sport.
U.S.S.R.	May 16	Jun 27		X	Jul 1	Jun 27	FAO	mo	100	U		X							
Venezuela																			
<b>Albacore Surface Fleet</b>																			
<i>BB</i>																			
Brazil	May 30	Aug 29	X	X	Mar 14	Aug 29	1x1	mo	61	U	X	X							
Brazil-based (leased)																			
Japan		Aug 29	X	X		Aug 29	1x1	mo	96	U	X	X							C/E 1982.
						Aug 29	1x1	mo	90	U	X	X							
Cape Verde		Jun 7	X	X		Jun 7	5x5	mo	100	U	X	X							
France	May 2	Oct 30	X	X															
Portugal																			
(Azores)	Aug 2	Jun 14	X	X	Aug 2	Jun 14	5x5	mo	91	U	X	X		Jun 14	local	mo	U		Size for 82-83. Data Jan-Mar 83. Data Apr-Sep 83. Data Oct-Dec 83.
(Madeira)	Aug 24		X	X	Aug 24		5x5	mo	100	U	X	X							
	Dec 19		X	X	Dec 19		5x5	mo	100	U	X	X							
		Mar 14	X	X		Mar 14	5x5	mo	100	U	X	X							

Table 1. (cont.)

Species, Gear and Country	TASK I				TASK II CATCH & EFFORT								BIOLOGICAL (SIZE)					Remarks	
	Date Rec'd		Effort	By areas	Date Rec'd		Area	Time	Cov. rate %	Raised	Effort	Weight	Date Rec'd		Area	Time	Raised		No. of fish sampled/ total catch (MT)
	1983	1984			1983	1984							1983	1984					
S.Africa	Apr 6	May 4	X	X	Apr 6	May 4	1x1	mo	100	U	X	X							No sampling in 1983.
Spain (Can. Is.)	Jun 14	May 8	X	X		Feb 7	1x1	mo	75	U	X	X		Feb 7	local	mo	U	1768/768	1982 data: C/E also in no. fish. C/E also in no. fish.
(Biscay)	Jun 14	May 8	X	X	Sep 27	Jun 1	ICCAT	mo	100	U	X	X	Sep 27	Jun 1	ICCAT	mo	R	1007/519	
(Med.)	Jun 14	May 8		X	Sep 27	Jun 1	ICCAT	mo	100	U	X	X	Sep 27	Jun 1	ICCAT	mo	R		
Venezuela	Jun 30	Jun 11	X	X	Jun 30	Jun 4	local	mo	100	U	X	X							
<b>TROL</b>																			
France	May 2	Oct 30	X	X		Oct 30	ICCAT	mo	100	R	X	X		Oct 30	ICCAT	mo	R	461736/2390	Task II includes BB.
Spain (Biscay)	Jun 14	May 8	X	X	Sep 27	Jun 1	ICCAT	mo	100	U	X	X	Sep 27	Jun 4	ICCAT	mo	R	?/10596	C/E also in no. fish.
U.S.A.		Jul 16		X															
<b>Uncl &amp; Others</b>																			
Argentina																			
Brazil	May30	Apr 11		X															YFT-ALB-BET-BLM mixed.
FISM	Apr 15	Apr 4		X															
Italy	May																		
Portugal (Azores)														Jun 14	local	mo	U		
S.Africa	Apr 6	May 4	X	X	Apr 6	May 4	1x1	mo	100	U	X	X							No sampling in 1983.
Spain (trop.)	Jun 14	Mar 13	X	X															
U.S.A.	Jul 8	Jul 16	X	X															
Venezuela		Jun 11	X	X		Jun 4	local	mo	100	U	X	X							C/E Atl & Pacific

**Bluefin Surface Fleet**

**BB**

Cape Verde  
France

Jun 7 X X  
Sep 2 Sep 11 X X

Jun 7 5x5 mo 100 U X X

(Biscay)  
Portugal

Aug 2 Jun 14 X X  
Aug 24 X X  
Dec 19 X X  
Mar 14 X X

Aug 24  
Dec 19

5x5 mo 100 U X X  
5x5 mo 100 U X X  
5x5 mo 100 U X X

Jun 22

Jun 14

local mo U

Size for 1982.  
Data Jan-Mar 83.  
Data Mar-Sep 83.  
Data Sep-Dec 83.

Spain  
(Can. Is.)

Jun 14 May 8 X X

Feb 7 1x1 mo 75 U X X  
Mar 9 local mo 95 U X X

Feb 7

local mo U

62/305

1982 data.  
1982 data.

(Biscay)

Jun 14 May 8 X X

Jun 14

Jun 1 1x1 mo 100 U X X

Jan 13

Jan 19

1x1 mo

?/734

Jun 1

mo R

?/2264

**PS**

France (Med.)

Jul 29 Sep 11 X X

Nov 9

Oct 1

ICCAT mo R

?/3600

Italy

Morocco

Apr Mar 27 X

Norway

May 18 Mar 16 X

Portugal

(Peninsula)

Jul 16 X

(Azores)

Spain

Jun 14 May 8 X X

U.S.A.

Aug 5 Jul 16 X X

Aug 5

Jul

local mo U

3816/384

Yugoslavia

**TRAP**

Canada

Aug 3 May 14 X

Nov 11

5x5 mo U

157/68

1982 size data.

\*HAND included.







Table 1. (cont.)

Species, Gear and Country	TASK I				TASK II CATCH & EFFORT							BIOLOGICAL (SIZE)					Remarks			
	Date Rec'd		Effort	By areas	Date Rec'd		Area	Time	Cov. rate %	Raised	Effort	Weight	Date Rec'd		Area	Time		Raised	No. of fish sampled/ total catch (MT)	
	1983	1984			1983	1984							1983	1984						1983
U.S.A.	Jul 8	Jul 16	X	X																
U.S.S.R.	May 16	Jun 27	X	X	Jul 1	Jun 27	FAO	mo		U	X	X								
Venezuela	Jun 30	Jun 11	X	X																
<b>Longline Fleet (All Species)</b>																				
Brazil	May 30	Aug 29	X	X		Aug 29 Nov 3	5x5 5x5	mo mo	100 100	U	X X	X X		Aug 29	ICCAT	mo	U	334/1459		
Brazil-based (leased)																				
Japan	May 30	Aug 29	X	X		Aug 29 Nov 3	5x5 5x5	mo mo	100 100	U	X X	X X		Aug 29	ICCAT	mo	U	1696/2265		
Canada	Aug 3	May 14		X																
China(Taiwan)	Oct 4	Aug 8		X	Sep 23	Aug	5x5	mo	var.	U	X	X		Oct 28	5x5	qtr	U,R		C/E also in no. fish.	
Cuba	May 19	Aug 23	X	X		Oct 5	5x5	mo		U	X								C/E in no. fish.	
Japan		Jan 18 Sep 10			Aug	Apr 3	5x5	mo	100	R	X		Jun	Jun 20	5x10 10x20	qtr			Task I 1982 (final). C/E in no. fish. Size 79-81 suppl. & 82.	
Korea	Aug 24	Aug 6	X	X	Aug 24	Aug 6	5x5	mo	58.4	U	X	X	Aug 24	Aug 6	5x5	mo	U	7487/16224		
Korea-Panama Morocco Panama	(Secretariat)				See Korea-Panama									See Korea-Panama						Task I per port sampling. No sampling in 1983.
S.Africa	Apr 6	May 4	X	X	Apr 6	May 4	5x5	mo	100	U	X	X								
Spain	Jun 14	May 8	X	X																
Uruguay	Nov 1	Mar 22		X																
U.S.A.	Jul 5	Jul 16		X		Jul	5x5	mo		U	X	X		Jul	local	mo	U	769/114	From Nat. Rep. 1983. BFT.	
U.S.S.R.	May 16	Jun 27		X	Jul 1	Jun 27	FAO	mo	100	U	X	X		Aug 24	ICCAT	mo	U	1012/432	Size BET&SKJ.	
Venezuela					Jun 30	May 28	10x10	qtr		U	X	X							82 C/E also in no. fish. 1983.	
	Jun 30	Jun 11	X	X	Jun 30	Jun 4	local	mo	?	U	X	X								
<b>Various</b>																				
Puerto Rico transshipments																				
	Mar 15	Jul 16		X									Jul 8	Jul 16		qtr	U		Reported by U.S.A.	

*Addendum 1 to Appendix 3 to Annex 10*

Agenda of the Sub-Committee on Statistics

1. Opening of the meeting
2. Adoption of Agenda and arrangements for the meeting
3. Report of the progress made by national offices
4. Report of the group to study procedures of reporting statistics
5. Examination of ICCAT statistics
  - 5.1 National data collection systems
  - 5.2 Data processing by national offices
  - 5.3 Reporting to ICCAT
  - 5.4 Secretariat data management policy
  - 5.5 Improvements to be made
6. Review of criteria for data requirements by ICCAT
7. Examination of progress made by the Secretariat
  - 7.1 Data processing done in 1984
  - 7.2 Port sampling program
  - 7.3 Biostatistical assignments
  - 7.4 Publication and data dissemination
  - 7.5 Other matters
8. Future plans to improve statistics, and recommendations to the SCRS
9. Other matters
10. Adoption of Report
11. Adjournment

### Report of the "Day to Review Statistics"

The chairman of the session, Mr. P. Cayré, summarized the reasons why the SCRS decided to organize this group. The purpose is to review critically the data collection and procedures adopted to process the data currently used by ICCAT.

After presentation, discussion and acceptance of the Agenda (Attachment 1), Mr. J. Marcille (FAO) was nominated rapporteur.

The items on the agenda were then considered. A list of the documents specially prepared by the Secretariat and the delegations is given in Attachment 2.

#### 1. Review of the recommendations and current methods used by the Secretariat to collect, process and publish national data

The ICCAT Assistant Executive Secretary presented document SCRS/84/25 which explains the methods used by the Secretariat to gather, compile and distribute the statistics which comprise the ICCAT data base (Task I and II).

Flag countries of the fishing boats are, as a rule, responsible for reporting catch data but often it is not practiced. The Secretariat tries to avoid double reporting and non-reporting by using supplemental data collected through its port sampling system.

The SCRS had adopted the policy to maintain the best scientific estimates of catches in its Task I data base instead of keeping only official data. The Assistant Executive Secretary recognized that the system of reporting such estimates through statistical correspondents is quite effective. For Task II catch and effort and biological data, he stated that the ICCAT data base maintains all the basic data unchanged even if working files (such as modified catch-by-species or catch-at-length tables) are changed as a consequence of using different hypotheses.

The ICCAT biostatistician presented some analyses on the adequacy of sampling based on the Task II sampling data (SCRS/84/27). He stressed the inertia of the sampling strategies in effect in various countries and suggested that these be analyzed periodically and possibly modified. He also noted that there were sometimes very variable sampling levels for a single species in similar fisheries. He pointed out that frequently the data exist but they are not transmitted.

#### 2. Review of the collection methods used by national offices, and problems found

The documents presented by the delegations showed in detail the procedures for collecting data for Task I and II and cited specific difficulties. The chairman considered that more emphasis should be placed on solving the difficulties.

## BRAZIL (SCRS/84/54)

Task I - Uncertainty about catches of artisanal fisheries.

Task II - Logbook coverage rates for baitboats and purse seiners, except boats leased from Japan, are still low. Artisanal fisheries are not well covered.

Task I and II statistics are adequate for longliners.

## CANADA

It has been difficult in recent years to obtain samples and estimate the catches of swordfish as these fish are often transshipped at sea to foreign vessels. The historical size sampling data for this species are available and will be resubmitted to the Secretariat.

For bluefin tuna, it is not certain if the logbooks collected (approximately 50 percent coverage by catch numbers) are representative, thus it is difficult to evaluate the CPUE series. Catch and effort data for 1981-1984 is being processed and will be sent to ICCAT.

The problem of representing catches by weight frequencies is being solved by using seasonal biometric relationships.

## CAPE VERDE

There is a problem of collecting data from the artisanal fisheries as the landing points are widely spread.

Task II data are only provided by 5° squares. Biological data were collected during the International Skipjack Year Program and it is hoped that collection will continue.

## CUBA

Biological sampling from longline catches has not been done. It was expected that the port sampling program carried out by the Secretariat would be extended to cover the Cuban longline fishery (particularly at Las Palmas). The Cuban delegate authorized this extension and informed the group that the captains of the Cuban longliners will be instructed to cooperate with the ICCAT port sampling.

## FRANCE, IVORY COAST, SENEGAL (FIS, SCRS/84/49, 67, 81)

Several points for the FIS tropical fleet were stressed. Most of these problems are common with all the other surface fisheries.

The problem of species composition of the catches is especially important at the Task II level considering the biases identified in the commercial reports and logbooks.

Catches made at the end of the year are often not reported until the following year when they are landed. However, this leads to errors only for the few unsampled catches.

Size frequency estimates of yearly catches are obtained (extrapolated) from samples (Task II). The sampling procedure particular to the FISM fleet is carried out in proportion to the volume of the catch so the size composition and the species composition can be estimated at the same time. Such procedure contradicts ICCAT's recommendations for sampling, although the best strategy to adopt has not yet been studied.

Raising procedures for samples and strata substitutions could lead to different results which have not been tested.

Size sampling in predorsal length ( $LD_1$ ) converted into fork length will require a study of the variance of fork length within each class of  $LD_1$ .

Albacore catches in the Bay of Biscay by the French fleet from 1970-1980 were officially reported in gutted weight, rather than live weight.

Only the size frequency data extrapolated to the total catch are sent to ICCAT for albacore and bluefin and for bluefin the data from the trollers and baitboats are combined.

Bluefin data from the Bay of Biscay and the location of catches in the Mediterranean are unreliable.

## GHANA

It is difficult to estimate catches of the artisanal fisheries as these fisheries are widely spread along the coast.

As regards the industrial fishery, Task II catch and effort data have improved in recent years. The establishment of a cooperative system between Ghana and Ivory Coast is desirable since many boats are now unloading in Abidjan.

## JAPAN (SCRS/84/49)

No species breakdown has been made for spearfish and sailfish taken in the longline fisheries.

The recent development of deep longlines for bigeye requires some effort adjustment procedures as the deep longline has a higher efficiency for catching bigeye. A report on this was presented to the SCRS this year.

The long delay in transmitting longline data is a result of the length of fishing cruises.

Not only for Japan, when catches are reported both in weight and number of fish, the weight reported may not coincide with catch estimates by number of fish multiplied by average weight of fish.

## KOREA (SCRS/84/51)

Task II catch and effort data still have to be improved in terms of coverage and accuracy.

Some clarification is required as to which boats are covered by Korean statistics to avoid double reporting between Korean and Panamanian flag vessels.

## PORTUGAL (SCRS/84/92)

There is a problem of coordination within sectors of Portuguese fishery in sending data to the Secretariat.

The statistics for Madeira and the Azores are clearly improving.

Biological data (size frequency samples) of Madeira should be transmitted to the Secretariat.

Tropical purse seine statistics have not been transmitted to the Secretariat.

## SPAIN (SCRS/84/70, 71, 73, 74, 78, 79, 80)

Statistical coverage of the artisanal fishery is sometimes inadequate and is difficult due to the large number of landing points, fishing gears and the variety of species caught (variable target species).

The tropical purse seine fishery is in a situation very similar to that mentioned for the FIS fleet and comments for the FIS fleet also apply to this fleet.

## UNITED STATES

Information on broadbill swordfish catches for past years have not yet been transmitted (problem being resolved).

Recently, U.S. flag vessels chartered by Venezuela started fishing in the west Atlantic. Doubts remain about the way the Task I and II data will be collected and released (responsibility of reporting the catches).

Bias in the catch estimates of the tropical tunas is possible as is the case for the FIS and Spanish fleets.

## VENEZUELA

There are problems in the breakdown of landing data between eastern Pacific and Atlantic catches and in landings of Venezuelan catches unloaded at foreign ports.

The lack of Task II data is also noted as well as doubts about the real catch level (Task I). In particular, landings made in Venezuela can include catches from the Pa-



cific while some catches unloaded in Panama are not reported. It is suggested that to solve these problems the Secretariat should continue contacting the fishing agencies involved or the external organizations which have some of the required Task I and II data.

### 3. Discussion of Secretariat and member country methods for estimating data (collection, processing, transmission), and recommendations

In principle, it is the flag of the vessels that identifies the nationality of the catches. However, this is not always the case as some countries report catches made by foreign boats working under license or in a joint venture (e.g., Brazil, Korea). These same catches may also be reported by the flag country. On the other hand, many catches are not reported by any country. This is often the case of certain vessels with flags of convenience (Panama, Cayman Islands). The problem of obtaining Task I and II statistics is particularly serious in the west Atlantic where surface fisheries are developing quickly. An efficient system for collecting data is essential if stock estimates are to be made.

The SCRS often decides to modify the estimates for a certain species and the Secretariat includes these in its data base; for example, the new catch estimates for yellowfin and bigeye tuna resulting from studies made by the Working Group on Juvenile Tropical Tunas.

In other cases, the Secretariat has to make the estimates (particularly breaking down the reported combined catches into species and include them in the data base. In this case, the Secretariat uses the methodology adopted by the SCRS in the previous Working Group meeting and the modifications are footnoted in the Statistical Bulletin.

A satisfactory solution to the problem of the species composition of the catches has still not been found. Sampling of catches is often adequate but the methodology should often be studied in more depth.

Revision of the data base and overall catch estimates for certain species causes problems when it is a question of fitting these new estimates to the Task II data base; thus, biases could again be introduced and special attention should be paid to this question.

Estimating fishing effort often causes problems, considering the many types of fishing gear and the considerable variation in vessel sizes. As far as possible, more accurate information should be sent to the Secretariat, especially for nominal effort of the more homogeneous vessel categories. Countries should also provide the SCRS with standardized effort estimates as well as measurements of nominal effort. The standardization procedures should also be sent to the SCRS.

It has been suggested that in certain cases and for certain species a better breakdown by age-class might be obtained for older fish from a histogram in weight rather than by size. This could be difficult for certain species such as bluefin tuna considering the seasonal variations in the length-weight relationship which have often been observed. Therefore, it did not seem necessary to modify the current form of data presentation sent to the Secretariat; however, if data in weight are available, this information can be included in the data base.

*Recommendations*

The recommendations resulting from this day of study deal mainly with general statistical problems which are not usually covered by the Sub-Committee on Statistics.

The estimates of species composition based on commercial reports or on logbooks will have to be validated or, if necessary, replaced by observations made by scientists. The methods proposed by the Working Group on Juvenile Tropical Tunas serve as a good example of these procedures. These will have to be perfected and generalized, particularly for Task II data.

The critical analysis of the statistical systems made during this day's session has exposed numerous national statistical problems which were previously poorly identified. Analyses of these problems will have to be developed by all member and non-member countries in order to solve these problems.

SCRS specifications for nominal fishing effort should be defined more accurately. In particular, catch and effort data by homogeneous vessel categories, at least annually, or effort data standardized according to the procedures described must be available for stock evaluation.

The efficiency of the sampling procedures in progress should be critically reviewed so they can be improved. This applies not only to the collection of size samples but also to the extrapolation procedures necessary to estimate the structure of the total catch by size. Multi-species sampling, which has been carried out recently should also be evaluated.

#### Agenda For Day to Review Statistics

1. Review of the recommendations and current methods used by the Secretariat to collect process and publish national data
2. Review of the collection methods used by national offices, and problems found
3. Discussion of Secretariat and member country methods for estimating data (collection, processing, transmission), and recommendations

#### Documents for Day to Review Statistics

Several documents, SCRS/84/25, 27, 28, 42, 49, 51, 54, 70, 71, 73, 74, 78, 79, 80, 81, 85, 88, 92 and two which arrived late and were accepted without SCRS numbers only for the Day to Review Statistics, were presented for review at this session. For full titles and authors please refer to the List of Documents (Appendix 2 to Annex 10).

*Addendum 3 to Appendix 3 to Annex 10***List of Statistical Recommendations  
Made at SCRS Species Sessions****Yellowfin**

1. Collection of fine Task II data and improvement of procedures to accurately estimate species composition of mixed catches.
2. Collection and/or improvement of catch, biological and catch and effort data for the western Atlantic.

**Skipjack**

1. Improvement of catch statistics (e.g., Venezuela, Tema).
2. Improvement of fishing effort data (especially in the west Atlantic).
3. Initiation of biological sampling from Caribbean catches.
4. Comparison of observer and port sampling data.

**Bigeye**

1. Continuation of Puerto Rico sampling from transshipments.
2. Fishing effort of deep longline should be continuously adjusted to the standard longline effort.
3. Continuation of species separation of mixed juvenile tropical catches.

**Albacore**

1. Improvement of catch and effort data for the Mediterranean.
2. Collection of accurate catch and effort statistics for the surface south stock, should it continue to develop.
3. Verification of French total catch for 1970-1980.

### Bluefin

1. Submission of catch-at-size data by finest time-area (but not less than monthly) resolution available (all countries).
2. Development of a set of standards for data collection and reporting and assurance of a mechanism to enforce such standards.
3. Collection of dependable statistics from Mediterranean non-member fisheries.
4. Re-examination of east-west division of Japanese 1957-66 longline catches.
5. Timeliness of reporting data. Complete Task I, II and size for 1984 and partial data for 1985 season should be reported by 1985 SCRS.
6. Reporting of catch and effort data in finest time-area scale possible.
7. Reporting catch (in number of fish) at length instead of catch at weight.
8. Increase of sampling intensity of the catch in the western Atlantic for the fisheries when it is required (target = 500 fish/ICCAT sampling area/quarter/country-gear).
9. Improvement in reporting of small fish catch in the east Atlantic and Mediterranean for countries other than France and Spain.

### Billfishes

1. Longline 5x5 Task II catch and effort data should include all billfish catches divided by individual species.
2. Separation of sailfish and spearfish catch statistics.
3. Reporting of sailfish catch (including historical data) for east and west and modification of ICCAT billfish area.
4. Regular collection of length frequency by sex for all billfishes.
5. Continuation of Senegalese sailfish sampling and improvement of Ghanaian sailfish data.
6. Description of historic and current longline operations for evaluation of effort statistics by depth of fishing.

### Swordfish

1. Reporting of catch and effort data by 5x5 (or at least by ICCAT sampling area) and by month.
2. Collection of size data by sex, and separate consideration of sexes in stock evaluation models.
3. Increase in size sampling efforts.
4. Reporting of swordfish catch and effort data separately from other species (even for by-catches).
5. Estimate of the magnitude of the non-recorded catches by Canada and USA since the imposition of mercury content restrictions (1971).
6. Catch, effort and size data from the new fishery in the future.

### Southern Bluefin

No recommendations were made.

### Small Tunas

1. Reporting by member countries of catch, effort and size data.
2. Obtaining data from non-member countries by Secretariat.
3. Collection of data from artisanal fisheries and from discards by industrial fisheries.
4. Monitoring of new fisheries development.

## CHAPTER III

# National Reports

### NATIONAL REPORT OF BRAZIL

by

JOSE HERIBERTO MENESES DE LIMA

#### 1. Present status of the fishery

##### *1.1 Fleet development*

The 1983 Brazilian tuna fleet was comprised of 11 longliners in the 51-200 GRT class and 57 baitboats, mostly in the 51-150 GRT class. The foreign tuna fleet leased by Brazil consisted of 4 longliners and 3 baitboats with Japanese flag (in the 201-500 GRT and the over 151 GRT classes, respectively); 3 purse seiners, two with Spanish flag (one in the 600 GRT class and the other in the 1,100 GRT class) and one with Cayman Islands flag (51-150 GRT); and one small baitboat with Cayman Islands flag (51-150 GRT).

Two Spanish purse seiners started operating in Brazilian waters in October, 1983, whereas a Cayman Islands purse seiner discontinued its activities in June of the same year.

Although there is no accurate information about the artisanal fleet, we suppose that there were few changes in fishing technology or in the number of boats in operation.

The number of boats in the national baitboat fleet has increased since 1979, when bait fishing began. This increasing trend halted in 1983, when the fleet was comprised of only 57 boats, representing 58 percent of the boats that operated in 1982.

The average GRT of the national baitboats has increased yearly. It has increased from 31.7 GRT in 1979 to 94.6 GRT in 1983. This seems to reflect a selective process towards bigger boats, better adapted to fishing conditions.

Original report in English.

## 1.2 Fishing areas

The national longliners based in Santos (São Paulo) continued operations in the same area, from Cabo Frio (23°S) to Tramandaí (31°S). The other national longliners, based in Rio Grande (Rio Grande do Sul), concentrated their operations in the south, between Cabo de Santa Marta (28°S) and Chuí (34°S).

The leased longline fleet operated mainly in the south between 28°S and 34°S. In the first quarter of the year only one boat operated in the northeast and southeast regions.

The traditional baitboat fishing area is located between Cabo de São Tomé (22°S) and Tramandaí (31°S). Most fishing operations, by both the national and leased fleets, have been carried out within this area. However, the leased fleet has also operated in fishing areas beyond the southern and northern limits of the above area. This pattern of operation has resulted in a southward expansion of the fishing area of national baitboats. Thus, at the end of 1983, national boats based in Santa Catarina operated as far as southeast of the Rio Grande estuary (33°S). The leased boats operated only sporadically in the area north of Cape São Tomé (up to 20°S). Good catches have been achieved during some periods of the year in the fishing grounds near the bank of Abrolhos region.

## 1.3 Trends in catch and effort (Tables 1, 2, and 3)

During 1983, total landings by the national longliners (1,028.4 MT) were about 20 percent less than in 1982. On the other hand, fishing effort has increased as a result of new boats that entered the fishery. This means that fishing yield continued to decrease, as can be noted by the decline in catch rates. This decrease in catch rates may have been influenced by the fishermen's inexperience or the inefficiency of the new boats.

Landings in 1983 by the leased longline fleet were less than in 1982. This was due to the decrease in the number of boats in operation. The catch rates remain at the same level as those in 1982. The high mobility of the fleet as well as the efficiency of the Japanese fishermen may be the reason the catch rates did not fall.

The national baitboat fleet landings, which showed an increasing trend until 1982, decreased 20 percent in comparison to 1983. This decrease in production was due to a reduction in the number of boats. As a result, fishing effort was lower than in 1982. As concerns fishing yields, catch rates showed a slight increase from 1982 to 1983, thereby ending the declining trend that has been noted since 1980. However, taking into account changes in the composition of the fleet, such as larger boats replacing smaller ones, it is possible that the fishing power of the fleet has increased. Thus, direct comparison should only be made after catch rates have been adjusted to compensate for these changes.

For the leased baitboat fleet, the total catches landed in 1983 were 3,713.3 MT, about 110 percent higher than those of the preceding year. The number of boats which operated in 1983 increased by two units and fishing effort was around three times the 1982 effort level. Catch rates showed a decline with respect to 1982.

Landings by the leased purse seine fleet amounted to about 498.9 MT. The Cayman Islands flag boat landed 179.9 MT, comprised only of skipjack. The two Spanish flag boats



landed 319.0 MT with equal proportions of skipjack and yellowfin. The higher quantities of yellowfin catches taken by the Spanish boats seem to be due to the fact that these boats operated farther out, sometimes up to 150 nautical miles from the coast.

The low catch rates by purse seiners apparently do not recommend continuing this method. The following facts were observed concerning the purse seine fisheries in Brazilian waters:

- There are long periods of bad weather conditions that seem to hamper fishing operations.
- For some areas and in some periods of the year, the thermocline occurs in waters shallower than 50 meters.
- With great frequency tuna schools move at great speeds, thereby reducing the chances of successful sets.

There is no good information on the artisanal fleet. The data available for the landings give figures of 2,059.6 MT in 1983. As in previous years, the landings have shown a decrease. However, no changes occurred in the artisanal fishery to account for a decline in catch. This decreasing trend, after 1981, may be due to deficiencies in the data collection system.

## 2. Research

During 1983, efforts were made to increase statistical coverage of the baitboat fisheries as well as the port sampling that was extended to the state of Santa Catarina where landings of baitboat fleets increased. As a result, the breakdown of catches by species was improved and size sampling was done on a higher volume of skipjack landings.

The following research institutions are conducting experimental fishing for skipjack: Instituto de Pesquisa e Desenvolvimento Pesqueiro, from SUDEPE, and Fundação Universidade do Rio Grande, from the University of Rio Grande State. One research project aims to try out the utilization of fish aggregating devices for increasing skipjack catches and another will experiment with purse seine gear for fishing skipjack and other species of small tunas.

One research vessel conducted three cruises to deploy aggregating devices and to provide maintenance support for the experiment. Preliminary results have shown the efficiency of these devices in attracting a diversified group of species from different age-classes. Good catches, mainly of dolphin (*Coriphaena hippurus*), were reported. The small number of cruises and the lack of an efficient monitoring system to cover commercial fishing trips have made assessment of the experiment difficult.

In relation to experimental fishing with purse seines, six fishing cruises were carried out. The poor catches seem to confirm that the existence of rapidly moving schools and

the bad weather conditions prevalent in the area do not encourage the possibility of employing this method in commercial fishing.

Based on catch and size frequency data from the skipjack fishery, during the period from March to August, 1983, and using the length cohort analysis and virtual population analysis, the annual recruitment and total biomass of the stock of skipjack in the fishing area between Cabo de São Tomé (22°S) and Cabo de Santa Marta (28°30'S) were estimated.

In order to verify estimates of *MSY*, based on the total biomass mentioned above, a production model was fitted to the data taken from the skipjack fishery in southeastern Brazil, for the period from 1979 to 1983. Copies of these documents were presented to the 1984 SCRS Meeting.

Two Brazilian scientists participated in the ICCAT International Skipjack Year Conference, held in Tenerife, Canary Islands, Spain, in June, 1983. Working papers concerning the distribution and abundance of skipjack larvae and juveniles in the Atlantic Ocean were presented.

A report on the procedures of collecting, processing and reporting data to ICCAT was submitted to the 1984 SCRS Meeting. This report was presented at the session dedicated to reviewing statistical procedures.

### 3. References

Documents presented to the SCRS in 1984 are listed in Appendix 2 to Annex 10 and/or are published in the Collective Volume of Scientific Papers, Vol. XXIII.

**Table 1. Total catch, estimated effort and catch rate by main tuna and tuna-like species caught by longline in Brazilian waters, 1976-1983**

Fleet	Year	Effort No. hooks	Yellowfin		Albacore		Bigeye		Swordfish		Total catch	
			Catch (MT)	Hook rate (kg/100 hks)	Catch (MT)	Hook rate (kg/100 hks)	Catch (MT)	Hook rate (kg/100 hks)	Catch (MT)	Hook rate (kg/100 hks)	Catch (MT)	Hook rate (kg/100 hks)
Japanese	1977	273,825	45.2	16.5	55.0	20.1	65.6	23.9	12.6	4.6	470.4	171.8
	1978	1,733,413	450.0	26.0	374.2	22.0	481.0	27.7	180.4	10.4	1,998.4	115.3
	1979	1,174,577	378.7	32.2	215.6	18.3	401.2	34.2	201.6	17.2	1,508.7	128.4
	1980	1,278,542	283.3	22.2	204.1	15.9	392.6	30.7	409.5	32.0	1,666.7	130.4
	1981	1,178,950	727.5	61.7	187.1	15.9	341.4	28.9	222.8	18.9	1,902.0	161.3
	1982	2,240,916	582.1	26.0	537.1	24.0	464.0	20.7	390.8	17.4	2,816.3	125.7
	1983	1,781,589	504.7	28.3	472.2	26.5	378.2	21.2	282.8	15.9	2,263.2	127.0
National (Estado de S. Paulo)	1976	1,085,005	424.3	39.1	156.8	14.5	111.8	10.3	371.8	34.3	358.2	33.0
	1977	1,250,335	368.0	29.4	157.0	12.6	150.0	12.0	330.0	26.4	1,423.8	113.9
	1978	1,281,380	331.0	25.8	65.0	5.1	76.0	5.9	138.0	10.7	872.0	68.1
	1979	1,294,565	553.0	42.7	151.0	11.7	167.0	12.9	213.0	16.5	1,361.0	105.1
	1980	1,192,610	236.2	19.8	184.9	15.2	174.0	14.6	1,125.0	94.3	2,150.0	180.3
	1981	1,223,105	459.5	37.6	63.1	5.2	102.4	8.4	405.0	33.1	1,140.4	93.2
	1982	1,552,970	269.0	17.3	165.2	10.6	160.3	10.3	602.8	38.8	1,326.9	85.4
	1983	1,955,280	269.8	13.8	169.5	8.7	105.3	5.4	364.1	18.6	1,028.4	52.6
National (Estado de Rio Grande do Sul)	1977	-	-	-	-	-	-	-	-	-	-	-
	1978	-	-	-	-	-	-	-	-	-	-	-
	1979	-	-	-	-	-	-	-	-	-	-	-
	1980	-	-	-	-	-	-	-	-	-	-	-
	1981	-	-	-	-	-	-	-	-	-	-	-
	1982	76,765	53.2	69.3	7.9	10.3	27.8	36.2	10.2	13.3	122.0	158.9
1983	347,635	67.3	19.3	21.7	6.2	22.1	6.3	106.6	30.7	429.8	123.6	

Source: PDP/SUDEPE, Instituto de Pesca (Sao Paulo).

**Table 2. Total catch (MT), estimated effort and catch rates by main species taken by the national baitboat fleet (Rio de Janeiro and Santa Catarina States), 1979-1983**

Years	State*	Total Catch (MT)	Effort (fish. days) <sup>2</sup>	Catch rate <sup>3</sup>	Skipjack		Yellowfin		Others <sup>1</sup>	
					Catch (MT)	Catch rate <sup>3</sup>	Catch (MT)	Catch rate <sup>3</sup>	Catch (MT)	Catch rate <sup>3</sup>
1979	RJ	2,104.0	---	---	1,818.0	---	117.0	---	169.0	---
1980	RJ	6,846.0	1,068	6.41	6,070.0	5.68	392.0	0.37	384.0	0.36
1981	RJ	14,575.0	2,792	5.22	13,620.0	4.88	910.0	0.32	45.0	0.02
1982	RJ/SC	17,472.0	4,054 (6,117)	4.31	16,299.0	4.02	1,027.0	0.25	146.0	0.04
1983	RJ	12,424.0	2,515 (4,181)	4.94	10,373.0	4.12	1,730.0	0.69	321.0	0.13
1983	SC	1,312.2	192	6.32	1,300.3	6.77	7.5	0.04	4.4	0.02

1 Includes blackfin tuna, albacore, frigate tuna, dolphins, Atlantic little tuna, etc.

2 The figures in ( ) refer to days of fishing, including unsuccessful scouting days.

3 MT/day of effective fishing.

\* RJ = fleet based in Rio de Janeiro State.

SC = fleet based in Santa Catarina State.

**Table 3. Total catch, estimated effort and catch rates by main tuna species taken by the leased Japanese baitboat fleet, based in Santa Catarina State, 1982-1983**

Years	Total catch (MT)	Effort (fishing days)	Catch rate <sup>1</sup>	Skipjack		Yellowfin		Others <sup>2</sup>	
				Catch (MT)	Catch rate <sup>1</sup>	Catch (MT)	Catch rate <sup>1</sup>	Catch (MT)	Catch rate <sup>1</sup>
1982	1,761.0	163	10.80	1,714.0	10.51	4.0	0.02	43	0.26
1983	3,713.3	513	7.23	3,659.6	7.13	39.7	0.08	14	0.03

1 MT/day of fishing (including unsuccessful scouting days).

2 Includes albacore, bigeye tuna and small tunas.

SOURCE: PDP/SUDEPE

## NATIONAL REPORT OF CANADA

by

T. HURLBUT, D. CLAY and R. STEPHENSON

## 1. Status of the fisheries

*1.1 Bluefin tuna*

Canadian landings of Atlantic bluefin tuna in 1983 amounted to 1,007 fish weighing 432.7 MT, the highest landings in the past five years.

The most notable difference in the Canadian fishery was the near complete failure of the trap fishery in St. Margaret's Bay, Nova Scotia. Only 17 fish were landed out of a total quota of 401 bluefin for this fishery.

The landings for Prince Edward Island, Quebec and New Brunswick were exceptional in 1983, exceeding annual provincial records for both total numbers and weight landed in recent years. In these provinces the "tended-line" handgear is now the predominant gear type.

Landings in St. Georges Bay, Nova Scotia, and off Newfoundland were down significantly in 1983 as in 1982.

The mean weight of bluefin caught throughout the Gulf of St. Lawrence in 1983 was higher than in previous years continuing the trend of increasing mean weight since 1974.

There has been no purse seine fishery for bluefin by Canadian vessels since 1981.

*1.2 Swordfish*

The nominal catch of swordfish in Canada in 1983 amounted to 1,088 MT. The long-line fishery accounted for 960 MT while 128 MT were taken by the harpoon fishery. The total catch represents a significant increase from the 1982 catch of 554 MT but probably reflects market conditions rather than the abundance of swordfish.

## 2. Research studies

*2.1 Bluefin tuna*

Intensive biological sampling was conducted on Prince Edward Island and at St. Margaret's Bay, Nova Scotia, in 1983. Approximately 400 otolith samples were collected, as well as a length-stratified sample of caudal vertebrae for use in age validation.

Original report in English.

Tissue samples were collected from a length-stratified sample for analysis of fat content.

A preliminary investigation of the parasites from the guts of giant bluefin was conducted and five new host records were recorded.

Individual weights were obtained for all the bluefin landed in Canada. The quality and coverage of log records returned by Canadian bluefin fishermen were poor in 1983. An analysis of the log records for 1982 and 1983 was conducted.

## 2.2 *Swordfish*

An aging validation study using anal fin spine sections was completed but no new research was initiated. No swordfish were tagged in 1983; however, a single tag was returned.

## 3. Preliminary information for 1984

### 3.1 *Bluefin tuna*

The Canadian quota for bluefin in 1984 was 573 MT. There were no new licenses and the Canadian fisheries were managed by sub-area quota. The catch to date (as of October 17, 1984) is 413 bluefin, 42 percent of the catch at the same time in 1983.

The St. Margaret's Bay trap net fishery appears to have failed again in 1984, as it did in 1983. The quotas have not been met in any of the areas and Prince Edward Island and St. Georges Bay, Nova Scotia, are the only areas presently sustaining catches.

There was no Canadian purse seine fishery for tuna in 1984 and there were no tuna tagged and released by Canada.

## 4. Documents presented to the 1984 SCRS

Documents presented to the SCRS in 1984 are listed in Appendix 2 to Annex 10 and/or are published in the Collective Volume of Scientific Papers, Vol. XXII.

## NATIONAL REPORT OF THE REPUBLIC OF CAPE VERDE

by

M. E. DA COSTA MONIZ

## 1. The fisheries

*1.1 The fleet*

The Cape Verde industrial and semi-industrial tuna fleet consists of 2 freezer baitboats and 25 baitboats without freezer facilities. These vessels use live bait during the months of the hot season.

*1.2 The fishing areas*

Cape Verde fishing operations take place in Cape Verde waters. However, one freezer baitboat was in the Azores until mid September. Another freezer baitboat, with crew, was rented in Mozambique for experimental fishing in that area.

*1.3 The catches*

The most important species of tuna caught in Cape Verde are skipjack, yellowfin, big-eye tuna, frigate tuna and Atlantic little tuna. Table 1 shows catch data for the industrial and semi-industrial fisheries up to the end of September.

## 2. Statistics

As regards statistics, Cape Verde has tried to follow the ICCAT recommendations by collecting catch, effort and size sampling data by 5x5 degree squares.

## 3. Research activities

Research activities are still in the developing stages due to the lack of infrastructure, limited personnel and the distances between landing ports. In spite of this, Cape Verde carries out size sampling on yellowfin, skipjack and bigeye, as well as sampling of gonads and stomach contents of these species.

Original report in French.



Table 1. Catch (MT) and effort data for 1984 (up to the end of September)

<i>Total Catch</i>	<i>T. albacáres</i>	<i>T. obesus</i>	<i>K. pelamis</i>	<i>A. solandri</i>	<i>A. thazard E. alletteratus</i>	<i>Gear</i>	<i>Effort</i>	<i>Area</i>
320	285	1	31	4	---	Hand	266	Cape Verde
920	607	15	283	16	---	BB	831	Cape Verde
230	84	2	144	---	---	FBB	111	Cape Verde
110	8	78	24	---	---	FBB	85	Azores
6	---	---	---	---	6	PS	4	Cape Verde
1,586	984	96	482	20	6		1,297	

## NATIONAL REPORT OF CUBA

by

B. GARCIA MORENO and A. RODRIGUEZ RODRIGUEZ

## 1. The fisheries

## 1.1 Fishing areas

Cuban vessels which catch tunas and tuna-like species in the Atlantic operated in an area similar to that of previous years (Figure 1).

In adjacent Cuban waters small and medium vessels carried out their activities, using troll/gill nets for king mackerels (*Scomberomorus* spp.), pole and line for skipjack (*K. pelamis*) and blackfin (*T. atlanticus*), and longline for tunas (*Thunnus* spp.) and billfishes (*Istiophoridae*, *Xiphidae*).

Longliners and a purse seiner fished in the central east Atlantic and targeted yellowfin. As in 1982, the fishing area of these vessels was limited by the 200-mile zone of the coastal countries to the east, 55°W in the west, the equator to the south and 15°N to the north.

## 1.2. The tuna fleet

The number of Cuban vessels fishing for tunas and tuna-like species was similar to that of previous years. The fleet was basically comprised of 18 long-range longliners, 9 medium-range longliners and about 59 baitboats.

The fleet also included one purse seiner and approximately 50 small boats using troll and gill nets.

## 1.3. The catches

The total 1983 catch (8,984 MT) is slightly higher than that of the previous year (4 percent) but it is relatively low with respect to the levels since 1971 (Figure 2). A slight increase is noted in the baitboat and purse seine catches.

Once again there was a decline in longline catches due to the extremely low yellowfin catch per unit of effort obtained with this gear.

Original report in Spanish.

In spite of the declines in the yellowfin catches, this species continues to be the most important (Figure 3) with 2,709 MT (30 percent) followed by skipjack (1,853 MT, 20.4 percent), swordfish (*X. gladius*, 1,228 MT, 13.7 percent), billfish (*Istiophoridae*, 1,068 MT, 11.9 percent), mackerels (689 MT, 7.7 percent) blackfin (558 MT, 6.2 percent), bigeye (*T. obesus*, 421 MT, 4.7 percent), blue marlin (*M. nigricans*, 396 MT, 4.4 percent) and others (80 MT, 0.9 percent).

It is expected that 1984 catches will be similar to those of 1983.

## 2. Research activities

Sampling for size composition of skipjack and blackfin continued and sampling of billfish and blue marlin was initiated in Cuban ports.

Experiments to convert medium-sized freezer boats to longliners for fishing within the Cuban Exclusive Economic Zone had satisfactory results and accordingly a fishery has been initiated. The possibility of using a medium-sized purse seiner in the Cuban EEZ is still being investigated.

Research was carried out on the relationship of numeric parameters, abundance of skipjack and blackfin, tuna larvae and the biological aspects of these species.

## 3. Participation in meetings

Cuban scientists participated in the meeting of the Working Group on Bluefin Tuna, held in Dartmouth, Canada.

## 4. Statistics

The species breakdown made in 1982 was continued and the corresponding forms were sent to ICCAT (forms 1.1, 1.2 and 2).

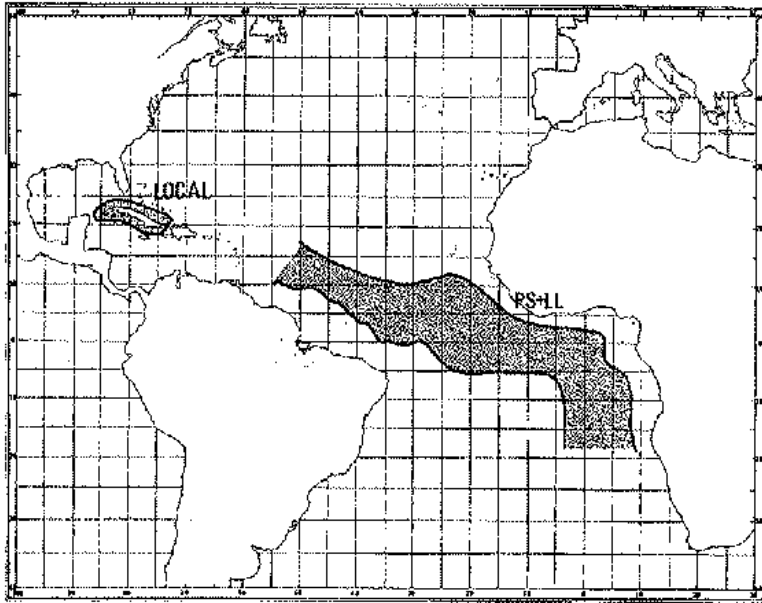


Fig. 1. Fishing areas of Cuban tuna vessels. (The local fishery includes small scale LL, troll and BB.

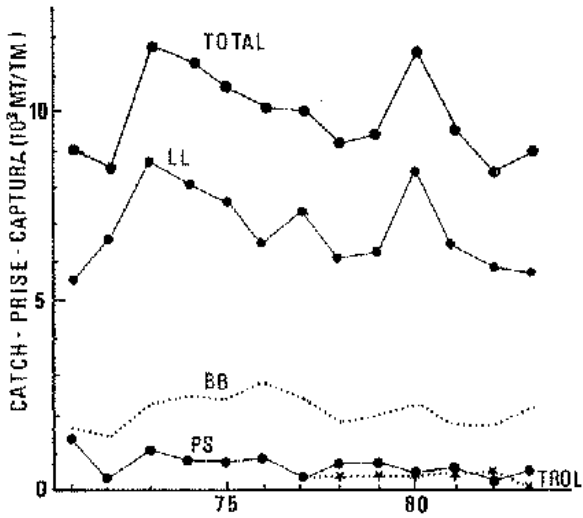


Fig. 2. Catches, by gear, of Cuban tuna vessels.

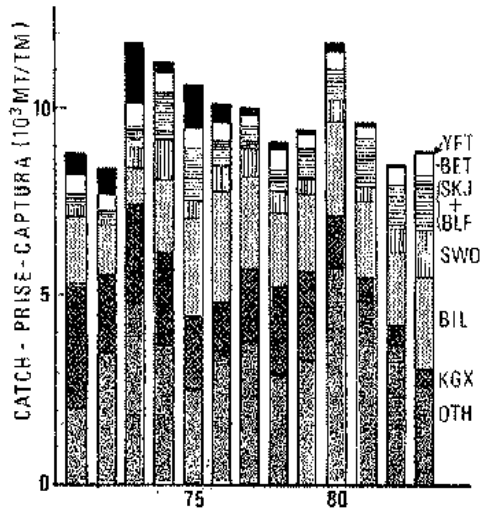


Fig. 3. Species composition of Cuban catches of tunas and tuna-like fishes.

## NATIONAL REPORT OF FRANCE

### 1. State of the fisheries

	1977	1978	1979	1980	1981	1982	1983
Albacore	6.8	8.4	8.0	4.2	3.3	3.6	3.0
Yellowfin	37.9	41.6	38.7	43.6	40.6	29.2	31.9
Skipjack	14.8	19.9	15.2	22.5	27.2	26.1	20.5
Bigeye	3.0	2.2	3.1	0.8	0.4	3.0	6.0
Bluefin	<u>3.7</u>	<u>2.3</u>	<u>1.8</u>	<u>1.7</u>	<u>2.4</u>	<u>5.0</u>	<u>4.1</u>
TOTAL (1,000 MT)	76.2	74.4	66.8	72.8	73.9	66.9	65.5

The decrease in tuna landings observed in 1982 continued in 1983 but to a lesser degree.

The catches of bluefin, mainly from the Mediterranean, decreased due to bad weather on the French Mediterranean coast during the 1983 fishing season. The peninsular albacore catch continued to decrease in 1983 to 2,400 MT with a growing decrease in the number of vessels directed at this fishery (129 in 1982 compared with 113 in 1983). Nevertheless it seems that the 1984 albacore season has been better than in previous years.

The catches of tropical tunas, taken mainly by purse seiners in the Gulf of Guinea, are decreasing slightly because of the very low yields and the decrease in the number of vessels operating in this area. Since the end of 1983 there has been a massive shift of French purse seiners towards the Indian Ocean. By October, 1984, there were no French purse seiners left in the tropical Atlantic.

### 2. Research

The principal organizations which conduct tuna research are ORSTOM (Office de la Recherche Scientifique et Technique d'Outre-Mer) and IFREMER (Institut Français de Recherche pour l'Exploitation de la Mer) which combines ISTPM and CNEXO.

Original report in French.

### *2.1 Albacore*

A research cruise, in which an ISTEPM scientist participated, was carried out in June in the area where these vessels operate during their fishing season. At that time, attempts at partial freezing undertaken in 1982 were continued on the pilot vessel of the fleet. The usual data were collected (hydrological data, biometrics, etc.).

IFREMER collected statistical data (catch, effort and size composition). The data processed by the data treatment centers of the national statistics network served as a base for the overall estimates for 1983.

### *2.2 Bluefin tuna*

Sampling of bluefin tuna landed by the 22 French purse seiners continued in the Mediterranean. A sample of vertebrae was also collected and sent to Dr. J. R. Calaprice (IATTC) to study trace elements in the hard parts.

### *2.3 Tropical tunas*

French research on tropical tunas is carried out in collaboration with research laboratories of Senegal and Ivory Coast. The collection of detailed statistical data and intensive sampling has continued on the French baitboat and purse seine fleets. Analyses of the state of the tropical tuna stocks were carried out for the Working Group on Juvenile Tropical Tunas (Brest, July, 1984). The new models were updated in order to answer the questions from the SCRS about the protection of juvenile yellowfin and bigeye. In addition, France has carried out several tuna tagging cruises with Ivory Coast. The results were submitted to the SCRS.

## 3. References

Documents presented to the SCRS in 1984 are listed in Appendix 2 to Annex 10 and/or are published in the Collective Volume of Scientific Papers, Vol. XXI.

## NATIONAL REPORT OF GHANA

## 1. The fishing fleet

A total of 43 of tuna vessels operated from Tema in 1983. These consisted of 10 foreign flag vessels and 33 Ghanaian flag vessels. All 10 foreign flag vessels were baitboats; 5 of the Ghanaian flag vessels were purse seiners and the rest (28) were baitboats.

The Ghanaian flag vessels which operated in 1983 were as follows:

<i>Vessel</i>	<i>Gear</i>	<i>GRT</i>
Mary Radine	Baitboat	283.88
Nick "T"	"	282.99
Fernanda Marisa	"	282.94
Kwamina Nortey	"	284.76
Big John	"	284.76
Manko Star	"	342.04
Lois II	"	284.76
Joy	"	253.38
Brenya No. 83	"	249.26
Obaatan No. 808	"	245.00
Ghako No. 101*	"	416.95
Gbese No. 6	"	416.00
Gbese No. 7	"	416.90
Gbese No. 8	"	416.90
Gbese No. 9	"	416.90
Afko No. 301	"	254.46
Afko No. 303	"	284.28
Afko No. 305	"	440.41
Afko No. 306	"	439.89
Afko No. 307	"	440.24
Afko No. 308	"	450.27
Afko No. 310	"	253.94
Afko No. 311	"	284.73
Kaas No. 101	"	253.00
Kaas No. 102	"	254.25
Kaas No. 103*	"	379.59
Kaas No. 105*	"	454.71
Kaas No. 107*	"	454.71
Donna "H"	Purse seine	898.00
Gold Coast	"	958.00
Captain Stendal	"	896.06
Marian Rosina	"	896.06
Wansima	"	898.06

\*These vessels operated as foreign flag vessels with different names during the early part of the year and later changed to Ghanaian flag.

Original report in English.

The foreign flag vessels that operated in 1983 consisted of the following:

<i>Flag</i>	<i>Vessel</i>	<i>Gear</i>	<i>GRT</i>
Japan	Katsushio Maru No. 202	Baitboat	284.92
Japan	Katsushio Maru No. 203	"	284.85
Japan	Katsushio Maru No. 205	"	284.59
Japan	Katsushio Maru No. 206	"	284.75
Japan	Katsushio Maru No. 301	"	373.60
Japan	Seisho Maru No. 30	"	284.60
Japan*	Fukuichi Maru No. 78	"	379.59
Panama*	Dong Won No. 806	"	454.71
Panama*	Dong Won No. 807	"	454.71
Korea*	Hae Chang No. 101	"	416.95

\*These vessels operated as Ghanaian flag vessels (with different names) during the latter part of the year.

## 2. Landings

Landings, in metric tons, made by the foreign and Ghanaian flag vessels in 1983 were as follows:

<i>Species</i>	<i>Foreign flag</i>	<i>Ghanaian industrial</i>	<i>Ghanaian artisanal</i>	<i>Total</i>
Yellowfin	346.794	2230.603	—	2577.397
Bigeye	3.766	284.188	—	287.954
Skipjack	7328.233	22404.145	—	29732.378
Black skipjack*	—	—	2432.1	2432.1
Frigate tuna	—	—	2909.4	2909.4
Others**	693.203	6738.016	—	7431.219
Total	8371.996	31656.952	5341.5	45370.448

\*Includes *Euthynnus alletteratus* and *Sarda sarda*.

\*\*Includes broken tuna (of any species) and *Elegatus bipinnulatus*.



The total quarterly baitboat landings were as follows:

<i>Species</i>	<i>1st Quarter</i>	<i>2nd Quarter</i>	<i>3rd Quarter</i>	<i>4th Quarter</i>	<i>Total</i>
Yellowfin	427.099	339.396	225.164	271.146	1262.805
Bigeye	30.548	37.602	80.334	5.970	154.454
Skipjack	8204.726	6823.086	7174.135	4969.862	27171.809
Others	<u>1171.535</u>	<u>909.907</u>	<u>1687.996</u>	<u>1904.535</u>	<u>5673.973</u>
Total	9833.908	8109.991	9167.629	7151.513	34263.041

The total quarterly purse seine landings were as follows:

<i>Species</i>	<i>1st Quarter</i>	<i>2nd Quarter</i>	<i>3rd Quarter</i>	<i>4th Quarter</i>	<i>Total</i>
Yellowfin	654.172	406.566	151.619	102.235	1314.592
Bigeye	0.050	0.160	74.772	58.518	133.500
Skipjack	836.964	706.276	700.337	316.992	2560.569
Others	<u>558.696</u>	<u>346.265</u>	<u>453.511</u>	<u>398.774</u>	<u>1757.246</u>
Total	2049.882	1459.267	1380.239	876.519	5765.907

### 3. Research

During the year, the collection of catch statistics (Task I and Task II) continued.

a) Studies continued on length frequency distribution, sex structure, maturity and feeding of the three principal tuna species (yellowfin, skipjack and bigeye). A total of 4,824 yellowfin, 5,848 skipjack and 380 bigeye were measured for length frequency distribution during the year. The results of these measurements continued to show the predominance of young yellowfin and bigeye off Ghana.

A total of 188 yellowfin and 2,238 skipjack were examined for sex. Of those, most were males.

b) Port sampling was continued and improved.

c) The recovery and return of tags released during the International Skipjack Year Program continued. Twelve tags were recaptured and returned to the laboratories that released them.

**4. Research program for 1984-85**

- a) Improvement in Task II statistics and size sampling.
- b) Improvement in logbook coverage.
- c) Studies on gonado-somatic indices of skipjack and yellowfin.

## NATIONAL REPORT OF IVORY COAST

by

J. B. AMON KOTHIAS and F. X. BARD

### 1. Introduction

There were many important changes in tuna fishing in Ivory Coast in 1984. The FISM fleet which was based at the port of Abidjan has gradually moved to new fishing grounds in the Indian Ocean. By the end of 1984 there will be no tuna vessels from this fleet based in Abidjan.

On the other hand, the activities of the large Spanish purse seiners have continued. The baitboats usually based at Tema have shifted towards Abidjan and currently about 30 baitboats with Ghanaian and Japanese flags land their tuna catches at Abidjan. Four Ghanaian purse seiners and one Japanese seiner also regularly land their catches at this port.

These circumstances have caused some confusion and problems for the "Centre de Recherches Océanographiques" (CRO), which is responsible for collecting Task I and II statistics and biological data. However, with the collaboration of France, Ivory Coast has continued with the tagging program which was recommended as a complement to the Skipjack Program, and with research on aggregating devices.

### 2. Statistics

#### 2.1 *The FISM fleet*

Task I statistics for the FISM fleet were collected and sent to ICCAT. As regards the Ivorian fleet, the catches for 1983 and 1984 are shown in Table I.

Task II statistics for 1983 for the FISM fleet as a whole were also sent to ICCAT. Size data were also provided.

#### 2.2 *Other fleets*

The Spanish fleet is monitored through a contract with the "Instituto Español de Oceanografía" (IEO). Therefore, Task I and II statistics and size data were routinely collected for 1983 and sent to the IEO. The same procedure was applied in 1984.

Original report in French.

A new problem for the CRO in 1984 was the collection of statistics from Ghanaian baitboats and purse seiners landing at Abidjan. These vessels be categorized in two groups: (1) the purse seiners, still few in number, and for which FISM sampling procedures are applied; and (2) the baitboats, for which considerable work still must be done.

In 1984, the CRO tried to collect as much data as possible. However, the data were not always complete due to the lack of collaboration from the vessel captains and to the lack of English-speaking samplers and surveyors. It is important that, in 1985, ICCAT assist the CRO in the following:

- Provide specific logbooks for the baitboats. These should be written in English, Korean and Japanese so as to enable us to convince the captains to fill them out.
- Provide financial assistance towards the collecting, coding, verifying and storing of information for submission to ICCAT and to the authorities of the flag country.

Table 2 provides a summary of the baitboat landings at Abidjan during the first ten months of 1984 as well as an indication of the coverage rate and shows the importance of the problem.

### 3. Research

#### 3.1 Tagging

Ivory Coast carried out three tagging cruises with France in 1983 and 1984. During these cruises tagging operations as well as studies on skipjack aggregating devices were carried out.

Table 3 gives the number of tunas tagged, by species, and recoveries (up to October 15, 1984). The locations where the tagging took place are indicated in Figure 1. Preliminary tagging results confirm the conclusions of the Skipjack Program.

The skipjack and yellowfin tunas tagged on the high seas (cruise 13) were recaptured much later in the south Senegal area, even though extensive skipjack fishing took place in the tagging area at this time. This confirms that the west equatorial area (Liberian Zone) is a gathering place for skipjack migrating from the Gulf of Guinea and west of Senegal in the fourth quarter of each year. The biomasses present seem high and the return of tagged fish is low. It is also very probable that skipjack escape towards the high seas.

Skipjack tagged to the east of Three Point Cape (cruise 14) were mainly recaptured by the purse seiners and baitboats working near this cape in June and July, 1984. This confirms that there is a high rate of local exploitation of skipjack well within the Gulf of Guinea.

As of the time of writing there were no recoveries yet of fish tagged on Cruise 15. We expect a large number of tagged fish will be registered in the area far to the west along the equator. These recoveries should prove very interesting. The transatlantic recovery of an Atlantic blue marlin is noteworthy (Table 4).

*3.2 Aggregating devices*

As recommended in the Report of the Skipjack Program, Ivory Coast carried out research on the possibility of increasing skipjack fishing on the high seas using these devices. The results are good and will be presented in a later publication. It is now possible to forecast purse seine fishing strategy using the position of aggregating devices in the Atlantic.

*3.3 Working groups*

Dr. J. B. Amon Kothias chaired the third meeting of the Working Group on Juvenile Tropical Tunas held in Brest in July, 1984. The report of this Group was presented to the 1984 SCRS (Collective Volume of Scientific Papers, Vol. XXI (1 and 2)).

**4. Publications**

The documents presented to the SCRS in 1984 are listed in Appendix 2 to Annex 10 and/or are published in the Collective Volume of Scientific Papers, Vols. XXI and XXIII.

Table 1. Tuna catches (in MT) by Ivory Coast, 1983-1984

	1983	1984*
Yellowfin. . . . .	7,712	837
Skipjack . . . . .	6,961	2,935
Bigeye. . . . .	96	10
Albacore . . . . .	72	1
<b>TOTAL</b> . . . . .	<b>14,841</b>	<b>3,783</b>

\*Atlantic fishing, final.

Table 2. Monthly arrivals of Ghanaian baitboats and purse seiners for landing at Abidjan in 1984

Arrivals	BB	Trips covered*	Ghana PS	Trips covered*
Jan. . . . .	17	0		
Feb. . . . .	8	0	1	0
Mar. . . . .	9	2	1	1
Apr. . . . .	10	4		
May . . . . .	9	8	3	3
Jun. . . . .	12	7	2	2
Jul . . . . .	10	10	1	1
Aug . . . . .	16	10	1	1
Sep. . . . .	19	10	1	1
Oct. . . . .	**	**	1	1

\*Number of trips from which Task I data were collected.

\*\*Data not yet available.

Table 3. Tagging carried out by Ivory Coast in 1983-1984

<i>Cruise No.</i>	<i>Effective tagging (by species)</i>	<i>Recovery &lt;30 days</i>	<i>Recovery &gt;30 days</i>	<i>Tagging area</i>
13	SKJ - 35	0	1	Liberia
	YFT - 193	0	5	
	BET - 85	0	0	
14	SKJ - 355	55	10	Cape Three Points
	YFT - 32	4	0	
15	SKJ - 564			Liberia
	YFT - 248			
	BET - 341			

Table 4. Information on a transatlantic recovery of a blue marlin\*

<i>TAG NUMBER: R-59578 (U.S.A.)</i>		
	<i>Tagging conditions</i>	<i>Recovery conditions</i>
Place . . . . .	St. Thomas, Virgen Is., U.S.A.	19°30'N and 20°22'W
Date . . . . .	September 29, 1983	January 29, 1984
Estimated size. . . . .	400 kgs.	260 cm FL
Tagger . . . . .	Ms. A. Lopez	
Type of fishery . . . . .	Sport	FISM purse seiner

\*This is the second recovery of a blue marlin. The first marlin had been tagged at St. Thomas in August, 1976, and was recaptured on the high seas of Ivory Coast six months later by a FISM tuna vessel.

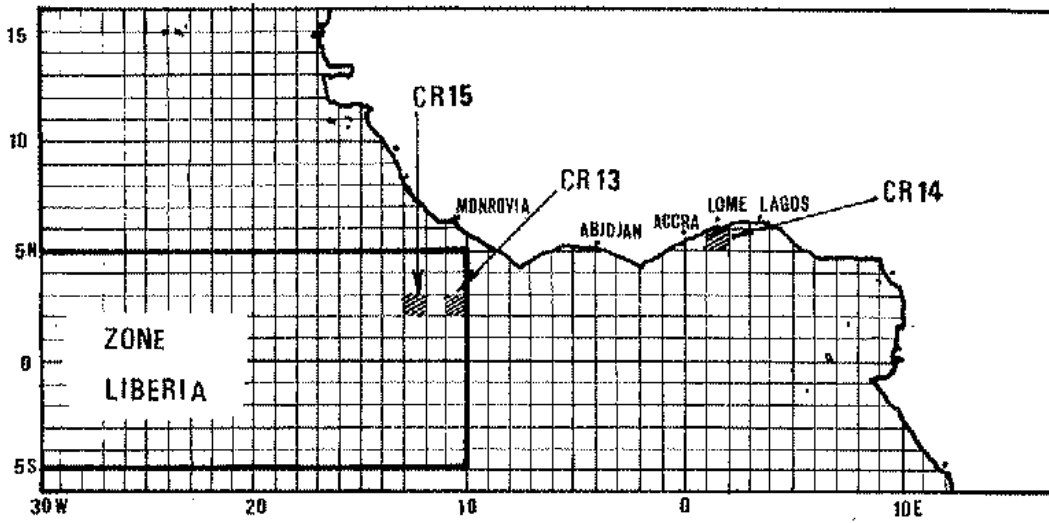


Fig. 1. Tagging areas of three Ivory Coast cruises (CR-13, 14, 15) in 1983-1984.



## NATIONAL REPORT OF JAPAN

by

S. KUME  
 FAR SEAS FISHERIES RESEARCH LABORATORY

### 1. Fishing activities

The Japanese Atlantic tuna fishery is presently comprised of two gear types, longline and purse seine. (In this paper the Atlantic includes the Mediterranean Sea, unless otherwise noted.) The Japanese pole-and-line fishery ceased operations in April, 1984. The total annual catch of tuna and tuna-like species caught by the Japanese Atlantic tuna fisheries in 1983 amounted to 33,995 MT, about half that of 1982 (Table 1). The decline was attributed mainly to the decrease in the number of longliners in 1983 (Table 2). The 1983 total catch was comprised of 45 percent bigeye tuna, 18 percent skipjack tuna, 13 percent yellowfin tuna, and 12 percent bluefin tuna (Figure 1). The predominance of bigeye tuna has been notable in recent years. About 76 percent of the total catch was made by the longline fishery, which has been the principal gear among the Japanese tuna fisheries (Figure 2). The proportion of the pole-and-line and purse seine catches was 16 percent and 8 percent, respectively.

Japanese fishermen have been under governmental regulatory measures relating to the regulations of the International Commission for the Conservation of Atlantic Tunas (ICCAT) imposed on bluefin, yellowfin and bigeye tunas. In May and June of 1983 and 1984, a governmental patrol boat was dispatched to monitor the Atlantic longline fleet for bluefin tuna.

#### *1.1 The longline fishery*

The preliminary longline catch in 1983 was 25,685 MT compared to 50,302 MT in 1982. The marked decrease was due to the decline in the number of longline vessels from 269 in 1982 to 182 in 1983 (Table 2). Of the total longline catch, 15,141 MT (59 percent) was bigeye, and 3,997 MT bluefin tuna and 2,069 MT yellowfin were taken (Table 3). The predominance of bigeye tuna in the longline catch in recent years indicates the stable operation of the fleet, i.e. in the general fishing grounds, the fleet concentrates in the bigeye area. In 1984, the general pattern and fishing strategy of the longline fishery were basically the same as in recent years (as of August), except for the increase in the number of boats in the southern bluefin tuna fishing grounds.

Original report in English.

### *1.2 The pole-and-line fishery*

The Japanese baitboat fleet based at Tema was comprised of four vessels in 1983. The catch of tropical tuna species by this fleet amounted to 5,577 MT. More than 80 percent of the catch was comprised of skipjack (Table 4). In 1984, two Japanese baitboats based in Tema were active during the January-March period, and produced 442 MT of skipjack, 97 MT of yellowfin tuna and 26 MT of bigeye tuna. No Japanese baitboat has been operating in the Atlantic since April, 1984.

### *1.3 The purse seine fishery*

Since March, 1982, one Japanese purse seiner has been in operation in the Gulf of Guinea. In 1983, the fishery caught 2,733 MT, of which skipjack and yellowfin tuna each accounted for half of the catch. In 1984, this vessel continued its operations in the Atlantic.

## **2. Research activities**

Scientific research on Atlantic tunas and tuna-like species was conducted by the Far Seas Fisheries Research Laboratory (FSFRL) during the 1983-1984 period. The FSFRL has been collecting and processing all statistical data as required by the Standing Committee on Research and Statistics (SCRS). The results are routinely reported to the ICCAT Secretariat. All the scientific research which was carried out based on these data, as well as on the ICCAT data base, has been summarized and presented to the regular SCRS and intersessional meetings for a better understanding of Atlantic tuna and tuna-like resources. In 1984, Japanese scientists participated in the following intersessional meetings of the SCRS: the Meeting of the Working Group on Juvenile Tropical Tunas at Brest, France (July, 1984) and the Meeting of the Working Group on Bluefin Tuna, held at Dartmouth, Canada (September-October, 1984).

### *2.1 Fishery data*

Final 1982 and preliminary 1983 longline catch statistics, by species, (Task I) were reported to the ICCAT Secretariat, as well as final 1983 data for the pole-and-line and purse seine fisheries. Catch and effort statistics (Task II) for the longline fishery for 1982 and for the pole-and-line and purse seine fisheries for 1983 were submitted to ICCAT. In April, 1984, the Fisheries Agency promulgated a rule to expedite submission of logbook records for the longline fishery by reporting at a port of call instead of after the termination of a trip. This procedure will facilitate earlier compilation of Task I and II data than before. Task II biological sampling and size frequency data have been collected through size measurements on board the vessels, and length data compiled for 1982 were reported to ICCAT.

## *2.2 Tuna biology and stock assessment*

The FSFRL has been conducting research on biology and population dynamics of Atlantic tunas and billfishes, the results of which have been continuously presented to the SCRS. During 1984, research activities were focused on completing bluefin tuna work assigned by the SCRS and at the Bluefin Workshop held in Japan in 1983. The results were presented in several documents at the Meeting of the Working Group on Bluefin Tuna held in Dartmouth in 1984. The stock status of the Atlantic bigeye tuna resource was evaluated using updated standardized effort and CPUE of the longline fishery.

## **3. References**

The documents presented to the SCRS in 1984 are listed in Appendix 2 to Annex 10 and/or are published in the Collective Volume of Scientific Papers, Vols. XXII and XXIII.

**Table 1. Japanese catch (MT) of tunas and tuna-like fishes by type of fisheries,  
Atlantic Ocean and Mediterranean Sea, 1979-83**

<i>Type of fishery</i>	<i>1979</i>	<i>1980</i>	<i>1981</i>	<i>1982</i>	<i>1983</i>
Total . . . . .	44,480	48,833	52,975	63,172	33,995
LL (Home-based) . . . . .	27,613	34,765	36,797	50,302	25,685
Pole-and-line . . . . .	16,867	14,068	16,178	10,620	5,577
Purse seine . . . . .	---	---	---	2,250	2,733

**Table 2. Annual number of Japanese tuna boats which operated in the Atlantic  
Ocean, 1979-83**

<i>Type of fishery</i>	<i>1979</i>	<i>1980</i>	<i>1981</i>	<i>1982</i>	<i>1983</i>
LL (Home-based) . . . . .	249	300	320	269	182
Pole-and-line . . . . .	15	12	10	7	4
Purse seine . . . . .	---	---	---	1	1

**Table 3. Catch (MT) of tunas and tuna-like fishes taken by the Japanese Atlantic longline fishery, 1979-83**

<i>Year</i>	<i>1979</i>	<i>1980</i>	<i>1981</i>	<i>1982</i>	<i>1983</i>
TOTAL . . . . .	27,613	34,765	36,797	50,302	25,685
ATLANTIC					
Sub-total . . . . .	27,511	34,645	36,696	49,336	25,002
Albacore . . . . .	1,324	1,369	2,298	1,350	1,318
Bigeye . . . . .	11,957	20,477	21,044	32,867	15,141
Bluefin . . . . .	4,251	4,816	4,286	2,865	3,320
S. bluefin . . . . .	6,192	2,116	1,667	643	594
Yellowfin . . . . .	1,986	2,839	4,145	6,062	2,069
Swordfish . . . . .	968	2,107	2,232	3,723	1,893
Blue marlin* . . . . .	134	308	468	1,132	440
White marlin . . . . .	57	106	143	111	44
Sailfish** . . . . .	39	55	94	173	69
Others . . . . .	603	452	319	410	114
MEDITERRANEAN					
Sub-total . . . . .	102	120	101	966	683
Bluefin . . . . .	99	119	100	961	677
Swordfish . . . . .	3	1	1	5	6

\*Includes a minor amount of black marlin.

\*\*Includes shortbill spearfish.

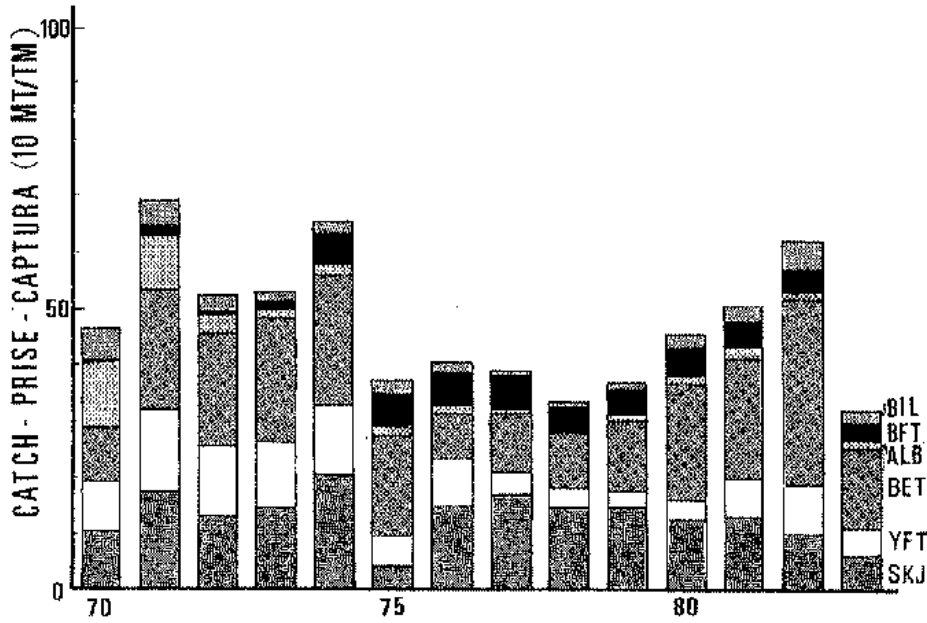


Fig. 2. Japanese annual yield of tunas and billfishes in the Atlantic, by type of fisheries, 1970-83.

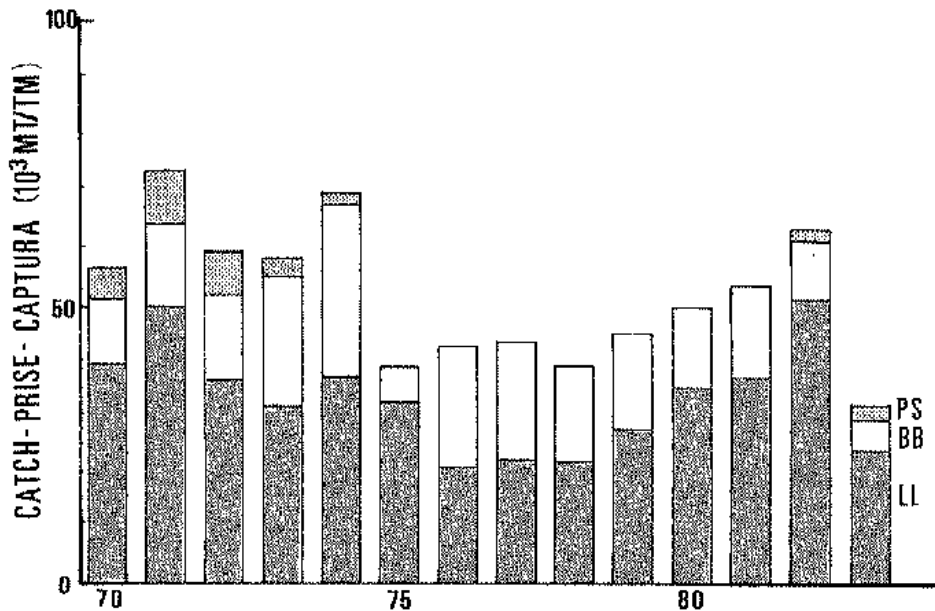


Fig. 1. Japanese annual yield of tunas and billfishes in the Atlantic, by species, 1970-83.

## NATIONAL REPORT OF KOREA

### I. The fisheries

The total catch in 1983 amounted to 17,921 MT, a decrease of 27.0 percent compared to the 1982 figure. Of this amount, 90.5 percent of the catch was taken by longliners and 9.5 percent by baitboats.

The total longline catch for the first half of 1984 was estimated at 5,508 MT, a 42.7 percent decrease compared to that of the previous year.

#### *1.1 The longline fishery*

The distribution of the longline fishing grounds was basically the same as for the past year without any considerable changes. The main fishing grounds of the total area fished were in the tropical area from the equator to near 10°N.

The total longline catch in 1983 amounted to 16,223 MT, a 22.9 percent decrease compared to the 1982 catch (Table 1). The catch composition by major species is as follows:

Bigeye:	9,383 MT (57.8 percent of the total catch)
Yellowfin:	3,406 MT (21.0 percent of the total catch)
Albacore:	1,076 MT (6.6 percent of the total catch)

The largest portion of the total catch has been comprised of bigeye tuna since 1979 but this figure showed a decreasing trend from 1981 (Table 2). The bigeye catch in 1983 decreased approximately 12 percent from the previous year.

The total catch by the Korean longline tuna fishery in the Atlantic has been decreasing considerably, from 39,000 MT in 1977 to 16,200 MT in 1983.

### 1.2 The pole-and-line fishery

In 1983, Tema-based baitboats carried out fishing activities for tropical tunas in the Gulf of Guinea. The total catch was recorded at 1,697 MT which showed a 51.6 percent decrease over the 1982 catch (Table 2). The catch composition, by species, is as follows:

Skipjack:	1,553 MT (91.5 percent of the total catch)
Yellowfin:	144 MT (8.5 percent of the total catch)

The catch of skipjack, the main target species of this fishery, decreased about 54.1 percent compared to last year's figure. The total catch of this fishery has decreased continuously since 1979, having peaked at 17,200 MT. After June, 1983, Korea had no baitboats based at Tema because of changes of the vessel's flags to other nations.

## 2. Research activities

The National Fisheries Research and Development Agency (FRDA) collected catch and effort data as well as size data on tunas and related species from the commercial fishing vessels as in the past.

Task I, II and size data were sent to ICCAT. Since mid-1983 the FRDA has been collecting length data for billfishes from fishermen. Length frequency data on sailfish and blue marlin were submitted this year for the first time.



**Table 1. Nominal catch (in MT), by species, of tunas and tuna-like fishes taken by Korean longliners in the Atlantic Ocean, 1971-1983**

<i>Year</i>	<i>Bluefin</i>	<i>Yellow- fin</i>	<i>Albacore</i>	<i>Bigeye</i>	<i>Skipjack</i>	<i>Sword- fish</i>	<i>Blue marlin</i>	<i>White marlin</i>	<i>Sail- fish</i>	<i>Other Billfishes</i>	<i>Others</i>	<i>Total</i>
1971	3,039	9,901	11,539	7,353	47	---	---	---	---	780	4,078	36,737
1972	30	11,078	13,577	5,730	45	---	---	---	---	1,714	3,562	35,736
1973	66	12,844	8,525	5,829	---	---	---	---	---	1,984	2,809	32,057
1974	56	15,518	5,216	7,376	116	---	---	---	---	1,335	3,951	33,568
1975	23	15,344	6,073	10,162	196	451	---	---	---	990	5,580	38,819
1976	10	11,211	8,755	6,747	26	1,147	---	---	---	1,015	2,664	31,575
1977	3	16,347	9,345	7,610	9	1,240	164	202	141	449	3,339	38,849
1978	---	11,512	4,418	9,182	42	1,333	177	79	29	111	2,211	29,094
1979	2	6,997	3,875	7,035	2	606	95	13	20	96	1,058	20,069
1980	---	5,869	1,487	8,963	4	683	9	1	5	167	1,764	18,952
1981	---	6,650	1,620	11,682	47	447	81	13	11	171	1,584	22,306
1982	---	5,872	1,889	10,615	21	684	17	24	16	114	1,781	21,033
1983	3	3,405	1,076	9,383	530	462	65	20	4	51	1,224	16,223

Table 2. Nominal catch (in MT), by species, of tunas and tuna-like fishes taken by Korean baitboats in the Atlantic Ocean, 1973-83

<i>Year</i>	<i>Yellowfin</i>	<i>Bigeye</i>	<i>Skipjack</i>	<i>Albacore</i>	<i>Unclassified &amp; others</i>	<i>Total</i>
1973	900	—	922	—	—	1,822
1974	2,169	—	2,123	—	120	4,412
1975	1,259	1,750	4,469	—	175	7,653
1976	365	810	1,948	—	216	3,339
1977	1,075	640	3,600	—	887	6,202
1978	941	965	8,132	43	283	10,364
1979	2,871	1,712	12,017	—	588	17,188
1980	2,122	563	6,718	113	385	9,901
1981	947	61	8,085	—	436	9,529
1982	22	—	3,386	—	95	3,503
1983	144	—	1,553	—	—	1,697

## NATIONAL REPORT OF SAO TOME AND PRINCIPE

by

G. ESPIRITO SANTO

### 1. Current status of the fishery

The Democratic Republic of São Tomé and Príncipe currently does not have a tuna fleet and for this reason it does not specifically target tunas.

Occasionally, the artisanal canoe fishery catches tunas during their daily fishing for bottom species and pelagic species.

This situation could change in the future when infrastructures capable of exploiting this important marine resource are developed.

### 2. The fleet

The fishing activities that are developing in São Tomé waters are almost exclusively carried out by foreign vessels.

### 3. Catches

#### *3.1 The national catch*

The total tuna catch by the artisanal canoes landed 103 MT in 1984, which is lower than the 1983 catch (149.3 MT).

#### *3.2 The foreign catch*

The problems to be resolved regarding statistics are complex. Up to the time of writing this report, we have received from those countries licensed to fish in the São Tomé Exclusive Economic Zone some data on total catches, species composition and size of the species.

Original report in French.

#### 4. Research

In 1984, research activities on tunas were carried out by a Soviet vessel in collaboration with technicians from São Tomé. The objectives were to study species composition, to examine biological characteristics, and to study hydrological and meteorological conditions which could have an influence on species distribution.

## NATIONAL REPORT OF SENEGAL

by

P. CAYRE

### 1. The tuna fishery

#### 1.1 *Yellowfin, skipjack and bigeye*

In 1983 the tuna fleet based at Dakar was comprised of 23 baitboats and 5 purse seiners. There is still a regular decrease in the outdated baitboat fleet. The number of baitboats decreased further to 21 in 1984.

Total catches for 1983 (9,722 MT) were lower than in 1982 (12,349 MT) (Table 1). However, this is considered normal as such a decrease has been recorded for more than six years. The decrease in total catches is partly due to the decline in skipjack catches (4,197 MT in 1983 compared to 6,233 MT in 1982).

In 1984 there was a slight decrease in total catches due to a sharp decrease in yellowfin and bigeye catches. This was partly compensated for by good skipjack catches.

The transshipments and landings of the FISM fleet in 1983 (7,004 MT) showed a marked decrease compared with those for 1982 (12,300 MT). The situation is more marked in 1984 due to the departure of most of this fleet for the Indian Ocean.

The landings by the Spanish tuna fleet are increasing substantially (8,876 MT in 1983 compared with 6,516 MT in 1982). However, this increase is insufficient to offset the decrease noted in total tonnage landed and transhipped at Dakar by the FISM fleet (31,000 MT in 1982 to 26,000 MT in 1983).

#### 1.2 *Other species*

In 1983, landings of small tunas (7,129 MT), especially Atlantic little tuna (5,905 MT) increased considerably due to the good catches made by the artisanal fishery (Table 2).

Sailfish catches decreased in 1983 (Table 3). It has been noted that the artisanal fishermen are not too interested in catching this species since during the sailfish season they found the good catches of other more commercial species more lucrative.

It should be noted that two longliners caught 365 MT of swordfish (*Xiphias gladius*) in 1983.

Original report in French.

## 2. Research

Data collection and sampling activities continued for all the tuna fleets in Senegal. Special attention was given to the problem of estimating species composition of the catches.

An informal preparatory meeting of the Working Group on Juvenile Tropical Tunas was held at the "Centre de Recherches Océanographiques" (CRO) from February 3 to 9, 1984, in Dakar. At this meeting, the structure and type of data bases necessary for a successful later meeting of the Working Group were defined. Scientists from the CRODT played an important part in the work of this Group and presented several documents at the formal meeting of the Working Group held in Brest (July 12-21, 1984).

## 3. References

The documents presented to the SCRS in 1984 are listed in Appendix 2 to Annex 10 and/or published in the Collective Volume of Scientific Papers, Vols. XXI and XXIII.

Table 1. The tuna fishery in Dakar, 1983-84

	<i>BB</i>	<i>Dakar-based PS</i>	<i>Total</i>	<i>FISM<sup>1</sup></i>	<i>Foreign vessels Spain<sup>2</sup></i>	<i>Total<sup>3</sup></i>
1983 Catch (MT)						
No. of boats . . . . .	23	5	28	17	20	37
Effort (days at sea) . . . . .	3272	734	---	770	---	---
Yellowfin . . . . .	2672	475	3147	3405	5842	9247
Skipjack . . . . .	2611	1586	4197	3592	2949	6541
Bigeye . . . . .	2019	359	2378	7	85	92
Total . . . . .	7302	2420	9722	7004	8876	15880
1984 Catch (MT) <sup>4</sup>						
No. of boats . . . . .	21	3	24	7	---	7
Effort (days at sea) . . . . .	---	---	---	---	---	---
Yellowfin . . . . .	807	437	1244	---	---	---
Yellowfin - Bigeye . . . . .	---	---	---	413	---	413
Skipjack . . . . .	2638	1847	4485	872	---	872
Bigeye . . . . .	609	329	938	---	---	---
Total . . . . .	4054	2613	6667	1285	---	1285

1. Landings and transshipments for 1983 and 1984.
2. 1984 landing data not available.
3. The 1984 total (up to August 31) does not include Spanish landings.
4. Provisional data up to August 31, 1984.

**Table 2. Landings (MT) of small tunas in Senegal (1982-1983)**

<i>Species</i>	<i>Artisanal fishery</i>	<i>1982 Commercial fishery</i>	<i>Total</i>	<i>Artisanal fishery</i>	<i>1983 Commercial fishery</i>	<i>Total</i>
Atlantic little tuna ( <i>Euthynnus alletteratus</i> ) . . . . .	2378	1006	3384	4572	1333	5905
West African Spanish mackerel ( <i>Scomberomorus tritor</i> ) . . . . .	310	---	310	662	---	662
Atlantic bonito ( <i>Sarda sarda</i> ) . . . . .	920	---	920	562	---	562
TOTAL . . . . .	3608	1006	4614	5796	1333	7129



**Table 3. Landings (MT) of sailfish (*Istiophorus albicans*) in Senegal in 1983**

	<i>Number of individuals</i>	<i>Weight (MT)</i>	<i>Percent</i>	<i>Percent in 1981 Report</i>
Artisanal fishery . . . . .	13,730	411.9	89.1	84.3
Sport fishery . . . . .	1,620	48.6	10.5	10.7
Commercial fishery . . . . .	57	1.7	0.4	5.0
TOTAL . . . . .	15,407	462.2	100.0	100.0
1982 Report. . . . .	21,358	640.7	---	---

## NATIONAL REPORT OF SOUTH AFRICA

by

J. P. MATTHEWS

## 1. The fishery

As before, the biggest catches were made during the summer months, especially over December and January. Albacore, forming 78 percent of the total catch of 3,714,484 kg, came mostly from pole fishing in the vicinity of the Tripp Seamount and South Bank. The yellowfin catch of 748,467 kg formed only 20 percent of the total catch. An interesting development in the fishery was the increase in the catch of broadbill swordfish. The 4,198 kg landed came mostly from incidental catches on longlines used for hake and kingklip.

## 2. Biological sampling

Measurements from 3,690 albacore were taken from 3,064 tons of tuna transshipped by 38 foreign vessels in Table Bay harbour. Unfortunately, no samples were taken from local vessels.

## 3. The environment

Biological and hydrological surveys were conducted in areas where local tuna vessels operated.

## NATIONAL REPORT OF SPAIN

by

A. GONZALEZ-GARCES  
SPANISH OCEANOGRAPHIC INSTITUTE

## 1. The fisheries

The Spanish catch of tunas and tuna-like species in the Atlantic and Mediterranean in 1983 amounted to 142,701 MT, which was 1,400 MT lower than the 1982 catch. However, this slight decrease in total catches does not give a clear picture of what occurred in the fisheries as there were significant increases in some fisheries while in others there were considerable decreases, as can be noted later in this report.

The catches, in metric tons, of the principal species for the last six years have been as follows:

<i>Year</i>	<i>YFT</i>	<i>SKJ</i>	<i>BET</i>	<i>BFT</i>	<i>ALB</i>	<i>SWO</i>	<i>OTH</i>	<i>TOTAL</i>
1978	31,535	31,553	6,528	4,190	25,404	4,342	6,803	110,337
1979	41,135	19,862	5,419	3,656	29,810	3,382	5,399	108,663
1980	38,759	26,384	8,430	2,468	25,202	4,560	10,365	116,168
1981	51,428	35,458	10,010	2,601	22,631	5,134	8,307	135,569
1982	54,164	38,016	9,332	3,813	26,156	5,454	7,205	114,140
1983	54,627	33,349	4,192	5,257	30,387	8,422	6,467	142,701

There are certain variations in the catches presented this year with respect to the historical series presented in last year's national report. These variations are due to modifications in the species breakdown of the tropical fleet, as agreed upon in the meeting of the Working Group on Juvenile Tropical Tunas (Brest July, 1984).

Spain catches tunas in four distinct areas of the Atlantic: the tropical area, the Canary Islands, the northeast Atlantic and the Mediterranean.

*1.1 Tropical fisheries*

Spain initiated its fishery in the tropical area in 1961 with a baitboat fleet that was gradually transformed into a fleet of large purse seiners. In 1983 the tropical Spanish fleet was comprised of 51 purse seiners, five more than in 1982, with a carrying capacity of

Original report in Spanish.

36,800 tons. The distribution of this fleet, according to vessel gross tonnage (GRT), was as follows:

<i>GRT</i>	<i>No. of vessels in 1983</i>
300-450	1
451-750	8
751-1250	24
more than 1250	18

As of August 31, 1984, three new vessels of more than 1,250 GRT were added to the fishery. However, in early 1984 six vessels shifted to the Indian Ocean. Thus, the carrying capacity was reduced by about 34,000 tons.

Catches from the east tropical Atlantic in the last few years, after corrections made at the meeting of the Working Group on Juvenile Tropical Tunas, were estimated as follows:

<i>Year</i>	<i>YFT</i>	<i>SKJ</i>	<i>BET</i>	<i>ALB</i>	<i>OTH</i>	<i>TOTAL</i>
1978	29,258	28,964	2,678	—	600	61,500
1979	39,938	17,480	2,444	—	800	60,662
1980	38,682	24,222	4,396	—	5,800	73,100
1981	51,332	31,307	7,598	889	4,685	95,811
1982	53,779	34,650	7,496	106	2,461	98,492
1983	51,871	31,829	1,588	295	2,472	88,055

In comparing these catch data with those presented in last year's report, we note variations in the species breakdown but not in the total catch.

Yields in 1983 were about 10,000 MT below the 1982 figure. This was due to a considerable decrease in the catch of the three main species in this fishery, yellowfin, skipjack and bigeye. Nevertheless, the species breakdown for the 1983 catch should be considered provisional until definitive corrections based on size sampling are made.

During the first three quarters of 1984, estimated yellowfin plus bigeye catches amounted to 30,000 MT, whereas skipjack plus some small yellowfin amounted to 35,000 MT. Total catches are estimated at about 67,000 MT.

In 1983, 1,957 MT of yellowfin and 209 MT of skipjack were caught in the western tropical Atlantic.

### *1.2 Canary Islands fisheries*

The Canary Islands tuna fleet is comprised mainly of small vessels of less than 20 GRT which use live bait. The number of vessels varied only by three vessels with respect to 1982; i.e., in 1983 there were 256 vessels of less than 20 GRT, 34 in the 20-50 GRT class, 26 in the 51-150 GRT class and a 750 GRT longliner.

Catches in this area in the last six years were as follows:

<i>Year</i>	<i>YFT</i>	<i>SKJ</i>	<i>BET</i>	<i>BFT</i>	<i>ALB</i>	<i>TOTAL</i>
1978	248	558	3,850	1,548	1,160	7,364
1979	145	1,330	2,975	758	604	5,812
1980	77	2,162	4,034	397	518	7,203*
1981	96	3,876	2,313	524	1,009	7,818
1982	385	3,366	1,449	43	519	5,762
1983	690	1,255	2,352	305	768	5,370

\*Includes 15 MT "Others".

The 1983 catches remained low and were less than in 1982, which represents the lowest level in the last thirteen years. Skipjack tuna, which had been the predominant species in 1981-1982, was once again in second place, following bigeye.

Up to September 30, 1984, the catches were estimated at 567 MT yellowfin, 736 MT skipjack, 1,994 MT bigeye, 162 MT bluefin, and 908 MT albacore.

### 1.3 Northeast Atlantic fisheries

Three fisheries which mainly take tunas and tuna-like species operate in this area: (1) the albacore fishery which operates from June to October in a large area from the Strait of Gibraltar to Ireland and from the European coasts to 35°W; (2) the swordfish fishery which operates mainly in the first and fourth quarters of the year in an area from Senegal to Ireland and from the African and European coasts to 35°W; and (3) the bluefin fishery which has two distinct fishing areas, one in the Bay of Biscay in the summer and another in the Gulf of Cadiz in the spring.

The fleet which operated in 1983 was comprised of 232 baitboats, 247 trollers, 185 longliners, 3 traps and an indeterminate number of vessels which take tunas sporadically (usually bluefin), although they do not target tuna species (for example, purse seiners directed at sardines, trawlers which set hand lines at night, vessels with gill nets in which tunas occasionally become caught, etc.).

Catches in this area during the last few years were as follows:

<i>Year</i>	<i>BFT</i>	<i>ALB</i>	<i>SWO</i>	<i>OTH*</i>	<i>TOTAL</i>
1978	2,477	24,244	3,611	2,623	32,955
1979	2,783	29,206	2,582	1,132	35,703
1980	1,938	24,684	3,810	1,150	31,582
1981	1,723	19,833	4,014	1,580	27,150
1982	2,781	24,959	4,554	1,501	33,795
1983	4,140	28,789	7,100	1,051	41,080

\*Includes bigeye, skipjack, frigate tuna, Atlantic little tuna and Atlantic bonito (10 MT of billfishes were also included in 1982).

It can be noted that in this area the 1983 catches increased considerably (by about 7,000 MT) due to increases in catches of the three major species in the area.

For January to September, 1984, catches were estimated at 3,000 MT bluefin, 20,000 MT albacore, 4,000 MT swordfish, and 700 MT others.

#### 1.4 Mediterranean fisheries

A varied fleet, which includes longliners, trollers, baitboats, small purse seiners, sport vessels and three traps, operates in this area.

Catches for the last few years were as follows:

<i>Year</i>	<i>BFT</i>	<i>ALB</i>	<i>SWO</i>	<i>BON</i>	<i>FRI</i>	<i>OTH</i>	<i>TOTAL</i>
1978	161	--	720	711	1,676	1,192	4,460
1979	115	--	800	713	1,771	993	4,392
1980	133	--	750	480	2,120	800	4,283
1981	354	900	1,120	710	1,700	6	4,790
1982	989	572	900	990	1,935	705	6,091
1983	812	535	1,322	1,225	2,135	1	6,030

Catches for 1983 were very similar to those in 1982 but were considerably higher than those for 1981 and previous years. It should be noted that in 1981 a bluefin fishery was initiated in this area.

It is expected that 1984 catches will be around the same level as 1983.

## 2. Research

### 2.1 Tropical fisheries

As regards data collection in 1983, information was obtained on catch and effort by month, area and gear (Task II) from more than 80 percent of the catch in the area. Size sampling was carried out this year and 33,611 fish (13,718 yellowfin, 15,114 skipjack, 2,066 bigeye and 2,713 fish of other species) were measured.

Collection of these data and sampling in African ports, where the Spanish fleet landed the majority of its catches, were carried out in cooperation with the "Centre de Recherches Océanographiques" of Abidjan (Ivory Coast), and with the "Centre de Recherches Océanographiques" of Dakar (Senegal). It should be noted that without their collaboration and help, the high statistical and sampling coverage would have been impossible to attain.

Research during 1983 and 1984 was centered on the ICCAT SCRS recommendations on tropical tunas. The results were given in documents presented at the Skipjack Conference in 1983, the 1983 SCRS Meeting, the meeting of the Working Group on Juvenile Tropical Tunas in 1984 and the 1984 SCRS Meeting. These documents give details of the activities of the Spanish tropical tuna fleet, such as studies of the duration of the sets, fishing power, fishing effort, species composition of the sets, and the behavior of the schools of fish with respect to the fisheries, the effects of lunar phases on yield, association of schools with floating objects, etc.

### 2.2 Canary Islands fisheries

As regards Task II statistics, catch data by area and species were collected with a coverage rate of 100 percent. In 1983, 7,223 fish of different species caught in this area were measured; 6,223 fish were measured in 1984 (up to September 30).

Two tagging cruises were carried out in Canary Islands waters, one in October, 1983, in which 105 skipjack were tagged, and another in April-May, 1984, in which 208 fish (skipjack, albacore, yellowfin and bigeye) were tagged. Of these, an albacore tagged in the Canary Islands area in April, 1984, was recovered in September of the same year in the northern area of the Bay of Biscay.

### 2.3 Northeast Atlantic fisheries

Detailed Task II data were collected with a coverage rate of 90 percent of the total catch and effort in this area. In 1983 size sampling was carried out on 16,175 albacore, 23,996 swordfish, 2,561 bluefin, 257 yellowfin and 76 bigeye tunas.

Two tagging cruises were carried out in 1983, one for albacore in which 271 albacore and 2 bluefin were tagged, and one for bluefin tuna in which 370 bluefin, 6 albacore and 1 bigeye tuna were tagged.

In 1984, through the efforts of samplers-reporters, a swordfish tagging program on commercial vessels was initiated in Galicia (northwest Spain). In this program, the fishermen themselves tag the young fish that are still alive when the longline is raised. To date, nine swordfish have been tagged using this system.

Also in 1984, sampling began on bluefin tuna, by sex, in the traps in the south of Spain. Intensive sampling is being carried out on frigate tuna in order to formulate a synopsis on this species and to determine if they are *A. thazard* or *A. rochei*, as their external

morphological characteristics do not coincide with the existing descriptions of either species.

Research on other species is shown in the documents presented to the 1983 and 1984 SCRS meetings. New evaluations of the North Atlantic albacore population were made, using production model and cohort analysis and yield-per-recruit analyses. Scientists of the NMFS-Southwest Fisheries Center (La Jolla, California, U.S.A.) collaborated in carrying out these evaluations. A size-weight relationship applicable to the Spanish albacore fishery was also carried out.

Laboratory research on bluefin tuna centered on studies of growth, migration and mortality rates, obtained from the results of tagging programs in the east Atlantic. Studies on the recruitment of this population were also carried out.

Swordfish studies dealt mainly with how possible changes in fishing effort would affect the populations.

#### *2.4 Mediterranean fisheries*

In 1984, the sampling and data networks were expanded to include the majority of the Spanish ports in the area and surveys and sampling were carried out in 10 of the 11 major ports. In 1983, 1,289 bluefin, 6,821 swordfish, 2,261 Atlantic bonito and 1,804 frigate tuna were measured.

The "Ichthyoplankton Collection Cruise" (carried out in July, 1984, south of the Balearic Islands), and the tagging cruises on age-class 0 juvenile bluefin were among the most important research activities in the Mediterranean area. There were 333 juvenile bluefin tagged in 1983 and 51 in 1984 as of the time of this report.

As regards the tagging cruises, two age-class 0 bluefin tagged in the Mediterranean in November, 1983, were recaptured in the Canary Islands area at the end of the summer of 1984. This clearly shows that juvenile bluefin leave the Mediterranean for the Atlantic.

### 3. Documents presented

The documents presented to the SCRS in 1984 are listed in Appendix 2 to Annex 10 and/or are published in the Collective Volume of Scientific Papers, Vols. XXI, XXII and XXIII.



## NATIONAL REPORT OF THE UNITED STATES

by

NATIONAL MARINE FISHERIES SERVICE\*

### 1. Introduction

The National Marine Fisheries Service maintains national responsibility for monitoring fishery statistics and conducting research on Atlantic tunas and tuna-like species. These activities are conducted primarily through the Southwest Fisheries Center in La Jolla, California, and the Southeast Fisheries Center in Miami, Florida.

### 2. Fisheries monitoring

The principal tropical tuna fisheries monitored in the Atlantic Ocean include those for yellowfin, skipjack and bigeye tunas, whereas the principal temperate tuna fisheries are those for bluefin and albacore tunas. Also monitored are statistics on the billfish fisheries and soombrid fisheries of lesser commercial importance. Monitoring includes not only the collection of data but the preparation of documents describing the process and results, timely submission of data to ICCAT and maintenance of a comprehensive data base.

#### 2.1 *Tropical tunas*

Total Atlantic catches of the three principal tropical tunas (yellowfin, bigeye and skipjack tunas) declined from approximately 376,000 MT in 1982 to 347,000 MT in 1983. The yellowfin catch of 141,000 MT was down 3 percent, the bigeye catch of 64,000 MT was down 3 percent and the skipjack catch of 143,000 MT was down 14 percent.

The United States combined catch of these species also declined from an estimated 1,990 MT in 1982 to 1,070 MT in 1983. The yellowfin catch of 226 MT was down 74 percent, the bigeye catch of 255 MT was down 32 percent and the skipjack catch of 589 MT was down 19 percent (Table 1). Decreased United States catches were due primarily to the total cessation of fishing effort in the east tropical Atlantic by United States purse seiners. United States catches in 1983 were made in the northwest Atlantic where five small purse seiners that typically fish for bluefin tuna accounted for approximately half the yellowfin catch and virtually all of the skipjack tuna catch. The United States swordfish longline fish-

\*Prepared by staff members of the Southwest Fisheries Center, La Jolla, California, and the Southeast Fisheries Center, Miami, Florida.  
Original report in English.

ery took most of the remainder of the yellowfin tuna catch and almost all of the bigeye tuna catch in the northwestern Atlantic.

Although United States catches have diminished in recent years, levels of Atlantic-caught tunas imported remain high. In 1983 approximately 47,500 MT of skipjack and 9,900 MT of mixed yellowfin and bigeye were imported in Puerto Rico. A port sampling program, initiated in Puerto Rico by the Southwest Fisheries Center in 1974, indicates the mixed yellowfin/bigeye catch was approximately 74 percent yellowfin and the remainder mostly bigeye tuna in 1983. The sampling also indicates that in 1983 a large percentage of the yellowfin and bigeye tuna imported were below the 55 cm size limit imposed by ICCAT.

The sampling in Puerto Rico of imports continues; from January 1 through August, 1984, 948 yellowfin, 633 bigeye and 521 skipjack tuna from the Atlantic Ocean have been measured. Two documents concerning this sampling program were prepared for the 1984 SCRS Meeting. One describes the stratified sampling scheme used in Puerto Rico and the other provides results of the 1983 sampling.

### *2.1 Temperate tunas and billfishes*

The Atlantic-wide catches of bluefin and albacore tunas in 1983 were 24,000 MT and 66,030 MT, respectively. These figures represent an 8 percent increase for bluefin tuna and a 9 percent decrease for albacore. Bluefin tuna continues to be regulated by quotas and size limits.

United States vessels caught 1,394 MT of bluefin and 18 MT of albacore in the Atlantic Ocean in 1983. The bluefin catch was double the 1982 catch and matched the United States 1983 quota. The catch was made by several types of gears including hook and line, purse seine, harpoon and longline. The 18 MT of primarily longline-caught albacore represented an 86 percent reduction from 1982.

Approximately 30,000 MT of Atlantic albacore were imported into Puerto Rico in 1983. This figure amounts to 45 percent of the Atlantic caught albacore and approximately one third of the total United States Atlantic-caught import of tunas in 1983.

The swordfish longline fishery in the northwest Atlantic caught approximately 2,100 MT of swordfish in 1983, down 43 percent from the 1982 catch. An additional 20 MT of marlin were caught incidental to this operation. United States recreational fishermen caught an estimated 187 MT of bluefin marlin and 141 MT of white marlin in 1983.

### **3. Research activities**

In addition to monitoring the various fisheries, scientists from the Southwest and Southeast Centers conduct research aimed at assessing the stocks of tuna and tuna-like species. This research includes the preparation and presentation of analyses, and coordination of national activities and participation in regular ICCAT meetings and special working groups.

### *3.1 Southwest Fisheries Center*

During 1983 and 1984, research at the Southwest Fisheries Center (SWFC) was largely directed toward the juvenile tuna problem. The surface fisheries of the Gulf of Guinea catch skipjack of a reasonable size but in so doing catch considerable amounts of small yellowfin and bigeye tunas which are mixed with the skipjack tuna. If these small yellowfin and bigeye tunas are allowed to survive and grow they would contribute more catch from the standpoint of yield per recruit. Effort by the Center included participation in the meeting of the Working Group on Juvenile Tropical Tunas held in Brest, France, in July 1984, and the preparation of two documents addressing the problem. The first document dealt with analytical considerations, the assumptions necessitated by varied degrees of data limitations, and possible approaches to a meaningful analysis of the situation. The second document dealt specifically with the methodology of determining yield per recruit of yellowfin tuna with varied levels of undersized catches and, also, the sensitivity of the methodology to the variability in certain parameters.

For the 1984 SCRS Meeting one document was prepared on the analysis of data collected by United States observers on board foreign vessels fishing in the Fisheries Conservation Zone. This analysis provides species composition and catch rates of tunas, billfishes and sharks caught by the Japanese longline fleet fishing off the East Coast of the United States and in the Gulf of Mexico in 1978, 1979 and 1980.

### *3.2 Southeast Fisheries Center*

Scientists at the Southeast Fisheries Center (SEFC) emphasized bluefin tuna research during 1983-1984. Bluefin tuna, the most heavily exploited of the tunas worldwide, was the subject of four SEFC-sponsored national workshops held at the Center during the past year at which invited scientists reviewed stock assessment procedures for bluefin tuna. Topics included improving the ICCAT catch-at-size data base, statistical estimation of catch-per-unit-effort indices of abundance, stock identification research, estimation of recreational catch, and evaluation of new or alternative methods for improving abundance estimates (aerial and ichthyoplankton surveys). Center scientists also assisted ICCAT personnel in implementing an ICCAT catch-at-size data base at a working meeting in Miami in May, 1984. In addition, Center scientists reviewed progress in bluefin research with a Japanese scientist in July, and participated in the Meeting of the Working Group on Bluefin Tuna in Dartmouth, Nova Scotia, in September-October, 1984.

Billfish research in 1984 emphasized the development of a swordfish data base (over 300,000 carcass weights have been collected and entered), age and growth studies of marlin for catch-at-age stock assessments, monitoring of catch and catch rates of billfish from tournaments and dock surveys and evaluation of statistical techniques for estimating indices of migration rates and to verify growth rates. Tag returns during 1984 have been especially useful. A sailfish at large for 11 years has shown that this species lives longer than had been previously thought. One blue marlin return has shown a four month, 7,300 km transatlantic migration from the Virgin Islands in the summer to the Gulf of Guinea in the winter

and another has shown the first documented blue marlin migration from the northern Gulf of Mexico to the Atlantic Ocean. Research activities in 1984 will permit stock assessment analyses to be completed during the coming year.

An extensive research effort was devoted to king mackerel during 1984. These efforts included: collection of charter boat catch-per-unit-effort data throughout the Gulf of Mexico and southeastern coasts of the United States, collection of size frequency data and collection of samples for stock identification analyses. Stock assessment studies included estimates of migration and mortality and evaluation of potential bag limits in recreational fisheries. Finally, an ichthyoplankton survey was conducted in August, 1984, in the Gulf of Mexico to determine the spawning area of king mackerel.

#### 4. Documents

The documents presented to the SCRS in 1984 are listed in Appendix 2 to Annex 10 and/or published in the Collective Volume of Scientific Papers, Vols. XXI, XXII and XXIII.

**Table 1. Catches and landings (MT) of Atlantic tunas and tuna-like fishes by American fishermen, 1967-83<sup>1</sup>**

<i>Year</i>	<i>Blue-fin</i>	<i>Yellow-fin<sup>2,3</sup></i>	<i>Albacore</i>	<i>Big-eye<sup>2</sup></i>	<i>Little tunny</i>	<i>Skip-jack<sup>2</sup></i>	<i>Bonito</i>	<i>Sword-fish</i>	<i>Spanish mackerel</i>	<i>King mackerel</i>	<i>Unclassified</i>	<i>Total</i>
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	1,852	9,747	9	248	113	8,492	224	3,039	3,310	2,507	31	29,572
1979	2,297	3,182	11	212	12	3,102	502	3,405	2,926	2,204	11	17,864
1980	1,505	2,118	21	202	88	3,589	195	3,535	5,429	3,192	513	20,387
1981	1,530	1,866	54	152	97	5,373	333	2,074	2,748	3,368	200	17,795
1982	689	883	126	377	87	731	209	3,746	3,747	3,713	962	15,270
1983 <sup>4</sup>	1,394	226	18	254	107	589	253	2,132	2,784	3,033	453	11,243

1 Estimated catch is for bluefin tuna, yellowfin tuna, albacore, bigeye tuna, skipjack tuna and little tunny. Landings are 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.

## NATIONAL REPORT OF THE U.S.S.R.

by

YU. A. VIALOV and V. V. OVCHINNIKOV  
ATLANTNIRO

## 1. The fisheries

In 1983, the total catch of tunas, swordfish and bonito taken in the Atlantic Ocean by the Soviet fleet amounted to 13,461 MT including 1,282 MT yellowfin, 352 MT bigeye, 1,223 MT skipjack, 6,528 MT little tuna, 1,655 MT frigate and bullet tunas, 46 MT swordfish and 2,375 MT bonito. Compared to 1982, the 1983 catch decreased by 5,267 MT due to a decrease in the catch of bigeye tuna (by 283 MT), skipjack (by 2,734 Mt), bonito (by 3,954 MT), frigate and bullet tunas (by 3,968 MT) and swordfish (by 49 MT). The catch of yellowfin and little tunas increased by 278 MT and 5,443 MT, respectively, which is attributed to an increase in purse seine fishing effort. The largest quantity of fish (9,300 MT) was taken by surface fishing gears. Purse seine and longline catches were 3,728 MT and 433 MT, respectively.

As in 1983, the fishery was conducted in the east-central and southeast Atlantic in the first half of 1984. According to preliminary data the catch was 5,571 MT, somewhat higher than for the same period in 1983 (4,952 MT).

## 2. Scientific research

In 1983-1984, research included studies on fishing and biological characteristics of skipjack from the east Atlantic, peculiarities of distribution, the fisheries and the state of bigeye and yellowfin tuna stocks from the Atlantic. Studies were also carried out on the ecological characteristics of small tunas (Atlantic little tuna, frigate and bullet tunas), which are taken by the purse seine and trawl fisheries.

2.1 *Skipjack*

There is an indication that skipjack from the east Atlantic are underexploited and are represented by two stock units (a north stock and a south stock) with seasonal mixing occurring in the equatorial area. Skipjack (south stock) have long seasonal migrations (from tagging data) of distances of over 2,000 km at a speed of up to 50 kms per day. Annual absolute increment for skipjack is 292 cm by the end of the first year of life, 13.7 cm by

Original report in English.

the end of the second year, 12.6 cm in the third year, 9.6 in the fourth year and 4.0 cm in the fifth year. Skipjack in the neritic zone mix with juvenile yellowfin and bigeye tunas in their habitat. In the open ocean, single schools of skipjack predominate. Therefore, fishing seems more rational outside economic zones to ensure the protection of juvenile yellowfin and bigeye tuna stocks.

## *2.2 Bigeye tuna*

From national fisheries statistics for 1970-1982 an estimate of the bigeye tuna stock size was made using virtual population analyses. The size of the total Atlantic stock was 124,000-181,500 MT, 98,800 MT for the north Atlantic stock and 61,000-93,900 MT for the south Atlantic stock.

## *2.3 Yellowfin tuna*

In Sub-areas 2 and 3 (surface fishing), significant year-to-year variability in the number of yellowfin tunas was recorded and so the size of potential catch may vary 2-3 times. In 1983 no juvenile yellowfin tuna were found in the catches. Mixed schools of yellowfin tunas and dolphins were observed for the first time.

## *2.4 Small tunas*

In the same areas, spawning aggregations of frigate and bullet tunas easily available to surface fishing gears were recorded in February-June. These species spawn at a water temperature of 24.5-28.5°C with a salinity of 30.2-35.3 ppm. The fish are 26-49 cm long (39 cm on the average), and their weight is 0.3-2.2 kg (1.0 kg on the average).

Biological statistics on Atlantic little tuna from the central east Atlantic for 1971-1982 were summarized. Lengths of this species ranged between 32-75 cm (38 cm on the average) and weights ranged 0.4-7.4 kg (1.9 kg on the average). The most intense spawning was recorded in June in the Gulf of Guinea area. The bulk of the commercial catches is represented by age 2 fish measuring 48 cm in length.

## *2.5 Immature (juvenile) tunas*

During the meeting of the Working Group on Juvenile Tropical Tunas (Brest, France-1984), the Soviet delegation pointed out that the by-catch of juvenile bigeye and yellowfin tunas from the open ocean is small and constitutes 1.72-3.9 percent of the total catch, i.e., considerably lower than the current regulatory measures envisage.

In the economic zones of sub-areas 2 and 3, juvenile tunas account for 14.4 percent of the catch. The percentage of juvenile tunas is considerably lower in multi-species mixed schools from the open ocean (1.5 percent) than from the economic zone (32 percent). The proportion of immature tunas is also low in the specialized purse seine fishing which uses floating objects.

### 3. Preliminary data for 1984

Data on the U.S.S.R. catch of tunas for the first half of 1984 show a total of 5,571 MT of tunas caught (2,620 MT frigate tuna, 1,280 MT yellowfin, 1,230 MT skipjack and 441 MT Atlantic little tuna).

### 4. Research cruises

Two research cruises and one cruise aimed at studying longline and purse seine fishing for tunas were carried out in 1983-1984. Five observers were on board commercial seiners and two observers on board the tuna mother-ship.

The materials collected on these cruises were as follows:

- massive measurements	12,588 sp.
- biological analysis	4,178 sp.
- age samples	2,478 sp.
- muscle samples for genetic-biochemical analysis	2,390 sp.
- samples for feeding studies	50 sp.
- samples for fecundity studies	40 sp.
- fish tagged	98 sp.

### 5. Documents submitted to ICCAT

The documents presented to the SCRS in 1984 are listed in Appendix 2 to Annex 10 and/or are published in the Collective Volume of Scientific Papers, Vol. XXI.



## NATIONAL REPORT OF VENEZUELA

### 1. Fisheries

The total Venezuelan catch in 1983 by the tuna fleet amounted to 38,193 MT\*, broken down as follows:

Skipjack	13,864 MT
Albacore	874 MT
Sharks	649 MT
Yellowfin	17,645 MT
Misc. tunas	4,813 MT
Other species	344 MT

\*These catch figures do not take into account the correction factor for data coverage.

During 1983, 60 tuna vessels were in operation: 14 baitboats, 16 purse seiners and 30 longliners. The catches of these vessels are broken down as follows:

Purse seine	31,127 MT
Longline	2,483 MT
Baitboat	4,583 MT

Fishing activities took place in FAO areas 31 (northwest Atlantic) and 77 (eastern Pacific), while the landing sites were Cumaná and Carupano, Estado Sucre. These two cities are located on the east coast of Venezuela. Five of the tuna processing plants in operation in this country are located in Cumaná.

In 1984, there was a 13,690 MT increase in the catches of the tuna fleet, and the number of vessels in operation increased by 19 in relation to the previous year. Area 31 was the most active as regards fishing trips, especially in the Caribbean area.

### 2. Research

Biological sampling for size, weight and age are carried out on the principal tuna species in Cumaná.

Original report in Spanish.

## NATIONAL REPORT OF TAIWAN

by

R. T. YANG

## 1. The fisheries

Due to the greater demand and higher price for albacore in Puerto Rico and to the rather low fish price and relatively high fuel price in Cape Town, a significant change occurred in the operation of Taiwanese fleets in the Atlantic in 1983. Vessels of 300 tons and above moved from the southern to the northern hemisphere while those smaller than 300 tons shifted from the Atlantic to the Indian Ocean. As a result, the total number of longliners in the Atlantic decreased from 200 vessels in 1982 to 99 at the end of 1983, and the total landings also decreased from 38,800 MT in 1982 to 27,780 MT in 1983. Nevertheless, albacore was still the target species in 1983 and comprised 88.5 percent of the total landings (23,756 MT). Of the albacore landings, 14,254 MT were from the North Atlantic and 9,502 MT were from the south Atlantic.

## 2. Statistics

*2.1 Task I statistics*

Landing reports made at the base ports in the Atlantic were used to estimate Task I statistics. Landing statistics were reported by local agents, in weight by species, to the fishing companies in Taiwan. Each company then summarized the landing statistics and reported them to the Taiwan Fisheries Bureau. The TFB compiled and released the official landing statistics by port. Based on these, Task I statistics were estimated and submitted to the ICCAT Secretariat.

*2.2 Task II Statistics*

Logbooks filled out on board for each vessel operating in the Atlantic were either mailed directly to the company or transferred by local agents at the base port to the company in Taiwan. Each company then submitted the logbooks to the TFB, which made the first check. Next, the TFB transferred them to the Tuna Research Center located at the Taiwan University's Institute of Oceanography. Lastly, the TRC double checked the logbooks before compiling them by computer.

Original report in English.

To compile Task II statistics, monthly coverage rates for each 5x5 degree square were estimated. Each unit areas coverage rate was calculated by:

$$\text{Coverage rate} = \frac{\text{Total no. of hooks of the logbooks returned}}{\text{Total no. of hooks used}}$$

The total number of hooks used in each unit area was obtained by summarizing the Daily Position Reports of Vessels, provided by the Fishery Radio Station, Kaohsiung, which is operated by the TFB. According to regulations, all vessels in distant waters have to report their position daily while operating at sea. The number of hooks for each vessel is also provided by the TFB.

Thus, the logbooks collected were summarized and raised to 100 percent based on the monthly coverage rate of each unit area.

### *2.3 Biological data*

All of the vessels in the Atlantic were requested to conduct on-board size measurements on the first 30 fish captured in each operation. The size data were either mailed directly along with the logbook or transferred by the local agent at the base port to the company in Taiwan. Each company then submitted them to the TFB which subsequently passed them on to the TRC. The TRC compiled these size data by quarter in both ICCAT large area units and 5x5 degree square units and presented them to the ICCAT Secretariat.

### 3. Quick projected annual catch estimates for 1984

As of August, 1984, the number of vessels fishing in the Atlantic was 109. Based on landing statistics for the first six months, by port, this year's total landings will be approximately 29,900 MT.

### 4. Research

Standardized total longline effort on albacore was updated to 1983. Based on this, fishing intensity and CPUE of the albacore longline fishery were analyzed. Evaluation of the south Atlantic albacore stock was also updated to 1983. The results of these studies are summarized in two working papers which were presented at the 1984 SCRS Meeting.

### 5. Documents

The documents presented to the SCRS in 1984 are listed in Appendix 2 to Annex 10 and/or are published in Collective Volume of Scientific Papers, Vol. XXIII.